

ARTICLES

MEDICAL OR RECREATIONAL MARIJUANA AND DRUGGED DRIVING

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ABSTRACT

Beginning in the 1920s and lasting for seventy years, state and federal law treated marijuana as a dangerous drug and as contraband, forbidding its cultivation, distribution, possession, and use. Over the last two decades, however, numerous states have enacted laws permitting marijuana to be used for medical treatment. Some also permit its recreational use. Those laws have raised a host of novel legal and public policy issues. Most of the discussion, and almost all of the litigation, has involved the respective roles of the states and federal government and how each one may and should deal with this very controversial subject. One issue that has received little attention in the legal community is the risk that medical and recreational marijuana laws will pose to highway safety. Will those laws increase, decrease, or leave untouched the rate of accidents and fatalities on our nation's roadways? How should the criminal justice system—in particular, its law enforcement officers—address the problem of “drugged driving” in general and in states with medical marijuana laws? This Article addresses those issues. Some of the possible solutions do not involve changing the law. Training law enforcement officers to better spot drugged drivers, developing safe, reliable, portable, and inoffensive devices to test drivers for marijuana use on a highway shoulder, identifying a particular concentration of marijuana in the blood or some other bodily fluid that can be used to establish impairment—those and other steps can be taken without changing the legal framework for addressing the problems that occur when people drive under the influence of an intoxicating substance. But it also may be necessary to modify the laws governing alcohol in order to reduce the crashes caused by marijuana use. People often take those drugs in combination, and a marijuana-alcohol cocktail is more debilitating than either drug consumed alone. States therefore may need to lower their thresholds for drunken driving in order to dissuade people who use marijuana and alcohol together from getting behind the wheel.

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INTRODUCTION

Driving is a complex activity requiring alertness, divided yet wide-ranging attention, concentration, eye-hand-foot coordination, and the ability to process visual, auditory, and kinesthetic information quickly.¹ Although there have been reckless drivers for as long as there have been motor vehicles, psychoactive

1. See ROBERT L. DUPONT, *THE SELFISH BRAIN: LEARNING FROM ADDICTION* 135 (rev. ed., 2000); Gary M. Reisfield et al., *The Mirage of Impairing Drug Concentration Thresholds: A Rationale for Zero Tolerance Per Se Driving Under the Influence of Drugs Laws*, 36 J. ANALYTICAL TOXICOLOGY 353, 353 (2012). A driver must successfully divide his concentration when he tunes a radio or switches CDs while remaining alert to his surroundings and traffic. See DUPONT, *supra*, at 135.

substances like alcohol can impair the driving skills of even the most careful Formula One racer. Operating a motor vehicle while under the influence of alcohol—known by the acronyms DWI, DUI, or OWI—demonstrably impairs the skills necessary for driving safely, making driving a hazardous activity.² Alcohol hampers tracking skills, attention, signal detection, hazard perception, reaction time, concentration, and hand-eye coordination.³ It also reduces the perceived negative consequences of risk-taking.⁴ Alcohol is also notorious for diminishing a person's driving skills even before he becomes aware of any impairment.⁵

Aware of the problems created by alcohol-impaired drivers early in the twentieth century,⁶ states began to address the problem by prohibiting “driving while intoxicated” or “driving under the influence” of alcohol.⁷ The states, however, did not stop there. By 2012, all fifty states and the District of Columbia adopted laws that deem driving with a specific blood-alcohol concentration level—0.08 grams per deciliter (g/dL)—as a crime. The effect of those laws is to render a driver with that BAC intoxicated as a matter of law, whether or not he was impaired in fact.⁸ Those two sets of laws are a mainstay in the attempt to reduce mortality on our roadways.

2. “Traditionally, ethanol has been the drug of greatest concern in relation to driving impairment. Ethanol is by far the most frequently documented drug in fatal motor vehicle accidents.” Consensus Dev. Panel, *Consensus Report: Drug Concentrations and Driving Impairment*, 254 J. AM. MED. ASS'N 2618, 2619 (1985) [hereinafter *AMA Consensus Report*].

3. See, e.g., DUPONT, *supra* note 1, at 135; R. Andrew Sewell et al., *The Effect of Cannabis Compared with Alcohol on Driving*, 18 AM. J. ON ADDICTIONS 185, 188 (2009).

4. See, e.g., Sewell et al., *supra* note 3, at 186.

5. See, e.g., STEVEN B. DUKE & ALBERT C. GROSS, AMERICA'S LONGEST WAR: RETHINKING OUR TRAGIC CRUSADE AGAINST DRUGS 37 (1993); DUPONT, *supra* note 1, at 134–36; Robert D. Budd et al., *Drugs of Abuse Found in Fatally Injured Drivers in Los Angeles County*, 23 DRUG & ALCOHOL DEPENDENCE 153, 155 (1989).

6. “Inebriates and moderate drinkers are the most incapable of all persons to drive motor wagons. The general palsy and diminished power of control of both the reason and senses are certain to invite disaster in every attempt to guide such wagons.” Eric J. Gouvin, *Drunk Driving and the Alcoholic Offender: A New Approach to an Old Problem*, 12 AM. J.L. & MED. 99, 100 (1986) (quoting a 1904 editorial from the *Quarterly Journal of Inebriety*) (internal quotation marks omitted).

7. See, e.g., Motor Vehicle Act of 1915, CAL. STATE LAWS 1915 § 17, as amended by 1915 Cal Stat. 214 (“No person who is under the influence of intoxicating liquor and no person who is an habitual user of narcotic drugs shall operate or drive a motor or other vehicle on any public highway within this state.”); An Act Relative to Automobiles and Motor Cycles, ch. 412, § 4, 1906 Mass. Acts 419, 422 (making the operation of an automobile or motorcycle “while under the influence of intoxicating liquor” a misdemeanor); Robert L. DuPont et al., *The Need for Drugged Driving Per Se Laws: A Commentary*, 13 TRAFFIC INJURY PREVENTION 31, 32 (2012) (summarizing state laws about prohibition of alcohol-impaired driving); Robert B. Voas et al., *Prescription Drugs, Drugged Driving and Per Se Laws*, 19 INJ. PREVENTION 218, 218 (2014) (“Impaired driving laws date back to the early part of the 20th century when states first criminalized alcohol-impaired driving.”). For a current statute, see VA. CODE ANN. § 18.2-266 (2014) (“It shall be unlawful for any person to drive or operate any motor vehicle, engine or train (i) while such person has a blood alcohol concentration of 0.08 percent or more by weight by volume or 0.08 grams or more per 210 liters of breath as indicated by a chemical test administered as provided in this article, (ii) while such person is under the influence of alcohol . . .”).

8. See 23 U.S.C. § 163(a) (2012); *Missouri v. McNeely*, 133 S. Ct. 1552, 1565 & n.8 (2013); 23 C.F.R. § 1225.1 (2012); NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 811 870, ALCOHOL-IMPAIRED DRIVING 1 (2013).

Alcohol, however, is not the only drug that impairs a person's driving skills. Other psychoactive substances can also have that effect. As a result, over time states added various drugs to their statutes making it a crime to drive under the influence of alcohol.⁹ One of those drugs is marijuana.¹⁰

Marijuana, a plant with an ancient origin,¹¹ is the third most commonly used recreational drug worldwide, after only alcohol and tobacco.¹² It also is the most widely used illicit drug despite having been under international control for eight

9. See, e.g., VA. CODE ANN. § 18.2-266 (2014) ("It shall be unlawful for any person to drive or operate any motor vehicle, engine or train . . . (iii) while such person is under the influence of any narcotic drug or any other self-administered intoxicant or drug of whatsoever nature, or any combination of such drugs, to a degree which impairs his ability to drive or operate any motor vehicle, engine or train safely, (iv) while such person is under the combined influence of alcohol and any drug or drugs to a degree which impairs his ability to drive or operate any motor vehicle, engine or train safely, or (v) while such person has a blood concentration of any of the following substances at a level that is equal to or greater than: (a) 0.02 milligrams of cocaine per liter of blood, (b) 0.1 milligrams of methamphetamine per liter of blood, (c) 0.01 milligrams of phencyclidine per liter of blood, or (d) 0.1 milligrams of 3,4-methylenedioxymethamphetamine per liter of blood."); Voas et al., *supra* note 7, at 218. Alcohol remains, however, the most commonly used recreational drug. See, e.g., Alan W. Jones et al., *Driving Under the Influence of Cannabis: A 10-Year Study of Age and Gender Differences in the Concentrations of Tetrahydrocannabinol in Blood*, 103 ADDICTION 452, 453, 457 (2008).

10. The psychoactive ingredient in marijuana is Δ^9 -tetrahydrocannabinol (THC), although other cannabinoids also have pharmacological effects. An intoxicating dose of THC is extremely small, just 100–200 micrograms (μ g). THC affects receptors in the brain in regions involved in cognition, memory, reward, pain perception, and motor coordination. The THC content in marijuana varies according to phenotype, soil, climate, and cultivation technique. The concentration of THC is highest in the flowering top of the female plant. See, e.g., BRITISH MED. ASS'N, THERAPEUTIC USES OF CANNABIS 7, 10–11 tbl.1 (1997) [hereinafter BRITISH MED. ASS'N]; LESLIE L. IVERSEN, THE SCIENCE OF MARIJUANA 27–65, 189 (2d ed. 2008); Wayne Hall & Louisa Degenhardt, *Adverse health effects of non-medical cannabis use*, 374 LANCET 1383, 1383–84 (2009); Richard L. Hawks, *The Constituents of Cannabis and the Disposition and Metabolism of Cannabinoids*, in NAT'L INST. ON DRUG ABUSE, U.S. DEP'T OF HEALTH & HUMAN SERVS., at 125, 125–26 (Richard L. Hawks ed., 1982), available at <http://archives.drugabuse.gov/pdf/monographs/42.pdf>; Zlatko Mehmedic et al., *Potency Trends of Δ^9 -THC and Other Cannabinoids in Confiscated Cannabis Preparations from 1993 to 2008*, 55 J. FORENSIC SCI. 1209, 1209 (2010). Cannabis is also grown for use as hemp, but that species of the plant does not contain a sufficient quantity of THC for it to serve as a drug. "In contrast to psychoactive marijuana plants, which contain 2% THC or more, industrial hemp often contains as little as .15% THC At this concentration, smoking a whole field would not create intoxication." MITCH EARLEYWINE, UNDERSTANDING MARIJUANA: A NEW LOOK AT THE SCIENTIFIC EVIDENCE 4 (2002).

11. Archaeological evidence shows that man used naturally growing marijuana—labeled in 1753 by Swedish botanist Carl Linnaeus as *Cannabis sativa* L.—before the Neolithic Revolution, more than ten thousand years ago. See, e.g., BRITISH MED. ASS'N, *supra* note 10, at 7; RICHARD J. BONNIE & CHARLES H. WHITBREAD II, THE MARIJUANA CONVICTION: A HISTORY OF MARIJUANA PROHIBITION IN THE UNITED STATES 1–2 (1999); JONATHAN P. CAULKINS ET AL., MARIJUANA LEGALIZATION: WHAT EVERYONE NEEDS TO KNOW 18 (2012); Sunil K. Aggarwal et al., *Medicinal Use of Cannabis in the United States: Historical Perspectives, Current Trends, and Future Directions*, 5 J. OPIOID MGMT. 153, 153–57 (2009); Gregg A. Bilz, *The Medical Use of Marijuana: The Politics of Medicine*, 13 HAMLINE J. PUB. L. & POL'Y 117, 118 (1992); Hawks, *supra* note 10, 125; Solomon H. Snyder, *Foreword*, in IVERSEN, *supra* note 10, at v, 12–13, 17–18, 21–24, 116, 121; Alex Kreit, Comment, *The Future of Medical Marijuana: Should the States Grow Their Own?*, 151 U. PA. L. REV. 1787, 1793 & n.39 (2003).

12. See CAULKINS ET AL., *supra* note 11, at 16; IVERSEN, *supra* note 10, at 189. Approximately forty percent of the population in this nation has tried marijuana. Sewell et al., *supra* note 3, at 185.

decades.¹³ Aside from the psychoactive effect of marijuana, two facts make its use particularly troublesome for highway safety: marijuana use is common among young people,¹⁴ and young drivers account for a disproportionate share of traffic accidents.¹⁵

Until recently, society did not focus specifically on the problems caused by drugged driving. The federal and state governments made it a crime to manufacture, cultivate, distribute, and possess “controlled substances,” including marijuana. The assumption was that, by outlawing cannabis, the criminal law would dissuade people from using it, whether or not they were driving.

Over the last few years, however, numerous states have revised their laws and now permit marijuana to be used for medical purposes.¹⁶ Four states and the District of Columbia have gone even further and have decriminalized under state

13. United Nations Conventions adopted in 1961 and 1988—to which the United States is a signatory—require nations to treat marijuana production and use as a crime. See IVERSEN, *supra* note 10, at 222; ROBIN ROOM ET AL., CANNABIS POLICY: BEYOND STALEMATE 3, 7–8 (2010).

14. The age of first use has declined over the past fifty years. On average, first-time users of marijuana are five years younger today than they were in the 1960s, when people often first smoked marijuana as college students. See CAULKINS ET AL., *supra* note 11, at 12. Nonetheless, few Americans go on to become habitual users; most desist in their mid-to-late 20s after a small number of experimental or recreational uses. See Hall & Degenhardt, *supra* note 10, at 1383; Sewell et al., *supra* note 3, at 185; see also, e.g., JEFFREY A. MIRON, DRUG WAR CRIMES: THE CONSEQUENCES OF PROHIBITION 67 tbl.5.1 (2004); Steven D. Levitt, *Review of Drug War Heresies by MacCoun and Reuter*, 41 J. ECON. LIT. 540, 540 (2003). In America, usage drops steeply after youths obtain full-time employment, get married, and become parents. Only (and approximately) ten percent of persons who try marijuana become daily users, with only 20–30 percent (again, approximately) becoming weekly users. See Hall & Degenhardt, *supra* note 10, at 1383. See also CAULKINS ET AL., *supra* note 11, at 16; IVERSEN, *supra* note 10, at 189; DAVID F. MUSTO, THE AMERICAN DISEASE: ORIGINS OF NARCOTICS CONTROL 217 (3d ed. 1999).

15. Drivers under age twenty-five account for a quarter of all traffic fatalities, and the fatality rate for teenage drivers is four times as large as the rate for persons between twenty-five and sixty-nine. See, e.g., Sewell et al., *supra* note 3, at 185. The greater incidence of accidents and fatalities among young drivers is attributable to several factors, such as inexperience behind the wheel, an overconfident, thrill-seeking attitude, late night driving, failing to wear a seatbelt, and being a male. See, e.g., RICHARD COMPTON & AMY BERNING, NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP’T OF TRANSP., DOT HS 811 174, RESULTS OF THE 2007 NATIONAL ROADSIDE SURVEY OF ALCOHOL AND DRUG ABUSE BY DRIVERS 1 & fig.2 (2009); Sewell et al., *supra* note 3, at 185–86. Young drivers are more likely than older ones to drive after using marijuana. See Rebecca L. Hartman & Marilyn A. Huestis, *Cannabis Effects on Driving Skills*, 59 CLINICAL CHEMISTRY 478, 479 (2013) (“Cannabis smokers share demographic characteristics similar to those of other groups with a high crash risk, including youth (ages 18–25 years), male sex, risk taking, and high drunk-driving incidence . . .”); Carl Soderstrom et al., *Marijuana and Alcohol Use Among 1023 Trauma Patients*, 123 ARCHIVES SURGERY 733, 734 (1988) (finding that “[m]arijuana use was significantly greater in those 30 years of age or younger and among men.”).

16. See ALA. CODE § 13A-12-214.2 (2014); ALASKA STAT. ANN. §§ 17.37.010–17.37.080 (2014); ARIZ. REV. STAT. ANN. §§ 36-2801 to 36-2819 (2014); CAL. HEALTH & SAFETY CODE §§ 11362.5, 11362.7–11362.83 (West 2014); COLO. REV. STAT. ANN. § 25-1.5-106 (West 2014); CONN. GEN. STAT. § 21a-408 (2014); DEL. CODE ANN. tit. 16, Ch. 49A (2015); HAW. REV. STAT. ANN. §§ 329-121 to 329-128 (2014); 410 ILL. COMP. STAT. ANN. 130/1 (2014); ME. REV. STAT. ANN. tit. 22, § 2383-B (2014); MASS. GEN. LAWS ch. 94C, § 32L (2014); MICH. COMP. LAWS § 333.26424(j) (2014); MONT. CODE ANN. § 50-46-301 (2014); NEV. REV. STAT. ANN. §§ 453A.010 to 453A.240 (West 2014); N.H. REV. STAT. ANN. § 126-X:2 (2013); N.J. STAT. ANN. §24:6I (West 2014); N.M. STAT. ANN. § 30-31C-1 (2014); 2014 N.Y. Laws 90 (A.6357-E); OR. REV. STAT. ANN. § 475.300 (2014); R.I. GEN. LAWS ANN. § 21-28.6 (West 2014); VT. STAT. ANN. tit. 18, §4474b (2014); WASH. REV. CODE ANN. § 69.51A.040 (West 2014); see also, e.g., William Vertes & Sarah Barbantini, *Caught in the Crossfire: The Dilemma of Marijuana “Medicalization” for Health Care Providers*, 58 WAYNE L. REV. 103, 105 n.17 (2012) (collecting ballot

law the possession and use of small amounts of marijuana.¹⁷ Those decisions complicate the question of how the criminal justice system should treat cannabis use. If that drug is not always and everywhere contraband, if it can be used for at least some purposes, the criminal justice system will need to address the distinct problems that arise when those new medical and recreational marijuana laws intersect with the statutes criminalizing reckless driving and driving under the influence of alcohol. It may or may not be the case that the current legal framework is adequate to address the risk that drugged driving will contribute to the mortality we already witness from the combination of alcohol and motor vehicles. If our existing framework is not sufficient, then we will need to identify and implement new remedies to deal with the intersection of those important and controversial public policies.

This Article analyzes the problem of drugged driving and the remedies available to deal with it. This Article does not take a position on any of the public-policy issues that are part of the current debate over marijuana legalization. That debate has lasted for fifty years, with numerous scholarly works endorsing one position or the other, and the prospect is slim that any one of them will triumph any time soon. The White House Office of National Drug Control Policy does not believe that either bookend proposal to today's drug problems—draconian punishment or complete legalization—is a good solution.¹⁸ Given the important role that that office plays in setting our national drug control strategy, it is unlikely that the nation will adopt either of those alternatives. Accepting our current legal framework therefore seems to be a reasonable starting point. Accordingly, taking as a given our current federal and state positions on cannabis policy, I propose to address two questions: (1) What effects will the recent state decriminalization efforts have on highway safety? (2) If there is an actual or potential adverse effect, what can we do about it? Answering those questions is difficult enough without also taking on the issue whether our national drug control policy should be fundamentally changed.¹⁹

measures); Claire Frezza, Note, *Medical Marijuana: A Drug Without a Medical Model*, 101 GEO. L.J. 1117, 1118 (2013). Additional states might consider that issue in 2016. See *infra* text accompanying note 270.

17. See 2013 Wash. Legis. Serv. ch. 3 (1.M.502) (West) (amending WASH. REV. CODE § 69.50.4013 (2014)); AMENDMENT 64: USE AND REGULATION OF MARIJUANA (2012) (amending COLO. CONST. art. XVIII, § 16(3)); TODD GARVEY & BRIAN T. YEH, CONG. RESEARCH SERV., R43034, STATE LEGALIZATION OF RECREATIONAL MARIJUANA: SELECTED LEGAL ISSUES 1–5 (2014) (summarizing the Colorado and Washington Initiatives); WILLIAM J. BENNETT & ROBERT A. WHITE, GOING TO POT: WHY THE RUSH TO LEGALIZE MARIJUANA IS HARMING AMERICA 9–10 (2015). That issue also might appear on the ballot in additional states in 2016. See *infra* text accompanying note 270.

18. OFFICE OF NAT'L DRUG CONTROL POLICY, NATIONAL DRUG CONTROL STRATEGY 1–2 (2013) ("In recent years, the debate about drug policy has lurched between two extremes. One side of the debate suggests that drug legalization is the 'silver bullet' solution to drug control. The other side maintains a law enforcement-only 'War on Drugs' mentality Neither of these approaches is humane, effective, or grounded in evidence.").

19. The drug policy literature is enormous, diverse, and growing. For a sample of competing views on the general subject, see DRUG LEGALIZATION: FOR AND AGAINST (Rod L. Evans & Irwin M. Berent eds., 1992); DUKE & GROSS, *supra* note 5; DUPONT, *supra* note 1; GENE M. HEYMAN, ADDICTION: A DISORDER OF CHOICE (2009);

The discussion below proceeds as follows. Part I summarizes how the federal and state governments have used the criminal law to prohibit the cultivation, distribution, possession, and use of marijuana for most of the twentieth century. That section also describes how medical or recreational marijuana use creates a problem for a nation committed to enhancing the safety of driving on our nation's roads. Part II relates the story of the relatively recent movement to create an exception to the current criminal laws for the supposedly limited, small-scale use of marijuana as a medical treatment or for recreational use. Part III discusses the current state of scientific knowledge regarding the problems caused by drugged driving. Part IV asks whether we can use the same legal framework now used to identify and punish alcohol-impaired drivers also to spot and penalize marijuana-impaired drivers. Part V offers proposals for going forward that do and do not involve a change in the law and discusses the problems that society will have choosing whether to follow those paths. Part V concludes that, at the end of the day, one way to limit the mortality caused by drugged driving is to lower the BAC cap for alcohol. That remedy will at least help deter individuals from driving after using the two drugs together.²⁰

I. THE INTERSECTION OF TWO IMPORTANT AND CONTROVERSIAL PUBLIC POLICY ISSUES

If the penal code represents contemporary criminal justice policy, until the last decade of the twentieth century there was a national consensus that the cultivation,

DRUG ADDICTION AND DRUG POLICY: THE STRUGGLE TO CONTROL DEPENDENCE (Philip B. Heymann & William N. Brownsberger eds., 2001); DOUGLAS HUSAK & PETER DE MARNEFFE, *THE LEGALIZATION OF DRUGS* (2005); JOHN KAPLAN, *THE HARDEST DRUG: HEROIN AND PUBLIC POLICY* (1985) [hereinafter KAPLAN HEROIN]; MARK A.R. KLEIMAN, *AGAINST EXCESS: DRUG POLICY FOR RESULTS* (1992); ROBERT J. MACCOUN & PETER REUTER, *DRUG WAR HERESIES* (2001); H. WAYNE MORGAN, *DRUGS IN AMERICA: A SOCIAL HISTORY, 1800–1980* (2001); SALLY L. SATEL, *DRUG TREATMENT: THE CASE FOR COERCION* (1999); John Kaplan, *Taking Drugs Seriously*, 92 PUB. INT. 32 (1988); Ethan A. Nadelmann, *The Case for Legalization*, 92 PUB. INT. 3 (1988); James Q. Wilson, *Against the Legalization of Drugs*, 89 COMMENT. 21 (1990). For a sample of authorities dealing specifically with marijuana, see BONNIE & WHITBREAD II, *supra* note 11; CAULKINS ET AL., *supra* note 11; WAYNE HALL, *CANNABIS USE AND DEPENDENCE: PUBLIC HEALTH AND PUBLIC POLICY* (2003); JOHN KAPLAN, *MARIJUANA: THE NEW PROHIBITION* (1969) [hereinafter KAPLAN MARIJUANA]; MARK A.R. KLEIMAN, *MARIJUANA: COSTS OF ABUSE, COSTS OF CONTROL* (1989) [hereinafter KLEIMAN COSTS]; KEVIN A. SABET, *REEFER SANITY: SEVEN GREAT MYTHS ABOUT MARIJUANA* (2013).

20. A related issue is the abuse of lawfully prescribed and possessed prescription drugs—especially opiate painkillers, sedatives or tranquilizers, and stimulants—which has been described as the second leading cause of deaths from unintentional injuries, second only to motor vehicle crashes. *See, e.g.*, ERIN BAGALMAN ET AL., CONG. RESEARCH SERV., CRS R43559, *PRESCRIPTION DRUG ABUSE* (2014); OFFICE OF NAT'L DRUG CONTROL POLICY, *EPIDEMIC: RESPONDING TO AMERICA'S PRESCRIPTION DRUG ABUSE CRISIS* (2011); Robert L. DuPont, *Prescription Drug Abuse: An Epidemic Dilemma*, 42 J. PSYCHOACTIVE DRUGS 127 (2010); Neil Kirschner et al., *Prescription Drug Abuse: Executive Summary of a Policy Position Paper from the American College of Physicians*, 160 ANNALS INTERNAL MED. 198 (2014). By definition physicians may prescribe, and patients may possess and use, those drugs, so it is more difficult for the criminal justice system to prevent their abuse. The problem is materially different from medical marijuana because that drug still is contraband under federal law even if a physician recommends its use.

distribution, possession, and use of marijuana should be outlawed.²¹ That concordance rested on the belief that marijuana is physically damaging, can be addictive, and offers no medicinal benefit that could not be obtained from other drugs lacking its short- and long-term harms. For most of the twentieth century, federal and state laws prohibited the distribution of marijuana²² and occasionally punished that crime quite harshly.²³

The principal federal statute governing marijuana today is the Controlled Substances Act.²⁴ The Act regulates all “controlled substances”²⁵ according to their perceived risk of addiction and medical utility.²⁶ It also flatly prohibits the distribution and possession of drugs that Congress saw as particularly dangerous, such as heroin and marijuana.²⁷ Congress has displayed no intention of fundamentally revising the current federal controlled substances laws. If anything, Congress has stiffened its attitude toward drug trafficking by adopting mandatory minimum penalties for that crime.²⁸ As the result, after 1970, reformers turned to the administrative process and the federal courts. Those efforts, however, were

21. See, e.g., Controlled Substances Act, Pub. L. No. 91-513, 84 Stat. 1242 (1970) (codified as amended at 21 U.S.C. §§ 801–904 (2012)); see MUSTO, *supra* note 14, at 46, 217–18 (detailing the history of federal regulation of marijuana); Richard J. Bonnie & Charles H. Whitebread, II, *The Forbidden Fruit and the Tree of Knowledge: An Inquiry into the Legal History of American Marijuana Prohibition*, 56 VA. L. REV. 976 (1970) (same).

22. See 21 U.S.C. § 841 (2014); JONATHAN P. CAULKINS ET AL., RAND CORP., *CONSIDERING MARIJUANA LEGALIZATION: INSIGHTS FOR VERMONT AND OTHER JURISDICTIONS* 1–4 (2015) (summarizing America’s domestic federal and state marijuana policy).

23. See, e.g., *Hutto v. Davis*, 454 U.S. 370, 374–75 (1982) (per curiam) (ruling that a forty-year term of imprisonment was not a cruel and unusual punishment for the crimes of possessing and distributing marijuana).

24. The Controlled Substances Act was enacted as Title II of the Comprehensive Drug Abuse Prevention and Control Act of 1970, Pub. L. No. 91-513, 84 Stat. 1236.

25. The Act defines a “controlled substance” as “a drug or other substance, or immediate precursor, included in schedule I, II, III, IV, or V of part B of this subchapter. The term does not include distilled spirits, wine, malt beverages, or tobacco, as those terms are defined or used in subtitle E of the Internal Revenue Code of 1986.” 21 U.S.C. § 802(6) (2012). That act incorporates the definition of a “drug” from the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 321(g)(1) (2012).

26. Only ten to eleven percent of all prescriptions written in the United States involve “controlled substances,” but the Controlled Substances Act governs the ones that do. See BAGALMAN ET AL., *supra* note 20, at 6 & n.26. The Act creates five “schedules” of controlled substances whose manufacture, distribution, or possession is regulated or prohibited and punished. 21 U.S.C. § 812 (2012). The Controlled Substances Act would apply to a physician who sought to prescribe marijuana for a patient because the Act makes it a crime for a physician to distribute a controlled substance outside of his “professional practice.” See *United States v. Moore*, 423 U.S. 122, 131–43 (1975) (holding that physicians are not exempted from prosecution under 18 U.S.C. § 841). Because marijuana, along with heroin and a few other drugs, is a Schedule I controlled substance, no physician could prescribe it for any patient.

