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Technological Incarceration and the End of the Prison Crisis

Mirko Bagaric

Dan Hunter

Gabrielle Wolf

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CRIMINAL LAW

TECHNOLOGICAL INCARCERATION AND THE END OF THE PRISON CRISIS

**MIRKO BAGARIC
DAN HUNTER
GABRIELLE WOLF***

The United States imprisons more of its people than any nation on Earth, and by a considerable margin. Criminals attract little empathy and have no political capital. Consequently, it is not surprising that, over the past forty years, there have been no concerted or unified efforts to stem the rapid increase in incarceration levels in the United States. Nevertheless, there has recently been a growing realization that even the world's biggest economy cannot readily sustain the \$80 billion annual cost of imprisoning more than two million of its citizens. No principled, wide-ranging solution has yet been advanced, however. To resolve the crisis, this Article proposes a major revolution to the prison sector that would see technology, for the first time, pervasively incorporated into the punishment of criminals and result in the closure of nearly all prisons in the United States.

The alternative to prison that we propose involves the fusion of three technological systems. First, offenders would be required to wear electronic ankle bracelets that monitor their location and ensure they do not move outside of the geographical areas to which they would be confined. Second, prisoners would be compelled to wear sensors so that unlawful or suspicious activity could be monitored remotely by computers. Third, conducted energy devices would be used remotely to immobilize prisoners who attempt to escape their areas of confinement or commit other crimes.

The integrated systems described in this Article could lead to the closure

* Mirko Bagaric is a Professor and Director of the Evidence-Based Sentencing Project at Swinburne University in Melbourne, Australia. Dan Hunter is a Professor and Foundation Dean at Swinburne Law School. Gabrielle Wolf is a Senior Lecturer at Deakin University in Melbourne.

of more than 95% of prisons in the United States. We demonstrate that the technological and surveillance devices can achieve all of the appropriate objectives of imprisonment, including the imposition of proportionate punishment and community protection.

In our proposal, only offenders who have committed capital offenses or equivalent crimes, or who attempt to escape from technological custody, would remain in conventional brick-and-mortar prisons. As a result, our proposal would convert prisons from a major societal industry to a curious societal anomaly. If these reforms are implemented, the United States would spend a fraction of the amount currently expended on conventional prisons on a normatively superior mechanism for dealing with society's criminals.

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INTRODUCTION

Sentencing is the forum in which the community acts in its most coercive manner against its citizens. The United States inflicts more deliberate institutionalized punishment on its people than any other country on Earth, and by a large margin.¹ More than two million Americans are currently incarcerated in prisons and local jails.² This equates to an incarceration rate that is, remarkably, ten times higher than that of some other developed nations.³

The incarceration crisis that the United States is experiencing did not occur suddenly or unexpectedly. It is the result of a forty-year “tough on crime” campaign, which has resulted in a quadrupling of the prison population.⁴ For some time, the fact that the United States became the world’s largest incarcerator did not seem to trouble the general community.⁵ The rise in prison numbers continued unabated without any unified or concerted effective public counter-movement. Recently, however, this tacit endorsement of the incarceration rate has begun to dwindle.⁶ The prison over-population problem is now regularly the subject of mainstream media

¹ See Nick Wing, *Here Are All of the Nations That Incarcerate More of Their Population Than the U.S.*, HUFFINGTON POST (Aug. 13, 2013), http://www.huffingtonpost.com/2013/08/13/incarceration-rate-per-capita_n_3745291.html.

² *Highest to Lowest – Prison Population Total*, WORLD PRISON BRIEF, <http://www.prisonstudies.org/highest-to-lowest/prison-population-total> (last visited Dec. 16, 2016); see also *infra* Part I.

³ *Highest to Lowest – Prison Population Total*, *supra* note 2. The only other country with a higher imprisonment rate than the U.S. is Seychelles, a country of only approximately 93,000 people. Central Intelligence Agency, *Seychelles*, THE WORLD FACTBOOK, <https://www.cia.gov/library/publications/the-world-factbook/geos/se.html> (last visited Dec. 16, 2016); see also *Highest to Lowest – Prison Population Total*, *supra* note 2; Wing, *supra* note 1. Denmark, Sweden, Finland, Japan, and Iceland (and a number of unexpected developing countries such as South Sudan, Tanzania, Syria, Yemen) each have an imprisonment rate less than ten times that of the United States. See Institute for Criminal Policy Research, *supra* note 2.

⁴ Michael Jonas, *Rethinking Tough on Crime*, COMMONWEALTH MAG. (July 7, 2015), <http://commonwealthmagazine.org/criminal-justice/rethinking-tough-on-crime-2/>.

⁵ Certainly, there was no influential counter-movement to the growth in incarceration numbers and, as noted below, it was not until 2015 that a serving president visited a prison.

⁶ As noted below, wide-ranging groups (in some cases, even comprising police, prosecutors and victims of crimes) agitating for a softening of sentencing laws have been formed and many states have implemented measures to curb prison numbers.

coverage and political discussion.⁷

Particularly in the past two years, there has been a growing awareness in the United States that mass incarceration is no longer tolerable, and public discussion has commenced regarding the need for change. The issue has shifted from academic curiosity and inquiry to mainstream prominence. In July 2015, Barack Obama became the first sitting United States President to visit a United States prison when he visited a medium-security prison in central Oklahoma.⁸ Following the visit, the former President “. . . called for lowering—if not ending—mandatory minimum sentences for nonviolent [sic] drug offenses, restoring the voting rights of ex-felons, revisiting hiring practices that require applicants to list criminal activity, and expanding job training programs so inmates are better prepared to reintegrate into society.”⁹ President Obama also mentioned the need for sentencing reform in his 2015 State of the Union address.¹⁰ Although public discussion about reducing incarceration numbers seems to have stalled following the election of Donald Trump,¹¹ the fall-off is probably attributable to preoccupation with the political changes that the new administration is likely to make and is making, rather than to some alteration of the perception that reform is needed. While there has been a slight reduction in the scale of incarceration recently,¹² the imperative to reduce prisoner numbers has not diminished.

The major reason for the current focus on the incarceration crisis has nothing to do with concern for the rights or interests of those most affected by sentencing policy or practice. Instead, it has everything to do with money. The fiscal burden of imprisoning nearly one adult person in every thousand weighs heavily on even the world’s largest economy. The United States spends approximately \$80 billion annually on corrections.¹³ Even for the

⁷ See *infra* Part I.

⁸ Sabrina Siddiqui, ‘An Injustice System’: Obama’s Prison Tour Latest in Late-Term Reform Agenda, *GUARDIAN* (July 17, 2015), <https://www.theguardian.com/us-news/2015/jul/16/barack-obama-prison-tour-criminal-justice-race-reform>.

⁹ *Id.*

¹⁰ Inimai M. Chettiar & Abigail Finkelman, *If You Blinked, You Missed When Obama Made Criminal Justice Reform History*, BRENNAN CTR. FOR JUSTICE (Jan. 13, 2016), <https://www.brennancenter.org/analysis/if-you-blinked-you-missed-when-obama-made-criminal-justice-reform-history>.

¹¹ See *infra* Part I.

¹² Timothy Williams, *U.S. Correctional Population at Lowest Level in Over a Decade*, *N.Y. TIMES* (Dec. 29, 2016), <http://www.nytimes.com/2016/12/29/us/us-prison-population.html>.

¹³ Melissa S. Kearney et al., *Ten Economic Facts about Crime and Incarceration in the United States*, THE HAMILTON PROJECT 9 (May 2014), https://www.brookings.edu/wp-content/uploads/2016/06/v8_THP_10CrimeFacts.pdf; Aimee Picchi, *The High Price of*

world's largest economy, this is a terrifying amount—especially when one considers that the total expenditure on the criminal justice system is \$270 billion, some \$870 for every woman, man, and child in the United States.¹⁴ As President Obama recently noted, this rate of expenditure is unsustainable,¹⁵ and recognition of this fact has prompted policy makers at least to start discussing the need to lower prison numbers and reform the sentencing system.¹⁶ Nevertheless, no principled options for systematically reducing prison numbers are currently being implemented, and any options for change are unlikely to be pursued if they are simply motivated by a desire to reduce prison numbers. While pragmatically motivated reform might be implemented, it will probably produce expedient solutions that exacerbate the United States' sentencing crisis. A durable, economically and ethically sound solution is urgently required.¹⁷

This Article outlines such a solution: technological incarceration. We propose adapting and incorporating technological and remote surveillance capabilities for dealing with criminals. A startling aspect of criminal sanctions is that they have remained largely impervious to developments in science and technology. The principal method we employ to deal with serious criminals is almost identical to that of our distant ancestors: we confine them behind high stone or concrete walls.¹⁸ As Neil Hutton notes, sentencing law is “neither formal nor rational. It is one part of a modern legal system which has remained substantive and irrational.”¹⁹ This Article aims to change this monumental societal oversight.

In the body of the Article, we show that the two appropriate aims of custodial sanctions—namely community protection and the infliction of proportionate punishment—can readily be achieved by creating new sanctions that substitute concrete walls with technological barriers and

Incarceration in America, CBS MONEYWATCH (May 8, 2014, 5:53AM), <http://www.cbsnews.com/news/the-high-price-of-americas-incarceration-80-billion/>.

¹⁴ Press Release, The White House, CEA Report: Economic Perspective on Incarceration and the Criminal Justice System 5 (Apr. 23, 2016), <https://www.whitehouse.gov/the-press-office/2016/04/23/cea-report-economic-perspectives-incarceration-and-criminal-justice>.

¹⁵ Barack Obama, *The President's Role in Advancing Criminal Justice Reform*, 30 HARV. L. REV. 811, 817 (2017).

¹⁶ See *infra* Part I.

¹⁷ This theme is the subject of a recent series of articles in *The Economist*. *Rethinking Prison*, ECONOMIST (May 27, 2017), <https://www.economist.com/news/leaders/21722642-lot-known-about-how-reform-prisoners-far-too-little-done-americas-prisons-are>.

¹⁸ To the extent that technology has been used in the sentencing process, it is essentially confined to electronic bracelets; however, as discussed below, there has only been a slow take up of this technology and, in any event, the technology is relatively rudimentary.

¹⁹ Neil Hutton, *Sentencing, Rationality, and Computer Technology*, 22 J. L. & SOC'Y 549, 551 (1995).

restrictions. Crucially, technological incarceration will still punish offenders and be as effective as conventional prisons in preventing offenders from committing crimes. Technological incarceration will be cheaper to administer than bricks-and-mortar imprisonment. Moreover, it will ameliorate the gratuitous, incidental forms of suffering and human rights deprivations that are regrettably inflicted on those incarcerated in conventional prisons. Prisoners housed behind concrete walls cannot procreate or engage in meaningful family relationships.²⁰ Their life expectancy is reduced.²¹ They are far more likely to be beaten or raped than other members of the community,²² and, hence, their right to sexual and physical security is diminished. Further, their ability to secure employment after release is reduced, as are their lifetime earnings.²³ The level of pain caused by imprisonment is not fully recognized in the sentencing calculus. As well as relieving offenders of these experiences, technological imprisonment will reduce recidivism to a far greater extent than conventional prisons through effectively facilitating offenders' rehabilitation and their integration into the community upon release from incarceration.²⁴

Technological incarceration will have three key components that, like conventional prisons, restrict offenders' liberty, thereby punishing them and preventing them from reoffending while they are incarcerated. The first component requires prisoners to wear electronic ankle bracelets that monitor their locations and alert authorities if the prisoners breach the geographical areas to which they are confined.

The second component of technological incarceration involves remote monitoring of offenders' activity in real time. While it is possible to install surveillance cameras and employ people to monitor the footage from them constantly, this process would be prohibitively expensive. Instead, our proposal requires prisoners to wear a series of remote sensors—including those for sound, video, and movement—that are connected to central computer systems that can detect unauthorized behavior. Computer software exists that can detect suspicious human behavior, and it is so sophisticated that it can distinguish between a person using a butter knife to make a sandwich and picking up a steak knife in an aggressive manner.²⁵

²⁰ Mirko Bagaric et al., *Mitigating the Incarceration Crisis: Redefining Excessive Imprisonment as a Human Rights Abuse*, 38 *CARD. L. REV.* 1663, 1694–1702 (2017).

²¹ *Id.* at 1703.

²² *Id.*

²³ *See infra* Part II.

²⁴ *See infra* Part IV.

²⁵ *See, e.g.*, Dimitrios Georgakopoulos et al., *Event-Driven Video Awareness Providing Physical Security*, 10 *WORLD WIDE WEB J.* 1 (2007); *see also infra* Part III.

The third component of technological imprisonment involves using remote-controlled Conducted Energy Devices (“CEDs”) to immobilize offenders who are in the process of committing serious criminal acts or moving outside the locations to which they have been confined. Currently, law enforcement officers widely use CEDs, in the form of stun guns or Tasers, to restrain offenders who are behaving in a violent or threatening manner by firing the electroshock weapons at them. Technology is, however, available that can enable a computer that is monitoring offenders’ movements to deliver remotely the same shock as a conventional electroshock device and thereby immobilize offenders.

The second and third components of technological imprisonment seek to ensure that the community is protected from offenders’ possible reoffending for the periods during which the offenders are incarcerated. Even if an offender’s location is monitored, he or she could still commit offenses within this space or breach the prescribed geographical area and commit offenses in its immediate vicinity. The integration and refinement of two technological systems (components two and three), however, enable us to attain the objective of community protection without confining offenders behind concrete walls.

In this Article, we show that technological incarceration systems can be developed and employed to achieve all of the advantages of conventional imprisonment and yield additional, incalculable benefits. Offenders would suffer less brutality and almost certainly reoffend at a lower rate than at present, thereby increasing public safety. The community would save billions of dollars. Implemented properly, the proposals in this Article could result in the total closure of all but a fraction of existing prisons, saving vast amounts of money and greatly reducing human suffering. The only offenders who would continue to be accommodated in conventional prisons would be offenders who breach the conditions of technological confinement—for example, by escaping or committing serious offenses—and offenders who have committed the most serious offenses, which are equivalent to capital offenses in states that have the death penalty. The latter group of offenders constitute less than five percent of the current prison population.²⁶

If implemented, the reforms we recommend in this Article would possibly represent the single greatest change to the criminal justice system that has ever been made. Given that the proposal is so novel and far-reaching, it is likely that, at least initially, it will attract some resistance. A foreseeable

²⁶ See *infra* Part III. See also NAT’L RESEARCH COUNCIL, THE GROWTH OF INCARCERATION IN THE UNITED STATES, EXPLORING CAUSES AND CONSEQUENCES 68 (Jeremy Travis et al. eds., 2014).

objection is that technological imprisonment may contravene offenders' human rights by breaching their privacy if they are subjected to constant surveillance and violating their physical integrity if they are immobilized remotely by CEDs. The Article rebuts these concerns by highlighting that offenders undergoing technological incarceration would in fact have more privacy than those incarcerated in conventional prisons (who have virtually no privacy), and experience less physical restraint and pain if they are immobilized by CEDs than are often inflicted on inmates of conventional prisons who are found committing serious offenses or trying to escape from custody.

Opponents of the proposal are also likely to argue that the sanction is not sufficiently harsh to constitute a punishment for serious offenses. We counter this criticism by highlighting that the deprivation of liberty is itself a considerable deprivation. Moreover, the sanction we are proposing is in some respects an extension of home detention, though with far greater capacity to protect the community. Hence, technological incarceration is likely to attract no less support than home detention, especially given the fact that in recent years even victims groups, police and prosecutors have called for more lenient and effective sentences than conventional imprisonment.²⁷

Fundamental reform is rarely achieved quickly. For our proposal to be implemented, it is necessary to bring it into operation incrementally and systematically and demonstrate its profound benefits. Thus, we suggest that, initially, it should be trialed for twelve months in relation to at least 10,000 prisoners who are serving time for minor offenses that are neither sexual nor violent crimes.

The Article proceeds as follows: in Part I, we examine the current sentencing landscape in the United States, describing the nature and significance of the incarceration crisis in the United States, and offer a brief explanation for the crisis and why it has not yet been alleviated. In Part II, we discuss the appropriate objectives of sentencing to provide the basis for assessing the normative validity of technological incarceration. Part III examines the technology that now exists for remote monitoring, surveillance, and incapacitation, and demonstrates the feasibility of technological incarceration. In Part IV, we explain why technological incarceration is superior to conventional imprisonment. Part V addresses and rebuts the likely criticisms of our proposals. Finally, in Part VI, we discuss how the recommendations in this Article could be implemented.

²⁷ See *infra* Part II.

I. THE INCARCERATION CRISIS

To demonstrate the need for a radical change to the current means of imprisoning offenders, this Part explains the severity of the present incarceration crisis. Sentencing in the United States suffers from three main problems: the financial cost of prisons is unsustainable; the hardship inflicted on prisoners is morally unjustifiable; and the rate of recidivism amongst former inmates is high. In subsequent Parts of this Article, we propose solutions to these problems, but in this Part, we begin by examining the nature of the issues in greater detail.

A. PRESENT INCARCERATION LEVELS ARE FISCALLY EXORBITANT

In the last forty years, incarceration of offenders in the United States has increased so substantially²⁸ that this nation now has the highest incarceration rate in the world.²⁹ Most developed countries imprison their citizens at a rate five to ten times less than the United States.³⁰ The United States' imprisonment rate is six times greater than the average imprisonment rate of countries in the Organization for Economic Co-operation and Development (OECD).³¹ With over two million Americans incarcerated in federal and state prisons and local jails,³² and approximately 700 adults for every 100,000

²⁸ See NAT'L RESEARCH COUNCIL, *supra* note 26, at 68.

²⁹ *Incarceration*, THE SENTENCING PROJECT, <http://www.sentencingproject.org/template/page.cfm?id=107> (last visited Dec. 1, 2016); Wing, *supra* note 1. Current incarceration rates are historically and comparatively unprecedented. The United States has the highest incarceration rate in the world, reaching extraordinary absolute levels in the most recent two decades. NAT'L RESEARCH COUNCIL, *supra* note 26, at 68.

³⁰ See NAT'L RESEARCH COUNCIL, *supra* note 26, at 2.

³¹ Melissa S. Kearney et al., *supra* note 13, at 10. Rates in the OECD range from forty-seven to 266 per 100,000 adult population. *Id.* See also Wing, *supra* note 1 (“At 716 per 100,000 people in 2013, according to the International Centre for Prison Studies, the U.S. tops every other nation in the world. Among OECD countries, the competition isn’t even close—Israel comes in second, at 223 per 100,000.”).

³² More than two million Americans are in federal prisons, state prisons, and local jails. By year end 2015, the exact number of prisoners had dropped slightly to 2,136,600. See U.S. DEPARTMENT OF JUSTICE, BUREAU OF JUSTICE STATISTICS, *Correctional Populations in the United States, 2015* 1, 1 (Dec. 2016). This is an imprisonment rate of approximately 700 adults for every 100,000 of the adult population. This rate has increased more than four-fold over the past forty years. See *id.* at 4. The United States now has the highest incarceration rate in the developed world and by a considerable margin. See *Highest to Lowest – Prison Population Total*, *supra* note 2. The imprisonment rate in most developed countries is five to ten times less than the United States, and on average, is six times that of a typical nation in the Organization for Economic Co-operation and Development (“OECD”). Kearney et al., *supra* note 13, at 9–10; see also NAT'L RESEARCH COUNCIL, *supra* note 26, at 68. Rates in the OECD range from 47 to 266 per 100,000 adult population. Kearney et al., *supra* note 13, at 10. For a breakdown of the incarceration numbers, see Peter Wagner & Bernadette Rabuy, *Mass*

people in the adult population imprisoned,³³ the United States' "serious over-punishment" and "mass incarceration" is too conspicuous to be ignored and is increasingly recognized even by non-Americans.³⁴ Most obvious amongst the problems with this crisis is its exorbitant and unmaintainable cost to the public purse: \$80 billion annually.³⁵ In the thirty years between 1980 and 2010, the United States effectively increased its spending on imprisonment more than three-fold.³⁶ Crucially, this expenditure diminishes the pool of government funds available for essential social services,³⁷ and the National Research Council has noted:

Budgetary allocations for corrections have outpaced budget increases for nearly all other key government services (often by wide margins), including education, transportation, and public assistance Today, state spending on corrections is the third highest category of general fund expenditures in most states, ranked behind Medicaid and education. Corrections budgets have skyrocketed at a time when spending for other key social services and government programs has slowed or

Incarceration: The Whole Pie 2015, PRISON POL'Y INITIATIVE (Dec. 8, 2015), <http://www.prisonpolicy.org/reports/pie2015.html>; *see also infra* Part I (discussing the theory that higher penalties deter crime).

