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**OUT THROUGH THE OUT DOOR: POLICY OPTIONS
IN THE FIGHT AGAINST VISA OVERSTAYS**

by

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**OUT THROUGH THE OUT DOOR: POLICY OPTIONS IN THE FIGHT
AGAINST VISA OVERSTAYS**

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ABSTRACT

Foreign nationals admitted to the United States who remain beyond their period of admission present an enforcement problem for U.S. immigration agencies. These “visa overstay” cases present a vulnerability for the homeland security enterprise. U.S. immigration enforcement agencies need to identify, apprehend, and remove foreign nationals who have overstayed their visas to address this issue. Identification of these subjects can be through biographical or biometric means. Current efforts to identify overstay violators rely mostly upon biographical data transmitted to enforcement agencies by third parties. Overstay violators are not normally targeted for apprehension and removal unless they present a threat to national security or public safety.

Biometric exit system proponents have argued that the identification of violators through biometric means presents a faster, more efficient (albeit possibly expensive) method to determine who has overstayed their visas. These proponents also indicate that such a system will have an impact on the number of overstay violation cases each year. To date, this exit system has not been implemented at the U.S. border despite congressional mandates to do so. This thesis examines current visa overstay enforcement policies, evaluates the impacts of a biometric exit system, and makes policy recommendations for visa overstay enforcement efforts.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADIS	Arrival and Departure Information System
AEER	Apex Air Entry/Exit Re-engineering
AFIS	Automated Fingerprint Identification System
CBP	Customs and Border Protection
CSRS	Community Status Resolution Service
CTCEU	Counterterrorism and Criminal Exploitation Unit
DHS	Department of Homeland Security
DNA	Deoxyribonucleic Acid
EES	Entry-Exit System (EU)
ERO	Enforcement and Removal Operations
EU	European Union
Eu-LISA	European Agency for the operational management of Large-Scale IT Systems in the area of freedom, security, and justice
FBI	Federal Bureau of Investigation
FRONTEX	European Border and Coast Guard Agency
GAO	Government Accountability Office
HART	Homeland Advanced Recognition Technology
HSI	Homeland Security Investigations
IAFIS	Integrated Automated Fingerprint Identification System
ICE	Immigration, Compliance, and Enforcement (U.K.)
ICE	Immigration and Customs Enforcement (U.S.)
IDENT	Automated Biometric Identification System
IE	Immigration Enforcement (U.K.)
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act 1996
INS	Immigration and Naturalization Service

OAU	Overstay Analysis Unit
OBIM	Office of Biometric Identity Management
RFID	Radio Frequency Identification
SIS	Schengen Information System
TSA	Transportation and Security Administration
UAE	United Arab Emirates
U.K.	United Kingdom
U.S.	United States
USCIS	United States Citizenship and Immigration Services
US-VISIT	U.S. Visitor and Immigrant Status Indicator Technology
VIS	Visa Information System
VWP	Visa Waiver Program

EXECUTIVE SUMMARY

Every year, tens of millions of nonimmigrants visit the United States for business, pleasure, school, or work. The expenditures of these foreign travelers provide revenue to U.S. businesses and create jobs across the country. While the vast majority of nonimmigrant visitors lawfully depart the United States each year, not every visitor leaves as instructed. In 2015, the Department of Homeland Security (DHS) calculated that only 1.17 percent of foreign visitors overstayed their visas in 2015.¹ This percentage increased to 1.47 percent in fiscal year 2016 but then decreased to 1.33 percent in 2017.²

While these percentages seem low, even with such a high compliance rate, the sheer volume of visitors to the United States means that those who overstayed their visa period approximated 527,127 foreign visitors in 2015; 739,478 in 2016; and 701,900 in 2017.³ In comparison, U.S. agencies apprehended 408,870 foreign nationals trying to cross the southern border illegally in 2016; in 2017 that number totaled 310, 531.⁴ These figures indicate that more foreign nationals are being legally admitted to the United States and unlawfully remaining here than are simply entering by illegally crossing the U.S.–Mexico border.

