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LEVERAGING PREDICTIVE POLICING ALGORITHMS TO
RESTORE FOURTH AMENDMENT PROTECTIONS IN HIGH-CRIME
AREAS IN A POST-WARDLOW WORLD

KELLY K. KOSS*

INTRODUCTION

Before walking the streets of his beat in Chicago’s West Englewood neighborhood, on October 25, 2017, Officer Adams uses one of the station’s computers to get the latest report on today’s forecasted criminal activity.¹ The report designates part of Officer Adams’ beat, specifically the 500-foot radius around the intersection of South Ashland Avenue and West 72nd Street, as a “high-crime area”² for brown-heroin trafficking. The statistical output from the Chicago Police Department’s sophisticated predictive policing software indicates that at around 8:22 P.M., Officer Adams can anticipate that a gang-related brown-heroin trafficking transaction will occur at this location. At 8:26 P.M, Officer Adams observes two young black men huddled closely together; one of them is holding a plastic bag at the corner of South Ashland Avenue and 73rd Place, which is located approximately 1,000 feet from the anticipated drug trafficking location. Before Officer Adams acts to stop-and-frisk the two men, he must decide whether his minimal observations—the two men huddled together while one holds a plastic bag—combined with the high-crime designation 1,000 feet north of this location, is enough to establish reasonable suspicion. *Is it?*

The United States Supreme Court has yet to hear a case addressing issues related to law enforcement’s use of data-driven tips from predictive policing software. However, soon, the courts will need to address how data from predictive policing software factors into the Fourth Amendment’s³

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1. Please note that this is a hypothetical situation intended to illustrate how predictive policing is or may be used in the future by some police departments. The Chicago Police Department currently employs CompStat in its operations and not the technology described above.

2. *Adams v. Williams*, 407 U.S. 143, 144 (1972) (creating the term “high-crime area”).

3. The Fourth Amendment guarantees “[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures . . .” U.S. CONST. amend. IV.

reasonable suspicion calculus because this software is becoming increasingly popular⁴ and is revolutionizing policing practices across the United States. Predictive policing technologies have become so powerful that these complex computerized algorithms⁵ can now help reveal localized future crime patterns before they even emerge.⁶

Predictive policing is defined as using quantitative analysis to make statistical predictions to suggest probable targets for criminal activity, prevent crime, and solve past crimes.⁷ The theory that crime is predictable is well documented.⁸ Studies have demonstrated that criminals are creatures of habit, committing the same types of crimes that they have successfully committed in the past.⁹ Not only do criminals repeatedly commit the same types of crimes, they also tend to commit subsequent crimes in close geographic proximity to the original crime at approximately the same time of day as the original crime.¹⁰ For decades, law enforcement agencies have taken advantage of this predictability by linking geospatial information to past crime data.¹¹ Police departments initially placed pushpins on paper maps to reveal clusters of criminal activity within a jurisdiction; however, recent technological advances have enabled police departments to move

4. Leslie A. Gordon, *Predictive Policing May Help Bag Burglars—but it May Also be a Constitutional Problem*, A.B.A. J. (Sept. 1, 2013), http://www.abajournal.com/magazine/article/predictive_policing_may_help_bag_burglars—but_it_may_also_be_a_constitutio/.

5. Beth Pearsall, *Predictive Policing: The Future of Law Enforcement?*, 266 NAT'L INST. JUST. J. (June 2010), <http://www.nij.gov/journals/266/Pages/predictive.aspx> (In the case of predictive policing software, an algorithm is a complex mathematical formula “taking data from disparate sources, analyzing them and then using results to anticipate, prevent and respond more effectively to future crime.”).

6. For example, the Santa Cruz Police Department uses PredPol software to forecast crime using a complex algorithm that takes information about past crimes and makes projections on a daily basis about which locations and windows of time have a heightened risk for crime. See Erica Goode, *Sending the Police before There's a Crime*, N.Y. TIMES, Aug. 15, 2011, <http://www.nytimes.com/2011/08/16/us/16police.html>.

7. WALTER L. PERRY ET AL., PREDICTIVE POLICING: THE ROLE OF CRIME FORECASTING IN LAW ENFORCEMENT OPERATIONS 1–2 (2013).

8. See Gordon, *supra* note 4 (quoting George Mason University Professor, Cynthia Lum, who says that crime is predictable—“[i]t's most likely to occur tomorrow where it occurred yesterday. We know that about offenders too: People who commit crimes are likely to commit them again.”).

9. PERRY ET AL., *supra* note 7, at 2.

10. *Id.*; Andrew Guthrie Ferguson, *Big Data Policing in the Big Apple*, HUFFINGTON POST, July 15, 2014, http://www.huffingtonpost.com/andrew-guthrie-ferguson/big-data-policing-in-the_b_5588009.html [hereinafter Ferguson, *Big Data*] (explaining “certain crimes—burglary, car theft, and theft from automobiles—are rather dependent on place and opportunity.”).

11. See Nate Berg, *Predicting Crime, LAPD-style: Cutting Edge Data-Driven Analysis Directs Los Angeles Patrol Officers to Likely Future Crime Scenes—but Critics Worry that Decision-Making by Machine will Bring 'tyranny of the algorithm'*, THE GUARDIAN, June 25, 2014, <http://www.theguardian.com/cities/2014/jun/25/predicting-crime-lapd-los-angeles-police-data-analysis-algorithm-minority-report>.

beyond this rudimentary system of prediction. Many law enforcement agencies now use sophisticated computer programs to leverage complex algorithms to link and analyze vast datasets, and reveal previously unseen crime patterns.¹² Police departments use information obtained from these statistical analyses to inform their police work.¹³

Although predictive policing technology has an array of the potential uses, the scope of this Note is limited to addressing how the statistical outputs from these technologies can be factored into the reasonable suspicion calculus to reduce the number of Terry stops¹⁴ performed in alleged high-crime areas. Predictive policing technology can be used to corroborate a police officer's "high-crime area" designation and help restore eroded Fourth Amendment protections to these neighborhoods. As the use of sophisticated predictive policing software becomes more widespread,¹⁵ courts will need to address the role that data from this technology plays in corroborating an officer's finding of reasonable suspicion in alleged high-crime areas.¹⁶

Courts all over the United States have struggled to define "high-crime area" since the Supreme Court's decision in *Illinois v. Wardlow*.¹⁷ *Wardlow* essentially reduced the reasonable suspicion "totality of the circumstances" analysis to a two-factor test in certain geographic areas: permitting the characterization of a neighborhood as "high-crime" to serve as a plus-factor for finding reasonable suspicion.¹⁸ However, the *Wardlow* Court failed to define the term "high-crime area."¹⁹ Furthermore, the Court did not offer any guidance regarding the evidentiary showing necessary to

12. See PERRY ET AL., *supra* note 7, at 2.

13. Gordon, *supra* note 4 (explaining that departments use data outputs to allocate personnel, reduce environmental vulnerabilities in neighborhoods, identify future crime hotspots, and generally reduce crime and recidivism).

14. Please note that the author uses the terms "stop and frisk" and "Terry Stop" interchangeably throughout this Note. A "Terry stop" is a general exception to the rule that a police officer must have probable cause to search a suspect. *Florida v. Royer*, 460 U.S. 491, 499 (1983). A lawful Terry stop permits a police officer to perform a brief seizure and partial search of a criminal suspect, when the totality of the circumstances leads the officer to believe that criminal activity may be afoot. *Terry v. Ohio*, 392 U.S. 1, 30 (1968). The partial search, or "frisk authority applies only when a concern about violence exists." Fabio Arcila Jr., *Nuance, Technology, and the Fourth Amendment: A Response to Predictive Policing and Reasonable Suspicion*, 63 EMORY L.J. 87, 89 (2014), available at <http://ssrn.com/abstract=2464257> (citation omitted).

15. See Andrew Guthrie Ferguson, *Predictive Policing and Reasonable Suspicion*, 62 EMORY L.J. 259, 262 (2012).

16. See *id.* at 312.

17. 528 U.S. 119, 124 (2000).

18. See *id.*

19. See Hannah Rose Wisniewski, *It's Time to Define High-Crime: Using Statistics in Court to Support an Officer's Subjective "High-Crime Area" Designation*, 38 NEW ENG. J. ON CRIM. & CIV. CONFINEMENT 101, 106 (2012).

corroborate a police officer's assertion that a neighborhood has a high propensity for crime.²⁰ Lacking guidance, the lower courts have taken a haphazard approach to defining the term "high-crime area," leading to amorphous and inconsistent definitions across jurisdictions.²¹ Thus, courts have generally deferred to a police officer's subjective belief that an area is high-crime, and have not required law enforcement agencies to corroborate an officer's belief with quantitative evidence.²²

The courts' failure to require law enforcement agencies to present concrete evidence demonstrating that a neighborhood has a heightened propensity for crime raises significant constitutional concerns. Areas defined as "high-crime" tend to disproportionately represent low-income and minority neighborhoods.²³ Courts' deference to police officers' subjective experiences has created significant animosity between the residents of these neighborhoods and law enforcement.²⁴ The high-crime label often coincides with an increased police presence in these neighborhoods.²⁵ Moreover, using the high-crime designation as a plus factor in a two-factor totality of the circumstances test, lowers the threshold for reasonable suspicion in these neighborhoods, and ultimately strips residents of critical con-

20. *See id.*

21. *See* Andrew Guthrie Ferguson & Damien Bernache, *The "High-Crime Area" Question: Requiring Verifiable and Quantifiable Evidence for Fourth Amendment Reasonable Suspicion Analysis*, 57 AM. U. L. REV. 1587, 1605, 1607–08 (2008).

22. *See id.* at 1607–08 (providing examples of the many incantations of high-crime area definitions and the array of evidence offered in various courts to support these definitions); Lenese C. Herbert, *Can't You See What I'm Saying? Making Expressive Conduct a Crime in High-Crime Areas*, 9 GEO. J. ON POV. L. & POL'Y 135, 136–36 (2002) (explaining that in her experience as an Assistant United States Attorney she would question police officers about their high-crime area characterizations before trial, and how judges never asked for data to support these assertions in court).

23. David A. Harris, *Factors for Reasonable Suspicion: When Black and Poor Means Stopped and Frisked*, 69 IND. L.J. 659, 677–78 (1994); *see also* David Seawall, *Wardlow's Case: A Call to Broaden The Perspective of American Criminal Law*, 78 DENV. U. L. REV. 1119, 1131 (2001) (stating "due to the politics of past and present racism, minority members are often forced to live in poverty-stricken, crime-riddled communities, and this segregation continues despite race-neutral policies.").