³³ *United States of America*, WORLD PRISON BRIEF, <http://www.prisonstudies.org/country/united-states-america> (last visited Dec. 1, 2016).

³⁴ *See, e.g.*, SASHA ABRAMSKY, AMERICAN FURIES: CRIME, PUNISHMENT AND VENGEANCE IN THE AGE OF MASS IMPRISONMENT (2007); ANTHONY THOMPSON, RELEASING PRISONERS, REDEEMING COMMUNITIES: RE-ENTRY, RACE, AND POLITICS (2009); Lynn Adelman, *What the Sentencing Commission Ought to Be Doing: Reducing Mass Incarceration*, 18 MICH. J. RACE & L. 295 (2013); Todd R. Clear & James Austin, *Reducing Mass Incarceration: Implications of the Iron Law of Prison Populations*, 3 HARV. L. & POL'Y REV. 307 (2009); Bernard E. Harcourt, *Keynote: The Crisis and Criminal Justice*, 28 GA. ST. U. L. REV. 965 (2012). The problem is so acute that even a "Reverse Mass Incarceration Act" has been proposed. Lauren-Brooke Eisen & Inimai M. Chettiar, *The Reverse Mass Incarceration Act*, BRENNAN CTR. FOR JUSTICE (Oct. 12, 2015), <https://www.brennancenter.org/publication/reverse-mass-incarceration-act>; *see also* U.S. JUSTICE ACTION NETWORK, REFORMING THE NATION'S CRIMINAL JUSTICE SYSTEM: THE IMPACT OF 2015 AND PROSPECTS FOR 2016 (Dec. 2015), *available at* <http://www.justiceactionnetwork.org/wp-content/uploads/2015/12/Justice-Action-Network-Year-End-Report.pdf>. Vivien Stern, secretary general of Penal Reform International, states: "Among mainstream politicians and commentators in Western Europe, it is a truism that the criminal justice system of the United States is an inexplicable deformity." Vivien Stern, *The International Impact of U.S. Policies*, in *INVISIBLE PUNISHMENT: THE COLLATERAL CONSEQUENCES OF MASS IMPRISONMENT* 279, 280 (Marc Mauer & Meda Chesney-Lind eds., 2002)

³⁵ Kearney et al., *supra* note 13, at 13.

³⁶ *Id.* In real terms, spending has increased from \$77 yearly by each United States resident in 1980 to \$260 in 2010. *Id.*

³⁷ For an analysis on why mass incarceration is flawed from the financial perspective, see Jason Furman & Douglas Holtz-Eakin, *Why Mass Incarceration Doesn't Pay*, N.Y. TIMES (Apr. 21, 2016), <http://www.nytimes.com/2016/04/21/opinion/why-mass-incarceration-doesnt-pay.html>.

contracted.³⁸

Comparative spending on prisons and education in many American states is particularly alarming: Over the past twenty years, expenditure on incarceration has increased at six times the rate of spending on higher education.³⁹ The Center on Budget and Policy Priorities reported recently that eleven states currently spend more on imprisoning offenders than on higher education.⁴⁰ A recent study by the Marshall Project shows that, for every dollar spent on corrections, incarceration leads to a further ten dollars expended in the form of social costs.⁴¹ This means that the total financial cost of prison is over \$1 trillion annually, an amount that equates to nearly six percent of the United States' gross domestic product.⁴²

Remarkably, there is no demonstrated positive community dividend that stems from mass incarceration. Study after study has shown that community safety is not meaningfully enhanced as a result of the massive increase in prison numbers: A recent Brennan Center report notes that "rigorous social science research based on decades of data shows that increased incarceration played an extremely limited role in the crime decline."⁴³ The report

³⁸ NAT'L RESEARCH COUNCIL, *supra* note 26, at 314. *See also* Kearney et al., *supra* note 13, at 13.

³⁹ *See* Adam Gopnik, *The Caging of America*, NEW YORKER (Jan. 30, 2012), <http://www.newyorker.com/magazine/2012/01/30/the-caging-of-america>.

⁴⁰ *See, e.g.*, Michael Mitchell & Michael Leachman, *Changing Priorities: State Criminal Justice Reforms and Investments In Education*, CTR. ON BUDGET AND POL'Y PRIORITIES 1 (Oct. 28, 2014), <http://www.cbpp.org/research/changing-priorities-state-criminal-justice-reforms-and-investments-in-education?fa=view&id=4220> (internal citations omitted, emphasis in original). Reduced investment in education is also occurring at the more junior education level: "In recent years . . . states have cut education funding, in some cases by large amounts. At least 30 states are providing less general funding per student this year for K-12 schools than in state fiscal year 2008, before the Great Recession hit, after adjusting for inflation. In 14 states, the reduction exceeds 10 percent. The three states with the deepest funding cuts since the recession hit—Alabama, Arizona, and Oklahoma—are among the ten states with the highest incarceration rates." *Id.* at 10 (internal citation omitted). *See also* Beatrice Gitau, *The Hidden Costs of Funding Prisons Instead of Schools*, CHRISTIAN SCI. MONITOR (Oct. 3, 2015), <http://www.csmonitor.com/USA/Justice/2015/1003/The-hidden-costs-of-funding-prisons-instead-of-schools> (noting that eleven states spend more on prisons than universities: Michigan, Oregon, Arizona, Vermont, Colorado, Pennsylvania, New Hampshire, Delaware, Rhode Island, Massachusetts, and Connecticut).

⁴¹ *See generally* INST. FOR ADVANCING JUST. RES. & INNOVATION RES., *THE ECONOMIC BURDEN OF INCARCERATION IN THE U.S.* (Oct. 2016), *available at* <https://advancingjustice.wustl.edu/sitecollectiondocuments/the%20economic%20burden%20of%20incarceration%20in%20the%20us.pdf>.

⁴² *Id.*

⁴³ BRENNAN CTR., *HOW MANY AMERICANS ARE UNNECESSARILY INCARCERATED?* 5 (2016). *See also* Mirko Bagaric, *The Punishment Should Fit the Crime – Not the Prior Convictions of the Person That Committed the Crime: An Argument for Less Impact Being*

continues:

Recent reforms enacted by states show that mass incarceration and crime are not inextricably linked. Over the last decade, 27 states have reduced both imprisonment and crime together. From 1999 to 2012, New Jersey and New York reduced their prison populations by about 30 percent, while crime fell faster than it did nationally. Texas decreased imprisonment and crime by more than 20 percent during the same period. California, in part because of a court order, cut its prison population by 27 percent, and violence in the state also fell more than the national average.⁴⁴

In addition to the burgeoning and increasingly unsustainable cost of conventional imprisonment, the means of dealing with offenders inflicts gratuitous and profound suffering on them.

B. CONVENTIONAL INCARCERATION VIOLATES INMATES' HUMAN RIGHTS

In addition to the financial burden of mass incarceration, the United States' current imprisonment rate raises an important moral consideration. Conventional incarceration often inflicts suffering on offenders that is disproportionate to the gravity of the crimes that they have committed. One of the authors has maintained that the human rights violations effected through America's mass incarceration generates the most urgent contemporary domestic human rights crisis.⁴⁵ Contributing to this crisis is the fact that an extremely high number of the victims of those human rights abuses either derive from racial minorities, especially African American⁴⁶ and Latino communities,⁴⁷ or are white Americans from socially and

Accorded to Previous Convictions in Sentencing, 51 SAN DIEGO L. REV. 343, 5 (2014).

⁴⁴ BRENNAN CTR., *supra* note 43, at 5.

⁴⁵ See generally Bagaric et al., *supra* note 20; Mirko Bagaric, *Rich Offender, Poor Offender: Why Economic and Social Status is Relevant to Sentencing*, 33 L. & INEQ. 1 (2015).

⁴⁶ See generally Mirko Bagaric, *Three Things That a Baseline Study Shows Do Not Cause Indigenous Over-Imprisonment; Three Things That Might (But Shouldn't) and Three Reforms That Will Reduce Indigenous Over-Imprisonment*, 32 HARV. J. ON RACIAL & ETHNIC JUST. 101 (2016); Bagaric, *supra* note 45. However, it should be noted that in recent years there has been a slight reduction in the extent to which African Americans are imprisoned compared to the rest of the community. See Keith Humphreys, *Black Incarceration Hasn't Been This Low in a Generation*, WASH. POST (Aug. 16, 2016), <https://www.washingtonpost.com/news/wonk/wp/2016/08/16/black-incarceration-hasnt-been-this-low-in-a-generation/>. However, their over-imprisonment rate is more than 5:1. Ashley Nellis, *The Color of Justice: Racial and Ethnic Disparity in State Prisons*, THE SENT'G PROJECT (June 14, 2016), <http://www.sentencingproject.org/publications/color-of-justice-racial-and-ethnic-disparity-in-state-prisons/>. The reasons that black Americans are imprisoned at greater levels are discussed in Part V.

⁴⁷ Nellis, *supra* note 46.

economically deprived backgrounds.⁴⁸

Few would contest the notion that imprisonment should punish offenders by restricting their freedom. However, inmates face unique and considerable hardships, many of which are not manifestly obvious from a superficial understanding of the nature of imprisonment. For instance, offenders are unable to access goods and services;⁴⁹ they are precluded from having sexual relationships,⁵⁰ procreating,⁵¹ and participating in families;⁵² and they are sexually and physically victimized at a significantly higher rate than those who are not imprisoned.⁵³ Solitary confinement, which is commonly used—in 2013, it was applied to almost twenty-seven percent of *adolescent* inmates of American prisons⁵⁴—is especially distressing because cells are cramped, their inhabitants have no contact with other people, and the only activity in which inmates are permitted to engage is a brief period of physical exercise outside the cell.⁵⁵ Offenders also experience further hardship after being released from prison, including diminished life expectancy,⁵⁶ prolonged unemployment, and reduced income.⁵⁷

The suffering associated with prison extends well beyond that felt by inmates. Imprisonment also often harms innocent people, most notably relatives of inmates, or those who are financially and/or emotionally dependent on inmates.⁵⁸ The fact that this harm is caused incidentally as a

⁴⁸ *Id.*

⁴⁹ GRESHAM M. SYKES, *THE SOCIETY OF CAPTIVES: A STUDY OF A MAXIMUM SECURITY PRISON* 67–68 (2007).

⁵⁰ *Id.* at 70–71. See also Robert Johnson & Hans Toch, *Introduction*, in *THE PAINS OF IMPRISONMENT* (Robert Johnson & Hans Toch, eds. 1982).

⁵¹ Bagaric et al., *supra* note 20, at 1695–1704.

⁵² *Id.* Annually, more than 70,000 prisoners are raped in America.

⁵³ *Id.*

⁵⁴ Jennifer Gonnerman, *Before the Law*, *THE NEW YORKER* (Oct. 6, 2014), <http://www.newyorker.com/magazine/2014/10/06/before-the-law>.

⁵⁵ *Id.*

⁵⁶ A study which examined the 15.5-year survival rate of 23,510 ex-prisoners in the U.S. State of Georgia found much higher mortality rates for ex-prisoners than for the rest of the population. See Anne C. Spaulding et al., *Prisoner Survival Inside and Outside of the Institution: Implications for Health-Care Planning*, 173 *AM. J. EPIDEMIOLOGY* 479, 479 (2011). There were 2,650 deaths in total, which was a 43% higher mortality rate than normally expected (799 more ex-prisoners died than expected). See *id.* The main causes for the increased mortality rates were homicide, transportation accidents, accidental poisoning (which included drug overdoses), and suicide. See *id.* at 479–480. See also NAT'L RESEARCH COUNCIL, *supra* note 26, at 220–26.

⁵⁷ NAT'L RESEARCH COUNCIL, *supra* note 26, at 247. One study estimated the earnings reduction to be as high as 40%. Bruce Western & Becky Pettit, *Incarceration & Social Inequality*, 139 *DAEDALUS* 8, 13 (2010).

⁵⁸ See Mirko Bagaric & Theo Alexander, *First-time Offender, Productive Offender*,

result of the prison environment, rather than intentionally, does not diminish its reality and intensity.⁵⁹ A dependency occurs where the dependant's flourishing would be affected significantly and adversely if the relationship with the person on whom he or she depends was severed.⁶⁰ There are numerous forms of dependence, but the most established and deepest form stems from the bond between parent and child. Imprisoning a parent has a damaging impact on his or her children. A recent report by David Murphey and P. Mae Cooper shows that more than five million children in the United States have had at least one parent in prison at some point.⁶¹ The report states that, after factoring in the effects of other variables, such as income and race, the incarceration of a parent is associated with a higher number of other major, potentially traumatic life events for his or her children; it can lead to more emotional difficulties for them; low school engagement; more problems in school among children aged six to eleven, as well as to a greater likelihood of problems in school among older youth (twelve to seventeen); and less parental monitoring of them.⁶²

Further, incarcerating a parent greatly increases the likelihood that his or her children will at some point in their lives also be sentenced to prison.⁶³ One study showed that children of incarcerated parents are five times more likely than other children to commit crimes and, alarmingly, 70% of them become incarcerated at some point.⁶⁴

C. THE RATE OF RECIDIVISM AMONGST FORMER PRISONERS IS HIGH

As we discuss in more detail below,⁶⁵ two benefits stem from imprisonment. The first is that it imposes a considerable hardship on the guilty defendant. The second is that it protects the community from the defendant. Nevertheless, the community protection that conventional prison

Offender with Dependents: Why the Profile of Offenders (Sometimes) Matters in Sentencing, 78 ALB. L. REV. 397 (2015).

⁵⁹ *See id.*

⁶⁰ For a discussion about the meaning of flourishing, see Mirko Bagaric, *Injecting Content into the Mirage That is Proportionality in Sentencing*, 25 N.E. U. L. REV. 411, 434 (2013).

⁶¹ *See* David Murphey & P. Mae Cooper, *Parents Behind Bars: What Happens to Their Children?*, CHILD TRENDS 2 (Oct. 2015), available at <https://childtrends-ciw49tixgw5lbb.stackpathdns.com/wp-content/uploads/2015/10/201542ParentsBehindBars.pdf>.

⁶² *See id.*

⁶³ *See* E. Mosley, *Incarcerated - Children of Parents in Prison Impacted*, TEX. DEP'T OF CRIM. JUST. (July 6, 2008), https://www.tdcj.state.tx.us/gokids/gokids_articles_children_impacted.html.

⁶⁴ *Id.*

⁶⁵ *See infra* Part IV.

affords is often overstated. It is true that, for the duration of time that offenders are incarcerated in prisons, they cannot commit offenses in the community. However, approximately 95% of offenders who are imprisoned are ultimately released back into the community,⁶⁶ and most of them subsequently reoffend.⁶⁷ It has been noted that

[i]f any other institutions in America were as unsuccessful in achieving their ostensible purpose as our prisons are, we would shut them down tomorrow. Two-thirds of prisoners reoffend within three years of leaving prison, often with a more serious and violent offense. More than 90 percent of prisoners return to the community within a few years (otherwise our prisons would be even more overcrowded than they already are). That is why it is vitally important how we treat them while they are incarcerated.⁶⁸

Not only do conventional prisons fail to protect the community beyond the periods for which offenders are incarcerated, but the conditions that inmates experience in fact appear to *increase* the rate of recidivism. The most recent wide-ranging data on recidivism derives from a 2016 United States Sentencing Commission report.⁶⁹ The study tracked 25,431 federal prisoners following their release from prison in 2005,⁷⁰ and found that, over the succeeding eight-year period, almost half (49.3%) were re-arrested.⁷¹ As

⁶⁶ NATHAN JAMES, CONG. RESEARCH SERV., OFFENDER REENTRY: CORRECTIONAL STATISTICS, REINTEGRATION INTO THE COMMUNITY AND RECIDIVISM 4 (2015), *available at* <https://fas.org/sgp/crs/misc/RL34287.pdf>. Nearly three quarters of released prisoners who reoffend are arrested within five years of release, and 60% of them are reconvicted. *See id.* There are three reasons that prisoners do not get released. The most common is that they are sentenced to life imprisonment. There are in fact 160,000 inmates serving a life sentence and of these approximately 49,000 have been sentenced to life without the possibility of parole. *See* THE SENTENCING PROJECT, LIFE GOES ON: THE HISTORIC RISE IN LIFE SENTENCES IN AMERICA (2013). Approximately 5,000 inmates die in prison or jail each year due to natural causes, illness or disease, suicide, or violence. *See* BUREAU OF JUST. STAT., MORTALITY IN LOCAL JAILS AND STATE PRISONS, 2000–2013 – STATISTICAL TABLES (Aug. 2015). For the report on number of deaths in federal prisons (444), *see* BUREAU OF JUST. STAT., MORTALITY IN STATE PRISONS, 2001–2014 - STATISTICAL TABLES PRESS RELEASE (Dec. 2016). A small number are also executed. In fact, in 2016, there were the smallest number of executions (20) in the modern era (i.e., since 1973 when some states commenced re-enacting the death penalty). *See The Death Penalty in 2016: Year End*, DEATH PENALTY INFO. CTR., <http://deathpenaltyinfo.org/documents/2016YrEnd.pdf> (last visited Dec. 2, 2016).

⁶⁷ Nearly three quarters of released prisoners who reoffend are arrested within five years of release, and 60% of them are reconvicted. CONG. RESEARCH SERV., *supra* note 66, at 4.

⁶⁸ James Gilligan, *Punishment Fails. Rehabilitation Works*, N.Y. TIMES (Dec. 18, 2016), <http://www.nytimes.com/roomfordebate/2012/12/18/prison-could-be-productive/punishment-fails-rehabilitation-works>.

⁶⁹ *See generally Recidivism Among Federal Offenders: A Comprehensive Overview*, UNITED STATES SENT'G COMM. 1 (Mar. 2016), http://www.ussc.gov/sites/default/files/pdf/research-and-publications/research-publications/2016/recidivism_overview.pdf.

⁷⁰ *Id.* at 3.

⁷¹ *Id.*

noted below, the recidivism rate of inmates who are detained in more humane custodial settings is significantly lower than this figure.⁷²

Further, it is noteworthy that conventional prisons seem to generate more criminality. A 2016 report of the Executive Office of the President of the United States reviewed research that suggested that imprisoning individuals can increase the probability that they will reoffend. It observed:

[A] growing body of work has found that incarceration increases recidivism For instance, one recent study that uses highly detailed data from Texas . . . finds that although initial incarceration prevents crime through incapacitation, each additional sentence year causes an increase in future offending that eventually outweighs the incapacitation benefit. Each additional sentence year leads to a 4 to 7 percentage point increase in recidivism after release.⁷³

The conclusion is obvious, if unpalatable: The unsustainable cost of conventional imprisonment, the human rights violations that stem from it, and the high recidivism rate of former inmates, demonstrate the desperate need for reform of the United States' sentencing system. This Article's proposal for reform is especially timely because, for the first time in at least forty years, there is growing political and social acceptance of the need for significant sentencing changes at the same time as it has become technologically feasible to effect real change to the means of imprisoning offenders. Before we set out the proposed reforms in greater detail, we explain the nature and extent of the momentum for change.

D. THE PRESENT RECEPTIVENESS TO CHANGING THE UNITED STATES SENTENCING SYSTEM RADICALLY

There is now widespread recognition that America's sentencing system is broken. This acceptance, and the consequent receptiveness to changing that system, is evident in mainstream media publications, public servants' attitudes, polls of community opinion, and views expressed by both the Republican and Democratic sides of politics.

Various media outlets have recently highlighted problems associated with the extreme rate of imprisonment and have endorsed moves for reform. Acknowledging the observations of lawyers and academics that mandatory prolonged sentences for nonviolent drug offenders are "oppressive and ineffective," an article in *Rolling Stone* magazine denounced the imposition of such sentences.⁷⁴ A documentary screened by HBO advocated for

⁷² See *infra* Part IV.

⁷³ See Press Release, *supra* note 14, at 39.