27. Congress placed marijuana in Schedule I when it enacted the Controlled Substances Act. See *Alliance for Cannabis Therapeutics v. DEA*, 930 F.2d 936, 937 n.1 (D.C. Cir. 1991). Marijuana, combined with salts, isomers, and synthetic equivalents, is on that list. See 21 C.F.R. § 1308.11(d)(31) (2014). Other Schedule I drugs are LSD, mescaline, methylenedioxymethamphetamine (MDMA), peyote, and psilocybin. See 21 C.F.R. § 1308.11.

28. See Paul J. Larkin, Jr., *Crack Cocaine, Congressional Inaction, and Equal Protection*, 37 HARV. J.L. & PUB. POL’Y 241, 246–47 (2014) (“Congress imposed lengthy, mandatory penalties for any violation of federal drug laws.”).

unsuccessful.²⁹ The consequence is that the Controlled Substances Act still represents federal marijuana policy.

A. *The Debate Over Marijuana Legalization*

For decades, there has been a smoldering debate over the issue whether society should reconsider its position on marijuana criminalization.³⁰ At the center of the debate has been the issue whether inhaled marijuana is actually or potentially physically harmful and, if so, whether it nonetheless has legitimate medical uses. Powerful arguments have been made for³¹ and against³² each of those positions.

29. Late in the 1970s and early in the 1980s, thirty-three states passed laws establishing therapeutic research programs approved by the federal government pursuant to the Food and Drug Administration's Investigational New Drug Program. *See* Proposed Recommendations to the Drug Enforcement Administration Regarding the Scheduling Status of Marijuana and Its Components and Notice of a Public Hearing, 47 Fed. Reg. 28,141, 28,151 (June 29, 1982) (noting that more than twenty states had enacted "Therapeutic Research Acts," authorizing use of marijuana for investigational medical research uses); Karen O'Keefe, *State Medical Marijuana Implementation and Federal Policy*, 16 J. HEALTH CARE L. & POL'Y 39, 43 (2013) (noting that state laws established therapeutic research programs approved under the FDA's Investigational New Drug Program); Kreit, *supra* note 11, at 1794 (same). The states disbanded those programs after 1985, however, when the Food and Drug Administration approved for treatment Marinol, a synthetic version of the main psychoactive ingredient in marijuana. *See* Bilz, *supra* note 11, at 125. During that period, the federal government also established a limited "Compassionate Investigational New Drug" program administered by the National Institute for Drug Abuse. Onerous regulatory requirements, however, kept more than a very small number of patients (twenty) from being able to participate, and the government discontinued the program in 1992. *See* Mohamed Ben Amar, *Cannabinoids in Medicine: A Review of Their Therapeutic Potential*, 105 J. OF ETHNOPHARMACOLOGY 1, 2 (2006); Kreit, *supra* note 11, at 1795; *see also* Stephen E. Sallan et al., *Antiemetic Effect of Delta-9-Tetrahydrocannabinol in Patients Receiving Cancer Chemotherapy*, 293 NEW ENG. J. MED. 795 (1975). Seeking better luck in the administrative process, several organizations filed petitions with the Administrator of Drug Enforcement, urging him to reclassify marijuana from Schedule I to II because it has legitimate medical uses. The Administrator rejected the petition, however, and successors have reaffirmed the DEA's original decision. After decades of challenging those judgments in the administrative process, *see, e.g., Denial of Petition to Initiate Proceedings to Reschedule Marijuana*, 76 Fed. Reg. 40,552 (July 8, 2011), and in the federal courts, *see, e.g., Americans for Safe Access v. DEA*, 706 F.3d 438 (D.C. Cir. 2013), the administrative effort to reclassify cannabis came a cropper. Kreit, *supra* note 11, at 1796.

30. *See, e.g., CAULKINS ET AL., supra* note 22, at 27–47. There is a technical difference between "decriminalizing" a drug and "legalizing" it. Decriminalization refers to the elimination of criminal penalties for the possession and use of small quantities of a drug, with or without the substitution of a small fine equivalent to what must be paid for a traffic offense. Decriminalization does not undo the punishments available for trafficking or possession of large quantities of a drug. Legalization, by contrast, does just that. Legalization involves the elimination of a particular drug from the category of substances always made an offense or criminalized unless strict regulations are followed, *e.g., possession or use of morphine unless prescribed by a licensed physician. See* GARVEY & YEH, *supra* note 17, at 1 n.4; KLEIMAN MARIJUANA, *supra* note 19, at 175–77, 180–81. For purposes of this Article, there is no material difference between legalization and decriminalization, and I will use the terms interchangeably.

31. Advocates for reform maintain that marijuana is no more harmful than alcohol or tobacco and has legitimate medical uses, including as a treatment for chemotherapy-induced nausea and vomiting, the neuropathic pain and spasticity afflicting victims of multiple sclerosis, severe pain that cannot be alleviated by over-the-counter analgesics, and the intraocular swelling caused by glaucoma. *See, e.g., IVERSEN, supra* note 10, at 56–63, 131–48, 162; Aggarwal et al., *supra* note 11, at 156, 163; Bilz, *supra* note 11, at 126–28; Hall & Degenhardt, *supra* note 10, at 1389 ("The public health burden of cannabis is probably modest compared with that of alcohol, tobacco, and other illicit drugs."); Nora D. Volkow et al., *Adverse Health Effects of Marijuana Use*, 370 NEW ENG. J. MED. 2219, 2224 (2014) (listing clinical conditions with symptoms that may be alleviated with use of marijuana). Moreover, smoked marijuana, they contend, is superior to other vehicles for delivering THC to the

brain (pills, inhalants, and suppositories) because inhalation works more effectively and more quickly, reaching the brain within seconds. *See, e.g.*, IVERSEN, *supra* note 10, at 41–47; Aggarwal et al., *supra* note 11, at 164. Even if there is evidence that marijuana is addictive and has some adverse long-term health effects, they argue, marijuana is reasonably safe, far more so than some other drugs that physicians can prescribe, such as morphine. *See, e.g.*, INST. OF MED., *MARIJUANA AND MEDICINE: ASSESSING THE SCIENCE BASE 4* (Janet E. Joy et al. eds., 1999) [hereinafter INST. OF MED.] (“[E]xcept for the harms associated with smoking, the adverse effects of marijuana use are within the range of effects tolerated for other medications.”); IVERSEN, *supra* note 10, at 56, 162; Aggarwal et al., *supra* note 11, at 162 (“In its 4,000+ years of documented use, there is no report of death from overdose with cannabis. In contrast, as little as 2 grams of dried opium poppy sap can be a lethal dose in humans as a result of severe respiratory depression.”); Marcus A. Bachhuber et al., *Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999–2010*, J. AM. MED. ASS’N INTERNAL MED. (2014) (reporting that there were fewer opioid overdoses in states with medical marijuana laws), available at <http://app.jamanetwork.com/#page=issuesContainer>. Moreover, any long-term problems are hardly risks for someone presently suffering from intractable pain, nausea, and vomiting or who is in the end stages of a terminal disease. *See, e.g.*, INST. OF MED., *supra*, at 6; Jerome P. Kassirer, *Federal Foolishness and Marijuana*, 336 NEW ENG. J. MED. 366, 366 (1997). Reformers also have argued that, as a matter of social policy, the criminal justice system cannot deter marijuana use without turning the nation into a police state. Aggressive enforcement of the marijuana laws has not and cannot prevent the supply of an easily cultivated drug for which consumers have an enduring demand on a widespread basis. Continued pursuit of contemporary drug enforcement policy will only exacerbate further the disproportionate effect that our drug laws have on racial and ethnic minorities.

32. Defenders of the current regulatory regime, such as the federal government (in particular, the Food and Drug Administration (FDA) and the Drug Enforcement Administration) and highly respected medical organizations (the American Medical Association, the American Cancer Society, the American Academy of Ophthalmology, and the National Institute for Drug Abuse) maintain that smoking marijuana has adverse short- and long-term health effects. *See* AM. ACAD. OPHTHALMOLOGY, *COMPLEMENTARY THERAPY ASSESSMENT: MARIJUANA IN THE TREATMENT OF GLAUCOMA 1* (2014); AM. CANCER SOC’Y, *MEDICAL USE OF MARIJUANA: ACS POSITION 3* (2013); AM. MED. ASS’N HOUSE OF DELEGATES, *REPORT OF REFERENCE COMMITTEE K 6–7* (2014); Volkow et al., *supra* note 31. Marijuana is not suitable for use as a medicine when smoked, they contend, and there is no good reason to exempt marijuana from the approval process demanded by the drug safety laws. *See* 21 U.S.C. § 355(a) (2012) (forbidding a new drug from being distributed in interstate commerce without FDA approval). The FDA cannot find that marijuana is “safe and effective” for use for two simple reasons: there is clear proof that cannabis has actual and potential adverse short- and long-term health effects, and there is no clear proof that it has valuable medical benefits, certainly none that other, approved pharmaceuticals cannot also deliver. *See, e.g.*, BRITISH MED. ASS’N, *supra* note 10, at 65–70; DUPONT, *supra* note 1, at 143–47; IVERSEN, *supra* note 10, at 124, 131, 163, 167–68, 175–81, 185; Manzar Ashtari et al., *Diffusion Abnormalities in Adolescents and Young Adults with a History of Heavy Cannabis Use*, 43 J. PSYCHIATRY RES. 189, 201–02 (2009) (concluding that heavy cannabis use by adolescents may lead to brain damage); David M. Fergusson & Joseph M. Bolden, *Cannabis Use and Later Life Outcomes*, 103 ADDICTION 969, 969 (2008) (finding that increasing cannabis use in late adolescence and early adulthood correlated with adverse outcomes later in life); Jodi Gilman et al., *Cannabis Use Is Qualitatively Associated with Nucleus Accumbens and Amygdala Abnormalities in Young Adult Recreational Users*, 34 J. NEUROSCIENCE 559 (2014); Hall & Degenhardt, *supra* note 10, at 1383; Madeline H. Meier et al., *Persistent Cannabis Users Show Neuropsychological Decline from Childhood to Midlife*, 109 PROCEEDINGS NAT’L ACAD. SCI. E2657 (2012); Rajiv Radhakrishnan et al., *Gone to Pot—A Review of the Association Between Cannabis and Psychosis*, 5 FRONTIERS PSYCHIATRY 54 (2014); Nadia Solowij et al., *Cognitive Functioning of Long-Term Heavy Cannabis Users Seeking Treatment*, 287 J. AM. MED. ASS’N 1123 (2002). *See generally* Volkow et al., *supra* note 31, at 2220 tbl.1, 2225 (“Marijuana use has been associated with substantial adverse effects, some of which have been determined with a high degree of confidence . . .” (citation omitted)). Defenders of the status quo also argue that legalization will simply lead drug cartels to shift funds to the transportation, weapons, and bribery used to get more of their other products—such as heroin and cocaine—to markets in poor, urban, African American communities already rent by despair, hopelessness, and violence. Finally, law enforcement believes that marijuana cannot be decriminalized without materially weakening the nation’s efforts to prevent or reduce the physical and psychological suffering by individual users, along with the financial and social harms wreaked on communities by other illicit drug use.

Neither side in that debate has completely prevailed in the public policy arena.³³ Despite years of debate and scores of studies, there still is no consensus on the effectiveness of marijuana as a treatment for the symptoms of disease or for the side effects of other treatments.³⁴ The result is that each side in the debate can—and does—rely on different studies and interpret the same scientific data differently to suit its own medical, legal, and political purposes.³⁵

Most of the debate, then and now, almost twenty years later, has involved many of the same issues that society has debated since marijuana use became an icon for a rebellious generation in the 1960s. Can marijuana truly alleviate suffering? What physical and psychological harm does marijuana cause? Is it addictive? Can a distribution system for medical marijuana prevent that drug from being diverted to unauthorized parties? The states' passage of medical marijuana laws has rekindled public discussion of those public policy issues and has raised a variety of new ones as well.³⁶

33. One reason is that, unlike drugs manufactured by pharmaceutical companies, cannabis is not a standardized product; its potency varies according to its strain, the geographic region where it is grown, and the manner by which it is cultivated. See CAULKINS ET AL., *supra* note 11, at 55 (“One reason for the lack of consensus is that marijuana is not a standardized good . . .”); IVERSEN, *supra* note 10, at 5, 115–86. Plus, the science regarding cannabis often does not provide clear-cut answers to medical issues, making it difficult to distinguish *causation* from *correlation*. CAULKINS ET AL., *supra* note 11, at 55–56. Finally, our knowledge of marijuana, the brain, and the effect of the former on the latter is still increasing.

34. There does seem to be a consensus, however, on two narrower propositions. First, additional medical research into potential uses of different cannabinoids for medical treatment should be undertaken because there may be small groups of people for whom those compounds may be the only effective medication. Occasionally, orthodox treatments will not remedy a patient's ills because he belongs to a small subpopulation for whom accepted treatment regimens do not work. Further research may discover how the ingredients of cannabis can be used to treat those individuals. Second, smoking marijuana is not an acceptable medical delivery system for long-term use. Smoking marijuana, like smoking cigarettes, does not deliver a uniform dose of medication and poses a risk of causing respiratory disease and cancer over the long haul. Accordingly, medicine must learn not only whether there are any as yet unknown therapeutic benefits from cannabinoids in marijuana but also, if so, how to incorporate them into effective treatment modalities in order for them to be used without harming a patient in the process. See BRITISH MED. ASS'N, *supra* note 10, at 10, 14–15 tbl.2, 21–64, 68, 77–81; INST. OF MED., *supra* note 31, at 2–4.

35. See CAULKINS ET AL., *supra* note 11, at 54–55; INST. OF MED., *supra* note 31, at 1; IVERSEN, *supra* note 10, at 5, 115–86; Magdalena Cerdá et al., *Medical Marijuana Laws in 50 States: Investigating the Relationship between State Legalization of Medical Marijuana and Marijuana Use, Abuse and Dependence*, 120 DRUG & ALCOHOL DEPENDENCE 22, 25 (2012) (“[N]o consensus exists at this time on the effectiveness of marijuana as a treatment for symptoms of pain, nausea, vomiting, and other problems caused by illnesses or treatment The lack of medical consensus means that both pro and con proponents of medical marijuana can find research support for their positions, and the medical profession has not delivered a clear message to the public.”).

36. For a discussion of the various legal and policy issues raised by the state medical marijuana initiatives, see, for example, TODD GARVEY, CONG. RESEARCH SERV., R42398, MEDICAL MARIJUANA: THE SUPREMACY CLAUSE, FEDERALISM, AND THE INTERPLAY BETWEEN STATE AND FEDERAL LAWS (2012); GARVEY & YEH, *supra* note 17; LISA N. SACCO & KRISTIN FINKLEA, CONG. RESEARCH SERV., R43164, STATE MARIJUANA LEGALIZATION INITIATIVES: IMPLICATIONS FOR FEDERAL LAW ENFORCEMENT (2014); D. Mark Anderson et al., *Medical Marijuana Laws, Traffic Fatalities, and Alcohol Consumption*, 56 J.L. & ECON. 333 (2013); Paul Armentano, *Should Per Se Limits Be Imposed for Cannabis? Equating Cannabinoid Blood Concentrations with Actual Driver Impairment: Practical Limitations and Concerns*, 35 HUMBOLDT J. SOC. RELATIONS 45 (2013); Michael Berkey, *Mary Jane's New Dance: The Medical Marijuana Legal Tango*, 9 CARDOZO PUB. L. POL'Y & ETHICS J. 417 (2011); Andrew J. Boyd,

This debate may have reached its apogee in 2014 because of an important development in federal law. In that year, Congress included a provision in the Consolidated and Further Continuing Appropriations Act, 2015, that prohibits the Department of Justice from using federal funds to prevent a state from implementing its medical marijuana laws.³⁷ That statute does not repeal or revise the provisions of the Controlled Substances Act making it a crime to traffic in marijuana; it only limits the Justice Department's use of federal funds to enforce those laws for the pendency of the 2015 fiscal year. Nonetheless, because the ultimate authority to bring and supervise all litigation in the federal courts rests with the U.S. Attorney General,³⁸ that provision bars the Justice Department from using federal appropriations in a manner that would "prevent" states with legitimate medical marijuana programs "from implementing their own State laws that authorize the use, distribution, possession, or cultivation of medical marijuana."³⁹ The result is that state medical marijuana programs should be able to operate without being charged with a violation of federal law if they confine themselves to that limited purpose for the life of the appropriations act.⁴⁰ That provision represents an important new federal position on the production, sale, and use of marijuana.⁴¹

Medical Marijuana and Personal Autonomy, 37 J. MARSHALL L. REV. 1253 (2004); Gerard Caplan, *Medical Marijuana: A Study of Unintended Consequences*, 43 MCGEORGE L. REV. 127 (2012); Tina Wescott Carafaro, *Slipping Through the Cracks: Why Can't We Stop Drugged Driving?*, 32 W. NEW ENG. L. REV. 33 (2010); Todd Grabarsky, *Conflicting Federal and State Medical Marijuana Policies: A Threat to Cooperative Federalism*, 116 W. VA. L. REV. 1 (2013); Alex Kreit, *Reflections on Medical Marijuana Prosecutions and the Duty to Seek Justice*, 89 DENV. U. L. REV. 1027 (2012); Rosalie Liccardo Pacula & Eric L. Sevigny, *Marijuana Liberalization Policies: Why We Can't Learn Much from Policy Still in Motion*, 33 J. POLICY ANALYSIS & MGMT. 212 (2014); Aaron J. Marcus, *Are the Roads a Safer Place Because Drug Offenders Aren't on Them? An Analysis of Punishing Drug Offenders with License Suspensions*, 13 KAN. J.L. & PUB. POL'Y 557 (2004); Kevin A. Sabet, *Much Ado About Nothing: Why Rescheduling Won't Solve Advocates' Medical Marijuana Problems*, 58 WAYNE L. REV. 81 (2012); Kenneth Falcon, Note, *A Lesson in Legalization: Successes and Failures of California's Proposition 19*, 9 GEO. J.L. & PUB. POL'Y 463 (2011); A. Claire Frezza, Note, *Counseling Clients on Medical Marijuana: Ethics Caught in Smoke*, 25 GEO. J. LEGAL ETHICS 537 (2012); Roni Caryn Rabin, *Legalization of Marijuana Raises Health Concerns*, N.Y. TIMES (Jan. 7, 2013), <http://www.well.blogs.nytimes.com/2013/01/07/legalization-of-marijuana-raises-health-concerns/>.

37. See Consolidated and Further Continuing Appropriations Act, 2015, § 538, Pub. L. No. 113-235, 128 Stat. 2130, 2217 (2014), available at <http://www.gpo.gov/fdsys/pkg/CPRT-113HPRT91668/pdf/CPRT-113HPRT91668.pdf>.

38. See 28 U.S.C. §§ 503, 506, 509–19 (2012).

39. See § 538, 128 Stat. at 2217.

40. The Consolidated and Further Continuing Appropriations Act, 2015, expires on September 30, 2015. See § 5, 128 Stat. at 2135 ("The following sums in this Act are appropriated, out of any money in the Treasury not otherwise appropriated, for the fiscal year ending September 30, 2015.").

41. Also noteworthy in 2014, but of less immediate practical importance, was the decision by the New York Times editorial board that the federal government should repeal all federal laws criminalizing marijuana distribution, possession, and use and should leave the matter for the states to regulate as they see fit. See N.Y. Times Editorial Bd., *Repeal Prohibition, Again*, N.Y. TIMES (July 27, 2014), <http://www.nytimes.com/interactive/2014/07/27/opinion/sunday/high-time-marijuana-legalization.html>. For the back-and-forth of the New York Times' earlier positions, see *Evolving on Marijuana: Highlights from the Editorial Board's Changing View of Marijuana Over Six Decades* (July 30, 2014), <http://www.nytimes.com/interactive/2014/07/30/opinion/high-time-evolving-on-marijuana.html>. The Times reasoned that marijuana is no more harmful than alcohol, the hundreds of

B. The Concern with Highway Safety

A question logically raised by that debate is what effect marijuana legalization will have on roadway safety?⁴² Motor vehicle accidents attributable to alcohol-impaired drivers annually impose more than an estimated \$37 billion in costs.⁴³ The number of fatalities is also jolting; in 2012 more than 10,000 people died in such incidents, or one every fifty-one minutes.⁴⁴ But a panoply of psychoactive drugs also affect the central nervous system's processing capacity and diminish the skills that a person needs to handle traffic safely.⁴⁵ Marijuana is one of them.

Even before the recent state medical marijuana laws went into effect, a considerable number of people drove after smoking marijuana.⁴⁶ In fact, some trauma centers have reported a higher incidence of positive test results among

thousands of marijuana-based arrests made yearly are quite costly, the disproportionate burden of those seizures falls on racial minorities, and the health benefits of the policy are debatable. N.Y. Times Editorial Bd., *supra*. The Gray Lady also published a series of related and follow-up articles and editorials supporting marijuana decriminalization. See, e.g., Philip M. Boffey, Editorial, *What Science Says About Marijuana*, N.Y. TIMES (July 30, 2014), <http://www.nytimes.com/2014/07/31/opinion/what-science-says-about-marijuana.html>; David Firestone, Editorial, *Let States Decide on Marijuana*, N.Y. TIMES (July 26, 2014), <http://www.nytimes.com/2014/07/27/opinion/sunday/high-time-let-states-decide-on-marijuana.html>; Brent Staples, Editorial *The Federal Marijuana Ban Is Rooted in Myth and Xenophobia*, N.Y. TIMES (July 29, 2014), <http://www.nytimes.com/2014/07/30/opinion/high-time-federal-marijuana-ban-is-rooted-in-myth.html>; Jesse Wegman, Editorial, *The Injustice of Marijuana Arrests*, N.Y. TIMES (July 28, 2014), <http://www.nytimes.com/2014/07/29/opinion/high-time-the-injustice-of-marijuana-arrests.html>. For responses to the New York Times editorials, see, for example, David W. Murray, *Comparing Alcohol and Marijuana: Seriously*, THE HUDSON INST. (July 27, 2014), <http://www.hudson.org/research/10478-comparing-alcohol-and-marijuana-seriously>; Peter Wehner, *Science Collides With the Push to Legalize Pot*, WALL ST. J. (July 29, 2014, 4:39 PM), <http://blogs.wsj.com/washwire/2014/07/29/science-collides-with-the-push-to-legalize-pot/>.

42. See, e.g., KLEIMAN MARIJUANA, *supra* note 19, at 5, 11, 172–73. See generally Sewell et al., *supra* note 3, at 187–92 (reviewing studies).

43. *Impaired Driving*, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., www.nhtsa.gov/impaired (last visited Mar. 13, 2015).

44. See *id.* Those numbers exist despite the fact that state and local police departments also vigorously enforce the DUI laws. See, e.g., *Navarette v. California*, 134 S. Ct. 1683 (2014) (holding that reasonable-suspicion based stop of motorist suspected of DUI did not violate the Fourth Amendment); *Missouri v. McNeely*, 133 S. Ct. 1552 (2013) (holding that blood sample taken to determine if driver was DUI required a warrant); *Mich. Dep't of State Police v. Sitz*, 496 U.S. 444 (1990) (upholding state's use of highway sobriety checkpoint). According to the FBI's data, 1.3 million out of the nearly 12.2 million arrests that law enforcement officers made in 2012 were for DUI. See CRIM. J. INFO. SERVS. DIV., FBI, CRIME IN THE UNITED STATES 2012, at tbl.29 (2014), available at <http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/persons-arrested/persons-arrested>.

45. See Joanne E. Brady & Guohua Li, *Trends in Alcohol and Other Drugs Detected in Fatally Injured Drivers in the United States, 1999–2010*, 179 AM. J. EPIDEMIOLOGY 692, 697 (2014) (“During the study period, the proportion of fatally injured drivers testing positive for narcotics and cannabinal has tripled.”). Marijuana also may be the illicit drug most commonly used in conjunction with alcohol. See Olaf H. Drummer et al., *The Incidence of Drugs in Drivers Killed in Australian Road Traffic Crashes*, 134 FORENSIC SCI. INT'L 154, 160 tbl.7 (2003) (finding that marijuana was the most often used drug other than alcohol in studies conducted in the United States, England, Canada, Australia, Spain, Germany, and Norway); Hartman & Huestis, *supra* note 15, at 478.

46. See NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 808 939, MARIJUANA, ALCOHOL AND ACTUAL DRIVING PERFORMANCE 4–15 (1999) [hereinafter NHTSA 1993 REPORT]; NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 808 078, MARIJUANA AND ACTUAL DRIVING

drivers involved in vehicle crashes for illicit drugs than for alcohol.⁴⁷ That phenomenon is still present.⁴⁸ In fact, the increased potency of marijuana grown today may have contributed to an increase in motor vehicle accidents.⁴⁹ The upshot is that the prevalence of drugged driving, and the potential mortality associated with that activity, raises an important public health concern.⁵⁰

In a 2009 report, the National Highway Traffic Safety Administration (NHTSA) presented the results of its first survey on drug use and driving. NHTSA tested for illicit, prescription, and over-the-counter drugs, including marijuana, narcotics, stimulants, and depressants.⁵¹ NHTSA found that 11% of daytime drivers tested positive for drug use, with the nighttime number increasing to 14.4%.⁵² Marijuana was the most commonly used illicit drug, showing up in 8.65% of the drivers tested.⁵³ NHTSA noted that, in 2009, nearly 22,000 drivers had been killed in vehicle accidents, nearly 4,000 of whom tested positive for the presence of some drug.⁵⁴ Later NHTSA testing found that, from 1992 to 2009, approximately 20,000

PERFORMANCE 1–9 (1993); Volkow et al., *supra* note 31, at 2221 (“[M]arijuana is the illicit drug most frequently reported in connection with impaired driving and accidents, including fatal accidents.”).

47. See Daniel Brookoff et al., *Testing Reckless Drivers for Cocaine and Marijuana*, 331 NEW ENG. J. MED. 518, 518 (1994); Erin Kelly et al., *A Review of Drug Use and Driving: Epidemiology, Impairment, Risk Factors and Risk Perceptions*, 23 DRUG & ALCOHOL REV. 319, 338 (2004) (noting that “there is evidence that the prevalence of alcohol in road trauma is decreasing and the incidence of drugs in accident-involved drivers is increasing”); Soderstrom et al., *supra* note 15, at 734–35.

48. See DRUG ENFORCEMENT ADMIN., U.S. DEP’T OF JUSTICE, *THE DEA POSITION ON MARIJUANA* 40–43 (2013); Mark Asbridge, *Driving After Marijuana Use: The Changing Face of “Impaired” Driving*, 168 J. AM. MED. ASS’N PEDIATRICS 602, 602 (2014) (noting a recent study showing that a higher proportion of first-year college students had consumed alcohol than marijuana, but a higher percentage of the latter than the former drove after consumption).

49. See Mahoud A. El Sohly et al., *Potency Trends of Δ^9 -THC and Other Cannabinoids in Confiscated Marijuana from 1980–1997*, 45 J. FORENSIC SCI. 24 (2000); Volkow et al., *supra* note 31, at 2222 (“The THC content, or potency, of marijuana, as detected in confiscated samples, has been steadily increasing from about 3% in the 1980s to 12% in 2012. This increase in THC content raises concerns that the consequences of marijuana use may be worse now than in the past and may account for . . . the increases in fatal motor-vehicle accidents.” (citations omitted)); *id.* fig.1A.

50. As Professor Mark Kleiman, an expert on drug policy, put it in 1989, “There is no doubt that marijuana impairs driving performance, and does so more than the average user is conscious of. The open question is how frequently marijuana users drive while intoxicated, and what contribution they make to accidents.” KLEIMAN COSTS, *supra* note 19, at 11. The issue is still a live one. See, e.g., Scott V. Masten & Gloriam Vanine Guenzburger, *Changes in Driver Cannabinoid Prevalence in 12 U.S. States After Implementing Medical Marijuana Laws*, 50 J. SAFETY RES. 35 (2014).