The total number of annual visa overstay cases poses a security risk to the United States. Terrorists have previously attempted to abuse the U.S. immigration system to carry out attacks against U.S. persons and interests. The 9/11 Commission commented on these

¹ Department of Homeland Security (DHS), “Fiscal Year 2015 Entry/Exit Overstay Report” (report, Department of Homeland Security, January 19, 2016), 7.

² DHS, “Fiscal Year 2017 Entry/Exit Overstay Report” (report, Department of Homeland Security, August 7, 2018), iii.

³ DHS, “Fiscal Year 2016 Entry/Exit Overstay Report” (report, Department of Homeland Security, April 20, 2016), iv, <https://www.dhs.gov/sites/default/files/publications/Entry%20and%20Exit%20Overstay%20Report%2C%20Fiscal%20Year%202016.pdf>; DHS, “2017 Entry/Exit Overstay Report,” iii.

⁴ Andrew V. Pestano, “Illegal Border Crossings from Mexico into U.S. up 23 Percent from 2015,” UPI, October 18, 2016, https://www.upi.com/Top_News/US/2016/10/18/Illegal-border-crossings-from-Mexico-into-US-up-23-percent-from-2015/7331476791148/; Geneva Sands, “Immigration Arrests Spiked, Illegal Border Crossings Dropped in 2017: DHS,” ABC News, December 5, 2017, <https://abcnews.go.com/US/immigration-arrests-spiked-illegal-border-crossings-dropped-2017/story?id=51599510>.

past violations, stating, “For terrorists, travel documents are as important as weapons.”⁵ The use of visas to legally come to the United States has aided terrorist operations; on thirteen different occasions in the past, including 9/11, terrorists have overstayed their visas.⁶ Additionally, at least four of the 9/11 hijackers had overstayed their visas or were out of status when they attacked the United States.⁷ Since 2001, more than thirty-six visa overstay violators have been convicted of terrorism-related charges in the United States.⁸

Congress and the 9/11 Commission have stated that a biometric exit system is needed to address the visa overstay issue.⁹ They believe that using biometric traits, such as fingerprints and facial recognition, to identify visitors may reduce or eliminate problems with current visa overstay violations. System proponents argue such a system will allow border agencies to identify visa violators more efficiently and reduce the number of foreign nationals who violate U.S. immigration laws. However, current practices do not prioritize most visa overstay cases for enforcement action; prior efforts to identify and apprehend violators have achieved limited success.¹⁰ If a newly implemented biometric exit system includes the flaws and fallacies of current overstay policies, such a system may not have the desired impact.

An increase in nonimmigrant visitors to the United States has led to a rise in visa overstay cases, which has consequently led to an increase in leads reviewed for

⁵ National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States*, 1st ed., Kindle (New York: W. W. Norton, 2004).

⁶ Janice L Kephart, *Immigration and Terrorism: Moving beyond the 9/11 Staff Report on Terrorist Travel* (Washington, DC: Center for Immigration Studies, 2005), 5.

⁷ *Visa Overstays: A Gap in the Nation’s Border Security: Hearing before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security*, House of Representatives, 115 Cong. 1 (2017) (statement of Chairwoman Martha McSally), 2.

⁸ *From the 9/11 Hijackers to Amine El Khalifi: Terrorists and the Visa Overstay Problem: Hearing Before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security*, House of Representatives, 112 Cong. 2 (2012) (statement of Candice S. Miller, Chairwoman, Subcommittee on Border and Maritime Security), 4.

⁹ National Commission, *9/11 Commission Report*, sec. 10834.

¹⁰ Government Accountability Office (GAO), *Overstay Enforcement: Additional Mechanisms for Collecting, Assessing, and Sharing Data Could Strengthen DHS’s Efforts but Would Have Costs*, GAO-11-411 (Washington, DC: Government Accountability Office, 2011), 2.

investigation. Visa overstay cases are currently identified through database analysis using biographical data received from third parties. Multiple DHS agencies are involved in the current effort to identify, locate, apprehend, and remove visa overstay violators. In 2005, agencies examined 13,000 leads and investigated 4,600; in 2012, the number of leads increased to 212,000, but only 2,800 were referred to agents for investigation.¹¹ Between 2004 and 2010, Homeland Security Investigations arrested just 20 to 27 percent of the overstay cases upon whom they initiated investigations.¹²

Limited resources, risk prioritization, biographical data issues, and the inability to locate overstays have all contributed to poor enforcement results against the large number of overstay violators. Criminology theories suggest that, based on the small number of enforcement resources and low removal numbers of overstay cases, some visitors may weigh the unlikely chance of being caught against the potential economic and social rewards of staying. If risk is perceived as low, they may decide to overstay their visas. In other words, low enforcement levels may embolden potential violators to believe they can avoid apprehension.