⁷⁴ See Andrea Jones, *The Nation's Shame: The Injustice of Mandatory Minimums*, ROLLING STONE (Oct. 7, 2014), <http://www.rollingstone.com/politics/news/the-nations-shame-the-injustice-of-mandatory-minimums-20141007>.

reducing the number of people imprisoned.⁷⁵ Several articles and editorials published in the *New York Times* have exposed exorbitant government spending on prisons,⁷⁶ and have supported lower sentences,⁷⁷ including those proposed by new federal sentencing laws.⁷⁸ Recent pieces in *The Atlantic* have observed that mass incarceration is both “a perverse form of social spending” on disadvantaged Americans as well as a means of enriching businesses that benefit from prisons.⁷⁹ These articles have recommended addressing urgent questions, such as, “what’s the best way to enact reform” when “overzealous prosecutors are driving a rise in prison admissions,” and whether the offenses that constitute “violent crimes” should be redefined.⁸⁰ *The Huffington Post* publicized details of a report released by the White House in April 2016 that expressed concern about the disproportionate number of Hispanic and African-American people in the prison population and the high rate of recidivism amongst offenders who receive lengthy sentences, and recommended increasing the minimum wage as a mechanism for reducing crime.⁸¹

In 2015, police officials, prosecutors, and attorney generals were amongst the public servants who, as the “Law Enforcement Leaders to Reduce Crime and Incarceration,” issued a press release noting that

⁷⁵ See VICE Staff, *Watch VICE’s Historic Conversation with President Obama*, VICE (Sept. 21, 2015, 9:31 PM), <http://www.vice.com/read/fixing-the-system-prisons-obama-shane-smith-hbo>; see also Gregory Korte, *Obama Launches Criminal Justice Tour: “Something I’ll keep fighting for”*, USA TODAY (Oct. 17, 2015, 7:25 PM), <http://www.usatoday.com/story/news/politics/2015/10/17/obama-criminal-justice-reform-tour-charleston-heroin/74090902/>.

⁷⁶ See, e.g., Eduardo Porter, *In the U.S., Punishment Comes Before the Crimes*, N.Y. TIMES (Apr. 30, 2014), <http://www.nytimes.com/2014/04/30/business/economy/in-the-us-punishment-comes-before-the-crimes.html>.

⁷⁷ See The Editorial Board, *Cut Prison Sentences, and Costs*, N.Y. TIMES (Dec. 24, 2016), <http://www.nytimes.com/2016/12/24/opinion/sunday/cutting-prison-sentences-and-costs.html>; The Editorial Board, *Cut Sentences for Low-Level Drug Crimes*, N.Y. TIMES (Nov. 23, 2015), <http://www.nytimes.com/2015/11/23/opinion/cut-sentences-for-low-level-drug-crimes.html>.

⁷⁸ See, e.g., The Editorial Board, *Toward Saner, More Effective Prison Sentences*, N.Y. TIMES (Oct. 3, 2015), <http://www.nytimes.com/2015/10/04/opinion/sunday/toward-saner-more-effective-prison-sentences.html>.

⁷⁹ See, e.g., Alex Lichtenstein, *Mass Incarceration Has Become the New Welfare*, THE ATLANTIC (Sept. 16, 2015), <http://www.theatlantic.com/politics/archive/2015/09/mass-incarceration-has-become-the-new-welfare/404422/>.

⁸⁰ See, e.g., Clare Foran, *What Can the U.S. Do About Mass Incarceration?*, THE ATLANTIC (Apr. 28, 2016), <http://www.theatlantic.com/politics/archive/2016/04/ending-mass-incarceration/475563/>.

⁸¹ Matt Ferner, *New Report Reveals Devastating Effects of Mass Incarceration on the U.S.*, HUFFINGTON POST (May 3, 2016), http://www.huffingtonpost.com.au/entry/effects-mass-incarceration_us_5727b6abe4b0b49df6ac0e00.

reductions in incarceration of “low-level offenders” can lower crime levels by diverting resources to pursuing serious and violent offenders.⁸² National polls undertaken in 2013 and 2014 indicated that a high proportion of the community—between 71 and 77%—believes that mandatory minimum sentences for nonviolent drug offenses should be abolished.⁸³ Victims of crime have similarly expressed their support for reduced imprisonment and expenditure on prisons and greater investment in rehabilitating offenders.⁸⁴

Democratic and Republican politicians recognize that mass incarceration is a major problem and it became a central topic of the primaries and of both presidential campaigns in 2016.⁸⁵ Measures proposed by Senator Hillary Clinton to resolve the crisis included halving the minimum mandatory sentences for nonviolent drug offenders, not placing federal prisoners in for-profit privatized prisons, investing resources in rehabilitating drug addicts, and assisting offenders to re-enter society upon their release from prison.⁸⁶ Although President Donald Trump has indicated his support for “tough on crime” policies,⁸⁷ other Republicans have appreciated that such an agenda is unpopular and have recommended softening sentencing laws⁸⁸ and reducing the number of prisoners.⁸⁹ Holly Harris and Andrew Howard observe:

First and foremost, it is conservatives in big red states like Texas, Georgia, and South Carolina who have led the way on justice reform issues for a decade. These efforts yielded great success in safely reducing the prison population, saving significant taxpayer resources, and most importantly lowering crime and recidivism rates

⁸² *Notable New Group Advocating for Sentencing Reforms: Law Enforcement Leaders to Reduce Crime and Incarceration*, SENT’G L. & POL’Y (Oct. 21, 2015), http://sentencing.typepad.com/sentencing_law_and_policy/2015/10/notable-new-group-advocating-for-sentencing-reforms-law-enforcement-leaders-to-reduce-crime-and-inca.html.

⁸³ *October 2014 Topline Results*, REASON-RUPE PUBLIC OPINION SURVEY, question 14, page 4 (Oct. 9, 2014), available at <http://reason.com/assets/db/14128084586864.pdf>.

⁸⁴ Christopher Ingraham, *Even Violent Crime Victims Say Our Prisons are Making Crime Worse*, WASH. POST (Aug. 5, 2016), <https://www.washingtonpost.com/news/wonk/wp/2016/08/05/even-violent-crime-victims-say-our-prisons-are-making-crime-worse/>.

⁸⁵ Foran, *supra* note 80.

⁸⁶ Jenna Goff & Joan Greve, *Trump vs. Clinton: Criminal Justice Reform*, PBS (Sept. 19, 2016), <http://www.pbs.org/weta/washingtonweek/blog-post/trump-vs-clinton-criminal-justice-reform>; Michelle Mark, *Here’s What Hillary Clinton and Donald Trump Think About Criminal Justice*, BUS. INSIDER AUSTRAL. (Sept. 27, 2016), <http://www.businessinsider.com.au/trump-and-clinton-on-issues-mass-incarceration-and-criminal-justice-2016-9>.

⁸⁷ Goff & Greve, *supra* note 86; Mark, *supra* note 86.

⁸⁸ Evan Halper, *Clinton’s Call for Easing Harsh Sentencing Laws Is Echoed by Republican Rivals*, L.A. TIMES (Apr. 29, 2015), <http://www.latimes.com/nation/politics/la-pn-clinton-prison-reform-20150429-story.html>.

⁸⁹ Peter Baker, *2016 Candidates Are United in Call to Alter Justice System*, N.Y. TIMES (Apr. 27, 2015), <http://www.nytimes.com/2015/04/28/us/politics/being-less-tough-on-crime-is-2016-consensus.html>.

Surveys in states that will have hotly-contested Senate races such as Florida, Illinois, North Carolina, Nevada, and Speaker Ryan's home state of Wisconsin show support for reform issues ranging from the 60s to high 80s. The smart political play is to embrace these reforms. Doing otherwise could backfire. Just ask Alaska's then-incumbent Senator Mark Begich. In the state's 2014 U.S. Senate race, Begich attacked his Republican opponent, Dan Sullivan, alleging he was soft on crime. Sullivan emerged victorious over Begich and is currently serving as the junior senator from Alaska.⁹⁰

President Trump may have difficulty resisting pressure from his party to reform the sentencing system, particularly in the face of significant evidence of bipartisan support at state and federal levels for lowering the rate of incarceration. For instance, although Congress might not pass it, the *Federal Sentencing Reform and Corrections Act*, which aims to reduce mandatory minimum penalties for many nonviolent offenses, was endorsed by members of both major parties.⁹¹ Further, the United States Sentencing Commission voted to reduce the sentencing guideline level for most federal drug trafficking offenses in 2014.⁹² In 2014 and 2015, forty-six American states passed legislation for the purpose of "creating or expanding opportunities to divert people away from the criminal justice system; reducing prison populations by enacting sentencing reform, expanding opportunities for early release from prison, and reducing the number of people admitted to prison for violating the terms of their community supervision."⁹³ Certain states

⁹⁰ Holly Harris & Andrew Howard, *Ryan's Victory Trumps Justice Reform Opponents*, THE HILL (Aug. 15, 2016), <http://thehill.com/blogs/pundits-blog/crime/291500-ryans-victory-trumps-justice-reform-opponents>.

⁹¹ For a summary of the key aspects of this legislation, see *With SRCA Now "Officially" Dead . . . Send your "Thanks" to (Failings of) Prez Obama and Bipartisan Bungling*, SENT'G L. & POL'Y (July 1, 2016), http://sentencing.typepad.com/sentencing_law_and_policy/2016/07/with-srca-now-officially-dead-send-your-thanks-to-failings-of-prez-obama-and-bipartisan-bungling.html. See also Seung Min Kim & Burgess Everett, *Time Running out for Major Criminal Justice Bill*, POLITICO (Apr. 20, 2016), <http://www.politico.com/story/2016/04/senate-justice-crime-bill-222225>.

⁹² Press Release, U.S. Sentencing Commission, U.S. Sentencing Commission Votes to Reduce Drug Trafficking Sentences, 1, 1 (Apr. 10, 2014), http://www.ussc.gov/sites/default/files/pdf/news/press-releases-and-news-advisories/press-releases/20140410_Press_Release.pdf.

⁹³ Rebecca Sibley et al., *Justice in Review, New Trends in State Sentencing and Corrections 2014-2015*, VERA INST. OF JUST. 1, 3 (May 2016), <https://www.vera.org/publications/justice-in-review-new-trends-in-state-sentencing-and-corrections-2014-2015>. Wide-ranging reforms are occurring in Ohio and Michigan. See U.S. Justice Action Network, *An Overview of Criminal Justice Reform in 2015*, U.S. JUSTICE ACTION NETWORK (Dec. 2015). The same is true in Texas. See Adam Bradon et al., *Congress Should Follow the Red States' Lead on Criminal-Justice Reform*, NAT'L REV. (May 2, 2016), <http://www.nationalreview.com/article/434783/criminal-justice-reform-conservatives-have>

lowered prison terms for property and drug offenses,⁹⁴ and in 2014, California Proposition 47, Reduced Penalties for Some Crimes Initiative,⁹⁵ reduced some nonviolent offenses from felonies to misdemeanors in California.⁹⁶

While these reforms are commendable, they are piecemeal; they lack an overarching methodology and have resulted in only minor reductions in prison numbers. This Article proposes measures to capitalize on the apparent receptiveness to change,⁹⁷ with a view to altering, fundamentally and permanently, the manner in which we imprison offenders. If the proposals offered here are implemented, we will soon see an America where prisons are a glitch on the societal and geographical landscape, as opposed to being a bedrock societal institution.

II. THE APPROPRIATE AIMS OF SENTENCING

The reforms suggested in this Article are fundamental and wide-ranging.

led-way. For a summary of recent changes in some states to lower penalties for property, drunk driving, and other low-level offenders, see Sarah Breitenbach, *Prisons, Policing at Forefront of State Criminal Justice Action*, PEW CHARITABLE TRUSTS (June 27, 2016), <http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/06/27/prisons-policing-at-forefront-of-state-criminal-justice-action>.

⁹⁴ Sibley et al., *supra* note 93, at 3, 22–23.

⁹⁵ This law brings about the following key changes: It “requires misdemeanor sentence instead of felony for certain drug possession offenses” and “for the following crimes when amount involved is \$950 or less: petty theft, receiving stolen property, and forging/writing bad checks”; it “allows felony sentence for these offenses if person has previous conviction for crimes such as rape, murder, or child molestation or is registered sex offender”; and it “requires resentencing for persons serving felony sentences for these offenses unless court finds unreasonable public safety risk.” *Proposition 47: Criminal Sentences. Misdemeanor Penalties. Initiative Statute.*, OFFICIAL VOTER INFO. GUIDE (2014), <http://vig.cdn.sos.ca.gov/2014/general/pdf/proposition-47-title-summary-analysis.pdf>.

⁹⁶ The law was passed with a majority of 59% of voters in favor. Kristina Davis, *Calif Cuts Penalties for Small Drug Crimes*, SAN DIEGO UNION-TRIB. (Nov. 4, 2014, 8:04 PM), <http://www.sandiegouniontribune.com/news/elections/sdut-prop-47-misdemeanor-law-vote-election-drug-2014nov04-story.html>; see also *San Francisco Called a Model for Ending Mass Incarceration*, THE CRIME REPORT (Dec. 1, 2015), <http://www.thecrimereport.org/news/articles/2015-12-san-francisco-called-a-model-for-ending-mass-incarce>. For an overview of the impact of the reform, see Rob Kuznia, *An Unprecedented Experiment in Mass Forgiveness*, WASH. POST (Feb. 8, 2016), https://www.washingtonpost.com/national/an-unprecedented-experiment-in-mass-forgiveness/2016/02/08/45899f9c-a059-11e5-a3c5-c77f2cc5a43c_story.html.

⁹⁷ It should be noted that all of the momentum is not towards less incarceration. Senator Cotton has recently stated that the U.S. is suffering from “under-incarceration.” See Nick Gass, *Sen. Tom Cotton: U.S. has ‘Under-Incarceration Problem’*, POLITICO (May 19, 2016, 2:16 PM), <http://www.politico.com/story/2016/05/tom-cotton-under-incarceration-223371>. This view is not commonplace.

In Part I, we demonstrated the pressing need to address the incarceration crisis. In this Part, we set out the empirically validated and normatively sound objectives that should be pursued by the sentencing system. To do so, we briefly discuss the current aims of sentencing law as well as research concerning the objectives that are actually attainable through a system of state-imposed sanctions.

Despite the fact that each of the states and the federal jurisdiction have different sentencing systems from one another,⁹⁸ they share similar objectives of sentencing, though they place varied weight on them.⁹⁹ The main aims of sentencing are community protection—often described as incapacitation—general deterrence, specific deterrence, retribution, and rehabilitation.¹⁰⁰ The first three of those aims are most commonly used to justify harsh penalties and, in particular, imprisonment.¹⁰¹ Retribution is often used interchangeably with the principle of proportionality,¹⁰² while rehabilitation normally inclines in favor of more lenient penalties.

Although it is beyond the scope of this Article to consider the extensive findings into the efficacy of state-imposed punishment to realize these goals, we note that, in a nutshell, the evidence suggests that specific deterrence is unattainable.¹⁰³ The existence of criminal sanctions can achieve general deterrence, but harsher sanctions do not help realize this aim any more than lenient sentences, and punishment only attains the goal of incapacitation in relation to a small group of offenders.¹⁰⁴ Nevertheless, sentencing courts continue to pursue all of these aims due to the inexcusable and profound gap between sentencing knowledge and practice. As Judge Michael Marcus, a federal Circuit Court Judge, observes:

Our persistence in ignoring research when exercising sentencing discretion exceeds even offenders' persistence in crime. Although academia and corrections agencies have

⁹⁸ Sentencing (and more generally, criminal law) in the United States is mainly the province of states. *See* *United States v. Morrison*, 529 U.S. 598, 612–613 (2000) (citing *United States v. Lopez*, 514 U.S. 549, 564 (1995)). The sentencing framework regarding federal offenses in general is derived from Mirko Bagaric, *From Arbitrariness to Coherency in Sentencing: Reducing the Rate of Imprisonment and Crime While Saving Billions of Taxpayer Dollars*, 19 MICH. J. RACE & L. 349, 360–61 (2014).

⁹⁹ *See United States Sentencing Commission Guidelines Manual*, U.S. SENT'G COMM'N (NOV. 1, 2014), <http://www.ussc.gov/guidelines-manual/2014/2014-ussc-guidelines-manual>.

¹⁰⁰ Community protection has been the overwhelming aim of sentencing in the United States over the past forty years. NAT'L RESEARCH COUNCIL, *supra* note 26, at 9.

¹⁰¹ Bagaric, *supra* note 98, at 360–61.

¹⁰² *Id.*

¹⁰³ Mirko Bagaric & Sandeep Gopalan, *Saving the United States from Lurching to Another Sentencing Crisis: Taking Proportionality Seriously and Implementing Fair Fixed Penalties*, 60 ST. LOUIS U. L.J. 169, 169–242 (2016).

¹⁰⁴ *Id.*

learned a great deal about how to reduce recidivism, we judges ignore their wisdom while they are content to defer to and even enable our hubris. We adhere to a liturgy of just deserts that celebrate aggravation and mitigation. We invoke reformation only rarely, and then only by assumption – with no more attention to results than when we purport to “send a message.”¹⁰⁵

The objectives of sentencing that are used to justify imprisonment are: (1) specific deterrence; (2) general deterrence; (3) incapacitation; and, in some instances, (4) proportionality. Given that this Article is focused on finding a substitute for conventional imprisonment, we now discuss each of these aims more fully.

The notion of specific deterrence is founded on the assumption that if individual offenders experience the unpleasant sanction of incarceration, they will not reoffend because they will seek to avoid further imprisonment.¹⁰⁶ Nevertheless, as noted above, research shows that offenders who receive harsh sanctions do not have a lower probability of recidivism than those who receive lenient sentences.¹⁰⁷ This finding confirms that imprisonment is no more effective at achieving specific deterrence than less onerous penalties.¹⁰⁸

Likewise, more lenient sanctions can be as successful as imprisonment in achieving the objective of general deterrence,¹⁰⁹ so this sentencing aim also does not justify imposing harsher penalties. Research confirms that any sanctions that inflict some hardship that an individual would wish to avoid can achieve “absolute general deterrence”—that is, the threat of a punishment

¹⁰⁵ Michael Marcus, *Archaic Sentencing Liturgy Sacrifices Public Safety: What's Wrong and How We Can Fix it*, 16 FED. SENT'G REP. 76, 76 (2013).

¹⁰⁶ Mirko Bagaric & Theo Alexander, *The Capacity of Criminal Sanctions to Shape the Behaviour of Offenders: Specific Deterrence Doesn't Work, Rehabilitation Might and the Implications for Sentencing*, 36 CRIM. L.J. 159, 159 (2012); Daniel S. Nagin et al., *Imprisonment & Re-offending*, 38 CRIME & JUST. 115, 115–16 (2008).

¹⁰⁷ In fact, some studies show the rate of recidivism among offenders sentenced to imprisonment to be higher. See Bagaric & Alexander, *supra* note 106, at 159.

¹⁰⁸ *Id.*

¹⁰⁹ For an overview of the literature, see NIGEL WALKER, SENTENCING IN A RATIONAL SOCIETY 60–61 (1969); NAT'L RES. COUNCIL, *supra* note 26, at 90; Richard Berk, *New Claims about Executions and General Deterrence: Déjà Vu All Over Again?*, 2 J. EMPIRICAL LEGAL STUD. 303, 328 (2005); Dale O. Cloninger & Roberto Marchesini, *Execution and Deterrence: A Quasi-Controlled Group Experiment*, 35 J. APPLIED ECON. 569 (2001); John K Cochran et al., *Deterrence or Brutalization? An Impact Assessment of Oklahoma's Return to Capital Punishment*, 32 CRIMINOLOGY 107, 129 (1994); Dieter Dölling et al., *Is Deterrence Effective? Results of Meta-Analysis of Punishment*, 15 EUR. J. CRIM. POL'Y RES. 201 (2009); Anthony N. Doob & Cheryl Marie Webster, *Sentence Severity and Crime: Accepting the Null Hypothesis*, 30 CRIME & JUST. 143 (2003); Steven D. Levitt, *Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six That Do Not*, 18 J. ECON. PERSP. 163, 177–178 (2004); Paul R. Zimmerman, *State Executions, Deterrence, and the Incidence of Murder*, 7 J. APPLIED ECON. 163 (2004).

being imposed for crimes discourages would-be offenders from committing them.¹¹⁰

However, there is no evidence to support “marginal general deterrence,” which is the theory that, the harsher a sanction, the more it discourages potential offenders from committing crimes.¹¹¹ The National Academy of Sciences recently undertook a thorough meta-analysis of relevant studies and found that longer prison sentences have (at best) only a very minor impact on crime reduction: “The incremental deterrent effect of increases in lengthy prison sentences is modest at best. Because recidivism rates decline markedly with age, lengthy prison sentences, unless they specifically target very high-rate or extremely dangerous offenders, are an inefficient approach to preventing crime by incapacitation.”¹¹²

Marginal general deterrence should therefore be discarded as an objective of the sentencing system. The most effective means of reducing crime is not increasing criminal penalties, but rather encouraging the perception in people’s minds that, if they commit an offense, they will be detected and prosecuted.