24. *Suspect Fits Description: Responses to Racial Profiling in New York City: A Panel Discussion with Darius Charney, Jesus Gonzalez, David Kennedy, Noel Leader, and Robert Perry*, 14 CUNY L. REV. 57, 63–64 (2010) (stating "I have not been any place where there is a lot of street action of this kind, where a lot of it was not transparently, inherently, flagrantly illegal Because of all of that, it undercuts the legitimacy, especially of the police in these communities and the alternative to having a legitimate law enforcement presence in the community is community self-help. And that is part of the reason that in these communities we are seeing the growth of a "stop snitching" and vendetta culture, because people feel that they have no recourse to law and order to deal with their personal and social problems"); *see* Seawall, *supra* note 23, at 1131 (explaining that the "high-crime area designation as a basis for increased legal justification of police, and the diminished expectations of privacy for residents, only perpetuate this distrust and the politics of identification.").

25. *See generally* MICHELLE ALEXANDER, *THE NEW JIM CROW* (2012) (arguing that the War on Drugs has led to heavy policing in low-income and minority neighborhoods and ushered in an era of mass incarceration and structural racism in our criminal justice system).

stitutional protections.²⁶ Thus, individuals living in these neighborhoods do not enjoy the same level of Fourth Amendment protections as individuals residing in wealthier whiter neighborhoods.²⁷

However, the prevalent use of predictive policing software and its increasing sophistication provides courts with an opportunity to narrowly define high-crime areas based on both geography and specific crime type. Requiring law enforcement to use narrow crime-specific definitions, and requiring these agencies to present quantitative evidence that supports these designations will help restore eroded Fourth Amendment protections to people living in neighborhoods historically stamped with the high-crime label. This Note argues that uniform standards and best practices must be developed to guide law enforcement's use of predictive policing software. This software should be leveraged as a tool to help restore previously eroded Fourth Amendment rights.

Part I briefly describes the development of predictive policing technologies. It illustrates this technology's ability to inform high-crime area classifications based on both geography and specific crime type, and describes the relevant limitations of this technology. Part II describes the erosion of Fourth Amendment protections for individuals in designated high-crime areas since *Terry v. Ohio*, and focuses on the deterioration of the totality of circumstances test into a two-factor test in *Illinois v. Wardlow*. It also illustrates how courts have struggled to define the term "high-crime area." Part III describes the effect that heavy policing and the high-crime area label has had on low-income and minority neighborhoods. Part IV focuses on the role of technology in Fourth Amendment jurisprudence. Part V argues that courts must require objective data to evaluate whether an area is "high-crime." It argues that Congress should pass legislation to establish uniform standards to guide the use of predictive policing technologies. Implementing uniform standards and best practices would ensure fair, accurate, and reliable data collection and analysis, enabling courts to reasonably rely on statistical outputs from these technologies in evidence suppression hearings.

26. See Andrew Guthrie Ferguson, *Crime Mapping and the Fourth Amendment: Redrawing "High-Crime Areas"*, 63 HASTINGS L.J. 179, 209, 214–15 (2011) [hereinafter Ferguson, *Crime Mapping*].

27. See *id.*

I. A BRIEF OVERVIEW OF THE DEVELOPMENT AND CAPABILITIES OF PREDICTIVE POLICING TECHNOLOGIES

CompStat, the precursor to the latest generation of predictive policing technologies, emerged in New York in 1994.²⁸ The New York City Police Department (NYPD) used CompStat to compile statistical data to show when and where different types of crime occurred in the city.²⁹ The NYPD used this data to distribute personnel and tailor its policing strategies to address these “hotspots” of criminal activity—revolutionizing the NYPD’s operations.³⁰ Under the CompStat system, data was collected and analyzed weekly, and precinct commanders met every few weeks with the Department’s leadership to discuss crime statistics and modify their policing strategies as needed.³¹ CompStat’s implementation created a constant feedback loop for the NYPD and “coincided with a staggering decline in crime” in New York City.³² Police departments across the United States began using the CompStat system after they learned about the NYPD’s success.³³ Although experts continue to debate the role of CompStat in facilitating New York City’s declining crime rate in the 1990s and early 2000s,³⁴ this software paved the way for the development of the latest emerging predictive policing technologies, which are used today by law enforcement agencies across the United States.³⁵

A. General Overview of New Predictive Policing Technologies

The development of next generation predictive policing programs has garnered not only national attention but also federal financing because of the software’s cost-effectiveness, high-tech image, and promising test results.³⁶ The latest predictive policing programs appear to reduce crime

28. Tina Rosenberg, *Armed With Data, Fighting More Than Crime*, N.Y. TIMES, May 2, 2012, <http://opinionator.blogs.nytimes.com/2012/05/02/armed-with-data-fighting-more-than-crime/>

(“The ideas in CompStat were first developed by Jack Maple, when he was a lieutenant in the New York City Transit Police, as a way to track subway crime and more intelligently deploy transit cops. In 1994, when William Bratton, the chief of the transit police, became chief of the New York City Police Department he brought Maple with him as deputy. They then applied CompStat principles throughout the city’s entire crime fighting operation.”).

29. *See id.*

30. *See id.*

31. *Id.* (noting that before the implementation of CompStat, reports on crimes and arrests were turned in every few months).

32. *Id.*

33. *See id.* (noting that a recent survey by the Police Executive Research Forum “found that 79 percent of medium to large police departments surveyed use some form of the CompStat model.”).

34. *Id.*

35. *See* PERRY ET AL., *supra* note 7, at 4–5.

36. *See* Ferguson, *supra* note 15, at 269–70.

without significantly disrupting other policing efforts in the small geographic areas where they have been tested.³⁷ Moreover, in an era of significant budget cuts, law enforcement agencies are taking advantage of the fact that this software seamlessly blends into their existing crime-fighting operations and saves money by more efficiently allocating resources.³⁸

Predictive policing technology is built upon the popular understanding that criminals are creatures of habit: they repeatedly commit the same types of crimes at around the same time of day in the same geographic area.³⁹ Studies have generally shown that certain property crimes, such as burglary, are highly predictable.⁴⁰ Generally, predictive policing models rely on an assumption that criminals are rational decision-makers who commit crimes by exploiting opportunities created under certain conditions.⁴¹ The latest predictive policing software uses “years—sometimes decades—worth of crime reports, [and] the algorithm analyses [sic] the data to identify areas with high probabilities for certain types of crime, placing little red boxes on maps of the city that are streamed into patrol cars.”⁴² Captain John Romero of the Los Angeles Police Department, explains, “Burglars tend to be territorial, so once they find a neighborhood where they get good stuff, they come back again and again . . . [a]nd that assists the algorithm in placing the boxes.”⁴³ Historically, the use of predictive policing technologies has been limited to tracking, analyzing, and predicting property crimes⁴⁴ because the software was designed to predict “where and when crime is mostly likely to occur, not who will commit it.”⁴⁵ However, unlike CompStat, which relied on data of past criminal activity to extrapolate patterns and predict future criminal activity, the new generation of predictive policing technologies is forward-looking, and truly

37. *Id.* (citations omitted).

38. Goode, *supra* note 6.

39. Ferguson, *supra* note 15, at 272 (stating “[i]t is now generally acknowledged that crime does not randomly disperse across a geographic area”).

40. PERRY ET AL., *supra* note 7, at 2–3.

41. Joel Rubin, *Stopping Crime Before it Starts*, L.A. TIMES, Aug. 21, 2010, <http://articles.latimes.com/2010/aug/21/local/la-me-predictcrime-20100427-1> (stating “a would-be criminal must find a target that is sufficiently vulnerable to attack and that offers an appealing payout. An empty house with no alarm on a poorly lighted street, for example, has a much higher chance of being burglarized than one with a barking dog on a busy block.”).

42. Berg, *supra* note 11.

43. *Id.* PredPol is a popular predictive policing program developed by a private company and is being used by law enforcement agencies all over the world. See generally *SacBee Online—Predpol Results in “Dramatic Crime Reduction”*, PREDPOL, Oct. 16, 2013, <http://www.predpol.com/sacbee-online-predpol-results-in-dramatic-crime-reduction/>.

44. Gordon, *supra* note 4.

45. Berg, *supra* note 11.

predictive.⁴⁶ As will be described below, the latest software can analyze vast and complex data sets in near real time speeds to reveal previously unseen patterns of crimes.⁴⁷

As the capabilities of these programs have advanced, police departments have begun to experiment with using the software to predict other types of crimes, such as gun violence and gang activity.⁴⁸ Although predictive policing technology has many potential uses,⁴⁹ this Note focuses on how this software can be used by law enforcement and the courts to identify and classify high-crime areas by specific crime type and geography. To illustrate how this software works and what it is capable of, the following two sections describe two analytic models that are particularly good at forecasting where and what type of criminal activity will occur: the near repeat model and the risk terrain model (RTM).

B. The Near Repeat Model

The near repeat model for predictive policing technology assumes that crime spreads through local environments on a micro-scale like a contagious disease.⁵⁰ Thus, when certain crimes occur at a location, these crimes tend to create repeat criminal activity in the same location.⁵¹ Professor Mohler of Santa Clara University has created an “earthquake modeling” algorithm based on this near repeat model.⁵² The earthquake modeling algorithm draws a grid over a jurisdiction and estimates the background rate

46. Ferguson, *supra* note 15, at 265 n.31.

47. See generally PERRY ET AL., *supra* note 7 (discussing the various data-mining techniques underlying new crime forecasting software).

48. Douglas Belkin, *Chicago Hunts for Answers to Gang Killings: Police Build Facebook-Like Database to Prevent Swift Cycles of Retaliation*, WALL ST. J., July 12, 2012,

<http://online.wsj.com/news/articles/SB10001424052702303644004577520863051001848>

(explaining that Chicago implemented a program tracking the social connections of many of the city’s gangs to try to keep them apart in the critical hours after an attack); *Can Software that Predicts Crime Pass Constitutional Muster?*, NPR.ORG (July 26, 2013),

<http://www.npr.org/templates/transcript/transcript.php?storyId=205835674> (discussing how Seattle has expanded its use of its predictive policing program, PredPol, to predict gun violence in the city); see also Gordon, *supra* note 4.

49. PERRY ET AL., *supra* note 7, at 8 (describing how these technologies are evolving to include capabilities such as identifying future offenders, creating offender profiles to match likely offenders with future crimes, and identifying potential crime victims); Berg, *supra* note 11 (describing how various law enforcement agencies across the United States are using PredPol as part of their policing strategies).