DHS agencies use biometric technology to identify arriving nonimmigrants. The department has conducted pilot programs to show that a biometric exit system can identify departing foreign nationals. However, to date, an exit system has not been implemented nationwide for a variety of reasons, including cost, infrastructure, and the evolving nature of technology. Proponents of a biometric exit system believe its implementation will curb overstay violations by automating departure records, rapidly identifying overstay cases, reducing data errors, and preventing imposters from departing. However, some officials have argued that the implementation of any system must also include aggressive enforcement to apprehend and remove violators; without this enforcement, the system is only a costly illegal immigrant tracking system.¹³

¹¹ *Implementation of an Entry/Exit System: Still Waiting After All These Years: Hearing before the Committee on the Judiciary*, House of Representatives, 113 Cong. 1 (2013), 81.

¹² GAO, *Overstay Enforcement*, 15.

¹³ Diem Nguyen and Jena McNeil, “Biometric Exit Programs Show Need for New Strategy to Reduce Visa Overstays” (backgrounder, The Heritage Foundation, 2010), 5.

The homeland security experiences of other countries can help us identify effective practices for potential application in the United States. Applying this data to U.S. border enforcement agencies provides a starting point for U.S. policy development. Some of the advantages of a biometric exit system are evident in the European Union and other nations. However, some critics, including the European Parliament, have indicated that enforcement is still necessary to address visa overstay cases and other immigration violations.

Various policy options are available to DHS to address the visa overstay problem. Immigration enforcement agencies could maintain the status quo, relying on biographical exit-based systems with the occasional “surge” of biometric systems at some airports. DHS could complete the installation of a biometric-based exit system at air and seaports across the United States while maintaining current enforcement levels. Alternatively, DHS could combine these methods by installing a biometric exit system while simultaneously increasing enforcement against visa overstay violators.

The research in this thesis indicates that combining a biometric exit system with increased enforcement would give DHS the most significant opportunity to effectively address the visa overstay problem. This system would combine the technological benefits of biometrically identifying violators with the enforcement resources needed to apprehend and remove them. A concerted enforcement effort to locate and remove these cases will not only reduce the number of violators currently in the United States but would also serve as a future deterrent. As such, the United States should continue the developing a biometric exit system while increasing interior enforcement efforts against visa overstay violators.

Even with increased enforcement operations, policy changes, and the implementation of a biometric exit system, reducing visa overstay violations requires resources and support from all levels of DHS and the executive branch. DHS border enforcement agencies must send a message that the integrity of our immigration system is paramount and that laws will be enforced. A commitment to enforcement, in conjunction with technology, will demonstrate that visa overstay cases are important and need to be addressed as a matter of U.S. immigration law and as part of the homeland security enterprise.

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I. INTRODUCTION

Every year, tens of millions of nonimmigrants visit the United States for business, pleasure, school, work, or various other reasons. The expenditures of these foreign travelers provide revenue to U.S. businesses and create jobs across the country; in 2016, this spending amounted to over \$244 billion in the tourism industry alone.¹ These visitors may travel to the United States on a particular type of visa, or they may arrive from certain nations where the requirement to have a visa is waived. In either case, they are nonimmigrants who intend to visit for a short period and then return home. While in the United States, they are subject to U.S. immigration laws and must depart when instructed.