Imprisonment of offenders can achieve the objective of community protection if the imprisoned offenders would have reoffended during the periods for which they are incarcerated. The objective of community protection has no role to play in relation to offenders who will not reoffend. Nevertheless, it is extremely difficult to forecast which offenders will reoffend and, in particular, to predict those who will commit serious offenses.¹¹³ Although some offenders who commit minor crimes may be especially likely to reoffend unless they are incapacitated, it is wasteful to spend considerable public funds imprisoning them given the relative triviality of their possible future offenses.¹¹⁴ Imprisonment may only be justified on

¹¹⁰ Bagaric & Alexander, *supra* note 106, at 159.

¹¹¹ See Mirko Bagaric & Theo Alexander, (*Marginal*) *General Deterrence Doesn’t Work – and What It Means for Sentencing*, 35 CRIM L.J. 269, 275 (2011); Donald Ritchie, *Does Imprisonment Deter? A Review of the Evidence*, SENT’G ADVISORY COUNCIL (Apr. 2011), <https://www.sentencingcouncil.vic.gov.au/sites/default/files/publication-documents/Does%20Imprisonment%20Deter%20A%20Review%20of%20the%20Evidence.pdf>.

¹¹² NAT’L RESEARCH COUNCIL, *supra* note 26, at 4; see also Bagaric & Alexander, *supra* note 111, at 275; Ritchie, *supra* note 111.

¹¹³ See generally Jessica Black, *Is the Preventive Detention of Dangerous Offenders Justifiable*, 6 J. APPLIED SECURITY RES. 317, 322–323 (2011). The most thorough treatment of the subject matter is DANGEROUS PEOPLE: POLICY, PREDICTION AND PRACTICE (Bernadette McSherry & Patrick Keyzer eds., 2011). See also BERNADETTE MCSHERRY & PATRICK KEYZER, *SEX OFFENDERS AND PREVENTIVE DETENTION: POLITICS, POLICY AND PRACTICE* (2009).

¹¹⁴ CRIME AND JUSTICE: A REVIEW OF THE RESEARCH 419, 420 (Michael Tonry ed., 2000); NAT’L RES. COUNCIL, *supra* note 26, at 4; DON WEATHERBURN ET AL., *HOW MUCH CRIME DOES*

the basis of the goal of community protection if it is ordered in relation to the limited group of serious sexual and violent offenders, and it would be legitimate to impose a “recidivist loading” of between 20% and 50% on their sanctions if they repeat their serious offenses.¹¹⁵ This loading is commensurate with the recidivism rate of this cohort of offenders and is not so oppressive as to constitute repeat punishment for their earlier offenses.¹¹⁶ Further, this premium is far less than that which is often currently accorded to recidivists (in some cases it can be more than a decade in prison).¹¹⁷ While the goal of community protection may not justify the imposition of particularly harsh penalties in relation to many offense types and offenders, there is no question that prison does ensure that offenders do not commit crimes in the community during the periods of their incarceration. Thus, it is clear that prison does enhance community safety.

It follows from this discussion that specific deterrence and marginal general deterrence should be abolished as sentencing objectives, and community protection is a valid aim of sentencing in so far as sentencing enhancements are concerned, but only in relation to recidivist sexual and violent offenders. This does not mean, however, that harsh sanctions such as imprisonment are never appropriate. Notwithstanding the ineffectiveness of harsh sanctions to achieve the sentencing objectives of specific deterrence, marginal general deterrence and incapacitation for most offenders (with the exception of recidivist serious sexual and violent offenders), imprisonment can remain an appropriate penalty when the hardship it imposes on offenders matches the seriousness of their crimes.

This reflects the application of the principle of proportionality, which is already a component of United States sentencing law. The Supreme Court has held that proportionality is implied from the Eighth Amendment.¹¹⁸ It is

PRISON STOP? THE INCAPACITATION EFFECT OF PRISON ON BURGLARY (2006); J. Cohen, *The Incapacitative Effect of Imprisonment: A Critical Review of the Literature*, in DETERRENCE AND INCAPACITATION: ESTIMATING THE EFFECTS OF CRIMINAL SANCTIONS ON CRIME RATES 209 (Alfred Blumstein et al. eds., 1978). William Spelman, *What Recent Studies Do (and Don't) Tell Us About Imprisonment and Crime*, 27 CRIME & JUST. 419, 485 (2000); Roger K. Warren, *Evidence-Based Sentencing: The Application of Principles of Evidence-Based Practice to State Sentencing Practice and Policy*, 43 U.S.F. L. REV. 585, 594 (2009); *Prison and Crime: A Complex Link - Crime Drop Since 1994 Has Been Bigger in States That Cut Imprisonment Rates*, PEW CHARITABLE TRUSTS (Sept. 11, 2014), <http://www.pewtrusts.org/en/multimedia/data-visualizations/2014/prison-and-crime>.

¹¹⁵ Bagaric, *supra* note 43, at 411.

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ The principle of proportionality applies only to invalid sentences which are grossly disproportionate to the seriousness of the relevant offense. *Weems v. United States*, 217 U.S. 349, 367 (1910). In *Coker v. Georgia*, the Court held that punishments that are grossly

also a requirement of the sentencing regimes of ten states,¹¹⁹ and it is a core principle that supposedly informs the Federal Sentencing Guidelines.¹²⁰ Proportionality has two elements: the seriousness of the crime and the harshness of the sanction. Further, the principle has a qualitative component: those two limbs must be matched. Thus, for the principle to be satisfied, the seriousness of the crime must be equivalent to the harshness of the penalty.¹²¹

While there are no clearly established criteria for evaluating the severity of offenses and the harshness of criminal sanctions, it has been suggested that the most persuasive manner for grading levels of harm caused by offenses and levels of hardship inflicted by sanctions is by referring to the concept of well-being.¹²² Thus, a criminal sanction should set back the interests of an offender to the same degree as the crime has set back the interests of the victim.¹²³

Empirical data shows that the crimes that have the most detrimental effect on victims are serious sexual and violent offenses,¹²⁴ and the most severe sanction (apart from capital punishment) is imprisonment. Hence, in theory, prison should be reserved for the most serious violent and sexual offenders.¹²⁵ This approach would result in a considerable reduction in the number of prisoners,¹²⁶ given that approximately half of the inmates in state

disproportionate are prohibited. 433 U.S. 584, 592 (1977); *Ewing v. California*, 538 U.S. 11, 29–31 (2003); *Solem v. Helm*, 463 U.S. 277, 292 (1983).

¹¹⁹ See Gregory S. Schneider, Note, *Sentencing Proportionality in the States*, 54 ARIZ. L. REV. 241, 250 (2012) (focusing on the operation of the principle in Illinois, Oregon, Washington, and West Virginia).

¹²⁰ See NAT'L RES. COUNCIL, *supra* note 26, at 23. In addition to this, a survey of state sentencing law by Thomas Sullivan and Richard Frase shows that at least nine states have constitutional provisions relating to prohibiting excessive penalties or treatment and twenty-two states have constitutional clauses which prohibit cruel and unusual penalties, including eight states with a proportionate-penalty clause. See THOMAS SULLIVAN & RICHARD S. FRASE, *PROPORTIONALITY PRINCIPLES IN AMERICAN LAW: CONTROLLING EXCESSIVE GOVERNMENT ACTIONS* 155–56 (2010).

¹²¹ JESPER RYBERG, *THE ETHICS OF PROPORTIONATE PUNISHMENT: A CRITICAL INVESTIGATION* 6 (2004).

¹²² See Bagaric, *supra* note 60, at 411–41.

¹²³ RYBERG, *supra* note 121, at 102; A. VON HIRSCH & A. ASHWORTH, *PROPORTIONATE SENTENCING: EXPLORING THE PRINCIPLES* ch. 9 (2005).

¹²⁴ See Bagaric & Gopalan, *supra* note 103, at 169–242.

¹²⁵ As noted below, the hardship of a sanction is determined not only by its severity but also its duration (or quantum, as in the case of fines). A one-year prison term is obviously much harsher than a term of one week. However, any term of prison is so harsh that it is suggested that this sanction should only be imposed in relation to the most damaging forms of offenses.

¹²⁶ Bagaric has suggested this approach. See Bagaric & Gopalan, *supra* note 103, at 169–242.

and federal prisons are detained for nonviolent and nonsexual offenses.¹²⁷ However, as we have demonstrated, although there is considerable public interest in reforming the sentencing system, this has not led to the implementation of concrete steps towards reserving imprisonment only for serious sexual and violent offenders. Some of the chief advantages of our reform proposal are that technological incarceration will suit nearly all offenders¹²⁸ who are currently imprisoned in conventional prisons and, as discussed below, it can be adapted so that the hardship it inflicts on offenders is equivalent to the severity of the varied offenses they have committed.

Before considering the scope and nature of our proposed technological incarceration, it is important to reinforce that empirical data and sentencing jurisprudence establish that imprisonment has two valid purposes: punishing offenders, provided that the hardship inflicted on them by incarceration is commensurate with the seriousness of their crimes, and protecting the community. The value of any proposed substitute to conventional imprisonment must be assessed by reference to its capacity to achieve these two justifiable objectives of incarcerating offenders.

We now explain the key features of our proposed technological incarceration in greater detail, and show how the proposal meets these two ends.

III. THE KEYS TO TECHNOLOGICAL INCARCERATION: MONITORING OF LOCATIONS, SURVEILLANCE OF ACTIONS, AND IMMOBILIZATION

There are three features of technological imprisonment that are critical to its effective operation: (1) electronic monitoring of offenders' locations, (2) computer surveillance of offenders' actions, and (3) remote immobilization of offenders. In this Part, we elaborate on each of these features.

A. ELECTRONIC MONITORING OF OFFENDERS' LOCATIONS

The most well-developed and least controversial aspect of our proposal for technological imprisonment is electronic monitoring of the location of offenders. This technology is already used in relation to the sanction of home detention.¹²⁹ At present, more than 130,000 people who have committed

¹²⁷ See Peter Wagner & Bernadette Rabuy, *Mass Incarceration: The Whole Pie 2016*, PRISON POLY INITIATIVE (Mar. 14, 2016), <https://www.prisonpolicy.org/reports/pie2016.html>.

¹²⁸ As discussed below, according to our proposal, offenders who commit capital offenses and offenses of similar gravity would remain in conventional prisons.

¹²⁹ Mike Nellis, *Electronic Monitoring: Exploring the Commercial Dimension*, 58 CRIM.

offenses are subject to electronic monitoring in the United States.¹³⁰ Although in absolute terms a considerable number of offenders are currently subjected to electronic tracking, in relative terms the use of the technology is still uncommon. The Pew Trust noted that

[d]espite the substantial growth of electronic tracking during the study period, it remains relatively rare in the context of the U.S. corrections system. Nationally, nearly 7 million people were in prison or jail or on probation or parole at the end of 2014, but individuals tracked using electronic devices in 2015 represented less than 2 percent of that total. Although some research suggests that electronic monitoring can help reduce reoffending rates, the expanded use of these technologies has occurred largely in the absence of data demonstrating their effectiveness for various types of offenders at different stages of the criminal justice process.¹³¹

Notwithstanding these observations, the use of electronic monitoring has increased in the past decade—it is estimated that in 2005, only 53,000 offenders were supervised by electronic monitoring¹³²—and this increase indicates the growing confidence of legislators, courts, and the public in the capacity of electronic monitoring to ensure community protection. The criteria for an offender to be subject to electronic monitoring as a sentencing option (as opposed to a means of post-sentencing monitoring) are not uniform throughout the United States, but generally, it is used only for offenders who have not committed a serious violent or sexual offense.¹³³

JUST. MATTERS 12, 12 (2008); Matthew DeMichele & B. K. Payne, *Offender Supervision with Electronic Technology: Community Corrections Resource*, BUREAU OF JUST. ASSISTANCE 10–12, 14, 16–17, 20 (2009), https://www.appa-net.org/eweb/docs/APPA/pubs/OSET_2.pdf. For a summary of its introduction and use in the United States, see Lars H. Andersen & Signe H. Andersen, *Effect of Electronic Monitoring on Social Welfare Dependence*, 13 CRIMINOLOGY & PUB. POL'Y 349, 350–51 (2014); see also Matthew DeMichele, *Electronic Monitoring: It Is a Tool, Not a Silver Bullet*, 13 CRIMINOLOGY & PUB. POL'Y 393, 395–97 (2014) [hereinafter DeMichele, *Electronic Monitoring: It Is a Tool, Not a Silver Bullet*]; Mike Nellis, *Surveillance and Confinement: Explaining and Understanding the Experience of Electronically Monitored Curfews*, 1 EUR. J. PROBATION 41, 41 (2009); Brian K. Payne, *It's a Small World, but I Wouldn't Want to Paint it: Learning from Denmark's Experience with Electronic Monitoring*, 13 CRIMINOLOGY & PUB. POL'Y 381, 382–83 (2014); .

¹³⁰ *Use of Electronic Offender-Tracking Devices Expands Sharply*, PEW CHARITABLE TRUSTS (Sept. 7, 2016), <http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2016/09/use-of-electronic-offender-tracking-devices-expands-sharply>.

¹³¹ *Id.*

¹³² *Id.*

¹³³ See, e.g., Juliet Lapidus, *You're Grounded! How Do You Qualify For House Arrest?*, SLATE (Jan. 28, 2009), http://www.slate.com/articles/news_and_politics/explainer/2009/01/youre_grounded.html; Oklahoma Department of Corrections, *Electronic Monitoring Program (EMP) – Oklahoma* (2014), <http://doc.ok.gov/Websites/doc/Images/Documents/>

Electronic monitoring works by attaching a transmitting object to the offender, which sends a signal to authorities who monitor the offender's location. Two main forms of technology are used to operate the system: Global Positioning System ("GPS") and radio frequency ("RF"). Both systems trigger an alarm when the offender steps outside a designated geographical area, which alerts the authorities and the offender. In recent years, GPS devices have been used for this purpose more than RF. In 2015, approximately 88,000 GPS units were in use, which represents a thirty-fold increase in their use over the past decade.¹³⁴ By contrast, the number of RF units fell from approximately 50,000 to 38,000 over the same decade (a reduction of about 25%).¹³⁵ This may be explained by the greater technological advances of GPS systems compared with RF, and their capacity to facilitate tracking of an offender's movements in real time.¹³⁶

The electronic monitors that track the movements of offenders are powered by a rechargeable battery that lasts for about twenty-four hours. The monitors are typically fitted into ankle bracelets. Modern monitors have a hard, plastic shell, a GPS chip, and a fiber-optic cable inside the shell, and the shell is attached to the offender's ankle with a rubber strap.¹³⁷ If an offender attempts to remove the bracelet or tamper with it, an alert is sent to law enforcement authorities who are monitoring the device.¹³⁸

Electronic monitoring has a number of advantages over imprisonment. The most important and obvious benefit is its low cost: Electronic monitoring is six to ten times less expensive than conventional imprisonment of offenders.¹³⁹ Less perceptible, but no less significant an advantage of

Policy/op061001.pdf; Brandon Martin & Ryken Grattet, *Attitudes to Incarceration in California*, PUB. POL'Y INST. CAL. (Apr. 2015), http://www.ppic.org/main/publication_quick.asp?i=1146; Wash. State Legis., *Home Detention—Conditions*, RCW 9.94A.734, available at <http://app.leg.wa.gov/rcw/default.aspx?cite=9.94A.734> (last visited Dec. 16, 2016).

¹³⁴ *Use of Electronic Offender-Tracking Devices Expands Sharply*, *supra* note 130.

¹³⁵ *Id.*

¹³⁶ *Id.*

¹³⁷ Mark Morri, *New Electronic Anklets a Tougher Collar for Prisoners*, THE DAILY TELEGRAPH (Dec. 11, 2014), <http://www.dailytelegraph.com.au/news/nsw/new-electronic-anklets-a-tougher-collar-for-prisoners/news-story/c2e00e5356bbf7a8e7596d4285df4971>; Rob Walker, *Contemplating the Criminal Justice Tool's Role in the Rehabilitation Process Amid the Wearable Tech Boom*, GOOD (Jan. 5 2016), <https://www.good.is/features/issue-35-ankle-monitors>.

¹³⁸ *Id.*

¹³⁹ *Use of Electronic Offender-Tracking Devices Expands Sharply*, *supra* note 130. A review in 2006 of the electronic monitoring of offenders found that the cost is about one-fifth that of imprisonment and "robust" in detecting violations of the term of the order. See *The Electronic Monitoring of Adult Offenders*, NAT'L AUDIT OFF. (2006), <http://>

electronic monitoring is that, in contrast to conventional imprisonment, it in fact reduces the rate of offenders' recidivism. Several studies have shown that the reduction in recidivism levels of offenders through electronic monitoring can be as much as between around 20% and 50%.¹⁴⁰

Despite these advantages of electronic monitoring, prison is currently superior to this sanction in two respects. The first advantage of prison over electronic monitoring is the certainty that it provides that inmates will not escape. Few offenders escape from prison,¹⁴¹ whereas electronic monitoring is not as reliable. While it is virtually impossible for an offender to remove the bracelet without triggering an alarm,¹⁴² under-resourcing of some electronic monitoring programs has resulted in inadequate investigation of and responses to the triggering of alarms.¹⁴³ Improvements can be made to the reliability of electronic monitoring simply by engaging more people to monitor alarms. However, this would not meaningfully prevent escapes. Even if alarms are acted upon every time offenders move outside the geographical zones to which they are confined, offenders will still be at large until they are arrested by law enforcement officials. It is for this reason that we recommend that offenders who are subject to technological incarceration

www.nao.org.uk/publications/0506/the_electronic_monitoring_of_a.aspx; see also Natasha Alladina, *The Use of Electronic Monitoring in the Alaska Criminal Justice System: A Practical Yet Incomplete Alternative to Incarceration*, 28 ALASKA L. REV. 125, 144 (2011); *Electronic Monitoring Reduces Recidivism*, U.S. DEP'T JUST. OFF. OF JUST. PROGRAMS 2 (Sept. 2011), available at <https://www.ncjrs.gov/pdffiles1/nij/234460.pdf>.

¹⁴⁰ *Electronic Monitoring Reduces Recidivism*, supra note 139, at 2; see also RAFAEL DI TELLA & ERNESTO SCHARGRODSKY, CRIMINAL RECIDIVISM AFTER PRISON AND ELECTRONIC MONITORING 69 (2010); F. Marklund & S. Holmberg, *Effects of Early Release from Prison Using Electronic Tagging in Sweden*, 5 J. EXPERIMENTAL CRIMINOLOGY 41, 53, 59 (2009); Stuart S. Yeh, *The Electronic Monitoring Paradigm: A Proposal for Transforming Criminal Justice in the USA*, 4 LAWS 60, 64 (2015); W. Bales et al., *A Quantitative and Qualitative Assessment of Electronic Monitoring*, U.S. DEP'T JUST. (2010), <https://www.ncjrs.gov/pdffiles1/nij/grants/230530.pdf>; Stephen Gies et al., *Monitoring High-Risk Sex Offenders With GPS Technology: An Evaluation of the California Supervision Program, Final Report*, U.S. DEP'T OF JUST. (2012), <https://www.ncjrs.gov/pdffiles1/nij/grants/238481.pdf>; John K. Roman, et al., *The Costs and Benefits of Electronic Monitoring for Washington, D.C.*, D.C. CRIME POL'Y INST. 6 (Sept. 2012).

¹⁴¹ Approximately 2,500 inmates escape each year from prison. See Mark Berman, *Prisoners Are Much More Likely to Die in Jail Than Escape*, WASH. POST (June 11, 2015), https://www.washingtonpost.com/news/post-nation/wp/2015/06/11/prisoners-are-much-more-likely-to-die-in-jail-than-escape/?utm_term=.2e331860cbaa.

¹⁴² Eric Markowitz, *Why GPS Doesn't Always Work for Tracking Convicts*, VOCATIV (Apr. 17, 2014), <http://www.vocativ.com/underworld/crime/gps-doesnt-always-work-tracking-convicts/>.