50. G.O. Mohler et al., *Self-Exciting Point Process Modeling of Crime*, 106 J. AM. STAT. ASS’N, 100, 100 (2011), available at <http://www.tandfonline.com/loi/uasa20#.VCmY1fldUk0>.

51. Ferguson, *supra* note 15, at 277 n.103 (“Research demonstrates that prior victimisation is a very good predictor of future risk and that when it occurs, repeat victimisation tends to occur swiftly.”).

52. PERRY ET AL., *supra* note 7, at 42; see also Ferguson, *supra* note 15, at 268.

at which new crime appears in each cell of the grid.⁵³ When a new crime occurs in a cell, the algorithm assumes that the rate for the new crime will temporarily increase, like an aftershock following an earthquake.⁵⁴ Over time, the rate for new crime declines the longer the cell goes without seeing any new crime, similar to how the aftershocks of an earthquake diminish over time.⁵⁵ As one of PredPol's developers, Jeffrey Brantingham, explains, "[C]rime hotspots pop up and spread and disappear and pop up again in really complicated ways that are just very, very difficult, if not impossible, for the individual to intuit."⁵⁶ Thus, to ensure accuracy when using the near repeat model, agencies must regularly input new data into the software because without up-to-date information, the utility of the software's predictions will diminish over time.⁵⁷

Software based on the near repeat model has a high-rate of success for predicting where and when burglaries are likely to occur in an area.⁵⁸ Although the near repeat model can accurately predict patterns in property crimes, it is unclear whether this model can effectively forecast other types of crime, such as gun violence or crimes of passion.⁵⁹ However, the results of one study were promising. The study showed that the near repeat model accurately forecasted the location of violent rival-gang related activity.⁶⁰ These findings support the proposition that in evidence suppression hearings, courts could rely on statistical outputs from predictive policing software to evaluate a police officer's claim that a particular stop-and-frisk occurred in a high-crime area.

C. Risk Terrain Modeling (RTM)

The risk terrain model serves as the foundation for some predictive policing software. RTM uses geographic information systems to identify geographic features that contribute to elevated crime risk and overlays them onto a base map.⁶¹ Potential geographic features used to predict crime risk in this model include: bars, liquor stores, and strip clubs.⁶² RTM is akin

53. PERRY ET AL., *supra* note 7, at 42. See also Ferguson, *supra* note 15, at 268 (describing the Santa Cruz Police Departments use of Mohler's software).

54. PERRY ET AL., *supra* note 7, at 42.

55. *Id.*

56. Berg, *supra* note 11.

57. See Ferguson, *supra* note 15, at 281.

58. See PERRY ET AL., *supra* note 7, at 42 (detailing studies using near repeat theory to predict burglaries).

59. *Id.* at 44.

60. Mohler et al., *supra* note 50, at 100 (citations omitted).

61. PERRY ET AL., *supra* note 7, at 51.

62. *Id.*

to a base map with layers of tracing paper laid on top of it—as more environmental features are plotted on top of each other, clusters of potential criminal activity are revealed based on these existing features.⁶³ The model's algorithm then makes predictions about an area's risk for crime based on how close the selected geographic location is to identified environmental features.⁶⁴

Unlike the near repeat model, the RTM predicts crimes based on the interactions between behavioral, social, physical, and environmental factors, instead of solely using information about where and when past criminal activity occurred.⁶⁵ For example, in Morris County, New Jersey, a RTM map was created to analyze burglaries.⁶⁶ The map was generated using five variables: “(1) past burglaries, (2) the residential location of individuals arrested for theft or burglary between 2009 and 2011, (3) the proximity to major highways, (4) the geographic concentration of males between the ages of 16 and 24, and (5) the location of apartment complexes and hotels.”⁶⁷ Morris County police administrators used the map to direct their resources to high-risk areas, which led to a general decrease in crime, and more specifically, decreases in both violent and property crimes.⁶⁸ RTM is considered genuinely predictive; it forecasts future crime using a location's geographic and environmental attributes rather than relying on data related to past criminal activity in that area.⁶⁹ Hence, software based on RTM could potentially be used to accurately forecast potential hotspots for specific types of criminal activity.

Although new predictive policing software has the potential to precisely define high-crime areas, the models underlying the software have limitations. The following section describes the general limitations of predictive policing technologies. Part V describes how to overcome these limitations to ensure that these technologies produce fair, accurate, and reliable data that courts can use to decide whether the high-crime label is appropriate for an area.

63. *See id.*

64. *See id.*

65. Ferguson, *supra* note 15, at 281 (citing Leslie Kennedy et al., *Risk Clusters, Hot Spots, and Spatial Intelligence: Risk Terrain Modeling as a Algorithm for Police Resource Allocation Strategies*, 27 J. QUANTITATIVE CRIMINOLOGY 339, 345–46 (2011)).

66. *Id.* at 282.

67. *Id.* (citations omitted).

68. *Id.* (citations omitted).

69. PERRY ET AL., *supra* note 7, at 53–55.

D. General Limitations of Predictive Policing Technologies

Although predictive policing software provides law enforcement agencies with a powerful tool that can help them efficiently allocate crime fighting resources, these technologies have some common limitations. First, effective use of predictive policing technologies requires reliability, transparency, and accuracy in data collection and analysis; without safeguards in place, data is susceptible to human fallibility.⁷⁰ Second, taken alone, predictive policing software cannot establish the requisite level of particularized suspicion required to perform a lawful Terry stop (premised on reasonable suspicion).⁷¹

1. Humans Create Data, Which Leaves it Fallible to Human Error

Currently, there are no uniform standards or best practices in place to guide police departments as they collect the data that will be used as inputs for statistical analysis. Data creation requires humans to select what information to collect and what information to discard—similar to the old adage, “garbage in, garbage out.”⁷² An uninformed user may believe that the representation of “previously unseen truths” generated by predictive policing software tells an entirely objective story.⁷³ However, this is not the case, because “[d]ata is something we create”⁷⁴ by making choices about what information to collect and the method used to collect it. Thus, police departments and courts should proceed cautiously when evaluating the statistical outputs from predictive policing algorithms because “[t]he word ‘data’ connotes fixed numbers inside hard grids of information and as a result, it is easily mistaken for fact.”⁷⁵

Moreover, humans select the language used to describe data—there is no mandatory program in place to guide data classification. Unfortunately, there is a common misconception that local law enforcement agencies are required to conform to the Federal Bureau of Investigation’s (FBI) Uniform Crime Reporting (UCR) Program standards to classify crimes.⁷⁶

70. See Ferguson, *Big Data*, *supra* note 10.

71. See Arcila, *supra* note 14, at 90.

72. See Ferguson, *Big Data*, *supra* note 10; see also Berg, *supra* note 11 (writing that one expert worries that “there’s too much submissive acceptance of these technologies by the public, without consideration of exactly how this data is collected and used.”).

73. Quentin Hardy, *Why Big Data is Not Truth*, N.Y. TIMES, June 1, 2013, <http://bits.blogs.nytimes.com/2013/06/01/why-big-data-is-not-truth/>.

74. *Id.*

75. *Id.*

76. See *Uniform Crime Reports*, FED. BUREAU OF INVESTIGATION, <http://www.fbi.gov/about-us/cjis/ucr/ucr> (last visited Nov. 9, 2014).

However, when reviewing the UCR Handbook it becomes clear that this program is *permissive*, and the FBI merely *recommends* that agencies conform to its classification system.⁷⁷ As the FBI explains on its website, “[O]ffense definitions may vary from state to state” and the FBI asks “agencies to report offenses not according to local or state statutes but according to those guidelines provided in the handbook.”⁷⁸ The FBI notes that “[m]ost agencies make a good faith effort to comply with established guidelines,”⁷⁹ however, compliance is not required. Hence, law enforcement agencies have discretion to describe crime data even when reporting to the FBI under the UCR Program.⁸⁰ As such, one might say, the data is “only as good as the people using it.”⁸¹

Moreover, critics of predictive policing technologies suggest that data-driven policing may create “self-fulfilling cycles of bias” for police departments using this information to make resource allocation decisions.⁸² For example, if statistical outputs suggest that a neighborhood is a “high-crime area”, a law enforcement agency may police that area more heavily than others. This increased police presence may in turn generate more arrests in the neighborhood because of the increased crime detection capacity. Thus, when new arrest data is added to the predictive policing software, it may reinforce a department’s original prediction by directing crime-fighting resources to an area that is already heavily policed. The algorithm then gives the impression that there are heightened levels of criminal activity in that neighborhood, when in reality, more criminals are getting caught because there are more police officers present to detect crime.⁸³ Heightened police presence in a neighborhood can lead to more stop-and-frisks and skew the data, so it appears that one neighborhood has a higher crime rate than other areas.⁸⁴ Thus, without safeguards in place, data analytics and

77. *A Word About UCR Data*, FED. BUREAU OF INVESTIGATION, <http://www.fbi.gov/about-us/cjis/ucr/word> (last visited Nov. 9, 2014).

78. *Id.*

79. *Id.*

80. *See id.*

81. Hardy, *supra* note 75.

82. Somini Sengupta, *In Hot Pursuit of Numbers to Ward Off Crime*, N.Y. TIMES, June 19, 2013, <http://bits.blogs.nytimes.com/2013/06/19/in-hot-pursuit-of-numbers-to-ward-off-crime/>.

83. *Id.*; *see* Berg, *supra* note 11 (quoting Jennifer Lynch, senior staff attorney at the Electronic Frontier Foundation, who says that with these technologies “what we forget is that the information that went in may have been subject to bias . . . may have been collected in certain communities more than other communities. The problem is technology legitimizes somehow the problematic policing that was the origination of the data to begin with.”).