51. See COMPTON & BERNING, *supra* note 15, at 3.

52. See *id.* at 3 & tbl.1. Drivers tested during the daytime provided breath and oral fluid samples, while nighttime drivers provided breath, oral fluids, and blood samples. *Id.*

53. See *id.* at 3.

54. NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., DEP’T OF TRANSP., DOT HS 811 415, *DRUG INVOLVEMENT OF FATALY INJURED DRIVERS* 1 (2010) (“Nationwide in 2009, 63 percent of fatally injured drivers were tested for the presence of drugs. Overall, 3,952 fatally injured drivers tested positive for drug involvement in 2009. This number represents 18 percent of all fatally injured drivers (Table 1) and 33 percent of those with known drug test results (Table 2) in 2009.”).

drivers nationwide involved in fatal crashes tested positive for cannabinoids.⁵⁵ In sum, before that report, society had ample evidence that alcohol negatively affects a person's ability to drive safely⁵⁶ and that the nation suffers massive costs from the accidents caused by people who drink and drive.⁵⁷ The 1999 NHTSA report indicated that drugged driving could be a problem of comparable significance.⁵⁸

The White House Office of National Drug Control Policy (ONDCP) first identified drugged driving as a significant national concern in 2010.⁵⁹ ONDCP pointed to a recent finding by NHTSA that "more than 16 percent of weekend nighttime drivers tested positive for drugs."⁶⁰ That discovery was "troubling news," ONDCP noted, because "drugs have adverse effects on judgment, reaction time, motor skills, and memory."⁶¹ ONDCP concluded that, because drug-impaired driving poses a threat to public safety similar to the one resulting from alcohol-impaired driving, the NHTSA report "demands a response on a level equivalent to the highly successful effort to prevent drunk driving."⁶² In sum, the effect of marijuana on a person's ability to drive is an important public policy issue.

II. THE EMERGENCE OF STATE LAWS AUTHORIZING THE MEDICAL AND RECREATIONAL USE OF MARIJUANA

Science and policy progressed in the years following the adoption of the Controlled Substances Act. The law governing marijuana, however, remained the same for most of this period. That began to change on November 5, 1996. On that day, California, the first state to outlaw marijuana, had a change of heart.

55. Masten & Guenzburger, *supra* note 50, at 35.

56. See Paul J. Larkin, Jr., *Swift, Certain, and Fair Punishment—24/7 Sobriety and HOPE: Creative Approaches to Alcohol- and Illicit Drug-Using Offenders*, 105 J. CRIM. L. & CRIMINOLOGY (forthcoming 2015) (manuscript at 2–3), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2465644.

57. See *id.*

58. See, e.g., NHTSA 1993 REPORT, *supra* note 46, at 4–15. NHTSA conducted another National Roadside Survey in 2013–2014. Preliminary results indicate there has been an 80% decrease in the percentage of alcohol-impaired roadside drivers from 1973 (7.5%) to 2013–2014 (1.5%), but there has been a 48% increase in the percentage of drivers testing positive for THC from 2007 (8.6%) to 2013–2014 (12.6%). AMY BERNING ET AL., NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 812 118, RESULTS OF THE 2013–2014 NATIONAL ROADSIDE SURVEY OF ALCOHOL AND DRUG USE BY DRIVERS 1, 3 (2015) [hereinafter 2013–2014 NATIONAL ROADSIDE SURVEY]; GOV'T ACCOUNTABILITY OFFICE, GAO-15-293, DRUG-IMPAIRED DRIVING: ADDITIONAL SUPPORT NEEDED FOR PUBLIC AWARENESS INITIATIVES 7 (2015) [hereinafter DRUG-IMPAIRED DRIVING].

59. OFFICE OF NAT'L DRUG CONTROL, NATIONAL DRUG CONTROL STRATEGY 2010, at 23 (July 2010).

60. *Id.*

61. *Id.*

62. *Id.*

A. *The Birth of Medical Marijuana*

Acting in the teeth of the federal government's strenuous opposition, California became the first state to enact so-called medical marijuana legislation.⁶³ Adopted by a direct initiative, Proposition 215, entitled the Compassionate Use Act of 1996, authorized the cultivation, distribution, possession, and use of marijuana by patients for medical purposes by creating an affirmative defense to the state criminal code for physician-approved personal medical use.⁶⁴ Today, twenty-three states have statutes authorizing physicians to recommend marijuana as a treatment.⁶⁵ State medical marijuana laws differ considerably in various respects, such as whether a patient must register his status with the state,⁶⁶ who may recommend the medical use of marijuana,⁶⁷ what medical conditions justify its use,⁶⁸ and what quantity a patient may possess.⁶⁹ All of the state laws, however, have two features

63. Canada was the first nation to decriminalize medical marijuana. Diane E. Hoffman & Ellen Weber, *Medical Marijuana and the Law*, 362 NEW ENG. J. MED. 1453, 1454 (2010). In December 2013, Uruguay adopted nationwide legalization of marijuana, the first nation to do so. See CAULKINS ET AL., *supra* note 22, at xi, 5 & n.10. The term "medical marijuana" is actually a misnomer. There is no special strain of marijuana used for medicinal purposes. Recreational users consume the same cannabis used by patients to relieve some of the symptoms of their illnesses. It would be more accurate to refer to "marijuana used for medical purposes." The term "medical marijuana" has become an accepted part of the lingo, however, so I will use it here.

64. See CAL. HEALTH & SAFETY CODE § 11362.5 (West 2014); Frezza, *supra* note 16, at 1120.

65. See *supra* note 16.

66. For example, most states require patients to register as medical marijuana patients. Others, such as California, do not. A few states permit unregistered but "qualifying" patients to use this defense if they satisfy the other requirements. See Frezza, *supra* note 16, at 1121–22 (listing the varying standards for patient qualification).

67. Technically, a physician cannot "prescribe" marijuana for a patient because federal law prohibits marijuana from being used for treatment purposes. See *United States v. Oakland Cannabis Buyers' Coop.*, 532 U.S. 483, 494–95 (2001) (holding that medical necessity is not a defense to distribution of marijuana); *supra* text accompanying note 26. A physician or caregiver, however, can "recommend" that a patient consider using marijuana to relieve the symptoms of certain disabling diseases even if the possession or use of marijuana is a crime, because the First Amendment Free Speech Clause prohibits the government from adopting a viewpoint-based restriction on the private communications between a physician and a patient of potential medical treatment options. See *Conant v. McCaffrey*, 172 F.R.D. 681, 694–95 (N.D. Cal. 1997) (issuing preliminary injunction), 2000 WL 1281174 (N.D. Cal. Sept. 7, 2002) (issuing permanent injunction), *aff'd*, *Conant v. Walters*, 309 F.3d 629 (9th Cir. 2002) (upholding permanent injunction).

68. States typically permit marijuana to be dispensed for patients suffering from severe diseases or chronic conditions such as cancer, cancer-caused chronic pain, nausea, cachexia, HIV/AIDS, Lou Gehrig's disease (Amyotrophic Lateral Sclerosis), Alzheimer's disease, multiple sclerosis, Crohn's disease, and glaucoma, but they differ as to whether problems such as chronic pain or nausea must be severe and whether those conditions must be consequences only of diseases such as cancer. Most states also permit their state health departments to add to the statutory list of qualifying conditions. Some states permit a physician to recommend marijuana only if there is an established physician-patient relationship; others neither require a pre-existing physician-patient relationship nor limit recommendation authority to a licensed physician. See, e.g., Aggarwal et al., *supra* note 11, at 159–62; Hoffman & Weber, *supra* note 63, at 1454–55 & tbl.1; Frezza, *supra* note 16, at 1122.

69. Some states allow a patient to possess up to one ounce of marijuana, others permit up to four ounces, and Washington permits up to twenty-four ounces. Most states allow a patient or a designated "caregiver" to grow the marijuana necessary for treatment, but they are silent whether either one can purchase marijuana and whether a marijuana dispensary may sell it. See, e.g., Aggarwal et al., *supra* note 11, at 159–61; Hoffman & Weber, *supra* note 63, at 1454–56 & tbl.2; Linda Simoni-Wastila & Francis B. Palumbo, *Medical Marijuana Legislation: What We Know—And Don't*, 16 J. HEALTH CARE L. & POL'Y 59, 65–66 (2013); Frezza, *supra* note 16, at 1124–25.

in common: They exempt private parties from state laws treating marijuana as contraband, and they permit individuals to engage in conduct forbidden by the federal controlled substances acts. The state medical marijuana initiatives therefore freed patients from criminal liability under state law, but, in so doing, they also created an express conflict between state and federal law.

The Supremacy Clause of Article VI of the Constitution preempts state laws that conflict with federal law,⁷⁰ a conflict that clearly arises when a state law expressly permits what federal law expressly prohibits.⁷¹ Accordingly, compliance with a state medical marijuana law does not grant anyone immunity from prosecution under federal law, and the Clinton and Bush Administrations signaled their willingness to continue enforcing the Controlled Substances Act. The federal government threatened physicians who prescribed marijuana with the loss of their federal license to prescribe controlled substances,⁷² and it signaled that it would aggressively prosecute businesses for distributing marijuana in states with medical marijuana laws.⁷³ Although the Justice Department did not prosecute individual patients, it did pursue large-scale companies.⁷⁴

The Obama Administration has formalized that approach. In 2009, the Justice Department publicly stated that it would not strictly enforce federal law against patients and caregivers but would continue to prosecute large businesses or individuals who used the cover of a marijuana dispensary as a sham for drug

70. See U.S. CONST. art. VI, cl. 2 (“This Constitution, and the Laws of the United States which shall be made in pursuance thereof; and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the constitution or laws of any state to the contrary notwithstanding.”).

71. See, e.g., *Mut. Pharm. Co. v. Bartlett*, 133 S. Ct. 2466, 2470 (2013) (holding that federal law preempts state law on design defects claims).

72. Barry McCaffrey, the Director of the Office of National Drug Control Policy, made that point pellucid. See Administration Response to Arizona Proposition 200 and California Proposition 215, 62 Fed. Reg. 6164, 6164 (Feb. 11, 1997) (warning that the “DEA will seek to revoke the DEA registrations of physicians who recommend or prescribe Schedule I controlled substances”).

73. From 1997 until 2009, the federal government did just that. The government won almost every battle in court. See, e.g., *Gonzalez v. Raich*, 545 U.S. 1 (2005) (upholding Congress’s Commerce Clause authority to prohibit the local cultivation and use of marijuana in compliance with state law); *United States v. Oakland Cannabis Buyers’ Coop.*, 532 U.S. 483 (2001) (rejecting a medical necessity defense to prosecution of the possession of controlled substances); *United States v. Rosenthal*, 454 F.3d 943 (9th Cir. 2006) (ruling that the City of Oakland could not “deputize” a person to distribute marijuana under state law and render him immune from prosecution under federal law); *United States v. Stacy*, 734 F. Supp. 2d 1074, 1079–80 (S.D. Cal. 2010) (holding that state medical marijuana laws do not grant a person immunity from prosecution under federal law). *Contra* *Conant v. Walters*, 309 F.3d 629 (9th Cir. 2002) (discussed *supra*, note 67). Nonetheless, there was considerable political blowback in the states with medical marijuana laws from public officials who (at least ostensibly) were outraged at the government’s refusal to respect a state’s decision to authorize medicinal marijuana use. See Kreit, *supra* note 11, at 1787–89.

74. See Kreit, *supra* note 36, at 1034 (noting that there were nearly two hundred raids of medical marijuana dispensaries between 1996 and 2008).

trafficking or allied financial crimes, such as money laundering.⁷⁵ The 2015 appropriations act appears to adopt that policy as a matter of federal law.

Regardless of the marijuana enforcement policy that the Justice Department itself adopts or that Congress imposes on the department, the U.S. Code still treats marijuana as a Schedule I controlled substance and still criminalizes its cultivation and distribution. Accordingly, Congress and a new administration could change current federal marijuana enforcement policy and aggressively enforce the federal marijuana laws against anyone violating their terms.

B. The Birth of Recreational Marijuana

The year 2012 witnessed another evolution in state marijuana legislation. In that year, Colorado and Washington decided to legalize under state law, to regulate, and to tax small amounts of marijuana for personal, nonmedicinal use by people over twenty-one.⁷⁶ Those laws were the first formal statewide decriminalization measures enacted since the states decided in the 1920s to treat marijuana as contraband by making its distribution, possession, and use a crime. In 2014, Alaska and Oregon enacted similar measures.⁷⁷ Just as state medical marijuana laws do not exempt residents from the federal marijuana laws, those laws cannot grant someone immunity under federal law for recreational marijuana trafficking, possession, or use. But local political pressure not to undermine the intended effect of those laws could deter state or local officials from cooperating with federal law

75. See Memorandum from James M. Cole, Deputy Att’y Gen., U.S. Dep’t of Justice, for United States Attorneys on Guidance Regarding the Ogden Memo in Jurisdictions Seeking to Authorize Marijuana for Medical Use 1 (June 29, 2011), *available at* <http://www.justice.gov/oip/docs/dag-guidance-2011-for-medical-marijuana-use.pdf>; Memorandum from James M. Cole, Deputy Att’y Gen., U.S. Dep’t of Justice, for United States Attorneys on Guidance Regarding Marijuana Enforcement 3 (Aug. 29, 2013), *available at* <http://www.justice.gov/iso/opa/resources/3052013829132756857467.pdf>; Memorandum from James M. Cole, Deputy Att’y Gen., U.S. Dep’t of Justice, for United States Attorneys on Guidance Regarding Marijuana Related Financial Crimes 2 (Feb. 14, 2014), *available at* [http://www.justice.gov/usao/waw/press/newsblog%20pdfs/DAG%20Memo%20-%20Guidance%20Regarding%20Marijuana%20Related%20Financial%20Crimes%202%2014%2014%20\(2\).pdf](http://www.justice.gov/usao/waw/press/newsblog%20pdfs/DAG%20Memo%20-%20Guidance%20Regarding%20Marijuana%20Related%20Financial%20Crimes%202%2014%2014%20(2).pdf); Memorandum from David W. Ogden, Deputy Att’y Gen., U.S. Dep’t of Justice, for Selected United States Attorneys on Investigations and Prosecutions in States Authorizing the Medical Use of Marijuana (Oct. 19, 2009), *available at* www.justice.gov/opa/documents/medical-marijuana.pdf. The Cole memoranda made clear that the federal government reserved the right to enforce federal law against large-scale marijuana production and distribution businesses, such as the dispensaries that had come into existence in California. See, e.g., Alex Kreit, *Beyond the Prohibition Debate: Thoughts on the Federal Drug Laws in an Age of State Reforms*, 13 CHAPMAN L. REV. 555, 565–72 (2010); O’Keefe, *supra* note 29, at 53–54; Frezza, *supra* note 36, at 542–44. As one U.S. Attorney put it, state marijuana dispensaries have been “hijacked by profiteers” masquerading as concerned citizens. Tim Dickinson, *Obama’s War on Pot*, ROLLING STONE (Feb. 16, 2012), <http://www.rollingstone.com/politics/news/obamas-war-on-pot-20120216> (quoting U.S. Attorney Melinda Haag).

76. See 2013 Wash. Legis. Serv. ch. 3 (1.M.502) (West) (amending WASH. REV. CODE § 69.50.4013 (2014)); AMENDMENT 64: USE AND REGULATION OF MARIJUANA (2012) (amending COLO. CONST. art. XVIII, § 16(3)); GARVEY & YEH, *supra* note 17, at 1–5 (summarizing the Colorado and Washington Initiatives). A California ballot initiative that would have allowed large-scale production and sale of marijuana failed in 2010, but California decriminalized the possession of small quantities of marijuana in 2011. See CAULKINS ET AL., *supra* note 22, at 2.

77. See BENNETT & WHITE, *supra* note 17, at 9–10; *supra* notes 16–17.

enforcement officials pursuing drug trafficking. Regardless, state recreational marijuana initiatives like the ones in those two states will doubtless lead to increased marijuana use and to a greater number of people driving while drugged.

C. The Effect of State Medical and Recreational Marijuana Initiatives on Highway Safety

There have been only a few recent studies focusing on the potential effect of the new state marijuana initiatives.⁷⁸ Their results have differed. One study of drivers involved in fatal crashes from 2000 to 2009 in states authorizing medical marijuana concluded that those statutes could be reliably associated with an increased accident rate in only three states: California, Hawaii, and Washington.⁷⁹ Similarly, a 2013 study of the relationship between state medical marijuana laws and traffic accidents concluded that those laws are associated with a decrease in accidents and fatalities resulting from a corresponding decrease in alcohol consumption.⁸⁰ People often consume alcohol in bars and restaurants and then drive home, the study reasoned, whereas marijuana consumption typically occurs at home

78. See GLORIAM VANINE GUENZBURGER & SCOTT V. MASTEN, CALIF. DEP'T OF MOTOR VEHICLES, RSS-13-242, CHANGES IN DRIVER CANNABINOID PREVALENCE ASSOCIATED WITH IMPLEMENTING MEDICAL MARIJUANA LAWS IN 14 U.S. STATES (2013); ROCKY MOUNTAIN HIGH INTENSITY DRUG TRAFFICKING AREA, THE LEGALIZATION OF MARIJUANA IN COLORADO: THE IMPACT (2014) [hereinafter 2014 ROCKY MOUNTAIN HIDTA REPORT]; Anderson et al., *supra* note 36; Cerdá et al., *supra* note 35; Masten & Guenzburger, *supra* note 50; Stacy Salomonsen-Sautel et al., *Trends in Fatal Motor Vehicle Crashes Before and After Marijuana Commercialization in Colorado*, 140 DRUG & ALCOHOL DEPENDENCE 137 (2014).

79. See Masten & Guenzburger, *supra* note 50, at 45.

Increased prevalence of cannabinoids among drivers involved in fatal crashes was only detected in a minority of the states that implemented medical marijuana laws. The observed increases were one-time changes in the prevalence levels, rather than upward trends, suggesting that these laws result in stable increases in driver marijuana prevalence. The reasons that changes in prevalence were detected in some states but not in others are unknown, but one factor may be differences between states in drug testing practices and regularity.

Id. at 51. The evidence in all three states, however, indicated that the increase was step-like, rather than arithmetic (or geometric), perhaps indicating that marijuana use stabilizes over time, or that new users are less likely to drive, less likely to be involved in a fatal crash, or both. See *id.* at 45. The authors of that study could not explain the three-state discrepancy, particularly given that a state's passage of a medical marijuana law increases adult marijuana use within its borders. See *id.* at 46–47. The authors speculated that the greater prevalence of marijuana use by drivers involved in fatal crashes in California, Hawaii, and Washington might be due to laxer regulatory schemes or a greater abundance of available marijuana. *Id.* at 47–48. The ultimate explanation, however, is unknown. *Id.* at 51.

80. See Anderson et al., *supra* note 36, at 335. The study concludes that marijuana and alcohol are substitutes. See *id.* at 359. That study, however, is susceptible to challenge on several grounds. For example, a considerable number of people consume marijuana and alcohol together. Plus, traffic fatalities have dropped nationwide by an even larger number due to the 0.08 BAC laws, better education about and enforcement of the alcohol laws, safer vehicle design, and better highway design. Moreover, the number of registered medical marijuana patients in the studied states ranged from only 0.5 to 3% of the population, which makes it unlikely that the legalization of medical marijuana could have accounted for a 49% decrease in the number of traffic fatalities. See ROBERT L. DUPONT, INST. FOR BEHAVIOR & HEALTH, COMMENTARY: MARIJUANA IMPAIRED DRIVING: A SERIOUS PUBLIC SAFETY PROBLEM 1–3 (2011), available at www.ibhinc.org/pdfs/IBHCommentaryMarijuanaImpairedDriving12811.pdf.

because public use is still forbidden even in states with medical marijuana laws.⁸¹ Marijuana use therefore may result in fewer vehicle crashes, not because cannabis does not impair driving skills, but because fewer people drive after using it than after drinking.⁸² For that reason, when taken together, the study concluded, state medical marijuana laws could reduce the total number of highway fatalities “even if driving under the influence of marijuana is every bit as dangerous as driving under the influence of alcohol.”⁸³

Other studies point in a different direction. A 2014 study concluded that the proportion of drivers testing positive for marijuana use had been decreasing before the Colorado medical marijuana law went into effect, but has increased since then and now exceeds the number of positive test results in states without such laws.⁸⁴ In a 2014 report, the Rocky Mountain High Intensity Drug Trafficking Area Task Force found a one-hundred percent increase in traffic fatalities involving drivers who tested positive for marijuana use from 2007 to 2012.⁸⁵ Similarly, a study of drug and alcohol use by drivers in Washington State, which permits medical and recreational marijuana use, concluded (albeit in a backhanded way) that liberalization of state marijuana laws is likely to have a negative effect on highway safety. As the authors put it, “The current trend towards the decriminalization of marijuana, and increased access to it for medical purposes[,] carries with it the often overlooked baggage of increased risk of driver impairment.”⁸⁶

81. See Anderson et al., *supra* note 36, at 335, 345, 359–60.

82. See DAVID K. DAMKOT ET AL., NAT’L HIGHWAY TRANSP. SAFETY ADMIN., U.S. DEP’T OF TRANSP., ON-THE-ROAD DRIVING BEHAVIOR AND BREATH ALCOHOL CONCENTRATION, DOT HS 364 37 567, at 6-6 (1975) (finding that 46% of legally impaired drivers had their last drink at a bar and “almost all (97%) legally impaired male respondents reported having consumed alcohol during the previous three hours, and 72% reported drinking within the previous hour”); Aidan J. Moore, *Alcohol Law Enforcement: Agencies, Methods, and Impact*, in TRANSP. RESEARCH BD. OF THE NAT’L ACADS., TRAFFIC SAFETY AND ALCOHOL REGULATION: A SYMPOSIUM 169, 177 (2006) (“Studies have shown that up to 50% of persons driving under the influence [of alcohol] had their last drink at a licensed establishment.”).

83. Anderson et al., *supra* note 36, at 360. It is unclear, however, whether the decrease in roadway fatalities will continue to decrease or will stabilize after five years. See *id.* at 347–49.

84. See Salomonsen-Sautel et al., *supra* note 78, at 140. The study noted, however, that given the longevity of marijuana’s metabolites in the body, the higher number may just indicate that a higher percentage of Colorado residents have used marijuana, but still did not drive while under its psychoactive effects. See *id.* at 142.

85. See 2014 ROCKY MOUNTAIN HIDTA REPORT, *supra* note 78, at 7. A High Intensity Drug Trafficking Area (HIDTA) is a geographic region in which the federal government provides additional resources to law enforcement to reduce drug trafficking. Congress created the Rocky Mountain HIDTA in 1996. It consists of Colorado, Montana, Utah, and Wyoming. See *What is HIDTA*, Rocky Mountain High Intensity Drug Trafficking Area, <http://www.rmhidta.org/> (last visited Mar. 13, 2015).

86. Eugene W. Schwilke et al., *Changing Patterns of Drug and Alcohol Use in Fatally Injured Drivers in Washington State*, 51 J. FORENSIC SCI. 1191, 1197 (2006). That study was conducted before Washington State approved recreational marijuana use.

A recently published report identified several recent, adverse, developing trends in Colorado and Washington. For example, although it might be expected that marijuana use in those states would exceed the national average, there was a significant increase in marijuana use by minors between 2011–2012 and 2012–2013. In Colorado, the number of children sent to an emergency room for unintentional marijuana ingestion doubled from 2008–2011 to 2013 and nearly doubled again in the first half of 2014 (although the numbers were small (four, eight, and

Accordingly, the jury is still out on two questions. First, will medical and recreational marijuana initiatives improve or worsen highway safety? Only time will tell. Further studies need to be conducted in order to discover the effect of medical and recreational marijuana use on traffic safety in states with such laws and in their border states. Second, what is the effect of medical and recreational marijuana laws on *individual drivers*, rather than on *statewide statistics*? That question demands our attention now. The states already make it a crime to drive recklessly or to drive when impaired by a substance such as marijuana, and state law enforcement agencies need guidance as to how to enforce those laws in a state with medical or recreational marijuana programs. To answer that question, we need to know what are the physiological and psychological effects that marijuana can have on a driver. The next section addresses that issue.

III. THE EFFECT OF MARIJUANA ON DRIVING

A. *The Effect of Marijuana Alone*

Inhaling marijuana produces a feeling of lightheadedness, sedation, euphoria (or dysphoria), sociability, perceived heightened sensory perception, increased appetite, and slightly altered mental processes.⁸⁷ Marijuana also has potentially

fourteen). And contaminant testing in Washington revealed that 13% of marijuana and THC-infused products contained mold, salmonella, and E. coli. SMART APPROACHES TO MARIJUANA, LESSONS AFTER TWO YEARS OF MARIJUANA LEGALIZATION (2015); *see also* CAULKINS ET AL., *supra* note 22, at 32 (“ED [Emergency Department] episodes involving children are a particular concern. Colorado has experienced an increase in young children admitted to EDs because of accidental ingestion of marijuana-infused edibles.”). For another problem created by state decriminalization of marijuana, see Jack Healy, *Odd Byproduct of Legal Marijuana: Homes That Blow Up*, N.Y. TIMES (Jan. 17, 2015), <https://www.nytimes.com+odd-byproduct-of-legal-marijuana-homes-blow-up.html> (“[A]mateur marijuana alchemists . . . are turning their kitchens and basements into ‘Breaking Bad’-style laboratories, using flammable chemicals to extract potent drops of a marijuana concentrate commonly called hash oil, and sometimes accidentally blowing up their homes and lighting themselves on fire in the process There were 32 such blasts across Colorado in 2014, up from 12 a year earlier, according to the Rocky Mountain High-Intensity Drug Trafficking Area [Task Force], which coordinates federal and state drug enforcement efforts.”).

In December 2014, Nebraska and Oklahoma, states that border Colorado, filed a lawsuit against Colorado in the Supreme Court, seeking to invoke the Court’s original jurisdiction over interstate disputes. *See* U.S. CONST. art. III, § 2, cl. 1 (“The judicial Power shall extend . . . to Controversies between two or more States[.]”); U.S. CONST. art. III § 2, cl. 2 (“In all Cases . . . in which a State shall be a Party, the supreme Court shall have original Jurisdiction”); Motion for Leave to file Complaint, *Nebraska v. Colorado*, No. 220144 (U.S. Dec. 18, 2014). Nebraska and Oklahoma argue that the Colorado recreational marijuana law has led to an increase in the amount of marijuana brought into those states, in violation of their own laws. *See* Complaint at 4–8, 21–23, 28–29, *Nebraska v. Colorado*, No. 220144 (U.S. Dec. 18, 2014); Brief in Support of Motion for Leave to File Complaint 9–27, *Nebraska v. Colorado*, No. 220144 (U.S. Dec. 18, 2014). The Supreme Court’s original jurisdiction is discretionary, not mandatory. *See, e.g., Rhode Island v. Massachusetts*, 37 U.S. (12 Pet.) 657, 657 (1838). The Court has not yet decided whether to hear the case.

87. *See, e.g.,* BRITISH MED. ASS’N, *supra* note 10, at 19–20 tbl.3 (listing marijuana’s pharmacological actions on people); Michael N. Bates & Tony A. Blakeley, *Role of Cannabis in Motor Vehicle Crashes*, 21 EPIDEMIOLOGICAL REV. 222, 222–23 (1999); Hartman & Huestis, *supra* note 15, at 478. Those sensations do not appear to dissuade marijuana users from driving. Canadian studies have noted that 22% of marijuana users have driven while under its influence, and 90% said that they were willing to drive after consuming a typical dose. *See* Scott MacDonald et

debilitating short-term cognitive effects. It slows reaction times and the learning process; it hampers concentration and short-term memory; it distorts perceptions of time and space, including distance; and it diminishes the eye-hand-foot coordination necessary for driving.⁸⁸ Together or separately, those effects could predictably deteriorate a person's ability to drive safely or to engage in other safety-related behaviors.⁸⁹

An army of scholars has sought to confirm or refute that prediction. Researchers have conducted a multitude of laboratory, experimental, and epidemiological studies on the effect of marijuana on driving,⁹⁰ and scholars have performed numerous meta-analyses of those studies.⁹¹ Their findings are not unanimous.⁹² Interestingly, there appears to be a disagreement between laboratory cognitive

al., *Driving Behavior Under the Influence of Cannabis or Cocaine*, 9 *TRAFFIC INJURY PREVENTION* 190, 191 (2008) (describing earlier studies).

88. See, e.g., DUPONT, *supra* note 1, at 144; Stephanie Blows et al., *Marijuana Use and Car Crash Injury*, 100 *ADDICTION* 605, 606 (2005); Hall & Degenhardt, *supra* note 10, at 1384–85; Hartman & Huestis, *supra* note 15, at 478.