¹⁴³ See *Analysis Finds Not Enough Monitoring of Monitoring Bracelets in US*, FOX NEWS (July 28, 2013), <http://www.foxnews.com/us/2013/07/28/analysis-finds-not-enough-monitoring-monitoring-bracelets-in-us.html>.

wear electronic ankle bracelets that are equipped with other community protection functionalities, notably the remote CEDs described below.¹⁴⁴

The second advantage of prison over electronic monitoring is that, while offenders are in prison, they cannot commit crimes that harm the community. Electronic monitoring does not offer the same protection because offenders can commit offenses against other people who are within the geographical zones to which they are confined.¹⁴⁵ Moreover, if offenders escape from those areas, they can harm other members of the community until they are apprehended. In the next two sections, we discuss technological enhancements that can overcome these disadvantages of electronic monitoring compared with conventional prisons.

Before doing so, it is important to emphasize that home detention with electronic monitoring of offenders is a relatively well-developed and commonly used sanction that is widely accepted by the community. This point is important because, as discussed below, it supports the view that technological incarceration is capable of being viewed in a similar light by the community.

B. COMPUTER SURVEILLANCE OF OFFENDERS' ACTIONS

A cornerstone of our technological incarceration proposal is the synchronous monitoring of offenders' actions in order to prevent them from escaping, or from committing harmful acts in their immediate vicinity. This could be achieved by installing closed-circuit televisions in offenders' residences and employing people to watch the footage from several residences on two or three screens simultaneously. However, this surveillance is impractical for a range of reasons, most notably because it would be prohibitively expensive to hire correctional officers to monitor millions of prisoners in real time in numerous environments. More than this, human monitoring is laborious, difficult, and prone to human error.¹⁴⁶ As Georgakopoulos et al. note:

Video surveillance solutions relying on human operators require humans to try to discover occurrences of complex events by continuously reasoning about patterns of simple video events distributed in time and possibly occurring in different locations in a facility. This is very hard to do and is impossible for humans to sustain even for a

¹⁴⁴ See *infra* Part III.C.

¹⁴⁵ Nevertheless, studies show that offenders who are subject to house arrest and are electronically monitored are 94.7% less likely to commit an offense than those that are not. Yeh, *supra* note 140, at 64.

¹⁴⁶ M. Sivarathinabala & S. Abirami, *An Intelligent Video Surveillance Framework for Remote Monitoring*, 2 INT'L J. ENG. SCI. & INNOV. TECH. 297, 297 (2013).

modest period of time (e.g., a few hours).¹⁴⁷

A more cost-effective, efficient, and reliable alternative is to use recent advances in signal processing and artificial intelligence to perform constant automated processing of audio and video surveillance streams on prisoners. This will allow for inexpensive, efficient, and effective constant monitoring of the prison population. The system has three main technical requirements: the mandatory wearing of a body sensor harness by all prisoners; a stable and secure communication system; and a remote signal processing system that can recognize unauthorized prisoner behavior. While all of these features were once in the realm of science fiction, they are no longer.

The first requirement is a sensor harness that can capture video and audio signals from a prisoner's environment.¹⁴⁸ These types of sensor units are already being produced in the form of body cameras that police departments are introducing across the United States in order to lower complaints, provide evidence where police officers' use of force results in fatalities, and improve the transparency and accountability of police officers' activities.¹⁴⁹ A variety of sophisticated and customizable body cameras are already on the market. Some of these cameras have night vision, built-in flashlights, twelve-hour batteries, high definition video recording that incorporates date and time information into recorded footage, capacity to restrict access to the footage to designated computers, GPS technology, and 150 degree fields of view. They are durable, fire-resistant, water-proof, and light-weight.¹⁵⁰ Current models cost between \$200-\$800, depending on the specifications and manufacturers, and this figure is certain to drop as the technology becomes ubiquitous.¹⁵¹

¹⁴⁷ Georgakopoulos et al., *supra* note 25, at 86.

¹⁴⁸ For the sake of simplicity, we will call this a "sensor harness" throughout this Article, but as cameras and sensors decrease in size, the harness will probably end up being the size of a matchbox and will be able to be clipped to the upper part of the prisoners' clothing.

¹⁴⁹ Damien Gayle, *Police With Body Cameras Receive 93% Fewer Complaints – Study*, GUARDIAN (Sept. 29, 2016), <https://www.theguardian.com/uk-news/2016/sep/29/police-with-body-cameras-receive-93-fewer-complaints-study>; Robinson Meyer, *Body Cameras Are Betraying Their Promise*, THE ATLANTIC (Sept. 30, 2016), <http://www.theatlantic.com/technology/archive/2016/09/body-cameras-are-just-making-police-departments-more-powerful/502421/>; Danny Shaw, *Police Body Cameras "Cut Complaints Against Officers"*, BBC NEWS (Sept. 29, 2016), <http://www.bbc.com/news/uk-37502136>.

¹⁵⁰ See, e.g., *Wolfcom Police Body Cameras*, WOLFCOM, <http://wolfcomusa.com/> (last visited Dec. 16, 2016); *Bodycam by Provision*, BODYCAM, <http://www.bodycameras.com/> (last visited Dec. 16, 2016); REVEAL, <http://www.revealmedia.com/> (last visited Dec. 16, 2016).

¹⁵¹ Eric Markowitz, *Police Departments Face a Crucial Question: How to Pay for Body Cameras?*, INT'L BUS. TIMES (Dec. 12, 2016), <http://www.ibtimes.com/police-departments-face-crucial-question-how-pay-body-cameras-2366968>; Alfred Ng, *How Police Body*

Offenders will be required to change the batteries in the sensor harness regularly and to wear them on the top half of their clothing at all times, and offenders would also need to wear the harness while bathing. They would be forbidden from removing the sensor harness during the period of incarceration. An obvious concern is that an offender might attach the sensors to someone else in an effort to thwart the monitoring. However, this difficulty can be easily overcome by incorporating an upward-facing camera into the sensor harness that undertakes constant facial recognition of the prisoner to ensure compliance. A combination of thermal and visual cameras has been shown to generate reliable identification in over 98% of cases.¹⁵² This figure is for a single-shot identification of a face, so the constant ongoing analysis of a prisoner's face from an onboard facial recognition system will make it completely impossible to remove the sensor unit without authorization.

The second requirement of this part of our proposal is a reliable and secure communication infrastructure that will allow transmission of video and audio streams to a remote location. This is a necessary feature of technological incarceration, as the signal processing of the video and audio activity will happen at remote computing facilities, potentially distant from the prisoner's location. This communication requirement is now met by the current combination of telecommunications and broadband infrastructure in the United States, as anyone who has Skyped or FaceTimed their parents, children, friends, or spouses will attest. Indeed, there is almost no part of the United States, outside remote parts of Alaska and the West, to which a relatively stable telecommunications infrastructure does not extend. Prisoners subject to technological incarceration would be required to live within the regions currently served by this telecommunications infrastructure. As this footprint extends, so too would the places that prisoners would be entitled to live.

Finally, the transmitted video and audio stream will be analyzed by a remote signal processing architecture. This system will analyze the signals in real time and trigger an alarm in the event that a prisoner attempts to commit a crime or engage in unauthorized activity, or if his/her sensor harnesses is deactivated or removed. This is the most technologically sophisticated requirement of our proposal. Nonetheless, however far-fetched

Cameras Became a Budget Battlefield, CNET (Oct. 25, 2016), <https://www.cnet.com/au/news/nypd-body-camera-police-justice-viewu-taser/>.

¹⁵² Sachin Sudhakar Farfade et al., *Multi-view Face Detection Using Deep Convolutional Neural Networks* (Apr. 20, 2015), available at <https://arxiv.org/pdf/1502.02766v3.pdf>; Diego A. Socolinsky & Andrea Selinger, *Thermal Face Recognition in an Operational Scenario* (2004), available at <http://www.dtic.mil/dtic/tr/fulltext/u2/a451507.pdf>.

it may seem, it is perfectly feasible these days. The recent publicity surrounding self-driving cars provides ample evidence of the strides that have been made in real-time sensor analysis. Self-driving cars rely on a range of environmental sensors—including ultrasonic sonar and radar arrays¹⁵³—together with a neural-network-based signals processing system, to drive a car more safely than any human.¹⁵⁴ This feat is something that, a few years ago, was seen as a virtually impossible task, and one that was expected to take decades to achieve.¹⁵⁵

We are now at the same inflection point in a range of signals processing fields that can be applied to technological incarceration. As many as ten years ago, Georgakopoulos et al. showed that a computer system called Video Event Awareness Workbench (“VEAW”) could monitor and analyze in real time footage of human motion that is captured on video surveillance cameras within offices and workplaces, and detect automatically any suspicious behavior or events.¹⁵⁶ VEAW looks for abnormal actions of multiple people—that is, where they diverge from typical movements, such as by fighting, wobbling around, moving their arms, hitting, falling over, running, punching, kicking, shaking their heads to both sides, and revolving side-by-side or back-to-back.¹⁵⁷ If the system recognizes such abnormal events, gestures, or actions, it triggers a visual and audible alarm alerting the human operators of the system, and retains and sends to the human operators to view a record of the sequence in which the detected behavior occurred that includes the date and time at which it took place.¹⁵⁸

¹⁵³ See Ryan Bradley, *Tesla Autopilot*, MIT TECH. REV. (Mar./Apr. 2016), <https://www.technologyreview.com/s/600772/10-breakthrough-technologies-2016-tesla-autopilot/>; Bryan Clark, *How Self-Driving Cars Work: The Nuts and Bolts Behind Google's Autonomous Car Program*, MAKE USE OF (Feb. 15, 2015), <http://www.makeuseof.com/tag/how-self-driving-cars-work-the-nuts-and-bolts-behind-googles-autonomous-car-program/>.

¹⁵⁴ Clark, *supra* note 153.

¹⁵⁵ For a simple and accessible overview of artificial intelligence, and especially the modern advances in convolutional and multi-layer/deep neural networks, and their social significance, see Gideon Lewis-Kraus, *The Great A.I. Awakening*, N.Y. TIMES (Dec. 14, 2016), <http://www.nytimes.com/2016/12/14/magazine/the-great-ai-awakening.html>.

¹⁵⁶ See generally Enrique Bermejo et al., *Security System Based on Suspicious Behavior Detection*, 25 BURAN 12 (2010); Georgakopoulos et al., *supra* note 25; Madhu S. & Padma Nayana, *An AMD Algorithm For Monitoring Suspicious Human Activity In Real-Time Automated Video Surveillance System*, 2 INT'L J. ENGINEERING RES. & TECH. 2435 (2013); Sivarathinabala & Abirami, *supra* note 146, at 297–98; Syed Ahmar Qamar et al., *A Supervisory System to Detect Suspicious Behavior in Online Testing System*, 3 IPCSIT 397 (2011).

¹⁵⁷ Bermejo et al., *supra* note 156, at 13; Sivarathinabala & Abirami, *supra* note 146, at 297–98, 300; Qamar et al., *supra* note 156, at 397–98.

¹⁵⁸ Bermejo et al., *supra* note 156, at 14–15; Madhu S. & Nayana, *supra* note 156, at 2437;

More recent systems are even more precise in determining unauthorized or problematic behaviors¹⁵⁹ and can be used to monitor larger areas with ease.¹⁶⁰ There is now even an industry standard, called ONVIF, to provide for integration of processing systems for the creation of wide-area surveillance systems.¹⁶¹ These algorithms can process signals from multiple sources—including video, audio, alarms, and satellite positioning systems—to assess behavior of the surveilled place or individual.¹⁶² Recent advances in speech recognition have improved to the point where commercially available systems like Siri, Cortana, Facebook M, Google Assistant, and Alexa are used by millions of people a day, and the technology for comprehension of voice and audio continues apace.¹⁶³ Finally, convolutional- and deep-neural networks now have the capacity to recognize the emotional state of a person speaking from the stress factors present in his or her voice and are making great strides in reading the feelings of people from faces presented to them.¹⁶⁴

When one ties all of these signals-processing components together, it is clear that the technology now exists to conduct remote, automatic analysis of the behavior of prisoners, and of those who come within their environment. It is no longer science fiction to imagine a system that can determine whether

Sivarathinabala & Abirami, *supra* note 146, at 297–98, 300.

¹⁵⁹ E. Acar et al., *Human Action Recognition using Lagrangian Descriptors*, INST. OF ELECTRICAL & ELECTRONICS ENGINEERS (2012); Bermejo et al., *supra* note 156, at 14–15; Alexander Kuhn et al., *A Lagrangian Framework for Video Analytics*, INST. OF ELECTRICAL & ELECTRONICS ENGINEERS—WORKSHOP ON MULTIMEDIA SIGNAL PROCESSING (2012).

¹⁶⁰ T. Senst et al., *On building decentralized wide-area surveillance networks based on ONVIF*, INST. OF ELECTRICAL & ELECTRONICS ENGINEERS (2011), <http://ieeexplore.ieee.org/abstract/document/6027365/?reload=true>.

¹⁶¹ See *ONVIF Overview*, ONVIF, <http://www.onvif.org/> (last visited Jan. 6, 2017).

¹⁶² R. Adderley et al., *MOSAIC: A Multi-modal Surveillance System to Enhance Situation Awareness and Decision Making*, in HCI INTERNATIONAL 2014 - POSTERS' EXTENDED ABSTRACTS 141–46 (Constantine Stephanidis ed., 2014); COMMUNICATIONS IN COMPUTER & INFORMATION SCIENCE, (vol. 434) (2014); Dragos Datcu, et al., *A Multimodal Workbench for Automatic Surveillance*, INST. OF ELECTRICAL AND ELECTRONICS ENGINEERS INT'L CONF. (2004).

¹⁶³ See, e.g., Ossama Abdel-Hamid et al., *Convolutional Neural Networks for Speech Recognition*, in IEEE/ACM TRANS. ON AUDIO, SPEECH & LANG. PROC. (Oct. 2014).

¹⁶⁴ Iulia Lefter et al., *Cross-Corpus Analysis for Acoustic Recognition of Negative Interactions*, in INT'L CONF. ON AFFECTIVE COMPUTING & INTELLIGENT INTERACTION (2015); Iulia Lefter et al., *Emotion recognition from speech by combining databases and fusion of classifiers*, in TEXT, SPEECH & DIALOGUE 353–360 (Sojka, P., Hor'ak, A., Kope'cek, I., Pala, K. eds., vol. 6231) (2010); Iulia Lefter et al., *Recognizing Stress Using Semantics and Modulation of Speech and Gestures*, in IEEE TRANS. ON AFFECTIVE COMPUTING (2016); W. Zajdel, et al., *CASSANDRA: audio-video sensor fusion for aggression detection*, PROC. IEEE CONF. ON ADVANCED VIDEO & SIGNAL BASED SURVEILLANCE 200–05 (2007).

a prisoner is having a psychotic episode (from speech recognition and audio processing of a prisoner's emotional states), is threatening another (from audio processing of the emotional states of all the people within the prisoner's environment and video processing of the prisoner's behavior), or is seeking to leave a designated zone (from GPS tracking).

We are at the point that the automatic, technological monitoring of all prisoners is feasible.

C. REMOTE IMMOBILIZATION OF OFFENDERS

The electronic monitoring of offenders' locations and computer surveillance of their actions proposed in this Article would provide superior scrutiny of offenders to conventional prison. In most prisons, offenders are not monitored continuously and are generally not monitored individually when they are in their cells or in parts of the prisons where large numbers of prisoners congregate, such as the exercise yard. The final component of technological incarceration, however, ensures better protection of other people from offenders than conventional prisons. Prison escapes do occasionally occur,¹⁶⁵ and many violent acts are committed in prisons against other inmates and corrections staff.¹⁶⁶ In sharp contrast, if implemented, the technological incarceration proposed here would prevent offenders from harming others.

In the event that prisoners leave their designated areas¹⁶⁷ or commit violent or unauthorized acts,¹⁶⁸ a Conduct Energy Device ("CED"), such as a stun gun or a Taser, would be remotely activated to immobilize offenders. This part of our proposal guarantees enforcement. Prisoners will be remotely immobilized where electronic monitoring or computer surveillance indicates that they: (1) are leaving the geographical areas to which they have been confined; (2) have disabled, turned off, or removed their body cameras; or (3) are in the process of committing dangerous acts against others, including people who are residing with them. If the computer detects, for instance, that a prisoner is in a location that he or she is prohibited from entering or is

¹⁶⁵ There are about 2,500 escapes annually. *See supra* Part II.

¹⁶⁶ Studies show that that violence is a major hazard in jail, with a recent survey showing that over one-third of state prisoners reported injuries with causes ranging from accidents to intentional acts of violence. *See generally* H. E. Sung, *Prevalence and Risk Factors of Violence-Related and Accident-Related Injuries Among State Prisoners*, 16 J. CORRECTIONAL HEALTH CARE 178 (2010). Further, nearly one out of every twenty state and federal prisoners report being raped or sexually abused behind bars. *US: Federal Statistics Show Widespread Prison Rape*, HUMAN RIGHTS WATCH (Dec. 15, 2007), <https://www.hrw.org/news/2007/12/15/us-federal-statistics-show-widespread-prison-rape>.

¹⁶⁷ As determined by the electronic bracelet monitoring described in *supra* Part III.A.

¹⁶⁸ As determined by the remote sensing described in *supra* Part III.B.

picking up an object to use as a weapon or his or her body camera has been deactivated, a CED would be remotely activated to shock the prisoner with volts of electricity that cause involuntary muscle contractions in and temporary incapacitation of the prisoner.¹⁶⁹ Law enforcement officers would be summoned to investigate the breach of the conditions of technological incarceration.

CEDs were developed by a NASA aerospace scientist, and the Taser was patented in 1974.¹⁷⁰ CEDs are now widely used throughout the United States by more than 15,000 law enforcement and military agencies.¹⁷¹ Although there has been controversy regarding the use of CEDs, a comprehensive report prepared by the National Institute of Justice for the United States Department of Justice confirmed in 2011 that “while CED use is not risk-free, there is no medical evidence that shows a high risk of serious injury or death from the direct effects of CEDs.”¹⁷² The report found:

Except for in Richland County where its effects were insignificant, CED use substantially decreased the likelihood of suspect injury. In Miami-Dade, the odds of a suspect being injured were almost 90 percent lower when a CED was used than when it was not. Similarly, the odds of suspect injury went down by almost 50 percent when CEDs were used in Seattle. The larger analysis of 12 agencies and more than 24,000 use-of-force cases showed the odds of suspect injury decreased by almost 60 percent when a CED was used. In Richland County, Seattle, and in the larger analysis, Taser use had no effect on officer injuries, while in Miami-Dade, officer injuries were less likely when a Taser was used. Controlling for other types of force and resistance, CED use significantly reduced the likelihood of injuries. CED adoption by the Orlando and Austin police departments reduced injuries to suspects and officers over time.¹⁷³

Certain precautions can, however, be taken to reduce the risk of injuries from the use of CEDs, and we recommend that these precautions be adopted in technological incarceration. For instance, medical practitioners should assess offenders’ health and suggest a voltage of shock that is appropriate for their age, size, gender, physical characteristics, and health conditions.¹⁷⁴ Offenders should not be shocked more than once on any one occasion, and

¹⁶⁹ *Police Use of Force, Tasers and Other Less-Lethal Weapons*, U.S. DEP’T OF JUST., OFF. OF JUST. 1, 2 (May 2011), <https://www.ncjrs.gov/pdffiles1/nij/232215.pdf>.

¹⁷⁰ Melissa Mann, *Police History: How a NASA Scientist Invented the Taser*, POLICEONE (Mar. 22, 2016), <https://www.policeone.com/police-products/less-lethal/TASER/articles/164475006-Police-History-How-a-NASA-scientist-invented-the-TASER/>.

¹⁷¹ *Police Use of Force, Tasers and Other Less-Lethal Weapons*, *supra* note 169, at 1.

¹⁷² *Id.* at 4, 14–15.

¹⁷³ *Id.* at 14.

¹⁷⁴ *Id.* at 15.

CEDs should not be activated on pregnant women.¹⁷⁵ In addition, CEDs should not be affixed to offenders' chests to avoid causing cardiac arrest,¹⁷⁶ or be close to their eyes to ensure they are not blinded by them.¹⁷⁷ The Taser user manual suggests avoiding directing the shock at an individual's "head, face, throat, chest, or groin."¹⁷⁸ We propose, therefore, to incorporate the remote CED into the electronic bracelet that is attached to the prisoner's ankle and is used also for monitoring the prisoner's location.