84. *See* Berg, *supra* note 11; Sengupta, *supra* note 82; *see generally* ALEXANDER, *supra* note 25 (discussing how the War on Drugs has contributed to heavy policing of low-income and minority neighborhoods).

data collection are susceptible to human fallibility. “Predictive policing can be a very useful tool, but it is just that—a tool. It is not a crystal ball.”⁸⁵

2. Predictive Policing Technologies Cannot Establish Particularized Suspicion that Criminal Activity is Afoot

Under the Fourth Amendment reasonable suspicion analysis, performing a lawful stop-and-frisk of a suspect requires police officers to have a particularized suspicion that criminal activity is afoot.⁸⁶ In order to justify a Terry stop, an officer needs to observe a person acting suspiciously.⁸⁷ Because predictive policing software uses probabilities to predict when and where criminal activity is likely to occur,⁸⁸ a police officer cannot use the statistical data derived from this software as his sole basis for justifying a Terry stop. In other words, these technologies can provide generalized predictions of criminal activity but they cannot establish the requisite particularized suspicion required by the Fourth Amendment’s reasonable suspicion calculus. For example, Seattle’s PredPol software predicted that a robbery would unfold in a “tiny patch of downtown that is dotted with liquor stores and loiterers.”⁸⁹ A robbery occurred in the area as predicted. However, “not one that a computer program could have predicted: a thief walked into a Chinese restaurant and made off with a live crab.”⁹⁰

As one expert laments, “[T]echnology such as predictive policing creates ‘categorical suspicion’ of people in predicted crime areas, which can lead to unnecessary questioning or excessive stopping-and-searching.”⁹¹ Thus, reliance on statistical outputs from predictive policing technologies must be limited to helping an officer develop a generalized suspicion about imminent criminal activity.⁹² An officer still needs to observe a specific person behaving suspiciously in order to perform a lawful Terry stop in an alleged high-crime area.⁹³ The concepts of particularized suspicion and the reasonable suspicion calculus are described in more detail below.

85. PERRY ET AL., *supra* note 7, at 7.

86. See Margaret Raymond, *Down on the Corner, Out in the Street: Considering the Character of the Neighborhood in Evaluating Reasonable Suspicion*, 60 OHIO ST. L.J. 99, 101–02 (1999).

87. See *Terry v. Ohio*, 392 U.S. 1, 21–22, 27 (1968).

88. Berg, *supra* note 11.

89. Sengupta, *supra* note 82.

90. *Id.*

91. Berg, *supra* note 11.

92. See Arcila, *supra* note 14, at 90.

93. See *Illinois v. Wardlow*, 528 U.S. 119, 123–24 (2000).

II. FROM *TERRY* TO *WARDLOW*: ERODING FOURTH AMENDMENT PROTECTIONS IN AMORPHOUS HIGH-CRIME AREAS

The Fourth Amendment guarantees “[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures . . . ,”⁹⁴ and requires police officers to conform to a “a standard of reasonableness” when engaging with private individuals “to safeguard the privacy and security of individuals against arbitrary invasions”⁹⁵ However, the Supreme Court has chipped away at this constitutional protection since its groundbreaking decision in *Terry v. Ohio* in 1968.⁹⁶ The *Terry* Court carved out an exception to the probable cause requirement for searches and seizures, and developed a new threshold standard of reasonable suspicion.⁹⁷ In 2000, the Court further weakened Fourth Amendment protections in *Illinois v. Wardlow*, where an ambiguously defined “high-crime area” designation was permitted to serve as one of only two factors in finding reasonable suspicion to perform a lawful *Terry* stop.⁹⁸ In the wake of *Wardlow*, lower courts have struggled to define high-crime areas in evidence suppression hearings.

A. Terry v. Ohio (1968): The Origins of the “Terry Stop,” the Totality of the Circumstances Analysis, and the Path to “High-Crime Area” Designations

Terry v. Ohio established the reasonable suspicion standard. Under the reasonable suspicion standard, a police officer may perform a lawful “*Terry* stop,” a brief seizure and a partial search of a criminal suspect, when the totality of the circumstances lead the officer to believe criminal activity is afoot.⁹⁹ The totality of the circumstances test uses an objective standard to assess what a trained police officer would reasonably believe in the context of a specific stop.¹⁰⁰ A police officer must “point to specific and articulable facts, which taken together with rational inferences from those facts, reasonably warrant that intrusion.”¹⁰¹ The test is a “practical, nontechnical

94. U.S. CONST. amend. IV.

95. *Delaware v. Prouse*, 440 U.S. 648, 653–54 (1979) (citations omitted).

96. 392 U.S. 1 (1968).

97. *See generally id.*

98. *See generally* 528 U.S. 119.

99. *Terry*, 392 U.S. at 30.

100. *See Raymond*, *supra* note 86, at 102.

101. *Terry*, 392 U.S. at 21–22.

conception”¹⁰² balancing direct observations of a suspect’s behavior and the entire context of a stop to establish particularized suspicion that criminal activity is afoot.¹⁰³ In order to perform a lawful Terry stop, an officer needs more than a “hunch”; he must directly observe suspicious behavior.¹⁰⁴ The officer must demonstrate that actions of the suspect somehow “distinguish[ed] that individual from the larger universe of law-abiding citizens.”¹⁰⁵ Moreover, “[t]he scope of the search must be ‘strictly tied to and justified by’ the circumstances which rendered its initiation permissible.”¹⁰⁶ Thus, the *Terry* Court viewed this new reasonable suspicion standard as carving out “limited exceptions to the general rule that seizures of the person require probable cause to arrest.”¹⁰⁷

There are two scenarios in which lawful Terry stops arise. The first type of Terry stop occurs when an officer fears imminent danger to himself, and the context in which, the *Terry* Court envisioned these stops would occur.¹⁰⁸ In this situation, an officer can conduct an over the clothes pat down of a suspect limited to a search for weapons.¹⁰⁹ The second scenario, developed after the *Terry* decision;¹¹⁰ it arises when an officer observes a suspect’s behavior and believes that a specific type of criminal activity is afoot based on these observations.¹¹¹ In this scenario, an officer’s search should be limited to frisking for evidence related to the specific suspected

102. *Illinois v. Gates*, 462 U.S. 213, 231 (1983) (citing *Brinegar v. United States*, 338 U.S. 160, 176 (1949)).

103. *See United States v. Cortez*, 449 U.S. 411, 417–18 (1981) (stating “[b]ased upon that whole picture the detaining officers must have a particularized and objective basis for suspecting the particular person stopped of criminal activity.”).

104. *See Terry*, 392 U.S. at 15 (“courts still retain their traditional responsibility to guard against police conduct which is over-bearing or harassing, or which trenches upon personal security without the objective evidentiary justification which the Constitution requires.”).

105. *Raymond*, *supra* note 86, at 101–02.

106. *Terry* 392 U.S. at 10, 17 (citing *Warden v. Hayden*, 387 U.S. 294, 310 (1967) (Fortas, J., concurring)).

107. *Florida v. Royer*, 460 U.S. 491, 499 (1983).

108. *See Terry*, 392 U.S. at 23.

109. Officer McFadden had reasonable suspicion to believe that Terry was armed and dangerous and planning to rob a store because McFadden watched three men (including Terry) “pace alternately along an identical route, pausing to stare in the same store window roughly 24 times; where each completion of this route is followed immediately by a conference between the two men on the corner . . .” *Id.*

110. When Chief Justice Warren wrote the *Terry* opinion, he was concerned about potential abuses of the power; he tried to prevent abuses of the power to stop-and-frisk by limiting the scope of the searches to an officer’s fear of imminent danger to himself if he does not stop-and-frisk a suspect. *Id.* at 10, 17–19. Later decisions expanded the scope of *Terry*. *See United States v. Hensley*, 469 U.S. 221 (1985); WAYNE R. LAFAVE ET. AL., CRIMINAL PROCEDURE 241 (5th ed. 2009).

111. *See Hensley*, 469 U.S. at 227–28; WAYNE R. LAFAVE ET. AL., CRIMINAL PROCEDURE 241 (5th ed. 2009).

criminal activity.¹¹² For example, a police officer observes members of Hell's Angels outside of a motorcycle shop; after observing their behavior, the officer suspects that they intend to rob the shop. An officer may lawfully perform a limited, over the clothes frisk for a commercial grade lock cutter or other typical burglary tools.¹¹³

Terry stops performed under the purview of the second scenario can be problematic. When Chief Justice Warren wrote the *Terry* opinion, he recognized that the seizure of a person is more than a "mere minor inconvenience and petty indignity[;]" rather, it "is a serious intrusion upon the sanctity of the person, which may inflict great indignity and arouse strong resentment, and it is not to be undertaken lightly."¹¹⁴ He pointed to then-current police scholarship to underscore his concerns that police officers may abuse their authority to stop-and-frisk, and use it as a means to maintain the image of police power and control in a neighborhood.¹¹⁵ Chief Justice Warren's hypothetical concerns about law enforcement abusing the power to stop-and-frisk in the Terry stop context recently became reality in New York City.

The NYPD has been accused of targeting certain demographics (i.e., young minority men) and performing excessive stop-and-frisks.¹¹⁶ A fact sheet created by the New York Civil Liberties Union observes, "though they account for only 4.7% of the city's population, black and Latino males between the ages of 14–24 accounted for 41.6 [percent] of the stops in 2011," and that "[t]he number of stops of young black men exceeded the entire city population of young black men."¹¹⁷ Studies of the NYPD's stop-and-frisk reports have shown that a disproportionate number of minority persons have been stopped-and-frisked with a very small number of these searches leading to arrests.¹¹⁸ In 2000, *Wardlow* further minimized the required nexus between observed behavior and specific crime type when the Supreme Court allowed the characterization of a neighborhood as a high-

112. *Hensley*, 469 U.S. at 227–28.

113. Interview with Professor Douglas Godfrey, Professor of Legal Research & Writing, Chicago-Kent Coll. of Law, in Chi., Ill. (Oct. 1, 2013).

114. *Terry*, 392 U.S. at 10, 17.

115. Carol S. Steiker, *Terry Unbound*, 82 MISS. L.J. 329, 334 (2013).

116. See N.Y. CIVIL LIBERTIES UNION, STOP AND FRISK: REPORT ON 2011 FINDINGS, available at <http://www.nyclu.org/files/stopandfrisk-factsheet.pdf> (last visited Nov. 9, 2014).