89. See, e.g., DUPONT, *supra* note 1, at 144. Cognitive studies are designed to measure the effect of marijuana on the mental processes necessary for safe vehicle handling. Those studies, with only slight disagreement, reveal that marijuana hampers all of the skills and traits that a driver needs to handle a vehicle safely, such as attentiveness, vigilance, perception of time and speed, use of acquired knowledge, motor coordination, visual functions, performance of complex tasks, and reaction time. See Sewell et al., *supra* note 3, at 187. Cognitive studies therefore would support the conclusion that marijuana use causes deterioration in the skills necessary to safely operate a vehicle. See *id.*

90. Laboratory studies test the effect of marijuana on test subjects performing various eye-hand-foot coordination tasks. Marijuana impaired fine motor skills and manual dexterity, and slightly slowed reaction time. See IVERSEN, *supra* note 10, at 95. In experimental studies, researchers administer marijuana to test subjects and measure its effect on their driving skills using a driving simulator or on a test course. Those studies show that marijuana weakens a driver's ability to use his peripheral vision, to stay within his lane, or to monitor his speedometer. Marijuana use also increases a driver's decision time when passing another vehicle and when needing to brake in response to a sudden light change or sound. See, e.g., *id.*; Sewell et al., *supra* note 3, at 187–88. Epidemiological studies retrospectively measure drug use by drivers injured in accidents. See, e.g., Franjo Grotenhermen et al., *Developing Limits for Driving Under Cannabis*, 102 *ADDICTION* 1910, 1912 (2007); Sewell et al., *supra* note 3, at 187–88. There, the evidence is mixed. The experimental studies do not reveal that marijuana does not cause long-term users to suffer a marked deterioration in their driving skills, but they do indicate that some driving skills are not seriously affected at low doses. That result is particularly odd given the evidence established in cognitive studies that marijuana causes drivers to suffer demonstrable neurophysiological impairments. See Grotenhermen, *supra*, at 1912–13; Sewell et al., *supra* note 3, at 187–88. (That result may be due to methodological flaws in the epidemiological studies. See J. Michael Walsh et al., *Drugs and Driving*, 5 *TRAFFIC INJ. PREVENTION* 241, 241 (2004).) While there is a “clear-cut and consistent” relationship between alcohol use and impairment, those studies do not establish the same relationship between marijuana use and impairment. See Kelly et al., *supra* note 47, at 326 (“The relationship between THC and street driving . . . is equivocal . . .”); Scott Macdonald et al., *Injury Risk Associated with Cannabis and Cocaine Use*, 72 *DRUG & ALCOHOL DEPENDENCE* 99, 104, 108–09 (2003); Sewell et al., *supra* note 3, at 189–90.

91. See, e.g., Sewell et al., *supra* note 3, at 187–92.

92. See, e.g., Bates & Blakeley, *supra* note 87, at 231 (finding insufficient proof that marijuana alone or in combination with alcohol increases the risk of traffic fatalities or injuries); Alfred Crancer, Jr. et al., *Comparison of the Effects of Marijuana and Alcohol on Simulated Driving Performance*, 164 *SCIENCE* 251, 254 (1969) (showing that marijuana users had more speeding errors, but did not have a greater number of braking, signaling, steering, or total errors than control group); Mark J. Neavyn et al., *Medical Marijuana and Driving: A Review*, 10 *J. MED. TOXICOLOGY* 269, 272–76 (2014); Ole J. Rafaelson et al., *Cannabis and Alcohol: Effects on Simulated Car*

studies, which largely show that marijuana impairs the skills necessary for driving safely, and experimental or epidemiological studies, which do not always point in that direction.⁹³ As one report noted, “Laboratory studies of the effect of acute marijuana intake on various tasks show impairment in reaction time, attention, coordination and motor skills, which are likely to be important in driving.”⁹⁴ Nonetheless, “there is less evidence that this translates into actual driving impairment in simulator studies,” and “recent literature reviews conclude that overall the evidence for the role of marijuana use in car crashes remains inconclusive.”⁹⁵

Some unavoidable methodological problems with experimental and epidemiological studies, including factors that confound the analysis by posing unquantifiable causal explanations, may have kept researchers from being able to determine whether marijuana plays a causal role in traffic accidents.⁹⁶ One such factor is the

Driving, 179 *SCIENCE* 920, 923 (1973) (showing that marijuana use increased braking time but did not adversely affect other driving skills).

93. See Sewell et al., *supra* note 3, at 187–92.

94. Blows, *supra* note 88, at 606; see also, e.g., IVERSEN, *supra* note 10, at 95.

95. Blows, *supra* note 88, at 606; see also *id.* at 609 (noting disagreement in earlier studies).

96. See, e.g., Hartman & Huestis, *supra* note 15, at 489; Walsh et al., *supra* note 90, at 241–42. There are a host of potential problems with experimental and epidemiological studies of marijuana’s effect on driving. For example, individuals who volunteer in experimental studies may be mistaken about, or not honestly report, their driving skills or prior marijuana usage. That matters because marijuana tolerance may affect a person’s driving skills, and there is no scientific test for tolerance. See *infra* text accompanying note 234–36. Simulator road tests may vary from study to study, and both the courses tested and their degree of difficulty may have changed over time. Not all studies may have tested for a driver’s ability to maintain lateral safety by staying in his lane, which appears to be a problem for marijuana (and alcohol) users. See EARLEYWINE, *supra* note 10, at 213 (“[Marijuana use] significantly increased lateral movement within the traffic lane. That is, participants’ cars weaved from side to side within the lane more after smoking cannabis than after smoking a placebo.”). Surveys of illicit drug use in the general population rely on questionnaires or interviews. If the pool includes drivers and non-drivers, there is a risk that the results obtained from the latter subset may not be representative of the results drawn entirely from the former. Roadside surveys are generally conducted at night, and nighttime drivers may not accurately represent the entire pool of drivers. See *id.* Compliance with roadside surveys is voluntary, and high refusal rates or underreporting is always a possibility if a person then possesses or is under the influence of an illicit drug. High refusal rates and underreporting may weaken the ability to draw inferences from the data. See *id.* If the population at issue is not the general population but people who have been arrested for driving while intoxicated, the police may not see a need to test a driver for drugs if his blood alcohol content exceeds the legal limit. See *id.* It may be that high-risk drivers also use marijuana and would not have been involved in an accident without having used that drug. If the population is users and addicts, where drug tests are generally performed at treatment facilities, the results may not be representative of the entire category of users given that adequate drug treatment facilities are not always available. See, e.g., NAT’L INST. ON DRUG ABUSE, PRINCIPLES OF DRUG ABUSE TREATMENT FOR CRIMINAL JUSTICE POPULATIONS: A RESEARCH-BASED GUIDE 12 (2014) (finding that fewer than twenty percent of state and federal prisoners needing drug abuse treatment received it); OFFICE OF NAT’L DRUG CONTROL POLICY, FACT SHEET: A 21ST CENTURY DRUG POLICY 2 (2013) (“Of the 21.6 million Americans aged 12 or older who needed treatment for an illicit drug or alcohol use problem in 2011, only 2.3 million (10.8 percent) received it.”); Kaplan, *supra* note 19, at 49 (“In many cities there is a months-long wait for those who want to enter a drug-treatment program; this is a serious problem, considering that the desire to reform is often ephemeral, and disappears if it cannot be acted upon at once.”). The police often do not test a driver for drug use if he is alcohol-impaired, which leads to underreporting of drug use. See Walsh et al., *supra* note 90, at 242. Finally, two researchers have noted that “[m]any epidemiologic studies have involved selection bias,” because, for example, “[s]ome evaluated only specific populations, such as deceased drivers or those being treated for substance abuse

phenomenon of compensating behaviors by drivers under the influence of marijuana. Researchers have explained the apparent oddity that the results of experimental or epidemiological studies do not match up with the findings in cognitive studies by suggesting that marijuana users will adopt compensatory behaviors to avoid traffic accidents. That is, unlike alcohol users, who *underestimate* the effect of alcohol on driving skills and engage in risky driving behavior, such as driving faster and more aggressively, marijuana users *overestimate* the drug's effect and compensate by driving more slowly, passing less frequently, and spacing their cars further from other vehicles by increasing their following distance.⁹⁷ Accordingly, while there are no studies establishing that marijuana improves a person's driving abilities and numerous studies showing that marijuana diminishes the skills necessary for safely navigating the road, there is no consensus that cannabis use will ineluctably cause the average marijuana user to suffer an automobile accident.

"Nevertheless," as one expert has put it, "driving while under the influence of marijuana cannot be recommended as safe."⁹⁸ As the National Institute of Medicine concluded in 1999, "[f]or most people the primary adverse effect of *acute* marijuana use is diminished psychomotor performance. It is, therefore, inadvisable to operate any vehicle or potentially dangerous equipment while under the influence of marijuana, THC, or any cannabinoid drug with comparable effects."⁹⁹ The psychic effects of marijuana impair psychomotor skills for a period of hours after taking the drug, making it inadvisable for any user to drive during that time.¹⁰⁰ Moreover, no amount of compensatory behavior can prepare a driver

or addiction." Hartman & Huestis, *supra* note 15, at 489. Some studies administered pure THC in pill form, rather than use inhaled marijuana. Finally, the potency of today's marijuana may be far greater than what was use in studies conducted decades ago. *See, e.g.,* Hall & Degenhardt, *supra* note 10, at 1383–84; Volkow et al., *supra* note 31, at 2222.

97. *See, e.g.,* EARLEYWINE, *supra* note 10, at 212–13; IVERSEN, *supra* note 10, at 95; Bates & Blakeley, *supra* note 87, at 224; Susan Goodwin Gerberich et al., *Marijuana Use and Injury Events Resulting in Hospitalization*, 13 ANNALS EPIDEMIOLOGY 230, 234 (2003); Grotenhermen et al., *supra* note 90, at 1913; Hall & Degenhardt, *supra* note 10, at 1385; Sewell et al., *supra* note 3, at 187–88.

98. IVERSEN, *supra* note 10, at 96; *see also, e.g.,* Jones et al., *supra* note 9, at 457 ("[C]annabis is an illicit drug used by people for the primary purpose of 'getting high' and escaping from reality, and this is not compatible with performing skilled tasks such as driving . . ."); Herbert Moskowitz, *Marihuana and Driving*, 17 ACCIDENT ANALYSIS & PREVENTION 323, 341 (1985) ("Clearly, marijuana is a substance which produces serious behavioral toxicological effects. Any situation in which safety both for self and others depends upon alertness and capability of control of man—machine interaction precludes use of marijuana.").

99. INST. OF MED., *supra* note 31, at 4; *see also, e.g.,* MARCELLINE BURNS, MEDICAL-LEGAL ASPECTS OF DRUGS 153 (2003) ("Without exception, all illicit drugs have the potential to impair the cognitive and behavioral skills that allow a person to engage in normal daily activities, such as driving and working.").

100. *See* BRITISH MED. ASS'N, *supra* note 10, at 66; IVERSEN, *supra* note 10, at 163; *see also, e.g.,* EARLEYWINE, *supra* note 10, at 214 ("Obviously, no one should operate dangerous machinery of any kind under the influence of a mind-altering drug."). Various studies and reports have found an association between marijuana use and road crashes or noted that there is a material increase in the risk of a motor vehicle accident if the driver is under the influence of marijuana. *See, e.g.,* NHTSA 1993 REPORT, *supra* note 46, at 4–15; WORLD HEALTH ORG., CANNABIS: A HEALTH PERSPECTIVE AND RESEARCH AGENDA 15–16 (1997); C. Heather Ashton, *Pharmacology and Effects of Cannabis: A Brief Review*, 178 BRIT. J. PSYCHIATRY 101, 104 (2001) ("Numerous studies have shown that

for unexpected events or accelerate reaction time hampered by cannabis.¹⁰¹ Accordingly, while studies do not prove that use of any particular amount of marijuana will inevitably cause an accident in any specific case or category of cases, overall those studies justify the conclusion that marijuana use is associated with an increased risk of motor-vehicle accidents, particularly ones involving fatalities, due to its effects on psychomotor performance.¹⁰² That is also the

cannabis impairs road-driving performance and have linked cannabis use with increased incidence of road traffic accidents.”); Michel Bédard et al., *The Impact of Cannabis on Driving*, 98 CANADIAN J. PUB. HEALTH 6, 8–9 (2007); Blows, *supra* note 88, at 610 (“This population-based case-control study suggests that habitual marijuana use is associated with a 10-fold increase in the risk of car crash injury.”); Budd et al., *supra* note 5, at 158; Drummer et al., *supra* note 43, at 245; Hartman & Huestis, *supra* note 15, at 489; Bernard Laumon et al., *Cannabis Intoxication and Fatal Road Crashes in France: Population-Based Case—Control Study*, 331 BRITISH MED. J. 1371, 1373 (2005) (“[C]onsumption of cannabis increases the risk of responsibility for road traffic crashes, while remaining significantly lower than the risk associated with alcohol.”); Mu-Chen Li et al., *Marijuana Use and Motor Vehicle Crashes*, 34 EPIDEMIOLOGIC REV. 65, 69 (2012); Moskowitz, *supra* note 98, at 340; K. Papafiotou et al., *The Relationship Between Performance on the Standardized Field Sobriety Tests, Driving Performance and the Level of Δ^9 -Tetrahydrocannabinol (THC) in Blood*, 155 FORENSIC SCI. INT’L 172, 176, 177–78 (2005); J.G. Ramaekers et al., *Marijuana, Alcohol and Actual Driving Performance*, 15 HUMAN PSYCHOPHARMACOLOGY CLINICAL & EXPERIMENTAL 551 (2000); Reisfield et al., *supra* note 1, at 354 (“A meta-analysis of 120 studies found a general correlation between blood THC levels and driving impairment, but less impairment among frequent users than infrequent users at a given THC dose, suggesting the development of tolerance.”); Sewell et al., *supra* note 3, at 187; Volkow et al., *supra* note 31, at 2220 tbl.1; Walsh et al., *supra* note 90, at 246. In one study, ten percent of the drivers involved in fatal motor vehicle accidents tested positive for marijuana use. See IVERSEN, *supra* note 10, at 163.

101. See, e.g., WORLD HEALTH ORG., *supra* note 100, at 15.

102. See, e.g., BRITISH MED. ASS’N, *supra* note 10, at 66 (“Impairment of psychomotor and cognitive performance, especially in complex tasks, has been shown in normal subjects in many tests. Impairments include slowed reaction time, short term memory deficits, impaired attention, time and space distortion, impaired coordination. These effects combine with the sedative effects to cause deleterious effects on driving ability or operation of machinery.” (citations omitted)); CAULKINS ET AL., *supra* note 22, at 33 (“Another important health concern associated with marijuana consumption is the risk of accidents (e.g., falls, motor-vehicle accidents, and workplace accidents). There is clear evidence from strictly controlled laboratory trials that marijuana use reduces psychomotor performance in ways that increase overall risk of accidents and, in particular, impairs driving. Of course, not unlike with alcohol, the degree of impairment is a function of the dose, as well as individual-level factors, including age, body mass, and length of time using the drug. Although early evidence from simulator and epidemiological studies was far less conclusive . . . , Room et al. (2010) argued that the more-recent better-controlled epidemiological studies do, in fact, provide credible evidence that marijuana users who drive while intoxicated are at greater risk of motor-vehicle crashes. Meta-analyses conducted since Room et al.’s evaluation, accounting for differences in study design and use of case controls, conclude that recent marijuana use (indicated by THC in blood or self-reported use near the time of the accident) more than doubles the risk of a car crash.” (citations omitted)); NAT’L INST. ON DRUG ABUSE, U.S. DEP’T OF HEALTH & HUMAN SERVS., DRUGFACTS: DRUGGED DRIVING 2 (2013) [hereinafter NIDA DRUGGED DRIVING] (“Considerable evidence from both real and simulated driving studies indicates that marijuana can negatively affect a driver’s attentiveness, perception of time and speed, and ability to draw on information obtained from past experiences.”), available at http://www.drugabuse.gov/sites/default/files/drugfacts_druggeddriving_2014.pdf; ROOM ET AL., *supra* note 13, at 18–19 (“Better-controlled epidemiological studies have recently supplied credible evidence that cannabis users who drive while intoxicated are at increased risk of motor vehicle crashes A convergence of fallible evidence thus suggests that cannabis use increases the risk of motor vehicle crashes 2–3 times”); Mark Asbridge et al., *Acute Cannabis Consumption and Motor Vehicle Collision Risk: Systematic Review of Observational Studies and Meta-Analysis*, 344 BRIT. MED. J. e536, e560 (2012) (“After a systematic review of the literature, this meta-analysis of studies examining acute cannabis consumption and motor vehicle collisions, with adequate

considered judgment of federal officials whose mission is to increase highway safety.¹⁰³ Accordingly, it would be eminently sensible for a state to treat marijuana-induced impairment in the same manner as alcohol-induced impairment by making each one a form of reckless driving.

B. The Combined Effect of Marijuana and Alcohol

There is an additional problem. Studies consistently show that people who smoke marijuana often combine it with other illicit drugs or alcohol.¹⁰⁴ The combination of marijuana and alcohol is particularly troublesome because each

control groups, found a near doubling of risk of a driver being involved in a motor vehicle collision resulting in serious injury or death.”); Wayne Hall, *What Has Research Over the Past Two Decades Revealed About the Adverse Health Effects of Recreational Cannabis Use?*, 110 ADDICTION 19, 21 (2014) (finding that over the past decade, better-designed epidemiological studies and meta-analyses have found that cannabis users who drive while intoxicated increase the risk of motor vehicle crashes two to three times); Neavyn et al., *supra* note 92, at 277 (“Based on our interpretation of the strength of these various studies and observations, we conservatively recommend that patients abstain from driving for a minimum of 8 h[ours] after achieving a subjective ‘high’ from marijuana use.”); Johannes G. Ramaekers et al., *Dose Related Risk of Motor Vehicle Crashes after Cannabis Use: An Update*, in DRUGS, DRIVING AND TRAFFIC SAFETY 495 (J.C. Verster et al. eds., 2009) (“There is no evidence that past use of THC alone affects crash risks, but there is growing evidence that recent use of THC increases the risk for motor vehicle accidents compared to drug free drivers, particularly at high concentrations.”); *infra* text accompanying notes 162–64 & note 175.

103. In 2014 the Subcommittee on Operations of the House Committee on Oversight and Government Reform held a hearing, entitled “Planes, Trains, and Automobiles: Operating While Stoned,” to examine the effect of drug use on highway safety. See *Planes, Trains, and Automobiles: Operating While Stoned: Hearing Before the Subcomm. on Operations of the H. Comm. on Oversight and Government Reform*, 113th Cong. (2014). Each of the expert witnesses who testified at the hearing acknowledged that drugged driving is an important public policy issue and poses a danger to road and highway safety. See *id.* at 9 (statement of Hon. Christopher Hart, Acting Chairman, National Transportation Safety Bd.); *id.* at 24–25 (statement of Jeffrey P. Michael, Assoc. Adm’r of Research & Program Development, National Highway Traffic Safety Admin., U.S. Dep’t of Transp.); *id.* at 42 (statement of Patrice M. Kelly, Acting Dir., Office of Drug & Alcohol Policy and Compliance, U.S. Dep’t of Transp.); *id.* at 44 (statement of Ronald Flegel, Dir., Division of Workplace Programs, Center for Substance Abuse Prevention, Substance Abuse & Mental Health Services Admin., U.S. Dep’t of Health & Human Servs.).

104. See, e.g., IVERSEN, *supra* note 10, at 95, 210–11; NIDA DRUGGED DRIVING, *supra* note 102, at 2; AMA Consensus Report, *supra* note 2, at 2619; Bates & Blakeley, *supra* note 87, at 224 & tbl.1; Jones et al., *supra* note 9, at 455–56 & tbl.3; Ramaekers et al., *supra* note 100, at 551; Reisfield et al., *supra* note 1, at 354 (“A considerable minority of drivers drive after consuming varying combinations of alcohol and drugs.”); Soderstrom et al., *supra* note 15, at 736. The combination of drugs can amplify the effect of any one of them. The combination can leave a driver far more impaired than if he had consumed only one drug in the cocktail, with the effects sometimes varying from “additive” to “supra-additive.” Reisfield et al., *supra* note 1, at 354; see K.L.L. Movig et al., *Psychoactive Substance Use and the Risk of Motor Vehicle Accidents*, 36 ACCIDENT ANALYSIS & PREVENTION 631, 633–34 (2004) (“Vehicle drivers who were exposed to drug-alcohol combinations were at the highest risk of experiencing injurious road accidents.”). A recent RAND report noted the following:

The descriptive statistics concerning overlap in use are clear. Marijuana users are much more likely than are nonusers to drink and to abuse alcohol. For example, current marijuana users are five times as likely as nonusers to meet DSM-IV criteria for alcohol abuse or dependence (26 percent versus 5 percent); that is, one in four current marijuana users is a problem drinker (calculated using 2012 NSDUH data using the SAMHSA online tool). Indeed, simultaneous use is common. The national household survey asks people what, if any, other substances they used the last time they drank alcohol. Among the 15.4 million people who used both alcohol and marijuana

drug amplifies the effect of the other.¹⁰⁵ “It may be that the greatest risk of marijuana in this context is to amplify the impairment caused by alcohol when, as often happens, both drugs are taken together[.]”¹⁰⁶ Consumed together, the two drugs seriously impair a person’s driving performance,¹⁰⁷ and they dramatically increase the risk of a single-vehicle crash.¹⁰⁸ In other words, a driver with a 0.05 BAC is not legally intoxicated as a matter of law in a state with a 0.08 g/dL BAC threshold, but he may be impaired as a matter of fact if he has also recently used marijuana, due to the combined effect of the two drugs. Accordingly, even if marijuana use by itself might not increase highway mortality, the combination of marijuana and alcohol manifestly could have that effect.

at some time in the past 30 days, 54 percent reported using marijuana along with alcohol the last time they drank, a proportion that rises to 83 percent among daily or near-daily marijuana users.

CAULKINS ET AL., *supra* note 22, at 44.

105. As one study concluded, “[c]ombined marijuana and alcohol use are a concern in the driving population because of the marked synergism demonstrated between these two drugs, particularly in inexperienced users” Schilke et al., *supra* note 86, at 1195 (citation omitted); *see also, e.g.*, BRITISH MED. ASS’N, *supra* note 10, at 73 (noting the “additive effect” when marijuana and alcohol are combined); DRUG-IMPAIRED DRIVING, *supra* note 57, at 16 (“[M]ultiple drugs or drugs and alcohol can have a synergistic effect, rather than a simple additive effect, so each substance may increase the impairing effects of the others.”); Johannes G. Ramaekers, *supra* note 102, at 495 (“The effects of THC and alcohol on driving performance and risk of motor vehicle crashes appear to be additive, but the sum can be large and potentially additive. Combined use of alcohol and THC produces severe driving impairment and sharply increases the risk of drivers’ accident culpability as compared to drug free drivers, even at low doses.”); Grotenhermen et al., *supra* note 90, at 1916 (“[T]he concurrent use of alcohol and cannabis impairs driving skills more than each drug individually.” (citation omitted)); Kelly et al., *supra* note 47, at 331–32 (“[T]here is evidence of an additive effect on performance when alcohol and cannabis are administered in combination.” (citation omitted)); Moskowitz, *supra* note 97, at 340–41; P. Mura et al., *Comparison of the Prevalence of Alcohol, Cannabis and Other Drugs Between 900 Injured Drivers and 900 Control Subjects: Results of a French Collaborative Study*, 133 FORENSIC SCI. INT’L 79, 84 (2003); Ramaekers et al., *supra* note 100, at 551; Walsh et al., *supra* note 90, at 246 (“In several studies, pharmacodynamics interactions between THC and ethanol have been documented with enhanced impairment greater than the effects of cannabis or ethanol alone[.] . . . In several studies, pharmacodynamics interactions between THC and ethanol have been documented with enhanced impairment greater than the effects of cannabis or ethanol alone[.]”). The combination of small quantities of marijuana and alcohol is comparable to driving with a BAC of 0.09 to 0.14, which corresponds to between an eleven-fold and a forty-eight-fold increase in the risk of a single vehicle crash. *Id.* at 556.

106. IVERSEN, *supra* note 10, at 96; *see also, e.g.*, EARLEYWINE, *supra* note 10, at 210–11 (“Driving after consuming alcohol, particularly in combination with cannabis, is extremely dangerous and ill-advised. Thus, users who wish to reduce the drug’s harm should never operate a motor vehicle during intoxication.”); NIDA DRUGGED DRIVING, *supra* note 102 (“Research shows that impairment increases significantly when marijuana use is combined with alcohol.”); ROOM ET AL., *supra* note 13, at 19; Luke A. Downey et al., *The Effects of Cannabis and Alcohol on Simulated Driving: Influences of Dose and Experience*, 50 ACCIDENT ANALYSIS & PREVENTION 879 (2013).

107. *See, e.g.*, Hartman & Huestis, *supra* note 15, at 478; Ramaekers et al., *supra* note 100, at 556–57.

108. *See, e.g.*, Ramaekers et al., *supra* note 100, at 556–57. Combining small quantities of marijuana and alcohol is comparable to driving with a BAC of 0.09 to 0.14, which corresponds to between an eleven-fold and a forty-eight-fold increase in the risk of a single vehicle crash. *Id.* at 556. Explanations for the increased risk are that the marijuana-alcohol combination adversely affects a driver’s ability (1) to remain in a safe lateral position in relation to other drivers, which means that this drug combination increases the time that a driver spends out of his lane, (2) to maintain a safe following distance, and (3) to react quickly to changed driving conditions. *Id.* at 556–57.

It is difficult to know exactly how many instances occur where a driver intoxicated by alcohol is also under the influence of marijuana. A police officer can readily test a driver to determine his blood-alcohol level, and a driver whose BAC exceeds the legal maximum of 0.08 g/dL is perforce guilty of driving while intoxicated. Where that is true, oftentimes police officers will not bother to determine whether the driver has also used marijuana or some other illicit drug, perhaps because a positive test result may not enhance the available punishment or perhaps for fear of being criticized for running up needless expenses.¹⁰⁹ The result is a likely underreporting of drug-impaired driving.

IV. THE FRAMEWORK FOR ADDRESSING MARIJUANA-INDUCED DRUGGED DRIVING

A. *The Existing Framework for Alcohol*

The principal federal law regulating the police response to driving while intoxicated is the Fourth Amendment.¹¹⁰ Applicable to “searches” and “seizures” of a person or his property,¹¹¹ the Fourth Amendment permits a law enforcement officer to make a brief investigative stop of a vehicle if, based on the totality of circumstances, he has “a particularized and objective basis” for suspecting that the driver is intoxicated.¹¹² The reasonable suspicion standard is not exacting. A mere “hunch” is insufficient,¹¹³ but the level of suspicion required is “considerably less” than proof of wrongdoing by a preponderance of the evidence,¹¹⁴ and is “obviously less” than the proof necessary for probable cause to arrest.¹¹⁵ A police officer can rely on his own observations or those of a bystander, such as another driver, if the private party’s reports are sufficiently reliable.¹¹⁵ In assessing the evidence, police

109. See, e.g., DRUG-IMPAIRED DRIVING, *supra* note 57, at 12; NIDA DRUGGED DRIVING, *supra* note 102, at 1–2 (“It is hard to measure the exact contribution of drug intoxication to driving accidents, because blood tests for drugs other than alcohol are inconsistently performed, and many drivers who cause accidents are found to have both drugs and alcohol in their system, making it hard to determine which substance had the greater effect.”); Wendy M. Bosker & Marilyn A. Huestis, *Oral Fluid Testing for Drugs of Abuse*, 55 CLINICAL CHEMISTRY 1910, 1911 (2009).

110. The Fifth Amendment Self-Incrimination Privilege does not bar the government from compelling a person to provide a blood sample for a BAC test. See *Schmerber v. California*, 384 U.S. 757, 761 (1966). If the driver refuses to submit to a blood test, the police may obtain a search warrant to obtain his blood, see *Missouri v. McNeely*, 133 S. Ct. 1552 (2013), or the government may introduce at trial his refusal to submit to a BAC test, see *South Dakota v. Neville*, 459 U.S. 553 (1983).

111. The Fourth Amendment provides as follows: “The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.” U.S. CONST. amend. IV.

112. *Navarette v. California*, 134 S. Ct. 1683, 1687 (2014) (quoting *United States v. Cortez*, 449 U.S. 411, 417–18 (1981)); see also, e.g., *United States v. Sokolow*, 490 U.S. 1, 7 (1989); *Terry v. Ohio*, 392 U.S. 1, 21–22 (1968).

113. *Terry*, 392 U.S. at 27.