The conventional manner of using CEDs effectively is to point the device at the target from a maximum of 4.6 meters away.¹⁷⁹ There is, however, no obstacle to developing technology to activate CEDs remotely. As noted above, the operative unit could be installed in the electronic monitoring ankle bracelet that offenders in technological incarceration wear. If they attempt to escape, commit harmful acts, or disable or remove their body sensors, the computers monitoring the events will instantly activate the CEDs embedded in their ankle bracelets to administer the electric shock. This will incapacitate offenders until the arrival of law enforcement officers, whom the computer system will have alerted.

Only two technologies are required to implement this feature of our proposal, and both of them are already commonplace. First, in order to ensure that prisoners do not move beyond their designated locations, the prisoners' sensor systems would be fitted with a global navigation positioning locator. There are currently three different world-wide satellite positioning systems¹⁸⁰—the Navstar Global Positioning System (commonly called "GPS"), the Russian Global Navigation System ("GLONASS"), and Europe's "Galileo"—with accuracy that ranges from ten or more yards, in the case of GPS, to a few feet for the more modern Galileo system.¹⁸¹ Our proposal does not require great accuracy, since prisoners can be confined to

¹⁷⁵ *Id.* at 4, 6, 16.

¹⁷⁶ George Arnett & Ami Sedghi, *How Dangerous is the Use of Tasers?*, *GUARDIAN* (Dec. 22, 2014), <https://www.theguardian.com/news/datablog/2014/dec/22/how-dangerous-is-the-use-of-tasers>.

¹⁷⁷ *Police Use of Force, Tasers and Other Less-Lethal Weapons*, *supra* note 169, at 2.

¹⁷⁸ Taser Pulse CEW, *User Manual*, TASER SELF DEFENSE PRODUCTS 11, available at <https://buy.taser.com/content/PulseManual.pdf> (last visited Dec. 2, 2016).

¹⁷⁹ *Id.* at 12.

¹⁸⁰ Xingxing Li et al., *Accuracy and Reliability of Multi-GNSS Real-Time Precise Positioning: GPS, GLONASS, BeiDou, and Galileo*, *J. GEODESY* 607, 607 (2015). Along with the three global systems, there are also three regional systems: China's BeiDou, India's Indian Regional Navigation Satellite System, and the Japanese Quasi-Zenith Satellite System. *Id.*

¹⁸¹ When it is fully functional, Galileo is projected to be accurate to a few centimetres. Dan Worth, *EU's Galileo satellite project: 7 fascinating facts about GPS-rival*, *V3* (May 27, 2016), <http://www.v3.co.uk/v3-uk/news/2402259/7-fascinating-facts-about-eus-galileo-satellite-project>.

locations that allow for movement of up to ten yards or more. Moreover, this monitoring system will be used to complement the tracking system that is part of the electronic monitoring process. Thus, even the relatively imprecise and outdated GPS system will suffice for our purposes, and future increases in its accuracy will merely provide greater sentencing options—for example, prisoners' sentences might involve being “confined to the house,” “confined to one room,” “confined to the perimeter of their property,” and so forth.

The second technology that will be required to implement this aspect of the proposed sanction is one that enables remote activation of the CED from a distance, either by an automated signal from the signals processing system or a human operator who is alerted to the transgression of the prisoner. As noted in the previous section, prisoners will be confined to locations where telecommunications or broadband internet service is available, so it will be extremely easy to outfit the prisoner's sensor-CED device with an actuator that can be triggered from the remote facility by a signal sent via the internet.

IV. THE SUPERIORITY OF TECHNOLOGICAL INCARCERATION TO CONVENTIONAL PRISONS

Technological incarceration can achieve all of the benefits of conventional imprisonment, and it has a number of additional advantages. Not only can it attain the two justifiable objectives of imprisonment—proportionate punishment of offenders and community protection—but it is more economical and humane than conventional incarceration. In the sections below, we explain in greater detail the reasons why technological incarceration is superior to conventional imprisonment.

A. PROPORTIONATE PUNISHMENT OF OFFENDERS

Technological imprisonment would punish offenders by restricting their liberty. All offenders would be confined to particular geographical zones and have their locations and actions electronically monitored.¹⁸² As discussed below, the deprivation of liberty is a considerable hardship. Further, in keeping with the principle of proportionality, technological imprisonment is able to be adapted to impose hardships on offenders that match the seriousness of, and the harms caused by, their crimes. One obvious means of incorporating this principle of proportionality into technological imprisonment is to adjust the length of the period for which offenders are incarcerated (given that the severity of a sanction is determined by its

¹⁸² Mirko Bagaric, et al., *The Hardship That is Internet Deprivation and What It Means for Sentencing: Development of the Internet Sanction and Connectivity for Prisoners*, __ AKRON L. REV. __ (forthcoming 2018).

harshness and length), but technological incarceration could also be adjusted in more nuanced ways so that it is proportionate to the seriousness of a prisoner's offense.

In Part VI, we discuss at length the manner in which technological incarceration should be implemented, but for present purposes, it is pertinent to note that we propose that offenders be restricted from moving beyond a certain radius surrounding their accommodation. While we suggest a default position that prisoners not be permitted to move beyond a fifty-meter radius of their accommodation, this distance could be changed to reflect the seriousness of the offenses that they have committed: The graver the crime, the more constricted the area beyond which they would be free to move, and vice-versa. We also suggest that the electronic devices, including computers, telephones, and tablets of offenders who have committed more serious offenses and white-collar crimes be monitored. According to our proposal, subjects of technological incarceration would be able to order online for delivery to their homes of a limited range of food and other household provisions, but would be restricted from obtaining any luxury items if they have committed more serious offenses. Offenders who have committed more serious crimes may also be prevented from having face-to-face interactions with other members of the community without official permission to do so.

B. COMMUNITY PROTECTION

Technological incarceration protects the community because it prevents offenders from reoffending while they are undergoing the sanction by monitoring them constantly and immobilizing them if they attempt to commit crimes. As noted earlier, the fact that prisoners are aware that they are being monitored can also discourage them from attempting to reoffend.¹⁸³ Prisoners will rightly assume that they are constantly under surveillance and that they will be detected and punished further if they commit more offenses.¹⁸⁴ Further, as machine recognition of various human activities improves, prisoners will realize that it will become virtually impossible to do anything illicit, and they will modify their actions accordingly.

Subjects of technological incarceration will not, however, suffer the hardships, in addition to deprivation of their liberty, that inmates of conventional prisons often endure and that can both diminish their capacity to integrate into society upon their release from prison and increase their risk

¹⁸³ See Shaw, *supra* note 149.

¹⁸⁴ Thomas McMullan, *What Does the Panopticon Mean in the Age of Digital Surveillance?*, *GUARDIAN* (July 23, 2015), <https://www.theguardian.com/technology/2015/jul/23/panopticon-digital-surveillance-jeremy-bentham>; see also *infra* Part IV.C.

of reoffending. For example, offenders who are subject to technological incarceration are not at risk of threats to their physical safety from other prisoners. Moreover, while undergoing technological incarceration, offenders will be able to develop and maintain relationships, and will be encouraged to participate in activities, including education and employment, that sustain their involvement in the community and motivate them to reform and contribute beneficially to it. We also recommend that offenders be required to participate in rehabilitation programs that are tailored to their particular needs. One of the benefits of technological incarceration is that prisoners can take advantage of many of the rehabilitative resources and programs that are available in free society but not in conventional prisons, such as libraries, therapists, Alcoholics Anonymous meetings, job-readiness training, and college classes.

For these reasons, technological incarceration is more likely to lead to effective rehabilitation of offenders, thereby reducing recidivism and enhancing community safety to a far greater extent than conventional prisons. As Mark Berg and Beth Huebner observe, “prison can be a driving force in the pathway of chronic offending through its corrosive effect on conventional opportunities and relations,” whereas “facilitating job attainment [and] familial social ties . . . may break the cycle of prison to unemployment and thereby stymie the pathway of state dependence leading from prison to reoffending.”¹⁸⁵ Importantly, prisoners who are subject to technological incarceration will have greater capacity to develop and sustain relationships with their families than inmates of conventional prisons. Offenders’ familial relationships can be crucial to reducing their likelihood of recidivism where their relatives provide emotional support to them, encourage them to conform to social conventions, including by helping them form an identity as a contributor to society, and assist them to secure jobs following their release from prison.¹⁸⁶

While based in their homes, and in contrast to offenders in conventional prisons, offenders who are subject to technological incarceration will be able to access the internet, albeit under surveillance, especially if they have committed more serious offenses. Such access will assist offenders to understand developments in the wider community and help with their reintegration into society once they are released. It can also considerably enhance prisoners’ employment and educational opportunities and thereby reduce their likelihood of reoffending. Current technology can readily track

¹⁸⁵ Mark T. Berg & Beth M. Huebner, *Reentry and the Ties That Bind: An Examination of Social Ties, Employment, and Recidivism*, 28 JUST. Q. 382, 405 (2011).

¹⁸⁶ *Id.* at 384–86, 388, 402.

every keystroke on a computer, which greatly minimizes prisoners' opportunities to use the internet for illegal activities.¹⁸⁷

To boost their rehabilitation, we recommend that the subjects of technological imprisonment have discretion regarding activities they undertake on a daily basis, but also be encouraged to enroll in and complete educational courses and find employment. Importantly, there is a strong correlation between education and reduced rates of offending. According to Davis et al., inmates who participate in correctional education programs have on average a 43% lower chance of reoffending than prisoners who are not involved in such programs, which equates to a reduced recidivism risk of thirteen percent points overall.¹⁸⁸ Prisoners who participate in academic or vocational education programs in prison are also 13% more likely to obtain employment on their release.¹⁸⁹

Likewise, research demonstrates a clear connection between employment and lower rates of recidivism: offenders who are employed are less likely to commit further crimes.¹⁹⁰ Scholars hypothesize that the reasons for this trend include that when they are employed, offenders are: confined to routines that restrict their involvement in situations where they could commit crimes; able to support themselves financially, so they do not need to offend as a source of income; and connected to conventional society.¹⁹¹ The ability of those who are subject to technological incarceration to acquire further qualifications and secure employment while imprisoned can greatly enhance their potential to gain or continue employment after release from incarceration and therefore also diminish their risk of reoffending.¹⁹² Those offenders will not experience the difficulties in finding employment that former inmates of conventional prisons often experience due to the stigma of their convictions, but also deficiencies in their educational qualifications, lack of continuous work history, and possession of outdated skills.¹⁹³

We recommend that subjects of technological incarceration who have committed more serious crimes be restricted to participating in education that is delivered online and to employment in roles that can be fulfilled through online work. Permitting serious offenders to study or work beyond the geographical areas to which they are confined would reduce the hardship

¹⁸⁷ See *infra* Part IV.

¹⁸⁸ Lois M. Davis et al., *How Effective Is Correctional Education, and Where Do We Go from Here? The Results of a Comprehensive Evaluation*, RAND CORP., xiii (2014).

¹⁸⁹ *Id.*

¹⁹⁰ Berg & Huebner, *supra* note 185, at 387, 397.

¹⁹¹ *Id.* at 387.

¹⁹² *Id.* at 402.

¹⁹³ *Id.* at 388, 404.

inflicted on them to a point where much of the sting of the sanction would be eliminated. Nevertheless, consistent with the theory of proportionate punishment, we suggest that nonviolent and nonsexual offenders be permitted to travel to destinations beyond their designated locations for employment and educational purposes. Those offenders are routinely sentenced to prison on the basis of contemporary sentencing principles. However, according to relevant empirical data and normative standards, they should actually receive lighter penalties than conventional imprisonment. Their crimes are not so serious that the need to deprive them of their liberty outweighs the benefits of ensuring their rehabilitation and community reintegration at the cessation of their penalty. Further, GPS technology is sufficiently sophisticated to enable monitoring of those prisoners' travel outside the geographical zones to which they are confined.

A crucial aspect of our proposed technological incarceration is a requirement for prisoners to participate in rehabilitation programs that are designed for them, taking into account their particular issues and needs. Rehabilitation was central to United States prison policies until the 1970s when it was displaced by a focus on punishing offenders due to the rising "tough on crime" agenda.¹⁹⁴ This shift coincided with many mentally ill people moving out of mental health institutions and into the criminal justice system, with the result that the rates of mental illness and recidivism amongst offenders is now extremely high.¹⁹⁵ There have nonetheless been some important initiatives, such as the Lionheart Foundation's "Houses of Healing" program,¹⁹⁶ and in 2007, a report for the United States Department of Justice reinforced that extensive research has established that treatment programs for offenders developed according to evidence-based research can drastically lower rates of reoffending.¹⁹⁷

According to that report, successful rehabilitation programs would address offenders' "criminogenic needs," that is, their attitudes and behaviors that are related to their probability of reoffending, use cognitive-behavioral treatments, and provide continuity of support and care to offenders.¹⁹⁸ We

¹⁹⁴ Etienne Benson, *Rehabilitate or Punish*, APA (July/Aug. 2003), <http://www.apa.org/monitor/julaug03/rehab.aspx>; Roger K. Warren, *Evidence-Based Practice to Reduce Recidivism: Implications for State Judiciaries*, U.S. DEP'T OF JUST., NAT'L INST. OF CORR. xi (Aug. 2007), <https://www.wicourts.gov/courts/programs/docs/cjjudicialpaperfinal.pdf>.

¹⁹⁵ Benson, *supra* note 194, at 189.

¹⁹⁶ *The Development of Houses of Healing*, THE LIONHEART FOUND., <http://lionheart.org/the-development-of-houses-of-healing/> (last visited Sept. 25, 2017).

¹⁹⁷ See generally THE CRIME AND JUST. INST. AND THE NAT'L INST. OF CORR., COMMUNITY CORRECTIONS DIVISION, EVIDENCE-BASED PRACTICE TO REDUCE RECIDIVISM: IMPLICATIONS FOR STATE JUDICIARIES (2007).

¹⁹⁸ *Id.* at xix–iii.

suggest that such components be incorporated into rehabilitation programs for subjects of technological incarceration, in addition to, where necessary, specific treatment for mental health issues and/or drug and alcohol addiction, and education about emotional expression and managing stress and anger. While such rehabilitation programs will involve financial costs, this expense will be significantly less than the costs involved in conventional imprisonment (in the case of drug offenders, for instance, a report for the Justice Policy Institute noted in 2004 that in Maryland, the annual cost of incarcerating a drug offender was \$20,000, compared with a yearly cost of \$4,000 for treatment of an individual's drug addiction).¹⁹⁹ In addition, successful rehabilitation programs will save society the expenses associated with managing offenders who have not been rehabilitated.²⁰⁰

C. POTENTIAL TO APPLY TECHNOLOGICAL INCARCERATION TO MOST OFFENDERS

The majority of offenders who are currently incarcerated in conventional prisons can be punished through technological incarceration, provided that they can access appropriate accommodation. While there may be practical difficulties associated with this requirement, there are means of overcoming them.

In many cases, offenders will reside in accommodation with others, including relatives and friends. We suggest that such offenders only be permitted to undergo technological incarceration in those locations if the people with whom they live consent to this taking place, and it is likely that they would do so. This requirement is similar to that which currently exists in relation to home detention—prisoners are only eligible for it if those with whom they live provide informed consent to the sanction,²⁰¹ which occurs in most cases.

As part of implementing technological incarceration, we propose providing accommodation (and food and household provisions) to offenders who report an episode of homelessness in the year before they are arrested, so that they can be subject to this sanction. This would apply to

¹⁹⁹ Doug McVay et al., *Treatment or Incarceration: National and State Findings on the Efficacy and Cost Savings of Drug Treatment Versus Imprisonment*, JUST. POL'Y INST. 1, 6 (Mar. 2004).

²⁰⁰ For an example of the savings of rehabilitation programs and measured compared to the cost of incarceration, see Adi Jaffe et al., *Jurisdictional Variation in the Economic Impact of California's Proposition 36 Drug Offender Diversion Program*, J. OF ALCOHOLISM & DRUG DEPENDENCE 1, 3–4 (Apr. 24, 2014), available at <https://www.omicsonline.org/open-access/jurisdictional-variation-in-the-economic-impact-of-californias-proposition-drug-offender-diversion-program-2329-6488.1000158.php?aid=27288&view=mobile>.

²⁰¹ See, e.g., U.S. SENT'G COMM'N, GUIDELINES MANUAL, § 5F1.2 (Nov. 2016).

approximately 10% of the current prison population.²⁰² Although taxpayers would pay for this accommodation, public housing and government-subsidized private accommodation is far cheaper than conventional prisons. In most American cities, basic accommodation can be secured for less than \$200 per week.²⁰³ Providing homeless offenders with accommodation will increase their chances of living self-sufficiently after their sentences expire.

This is an especially important objective given that emerging evidence shows that some of the few recent reforms that have resulted in a lowering of the imprisonment rate have had significant adverse unintended consequences for the homeless population. As noted earlier, California's Proposition 47 led to a lowering of penalties for a number of drug offenses. As a result of this change, more than 13,000 low level offenders were freed from prison, but many of these people are now homeless and destitute. A recent report notes:

Two years after it was approved by California voters, Prop 47 has scaled back mass incarceration of drug addicts, but successful reform is woefully incomplete. Proponents celebrate how the law freed at least 13,500 inmates . . . from harsh sentences in crowded prisons and jails, but Prop 47 has done little to help these people restart their lives. Instead, the unprecedented release of inmates has exposed the limits of California's neglected social service programs: Thousands of addicts and mentally ill people have traded a life behind bars for a churning cycle of homelessness, substance abuse and petty crime.²⁰⁴

There is a risk that some of the 600,000 homeless people in the United States²⁰⁵ will find the prospect of free accommodation under technological surveillance more appealing than ongoing homelessness, and therefore commit crimes merely in order to be placed in accommodation. It is nonetheless unlikely that this risk is high; while a roof over one's head is important to human flourishing, most people would probably value their liberty more highly, especially in a jurisdiction such as the United States where even the poorest people are able to access the very basics for

²⁰² S. Metraux & D.P. Culhane, *Homeless Shelter Use and Reincarceration Following Prison Release: Assessing the Risk*, 3 CRIMINOLOGY & PUB. POL'Y 139, 140 (Jan. 2004). See also Greenberg G.A. & Rosenheck RA., *Homelessness in the State and Federal Prison Population*, 18 CRIM. BEHAV. MENT. HEALTH 88, 88-103 (2008).

²⁰³ The median rental income in the United States is slightly over \$200 per week (i.e., \$934 per month). See *U.S Residential Rent and Rental Statistics*, DEP'T OF NUMBERS, <http://www.deptofnumbers.com/rent/us/> (last visited Jan. 6, 2017).

²⁰⁴ Jill Castellano et al., *Two Years after Prop 47, Addicts Walk Free with Nowhere to Go*, THE DESERT SUN (Dec. 14, 2016), http://www.desertsun.com/story/news/crime_courts/2016/12/14/prop-47-california-addiction/94083338/.

²⁰⁵ *The State of Homelessness in America 2016*, NAT'L ALLIANCE TO END HOMELESSNESS (Apr. 6, 2016), <http://www.endhomelessness.org/library/entry/SOH2016>.

survival.²⁰⁶ Nevertheless, if some homeless people do commit crimes in order to obtain state-sponsored accommodation through technological incarceration, this is likely to provide a catalyst for governments to take appropriate responsibility for putting in place policy reforms to deal with the issue of homelessness. To this end, state and federal governments can apply some of the considerable money they will have saved as a consequence of the proposals advanced here to address the homelessness crisis in the United States.

Further, providing accommodation to homeless offenders who are sentenced to technological incarceration is preferable to excluding them from this sanction, given that the latter approach would entrench the disadvantages that they already suffer. It is also more appropriate than subjecting homeless offenders to technological incarceration and confining them to a geographical precinct (rather than to a residence) because people are not legally entitled to occupy and remain in public areas and, more importantly, it is unreasonable to compel people to live outdoors without basic amenities.

As noted above, only two small cohorts of offenders would be ineligible for technological incarceration and should remain in conventional prisons: offenders who commit extremely grave crimes and offenders who breach the conditions of technological incarceration in a serious manner.

The first cohort consists of offenders who have committed what are conventionally termed “capital offenses.” Although the term is strictly only used in states that have the death penalty²⁰⁷ and the offense types that fall within the scope of capital offenses vary slightly from state to state, in essence they are the most heinous crimes.²⁰⁸ The federal jurisdiction has the longest list of capital offenses.²⁰⁹ Many of these are obscure offenses that are rarely committed, such as genocide,²¹⁰ assassination or kidnapping resulting

²⁰⁶ Sometimes this is with the assistance of food assistance programs and the like. *See, e.g., Federal Food Assistance Programs*, FEEDING AMERICA, <http://www.feedingamerica.org/take-action/advocate/federal-hunger-relief-programs/?referrer=https://www.google.com.au/>.