The vast majority of nonimmigrant visitors do lawfully depart the United States each year under the conditions of their visa. The Department of Homeland Security (DHS) estimated that close to 99 percent of the fifty-two million foreign travelers who visited the United States in 2017 departed legally. However, not every visitor leaves as instructed. In 2015, DHS provided an overstay estimate to Congress, calculating that only 1.17 percent of foreign visitors overstayed their visas in 2015.² For fiscal year 2016, this number increased to 1.47 percent but then decreased to 1.33 percent in fiscal year 2017.³ While these percentages seem low, even with such a high compliance rate, the sheer volume of visitors to the United States means that those who overstayed their visa period approximated 527,127 foreign visitors in 2015; 739,478 in 2016; and 701,900 in 2017.⁴

Some foreign nationals also try to enter the United States at the border without inspection. However, they comprise a smaller amount of illegal aliens than visa overstay

¹ “Travel, Tourism & Hospitality Industry Spotlight,” Select USA, accessed June 26, 2018, <https://www.selectusa.gov/travel-tourism-and-hospitality-industry-united-states>.

² Department of Homeland Security (DHS), “Fiscal Year 2015 Entry/Exit Overstay Report” (report, Department of Homeland Security, January 19, 2016), 7.

³ DHS, “Fiscal Year 2017 Entry/Exit Overstay Report” (report, Department of Homeland Security, August 7, 2018), iii.

⁴ DHS, “Fiscal Year 2016 Entry/Exit Overstay Report” (report, Department of Homeland Security, April 20, 2016), iv, <https://www.dhs.gov/sites/default/files/publications/Entry%20and%20Exit%20Overstay%20Report%2C%20Fiscal%20Year%202016.pdf>; DHS, “2017 Entry/Exit Overstay Report,” iii.

cases. For comparison, 331,333 foreign nationals were apprehended trying to cross the U.S. southern border illegally in 2015; 408,870 in 2016; and in 2017 that number totaled 310,531.⁵ These figures (shown in Figure 1) indicate that more foreign nationals are being legally admitted to the United States and unlawfully remaining here than are simply entering by illegally crossing the U.S.–Mexico border.

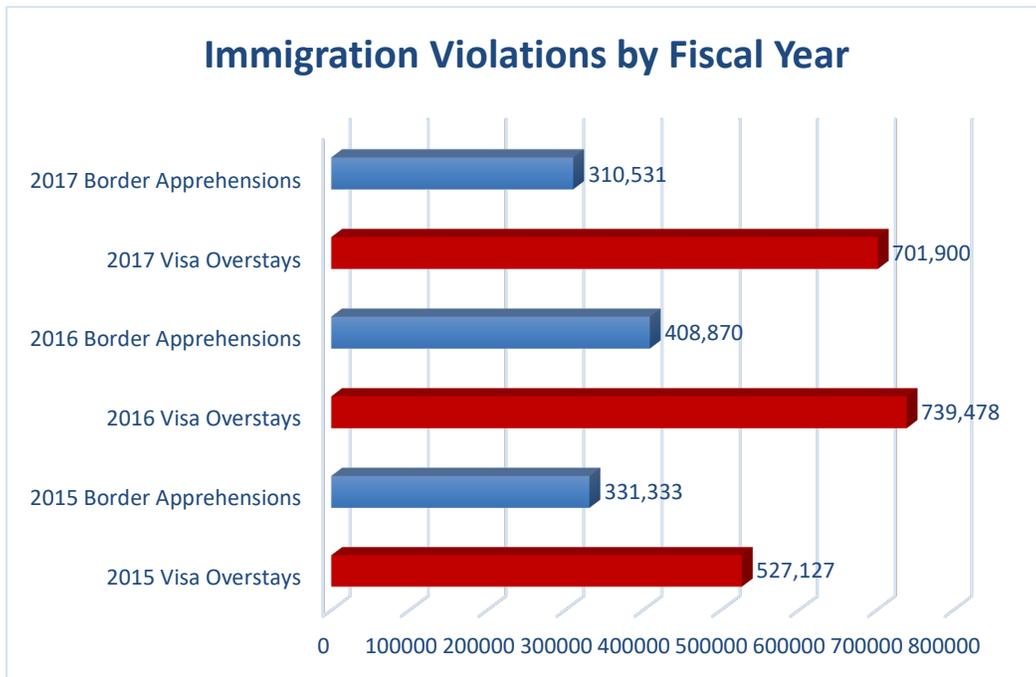


Figure 1. Immigration Violations by Fiscal Year⁶

⁵ Andrew V. Pestano, “Illegal Border Crossings from Mexico into U.S. up 23 Percent from 2015,” UPI, October 18, 2016, https://www.upi.com/Top_News/US/2016/10/18/Illegal-border-crossings-from-Mexico-into-US-up-23-percent-from-2015/7331476791148; Geneva Sands, “Immigration Arrests Spiked, Illegal Border Crossings Dropped in 2017,” ABC News, December 5, 2017, <https://abcnews.go.com/US/immigration-arrests-spiked-illegal-border-crossings-dropped-2017/story?id=51599510>.