114. See, e.g., *Navarette*, 134 S. Ct. at 1687; *Sokolow*, 490 U.S. at 7.

115. See, e.g., *Navarette*, 134 S. Ct. at 1687; *Sokolow*, 490 U.S. at 7.

officers not only may reach common sense conclusions about human conduct,¹¹⁶ but also may draw on their experience and training to make inferences from and deductions about the entire body of information available to them—inferences and deductions that “might well elude an untrained person.”¹¹⁷ Police officers also need not rule out the possibility of innocent conduct in order to make an investigatory stop.¹¹⁸ Accordingly, if a police officer sees (or receives a reliable report) that a particular motorist is handling his vehicle in a manner suggesting that the driver is intoxicated—for example, if one car almost forces another automobile off the road—the officer is justified in stopping the driver in order to determine if he is under the influence of alcohol.¹¹⁹

Once a police officer stops a driver suspected of being under the influence of alcohol, the officer then focuses on that person and his vehicle. There are several potential physiological signs of intoxication, such as the odor of alcohol on a person’s breath,¹²⁰ slurred or garbled speech, bloodshot eyes, mydriasis (dilated pupils), unresponsiveness of the pupils to light, nystagmus (rapid involuntary eye movement), swaying or staggering when walking, aggression or a refusal to cooperate, and impaired balance or movement.¹²¹

If a police officer concludes that the driver may be impaired by alcohol, the officer may require him to complete one or more informal sobriety tests, such as touching finger to finger or pronouncing “Methodist Episcopal” without a lisp.¹²² Alternatively, the officer may administer a Standardized Field Sobriety Test, a test developed by the National Highway Traffic Safety Administration (NHTSA) as an objective, noninvasive, easily applied means that police officers can use at roadside to determine intoxication.¹²³ It requires a driver to walk in a straight line,

116. See, e.g., *Illinois v. Wardlow*, 528 U.S. 119, 125 (2000); *Cortez*, 449 U.S. at 418.

117. *Cortez*, 449 U.S. at 418; see also, e.g., *United States v. Arvizu*, 534 U.S. 266, 273 (2002).

118. See, e.g., *Arvizu*, 534 U.S. at 277; *Wardlow*, 528 U.S. at 125–26; *Terry*, 392 U.S. at 5–6, 30.

119. Those facts describe the scenario in *Navarette*, see 134 S. Ct. at 1686–88, and the Supreme Court upheld the constitutionality of that vehicle stop, *id.* at 1691–92. See also DAMKOT, *supra* note 82, at 2.5 (finding that, in deciding what cues lead police officers to stop a driver for suspected DWI, study showed that “[t]raditionally, officers use some combination of the deviations from normal driving behavior listed in ‘The Drinking Driver’ manual of the California Highway Patrol (e.g., driving unreasonably fast or unreasonably slow, driving in spurts of speed, frequent lane changing with excessive speed, improper passing, overcontrol in passing, driving too close to edge of road, approaching signals unreasonably fast or slow, stopping or attempting to stop with uneven motion, etc.)”; NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP’T OF TRANSP., DOT HS 808 677, THE VISUAL DETECTION OF DWI MOTORISTS 4–15 (2010) (describing evidence of alcohol-impaired driving).

120. While conventional wisdom may be that intoxicated drivers always betray alcohol on their breath, in one study up to one-third of legally intoxicated drivers had no appreciable odor of alcohol when examined after being stopped. See Brookoff et al., *supra* note 47, at 519.

121. See, e.g., Brookoff et al., *supra* note 47, at 519; Stefan W. Toennes et al., *Driving Under the Influence of Drugs—Evaluation of Analytical Data of Drugs in Oral Fluid, Serum and Urine, and Correlation with Impairment Syndromes*, 152 FORENSIC SCI. INT’L 149, 150, 151 tbl.1 (2005).

122. See BARRON H. LERNER, ONE FOR THE ROAD: DRUNK DRIVING SINCE 1900, at xi, 24 (2011); Steven J. Rubenzer, *The Standardized Field Sobriety Tests: A Review of Scientific and Legal Issues*, 32 L. & HUMAN BEHAV. 293, 293 (2008).

123. See Rubenzer, *supra* note 122, at 293.

turn around, and retrace his steps (Walk-and-Turn or WAT); to maintain his balance while standing on one foot (One-Leg Stand or OLS); and to watch a moving object (Horizontal Gaze Nystagmus or HGN).¹²⁴ If the driver cannot successfully perform the first two tasks or if his eyes saccade as he watches a moving object, the officer may conclude that he is inebriated.¹²⁵ The officer also can require the driver to submit to a breathalyzer test or temporarily forfeit his driver's license under many state "implied consent" laws.¹²⁶

Police officers have used breathalyzers on innumerable occasions since they first became available because they are portable, easily and quickly administered, noninvasive, and, perhaps most importantly, given the relatively simple pharmaceuticals of alcohol, very reliable.¹²⁷ Moreover, the same ethyl alcohol is present in every alcoholic beverage; only the quantity and flavoring additives differ.¹²⁸ Breath testing is the standard means for measuring alcohol-induced intoxication because alcohol, a volatile liquid, is excreted (in part) through the lungs.¹²⁹ There also is an established straight-line correlation between the presence of a particular blood-alcohol level and the impairment it causes.¹³⁰ Breath testing therefore can

124. See, e.g., JACK W. STUSTER & MARCELLINE BURNS, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP'T OF TRANSP., DOT HS 808 839, VALIDATION OF THE STANDARDIZED FIELD SOBRIETY TEST BATTERY AT BACs BELOW 0.10 PERCENT 33–34 (1998) (describing the three components of the Standardized Field Sobriety Test); W.M. Bosker et al., *A Placebo-Controlled Study to Assess Standardized Field Sobriety Tests Performance During Alcohol and Cannabis Intoxication in Heavy Cannabis Users and Accuracy of Point of Collection Testing Devices for Detecting THC in Oral Fluid*, 223 PSYCHOPHARMACOLOGY 439, 442 (2012); Brookoff et al., *supra* note 47, at 519.

125. See Rubenzer, *supra* note 122, at 293.

126. See, e.g., Brookoff et al., *supra* note 47, at 519.

127. See ROBERT L. DUPONT ET AL., INST. FOR BEHAVIOR & HEALTH, DRUGGED DRIVING RESEARCH: A WHITE PAPER 20 (2011) ("Advances in technology have provided rapid, accurate instrumentation alcohol sensing for use in both the police station and at the roadside by minimally trained officers . . . [P]ortable hand held preliminary breath test (PBT) devices employing fuel cell sensors for use at the roadside, have been found to be as accurate for measuring BACs as the large desk evidential units employed at police stations for collecting BAC measures for submission in court. These devices can be used in the field early in an officer's investigation of a potential impaired driver to avoid delaying drivers who are not impaired and consuming officer time in an unnecessary investigation.").

128. See DUPONT, *supra* note 1, at 131.

129. See AM. SOC'Y OF ADDICTION MED., DRUG TESTING: A WHITE PAPER OF THE AMERICAN SOCIETY OF ADDICTION MEDICINE (ASAM) 26 (Oct. 26, 2013) [hereinafter DRUG TESTING WHITE PAPER], available at <http://www.asam.org/docs/default-source/public-policy-statements/drug-testing-a-white-paper-by-asam.pdf>; Sewell et al. *supra* note 3, at 185. The liver can metabolize alcohol over a few hours. See, e.g., DUPONT, *supra* note 1, at 126, 132; Nancy P. Barnett, et al., *Contingency Management for Alcohol Use Reduction: A Pilot Study Using a Transdermal Alcohol Sensor*, 118 ALCOHOL & DRUG DEPENDENCE 391, 391 (2011); Robert Swift, *Direct Measurement of Alcohol and its Metabolites*, 98 ADDICTION 73, 75 (2003) (finding that the liver can metabolize about seven grams of alcohol, or one drink, per hour). Some very sophisticated tests allow alcohol to be measured up to seventy-two hours after use. See DRUG TESTING WHITE PAPER, *supra*, at 34.

130. See, e.g., Grotenhermen et al., *supra* note 90, at 1912 ("For alcohol, scientists have developed, based on the results of numerous epidemiological studies, hazard curves that assign each alcohol concentration to a certain accident risk."); Reisfield et al., *supra* note 1, at 353; Sewell et al., *supra* note 3, at 191 ("Alcohol levels, which have linear pharmacokinetics, are easier to back-calculate to the time of the accident, and are consistently linked with culpability in crashes.").

be used in lieu of blood testing or a urinalysis test to detect the presence and debilitating effect of alcohol.¹³¹ The result is that curbside or roadside breathalyzer tests permit law enforcement officers to police drunken driving in an effective, reliable, nondegrading manner.¹³²

B. The New Framework for Marijuana

1. Treating Driving Under the Influence of Drugs in the Same Manner as Driving Under the Influence of Alcohol

Over time, states added drugs such as marijuana to their reckless driving or DUI laws.¹³³ Unfortunately, there is no procedure comparable to the Standard Field Sobriety Test that a police officer can administer on a roadside to determine if a driver is under the influence of drugs. For example, marijuana diminishes a person's temporal and spatial judgment, but the Standard Field Sobriety Test does not measure those effects.¹³⁴ Police officers also rely on nystagmus to determine if a person is under the influence of alcohol, but drugs that dilate or constrict the pupils do not also cause nystagmus.¹³⁵ There also is no device comparable to a breathalyzer to identify marijuana intoxication or the presence and amount of THC, the psychoactive ingredient in marijuana, in a driver's blood.¹³⁶ What is worse, even if that measurement could be done, there is no medical or scientific consensus regarding the amount of THC that would impair the average driver. That is true for a host of reasons, most of which stem from the fact that the relevant pharmaceuticals are far more complicated for drugs than for alcohol.¹³⁷

Alcohol has been the subject of extensive testing over decades. Science has established a strong relationship between BAC level and impairment or crash risk

131. Blood, urine, hair, and sweat also are test matrices for drugs, but it takes a considerable time to receive the test results, because the testing must be done at a laboratory. *See, e.g.*, Grotenhermen et al., *supra* note 90, at 1911. Police officers also prefer using breathalyzers to the other options. *See* Walsh et al., *supra* note 90, at 247.

132. If the officer arrests the driver for being under the influence of alcohol while driving, the officer can obtain a search warrant to test the arrestee's blood or urine for the presence of alcohol. *See* Missouri v. McNeely, 133 S. Ct. 1552 (2013). Laboratory tests such as gas chromatography, mass spectrometry, and radioimmunoassay then can confirm or refute the presence of alcohol. *See* Brookoff et al., *supra* note 47, at 519.

133. *See* Voas et al., *supra* note 7, at 219.

134. *See* Bosker et al., *supra* note 124, at 442; Brookoff et al., *supra* note 47, at 521. The Standard Field Sobriety tests do not work well to identify THC use. *See* Bosker et al., *supra* note 124, at 444–45; Luke A. Downey et al., *Detecting Impairment Associated with Cannabis With and Without Alcohol on the Standardized Field Sobriety Tests*, 224 PSYCHOPHARMACOLOGY 581, 588–89 (2012).

135. *See* Brookoff et al., *supra* note 1, at 521. The exception is methaqualone. *Id.*

136. *See, e.g.*, Sewell et al., *supra* note 3, at 191. Some scholars pointed out that problem some time ago. *See* KLEIMAN COSTS, *supra* note 19, at 173.

137. *See, e.g.*, KLEIMAN COSTS, *supra* note 19, at 10–11, 173; Walsh et al., *supra* note 90, at 249. There is an additional problem. Unless a driver consents to a blood test, someone will need to draw his blood over his objection. Police officers are not generally trained to act as paramedics or phlebotomists, however, and, even if they were, they cannot generally take a suspect's blood without a search warrant. *See* Missouri v. McNeely, 133 S. Ct. 1552 (2013). The time necessary to obtain a warrant could push the time of conducting the procedure past the point at which the THC concentration in his blood could indicate impairment.

and that a person's BAC level changes slowly over time.¹³⁸ By contrast, there are a host of factors that affect how a given drug concentration affects someone. Individuals differ in their body weight and composition, absorption, distribution, metabolism, and accumulation of a drug, as well as the effect it may have due to the rate at which it is absorbed, the frequency by which it has been used, and whether the blood-concentration level was obtained when the amount of the drug consumed was rising or falling.¹³⁹ The effect of cannabis on an individual also hinges on what is known as "the set and setting" in which he uses marijuana—that is, an individual's prior experience with marijuana, his attitude toward its effect, his current mood, and the social setting in which it is used.¹⁴⁰ Moreover, there presently is a poor correlation between the level of a drug in a driver's blood or plasma and the effect of that drug on his psychomotor or executive functions, because there will be detectable levels of illicit drugs in a driver's system long after the impairing effect of the drug has worn off.¹⁴¹ Also, some parties who repeatedly use certain drugs develop a tolerance to their neurocognitive effects, requiring users to increase their dose over time in order to obtain the same pleasurable effect, which means that the effect a drug may have on a driver's motor skills will vary from driver to driver. The upshot, as NHTSA concluded in 2009, is two-fold: First, testing for the presence of marijuana in a driver's system has not yet reached the same state of scientific knowledge that we possess today for BAC testing. Second, specific drug-concentration levels cannot be reliably equated with effects on a driver's performance.¹⁴² Any particular level could be overinclusive or underinclusive.¹⁴³

138. See, e.g., *AMA Consensus Report*, *supra* note 2, at 2619; Bosker et al., *supra* note 124, at 441; Moskowitz, *supra* note 98, at 323–24 (noting that the BAC level changes only 0.017 % per hour).

139. See, e.g., *AMA Consensus Report*, *supra* note 2, at 2620. That last factor refers to the phenomenon of "hysteresis," the term used to describe the proposition that a drug's effect is greater at a particular concentration level if the amount in the blood is rising, rather than falling. *Id.*

140. See, e.g., Hall & Degenhardt, *supra* note 10, at 1383.

141. A study has estimated that a THC concentration of 6–8 ng/mL in the blood is comparable to a BAC of 0.05. See Grotenhermen et al., *supra* note 90, at 1912 (discussing study). That study, however, did not have a sufficiently large database to be statistically significant. See *id.* at 1913 ("Overall, current epidemiological evidence on the effects of cannabis on accident risk is much less conclusive than for alcohol and must be considered insufficient for deriving a science-based legal limit for THC in blood. However, it suggests that the presence of THC as the sole drug in whole blood at concentrations above 5 ng/ml correlates with a gradually increasing accident risk.").

142. COMPTON & BERNING, *supra* note 15, at 4; Grotenhermen et al., *supra* note 90, at 1912–13. NHTSA conducted another roadside survey in 2013–2014 and is currently analyzing the results. In February 2015, NHTSA published a Research Note with its preliminary analysis of the survey data. See 2013–2014 NATIONAL ROADSIDE SURVEY, *supra* note 58. NHTSA also has several other studies in progress—an experimental test, being conducted with the National Institute of Drug Abuse and ONDCP, to measure the effect of inhaled marijuana, along with alcohol, on driving skills; a comparison study of the driving risks posed by persons with and without drugs in their system; and a study, in partnership with Washington state, on the effect of its new marijuana recreational use law on driving safety. See *id.*

143. See, e.g., *AMA Consensus Report*, *supra* note 2, at 2620.

Unfortunately, science has not moved the needle far since then. That is true for several reasons.

Start with the fact that there is no study showing any residual, long-term effect of chronic marijuana use on a person's ability to drive,¹⁴⁴ nor is there evidence that THC remains in brain tissue on a long-term basis.¹⁴⁵ Long-term marijuana smokers are no more likely than non-smokers are to be involved in a vehicle accident unless they are actually intoxicated while driving.¹⁴⁶ Accordingly, it is critical to measure a driver's THC concentration relatively shortly after he uses marijuana because long-term measurements are not very helpful.

A high THC concentration, however, is transient. THC concentration in blood peaks within minutes of smoking marijuana and elevated levels last up to an hour, but then rapidly decrease, even though functional impairment lags behind peak THC levels.¹⁴⁷ An individual therefore can be far more "stoned" in fact than his THC test results would indicate. At the same time, if a person has a high drug tolerance level, "there is often no difference in psychomotor performance between peak and trough drug levels."¹⁴⁸ Moreover, the psychoactive effect of THC can occur within seconds if marijuana is inhaled or take one-to-four hours if it is ingested.¹⁴⁹ That effect, however, lasts for a relatively short period. "[E]ven a high dose of smoked THC typically causes acute impairment of driving skills for only 3–4 hours."¹⁵⁰

The pharmacokinetics (the movement of drugs through the body) and pharmacodynamics (the effect of drugs and their mechanism of action) of cannabis are also far more complicated than the same features of alcohol. Alcohol dissolves in water or lipids, allowing it to become widely distributed; alcohol moves freely and is distributed fairly evenly throughout the body; it equilibrates rapidly between blood

144. "The acute effects of marijuana on working memory [also known as short-term memory] are relatively short lived, and disappear after 3 to 4 hours as the marijuana high wears off." IVERSEN, *supra* note 10, at 164. "The evidence for any more persistent cognitive defects [past 24 hours after last use] is equivocal." *Id.* at 165.

145. See, e.g., IVERSEN, *supra* note 10, at 41, 47; Ashton, *supra* note 100, at 102 (finding that the body excretes THC within thirty days).

146. See, e.g., Sewell et al., *supra* note 3, at 187.

147. See, e.g., IVERSEN, *supra* note 10, at 47; Hall & Degenhardt, *supra* note 10, at 1383; Hartman & Huestis, *supra* note 15, at 479; Reisfield et al., *supra* note 1, at 354; Sewell et al., *supra* note 3, at 191–92; Soderstrom et al., *supra* note 15, at 735.

148. Reisfield et al., *supra* note 1, at 354 (citations omitted).

149. See, e.g., IVERSEN, *supra* note 10, at 41, 47.

150. Grotenhermen et al., *supra* note 90, at 1911; see also, e.g., Aggarwalet al., *supra* note 11, at 163 ("[C]annabis and its psychoactive components are fully metabolized and excreted . . . usually within 3–4 hours, although oral ingestion may prolong the duration of these effects."); James C. Garriott et al., *Detection of Cannabinoids in Homicide Victims and Motor Vehicle Fatalities*, 31 J. FORENSIC SCI. 1275, 1281 (1986). It is unclear whether a lab can calculate the last use of marijuana or time of driving based on a particular THC concentration. One study estimated that a carboxy-THC/THC ratio greater than four might indicate a time when the psychoactive effects of THC have dissipated. *Id.* Another study concluded that "[b]ack-extrapolation of the measured THC concentration from time of sampling blood to the time of driving is not an option, owing to the many variable and unknown factors involved and the complex pharmacokinetic profile of THC." Jones et al., *supra* note 9, at 457.

and brain tissue; and it produces no active metabolites. Because the lungs metabolize alcohol, the concentration in a person's breath approximates the level present in his blood or brain with a good deal of accuracy.¹⁵¹

By contrast, THC readily dissolves in adipose tissue, so the amount detected in blood is not necessarily a good marker for the amount that someone has inhaled or ingested.¹⁵² Also, urinalysis measures not only the THC content in blood but also the presence of the long-lasting THC metabolite 9-carboxy-THC,¹⁵³ which is not psychoactive and therefore does not contribute to impairment.¹⁵⁴ To complicate the matter further, THC's lipophilic (fat soluble) nature and insolubility in water causes it to remain in the body for days or weeks after a person has used marijuana, long after the drug's euphoric feeling has passed and a person has recovered his ability to drive safely.¹⁵⁵ In the case of a chronic user, THC can remain in the blood for more than a month.¹⁵⁶ There is, however, no evidence of THC from smoked cannabis leaking from adipose tissue to the blood and hence to the brain causes ongoing intoxication.¹⁵⁷ In these circumstances, punishing someone for a positive THC result merely penalizes him for having used marijuana within the last month, not for driving while under its influence.

Even if there were indisputable proof that a person drove within four hours of having inhaled marijuana, the mere presence of THC in the blood cannot by itself

151. See, e.g., DUPONT, *supra* note 1, at 131–32; *AMA Consensus Report*, *supra* note 2, at 2619; Reisfield et al., *supra* note 1, at 353; Sewell et al., *supra* note 3, at 188.

152. See, e.g., IVERSEN, *supra* note 10, at 5; *AMA Consensus Report*, *supra* note 2, at 2619; Sewell et al., *supra* note 3, at 188.

153. The THC metabolite 9-carboxy-THC is present in the blood for a much longer period than THC is. See Garriott et al., *supra* note 150, at 1281.

154. See, e.g., Bates & Blakeley, *supra* note 87, at 223; Brookoff et al., *supra* note 47, at 519; Grotenhermen et al., *supra* note 90, at 1911; Hawks, *supra* note 10, at 135; Sewell et al., *supra* note 3, at 192; Walsh et al., *supra* note 90, at 244. The liver metabolizes Δ^9 -THC into 11-hydroxy- Δ^9 -THC and then into carboxy-THC (COOH-THC), which is not psychoactive, but is the primary urinary metabolite of THC. A graph illustrating the rapidly decreasing presence of THC in the blood and the rapidly increasing presence of 9-carboxy-THC would show that the two curves intersect twenty minutes after smoking. A person excretes eighty to ninety percent of the total amount of THC inhaled or ingested within five days, mostly (65%) in feces. From eighteen to twenty-three percent is contained in urine, and it consists primarily of metabolites such as 9-carboxy-THC. The body eliminates any remaining THC and its metabolites slowly over a period of time, in part because of its lipid solubility. See, e.g., IVERSEN, *supra* note 10, at 47; Bates & Blakeley, *supra* note 87, at 223; Hawks, *supra* note 10, at 131–32.

155. See, e.g., IVERSEN, *supra* note 10, at 46–47; Garriott et al., *supra* note 150, at 1281; Grotenhermen et al., *supra* note 90, at 1911; Soderstrom et al., *supra* note 15, at 733. For that reason, urine testing is of little use in determining impairment. Radioimmunoassay testing, however, can detect marijuana use for up to four hours after use. See Soderstrom et al., *supra* note 15, at 733. Only a lab, however, can perform that test. The police cannot use it for a roadside stop.

156. See, e.g., DRUG-IMPAIRED DRIVING, *supra* note 57, at 15; IVERSEN, *supra* note 10, at 47–48.

157. See, e.g., IVERSEN, *supra* note 10, at 48. There is a further complication. Blood is never “impaired”; only brain tissue can be. Blood testing, although the gold standard for drug testing, is only a surrogate for brain tissue testing.

justify the inference that a person was impaired.¹⁵⁸ The effect of inhaled marijuana on a user's driving skills varies from person to person based on a host of individual factors: the absorption, distribution, metabolism, and excretion rate of THC; the quantity of past marijuana usage; THC tolerance; the time when a person last inhaled or ingested marijuana; the time since a person last ate, as well as the fat content of his meal; and individual smoking techniques.¹⁵⁹ Those factors can confound the analysis of a particular level of THC in the blood. There also is little that can be done today to distill and identify the particular contribution each factor makes to impairment. For example, there is no scientific test that can measure a person's tolerance for THC, which varies from person to person and may hinge on whether someone is a long-term user.¹⁶⁰ Urine testing for THC metabolites, therefore, can answer the question whether a person has used marijuana but cannot indicate when that use occurred or what affect it had on the user, especially when he drove, with the precision demanded by the criminal law.¹⁶¹ Atop that, additional factors that affect marijuana users and nonusers alike—such as fatigue, driving experience, the difficulty of the course to be driven, daytime or nighttime driving, and so forth—also figure into the effect of marijuana on driving safety.¹⁶²

The bottom line is this: We cannot presently undertake roadside marijuana testing in the same way that we perform alcohol testing. Science cannot identify a

158. See, e.g., DUPONT ET AL., *supra* note 127, at 21 (“In drugged driving there is no standard relationship between blood levels of a drug (or drug metabolites) and impairment . . . [S]etting impairment thresholds based on blood levels or drug metabolites for illegal drugs is not a viable option.”); *id.* at 23–24 (“[A]lthough it is well-established that cannabis can impair driving ability, . . . it is impossible to establish an impairment level for cannabis because the relationship between the concentration of THC and marijuana metabolites in blood, urine and oral fluids is complex.”); J.G. Ramaekers et al., *Cognition and Motor Control as a Function of Δ^9 -THC Concentration in Serum and Oral Fluids: Limits of Impairment*, 85 DRUG & ALCOHOL DEPENDENCE 114, 115 (2006) (“[T]here is little scientific evidence to show that detection of THC or THC-COOH in bodily fluids can be taken as proof of impairment in any circumstance.”); *id.* at 119 (“[M]agnitude of performance impairment is not a suitable parameter for defining threshold levels of THC in serum.”).

159. See, e.g., IVERSEN, *supra* note 10, at 44, 82–83; Grotenhermen et al., *supra* note 90, at 1910; Sewell et al., *supra* note 3, at 190.

160. It may be that only chronic marijuana users develop a tolerance for THC. See IVERSEN, *supra* note 10, at 105–06. People can also develop a tolerance for alcohol. Some alcoholics and heavy drinkers can “hold their liquor” and function without betraying their consumption. Their ability to operate a vehicle, however, remains impaired even if they can successfully disguise their inebriation. See DUPONT, *supra* note 1, at 135.

161. See, e.g., AMA Consensus Report, *supra* note 2, at 2621; Hartman & Huestis, *supra* note 15, at 489; Soderstrom et al., *supra* note 15, at 733, 735. In 1985, a committee of the AMA said,

At present, we cannot define critical body fluid concentrations above which all would be impaired and below which all would lack impairment . . . [T]he presumed [G]aussian distribution curve relating impaired driving ability at a given drug concentration against number of individuals is probably, broad, flat, and diffuse for most drugs.

AMA Consensus Report, *supra* note 2, at 2621. The scientific community is in the same position today. See, e.g., Hartman & Huestis, *supra* note 15, at 489.

162. See, e.g., Reisfield et al., *supra* note 1, at 354; cf. ROBERT W. WILLETTE, NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP’T OF TRANSP., DOT HS 806 888, FEASIBILITY ASSESSMENT OF CHEMICAL TESTING FOR DRUG IMPAIRMENT 5 (1985) [hereinafter NHTSA FEASIBILITY ASSESSMENT] (critiquing laboratory studies that “use healthy volunteers, usually well rested, . . . with task learning and practice periods” not present in actual driving).

particular THC concentration level in blood that can serve as a measure of impairment with the same degree of confidence we have that a 0.08 g/dL BAC level for alcohol demarks someone as legally impaired. Accordingly, we cannot rely on the alcohol model to generalize a drug-concentration level rendering the majority of drivers sufficiently impaired as a factual matter that the law can use that number as a *per se* definition of legal impairment.¹⁶³ As Professor Mark Kleiman has concluded, “A useful test would need to be physiological or psychometric rather than chemical.”¹⁶⁴

How then can we enforce the laws prohibiting marijuana-induced impaired driving? The next part explains how some states have made that attempt.

2. *The Adoption of Zero Tolerance Laws*

The Operation of Zero Tolerance Laws.—All fifty states make it a crime to drive while intoxicated by or under the influence of drugs.¹⁶⁵ Those laws require proof that a person’s drug use impaired his driving ability.¹⁶⁶ Many police cars today have a dashboard camera that records each officer-driver interaction, and the state can use that tape (along with other evidence) as proof that a particular driver was impaired due to marijuana use.

Some states, however, have followed a different path. Borrowing from their laws dealing with alcohol, those states have fixed a “*per se*” or “zero tolerance” standard for the presence of marijuana.¹⁶⁷ Federal law conditions a portion of federal highway funds on each state’s adoption of strict limits on the use of alcohol by young drivers.¹⁶⁸ To satisfy that obligation, states adopted legislation making it a crime for a person under twenty-one to drive with the presence of any amount (or a trivial amount, such as 0.02 g/dL BAC) of ethanol in his blood.¹⁶⁹ Drawing on that approach, some states treat the presence of any amount¹⁷⁰ (or a trivial

163. See, e.g., DRUG-IMPAIRED DRIVING, *supra* note 57, at 15; *AMA Consensus Report*, *supra* note 2, at 2620; Grotenhermen et al., *supra* note 90, at 1913.

164. KLEIMAN COSTS, *supra* note 19, at 173.

165. See Carfaro, *supra* note 36, at 44.

166. See *id.*

167. There is a technical difference between “*per se*” and “zero tolerance” laws. A classic *per se* law fixes a ceiling, and anyone with a THC concentration above it is deemed guilty. A zero tolerance law starts from the premise that marijuana use is forbidden and uses the presence of *any* amount of THC in the blood as conclusive proof of marijuana use. For purposes of this Article, the two categories of laws have the same practical effect. In addition, some state laws refer to “marijuana,” rather than “THC.” See, e.g., OHIO REV. CODE ANN. §§ 4511.19(A)(1)(j)(i), (vii), & (viii) (West 2014) (using “marihuana”). It is not clear whether the legislature intended those laws to refer narrowly to only THC or to refer broadly to any metabolite of cannabis, even ones, like carboxy-THC that are not psychoactive.