²⁰⁷ There are thirty-one states which still have the death penalty. *States with and Without Death Penalty*, DEATH PENALTY INFO. CTR. (July 1, 2015), <http://www.deathpenaltyinfo.org/states-and-without-death-penalty>. Since 1976, there have been 1,414 executions. *Executions by Year*, DEATH PENALTY INFO (Oct. 30, 2015), <http://www.deathpenaltyinfo.org/executions-year>.

²⁰⁸ Tracy L. Snell, *Capital Punishment, 2013—Statistical Tables*, BUREAU JUST. STAT. 8, 6, <https://www.bjs.gov/content/pub/pdf/cp13st.pdf> (last updated Dec. 19, 2014); *Crimes Punishable by the Death Penalty*, DEATH PENALTY INFO. CTR., <http://www.deathpenaltyinfo.org/crimes-punishable-death-penalty#BJS> (last visited Jan. 6, 2017). The federal jurisdiction has the largest number of capital offenses (forty-one). *Id.*

²⁰⁹ *Crimes Punishable by the Death Penalty*, *supra* note 208.

²¹⁰ 18 U.S.C. § 1091 (2009).

in the death of the President or Vice President,²¹¹ murder by the use of a weapon of mass destruction,²¹² and the terrorist murder of a United States national in another country.²¹³ Given the lack of uniformity regarding the type of offenses that attract the death penalty, it is desirable to focus on the offenses that are consistently categorized as capital offenses and that in fact result in the highest number of executions. To this end, it is noteworthy that, in effect, the death penalty is only applied in relation to murder offenses. Since the death penalty was reinstated in the United States in 1976, only two people have been placed on death row for non-murder offenses, and no one has been executed for a non-murder offense.²¹⁴ Moreover, most states limit the death penalty to first-degree murder.²¹⁵ This offense accounts for only a small portion of the total number of inmates in prison.²¹⁶ Thus, in effect, only a very small portion of offenders would not qualify for technological incarceration on the basis of the nature of their offenses.

Ultimately, sound logical arguments could be made for also making first-degree murderers subject to technological incarceration for decades or life. However, this proposal should not be seriously entertained until technological imprisonment obtains widespread community endorsement and the necessary technology has been proven to be virtually foolproof. Criminal justice is the area of social and political policy that is most influenced by the collective psyche of the community and has been most resistant to reasoned, evidence-based reform.²¹⁷ Indeed, the “tough on crime” agenda has resulted in an almost total disregard of expertise in sentencing law and a substantial gulf between practice and knowledge of what is achievable in sentencing law.²¹⁸ Public emotion that has driven the “tough on crime” agenda has been mostly directed at the more serious crimes.

²¹¹ 18 U.S.C. § 1751 (2009).

²¹² 18 U.S.C. § 2332(a) (1996).

²¹³ 18 U.S.C. § 2332 (1996).

²¹⁴ *Death Penalty for Offenses Other Than Murder*, DEATH PENALTY INFO. CTR., <http://www.deathpenaltyinfo.org/death-penalty-offenses-other-murder> (last visited Jan. 6, 2017); see generally *Kennedy v. Louisiana*, 554 U.S. 407 (2008).

²¹⁵ See *Crimes Punishable by the Death Penalty*, *supra* note 208.

²¹⁶ There is no accurate data on what portion of prisoners have committed capital crimes, but the total number of prisoners who are in prison for the main capital offense (murder) is 169,000. Peter Wagner & Bernadette Rabuy, *Mass Incarceration: The Whole Pie 2016*, PRISON POL’Y INITIATIVE (Mar. 14, 2016), <https://www.prisonpolicy.org/reports/pie2016.html>. However, this figure includes all types of murder—not simply first-degree murder.

²¹⁷ Mirko Bagaric et al., *Bringing Sentencing into the 21st Century: Closing the Gap Between Practice and Knowledge by Introducing Expertise into Sentencing Law*, 45 HOFSTRA L. REV. 785, 786–7, 804–12, 848 (2017).

²¹⁸ *Id.* at 819–29.

Reforms that seek to change core aspects of the criminal justice system may fail if they do not take this into account because they are likely to be viewed as untenable at the political level.

Imprisoning in conventional prisons offenders who breach the conditions of technological incarceration in a serious manner, for example by escaping or committing serious crimes, will encourage offenders who are undergoing technological imprisonment to comply with those conditions and reassure the public that community protection is a core objective of this sanction. The prospect of confinement in conventional prisons will provide a very effective deterrent to the subjects of technological incarceration contravening their conditions, given that they will appreciate that all breaches are likely to be detected.²¹⁹ As noted above, studies have established that the most effective way to deter crime is not through imposing harsher penalties, but by increasing the perception in people's minds that, if they commit crimes, they will be detected and apprehended.²²⁰ Given the constant and intense monitoring of prisoners who are subject to technological incarceration, all offenders who move outside the geographical zones to which they are confined will be detected and almost inevitably apprehended. In addition, most crimes that are committed by offenders during technological incarceration would be detected as they occur. Even if those crimes are not detected by the monitoring systems, but instead are reported by victims, the offenders will probably be apprehended and prosecuted.²²¹ In any case, given that offenders will be aware of the nature and degree of surveillance to which they are subject, the rate at which they breach their conditions of incarceration is likely to be low.

We recommend that, if offenders do breach the core aspects of technological incarceration, they should be compelled to serve some of their remaining terms in conventional prisons and, if their contraventions are particularly grave—for example, if offenders escape and commit serious offenses—they should serve the remainder of their sentences in conventional prisons.²²²

D. THE COST OF TECHNOLOGICAL INCARCERATION

One of the main advantages of technological incarceration compared with conventional imprisonment is that it will be cheaper and more cost-

²¹⁹ See Bagaric & Alexander, *supra* note 111, at 282.

²²⁰ See *supra* Part III.

²²¹ This is especially the case given that that the data from the tracking and recording devices can be stored and later used as evidence.

²²² Minor transgressions should not trigger imprisonment given that it would be a disproportionate response to the breaching event.

effective.

The cost of imprisonment varies considerably from state to state, but it is estimated that the average direct cost to United States taxpayers is \$31,000 per prisoner per annum.²²³ It is not possible at this point to quantify exactly the cost of technological incarceration—as noted above, the system has not yet been fully developed. Nevertheless, we can gain an idea of the overall cost of the system from the current expense of each of the technologies that make up the component parts of the technological incarceration system. The sensor harness is likely to cost the same as the combined cost of current police body cameras and electronic monitoring bracelets. The cost of each of these products is in the hundreds of dollars, not in the thousands.²²⁴ Communication costs for technological incarceration are likely to be similar to the current telecommunications and internet costs for retail phone and internet users²²⁵—a figure in the low thousands of dollars a year, and one that is likely to drop over time. The cost of a CED such as a Taser is, again, in the low hundreds of dollars.²²⁶ Therefore, the hardware and communications costs will likely be in the low thousands of dollars a year, even assuming that each offender is issued a new hardware system annually.

The two other costs of the system involve the remote signals processing system and employment of a small staff of remote monitoring or corrections officers to view the computers' footage and attend to prisoners when the computers trigger alarms. The initial development of the signals processing system is likely to be expensive, even though it involves merging a range of existing technologies. Initial development and testing will be required to ensure that the system can operate as promised, and this will likely be in the

²²³ VERA INST. OF JUST., *THE PRICE OF PRISONS: WHAT INCARCERATION COSTS TAXPAYERS* 9 (2012). While the average cost is \$31,000 per prisoner, the cost is higher in some states and cities. For example, in New York, the average cost is \$60,000 per year. *Id.*

²²⁴ A typical clip-on body camera costs \$400. Utility, *5 Year Total Cost of Ownership Analysis: Typical Clip-On Body Cameras Compared to Utility Body Worn Video Camera* 1, 13 (May 2016), <http://utility.com/perch/resources/bodyworn-total-cost-of-ownership-analysis-may-2016-1.pdf>. A “body-attached bracelet device” for electronic monitoring can be as little as \$100. Washington State Department of Enterprise Services, Contract 00212 with 3M Electronic Monitoring, Inc. for Electronic Monitoring of Offenders, Appendix E, <https://fortress.wa.gov/ga/apps/contractsearch/contractsummary.aspx?c=00212> (last visited Dec. 2, 2016).

²²⁵ ‘Unlimited storage and software usage is generally charged monthly, at a rate of \$80 per month. Utility, *supra* note 224. For the daily rates of a radio frequency continuous signalling electronic monitoring service with a landline connection and a cellular communication connection, which are under \$2.00, see Washington State Department of Enterprise Services, *supra* note 224.

²²⁶ *See, e.g., Taser Pulse*, TASER SELF-DEFENSE, <https://buy.taser.com/about-the-taser-pulse-1/> (last visited Oct. 16, 2017).

millions of dollars. However, once it has been created, the system will require very little ongoing development, and the only costs associated with running it will be ongoing maintenance of the codebase. Finally, we can estimate the cost of electronic monitoring, based on the current costs of existing electronic bracelet monitoring systems. Electronic monitoring by human operators costs only one-sixth to one-tenth of the current cost of conventional imprisonment.

Putting all these costs together, we estimate an ongoing cost of technological incarceration of between \$10,000 and \$15,000 per annum per prisoner, including amortization of the initial development costs. This figure is between one-third and one-half of the average cost of prisons in the United States. And, as technology costs decline over time, this figure will drop.

Once those technological systems have been developed, only a relatively small number of people will need to be involved in their operation. Those individuals would view footage of offenders' movements that the computers have detected and attend to prisoners where computers have triggered alarms because the offenders have moved outside of the geographical zones to which they have been confined; deactivated, disabled or removed their sensor harnesses; or attempted to commit offenses and been immobilized. Given that so few contraventions of the conditions of technological incarceration are anticipated, it is likely that the labor cost associated with this system will be minimal. Certainly, the number of people who will need to be involved in the operation of technological incarceration will be significantly less than the hundreds of thousands of people who are at present employed in the prison industry. To this end, where possible, it would be desirable to redeploy current prison staff to roles within the technological incarceration system.

We do not underrate the complexity of the technology involved in our proposed sanction. However, a universal truth relating to technological systems is that most of the costs involved in them are associated with their development such that they become cheaper as their roll-out increases.²²⁷ Given that the system we are proposing will apply to approximately two million offenders, it is most likely that, amortized over the offender cohort,

²²⁷ Consider for example, the reduction in the cost of cell phones and computers over the past two decades. See, e.g., *Long-term Price Trends for Computers, TVs, and Related Items*, BUREAU OF LABOR STAT. (Oct. 13, 2015), <https://www.bls.gov/opub/ted/2015/long-term-price-trends-for-computers-tvs-and-related-items.htm>; Matt Rosoff, *Every Type of Tech Product Has Gotten Cheaper Over the Last Two Decades -- Except One*, BUS. INSIDER AUST. (Oct. 15, 2015), <https://www.businessinsider.com.au/historical-price-trends-for-tech-products-2015-10?r=US&IR=T>; *The Cost of Computers Over Time*, FREE BY 50 (Apr. 15, 2009), <http://www.freeby50.com/2009/04/cost-of-computers-over-time.html>.

the cost of developing the technology will be inconsequential compared to the savings from not incarcerating offenders in conventional prisons. If nothing else, our back-of-the-envelope numbers suggest that the system will be significantly cheaper than the current prison system that the United States finances, whose operation depends heavily on many people. Given the many other advantages of technological incarceration, in addition to its cost-effectiveness, it would be foolish to ignore the technological opportunity now before us.

E. REPURPOSING CONVENTIONAL PRISONS

Another major advantage of closing conventional prisons is that governments can sell the property on which prisons are currently located and apply the proceeds of those sales towards productive community projects, such as public health and education schemes. Alternately, they could use the sites for other purposes associated with technological incarceration—such as public housing for prisoners, retraining centers, and other facilities to ease the transition to technological incarceration for both prisoners and former correctional officers. Indeed, some former prison sites have already been repurposed, resulting in substantial benefits for the community.

A recent report by the Sentencing Project notes:

Prison closures offer a challenge to officials and the communities that are impacted, particularly in rural areas with limited employment opportunities. In recent years, entrepreneurs, elected officials and community leaders in a handful of states have reimagined sites that once incarcerated prisoners for new uses. In Manhattan, the Osborne Association, a non-profit organization, is working to convert a closed women's prison into a space that provides services to women leaving incarceration. An entrepreneur in California purchased a closed correctional facility and plans to repurpose it as a medical marijuana cultivation center. At least four states—Missouri, Ohio, Pennsylvania, and West Virginia—have converted closed prisons into tourist destinations open to visitors and host Halloween events.²²⁸

Likewise, the National Conference of State Legislatures recently reported that in Colorado, a closed prison is being repurposed to offer support services for homeless people. In New York, a former prison will provide support services for victims of crime and rehabilitation of offenders, while another facility has become an animal shelter.²²⁹ In North Carolina and

²²⁸ Nicole D. Porter, *Repurposing: New Beginnings for Closed Prisons*, THE SENTENCING PROJECT (Dec. 14, 2016), <http://www.sentencingproject.org/publications/repurposing-new-beginnings-closed-prisons/>.

²²⁹ NAT'L CONF. OF STATE LEGISLATURES, E-BULLETIN: SENTENCING AND CORRECTIONS POLICY UPDATES, ISSUE 9 (Sept. 2013), *available at* <http://www.ncsl.org/Documents/CJ/bulletinSept-2013.pdf>.

Michigan, legislatures have approved transferring to local governments the land on which prisons were operated.²³⁰ The Sam Houston State University in Texas has received former prison land so that it can develop criminal justice education and training.²³¹ The former McNiel Island Corrections Center in Washington is now used to train prisoners for employment in land and water maintenance.²³²

The closure of prisons is likely to have an adverse financial impact on one sector of the community: the operators of private prisons, who will of course be disadvantaged by the virtual cessation of demand for their services. Implementation of electronic incarceration will lead to the closure of prisons and job losses for staff who currently work within them. However, this disadvantage will be ameliorated by a number of factors. First, the scale of the reform in so far as it concerns private prisons is not as significant as might intuitively appear to be the case. Less than 10% of all prisoners are currently housed in private prisons.²³³ Second, as noted below, technological incarceration will take time to implement, and it is likely to be rolled out over a number of years. There will be time for the private prison operators and their employees to attempt to transition into other employment.²³⁴ Third, when prisons are repurposed, there is likely to and should be a preference for employing prison staff in new roles that emerge within the relevant activity. Finally, it is important not to lose sight of the fact that prison is often a brutal sanction, which, for the reasons noted above, frequently causes profound pain to offenders and the wider community. The financial interests of a relatively small number of people can never outweigh society's need to reduce unnecessary suffering and put in place fair and efficient processes for dealing with criminal offenders.

V. REBUTTING ANTICIPATED OBJECTIONS TO TECHNOLOGICAL INCARCERATION

Two main criticisms are likely to be leveled at this Article's proposal. First, some will probably suggest that technological incarceration is too harsh

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.*

²³³ Private prisons house approximately 7% of state prisoners and 18% of federal prisoners. Cody Mason, *International Growth Trends in Prison Privatization*, THE SENT'G PROJECT 1, 1 (2013), <https://sentencingproject.org/wp-content/uploads/2015/12/International-Growth-Trends-in-Prison-Privatization.pdf>; *Private Prisons*, ACLU, <https://www.aclu.org/issues/mass-incarceration/privatization-criminal-justice/private-prisons> (last visited Sept. 23, 2017).

²³⁴ *See infra* Part VI.

because it violates basic human rights, including the rights to privacy, liberty, and physical integrity. Alternatively, the proposal is likely to come under fire on the basis that it is not harsh enough because it permits offenders to participate in many fulfilling and pleasurable social and other activities.

In this Part, we explain why both of these objections are flawed.

A. TECHNOLOGICAL INCARCERATION VIOLATES HUMAN RIGHTS

Technological imprisonment will contravene a number of human rights, most obviously the rights to privacy and liberty, but also the right to physical integrity in the case of offenders who are shocked by CEDs during their sentences. Nevertheless, those human rights incursions constitute punishment that justifiably inflicts a degree of hardship or suffering on offenders in proportion to the harm they have caused. Moreover, technological incarceration breaches offenders' human rights significantly less than conventional imprisonment. As we discuss below, the risk of an inmate experiencing physical harm, or even dying, is likely to be far greater in a conventional prison than under technological incarceration.²³⁵ To deal with the potential human rights concerns, we now consider each type of rights violation in greater detail, and explain why technological incarceration is an appropriate means of dealing with criminal offenders.

Technological incarceration will infringe offenders' right to privacy because it will involve constant computer monitoring of their movements and actions, as well as the prospect of law enforcement officials viewing footage of their activities in response to computer alerts. Nevertheless, offenders who are subject to technological incarceration would experience greater levels of privacy than inmates of conventional prisons, who have virtually no privacy, even in their cells. The Supreme Court explicitly acknowledged this breach of the right to privacy for inmates of conventional prisons in *Hudson v. Palmer*:

A prisoner has no reasonable expectation of privacy in his prison cell entitling him to the protection of the Fourth Amendment against unreasonable searches. While prisoners enjoy many protections of the Constitution that are not fundamentally inconsistent with imprisonment itself or incompatible with the objectives of incarceration, imprisonment carries with it the circumscription or loss of many rights as being necessary to accommodate the institutional needs and objectives of prison facilities, particularly internal security and safety. It would be impossible to accomplish the prison objectives of preventing the introduction of weapons, drugs, and other contraband into the premises if inmates retained a right of privacy in their cells. The

²³⁵ This is especially true given that technological incarceration does not involve the risk of being harmed by other inmates, which as noted earlier, happens frequently in prisons.

unpredictability that attends random searches of cells renders such searches perhaps the most effective weapon of the prison administrator in the fight against the proliferation of weapons, drugs, and other contraband. A requirement that random searches be conducted pursuant to an established plan would seriously undermine the effectiveness of this weapon.²³⁶

By comparison, although the locations of offenders who are subject to technological incarceration will be electronically monitored, their actions will only be viewed by remote monitoring or corrections officers if they behave suspiciously²³⁷ or move outside their designated geographical zones. Consequently, unlike the inmates of many conventional prisons, they will be free to shower, use the toilet, and participate in other daily activities unscrutinized by others.

Similarly, while technological imprisonment will considerably infringe upon offenders' right to liberty, inmates of conventional prisons suffer far greater deprivations of their freedom. Offenders who are subject to technological incarceration will be geographically confined to their designated electronic monitoring zones and will be unable to drive any great distances or take vacations. They will, nonetheless, be permitted to adapt their accommodation to suit their preferences and at any time undertake legal activities of their choosing, such as work, exercise, or watching television. Conversely, inmates of conventional prisons live behind high walls according to the prison schedule without the creature comforts of home, and most aspects of their lives—from the content and timing of their meals to the people with whom they socialize to exercise and movement outside of their cells—are tightly regimented and dictated by the institution and its corrections staff.²³⁸

Technological incarceration will only lead to violation of prisoners' right to physical integrity if they are immobilized by CEDs, which will be remotely activated in response to offenders breaching the conditions of their imprisonment by moving outside their designated geographical zones, disabling, removing, or turning off their sensor harnesses, or attempting to harm themselves or others. Nevertheless, not only is it highly unlikely that offenders would experience any lasting injury from the shocks delivered by CEDs, but most offenders in technological incarceration, and especially those who do not engage in any suspicious activity, will never suffer any physical

²³⁶ 468 U.S. 517, 518 (1984). *See also* Williams v. Kyler, 680 F. Supp. 172, 173 (D. Md. 1986); Giano v. Goord, 9 F. Supp. 2d 235, 241 (W.D.N.Y. 1998).

²³⁷ That is when they have moved in a manner which is consistent with the application of force to another person, e.g., a quick movement of limb in close proximity to another person.

²³⁸ The fact the right to privacy is virtually negated in the prison setting is noted by the Supreme Court in *Palmer*. *See* 468 U.S. at 518.

harm as a consequence of their imprisonment.