117. *Id.*

118. *Id.* (stating "[n]ine out of 10 people stopped are totally innocent, meaning they are neither arrested nor ticketed."); see also The Editorial Board, *More Disclosures About Stop-and-Frisk*, N.Y. TIMES, Nov. 29, 2013, http://www.nytimes.com/2013/11/30/opinion/more-disclosures-about-stop-and-frisk.html?_r=0.

crime area to serve as one of only two factors in the totality of the circumstances test.¹¹⁹

B. Illinois v. Wardlow (2000): The Totality of Circumstances Test Becomes a Two-Factor Test Giving Rise to the Amorphous “High-Crime Area” Label

In *Illinois v. Wardlow*, the Supreme Court explicitly declared that the designation of a neighborhood as a “high-crime area” could serve as one of two required factors in the totality of the circumstances test.¹²⁰ The Court explained that “officers are not required to ignore the relevant characteristics of a location in determining whether the circumstances are sufficiently suspicious to warrant further investigation,” and that past precedent permitted this finding.¹²¹ Hence, a police officer met the threshold requirement for reasonable suspicion when he stop-and-frisked Sam Wardlow based on two factors: (1) Mr. Wardlow’s presence in a known narcotics trafficking area (i.e., high-crime area), and (2) his “unprovoked flight upon noticing the police.”¹²²

By relying solely on these two factors to find reasonable suspicion, the *Wardlow* Court dramatically expanded the role that neighborhood character could play in the totality of the circumstances analysis. By giving the high-crime area label significant weight in the reasonable suspicion calculus, the Court weakened the required nexus between particularized suspicion and suspected criminal activity.¹²³ The Court effectively bifurcated Fourth Amendment jurisprudence by according people two different levels of Fourth Amendment protections based on their geographic location.¹²⁴

If an individual behaves ambiguously in a designated “high-crime area,” he is more likely to be stopped-and-frisked because of his presence in this area than a person who behaves similarly in a neighborhood without the high-crime label.¹²⁵ Under *Wardlow*, standing in an area labeled as high-crime is enough to create a generalized suspicion of criminal wrong-

119. See generally 528 U.S. 119 (2000).

120. See *id.* at 124.

121. *Id.* (citing *Adams v. Williams*, 407 U.S. 143, 144, 147–48 (1972)).

122. See *id.*

123. See Ferguson, *Crime Mapping*, *supra* note 26, at 214–15.

124. See *id.*

125. See Raymond, *supra* note 86, at 99–102, 115–24 (describing case law showing that whether reasonable suspicion is found often hinges on whether the ambiguous behavior occurred in a high-crime area).

doing.¹²⁶ When a person's presence in a high-crime area is coupled with an ambiguous activity, such as standing on a street corner in the Englewood neighborhood of Chicago holding a plastic bag, officers are more likely to interpret ambiguous conduct as indicative of criminal wrongdoing.¹²⁷ Whereas, standing on a corner and talking to someone while holding a plastic bag in the wealthy Gold Coast neighborhood of Chicago will likely not elicit the same response from the police.¹²⁸ Many *Wardlow* critics have questioned whether *Wardlow*'s presence on a street corner holding a plastic bag was any more indicative of criminal activity than the actions of the other 98,000 people living in the same district.¹²⁹

Although the *Wardlow* decision has significantly weakened the Fourth Amendment protections provided to individuals living in areas labeled as high-crime, the *Wardlow* Court *did* recognize that neighborhood character *alone* could not justify an officer's finding of reasonable suspicion.¹³⁰ The totality of the circumstances test still requires a police officer to have a particularized suspicion that criminal activity is afoot; this factor of particularized suspicion appears to carry more weight than the factor of neighborhood character.¹³¹ Thus, taken alone, an individual's mere presence in a high-crime area without indicia that he is engaged in criminal activity would not be enough to justify a stop-and-frisk.¹³² However, because the Supreme Court failed to offer a definition for the "high-crime area" label or provide guidance to lower courts regarding the evidence required to prove that an area is indeed high-crime,¹³³ courts have struggled to develop socially just standards that offer equal levels of Fourth Amendment protections to everyone, regardless of a person's geographic location.

126. See Ferguson, *supra* note 15, at 301–03 (describing the ambiguity involved in *Wardlow* and the confusing results of creating an unclear standard for individualized suspicion); Ferguson, *Crime Mapping*, *supra* note 26, at 215 (describing how the NYPD conducted 52,000 stop-and-frisks in Brownsville, Brooklyn an area with a population of 14,000 between 2006 and 2010); Raymond, *supra* note 86, at 99–102, 115–24.

127. *Id.*

128. See Ferguson, *supra* note 15, at 301–03.

129. *Id.*

130. 528 U.S. 119, 124 (2000) (citing *Brown v. Texas*, 443 U.S. 47, 99 (1979)) (“An individual’s presence in an area of expected criminal activity, standing alone, is not enough to support a reasonable, particularized suspicion that the person is committing a crime”).

131. See *id.* (giving more attention to *Wardlow*'s unprovoked flight upon seeing the police officers than his presence in a high-crime area).

132. *Brown v. Texas*, 443 U.S. 47, 52 (1979) (establishing reasonable suspicion requires more than a person's mere presence in a designated high-crime area).

133. Ferguson, *Crime Mapping*, *supra* note 26, at 198.

*C. Post-Wardlow: The Vague High-Crime Area Label Mucks Up
Fourth Amendment Jurisprudence*

The *Wardlow* Court did not establish a clear definition for “high-crime area” or the criteria to use to evaluate the character of an area.¹³⁴ Courts all over the United States “began labeling areas as ‘high-crime’ without settling on a definition” or using a uniform method to determine whether an area is high-crime.¹³⁵ The absence of a uniform approach to evaluating neighborhood character has led jurisdictions to haphazardly define and classify high-crime areas.¹³⁶ For example, some courts describe high-crime areas as locations of known drug activity or locations under police surveillance.¹³⁷ Others will accept an officer’s subjective belief that an area is high-crime without requiring him to offer facts corroborating his testimony.¹³⁸ Other courts have labeled an “area of expected criminal activity”¹³⁹ as high-crime without requiring any data to support this claim.¹⁴⁰

Generally, courts have been deferential to the government’s high-crime classifications.¹⁴¹ Courts typically do not require the government to present quantitative evidence to support its classifications, even though advancements in crime-mapping technologies have made it possible for police departments to analyze actual reported crime levels in specific geographic areas and compare crime rates across jurisdictions.¹⁴² Crime maps and analysts’ reports are rarely introduced in court to prove that a Terry stop actually occurred in a high-crime area.¹⁴³ For example, in *United States v. Baskin*, the Seventh Circuit expressly rejected the argument that the government must produce “specific data” to establish that a location is

134. See generally *Wardlow*, 528 U.S. 119 (2000).

135. See Ferguson & Bernache, *supra* note 21, at 1605, 1607–08 (providing examples of the array of definitions for the term “high-crime area” and evidence offered to support these definitions in different courts); see also *United States v. Bonner*, 363 F.3d 213, 218–20 (3d Cir. 2004) (Smith, J., concurring) (raising questions about how judges should evaluate the definition and evidence put forth to establish a high-crime area).

136. See Ferguson, *Crime Mapping*, *supra* note 26, at 203–06.

137. Ferguson & Bernache, *supra* note 21, at 1605 (citing *State v. Biehl*, No. 22054, 2004 WL 2806340, at *5 (Ohio Ct. App. Dec. 8, 2004)).

138. *Id.* at 1608.

139. *Id.* at 1605.

140. See *id.* (citing *United States v. Baskin*, 401 F.3d 788, 791, 793 (7th Cir. 2005)).

141. See *id.* at 1605–07.

142. Ferguson, *Crime Mapping*, *supra* note 26, at 182 (stating, “There is no longer a statistical question about which areas in fact have higher levels of crime. Maps can be created detailing the last twenty auto thefts in a given neighborhood, the last three months of drug arrests within a city or the locations of all the homicides committed in a given year.”).

143. *Id.* at 198 (indicating that over 1,000 federal and state cases have used the term “high-crime area” in the context of Fourth Amendment reasonable suspicion without a consistent or sophisticated definition of the term).

a “high-crime area.”¹⁴⁴ The court held that the location of Baskin’s unprovoked flight remained a relevant factor because the Terry stop occurred near a “newly discovered” methamphetamine lab in a county park.¹⁴⁵ The court accepted the Government’s decision to designate a park as a high-crime area without requiring the Government to present any actual data to support its assertion.¹⁴⁶

The lack of rigor used to establish an objective basis for defining an area as high-crime has frustrated some judges.¹⁴⁷ Many judges and scholars have expressed their concern about the continued erosion of Fourth Amendment protections in neighborhoods haphazardly designated as high-crime.¹⁴⁸ For example, the majority opinion in *United States v. Montero-Carmargo* stated that the court must be careful that the high-crime label does not just blanket communities “in which members of minority groups regularly go about their daily business, but is limited to specific, circumscribed locations where particular crimes occur with unusual regularity.”¹⁴⁹

Although the *Montero-Carmargo* Court expressed that it wanted to exercise caution when applying the high-crime label, it failed to employ this rigor.¹⁵⁰ Judge Kozinski criticizes the majority for deferring to the two arresting officers’ perception of an area as high-crime as sufficient to label it as such.¹⁵¹ He warns, “to rely on every cop’s repertoire of war stories to determine what is a ‘high crime area’—and on that basis to treat otherwise innocuous behavior as grounds for reasonable suspicion—strikes me as an invitation to trouble.”¹⁵² Judge Kozinski further laments:

The question is not *whether* the characteristics of the area may be taken into account, but *how* these characteristics are established. In our first opinion to interpret this language from *Wardlow*, the majority adopts a

144. 401 F.3d 788, 793 (7th Cir. 2005).

145. *Id.*

146. *See id.*

147. *See United States v. Montero-Carmargo*, 208 F.3d 1122, 1143 (9th Cir. 2000) (Kozinski, J., concurring).

148. Ferguson, *supra* note 15, at 302 n.259 (citing David A. Harris, *Factors for Reasonable Suspicion: When Black and Poor Means Stopped and Frisked*, 69 IND. L.J. 659, 677–78 (1994)); Lenese C. Herbert, *Can’t You See What I’m Saying? Making Expressive Conduct a Crime in High-Crime Areas*, 9 GEO. J. ON POVERTY L. & POL’Y 135, 135–38 (2002); Sheri Lynn Johnson, *Race and the Decision to Detain a Suspect*, 93 YALE L.J. 214, 255–56 (1983); Raymond, *supra* note 86, at 116–24; Amy D. Ronner, *Fleeing While Black: The Fourth Amendment Apartheid*, 32 COLUM. HUM. RTS. L. REV. 383, 384–85 (2001); Christopher Slobogin, *The Poverty Exception to the Fourth Amendment*, 55 FLA. L. REV. 391, 405 (2003); Mia Carpiniello, Note, *Striking a Sincere Balance: A Reasonable Black Person Standard for “Location Plus Evasion” Terry Stops*, 6 MICH. J. RACE & L. 355, 358 (2001).

149. 208 F.3d at 1138.

150. *See id.*

151. *Id.* at 1143 (Kozinski, J., concurring).