⁶ Adapted from DHS, “Entry/Exit Overstay Report,” 2015, 2016, 2017; Pestano, “Illegal Border Crossings”; Sands, “Immigration Arrests.”

A. PROBLEM STATEMENT

The total number of annual visa overstay cases as reported by DHS poses a security risk to the United States of America. The number of yearly overstay cases can spread the attention of DHS enforcement agencies thinly across a large population of subjects.⁷ Terrorists and members of transnational criminal organizations can potentially exploit this risk since they desire to enter and operate inside the United States. These criminal actors have various methods to accomplish this mission. They can attempt to sneak illegally across the U.S. border, or try to enter the United States legally on a visa and then remain here to conduct operations. In either case, an immense number of overstays can show terrorists that they can exploit the U.S. visa system to enter and stay inside the United States.⁸ Depending on their goals, be it profiting from smuggling, trafficking in illegal goods, or attempting to destroy the hallmarks of our nation, these actors may or may not choose to violate the terms of their visas.

Terrorists have previously attempted to abuse the U.S. immigration system to carry out attacks against U.S. persons and interests. The 9/11 Commission commented on these past violations, stating that “For terrorists, travel documents are as important as weapons.”⁹ The use of visas to legally come to the United States has aided terrorists in their operations; on thirteen different occasions in the past, including 9/11, terrorists have overstayed their visas.¹⁰ Recent efforts by terrorists to violate immigration law can be traced back to at least the first World Trade Center bombing, where one of the convicted perpetrators had been working in the United States illegally after remaining past the period of admission for his

⁷ K. Jack Riley, *Border Security and the Terrorist Threat* (Santa Monica, CA: RAND, 2006), 10, <https://www.rand.org/pubs/testimonies/CT266.html>.

⁸ Riley, 10.

⁹ National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States*, 1st ed., Kindle (New York: W. W. Norton, 2004).

¹⁰ Janice L Kephart, *Immigration and Terrorism: Moving beyond the 9/11 Staff Report on Terrorist Travel* (Washington, DC: Center for Immigration Studies, 2005), 5.

tourist visa.¹¹ Additionally, at least four of the 9/11 hijackers had overstayed their visas or were out of status when they attacked the United States.¹² Since 2001, more than thirty-six visa overstay violators have been convicted of terrorism-related charges in the United States.¹³

Dating back to the 1996 Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA), Congress, and later, the 9/11 Commission, stated that a biometric entry/exit screening system is needed at the U.S. border to address the visa overstay issue.¹⁴ Using biometric traits, such as fingerprints, to identify visitors may reduce or eliminate problems with current visa overstay violations. Biometrics can verify a subjects' identity, track their encounters with law enforcement, and record their entry and subsequent exit from the United States. These capabilities could help border agencies to identify individuals who have overstayed their visas and take the appropriate enforcement action.

Congress has passed several laws regarding the implementation of an automated system, but to date DHS has not implemented such technology nationwide.¹⁵ However, DHS and Customs and Border Protection (CBP) have started testing biometric exit system technology at several U.S. airports. Proponents of such a system argue it will allow border enforcement agencies to identify visa violators more efficiently and reduce the number of foreign nationals who violate U.S. immigration law by overstaying their visas. However, current practices do not prioritize most visa overstay cases for enforcement action; prior

¹¹ *Overstaying Their Welcome: Security Risks Posed by Visa Overstays: Hearing before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security*, House of Representatives, 114 Cong. 2 (2016) (testimony of Martha McSally, Chairman, Subcommittee on Border and Maritime Security), 4.

¹² *Visa Overstays: A Gap in the Nation's Border Security: Hearing before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security*, House of Representatives, 115 Cong. 1 (2017) (statement of Chairwoman Martha McSally), 2.