Conventional prisons are brutal institutions where prison authorities are authorized to use force (even of a lethal nature) in order to prevent prisoners from escaping lawful custody or harming other inmates, and many prisoners are physically and sexually assaulted by fellow inmates.²³⁹ Although corrections staff are required to protect inmates from deliberate harm,²⁴⁰ they often fail to prevent the physical and sexual abuse of them by other prisoners and staff. In a recent survey, over one-third of state prisoners reported having suffered injuries in prison with causes ranging from accidents to intentional acts of violence.²⁴¹ Almost one out of twenty state and federal prisoners reports being raped or sexually abused behind bars.²⁴² Each year, many prisoners are assaulted and sometimes killed in prison due to the use of force by prison officials or other inmates.²⁴³

The public may initially be troubled by the notion of a computer remotely inflicting pain on prisoners undergoing technological incarceration and by the risk of a technological malfunction or human error leading to offenders being shocked unnecessarily. Nevertheless, that risk can be greatly minimized by proper testing of the technology prior to its implementation in technological incarceration. Further, the likelihood of human error resulting in harm to an offender is no greater under technological imprisonment than in conventional prisons where, for instance, corrections staff may use force against an inmate to thwart his/her conflict with another inmate, not realizing that the first prisoner was acting in self-defense rather than aggressively. Further, the use of CEDs in technological imprisonment is unlikely to cause any major or enduring harm to offenders who experience it. As discussed above, before their incarceration, doctors would assess offenders' health and determine the level of shock that would be sufficient to incapacitate them

²³⁹ Mirko Bagaric et al., *supra* note 20, at 1702–03.

²⁴⁰ *Brown v. Plata*, 563 U.S. 493, 545 (2011); *Wilson v. Seiter*, 501 U.S. 294, 298 (1991).

²⁴¹ See generally Sung, *supra* note 166.

²⁴² *US: Federal Statistics Show Widespread Prison Rape*, HUMAN RIGHTS WATCH (Dec. 15, 2007, 7:00 PM), <https://www.hrw.org/news/2007/12/15/us-federal-statistics-show-widespread-prison-rape>; see also *World Report 2014: United States*, HUMAN RIGHTS WATCH, <https://www.hrw.org/world-report/2014/country-chapters/united-states> (last visited Jan. 6, 2017).

²⁴³ In New York alone, guards used force against inmates more than 4,000 times in 2014. See, e.g., *New York Jail Guards Used Force Against Inmates Over 4,000 Times in 2014*, GUARDIAN (Jan. 12, 2015), <https://www.theguardian.com/us-news/2015/jan/14/new-york-jail-guards-report-use-of-force-inmates>. The problem seems to be particularly acute in relation to prisoners with mental illness. See e.g., *Callous and Cruel: Use of Force Against Inmates with Mental Disabilities in U.S. Jails and Prisons*, HUMAN RIGHTS WATCH (Ma 2015), <https://www.hrw.org/report/2015/05/12/callous-and-cruel/use-force-against-inmates-mental-disabilities-us-jails-and>.

temporarily without resulting in any lasting injuries, and, where necessary, the shock would be delivered through prisoners' ankles, which are not vulnerable parts of the body.

B. TECHNOLOGICAL INCARCERATION IS TOO LENIENT

Some may contend that technological incarceration is too mild a sanction to be an appropriate substitute for imprisonment. Indeed, this argument is likely to be the main criticism of technological incarceration, since conventional prison is such an ingrained aspect of American society, and the "tough on crime" agenda has remained so prominent in public discourse for the past forty years. As noted earlier, imprisonment has been the principal means of dealing with serious criminal offenders in the United States for over 500 years, and any proposal to change this social institution will inevitably be met with suspicion and opposition. To address these responses, it will be necessary to explain the capacity of technological incarceration to achieve the two legitimate sentencing objectives—and, in the case of the goal of community protection, to realize it more effectively than conventional prisons—and also to connect with the emotions and mindset of the community.

It is not difficult to make a sound, rational argument in favor of technological incarceration. The proposed sanction would, like conventional incarceration, fulfill the legitimate sentencing objective of punishing offenders. Technological imprisonment would do so chiefly by depriving offenders of their privacy and liberty, which constitutes an extremely harsh deprivation. The requirement to wear a sensor harness and electronic ankle bracelet constantly, day and night, the potential for incessant surveillance of an offender's everyday activities by computers and individuals whom he or she cannot see, and the prohibition on moving outside one's residence or a small radius beyond it would greatly intrude on and restrict an individual's sense of freedom, autonomy and solitude. Moreover, the severity of this sanction can be increased to match the seriousness of the offense. Thus, in relation to very serious offenses, the offender could be confined to his or her residence and have his or her activities tightly limited (for example, restrictions could be imposed on his or her use of communication and entertainment devices, and on the people who are permitted to visit him or her).

Nevertheless, technological incarceration would not impose the additional, incidental hardships on offenders that are inflicted on inmates of conventional prisons and, as one of us has previously noted, are unjustifiable because they are unnecessary to protect the community and punish

offenders.²⁴⁴ Indeed, because they do not experience this further gratuitous suffering, subjects of technological incarceration will have greater prospects of rehabilitation and lower rates of recidivism than inmates of conventional prisons.²⁴⁵ Consequently, technological incarceration is likely to achieve the other justifiable objective of imprisonment—community protection—more effectively than conventional prisons. As we have noted, research has also established that sanctions do not, by virtue of their harshness, achieve specific or general deterrence, which are other objectives that have been used to justify imprisonment.²⁴⁶ The public can be assured that it will be protected while offenders are undergoing technological incarceration if the electronic ankle bracelets are constructed carefully so that it is impossible to remove, deactivate or break them. Further, as noted above, if an offender attempts to deactivate his/her sensor harness or commit a crime while incarcerated, a CED will be remotely activated, which is guaranteed to immobilize the offender in every instance.

Progressive approaches to incarceration in Scandinavian countries have already demonstrated that treating prisoners humanely and permitting them to maintain a lifestyle that mirrors experiences outside prison and to continue participating in society and interacting with non-prisoners—while still depriving them of their liberty—minimize their rates of reoffending upon release.²⁴⁷ Norwegian prisoners have a recidivism rate of just 20%.²⁴⁸ Matthew DeMichele describes the differences between the Scandinavian and American prison systems:

Scandinavian prisons operate under the philosophy of normalization in which the punishment is the removal of liberty; that is, incapacitation is the punishment. The incarceration experience should resemble normal life as closely as possible to prepare the individual for release. [Further] . . . between 20% and 30% of all inmates serve their time in open prisons. These institutions allow inmates to work or attend school/training, purchase groceries, cook meals, own a car, and participate in other aspects of normal life. Numerous differences exist between U.S. and Scandinavian criminal justice systems: Recruitment, training, and health care are provided in the community (not in the prisons); inmates have input in prison policies; there is limited violence; and inmates are given individual cells. Essentially, then, many Scandinavian

²⁴⁴ Bagaric et al., *supra* note 20, at 1694–1702.

²⁴⁵ See *supra* Part V.

²⁴⁶ See *supra* Part III.

²⁴⁷ Jessica Benko, *The Radical Humaneness of Norway's Halden Prison*, N.Y. TIMES MAG. (Mar. 26, 2015), <http://www.nytimes.com/2015/03/29/magazine/the-radical-humaneness-of-norways-halden-prison.html>; *Council of Europe Annual Penal Statistics: Norway*, COUNCIL OF EUROPE (2010), <http://wp.unil.ch/space/publications/recidivism-studies>.

²⁴⁸ Benko, *supra* note 247.

inmates are working toward reentry after their admission to prison, whereas in the United States, inmate reentry is just beginning to gain serious traction.²⁴⁹

Unlike most inmates of American prisons, prisoners in Norway, Finland, and Sweden can maintain their access to health, social, and educational services that are available to free people²⁵⁰ and maintain close relationships with their relatives because their partners and children are able to stay in free accommodation at the prisons on weekends.²⁵¹ Many Scandinavian prisoners occupy more spacious cells than inmates of American prisons,²⁵² and even the cells of maximum-security inmates in Norway's Halden Prison have unbarred windows, designer furniture, and en-suite bathrooms.²⁵³ Also in Halden Prison, and in Finnish prisons, guards are unarmed, and inmates are encouraged to assess and provide suggestions for improvements to prison conditions.²⁵⁴

Thus, the principal difference between Scandinavian and American prisons is that the former are based on the ethos that the core punishment that imprisonment should inflict on offenders is deprivation of their liberty, which constitutes a serious and considerable hardship, and that prisoners should not experience any further avoidable suffering. To the extent possible, conditions in Scandinavian prisons emulate community standards of accommodation. By confining offenders in their own accommodations, rather than detaining them in the institutionalized, caged environment of conventional American prisons, technological incarceration will achieve the same advantages of the Scandinavian prison model and reinforce that depriving people of their liberty is alone a considerable and sufficient infliction of pain on offenders.

The emotional resistance to technological incarceration that we anticipate from the community will be more difficult to surmount than logical criticisms that may be levelled at our proposal. By their nature, people's feelings are not readily able to be changed through rational discourse.²⁵⁵

²⁴⁹ DeMichele, *Electronic Monitoring: It Is a Tool, Not a Silver Bullet*, *supra* note 129, at 394–95.

²⁵⁰ JOHN PRATT & ANNA ERIKSSON, *CONTRASTS IN PUNISHMENT: AN EXPLANATION OF ANGLOPHONE EXCESS AND NORDIC EXCEPTIONALISM* 125 (2013).

²⁵¹ John Pratt, *Scandinavian Exceptionalism in an Era of Penal Excess*, 48 *BRITISH J. CRIMINOLOGY* 119, 122 (2007).

²⁵² PRATT & ERIKSSON, *supra* note 250, at 122.

²⁵³ Sunanda Creagh, *Nordic prisons less crowded, less punitive, better staffed*, *THE CONVERSATION* (Mar. 19 2013), <http://theconversation.com/nordic-prisons-less-crowded-less-punitive-better-staffed-12885>.

²⁵⁴ *Id.*

²⁵⁵ See DAVID HUME, *A TREATISE OF HUMAN NATURE* (1738) 458 (1978). For a fuller account of Hume's theory of motivation, see M. Smith, *Valuing: Desiring or Believing?*, in

Nevertheless, empirical research shows that while people have an intrinsic desire to punish wrongdoers, this inclination can be suppressed if they recognize that such punishment is contrary to their self-interest.²⁵⁶

Politicians could thus persuade the community of the need to implement alternatives to prison, such as technological incarceration, by highlighting the the extraordinary and unsustainable fiscal burden on the community of conventional imprisonment, especially at its current rate. Politicians should have considerable confidence in their capacity to justify the development of technological incarceration as a substitute to conventional imprisonment particularly at this time, given that there is profoundly strong recent evidence that the community is now receptive to the concept of less harsh penalties. As noted above, in recent years, even victims' groups, police, and prosecutors have taken the unusual step of calling for more lenient sanctions.²⁵⁷ Further, electronic monitoring is at present a common sanction and its use is growing.²⁵⁸ The community is, therefore, already accustomed to the concept of offenders being imprisoned in locations other than prisons. Moreover, there has been no demonstrated opposition to this sanction, which suggests that it has community support. Accordingly, there is ample reason to assume that the timing is right, from social, legal, and economic perspectives, for the development and implementation of technological incarceration.

VI. RECOMMENDED IMPLEMENTATION OF PROPOSED REFORMS

We acknowledge that the reforms proposed in this Article are ambitious and substantial, not least because they depend on the use of technology that has not yet been tested in the context of punishing and containing offenders. Given the novelty of the proposals and the potential fallibility of any new technology or system, we recommend the gradual implementation of technological incarceration. This will also ensure there is sufficient time for testing and refining the required technology and for the community to accept and recognize the advantages of technological incarceration. Punishment and sentencing of offenders are not solely, and in fact not mainly, rational processes. As indicated earlier, it is the area of social policy where there is the biggest gap between what knowledge demonstrates is achievable and practice. Given that punishment and sentencing policy and practice are largely driven by emotional responses to offenders, including fear and dislike

REDUCTION, EXPLANATION AND REALISM (D. Charles & C. Lennon eds., 1992).

²⁵⁶ See generally Mirko Bagaric, *Scientific Proof that Humans Enjoy Punishing Wrongdoers: The Implications for Punishment and Sentencing*, 1 INT'L J. PUNISHMENT & SENT'G 98 (2005).

²⁵⁷ See *supra* Part II.

²⁵⁸ See *supra* Part III.

of them,²⁵⁹ it is important that technological incarceration is implemented in a systematic and methodical manner that reduces the likelihood of system failures. It is foreseeable that large-scale or high-profile failures of aspects of this sanction could lead to a disproportionate loss of confidence in the concept, thereby jeopardizing the adoption of technological incarceration.

The first phase of implementing technological incarceration will comprise laboratory field testing using participants who are not prisoners. This would involve testing all aspects of the technology. Once the integrity of the system is validated at the testing phase, it should then be rolled out for real offenders. Given the novelty of the proposal, there is no blueprint for how best to implement technological incarceration in real-life settings. This is a matter on which legislatures will obviously have different views.

However, in our view, in light of the fact that sentencing reform tends to evoke emotive responses from the community, the implementation should carefully target specific categories of offenders and be promulgated as a variant of existing sanctions, as opposed to a completely new reform. We suggest that technological incarceration should be promoted as an extension of electronic monitoring, with significant additional functionalities to improve the community protection aspects of this sanction. This description properly characterizes technological incarceration, but in rolling out technological incarceration, it is important to ensure that it is expressly explained and justified to the community in this way.

After the technology has undergone the laboratory testing phase, there should be an initial twelve-month-long trial of technological incarceration.²⁶⁰ This should be conducted in relation to offenders of whom the community has the least to fear and whose offenses have caused the least amount of harm. Thus, technological incarceration should be initially trialed in relation to offenders who have committed fraud and other property offenses. As we have seen, property crimes cause the least amount of harm to victims,²⁶¹ and, hence, starting a trial with this offender cohort will be particularly likely to garner community approval of technological incarceration. Confining the trial to this cohort of offenders has the additional advantage that it is this group of offenders who often already qualify for electronic monitoring.²⁶² In particular, it is important that sexual and violent offenders are not part of the initial trial. The trial should also be confined to offenders who already have a residence and whose co-residents consent to the trial. This will ensure that

²⁵⁹ Bagaric et al., *supra* note 217, at 787, 819–27, 848.

²⁶⁰ This period is sufficiently long to provide an informed assessment of the capabilities and limitations of the technology.

²⁶¹ See *supra* Part III.

²⁶² See *supra* Part IV.

the trial is conducted in the most efficient and cost-effective manner.

There is no objectively ideal number of offenders who should be subjected to the initial trial. In our view, however, the quantity of offenders who participate in it should be high, given the urgency of the need to remedy the mass incarceration problem. Further, for a trial to be an informed and relevant indication of the workings and functionality of technological incarceration, the capacity of the system to deal with a large number of offenders must be tested by the trial. As a crude figure, we propose that approximately 10,000 offenders should participate in the first trial. The proposal to involve 10,000 prisoners in the pilot stage may seem ambitious, but this figure only represents approximately 0.5% of the prison and jail population (which, as we noted above, is over two million). Moreover, the potential benefits of the new sanction are profound, and to realize these benefits, it is important to undertake testing and refinement of the sanction in a scaled-up context, especially given the enormous number of prisoners who should ultimately be subjected to it.

Once the technology has been validated, it should then be rolled out more widely. The offender cohorts that should first be subjected to technological incarceration are those who have not committed violent or sexual crimes. Violent and sexual offenders should only be subjected to technological incarceration once the integrity of the system is totally validated and once there is wide-ranging community acceptance of the sanction. It is of course impossible to anticipate the timeframe for the entire roll-out of the proposal. This will be contingent on a number of variables, including the workings and reliability of technology, its cost, the level of community endorsement, and the strength of the political resolve to implement the sanction. However, as with most policy initiatives, it is desirable to set in place a working timeframe. To this end, we suggest that a timeframe of approximately fifteen years should be set for the full roll-out of technological incarceration. At this point, all prisons in the United States would be emptied and repurposed, except for the small number of prisons that will be required to house offenders who have committed first-degree murder or seriously breached the conditions of technological incarceration.

CONCLUSION

With approximately one in a hundred American adults in prison, the United States can no longer ignore its mass incarceration crisis. Moreover, American society is increasingly conscious that its favored mode of punishing offenders, which is being imposed at an ever-expanding rate that is higher than that of any other nation on Earth—brick-and-mortar incarceration—is greatly problematic. Its costs to the public are exorbitant

and financially unsustainable; it violates basic human rights to an unwarranted extent; it fails meaningfully to achieve sentencing objectives that have historically been cited to justify such a harsh sanction (including that it rarely rehabilitates offenders); and it can, in fact, lead to increased recidivism.

The ubiquity of technology in 21st-century American society is attributable to the improvements that it can offer for so many aspects of day-to-day life. Yet a striking anomaly in the expanding pervasiveness of technological and scientific developments is that they have been used only minimally to alter centuries-old methods of imprisonment. Beyond the use of electronic monitoring bracelets, imprisonment today in the United States bears a great resemblance to incarceration of days gone by. The gulf between current criminal sanctions and technological developments is explicable on the basis that there is no empathy for criminals and criminals have no political capital. Consequently, there has not been a strong motivation to carefully examine the manner in which criminal sanctions can and should be reformed in light of contemporary technological capabilities.

There is, however, growing receptiveness at present to reform of the United States prison system in light of the mass imprisonment crisis, and technological incarceration can, to a large extent, address current concerns about conventional imprisonment. This Article recommends far-reaching, fundamental reform to the manner in which we accommodate individuals convicted of serious offenses, which would be superior to conventional imprisonment in several key ways. Technological incarceration would fulfill the two achievable sentencing objectives—community protection and punishment of offenders—in a significantly cheaper and more humane way than conventional imprisonment. It can be more easily adapted than conventional incarceration to inflict a level of hardship on offenders that is proportionate to the crimes they have committed. Further, it is likely to realize the aim of community protection more successfully than conventional imprisonment because of its potential to rehabilitate offenders and lower their rate of recidivism (including by facilitating their integration into the community upon their release from incarceration).

It is feasible to adapt existing technology to implement the three core elements of the proposed system of technological imprisonment to ensure that offenders are confined to designated geographical zones and are immediately and effectively immobilized if they attempt to escape or harm others. First, electronic monitoring of humans' locations is currently used effectively. Second, computer software has been developed that can detect suspicious or unusual human movements and trigger an alarm so that their actions can be monitored by humans. Third, CEDs are already in use and

available technology can be adapted to activate them remotely.

There are likely to be two major objections to our proposal. The first is that technological incarceration is too harsh because it violates basic human rights, especially the right to physical integrity by virtue of its use of CEDs to incapacitate offenders. The second probable objection to technological incarceration is that the sanction is not tough enough because offenders will enjoy far more autonomy and fulfilling experiences than inmates in conventional prisons. As discussed above, both of those arguments are flawed, and the fact that the reforms will be criticized as being both too harsh and too soft is a good indication that they are well-balanced. Technological imprisonment falls within the definition of punishment because its deprivation of prisoners' liberty and privacy inflicts hardship and suffering on offenders. Nevertheless, it does not impose on prisoners the gratuitous, additional deprivations of conventional imprisonment, which violate offenders' human rights unnecessarily and excessively, and ultimately impedes offenders' rehabilitation. Further, technological incarceration encourages offenders to pursue constructive and law-abiding lives after release from incarceration and, therefore, enhances community protection. Various features of technological incarceration would ensure that the community is protected while offenders are subject to it, including tamper-proof electronic ankle bracelets that monitor offenders' locations and alert law enforcement authorities if they seek to move beyond the geographical zones to which they are confined; sensor harnesses that record offenders' actions and transmit the data to computers for analysis in real time; and swift, remote immobilization of offenders who attempt to leave designated areas, evade monitoring or commit dangerous acts.

There is now considerable support for lighter penalties, even amongst victims' groups, police, and prosecutors, but no overarching, coherent alternative to conventional prisons has yet been proposed. This Article provides that alternative. Technological incarceration is capable of attracting wide-ranging support within the community. It is, after all, an extension of an existing sanction—electronic monitoring—with enhanced functionalities that can better protect the community.

Technological incarceration should be substituted for conventional imprisonment for all offenders, with the exception of those who have committed capital crimes and who have seriously violated the conditions of technological imprisonment. This would result in the closure of virtually every prison in the United States. In the process, the community would be safer and governments would have more money to spend on critical social services including education and health.

By adopting this reform proposal, the United States would become a

beacon for progressive and effective criminal justice reform, as opposed to being an international outlier for its excessive punishment of its own people.