152. *Id.*

methodology for establishing the characteristics of the area that is about as rigorous as the recipe for Leftovers Casserole.¹⁵³

III. LOW-INCOME AND MINORITY NEIGHBORHOODS ARE DISPROPORTIONATELY IMPACTED BY HEAVY POLICING AND FREQUENT STOP-AND-FRISKS

Continuing to permit law enforcement agencies to rely on ambiguous definitions of high-crime areas comes at a significant cost to the people who live in these neighborhoods. As noted previously, the high-crime label tends to attach to hypersegregated, low-income, minority neighborhoods across the United States.¹⁵⁴ Many of these neighborhoods became saturated with police officers when the United States began its War on Drugs during the Reagan Administration.¹⁵⁵ Heavy policing of these low income-minority neighborhoods has led to a disproportionate number of people of color being stopped-and-frisked.¹⁵⁶ The *Wardlow* Court's transformation of the reasonable suspicion totality of the circumstances test into a two-factor test, has made it even easier for police officers to justify Terry stops in these alleged high-crime areas because courts are deferential to police officers' subjective beliefs about elevated crime rates in particular neighborhoods.¹⁵⁷ Thus, the reduction of the reasonable suspicion test into a two-factor test, and the structural racism built into our criminal justice system has helped fuel a culture of mass incarceration, and has disproportionately affected low-income minority neighborhoods.¹⁵⁸

Mass incarceration refers to the American cultural phenomenon of “the imprisonment of comparatively and historically high proportions of the population that cannot be accounted for by changes in crime rates.”¹⁵⁹ Currently, the United States “has the largest reported incarcerated population in the world, and by far the highest rate of imprisonment.”¹⁶⁰ The

153. *Id.*

154. Harris, *supra* note 23, at 677–78; Seawall, *supra* note 23, at 1131.

155. See ALEXANDER, *supra* note 25, at 72–96.

156. See N.Y. CIVIL LIBERTIES UNION, *supra* note 116 (detailing the number of stop-and-frisks performed by NYPD in recent years).

157. See generally 528 U.S. 119 (2000).

158. See generally ALEXANDER, *supra* note 25.

159. MARLA MCDANIEL ET AL., URBAN INST., IMPRISONMENT AND DISENFRANCHISEMENT OF DISCONNECTED LOW-INCOME MEN 1 (Aug. 2013), available at <http://www.urban.org/UploadedPDF/412986-Imprisonment-and-Disenfranchisement-of-Disconnected-Low-Income-Men.pdf>.

160. HUMAN RIGHTS WATCH, A NATION BEHIND BARS: A HUMAN RIGHTS SOLUTION 5 (2014), available at http://www.hrw.org/sites/default/files/related_material/2014_US_Nation_Behind_Bars_0.pdf (citation omitted).

number of prisoners in both federal and state facilities has increased by nearly 430 percent between 1979 and 2009.¹⁶¹ Moreover, “[r]acial disparities in imprisonment rates are striking. For every 100,000 Americans in each race or gender group, there are 478 white males, 3,023 black males, 51 white females, and 129 black females incarcerated in state or federal prison.”¹⁶² Undeniably, people of color are disproportionately overrepresented in the criminal justice system.¹⁶³

In *The New Jim Crow*, Michelle Alexander describes how the War on Drugs and the structural racism embedded in our criminal justice system have devastated low-income minority communities across the United States.¹⁶⁴ The culture of heavy policing created by the War on Drugs in low-income minority neighborhoods has fostered significant animosity between the police and residents of these neighborhoods.¹⁶⁵ Alexander observes that even though studies show that rates of drug use are similar across races, each year a disproportionate number of African American men are swept into the criminal justice system for low-level drug offenses because of racially biased police discretion.¹⁶⁶

Many scholars and law enforcement agencies have tried to justify heavily policing low-income minority neighborhoods by arguing that residents of these communities are more likely to engage in illegal activity outdoors and in plain sight than in higher-income areas.¹⁶⁷ These agencies argue that concentrating drug enforcement efforts in these neighborhoods enables them to efficiently allocate resources while combating illegal activity.¹⁶⁸ However, unlike their wealthier neighbors who would not tolerate heavy policing, residents of low-income minority neighborhoods often lack power in our political system, leaving them vulnerable to this biased policing.¹⁶⁹ As Alexander notes, “[H]ypers segregation . . . has made the round-up easy. Confined to ghetto areas and lacking political power, the black poor

161. *Id.*

162. *Id.* (citation omitted).

163. MCDANIEL ET AL., *supra* note 159 (noting that “the U.S. Department of Justice is reviewing laws and agency enforcement policies that may have had a disparate impact on African Americans and Hispanics, both in terms of incarceration and the collateral damage to their families and communities.”).

164. *See generally* ALEXANDER, *supra* note 25.

165. *Id.* at 125 (describing how “[t]he militarized nature of law enforcement in ghetto communities has inspired rap artists and black youth to refer to the police presence in black communities as ‘The Occupation.’”).

166. *Id.* at 123. Alexander notes that recent studies suggest that white youth are more likely to participate in illegal drug dealing than people of color. *Id.* at 99 (citation omitted).

167. *Id.* at 125.

168. *Id.*

169. *Id.* at 124.

are convenient targets.”¹⁷⁰

Heavy policing of these low-income neighborhoods has created an expectation among residents, particularly among young black men, that they will “be stopped, interrogated, and frisked numerous times in the course of a month, or even a single week.”¹⁷¹ In her book, Alexander shares a story from a law student who participated in a ride-along with a Chicago police officer. The student described how, “[e]ach time we drove into a public housing project and stopped the car, every young black man in the area would almost reflexively place his hands up against the car and spread his legs to be searched.”¹⁷² These regular encounters with law enforcement are problematic because they often function as “the gateway into the criminal justice system” for non-violent, low-level offenses such as marijuana possession.¹⁷³

Arrests for low-level non-violent offenses have created a climate where “a staggering 5.1 million people [are] under ‘community correctional supervision’—i.e., on probation or parole.”¹⁷⁴ Moreover, an individual does *not* even need to be *convicted* of a crime to be barred from gainful employment, access to public housing or other public assistance—getting *arrested* is enough to essentially lock someone out of mainstream society.¹⁷⁵ Once a person has been swept into the criminal justice system, it is difficult to get out.¹⁷⁶ Scholar, Loïc Wacquant has described this phenomenon “of people cycling in and out of prison” and “trapped by their second-class status” as a “closed circuit of perpetual marginality.”¹⁷⁷ Thus, requiring narrower definitions of high-crime areas could reduce the number of Terry stops that occur in these neighborhoods. Reducing the number of Terry stops occurring in these neighborhoods may, in turn, reduce the number of young minority men who are swept into the criminal justice system’s “closed circuit of perpetual marginality” for committing low-level, non-violent offenses.¹⁷⁸

170. *Id.*

171. *Id.* at 124–25.

172. *Id.* at 125.

173. *See id.* at 136.

174. *See id.* at 94 (citation omitted) (noting that approximately 2.3 million people were in prisons or jails as of 2008).

175. *Id.* at 144–77.

176. *See id.*

177. *Id.* at 95 (citing Loïc Wacquant, *The New ‘Peculiar Institution’: On the Prison as Surrogate Ghetto*, 4 THEORETICAL CRIMINOLOGY 377, 384 (2000)).

178. *See id.* at 95–96.

IV. THE ROLE OF TECHNOLOGY IN FOURTH AMENDMENT JURISPRUDENCE

The courts have not only struggled with defining high-crime areas and applying *Wardlow*, they have also had difficulty evaluating the role that emerging technologies should play in Fourth Amendment analyses. In recent years, technology has become increasingly complex and judges have had trouble staying abreast of the latest developments. As Judge Posner lamented in his book, *Reflections on Judging*, “Federal judges are on the whole not well adapted by training or experience to the technological age that we live in.”¹⁷⁹ However, as new technologies develop, the courts must figure out how to embrace these technological advancements because the “law must apply itself to the life of a society driven more and more by technology and technological improvements.”¹⁸⁰

The Supreme Court has yet to hear a case specifically addressing the use of predictive policing technology; however, past cases have required the Court to strike a balance between permitting law enforcement to use emerging technologies and safeguarding Americans’ Fourth Amendment protections.¹⁸¹ For example, when deciding whether police officers’ use of a thermal imaging device constituted an unlawful search of a private home in *Kyllo v. United States*, Justice Scalia wrote, “[I]t would be foolish to contend that the degree of privacy secured to citizens by the Fourth Amendment has been entirely unaffected by the advance of technology.”¹⁸² In this case, police officers suspected that Kyllo was growing marijuana in his home and used a thermal imager to determine if the heat emanating from his home was consistent with the high intensity heat lamps typically required to grow marijuana.¹⁸³

Although Justice Scalia recognized that the technology of the particular device used by the officers was “crude,”¹⁸⁴ he acknowledged that as technology evolves, these devices have the potential to reveal all human activity in the home.¹⁸⁵ Anticipating that significant technological ad-

179. RICHARD A. POSNER, *REFLECTIONS ON JUDGING* 78 (2013).

180. *Id.* at 54 (quoting Judge Hamilton).

181. *See* *United States v. Jones*, 132 S. Ct. 945, 953 (2012) (discussing electronic signal transmissions and physical trespass); *see* *Kyllo v. United States*, 533 U.S. 27, 33–34 (2001) (stating that the question presented to the Court “is what limits there are upon this power of technology to shrink the realm of guaranteed privacy”); *see generally* *Dow Chemical Co. v. United States*, 476 U.S. 227 (1986) (discussing the EPA’s use of high-resolution aerial photography).

182. 533 U.S. at 29, 33–34.

183. *Id.* at 29–30.

184. *Id.* at 36.

185. *See id.* at 35–36.

vancement was on the horizon, the Court ruled that the use of thermal imaging devices constituted an unlawful search in violation of the Fourth Amendment.¹⁸⁶ Moreover, writing for the Court, Justice Scalia rejected a case-by-case approach to deciding whether a law enforcement agency's use of an emerging technology was lawful.¹⁸⁷ Justice Scalia reasoned that before a law enforcement agency uses new technology as part of its policing efforts, it must know whether the use of such technology is lawful, so the agency can adjust its policing strategies accordingly.¹⁸⁸

The Court's reasoning in a 2014 case, *Riley v. California*, further illustrates the Court's preference for using a long-term and uniform approach to evaluating the role of new technologies in Fourth Amendment jurisprudence.¹⁸⁹ The question presented to the Court in *Riley* was whether the police may perform a warrantless search of the digital information on a cell phone seized from a person who was lawfully arrested.¹⁹⁰ Writing for the Court, Chief Justice Roberts focused on the sophistication of emerging technologies, such as the smartphone, and highlighted the pervasiveness of technology in our society.¹⁹¹ He observed how quickly this technology has evolved, citing a Pew Research Center Study from 2013, and noting that even the outdated flip phone technology of one of the arrestees, had "been around for less than 15 years."¹⁹²

After describing the sophistication and prevalence of these smartphones in our daily lives, the Court rejected the Government's arguments for permitting warrantless cell phone searches.¹⁹³ Chief Justice Roberts describes the Court's "general preference to provide clear guidance to law enforcement through categorical rules."¹⁹⁴ Quoting *Michigan v. Summers*, the Court reasoned, "If police are to have workable rules, the balancing of the competing interests . . . 'must in large part be done on a categorical basis—not in an ad hoc, case-by-case fashion by individual police officers.'"¹⁹⁵ In order to ensure that law enforcement agencies under-

186. *See id.* at 35–36, 40.