¹³ *From the 9/11 Hijackers to Amine El Khalifi: Terrorists and the Visa Overstay Problem: Hearing Before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security*, House of Representatives, 112 Cong. 2 (2012) (statement of Candice S. Miller, Chairwoman, Subcommittee on Border and Maritime Security), 4.

¹⁴ National Commission, *The 9/11 Commission Report*, sec. 10834.

¹⁵ Immigration Control and Financial Responsibility Act of 1996, H. Res. 2202, 104th Cong. (1996); Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. No. 108-458 (2004).

efforts to identify and apprehend violators have achieved limited success.¹⁶ If the implementation of a biometric exit system includes the flaws of current overstay enforcement policies, it may not have the impact desired by its proponents.

This thesis hypothesizes that a biometric exit system will have minimal impact on the number of visa overstay cases; technology alone will not solve the current overstay problem. A terrorist or criminal's primary goal in coming to the United States is to obtain entry into the country; if lawful entry is achieved using a visa, it is unlikely that the criminal would leave until his or her objective is complete.¹⁷ The presence of a biometric exit-tracking system would do little to discourage overstay violations because the subject came never intending to leave; once admitted, he or she is unlikely to depart no matter what exit system may be in place as a deterrent.¹⁸

B. RESEARCH QUESTION

When assessing measures that the United States and DHS can take to ensure that visa laws are enforced, how effectively will a biometric exit system address the problem of visa overstay violators? What measures can be taken to enforce visa laws?

C. RESEARCH METHODOLOGY

To examine the impacts of visa overstays on homeland security and assess current policies related to this issue, research for this thesis focuses on primary sources where available but also uses government studies and reports, congressional testimony, case law, statutes, news reports, and think tank studies. It also focuses on the implementation of a biometric exit system, its goals, and possible effects on visa overstays. Scientific studies, journal articles, and other scholarly works provide an exploration of biometrics and their use in border security. Also, this thesis looks at overstay enforcement and biometric exit

¹⁶ Government Accountability Office (GAO), *Overstay Enforcement: Additional Mechanisms for Collecting, Assessing, and Sharing Data Could Strengthen DHS's Efforts but Would Have Costs*, GAO-11-411 (Washington, DC: Government Accountability Office, 2011), 2.

¹⁷ *Visa Overstays: Can They Be Eliminated? Hearing before the Committee on Homeland Security*, House of Representatives, 111 Cong. 2 (2010) (testimony of Edward Alden, senior fellow, Council on Foreign Relations), 25.

¹⁸ Alden, 25.

system implementation in comparable nations to identify viable policy options that may be transferable to the United States.

Ultimately, a synthesis of the previous data led to an analysis of current overstay enforcement efforts. This analysis helped generate policy recommendations to agency leaders for consideration as they search for resolutions to the security issue of visa overstays. A biometric exit system may enhance the ability to identify visa violators when compared to current methods. DHS could continue current enforcement actions against overstay violators; combining a biometric exit system with increased enforcement would allow DHS to identify, apprehend, and remove visa violators.

This thesis only reviews foreign nationals legally admitted to the United States who did not depart under their visa conditions; it does not describe efforts related to violators entering the United States without inspection. Also, the Donald J. Trump administration has recently proposed making nonimmigrant visa overstay violations a federal criminal misdemeanor. Such a legal change may have an impact on the number of overstay violators; however, it is difficult to assess these implications without a bill for analysis. Therefore, research for this thesis focuses primarily on current policies, laws, and statutes.

D. OVERVIEW

This thesis constructs and analyzes alternative policy options to identify a successful outcome to address the homeland security gap posed by visa overstays. Chapter II provides background information on visa laws and processes as well as a review of the current literature on this topic. Chapter III discusses biometric methods and related exit systems, while Chapter IV analyzes similar enforcement efforts in comparable nations. Chapter V examines policy options regarding visa overstays by describing and assessing current agency policies related to violator identification and overstay enforcement. Finally, Chapter VI offers some alternative solutions to visa overstay enforcement to provide decision makers with insight into this matter.