168. See 23 U.S.C. § 158 (2012) (conditioning a state’s receipt of federal highway construction funds on its adoption of a minimum drinking age of twenty-one); Christopher Carpenter, *How Do Zero Tolerance Drunk Driving Laws Work?*, 23 J. HEALTH ECON. 61, 64 (2004).

169. See Carpenter, *supra* note 168, at 64.

170. See, e.g., ARIZ. REV. STAT. ANN. § 28-1381(A)(3) (West 2014) (“It is unlawful for a person to drive or be in actual physical control of a vehicle in this state under any of the following circumstances: . . . [w]hile there is

amount¹⁷¹) of marijuana or one of its metabolites in the bloodstream as tantamount

any . . . [marijuana] or its metabolite in the person's body."); DEL. CODE ANN. tit. 21, § 4177(a)(6) (2014) ("No person shall drive a vehicle: . . . [w]hen the person's blood contains, within 4 hours of driving, any amount of an illicit or recreational drug that is the result of the unlawful use or consumption of such illicit or recreational drug or any amount of a substance or compound that is the result of the unlawful use or consumption of an illicit or recreational drug prior to or during driving."); GA. CODE ANN. § 40-6-391(a)(6) (2014) ("A person shall not drive or be in actual physical control of any moving vehicle while . . . there is any amount of marijuana . . . present in the person's blood or urine, or both, including the metabolites and derivatives of each or both without regard to whether or not any alcohol is present in the person's breath or blood."); 625 ILL. COMP. STAT. § 5/11-501 (2014) ("A person shall not drive or be in actual physical control of any vehicle within this State while . . . there is any amount of a drug, substance, or compound in the person's breath, blood, or urine resulting from the unlawful use or consumption of cannabis . . ."); IND. CODE § 9-30-5-1 (2014) ("A person who operates a vehicle with a controlled substance listed in schedule I or II of IC 35-48-2 [which includes marijuana, *see* IND. CODE ANN. § 35-48-2-4(d)(22)] or its metabolite in the person's body commits a Class C misdemeanor."); IOWA CODE § 321J.2(1)(c) (West 2014) ("A person commits the offense of operating while intoxicated if the person operates a motor vehicle in this state in any of the following conditions: . . . [w]hile any amount of a controlled substance is present in the person, as measured in the person's blood or urine."); MICH. COMP. LAWS § 257.625(8) (2014) ("A person, whether licensed or not, shall not operate a vehicle upon a highway or other place open to the general public or generally accessible to motor vehicles, including an area designated for the parking of vehicles, within this state if the person has in his or her body any amount of a controlled substance listed in schedule 1 under section 7212 of the public health code [which includes marijuana, *see* MICH. COMP. LAWS ANN. § 333.7212(1)(c)(2) (2014)]."); MONT. CODE ANN. § 61-8-411(1) (2014) ("It is unlawful . . . for any person to drive or be in actual physical control of: (a) a noncommercial vehicle upon the ways of this state open to the public while the person's [THC] level, excluding metabolites, as shown by analysis of the person's blood, is 5 ng/ml or more; or (b) a commercial motor vehicle upon the ways of this state open to the public while the person's [THC] level, excluding metabolites, as shown by analysis of the person's blood, is 5 ng/ml or more."); OKLA. STAT. tit. 47, § 11-902(A)(3) (2014) ("It is unlawful . . . for any person to drive, operate, or be in actual physical control of a motor vehicle . . . who . . . [h]as any amount of a Schedule I chemical or controlled substance, as defined in Section 2-204 of Title 63 of the Oklahoma Statutes [which includes marijuana, *see* OKLA. STAT. tit. 63, § 2-204(C)(12) (2014)], or one of its metabolites or analogs in the person's blood, saliva, urine or any other bodily fluid at the time of a test of such person's blood, saliva, urine or any other bodily fluid administered within two (2) hours after the arrest of such person . . ."); 75 PA. CONS. STAT. § 3802(d) (2014) ("An individual may not drive, operate or be in actual physical control of the movement of a vehicle under any of the following circumstances: (1) There is in the individual's blood any amount of a . . . (i) Schedule I controlled substance [which includes marijuana, *see* PA. CONS. STAT. § 780-104(1)(iv) (2014)."]; R.I. GEN. LAWS § 31-27-2(b)(2) (2014) ("Whoever drives or otherwise operates any vehicle in the state with a blood presence of any scheduled controlled substance as defined within chapter 28 of title 21 [which includes marijuana, *see* R.I. GEN. LAWS §§ 21-28-1.02(7) & 21-28-2.08(d)(10) (2014)], as shown by analysis of a blood or urine sample, shall be guilty of a misdemeanor and shall be punished as provided in subsection (d) of this section."); UTAH CODE ANN. §§ 41-6a-517 (West 2014) ("In cases not amounting to a violation of Section 41-6a-502 [driving under the influence of alcohol or drugs], a person may not operate or be in actual physical control of a motor vehicle within this state if the person has any measurable controlled substance or metabolite of a controlled substance [which includes marijuana, *see* UTAH CODE ANN. §§ 58-37-2(f)(1), 58-37-4(2)(a)(iii)(S) (West 2014)] in the person's body.").

171. *See, e.g.*, NEV. REV. STAT. § 484C.110(3) (2014) ("It is unlawful for any person to drive or be in actual physical control of a vehicle on a highway or on premises to which the public has access with an amount of a prohibited substance in his or her blood or urine that is equal to or greater than" ten nanograms per milliliter (g/M) in urine of marijuana or two g/M in blood of marijuana, or fifteen g/M in urine or five g/M in blood for a marijuana metabolite); OHIO REV. CODE ANN. § 4511.19(A)(1)(j)(i) & (vii) (West 2014) ("No person shall operate any vehicle, streetcar, or trackless trolley within this state, if, at the time of the operation, any of the following apply: . . . the person has a concentration of any of the following controlled substances or metabolites of a controlled substance in the person's whole blood, blood serum or plasma, or urine that equals or exceeds any of the following: . . . The person has a concentration of marihuana in the person's urine of at least ten nanograms of marihuana per milliliter of the person's urine or has a concentration of marihuana in the person's whole blood or

to complete impairment and apply that standard to everyone, young and adult drivers alike.¹⁷² Some drug policy experts have endorsed that approach.¹⁷³

The argument for aggressive zero tolerance laws is that waiting until a driver displays obvious signs of drug-induced intoxication or impairment may come too late to prevent needless mortality.¹⁷⁴ That concern surely is a legitimate one. Unfortunately, however, per se or zero tolerance laws may not turn out to be the answer to drugged driving. They are susceptible to the challenge that they rest on a scientifically unsound premise, which, if true, would render them subject to invalidation as being arbitrary.

Scientific Challenges to Zero Tolerance Laws.—The presence of some THC in the bloodstream does not indicate that the driver is impaired. Impairment lasts for one to four hours, but THC may remain in adipose tissue long past the point at which marijuana's euphoric and dissociative feelings have dissipated.¹⁷⁵ As already noted, in some people, tests can detect marijuana up to a month after a driver last used it.¹⁷⁶ Moreover, urine or blood tests yield positive results for pharmacologically inactive THC metabolites long after the last drug use,¹⁷⁷ so "it is not surprising to find many people registering positive."¹⁷⁸ For example, unlike Δ^9 -THC, carboxy-THC is the primary analyte present in urine, it is not psychoactive, and it can remain in the blood for a lengthy period after the psychoactive effects of marijuana have worn off.¹⁷⁹ As one study put it, "[z]ero-limit DUID [Driving Under the Influence of Drugs] laws for cannabis based on analysis of

blood serum or plasma of at least two nanograms of marihuana per milliliter of the person's whole blood or blood serum or plasma."); WASH. REV. CODE § 46.61.502(1)(b) (2014) ("A person is guilty of driving while under the influence of intoxicating liquor, marijuana, or any drug if the person drives a vehicle within this state [if] . . . [t]he person has, within two hours after driving, a THC concentration of 5.00 or higher as shown by analysis of the person's blood made under [Washington state law] . . .").

172. Several European Union nations also have zero tolerance drug laws. See Sarah M.R. Wille et al., *Evaluation of On-Site Oral Fluid Screening Using Drugwipe-5®, RapidSTAT® and Drug Test 5000® for the Detection of Drugs of Abuse in Drivers*, 198 FORENSIC SCI. INT'L 2, 2 (2010).

173. See, e.g., DuPont et al., *supra* note 7, at 40; Robert L. DuPont et al., *The Seductive Mirage of a 0.08 G/DL BAC Equivalent for Drugged Driving*, 6 DATIA FOCUS, Winter 2013, at 36, 42; Reisfield et al., *supra* note 1; Stephen K. Talpins et al., *License Revocation as a Tool for Combating Drugged Driving*, 18 IMPAIRED DRIVING UPDATE Spring 2014, at 29, 29; Voas et al., *supra* note 7, at 218.

174. See, e.g., Brookoff et al., *supra* note 47, at 521. There is a disagreement over the issue whether zero tolerance laws effectively reduce the incidence of fatal accidents by persons under twenty-one. Compare, e.g., Carpenter, *supra* note 168, at 62–63, 81 (concluding that zero tolerance laws lower the number of traffic fatalities by reducing the incidence of heavy drinking) with, e.g., Darren Grant, *Dead on Arrival: Zero Tolerance Laws Don't Work*, 48 ECON. INQUIRY 756 (2010) (concluding that zero tolerance laws are ineffective at reducing the number of traffic fatalities).

175. See, e.g., Grotenhermen et al., *supra* note 90, at 1916; *supra* notes 152 & 157 and accompanying text.

176. See *supra* note 145 and accompanying text.

177. "A urine concentration of 50 ng/ml for carboxy-THC is generally taken as the definition of a positive test. Such levels may occur in urine for days or even weeks after the last dose of drug." IVERSEN, *supra* note 10, at 213.

178. *Id.*

179. See, e.g., Bosker & Huestis, *supra* note 109, at 1921. Some studies have indicated that THC metabolites can appear in the blood through passive inhalation, but there is doubt on that score. See Jones et al., *supra* note 9, at 457.

carboxy-THC in blood or urine lack scientific support and cannot be defended.”¹⁸⁰ The reason is that

[s]cientists find it virtually impossible to agree upon the concentration of a psychoactive substance in blood that leads to impairment in the vast majority of people, owing to individual differences in response, habituation, potency of the abused drug and differences related to dose, mode of administration as well as the pharmacokinetic profile.¹⁸¹

Accordingly, it would be irrational to treat the presence of THC or one of its metabolites as a basis for declaring that a driver was impaired as a matter of law when he was stopped.

Legal Challenges to Zero Tolerance Laws.—Legislatures have broad authority to define crimes and affix their punishments, including offenses involving drug trafficking.¹⁸² Nonetheless, there are certain limits regarding how far they may go. There are certain obvious restrictions imposed by substantive limitations found in the Bill of Rights as well as the Equal Protection Clause of the Fourteenth Amendment.¹⁸³ But there is an additional restraint as well: namely, the states cannot define crimes in an irrational manner. That is the teaching of *Leary v. United States*¹⁸⁴ and *Turner v. United States*.¹⁸⁵

180. Jones et al., *supra* note 9, at 457.

181. *Id.* at 459; *see also, e.g., CAULKINS ET AL., supra* note 22, at 33 (“There is understandably a strong desire to have quantitative metrics that would allow one to conclude that some particular concentration of THC or its metabolites produced an increase in risk equivalent to that of some familiar measure of alcohol intoxication. For example, after a review of the evidence on the impairment of driving-related skills by alcohol or cannabis, one international group of experts concluded that a THC concentration of 7–10 nanograms (ng) per milliliter in serum is sufficient to produce impairment equivalent to 0.05-percent blood alcohol content. Some argue that the pharmacokinetics of THC suggest that any serum concentration of THC could be indicative of intoxication sufficient to impair driving, because THC concentrations are measurable in blood only within the first two hours of smoking marijuana while the psychomotor effects can last for eight hours or more. Thus, considerable debate continues about the ideal (from a policy perspective) blood or serum levels to indicate marijuana intoxication while driving. We view this quest as being as of yet unfulfilled, though innovations are in development in various jurisdictions in the United States and abroad, including defined per se levels for impaired driving and saliva testing.” (citations omitted)).

182. *See, e.g., Harmelin v. Michigan*, 501 U.S. 957 (1991) (rejecting an Eighth Amendment challenge to a life sentence for drug trafficking); *Chapman v. United States*, 500 U.S. 453 (1991) (noting that Congress may fix mandatory minimum sentences for possession of illicit drugs); *United States v. Doremus*, 249 U.S. 86 (1919) (upholding the constitutionality of the Harrison Narcotics Tax Act of 1914, ch. 1, 38 Stat. 785). *See generally Minnesota ex rel. Whipple v. Martinson*, 256 U.S. 41, 45 (1921) (“There can be no question of the authority of the state in the exercise of its police power to regulate the administration, sale, prescription and use of dangerous and habit-forming drugs, such as are named in the statute. The right to exercise this power is so manifest in the interest of the public health and welfare, that it is unnecessary to enter upon a discussion of it beyond saying that it is too firmly established to be successfully called in question.”).

183. *See, e.g., Robinson v. California*, 370 U.S. 660, 667 (1962) (finding that the Eighth and Fourteenth Amendments prohibit a state from making narcotics addiction a crime because it is a cruel and unusual punishment).

184. 395 U.S. 6 (1969).

185. 396 U.S. 398 (1970).

Leary and *Turner* involved the use of inferences and presumptions, evidentiary devices that are “a staple” of the fact-finding process at a criminal trial.¹⁸⁶ An inference, also called a permissive inference, allows a decisionmaker to find an ultimate fact based on proof of a basic fact. The law of homicide offers a classic example of a “permissive inference.” A jury may infer the ultimate fact that the defendant acted with an intent to kill the victim from proof of the basic facts that the defendant, knowing that the victim was a person, shot him with a rifle. The validity of that inference, or any other, turns on the strength of the proof of the basic fact and the reasonableness of concluding the ultimate fact from one or more basic facts.¹⁸⁷

Presumptions differ from inferences. Some define how the parties must prove an ultimate fact. For example, the presumption of innocence places the burden of proof on the government. Others, such as a “permissive or rebuttable presumption,” operate in the same manner as an inference, and their validity is measured in the same way, based on the strength of the proof in each case.¹⁸⁸ By contrast, a “mandatory presumption” is quite different. It *requires* the decisionmaker to infer an ultimate fact in *every* case unless the defendant adduces proof to rebut it.¹⁸⁹ A mandatory presumption is lawful only if the basic and ultimate facts coincide “in the run of cases,” regardless of the proof in an individual case.¹⁹⁰ A state cannot use a mandatory presumption if the basic and ultimate facts do not reasonably coincide.¹⁹¹ Even then, a state cannot use a presumption in a manner that violates the proof beyond a reasonable doubt standard applicable at the guilt phase of a criminal trial.¹⁹²

In *Leary* and *Turner*, Congress sought to use a mandatory presumption to help the prosecution prove an element of the offense. In each case, the Supreme Court held that device unconstitutional because it was irrational to presume that the

186. See, e.g., *Cnty. Court v. Allen*, 442 U.S. 140, 156 (1979) (“Inferences and presumptions are a staple of our adversary system of factfinding.”).

187. See *id.* at 157; see also, e.g., *Jackson v. Virginia*, 443 U.S. 307 (1979) (ruling that the Due Process Clause requirement of proof beyond a reasonable doubt requires sufficient proof that a reasonable juror could infer each element of the offense).

188. See *Allen*, 442 U.S. at 157. A permissive or rebuttable presumption could differ from a permissive inference if the former shifts a burden of proof or production to the defendant. See *id.*, 442 U.S. at 157–59. Whether a state law can execute that shift is a technical question that hinges on the precise definition of each element of an offense. Compare, e.g., *Mullaney v. Wilbur*, 421 U.S. 684, 704 (1975) (holding that the state cannot shift the burden of proving provocation to a defendant for the crime of manslaughter), with, e.g., *Patterson v. New York*, 432 U.S. 197, 201 (1977) (holding that the state can shift the burden of proving extreme emotional distress to a defendant). Questions involving a potential shift in the burden of proof do not bear on the issues discussed in this Article.

189. See *Allen*, 442 U.S. at 157–60.

190. See *id.* at 159–60 (collecting cases).

191. See *id.*

192. See, e.g., *Francis v. Franklin*, 471 U.S. 307, 313–15 (1985) (collecting cases); *Sandstrom v. Montana*, 442 U.S. 510, 520–24 (1979).

ultimate fact (the defendant knew that a controlled substance had been imported) inevitably followed from the basic fact (the defendant possessed that drug).

Timothy Leary tried to enter Mexico at the International Bridge at Laredo, Texas.¹⁹³ Mexican border officials refused Leary entry, however, so he turned around and returned to the United States.¹⁹⁴ After being stopped at the American inspection area, customs officers discovered marijuana seeds and a small amount of marijuana in Leary's car.¹⁹⁵ The government charged him with violations of different federal laws that had in common the requirement that the government prove that he had knowingly smuggled marijuana into this country.¹⁹⁶ To establish that element, the government relied on a statutory presumption that a jury could infer from a defendant's possession of marijuana his knowledge that it had been illegally imported into the United States.¹⁹⁷ On review of Leary's convictions, the Supreme Court ruled that the statutory presumption was unconstitutional. Writing for the Court, Justice Harlan explained that "the controlling test for determining the validity of a statutory presumption was that there be a rational connection between the fact proved and the fact presumed."¹⁹⁸ In Leary's case, the statute authorized the jury to infer from his possession of marijuana that it was illegally imported and that Leary knew its origin and status as smuggled goods.¹⁹⁹ Without reaching the question whether the presumption rationally permitted a jury to infer that marijuana had been smuggled based only on its possession, the Court held that it was unreasonable to infer that Leary knew that the marijuana had been smuggled in the United States based simply on his possession of that drug.²⁰⁰ After canvassing the available evidence, the Court found itself "at large to estimate even roughly the proportion of marihuana possessors who have learned in one way or another the origin of their marihuana."²⁰¹ Because a significant proportion of domestically consumed marijuana was grown domestically, "it would be no more than speculation were we to say that even as much as a majority of possessors 'knew' the source of their marihuana."²⁰² The Court therefore reversed Leary's conviction.²⁰³

The Court relied on *Leary* in deciding *Turner*. James Turner and two partners in crime were convicted of the illegal possession of heroin and cocaine.²⁰⁴ Two counts separately charged the defendants with transporting heroin and cocaine

193. *Leary v. United States*, 395 U.S. 6, 9–10 (1969).

194. *Id.* at 10.

195. *Id.*

196. *Id.* at 10–11.

197. *Id.* at 9–11, 30.

198. *Id.* at 33 (citation omitted) (internal quotation marks omitted).

199. *Id.* at 37.

200. *Id.* at 37–64.

201. *Id.* at 52.

202. *Id.* at 53.

203. *Id.* at 53–54.

204. *Turner v. United States*, 396 U.S. 398, 401–402.

with knowledge that they had been illegally imported into this nation. The government presented no evidence regarding the origin of the drugs.²⁰⁵ Instead, the government relied entirely on a presumption in the statute that the jury could infer from a defendant's simple possession of either drug that he knew that the drug had been illegally imported.²⁰⁶ On review of the defendants' convictions, the Supreme Court affirmed in part and reversed in part.²⁰⁷ The Court found it reasonable for a jury to draw the inference, as permitted by the statute, that "possession of heroin is equivalent to possessing imported heroin" because there was no reasonable doubt that "at the present time heroin is not produced in this country" and therefore had been "smuggled" across the border.²⁰⁸ The Court reached the opposite conclusion with respect to cocaine.²⁰⁹ The evidence showed that legitimate businesses had lawfully imported cocoa leaves in order to manufacture cocaine for legitimate medical purposes, and a material amount of lawfully imported leaves had been diverted for illicit uses. The result was that, at that time, it was unreasonable to infer that, as a matter of law, more domestically consumed cocaine had been illegally imported as cocoa leaves than had been manufactured from lawfully imported but illegally diverted leaves.²¹⁰ The result was that, even under a preponderance of the evidence standard, it was irrational to infer that the cocaine in *Turner* necessarily had been unlawfully imported and that the defendants knew that it had been smuggled into the United States.²¹¹

Leary and *Turner* could raise serious problems for per se or zero tolerance laws. States use those laws in order to avoid the need to prove that a particular individual was driving recklessly by showing, for example, that he was weaving back and forth across the road. Instead, the prosecution can rely entirely on proof that a person had a particular concentration of THC in the blood, urine, or saliva to establish a surrogate for recklessness. That finding serves as an irrebuttable presumption that the driver was impaired by marijuana. The problem, however, is that the science does not support such a method of proof, and *Leary* and *Turner* make clear that statutory presumptions unsupported by legislative facts cannot serve as the predicate for a conviction. That will be the challenge to per se or zero tolerance laws, and it will go as follows:

Zero tolerance statutes attempt to make the leap from a basic fact—the presence of a quantity of alcohol or THC (or one of THC's metabolites) in a driver's bodily fluid—to the ultimate fact—the defendant was impaired by alcohol or marijuana as he drove. The pharmacokinetics and pharmacodynamics of marijuana, however,

205. *Id.* at 403.

206. *See id.* at 401 n.1 (quoting 21 U.S.C. § 174); *id.* at 402–03 (describing jury instructions).

207. *Id.* at 424.

208. *Id.* at 408.

209. *Id.* at 418, 423.

210. *Id.* at 418 & n.36, 423.

211. *Id.* at 418–19, 424.

are different from, and far more complex than, the pharmacology of ethanol. There is a strong, established relationship between a 0.08 g/dL BAC level and impairment, but there is no necessary correlation between a trace amount of THC in a person bodily fluids and impairment. As explained above, THC will remain in the body long after the lightheadedness and euphoria from marijuana use have faded away, perhaps for weeks after a person's last drug use. The presence of carboxy-THC in a bodily fluid is even less reliable because that compound is not psychoactive even in a high concentration. A roadside blood, urine, or saliva test that reveals a trivial quantity of THC or carboxy-THC proves only that the test subject used marijuana at some point, not that it had any debilitating effect on him as he drove before being stopped by the police. In sum, the factual premise of the per se or zero tolerance presumption may be too weak in the case of marijuana to survive challenge under *Leary* and *Turner* as being arbitrary.

States will attempt to fend off any such challenge by arguing that *Leary* and *Turner* are inapplicable because per se or zero tolerance laws work differently than the statutes at issue in those cases. *Leary* and *Turner* involved statutes using mandatory presumptions requiring a jury to infer an ultimate fact (knowledge that marijuana, heroin, or cocaine had been smuggled into the United States) from proof of a basic fact (possession of one of those drugs). If the jury found the latter, it was directed to find the former. State per se or zero tolerance laws, however, operate in a different manner. They do not establish a defendant's guilt by requiring a jury to infer that the defendant drove recklessly because he had a particular quantity of THC in his blood. Instead, per se and zero tolerance laws make it a crime for someone (1) to drive whether or not impaired (2) if the driver has either any amount of THC in his blood or any amount above the threshold. It is the combination of those two facts that defines the crime; no inference of impairment is necessary. In other words, states will maintain that per se and zero tolerance laws do not employ a *mandatory* presumption; they use an *irrebuttable* or *conclusive* presumption. The latter device is materially different from all other inferences and presumptions because it "relieves the State of its burden of persuasion by removing the presumed element from the case entirely if the State proves the predicate facts."²¹² An irrebuttable or conclusive presumption enables the state to establish a defendant's guilt by proving only the predicate fact. The prosecution need not prove *X* and rely on a presumption to demand that the jury find *Y*; proof of *X* alone is sufficient. An irrebuttable or conclusive presumption therefore is not a device used to prove one fact from another; it is tantamount to a rule of law. Using the label "presumption" to classify an irrebuttable or conclusive presumption is actually a mistake because it does not operate as one. Presumptions either establish a baseline allocating the burden of proof—such as the presumption

212. *Francis v. Franklin*, 471 U.S. 307, 317 (1985); see also *Michael H. v. Gerald D.*, 491 U.S. 110, 119–21 (1989) (plurality opinion).

of innocence or sanity—or they serve as a means of proving one fact from another; prove *X* and the jury must find *Y*. Per se or zero tolerance laws are materially different. Proof of the basic fact *X*—a certain amount of THC in the blood—establishes a crime regardless of whether the ultimate fact *Y*—impairment—is present.

So viewed, the states will argue, the Supreme Court's decisions in *Leary* and *Turner* are beside the point. The Due Process Clause requires the state to prove every element of a charged offense beyond a reasonable doubt, but the clause does not require the state to define any particular offense in a way that best suits the defense. The state may render certain facts irrelevant by defining an offense to exclude them from consideration.²¹³ That, the states will conclude, is precisely what zero tolerance laws do. They make dispositive the factual question whether a driver had any detectable amount of marijuana in his blood and simultaneously make irrelevant any and every other issue, including whether that drug impaired his driving performance.

That argument, however, may not carry the day. Defendants have a strong response. They will maintain that *Leary*, *Turner*, and other cases establish the principle that statutes cannot irrationally define the elements of an offense, and the zero tolerance laws, they will say, do just that. The only reason that the state has made it a crime for a driver to have any detectable amount of marijuana in his blood is the fear that the driver is impaired. The state has not made it a crime for someone to drive with caffeine in his blood because that substance would not impair a driver's skills. In fact, it would be irrational to create any such offense because caffeine probably enhances a person's ability to drive by helping him remain awake. Similarly, it is irrational to infer that a person with a minimal amount of THC in his system is necessarily impaired. Perhaps, in some circumstances—for example, law enforcement hiring or other employment settings—the state can avoid the problem of not being able to prove an ultimate fact—such as impairment—by instead proving the existence of a basic fact—such as the presence of trace amounts of THC in the blood. But in a criminal case the state cannot treat proof of an entirely innocent fact as tantamount to proof of the *actus reus* of a crime. A state's medical marijuana laws allow patients to consume cannabis; recreational marijuana laws allow any adult to do so as well; and science can prove with certainty that consuming THC will leave some residue or metabolite in the body for a far longer period than THC will have a psychoactive effect. Accordingly, the mere presence of any such compound in a person's system proves nothing more than that he has engaged in conduct that state law expressly permits. The state's power to define crimes may reach far, defendants will admit, but not so far as to make criminal conduct that a different state law treats as entirely innocent.

213. See *Montana v. Engelhoff*, 518 U.S. 37, 55 (1996) (ruling that a defendant does not have a right under the Due Process Clause to present an intoxication defense even to a crime requiring proof of *mens rea*).

Consider this issue from another perspective. All fifty states fit into one of two categories. Some states permit marijuana to be used for medical or recreational purposes; the rest do not. Any state that allows marijuana to be used for those purposes has made the judgment that such conduct should not be deemed criminal. If so, it makes no sense to allow that conduct to be made a crime in a backhanded manner by deeming it as tantamount to proof of impairment. The state cannot define as a crime (1) driving a vehicle (2) with trace amounts of orange juice in the driver's blood, even if it could show that chronic marijuana users consume vast quantities of that drink. Regardless of how a statute is drafted, a per se or zero tolerance law treats proof of a basic fact (past use of marijuana) as proof of an ultimate fact (impaired driving). *Leary* and *Turner* do not permit the legislature to use arbitrary presumptions, the argument goes, and it certainly is arbitrary to conclude that because a person has used marijuana at some past time, perhaps a week ago, he must necessarily have been under its influence when he was stopped a week later. At one time, the Supreme Court was unwilling to license the use of irrebuttable presumptions in civil cases, let alone criminal prosecutions, where the demands of due process are far more stringent.²¹⁴ Accordingly, the reply concludes, the states cannot escape the teaching of *Leary* and *Turner* simply by trying to define their way around the underlying principle endorsed in those precedents.

* * * * *

Each side has a reasonable argument, and it is uncertain who will prevail in that contest.²¹⁵ At the end of the day, therefore, we are left with this question: Given our current inability to measure marijuana-induced driving impairment scientifically in a manner akin to alcohol breathalyzer testing, what can society do to protect nonusers from the dangers posed by drug-impaired drivers? The next section will address that question.