187. *Id.* at 38–39.

188. *See id.*

189. *See generally* 134 S. Ct. 2473 (2014).

190. *Id.* at 2480.

191. *Id.* at 2484 (stating, "These cases require us to decide how the search incident to arrest doctrine applies to modern cell phones, which are now such a pervasive and insistent part of daily life that the proverbial visitor from Mars might conclude that they were an important feature of human anatomy.").

192. *Id.* (citation omitted).

193. *Id.* at 2491.

194. *Id.*

195. *Id.* at 2491–92 (citing *Michigan v. Summers*, 452 U.S. 692, 705 n.19 (1981) (quoting *Dunaway v. New York*, 442 U.S. 200, 219–20 (1979))).

stand how they may lawfully use the technology on which they rely, they need clear categorical rules delineating these parameters—even for emerging technologies.

As Judge Posner further observes in his book, new technologies that rely on complex mathematical models and statistical analyses can be particularly difficult for judges to understand when compared with technologies of the past, such as the steam engine or the automobile.¹⁹⁶ He explains that compared to the latest emerging technologies, even when technologies of the past were complex, it was easier to explain how they worked to judges who did not possess a technical background.¹⁹⁷ Evaluating emerging technologies places judges who do not have technical or scientific backgrounds in uncomfortable territory because they must make sense of “the kinds of variable[s] that science measures” rather than the soft variables they are accustomed to in the courtroom.¹⁹⁸

Judges’ reluctance to embrace new technology and rely on quantitative data in evidence suppression hearings can be seen in courtrooms across the country. As discussed previously, courts have been reluctant to rely on the statistical data that parties have offered as evidence to prove or disprove a police officer’s assertion that he performed a Terry stop in a high-crime area.¹⁹⁹ However, as predictive policing technologies become increasingly popular and become an essential law enforcement tool, the courts will not be able to ignore the existence of these sophisticated technologies.

In order for law enforcement agencies to fully integrate this technology into their daily policing strategies and avoid running afoul of the Fourth Amendment, these agencies need guidance from the courts. Moreover, as law enforcement begins to increasingly rely on this technology, Americans will expect courts to integrate the statistical outputs from these technologies into their reasoning to ensure that individuals’ constitutional rights are protected. Thus, courts must acknowledge the role of these emerging technologies in law enforcement activities and begin to responsibly integrate quantitative data into their decision-making processes.

196. POSNER, *supra* note 179, at 72.

197. *See id.* at 71–72, 78 (using members of the current Supreme Court as examples, Judge Posner points to the fact that none of them have a graduate or undergraduate degree in a technical field to illuminate this lack of technical training).

198. *Id.* at 73.

199. *See* Ferguson, *Crime Mapping*, *supra* note 26, at 203–06.

V. STANDARDIZING PREDICTIVE POLICING TECHNOLOGIES TO ENSURE FAIRNESS, ACCURACY, RELIABILITY AND TRANSPARENCY

A 2012 survey by the FBI identified 14,006 law enforcement agencies across the United States, which employ 670,439 full-time law enforcement officers.²⁰⁰ As predictive policing technologies continue to evolve and technology becomes increasingly integrated into all aspects of our lives, it is likely that the United States' roughly 14,000 law enforcement agencies and their 670,439 officers will choose to incorporate this software into their day-to-day operations and decision-making processes. In fact, "[j]urisdictions as diverse as Palm Beach County, Florida; Memphis, Tennessee; Chicago, Illinois; Minneapolis, Minnesota; and Dallas, Texas, are testing predictive policing" software.²⁰¹ As the use of predictive policing software becomes more widespread, it will become impossible for judges to ignore quantitative data in the courtroom.²⁰² Judges will no longer be able to defer to police officers' subjective experiences when defining high-crime areas.²⁰³

Therefore, mandatory uniform standards and best practices must be established to ensure that the information produced by predictive policing technologies is fair, accurate, reliable and transparent. Congress should call on the FBI to establish these uniform standards and best practices, and oversee the implementation of these technologies across law enforcement agencies. Creating uniform standards will enable the 14,000 law enforcement agencies in the United States to responsibly rely on these technologies in their day-to-day work. Having the FBI develop and implement these standards will also enable judges to reasonably rely on data from these programs when deciding whether an officer had reasonable suspicion to perform a Terry stop in an alleged high-crime area.²⁰⁴ Most importantly, integrating quantitative data into the reasonable suspicion analysis will help

200. *Table 74: 2012 Full-time Law Enforcement Employees*, FED. BUREAU OF INVESTIGATION, http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2012/crime-in-the-u.s.-2012/tables/74tabledataoverviewpdfs/table_74_full_time_law_enforcement_employees_by_population_group_percent_male_and_female_2012.xls (last visited Nov. 9, 2014) (noting that this statistic includes both sworn officers and civilian employees).

201. Ferguson, *supra* note 15, at 268–69.

202. See Wisniewski, *supra* note 20, at 105–06.

203. See Ferguson & Bernache, *supra* note 21, at 1608.

204. The author recognizes that Rule 702 of the Federal Rules of Evidence (often referred to as the Daubert factors) plays a critical role in the admissibility and reliability of technical evidence in the courtroom; however, this discussion is beyond the purview of this note. This note assumes that these predictive policing programs will use reliable methods to generate data and establish high-crime areas, and these methods will be reliably applied.

restore eroded Fourth Amendment protections to people living in heavily policed neighborhoods.

A. Utilize the FBI to Coordinate and Oversee Predictive Policing Technologies

Congress should pass legislation requiring the FBI to create mandatory uniform standards and best practices to guide law enforcement agencies in their use of predictive policing technologies. The FBI is the appropriate agency to develop these guidelines and to oversee law enforcement agencies across the country for a variety of reasons.

First, as an agency under the umbrella of the United States Department of Justice, the FBI collects an array of information about crime and other relevant law enforcement topics, demonstrating the FBI's high-level of institutional competence in this area.²⁰⁵ For example, the FBI already uses the information it gathers to generate reports that American law enforcement agencies can use to guide their crime fighting strategies in areas as diverse as terrorism and white-collar crime.²⁰⁶ Because the FBI has the capacity to serve as a clearinghouse for information, it is well suited to develop best practices for collecting and analyzing data.

Second, providing oversight and establishing best practices for the use of predictive policing technologies in municipal police departments, aligns with both the FBI's mission, and its goal of combating public corruption and protecting civil rights.²⁰⁷ The FBI's mission is "to uphold and enforce the criminal laws of the United States, and to provide leadership and criminal justice services to federal, state, municipal, and international agencies and partners."²⁰⁸ Requiring the FBI to develop mandatory uniform standards will help the FBI further its mission because the Bureau will lead the way by developing fair and appropriate technology-based policing strategies. Moreover, the FBI will further its goals of combating public corruption and protecting civil rights by helping local law enforcement agencies understand the limitations of these technologies.²⁰⁹ Creating data-

205. See *Reports and Publications*, FED. BUREAU OF INVESTIGATION, <http://www.fbi.gov/stats-services/publications> (last visited Nov. 9, 2014).

206. See *id.* One example of the FBI's efforts to serve as a clearinghouse for information was illustrated earlier: the efforts of the FBI to develop uniform crime reporting across the United States. See *Uniform Crime Reports*, *supra* note 76.

207. *Quick Facts*, FED. BUREAU OF INVESTIGATION, <http://www.fbi.gov/about-us/quick-facts> (last visited Nov. 9, 2014).

208. *Id.*

209. The FBI may help police departments understand that past data may lose its predictive value if an environmental vulnerability is remediated and changes crime patterns in an area. For example, if street lights are added on a block where a lot of cars are being stolen, and the police also arrest gang

neutral policies for local law enforcement to follow will minimize the risk of unreliable and inaccurate data collection and analysis, and help safeguard Americans' Fourth Amendment protections.

Third, the FBI is well-equipped to provide neutral third-party oversight because the agency has an extensive and reputable community outreach program.²¹⁰ Over time, the Bureau has formed many successful partnerships with law enforcement agencies in the United States and around the globe.²¹¹ The FBI often calls upon former graduates of its National Academy to help train police officers and build interagency relationships to increase the effectiveness of law enforcement operations.²¹² Thus, the FBI is already a well-established and well-respected organization capable of working in unison with the 14,000 agencies around the country to develop mandatory standards and best practices to ensure the responsible use of predictive policing technology.

B. Establish Mandatory Uniform Standards and Oversight to Ensure Fairness, Accuracy, Reliability and Transparency

Establishing mandatory uniform standards that: guide how data is collected and entered into predictive policing programs, provide for routine audits of local law enforcement's predictive policing systems, and guide how algorithms are written, will significantly decrease potential risks associated with human fallibility in big data collection.²¹³ Having the FBI implement uniform standards will help safeguard against "[b]lind reliance on the forecast, divorced from the reason for the forecast"²¹⁴ in police departments' use of predictive policing technologies.

First, new mandatory standards should prescribe procedures that ensure data is systematically gathered and entered into the software on a regular basis. Developing a uniform system for data collection and entry will reinforce the accuracy of the system's algorithms, maximize their objective predictive utility, and help guard against human bias. After all, "[i]f the

members who were stealing the cars, then the predictive value of the data outputs from the predictive policing software will diminish because these environmental vulnerabilities have been addressed. See Ferguson, *supra* note 15, at 314.

210. See *Partnerships and Outreach*, FED. BUREAU OF INVESTIGATION, http://www.fbi.gov/about-us/partnerships_and_outreach/ (last visited Nov. 9, 2014) (listing FBI partnerships and describing its community outreach program).

211. See *id.*

212. *The FBI Academy*, FED. BUREAU OF INVESTIGATION, <http://www.fbi.gov/about-us/training/national-academy/national-academy> (last visited Nov. 9, 2014) (describing the purpose of the National Academy and the training it offers to local leaders in law enforcement).

213. Refer to Part I of this note for an in-depth discussion of this risk.

214. Ferguson, *supra* note 15, at 316.

data collection, recording, analysis, or retention is flawed, then the entire system is called into question.”²¹⁵

Second, when developing these standards, the FBI should require police departments to provide mandatory predictive policing training to their staff. During this training, law enforcement agencies would describe: permissible methods for data collection, the limitations of this technology as a crime-fighting tool, and the constitutional concerns triggered by the use of this technology. The FBI should also provide third-party oversight by conducting routine audits of predictive policing systems. During these audits, the FBI can ensure that local police departments comply with its mandatory standards for training, data collection and analysis. By auditing these systems, the FBI can effectively allay concerns about human manipulation of crime data.²¹⁶

Third, FBI oversight is needed to validate and test algorithms of predictive policing software. Requiring neutral third party testing of these algorithms ensures that they paint an unbiased picture of criminal activity, and do not create self-fulfilling prophecies of bias against any demographic or geographic location.²¹⁷ Recently, the need for third party monitoring of police practices to protect civil liberties was recognized in *Floyd v. City of New York*, where the NYPD was accused of abusing its power to stop-and-frisk.²¹⁸

Although *Floyd's* procedural history led to debate about the validity of the court's decision,²¹⁹ the NYPD consented to adhere to some of Judge Scheindlin's holdings. Primarily, the NYPD consented to allow third-party oversight of its aggressive stop-and-frisk program, which led to a disproportionate number of stop-and-frisks taking place in black and Latino neighborhoods.²²⁰ Similar to the NYPD's stop-and-frisk program, predictive policing algorithms require closer inspection. When law enforcement uses predictive policing software to allocate resources, civil liberties are at

215. See *id.* at 316–17.

216. See Ferguson, *Big Data*, *supra* note 10 (noting concerns about manipulation of crime data following an audit of the NYPD's crime statistics).

217. See Ferguson, *supra* note 15, at 319 (arguing for third party testing and validation of algorithms in order to establish the legitimacy of this technology).

218. See generally 959 F. Supp. 2d 540 (S.D.N.Y. 2013).

219. Joseph Goldstein, *Court Blocks Stop-and-Frisk Changes for New York Police*, N.Y. TIMES, Oct. 31, 2013, http://www.nytimes.com/2013/11/01/nyregion/court-blocks-stop-and-frisk-changes-for-new-york-police.html?emc=edit_na_20131031&nlid=48206195&_r=0 (explaining the allegations that led to Judge Scheindlin's removal).

220. Benjamin Weiser & Joseph Goldstein, *Mayor Says New York City Will Settle Suits on Stop-and-Frisk Tactics*, N.Y. TIMES, Jan. 30, 2014, <http://www.nytimes.com/2014/01/31/nyregion/de-blasio-stop-and-frisk.html>.

stake because inaccurate data collection and algorithms can lead to crime forecasts tainted by human bias. In order to avoid abuses of police power, law enforcement must be held accountable for their policing strategies—especially in already vulnerable low-income minority communities.

A neutral third party testing requirement would also help legitimize this technology, and make judges more inclined to accept the statistical outputs from these programs as evidence in the courtroom. Using the FBI as the gatekeeper for this testing would be particularly advantageous because it would enable private companies developing proprietary algorithms to maintain their trade secrets, while simultaneously ensuring that the quantitative data output from these programs is reliable. Additionally, requiring mandatory third party testing and validation of these programs will enable judges to rely on the quantitative data presented to them by parties in a courtroom without requiring judges to act as statisticians, who must parse complex algorithms or evaluate the minutia of data collection techniques. In this scenario, judges could defer to a sophisticated neutral-party's opinion about the validity of the data presented and focus on requiring police departments to define high-crime areas with increased specificity and accuracy.

Moreover, requiring police departments to narrowly define high-crime areas is no Herculean task. A lot of crime data is readily available and can be plugged into common platforms, such as Google Earth. Thus, communities need not even rely on expensive proprietary predictive policing software. Instead, they can use these rather rudimentary programs to track various types of crime and demonstrate a propensity for a specific type of crime at a specific location.

C. Courts Should Use Predictive Policing Technology to Create Narrow Definitions of High-Crime Areas Based on Both Geography and Crime Type

Neutral third party oversight can bolster the legitimacy of predictive policing software and transform how judges evaluate high-crime classifications at evidence suppression hearings across the United States.²²¹ As the use of this technology becomes a ubiquitous part of policing, and standards are implemented to ensure data reliability, judges should create narrowly defined high-crime area designations based on not only geographic loca-

221. Evidence suppression hearings are typically where courts must address whether an officer had the requisite level of reasonable suspicion required to perform the stop-and-frisk that yielded evidence to establish a criminal case.

tion—but crime type as well. Judges should require law enforcement agencies and prosecutors to present quantitative data to demonstrate that an area labeled as high-crime is in fact high-crime.

Law enforcement agencies will likely claim that procuring and preserving the quantitative data an officer used to justify a finding of reasonable suspicion is too burdensome of a responsibility. However, this is not the case. Technological advancements in the United States have created an overarching public expectation of transparency in government²²² and have made it easier for government agencies to preserve data. In order to safeguard this transparency, many Americans' believe that government agencies have an institutional responsibility to preserve data that is critical to maintaining this transparency.²²³ The widespread growth of cloud computing has made it easy for government agencies to store vast quantities of data without overburdening their resources,²²⁴ and fulfill the public's expectations for government transparency.

As explained in Part I, predictive policing technologies have the capability of not only forecasting where crime will occur on a micro-scale of a 500-foot radius, but can also predict the specific types of crime that are likely to occur at a given location in a community.²²⁵ Therefore, predictive policing software has the capability of meaningfully defining high-crime areas based on both geographic location and crime-type. Harnessing the full technological capabilities of this software enables law enforcement agencies to eliminate the vague and generic "high-crime area" label.

Existing vague high-crime area definitions can be replaced by specific classifications of criminal activity, such as designating a location as a "high-brown heroin drug trafficking area" or "high-residential robbery area." Using these crime specific classifications will help restore individuals' Fourth Amendment protections in communities that were historically characterized as high-crime under *Wardlow's* vague and overbroad standard.²²⁶ Narrowly defining crime areas can help restore Fourth Amendment protections by tightening the required nexus between direct observation of suspicious conduct and an area's propensity for crime.

222. The public's desire for government transparency is so strong in the United States that President Obama issued a memorandum advising the Heads of Executive Departments and Agencies to incorporate more transparency into government processes. See Memorandum for the Heads of Executive Departments and Agencies, 74 Fed. Reg. 4685 (Jan. 26, 2009), available at <https://www.federalregister.gov/articles/2009/01/26/E9-1777/transparency-and-open-government#page-4685>.

223. See *id.*

224. See Berg, *supra* note 11.

225. *Id.*

226. See generally 528 U.S. 119 (2000).

Tightening this nexus will make police officers more accountable for their stop-and-frisk activity, and limit the role that a person's presence in a high-crime area can play when searching based on reasonable suspicion. Moreover, if law enforcement wants to benefit from predictive policing technology's ability to predict crime in a 500-foot radius, then law enforcement should be constrained by this same specificity. An officer should be required to use the same level of specificity to prove that she had reasonable suspicion to perform a Terry stop of a suspect in an area alleged to have a high propensity for a specific crime type.

Finally, because predictive policing technology is "[m]ore objective than a patrol officer's hunch about an area"²²⁷ and harnesses the power of big data to find patterns of criminal activity based on statistical algorithms, judges should place the burden on law enforcement agencies and prosecutors to present quantitative data supporting their high-crime designation. Law enforcement agencies and prosecutors should carry the burden of demonstrating that the data relied upon reflects a high-crime rate for the specific type of criminal activity the police officer suspected was afoot.

For example, if we applied the facts of *Terry v. Ohio* to a community using predictive policing software under this proposed model, would the court still find that Officer McFadden, the officer in *Terry*, had the requisite reasonable suspicion to perform a stop-and-frisk?²²⁸ Officer McFadden could meet the threshold requirement for particularized suspicion because he watched the suspects walk back and forth past the jewelry store alone dozens of times, and each time stopping to peer in the window.²²⁹ However, officer McFadden's finding of reasonable suspicion could be further bolstered if ten minutes before seeing the two suspects walking by the jewelry store, the predictive policing software installed in his patrol car corroborated his belief that the neighborhood had a high propensity for non-residential burglary.²³⁰ Although, the facts of *Terry* are straightforward because of the suspects' repetitive behavior, this example demonstrates how a court could use quantitative data as a tool to decide whether a lawful Terry stop was performed in an alleged high-crime area.

227. Ferguson, *supra* note 15, at 265.

228. 392 U.S. 1, 5-6 (1968).

229. *Id.*

230. *See id.*

CONCLUSION

As Cornel West wrote in his forward to the *New Jim Crow*, “Martin Luther King Jr. called for us to be lovestruck with each other, not color-blind toward each other. To be lovestruck is to care, to have deep compassion, and to be concerned for each and every individual, including the poor and vulnerable.”²³¹ As a society, we have an obligation to protect the civil rights of all people, including the poor and vulnerable. Restoring Fourth Amendment protections to low-income minority communities is essential to creating a socially just world.

Predictive policing technologies can play a critical role in restoring Fourth Amendment protections to neighborhoods historically stamped with the “high-crime area” label. To ensure that this technology is used fairly and responsibly by law enforcement agencies, it is critical to establish both neutral third party oversight and mandatory uniform standards. The latest generation of predictive policing technology has the ability to forecast crime, based on both geography and specific crime type, and can be used to help courts and police departments narrowly define “high-crime areas.” Establishing narrowly defined high-crime areas based on quantitative data, will enable the courts to play an essential role in restoring Fourth Amendment protections to people living in low-income minority neighborhoods.

Tightening the nexus between observed suspicious behavior and suspected criminal activity will help people living in these heavily policed neighborhoods recapture their eroded Fourth Amendment rights. Using quantitative data to narrowly define high-crime areas will require police officers to rely on more than a “hunch” to prove that an area has a high propensity for crime. And in turn, officers will be less likely to perform the arbitrary and intrusive stop-and-frisks to which many of the young minority men in these neighborhoods have grown accustomed.

231. ALEXANDER, *supra* note 25, at x–xi.