V. A WAY FORWARD

A. *The Policy Proposals*

1. *Proposals that Do Not Require a Change in the Law*

It is a mistake to assume that the only solution to a legal problem is to change the law. Sometimes that is not even the optimal solution. The problem of drugged

214. See, e.g., *Vlandis v. Kline*, 412 U.S. 441, 446 (1973) (“Statutes creating permanent irrebuttable presumptions have long been disfavored under the Due Process Clauses of the Fifth and Fourteenth Amendments ‘[A] statute creating a presumption which operates to deny a fair opportunity to rebut it violates the due process clause of the Fourteenth Amendment.’” (quoting *Heiner v. Donnan*, 285 U.S. 312, 329 (1932))). More recently, the Court has walked back from its decision in *Kline* because an irrebuttable presumption is just another way of characterizing a substantive rule of law. See *Michael H. v. Gerald D.*, 491 U.S. 110, 119–21 (1989) (plurality opinion).

215. An important factor is how the jury instructions are phrased. Regardless of what a state statute may say, what is critical in an individual case is what the jury instructions permit and require a jury to decide on the case-specific proof. See, e.g., *Francis*, 471 U.S. at 315–25; *Cnty. Court v. Allen*, 442 U.S. 140, 160–63 (1970).

driving illustrates why. A legislature could increase the sentence for driving under the influence of drugs, or for driving under the combined influence of drugs and alcohol, in the hope that the greater potential penalty will deter individuals from using marijuana, alone or in combination with alcohol, before driving. But all that approach does is to legislate at the margin, to add to whatever deterrent already exists under the state's reckless driving laws. If the penalty already is severe, the marginal increase may have little effect. Contrary to popular assumptions, imprisonment may not deter repeat substance abuse offenders.²¹⁶ Plus, criminologists maintain that offenders discount the potential harm of future imprisonment more than members of the general public do, because the former are more present-oriented than the latter.²¹⁷ If that is true, it is not clear that increasing the potential punishment will have any influence on the behavior of the group that the legislature has targeted. If so, authorizing an even longer term of imprisonment may not make sense because incarceration is quite expensive.²¹⁸ The result is that enhancing the sentence for an offender who drives while under the influence of marijuana may make for good politics, but it may not have any appreciable effect on the number of people who drive while impaired.

The problem, therefore, is not that drunken driving needs to be outlawed or punished more severely, but may be that there are too few law enforcement officers available to catch a vast number of outlaws. To make up for that shortfall without dramatically increasing the number of law enforcement officers, the government has sought to combat drinking and driving in part through education campaigns about its hazards and the costs that individuals suffer from being arrested and convicted. Some jurisdictions also have adopted creative approaches to the punishment of convicted drivers, programs that give a sentencing court an option between imprisonment and probation.²¹⁹ Nonetheless, the number of alcohol-impaired drivers has remained unacceptably high.

216. A California study found that imprisonment for DUI is ineffective at preventing repeat offenses. David J. DeYoung, *An Evaluation of the Effectiveness of Alcohol Treatment, Driver License Actions and Jail Terms in Reducing Drunk Driving Recidivism in California*, 92 ADDICTION 989, 996 (1997) ("[T]he first offender analyses showed that subjects receiving jail had, on average, almost double the number of DUI reconvictions as those assigned to first offender treatment programs plus license restriction."). See also NATHAN LOWE, NAT'L HIGHWAY TRAFFIC ADMIN., U.S. DEP'T OF TRANSP., DOT HS 812 022, SCREENING FOR RISK AND NEEDS USING THE IMPAIRED DRIVING ASSESSMENT 2 (2014) ("NHTSA's National Center for Statistics and Analysis data indicates that 25 to 30 percent of drivers with a blood alcohol concentration (BAC) level of .08 grams per deciliter (g/dL) or above who are involved in fatal crashes are repeat offenders.").

217. See, e.g., JAMES Q. WILSON, THINKING ABOUT CRIME 118–19 (rev. ed., 1983); JAMES Q. WILSON & RICHARD J. HERRNSTEIN, CRIME AND HUMAN NATURE 49–56, 416–21 (1985); John J. DiIulio, Jr., *Help Wanted: Economists, Crime and Public Policy*, 10 J. ECON. PERSP. 3, 16–17 (1996).

218. See, e.g., Paul J. Larkin, Jr., *Clemency, Parole, Good-Time Credits, and Crowded Prisons: Reconsidering Early Release*, 11 GEO. J.L. & PUB. POL'Y 1, 12–17 (2013) (discussing nationwide incarceration costs).

219. For a discussion of some creative approaches to the problem of drunken (and drugged) driving, see Larkin, *supra* note 55 (discussing the 24/7 Sobriety and Hawaii Opportunity Probation with Enforcement programs).

The single most important law enforcement need is a portable, easy-to-operate, non-invasive device that officers can use during a roadside stop to determine whether a person has consumed marijuana. No such device exists today, however,²²⁰ and it is difficult to know whether and when one will be available.²²¹ Law enforcement agencies could equip trucks as mobile labs that could be driven to the location where a particular driver has been stopped to conduct blood or urine testing.²²² That option, however, might prove prohibitively expensive. The cost of a mobile lab is likely to be quite high. A large police department may be able to purchase only a few of them, while small and mid-sized departments may be unable to afford any. Also, taking blood is an invasive procedure, requiring that the officer be experienced in that procedure and obtain a search warrant.²²³ The former imposes training or hiring expenses on a local police department, and the latter costs the officer and any stopped individual the time necessary for a magistrate to authorize a search warrant. Urine testing does not require a police officer to be trained as a paramedic, but the officer will need a search warrant because he is investigating a crime, rather than performing a non-law enforcement function.²²⁴ So here, too, there will be a delay involved, and a delay is costly.

Government agencies have been interested in the possibility that saliva could serve as an alternative THC-screening matrix, one that could be detected by a portable, roadside, point-of-contact testing device.²²⁵ Private corporations have developed several such devices, and researchers have analyzed their efficacy.²²⁶

220. See DUPONT ET AL., *supra* note 127, at 18 (“At the present time, the lack of sensitivity, especially for cannabis, limits the use of the drug testing technology available for rapid testing that does not require laboratory analysis.”).

221. See *id.* at 20 (“The short history of these devices shows that initial rapid development has stalled based on the limitations of existing immunoassay technology. There is a tradeoff between ease of use against sensitivity and scope. Improvements in sensitivity with current technology require the use of an instrumented device which limits their deployment in the field. While some manufacturers are working on fine tuning the current technology through this approach, a major change in immunoassay technology would help in the development of broad spectrum, high sensitivity tools.”).

222. See Brookoff et al., *supra* note 47, at 518 (noting that the Memphis Police Department used a van for mobile drug testing).

223. See *Missouri v. McNeely*, 133 S. Ct. 1552, 1563 (2013).

224. Compulsory drug testing is a “search” for Fourth Amendment purposes, and it can be performed on a suspicionless basis only when there are “special needs” for the intrusion, “concerns other than crime detection.” See, e.g., *Chandler v. Miller*, 520 U.S. 305, 313–14 (1997).

225. See, e.g., NHTSA FEASIBILITY ASSESSMENT, *supra* note 162, at 2–3 (“[S]aliva collection is [less] intrusive [than urine] and the more likely specimen to be accepted as a screening procedure which, if positive, would still require a blood specimen be taken and tested . . . THC . . . is nearly completely bound to blood proteins, thereby preventing it from being secreted into saliva. Thus, any THC found in saliva is present because it was trapped during smoking in tissue in the mouth, from which it slowly diffuses back into saliva. Sufficient data are not presently available to associate saliva concentrations of THC with time of use, although it appears to be evidence that marijuana has been smoked in the recent past.”). The levels of THC and its metabolites in a person’s breath appear to be lower than what is found in saliva after smoking marijuana. A very sensitive detection method would be necessary to use breath as a test matrix. See Hawks, *supra* note 10, at 134.

226. See, e.g., Bosker & Huestis, *supra* note 109, at 1916–17 tbl.3 (evaluating different point-of-contact testing devices for oral fluids); Mark Chu et al., *The Incidence of Drugs of Impairment in Oral Fluid from Random*

The European Union has also conducted several studies of the workability of testing oral fluids for THC.²²⁷ Oxford Professor of Pharmacology Leslie Iversen has concluded that oral fluid can serve as a test matrix and that the measurement of saliva can accurately reflect the use of cannabis within the last few hours.²²⁸ “A mobile kit allows police to use [saliva testing] as a roadside test,” which “has the advantage of offering a direct measure of recent cannabis consumption” and “a meaningful way of assessing . . . whether a driver was intoxicated.”²²⁹ If oral fluid drug testing were proved as accurate, reliable, and inexpensive as alcohol breathalyzer tests, police officers could administer a test during a roadside stop. That would reduce the privacy concern present whenever urine is the test matrix and would be far less intrusive than piercing someone’s skin to obtain a blood sample. Oral fluid testing therefore holds promise.

But oral fluid testing is not yet, and may never be, the answer.²³⁰ Oral fluid tests that produce rapid results and can be read onsite by a law enforcement officer have “significant limitations, notably cost, and limited scope and sensitivity.”²³¹ Test

Roadside Testing, 215 FORENSIC SCI. INT’L 28 (2012); Stuart Dickson et al., *The Recovery of Illicit Drugs from Oral Fluid Sampling Devices*, 165 FORENSIC SCI. INT’L 78 (2007); Hawks, *supra* note 10, at 132; O.R. Idowu & B. Caddy, *A Review of the Use of Saliva in the Forensic Detection of Drugs and Other Chemicals*, 22 J. FORENSIC SCI. SOC’Y 123 (1981); Wilhelm W. Just et al., *Detection of Δ^9 -Tetrahydrocannabinol in Saliva of Men by Means of Thin-Layer Chromatography and Mass Spectrometry*, 96 J. CHROMATOGRAPHY 189 (1974); Chikatoshi Maseda et al., *Detection of Δ^9 -THC in Saliva by Capillary GC/ECD After Marijuana Smoking*, 32 FORENSIC SCI. INT’L 259 (1986); Loren K. Thompson & Edward J. Cone, *Determination of Δ^9 -Tetrahydrocannabinol in Human Blood and Saliva by High-Performance Liquid Chromatography with Amperometric Detection*, 421 J. CHROMATOGRAPHY 91 (1987); Harold W. Peel et al., *Detection of Drugs in Saliva of Impaired Drivers*, 29 J. FORENSIC SCI. SOC’Y 185 (1984); Willfried Schramm et al., *Drugs of Abuse in Saliva: A Review*, 16 J. ANALYTICAL TOXICOLOGY 1 (1992); Stefan W. Toennes et al., *Screening for Drugs of Abuse in Oral Fluid—Correlation of Analysis Results with Serum in Forensic Cases*, 29 J. ANALYTICAL TOXICOLOGY 22 (2005); Wille et al., *supra* note 172, at 3; Christine Moore, Vice president of Toxicology Research & Development, Immunalysis Corp., Address at International Association of Chiefs of Police Convention, *Using Oral Fluid in DUID Enforcement Cases* (July 30, 2014) (PowerPoint on file with American Criminal Law Review).

227. See DUPONT ET AL., *supra* note 127, at 18–20. At least one state (Ohio) has authorized the State Board of Pharmacy to define an amount of marijuana in saliva that can be used in lieu of the blood concentration level otherwise determined by law. See OHIO REV. CODE ANN. § 4511.19(A)(1)(j)(xi) (West 2014).

228. See, e.g., IVERSEN, *supra* note 10, at 47–48, 213. One study has concluded that “THC levels in serum and oral fluid are strongly correlated,” and “results suggest that the presence of THC in oral fluid can be considered as a valid biomarker of recent cannabis exposure.” Ramaekers et al., *supra* note 158, at 118, 119; see also Toennes et al., *supra* note 121, at 154.

229. IVERSEN, *supra* note 10, at 213.

230. See, e.g., DRUG TESTING WHITE PAPER, *supra* note 129, at 26 (“Today, there are no commercial tests for other drugs [than alcohol] using breath; however, because drugs and drug metabolites are present in breath and the condensate from breath, albeit at very low concentrations, as testing technologies become more sophisticated, breath testing for various drugs will become available in the future.”).

231. DUPONT ET AL., *supra* note 127, at 24; see also, e.g., Bosker & Huestis, *supra* note 109, at 1912 (“Drugs may reduce salivation, limiting sample volume and necessitating sensitive analytical methods to quantify multiple analytes in 1 assay.”); Toennes et al., *supra* note 226, at 24; Wille et al., *supra* note 171, at 4; cf. Sjoerd Houwing et al., *Repeatability of Oral Fluid Collection Methods for THC Measurement*, 223 FORENSIC SCI. INT’L 266, 272 (2012) (finding that the studied oral fluid devices did not provide the same results when the test was repeated).

reliability also is in question.²³² Adsorption of a drug by the device can confound test results, and the more lipophilic the drug, the greater the absorption.²³³ That is a particular problem for detecting recent marijuana use, because THC is very lipophilic.²³⁴ A side effect of smoking marijuana, moreover, is xerostomia (“cotton mouth”), which makes it difficult to obtain sufficient fluid.²³⁵ Early oral fluid testing devices also did not perform well at night or in bad weather, and they returned difficult-to-read results.²³⁶ The jury, therefore, is still out on the accuracy and reliability of devices that use saliva as a test matrix.²³⁷

In any event, saliva testing may not be the hoped-for ideal test matrix even if a satisfactory test can be developed. It may be that the body sequesters THC into salivary glands when cannabis is smoked or eaten without any significant exchange between saliva and blood.²³⁸ Moreover, it is possible that THC accumulates in saliva after regular heavy use.²³⁹ Accordingly, the presence of THC in saliva may not indicate that a driver recently used marijuana, certainly not within the three-to-four hour window during which he may have been under its influence.

The more serious problem, however, is that science cannot identify a THC concentration level that can serve as a proxy for impairment in the same manner that a 0.08 BAC level does where the suspected drug is alcohol. Thirty years ago, a panel of experts called on the medical profession to conduct additional research into the relationship between drug-concentration levels and impairment in order to identify a specific minimum concentration that can serve as a proxy for impairment.²⁴⁰ So far, that effort has been unsuccessful. In 2012, ONDCP and NHTSA brought together criminal justice and drug-testing experts in order to investigate the feasibility of designing a drug-testing device that can be used by the police.²⁴¹ So far, no test has been approved, and there is no way to know when one might be endorsed.²⁴² Congress could fund additional research into this subject, but new

232. See, e.g., Bosker et al., *supra* note 124, at 440. Two studies found the presence of THC in saliva up to two hours after it was smoked. See Just et al., *supra* note 226, at 193; Schramm et al., *supra* note 226, at 2–3 (finding that THC could be detected in saliva two hours after use in five of ten cases). Another failed to detect either THC or its metabolites in saliva. See, e.g., Hawks, *supra* note 10, at 132–33.

233. See Bosker & Huestis, *supra* note 109, at 1913.

234. See *id.* at 1913, 1915.

235. See Toennes et al., *supra* note 226, at 24. Sometimes citric acid or sour candy is used to induce saliva flow, but that increases the pH of saliva, which makes detecting THC more difficult by lowering its concentration. *Id.*

236. See Bosker & Huestis, *supra* note 109, at 1915. The THC detection window also is not clear. *Id.* at 1923.

237. See Ramaekers et al., *supra* note 158, at 119.

238. See Bates & Blakeley, *supra* note 87, at 225; Hawks, *supra* note 10, at 132–133.

239. See Bates & Blakeley, *supra* note 87, at 225.

240. See, e.g., *AMA Consensus Report*, *supra* note 2; Reisfield et al., *supra* note 1, at 353.

241. See *Planes, Trains, and Automobiles: Operating While Stoned: Hearing Before the Subcomm. on Operations of the H. Comm. on Oversight and Government Reform*, 113th Cong. 24–25 (2014) (statement of Jeffrey P. Michael, Assoc. Adm’r of Research & Program Development, National Highway Traffic Safety Admin., U.S. Dep’t of Transp.). A demonstration program is underway. *Id.*

242. See *DRUG-IMPAIRED DRIVING*, *supra* note 57, at 18 (“Currently, there is no validated roadside drug-testing device, such as the evidential breath-testing device for alcohol, which would facilitate faster sample collection.”).

research projects compete with millions of other uses for scarce public funds.

What may be feasible is to identify a range of THC concentrations in some bodily fluid that, along with evidence regarding a particular driver's performance (such as weaving), can serve as a basis for further testing. One study concluded that a THC concentration of five $\mu\text{g/mL}$ could serve as the lower range of a THC limit with a THC concentration of thirty $\mu\text{g/mL}$ as the upper end of that range.²⁴³ In that study, seventy-five to ninety percent of the observations of participants with a THC concentration in the range of five to ten $\mu\text{g/mL}$ were indicative of impairment, while at THC concentrations greater than thirty $\mu\text{g/mL}$, 100% of the observations indicated impairment.²⁴⁴ Other studies may have found a different range of THC concentrations, so law enforcement officials may have to choose from among several options.²⁴⁵ Nonetheless, there may be generally accepted upper and lower boundaries that can be used until researchers can find a particular level that captures the vast majority of marijuana users.

In the meantime, law enforcement needs a way to identify specific drugged drivers, particularly in states with medical marijuana laws. One option, endorsed by ONDCP and NHTSA,²⁴⁶ is to train police officers as Drug Recognition Experts so that they can better accomplish the often-difficult task of spotting drugged drivers.²⁴⁷ The argument is that a police officer can stop a vehicle if he has a reasonable suspicion that the driver is impaired due to alcohol or drugs²⁴⁸ and then can rely on specific symptoms of drug use, such as mydriasis, bloodshot eyes, or any obvious impairment, to establish probable cause to make an arrest. Drug Recognition Expert training can educate officers to make better post-stop judgments about the sobriety of particular drivers. One problem, of course, is that even "experts" can often be wrong about such judgments.²⁴⁹ Aside from that, it is not clear how valuable that training would be if it is limited to officers seeking to become experts or what skills those individuals acquire from their training that

243. See Ramaekers et al., *supra* note 158, at 121.

244. *Id.*

245. See, e.g., Grotenhermen et al., *supra* note 90, at 1915–16 (recommending a THC concentration of 7–10 ng/mL in blood serum, or a 3.5–5 ng/mL THC concentration in whole blood, as the lower limit of THC intoxication).

246. See *Planes, Trains, and Automobiles: Operating While Stoned: Hearing Before the Subcomm. on Operations of the H. Comm. on Oversight and Government Reform*, 113th Cong. 24–25 (2014) (statement of Jeffrey P. Michael, Assoc. Adm'r of Research & Program Development, National Highway Traffic Safety Admin., U.S. Dep't of Transp.); OFFICE OF NAT'L DRUG CONTROL, *supra* note 58, at 24.

247. Cf. Herbert Moskowitz, *Detecting Alcohol Impairment by Observation of Intoxication*, in TRANSP. RESEARCH BD. OF THE NAT'L ACADS., TRAFFIC SAFETY AND ALCOHOL REGULATION: A SYMPOSIUM 164, 164 (2007) (summarizing studies in which police officers perceived as impaired only twenty-one to thirty-three percent of drivers with a BAC greater than 0.08). Additional academy or in-service training for patrol officers also would be useful. See DRUG-IMPAIRED DRIVING, *supra* note 57, at 17 (according to officials from NHTSA, the Governors' Highway Safety Association, and the International Association of Chiefs of Police, "basic training for officers on impaired driving enforcement is insufficient for identifying drivers that may be impaired by drugs").

248. See *supra* text accompanying notes 112–19.

249. See Brookoff et al., *supra* note 47, at 521.

other officers lack. In any event, the average expert becomes involved in fewer than half a dozen cases per year, so this program makes very little contribution to the efforts to deal with drugged driving.²⁵⁰

There is another option to consider. It takes advantage of the consensus that the combination of marijuana and alcohol can leave a driver far more impaired than if he had used just one drug or the other. It is standard police procedure for an officer who stops a driver to use the driver's license and vehicle registration to learn whether there is an outstanding warrant for his arrest and whether the vehicle is stolen. The attendant delay ordinarily is minimal and is justifiable because of the officer's need to protect his safety.²⁵¹ Accordingly, an officer also should be free to detain a lawfully stopped driver with a 0.05 g/dL BAC—a level at which a nontrivial number of drivers may be impaired²⁵²—for the additional limited purpose of determining whether he is a registered medical marijuana user. Some, albeit not all, state laws require that parties who obtain approval for medical marijuana use register with the state in advance of receiving marijuana.²⁵³ A police officer who stops a motorist can use his patrol car computer (or call the dispatcher, who can use his) to check to see if the stopped driver is on the registry. The additional delay should be brief. If the driver is not registered, the officer would have to end the stop and let him drive away. But if the driver is a registered marijuana user, then the question arises whether the totality of these circumstances establishes probable cause: (1) the evidence that justified the initial stop of the vehicle (perhaps crossing a double line); (2) the driver's 0.05 g/dL BAC; (3) the severe impairment that ethanol can have on a driver when the driver also has used marijuana; (4) the driver's registration as a lawful marijuana user; and (5) any other evidence of marijuana use that the officer comes by during the stop, such as the smell of cannabis or the discovery of marijuana itself or drug paraphernalia.²⁵⁴ All five items of evidence should establish probable cause to arrest the driver for being under the influence of an intoxicant.²⁵⁵ If so, the officer could then take the

250. In 2009, 3,396 experts made 18,882 evaluations, for an average of 5.5 per expert. See DUPONT ET AL., *supra* note 127, at 36. "This low annual rate is in part explained by the fact that many [Drug Recognition Experts] are the highly rated law enforcement officers who rapidly are promoted out of direct enforcement roles." *Id.* For other shortcomings in the DRE program, see DRUG-IMPAIRED DRIVING, *supra* note 57, at 23–24.

251. *Cf.* Maryland v. Wilson, 519 U.S. 408, 410 (1997) (holding that a police officer "as a matter of course" may order the driver of and all passengers in a lawfully stopped vehicle to exit the vehicle for the duration of the stop).

252. See *infra* note 261 and accompanying text.

253. See *supra* note 66 and accompanying text.

254. See Jones et al., *supra* note 9, at 458.

255. An arrest is more intrusive than a stop, and the Fourth Amendment requires the government to establish probable cause. While weightier than reasonable suspicion, probable cause does not require proof by a preponderance of the evidence that the person seized has committed a crime; only a fair probability is necessary. See Illinois v. Gates, 462 U.S. 213, 235 (1983) ("Finely tuned standards such as proof beyond a reasonable doubt or by a preponderance of the evidence, useful in formal trials, have no place in the magistrate's decision. While an effort to fix some general, numerically precise degree of certainty corresponding to 'probable cause' may not be helpful, it is clear that 'only the probability, and not a prima facie showing, of criminal activity is the standard of

driver to a police station or hospital where a traditional blood or urine test would be performed. In other words, in many cases the combination of those five facts may permit an officer to take a driver into custody so that more precise tests can be performed.

2. *Proposals that Require a Change in the Law*

Ultimately, the problem of marijuana-induced impaired driving may not be solvable in every case without a change in the law. The solutions discussed above may not be effective or feasible given our current scientific knowledge of THC. We also do not know when, if ever, we will have the technology available to conduct roadside THC testing in a safe, reliable, non-degrading manner or when, if ever, we will reach a consensus on our ability to translate a particular THC level into proof of impairment. Nonetheless, there is a proposal that could help address the problem of drugged driving today. Ironically, however, the proposal focuses on alcohol, not cannabis. States could reduce the BAC standard from 0.08 to 0.05 g/dL—or lower, possibly to zero—for anyone who is a registered marijuana user in the state. That reform would allow states to address the most serious problem caused by medical and recreational marijuana laws—the enhanced impairment caused by the combined use of marijuana and alcohol—without burdening anyone.²⁵⁶

Every state in this nation uses at least a 0.08 g/dL BAC level to define alcohol-induced impairment in adults.²⁵⁷ Many European Union nations, however, use a 0.05 (or lower) BAC standard.²⁵⁸ Some states use a 0.05 BAC standard for persons previously convicted of driving while intoxicated.²⁵⁹ Every state uses a BAC standard of zero (or slightly above it) for commercial drivers²⁶⁰ and for

probable cause.” (citations omitted)); *id.* at 238 (finding that a magistrate need only determine whether a “fair probability” exists that contraband will be found). *Gates* involved probable cause to search, not to seize, but the same term applies to both actions.

256. See *supra* notes 105–10.

257. 23 U.S.C. § 163 (2012) (conditioning a state’s receipt of federal highway construction funds on its adoption of a 0.08 BAC); see *supra* text accompanying note 8.

258. See DUPONT ET AL., *supra* note 127, at 21; Daniel Albalade, *Lowering Blood Alcohol Content to Save Lives: The European Experience*, 27 J. POL’Y ANALYSIS & MGMT. 20, 22–24 (2008) (discussing the history of the EU’s adoption of a 0.05 BAC standard); James C. Fell & Robert B. Voas, *The Effectiveness of Reducing Illegal Blood Alcohol Concentration (BAC) Limits for Driving: Evidence for Lowering the Limit to .05 BAC*, 37 J. SAFETY RES. 233, 233 (2006); Grotenhermen et al., *supra* note 90, at 1913–14 (“[J]urisdictions world-wide now typically use BAC concentrations of between 0.05 and 0.11% as indicators of various degrees of impairment by alcohol.”); Jones et al., *supra* note 9, at 458. Norway and Sweden have a 0.02 standard. By contrast, Canada, Great Britain, and Ireland, like the United States, use a 0.08 BAC level. See Jones et al., *supra* note 9, at 458.

259. See Ralph Hingson et al., *Effect of Maine’s 0.05% Legal Blood Alcohol Level for Drivers with DWI Convictions*, 113 PUB. HEALTH REP. 440, 440–41 (1998).

260. See, e.g., ROBERT L. DUPONT, INST. OF BEHAVIOR & HEALTH, PUBLIC POLICY STATEMENT REGARDING DRUGGED DRIVERS 1, available at <http://www.druggeddriving.org/pdfs/IBHPublicPolicyonDruggedDriving715.pdf>; Mireille Jacobson, *Drug Testing in the Trucking Industry: The Effect on Highway Safety*, 46 J.L. & ECON.

drivers not yet twenty-one years old.²⁶¹ A 0.05 BAC standard therefore is not an entirely novel rule. Moreover, there is evidence showing that reducing the BAC threshold from 0.08 to 0.05—or even lower, such as 0.02—will save lives.²⁶² The reason is that some studies indicate that the majority of the driving population can become impaired with a BAC of 0.05 or lower; in fact, some people can become impaired with a BAC as low as 0.02.²⁶³ Determining a driver's BAC is straightforward. A police officer can use a breathalyzer to determine if a driver's BAC is above or below a 0.05 or 0.02 BAC.²⁶⁴

The question, then, is this: What significance does that result have, or how can a state use that result to enhance traffic safety? In this way:

Many states with medical marijuana laws require users to register with the state as patients in order to be exempt from prosecution under the state criminal code.²⁶⁵ The remaining states could readily impose a registration requirement, even on current marijuana users, because a state has no obligation to grant anyone an exemption from a state criminal law in perpetuity. Once a state requires registration, a police officer can determine whether a stopped motorist is listed as a registered medical marijuana patient. If so, the threshold for alcohol-induced impairment would be 0.05 g/dL (or lower), rather than 0.08. Anyone scoring

131, 134–36 (2003) (explaining that states and the federal government adopted testing regulations for commercial drivers).

261. See *supra* note 168 and accompanying text. States fix a lower threshold for persons under twenty-one because they are not allowed to drink and drive at all. See Fell & Voas, *supra* note 258, at 239.

262. See Fell & Voas, *supra* note 258, at 237–40 & tbls.2 & 3 (discussing earlier studies showing that a BAC reduction from 0.08 to 0.05 lead to fewer fatalities); Ralph W. Hingson et al., *Preventing Impaired Driving*, 23 ALCOHOL RES. & HEALTH 31, 31–32 (1999) (“A driver’s ability to divide his or her attention between two or more visual stimuli can be impaired at BACs of 0.02 percent or lower. Starting at BACs of 0.05 percent, drivers exhibit impairment in eye movement, glare resistance, visual perception, reaction time, certain types of steering tasks, information processing, and other driving components . . . Compared with drivers who have not consumed alcohol, drivers with BACs between 0.02 and 0.04 percent are 1.4 times as likely to be involved in a single-vehicle fatal crash.” (citations omitted)); Paul L. Zador, *Alcohol-Related Relative Risk of Fatal Driver Injuries in Relation to Driver Age and Sex*, 52 J. STUD. ALCOHOL 301, 304–10 (1991) (finding that every 0.02 percent increase in BAC of a driver with a non-zero BAC nearly doubles the risk of a fatal vehicle crash).

263. See H. MOSKOWITZ & D. FIORENTINO, NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., U.S. DEP’T OF TRANSP., DOT HS 809 028, A REVIEW OF THE LITERATURE ON THE EFFECTS OF LOW DOSES OF ALCOHOL ON DRIVING-RELATED SKILLS 6–15 & fig.2 (2000); *id.* at 29–56 figs.A1–A12 & B1–B2; Fell & Voas, *supra* note 258, at 239; Hingson et al., *supra* note 259, at 441 (“[I]mpairments in divided attention, reaction times, visual functioning, information processing, and judgment have been identified at BALs of 0.05% or lower. A 1991 study found that in all ages and sex groupings, the fatal crash risk at BALs of 0.05%–0.09% was at least nine times the risk at zero BAL.”); Herbert Moskowitz & Marcelline Burns, *Effects of Alcohol on Driving Performance*, 14 ALCOHOL HEALTH & RES. WORLD 12, 14 (1990) (“Certain skills important for driving are impaired at 0.01 to 0.02 percent BAC or, in other words, at the lowest levels that can be measured reliably . . . With these kinds of central deficits [i.e., information processing, visual perception, divided attention], sooner or later a driver will fail to see something that is in the path of the vehicle—a car, a pedestrian, a fixed object—and an accident occurs.”).

264. See STUSTER & BURNS, *supra* note 124, at iii (“The results of this study provide clear evidence of the validity of the Standardized Field Sobriety Test Battery to discriminate at 0.08 percent BAC, using a slightly modified scoring procedure. Further, study results strongly suggest that the SFSTs also accurately discriminate at 0.04 percent BAC.”); *id.* at 25–26, 28.

265. See *supra* note 167.

higher than 0.05 would be deemed by law to be impaired and could be arrested for driving under the influence of alcohol. In other words, due to the difficulty of defining a THC level as impairing, a state should lower the BAC threshold for impairment for any registered medical marijuana patient from 0.08 to 0.05, 0.02, or zero.

The justification for such a revision is straightforward and rests on reason and science. First, a registered medical marijuana user is likely to use that drug. Logic certainly supports that conclusion—why else would someone register as a medical marijuana patient except for the opportunity to use marijuana without fear of a state criminal prosecution?—but there is empirical support for it as well. One study found that “states that legalized marijuana use for medical purposes have significantly higher rates of marijuana use and of marijuana abuse and dependence.”²⁶⁶ Second, the combination of marijuana and alcohol more seriously impairs a driver than use of either substance alone. Studies have shown that marijuana and alcohol have a synergistic and negative effect on a person’s driving skills, and the combination of the two substances unreasonably places third parties—passengers, other highway travelers, and pedestrians—at risk. Third, studies also indicate that alcohol begins to impair driving performance at a 0.05 g/dL BAC level, if not sooner. Fourth, a standard breathalyzer can readily measure a driver’s BAC at the 0.05 level or lower. Finally, it is hardly burdensome to force a medical or recreational marijuana user to choose between drinking alcohol and driving. If an individual is truly at death’s door, it is unlikely that he will be physically able to drive. This proposal does not put him to any choice. If a person is not that physically disabled, he still can legally drive as long as he does not consume a sufficient quantity of alcohol to register a 0.05 or 0.02 BAC level, depending on the level chosen by the state. Even if a state adopts a zero BAC level, asking someone to forgo drinking before driving is hardly an unreasonable request.

Of course, an even more aggressive approach would be to lower the BAC level to 0.05 or 0.02 g/dL across the board, applicable to medical or recreational marijuana users and nonusers alike. The evidence noted above would justify such a reduction even in the absence of a state law authorizing marijuana to be used for medicinal or recreational purposes. Deterring anyone who has consumed alcohol from driving—or, put differently, forcing individuals to drink alcohol at home or take a cab home after drinking at a bar or restaurant, and forcing groups to designate a nondrinking driver—would reduce highway mortality whether or not a person has also used cannabis. That approach also would work well in states that do not require medical marijuana users to register with the state or that authorize marijuana to be used recreationally. Of course, in those states, a lower BAC level would have its principal effect on people who consume alcohol, *not* marijuana. But it would likely reduce vehicle crashes, which would benefit everyone, regardless

266. See Cerdá et al., *supra* note 35, at 25; *supra* note 78.

of what, if any, intoxicant they may consume.

Ironically, reducing the BAC cap to address marijuana-induced impaired driving might be criticized on grounds similar to the ones discussed above that could be used to challenge zero tolerance laws. The argument would be that a state cannot or should not use a particular BAC level as a tool for measuring the impairment that marijuana causes. If a particular substance causes impairment, the state should determine what level of *that* substance in the body gives rise to a reasonable risk of impairment in the run of cases and should use the criminal law to prohibit driving after consuming in excess of *that* amount. It would be irrational, the argument would go, to use the presence of a lawfully-used substance—alcohol—in an amount that does not hinder a person’s driving ability—an amount below 0.08—as a predicate for criminal liability. Moreover, unless a state is willing to treat equally all driving impairments—such as prescription drug misuse, exhaustion, lack of sleep, a recently consumed heavy meal (think Thanksgiving), or cellphone use²⁶⁷—it is unfair to single out consumers of alcohol for special treatment or to treat a lawful substance like alcohol as Kryptonite.

That argument, however, is unpersuasive. The reason for lowering the BAC level is to combat the impairment resulting from the combination alcohol and marijuana. The state is not outlawing or regulating the consumption of an innocuous substance—alcohol is not orange juice—in order to deal with the problems caused by the consumption of a psychoactive substance, which marijuana certainly is. Alcohol and marijuana each can impair a driver’s ability to safely operate a vehicle, and a person’s contemporaneous consumption of both impairs his driving ability to a greater extent than the consumption of the same quantity of either substance alone. Unfortunately, for technical and pharmacological reasons, the state cannot readily identify drivers impaired by marijuana as easily as it can detect drivers who have consumed an unduly large quantity of alcohol. Lowering the BAC level therefore is a reasonable way to ensure that the state can deter parties impaired by marijuana and alcohol from getting behind the wheel. Accordingly, a state acts responsibly, not arbitrarily, by lowering the BAC cap in order to stave off the known problems that would be caused by an alcohol-marijuana cocktail.

Moreover, that approach is a reasonable one, not only for states with medical marijuana laws, but also for those permitting the recreational use of that drug. In the former category, only those parties who are registered medical marijuana users would feel the brunt of the new, lower BAC threshold if the state applied the lower threshold to only registered medical marijuana users. A state could rationally decide that those parties should be subject to a lower BAC level due to the harmful

267. See, e.g., James M. Lyznickie et al., *Sleepiness, Driving, and Motor Vehicle Crashes*, 279 J. AM. MED. ASS’N 1908 (1998); Donald A. Redelmeier & Robert J. Tibshirani, *Association Between Cellular-Telephone Calls and Motor Vehicle Collisions*, 336 NEW ENG. J. MED. 453, 453, 456 (1997).

effects of marijuana and alcohol when used in combination. It also is not unreasonable to demand that parties with a proven need for medical use of marijuana to limit their alcohol use or to abstain entirely before driving. Of course, some states have recreational use laws, and other states might decide not to discriminate between medical marijuana users and everyone else. In those jurisdictions, the state might decide to subject every driver to the lower threshold. But that approach is also reasonable. The lower BAC level would improve highway safety, and a state can hardly be faulted for using one BAC level for every driver. To be sure, the prospect of living with a lower BAC level if the state adopts a medical or recreational use marijuana law might spur voters to oppose such initiatives. But if a state nevertheless adopted one reform, the other, or both, and lowered the BAC level to address the new problems marijuana use and driving will inevitably cause, no one would be able to complain that he was the victim of discriminatory treatment.

B. The Political Process

Will society address this problem? More particularly, is there the critical mass necessary to change public policy by adopting the proposals mentioned here in order to lower the risks of injury and death from drugged driving? Given the recent trend toward expanding the permissible use of marijuana under state law, there likely will be additional marijuana initiatives on the ballot in 2016. Because that year will see a presidential election, voter turnout should be greater than for other ballot propositions.²⁶⁸ Two questions naturally arise from that combination: Will additional states license the medical or recreational use of marijuana? If so, will they also adopt one or more of the proposals noted above to address drugged driving?

I believe that the answer to each question likely is, “Yes.” I think that two groups of people discussed below—those who are *angered* by the adoption of medical and recreational marijuana laws and those who are *scared* by the adoption of those laws—are sufficiently large and sufficiently loud that states will take steps to prevent drugged driving from producing the harms that we know result from drunken driving.

The recent trend has been toward greater state decriminalization of marijuana use. Polls indicate that the public has become more willing to accept the regulated cultivation, distribution, and use of marijuana, particularly as new generations replace older ones.²⁶⁹ If that trend continues, more states are likely to approve medical- and recreational-use laws. At some point, however, that trend could stop or even move in the other direction. In November 2014, voters in Oregon, Alaska, and Washington, D.C., approved recreational marijuana use, but Florida voters

268. See CAULKINS ET AL., *supra* note 22, at 2.

269. See *id.* at 2–3.

rejected a statewide referendum that would have authorized medical marijuana.²⁷⁰ Accordingly, the jury is still out on whether medical- and recreational-use initiatives will remain on the same trajectory.

It also is uncertain whether the states will try to accommodate relaxed medical- and recreational-use laws with increased regulation of drugged driving. The liquor industry, as well as restaurant and bar owners, will likely oppose any effort to reduce the maximum BAC level below the current 0.08 g/dL standard. They certainly will be strongly motivated to oppose any reduction in the BAC level because it would cut into their profits in every state with a medical or recreational marijuana law. The proposal is misdirected, they will argue, because the real culprit is marijuana, not alcohol. The government therefore should do a better job of keeping marijuana from being used profligately in the state through an expanded education program and stricter law enforcement. By contrast, the law enforcement community and various private organizations, such as Mothers Against Drunk Driving (MADD), likely would support this option, albeit for different reasons. Law enforcement organizations would welcome this proposal because it would make it easier for police officers to handle individual cases by offering them an objective standard. MADD would see the BAC reduction as independently valuable regardless of whether the state permits cannabis to be used for medical treatment or recreationally.

The interesting political question is determining what the majority of the public would say about such a proposal. What makes that question interesting is that medical marijuana has become a modern day version of what Stanford Law School Professor Lawrence Friedman has termed the “Victorian Compromise.”²⁷¹ The Victorian Era enjoyed a reputation for staunchly opposing vices such as gambling, liquor, and sex outside of marriage, as well as other activities, such as working on Sunday, that were seen as lesser forms of evil. Society chose to prohibit that conduct through the criminal law to preserve the fact and appearance of propriety in all public and private affairs, which was perceived as a necessary means of safeguarding the social fabric. Legislatures adopted vice laws in order to appease parties who demanded that the government take a firm moral stand against conduct that, in the minds of some, could only lead to fiery individual damnation and large-scale societal ruin. Yet, legislatures and other public policymakers had no expectation or desire that those laws would be enforced, rigorously or otherwise, as long as the newly prohibited activities were conducted discretely. The law would nominally prohibit gambling parlors, saloons, and houses of prostitution

270. See Dan Merica, *Oregon, Alaska, and Washington, D.C. Legalize Marijuana*, CNN (Nov. 5, 2014, 2:39 PM), <http://www.cnn.com/2014/11/04/politics/marijuana-2014/index.html>.

271. See LAWRENCE M. FRIEDMAN, *CRIME AND PUNISHMENT IN AMERICAN HISTORY* 147–50, 155, 424–26 (1993); LAWRENCE M. FRIEDMAN, *GUARDING LIFE’S DARK SECRETS* 63–80 (2007); Lawrence M. Friedman, *Name Robbers: Privacy, Blackmail, and Assorted Matters in Legal History*, 30 *HOFSTRA L. REV.* 1093, 1099–1119 (2002).

from conducting business openly, but law enforcement officials were expected to wink at the existence of private clubs where gambling was conducted and alcohol consumed and to turn a blind eye toward “call girls” and other forms of debauchery that transpired behind closed doors. Professor Friedman described that double standard—the difference between what the law strictly prohibited when defining formal public morality and what the law studiously ignored as being acceptable for purely private conduct—as “the Victorian Compromise.”²⁷²

That compromise has been reborn today in the form of medical marijuana laws. Unlike straightforward proposals to legalize or decriminalize marijuana, medical marijuana initiatives do not frontally assault the longstanding consensus that, like any other drug, marijuana should not be deemed “safe and effective” just because alcohol can be an even more hazardous inebriant. Medical marijuana proposals do not directly challenge society’s decision to forbid marijuana from being used as an intoxicant while simultaneously permitting beer, wine, or spirits to be freely sold in grocery stores. Nor do they implicitly criticize as hypocritical the social acceptance of alcohol and communal rejection of cannabis. Supporters of medical marijuana measures sold them to the public on the ground that cannabis would be limited to the “personal medical purposes of the patient” acting in consultation with his physician.²⁷³ Supporters highlighted fearsome diseases (cancer, AIDS) and sympathetic parties (the terminally or chronically ill) in order to exploit the voters’ humanitarian impulses and thereby generate political support for otherwise controversial ballot initiatives that legislatures might shy away from.²⁷⁴ Medical marijuana advocates also took advantage of the belief that little harm and possibly some good could result from allowing medically-condemned patients to achieve some respite from their tragic predicaments by whatever means they found useful, means that harmed no one else.

Reform supporters persuaded the public. Beginning in 1996 with the California Compassionate Use Act, numerous states enacted laws ostensibly permitting only a limited exception from the state penal code so that marijuana could be used by a restricted number of severely crippled and dying patients in order to alleviate the symptoms of their disease or the side effects of their treatment. In theory, narrow exceptions to the criminal laws governing “medical marijuana” would benefit the innocent victims of horrible maladies without materially disrupting the purposes served by using the criminal law to prohibit marijuana’s widespread use and

272. The Victorian Compromise largely came undone early in the twentieth century. Reformers pushed too hard to use the law to enforce Puritanical values, and the general public eventually reacted harshly when it feared that reformers might actually be able to monopolize the criminal law’s punitive authority to sterilize the community of “desirable” vices. Prohibition came—and went, and with it the belief that law could readily force men and women to be virtuous, rather than merely try to curb their worst excesses. *See* Friedman, *supra* note 271, at 1119–23.

273. CAL. HEALTH & SAFETY CODE § 11362.5(d) (West 2014).

274. *See* DUPONT, *supra* note 1, at 132.

without materially weakening society's resolve that marijuana should continue to be branded as a dangerous drug.

It turns out, however, that the number of registered medical marijuana "patients" is far too large to believe that only the seriously afflicted are taking advantage of these new laws. The number of users gives strong reason to believe that a massive number of medical marijuana patients are not the poor suffering individuals on whom those laws were supposed to focus—people nearing the end of life or suffering from a debilitating disease or chronic pain. Instead, it is not unreasonable to believe that medical marijuana legislation is a sleight of hand to do indirectly what the new recreational marijuana laws do directly—allow individuals to use marijuana without risking state law criminal liability. It is fair to say that the only difference between medical marijuana laws and recreational marijuana laws are that the latter are honest in their goals.

Don't take my word for it, however—look at the evidence. There is considerable proof that many state medical marijuana programs are simply a sham for the decriminalization of that substance.²⁷⁵ Consider the following: according to a 2013 study, in Arizona merely seven of 11,186 applications for medical marijuana had been denied.²⁷⁶ Only 2,000 patients registered for Colorado's medical marijuana program before the Justice Department announced in 2009 that it would not enforce the federal marijuana laws against individual patients and caregivers. Colorado residents apparently listened because by March 2011, there were more than 127,000 Colorado registrants.²⁷⁷ In Colorado, fewer than fifteen physicians wrote more than seventy percent of all medical marijuana recommendations, with the reason being severe or chronic pain in ninety-four percent of the reported conditions.²⁷⁸ Michigan had fifty-five physicians certify approximately 45,000 patients.²⁷⁹ California does not require patients to register to receive marijuana for

275. *Marijuana for the Sick*, N.Y. TIMES (Dec. 30, 1996), <http://www.nytimes.com/1996/12/30/opinion/marijuana-for-the-sick.html>.

Supporters of the California measure did their cause no good by immediately lighting up marijuana cigarettes after it passed last month and proclaiming that a legitimate medicinal use would include smoking a joint to relieve stress. Dennis Peron, originator of the California initiative, said afterward, 'I believe all marijuana use is medical—except for kids.' These actions made it obvious that the goal of at least some supporters is to get marijuana legalized outright, a proposition that opinion polls indicate most Americans reject.

Id.; see also, e.g., Caplan, *supra* note 36, at 129–45.

276. See Anderson et al., *supra* note 36, at 338 n.6.

277. Caplan, *supra* note 36, at 130. As comedian Jon Stewart remarked, Colorado seemed to have changed almost overnight from "the healthiest state in the country" to "one of the sickest." *Id.*

278. Caplan, *supra* note 36, at 130.

279. Caplan, *supra* note 36, at 134; see Vertes & Barbantini, *supra* note 16, at 124 ("In the wake of the [Michigan Medical Marijuana Act's] passage, Michigan saw the rapid growth of 'certification clinics'—centers advertising quick, convenient certifications and competitive pricing. Critics argue such clinics, often connected to dispensaries or other marijuana-related businesses, are thinly veiled certification 'assembly lines' which violate the presumed intent of the certification process."); *id.* at 125 ("The physician allegedly issued pre-signed medical

medical use, so the number of patients is a matter of speculation. Estimates, however, are that the number increased from 30,000 in 2002 to more than 300,000 in 2009 and 400,000 in 2010.²⁸⁰ The California statute permits a patient or caregiver to possess six plants, but it allows counties to amend state guidelines. Humboldt County, which lies in the heart of the Northern California marijuana farming, allows resident to grow up to ninety-nine plants on behalf of a patient.²⁸¹ Not surprisingly, there is also considerable evidence that significant quantities of marijuana grown or sold for medical uses have been diverted for recreational use.²⁸²

The result is that a large segment of the nation's population justifiably believes that the medical marijuana movement is merely a Trojan Horse for legalization. To them, the sponsors of those initiatives took advantage of the natural sympathy that people have for others in extremis to achieve dishonestly what could not be done openly: legalize marijuana use. Many people quite reasonably believe that medical marijuana initiatives rest on the deceit that their purpose and effect would be limited to alleviating the suffering of parties desperate for relief from unrelenting pain or a crippling malady, some of whom have no hope for anything other than to limit their suffering before they die. Many people would have favored decriminalizing or legalizing marijuana—for example, people who may have supported Colorado and Washington's decisions to allow marijuana to be consumed for recreational use—but only if it were done openly, with a public debate followed by a vote of the legislature or, more likely, the state's voters. Now, however, they feel lied to and cheated. Worse still, they feel insulted. In their mind, the supporters of medical marijuana initiatives believe that the average person is so dim-witted that he will never realize what is really going on. Nobody likes being treated like a chump, so that group of voters likely is in a mood to fight back. If so, that portion of the electorate would be willing to adopt new legislation that permits the medical and recreational marijuana laws to remain on the books, but takes steps to ensure that those laws do not offset the gains that society has witnessed from a now decades-long effort to curb drunk driving.

marijuana physicians certificates, which were then sold for cash from an appliance store which was advertised as the location for a so-called 'safe access clinic.'" (noting an instance in which a Michigan agency suspended a physician's license to practice because of medical marijuana abuse)).

280. Caplan, *supra* note 36, at 133 & n.49.

281. *Id.* at 132.

282. See, e.g., ROCKY MOUNTAIN HIGH INTENSITY DRUG TRAFFICKING AREA, COLORADO'S "MEDICAL" MARIJUANA: ARE REGULATIONS WORKING OR IS "MEDICAL" MARIJUANA BEING DIVERTED?, 3-19 (2012) (summarizing numerous cases of the diversion of marijuana intended to be or originally sold for medical purposes); Kim Kiser, *Rocky Mountain Reality*, MINN. MED., Apr. 2014, at 12, 12 ("Seventy-four percent of teens in the Denver area who are in treatment said they used someone else's medical marijuana on average 50 times." (quoting Jan Kief, M.D.)).

Ironically, those voters may find themselves supported by the state voters who *knew* that they were voting for a backhanded way to legalize marijuana use.²⁸³ The latter collection of voters wanted marijuana to be readily available for use by adults, but realized that they could not persuade the federal government to transfer marijuana from Schedule I to Schedule II. After all, organizations like the National Organization for the Reform of Marijuana Laws (NORML) had tried for decades without success to persuade the Executive Branch to reschedule cannabis. Each time they failed, those organizations asked the federal courts to rule that the executive's decision was arbitrary and therefore unlawful, but each time they lost. Of course, organizations could urge Congress to reschedule marijuana, but a frontal attack on the federal marijuana laws in the nation's capital in 2015 is likely to be as successful as Pickett's Charge. No member of Congress wants to be labeled as being soft on crime, particularly drug offenses. So, having failed in

283. The hypocrisy of California's medical marijuana program seems by now to be universally accepted as a given. See, e.g., Hank Campbell, *Junk Science And The Hypocrisy Of Medical Marijuana*, SCIENCE 2.0 (July 23, 2013, 12:25 PM), http://www.science20.com/science_20/junk_science_and_hypocrisy_medical_marijuana-96254 ("While *medical* marijuana was sold to states for serious illness, Edward Gogek, M.D., notes, it is not the case in practice. Instead, it is sold for 'pain' 90% of the time, which is a symptom so non-specific and subjective that Ferris Buehler got a whole day off school with it."); Kerry Cavanaugh, A "Munchies" Cafe? California Needs to Fix Its Medical Marijuana Mess, L.A. TIMES (May 15, 2014), <http://www.latimes.com/opinion/opinion-la/la-ol-a-munchies-california-medical-marijuana-20140515-story.html> ("The sign reminded me, yet again, that California's medical marijuana system is a total joke. When voters passed the Compassionate Use Act in 1996, the ballot measure promised a way for patients with cancer, AIDS, glaucoma and other illnesses to use marijuana for pain relief. But in the absence of comprehensive state regulations, the law legalizing medical marijuana has also allowed the de facto legalization of pot for recreational use. That's led to a widespread ruse in which healthy people who want weed go to a doctor, profess some malady and get a recommendation that allows them to buy marijuana at a dispensary. Compassionate use has become indiscriminate use."); Andrew O'Hehir, "California, 90420": The Great Marijuana Hypocrisy, SALON (Apr. 18, 2012, 5:55 PM), http://www.salon.com/2012/04/18/california_90420_the_great_marijuana_hypocrisy/ ("The problem with California's nudge-wink medical marijuana system is the same as the problem with weed-attitudes (*weeditudes!*) in our culture generally, whether pro or con That problem is universal hypocrisy Just to be clear, I grew up in Oakland and nearby Berkeley (so draw your own conclusions about my personal history), and I'm 100 percent in favor of legalizing pot. But California's current medical marijuana law is a total farce, and you can't blame people who genuinely think that drugs are evil for claiming that it amounts to soft-focus legalization. Because it does. Yes, cannabis is medically helpful, and in some cases necessary, for people with cancer or AIDS or glaucoma or certain psychiatric ailments. And of course they should be able to get it. But everybody in California knows that's not how the system works in practice. You find a sympathetic doctor (and the right ones advertise widely), and you say, 'Gee, doc, I've been feeling kinda depressed lately. Plus I've been having hella headaches. Kind of seems like a recurring situation, dude.' He or she signs something, you get your ID card, and you're gold. Or Purple Urkel, or Diesel Granddaddy Mandala, as the case may be. (Blends of, y'know, medicine that are evidently for sale in downtown Oakland.) As Ix says when she first sees a legal cannabis dispensary, 'This is what heaven would be like if God were real.'"), Chris Roberts, *Anyone Can Get Their Medicine: California Has Already Pretty Much Legalized Marijuana. And That's Okay*, SFWeekly (Sept. 14, 2014) <http://www.sfweekly.com/sanfrancisco/chem-tales-marijuana-legalization-recreational-use/Content?oid=3154256> ("Anyone Can Get Their Medicine. Not long ago, a friend of mine visited the doctor. Afterward, I asked him for the diagnosis. 'Good news,' he said with a grin. 'I'm still sick.' A clean bill of health would have been a setback. That would mean no more marijuana. I am often asked how to legally obtain some weed in San Francisco, what ailment is required to get a medical marijuana recommendation. This fascinates people to this day, out-of-towners as well as locals. When I am honest, I say, 'About \$40 and 10 minutes.'").

Washington, D.C., to change federal law, advocates for marijuana liberalization went to the states, where they were able to persuade nearly two dozen of them to change the law in a field that is generally left to states to regulate: the practice of medicine.²⁸⁴ It is likely that a goodly number of voters in those states knew what was truly going on but saw medical marijuana initiatives as the only available option, so they went along with the charade because they wanted to see the laws regulating marijuana liberalized. Hypocrisy is the tribute that vice pays to virtue.

The result is that many supporters of the medical marijuana laws may look differently at drugged driving and may respond to the risks that it poses. Unlike the simple consumption of marijuana at home, which might harm the user and no one else, driving while under the influence of that drug poses a risk to other motorists. That is likely to concern even the people who played along with the medical marijuana initiatives because they and their families use the same roadways and want to be protected from injury or death, a role that only the government can play. As an economist would put it, the market will not efficiently regulate the problem of drugged driving without government intervention because that problem is characterized by “externalities,” costs not born by the person undertaking the activity, but by others. The result is that there will be more drugged driving than is optimal unless the government forces drugged drivers to bear its full expense. The current laws against reckless driving will not accomplish that result because the science available today does not enable the police to enforce those laws in an objective manner where cannabis is concerned. Some new approach is necessary.

Placing an additional restriction on the use of alcohol might move society toward the optimal position. Alcohol and marijuana have a synergistic effect, impairing one’s driving ability more than either drug would achieve by itself. Restricting the amount of alcohol that a person can consume before driving would at least lower the number of cases in which the marijuana-alcohol cocktail disables someone from handling a motor vehicle safely. To be sure, lowering the BAC level from 0.08 to 0.05 g/dL or lower is doubtless an indirect way to deal with the problem of marijuana-induced impairment. But it has at least three arguments in its favor: it will reduce the number of motor vehicle crashes; it may be the only tool available today to help lower the number of fatal crashes caused by substance use; and the cost that it imposes on individuals is trivial at best.

The bottom line is this: Different interest groups will line up on opposite sides of any debate over this proposal. But a large number of the voters who supported and opposed state medical marijuana initiatives may coalesce around a lower BAC threshold in states with medical marijuana programs. Members of the public may agree to revise the state’s alcohol laws in order to reduce the risk of injuries and

284. See *Gonzales v. Oregon*, 546 U.S. 243, 270 (2006) (“The structure and operation of the [Controlled Substances Act] presume and rely upon a functioning medical profession regulated under the States’ police powers.”).

death on the roads they drive caused by people over whom they have no control, who consume a psychoactive substance that, rightly or wrongly, can now be readily obtained in their jurisdiction. Whether or not those voters see that revision in the public interest, they are likely to see it in *their own* interest. If so—and if they make that fact known to their elected officials—proposals like the one discussed here could well become law.

CONCLUSION

Society has debated the legalization of marijuana for decades. Shortly before the turn of the century, advocates for reform of the nation's marijuana laws scored a victory. Voters in several states—perhaps prompted by an understandable humanitarian concern for people suffering and dying from painful, incurable diseases, or perhaps misled into believing that that was what they were doing—challenged the consensus on marijuana. The result was the birth of so-called medical marijuana laws. Later, a small number of states took the next step and legalized the possession and use for recreational purposes of small quantities of cannabis. More states may follow down those roads.

The problem is that an increase in the number of marijuana users in a state is highly likely to lead to an increase in the number of marijuana-impaired drivers. Society needs to be able to identify far better than it now can which drivers may be impaired by marijuana so that the medical marijuana and recreational initiatives do not increase the mortality that alcohol-impaired driving already imposes. One way to achieve that goal is to lower the BAC cap from 0.08 to 0.05 g/dL or lower for everyone who is a registered medical marijuana patient, or even across the board. That response may be only a small step toward improving highway safety, but it certainly would be a step in the right direction.