II. BACKGROUND AND LITERATURE REVIEW

This chapter defines what constitutes a visa overstay and provides background for current visa laws and processes. It provides information on why visitors may overstay their legal term of admission to the United States and discusses current enforcement policies and procedures. The use of biographical and biometric enforcement systems is also reviewed. Each section reviews the literature surrounding each of these issues, including academic works, government reports, think tank papers, and congressional testimony.

A. CURRENT VISA LAWS

When a foreign national wants to visit the United States, in most cases he or she must first obtain a visa to do so. This process allows U.S. consular officials overseas to review the applicant's case, conduct background checks, and determine if the subject is eligible for the visa applied for or if he or she poses a threat to national security. If applicants meet these (and other) requirements, they will receive a nonimmigrant visa to enter the United States.¹⁹

In reality, obtaining a nonimmigrant visa merely allows the visitor to come to the United States and apply for admission at a port of entry. Upon application for admission, a CBP officer reviews the subject's visa, documents, and biometrics, along with databases, to verify the person is admissible to the United States under the visa currently in his or her possession. During the arrival inspection process, CBP grants the visitor an authorized period of admission, either for a specific length of time or for as long as the visitor maintains a particular status.²⁰ The type of visa determines the length of the entry period granted by CBP. The actual visa the subject receives may be valid for entry to the United States multiple times. What does expire, however, is the visa's period of admission.

¹⁹ "Visitor Visa," U.S. Department of State, accessed June 16, 2018, <https://travel.state.gov/content/travel/en/us-visas/tourism-visit/visitor.html>.

²⁰ GAO, *Overstay Enforcement: Additional Actions Needed to Assess DHS's Data and Improve Planning for a Biometric Air Exit Program*, GAO-13-683 (Washington, DC: Government Accountability Office, 2013), 6, <http://www.gao.gov/assets/660/656316.pdf>.

Depending on the type of visa a nonimmigrant visitor arrives with, he or she may be granted a period of admission for anywhere from ninety days to two years. Unlike in some nations (for example, the United Kingdom), U.S. law allows visitors the possibility of remaining inside the country past their required departure date; visitors with certain visas can apply with United States Citizenship and Immigration Services (USCIS) to extend their stay while inside the country.²¹ Likewise, visitors who enter on one type of visa can apply to adjust their status to a different kind while they are in the United States.²² Specific requirements for these changes must be met but, if approved, the visitor does not always need to leave the United States before they occur.

The Immigration and Nationality Act (INA) establishes penalties for nonimmigrant visitors who overstay the period of admission allowed by their visa. Exceeding this period means the subject is in violation of U.S. immigration law and therefore possess “unlawful presence”; this unlawful presence has a bearing on the person’s admissibility to re-enter the United States in the future, among other things.²³ The act of overstaying a visa also results in the termination of the validity of the visa. Depending on how long the visitor remains past his or her admission period, the statute states that he or she will be inadmissible for future entry to the United States for a period of three or ten years. If DHS apprehends an overstay violator after their admission period expires, the violator is entitled to a hearing before an immigration judge.

Visitors who come to the United States under the Visa Waiver Program (VWP) are not required to obtain a visa but can only visit for ninety days. Remaining past this period means these subjects receive the same penalties of inadmissibility; they are also unable to participate in VWP again and must obtain a visa to visit the United States in the future.²⁴ If Immigration and Customs Enforcement (ICE) or another enforcement agency encounters

²¹ “Extend Your Stay,” USCIS, accessed June 16, 2018, <https://www.uscis.gov/visit-united-states/extend-your-stay>.

²² “If You Are Thinking about Changing Your Nonimmigrant Status,” U.S. Citizenship and Immigration Services, accessed June 16, 2018, <https://www.uscis.gov/visit-united-states/change-my-nonimmigrant-status-category/change-my-nonimmigrant-status>.

²³ Inadmissible Aliens, 8 U.S.C. § 1182(a)(9)(B)(I).

²⁴ GAO, *Overstay Enforcement: Additional Mechanisms*, 9.

a VWP visitor within the United States after his or her period of admission has expired, and the visitor has not received an extension from USCIS, he or she is subject to removal from the United States. Based on the conditions of the VWP program, participants are not normally afforded a hearing before an immigration judge. Instead, the lead immigration official in their jurisdiction decides their case. However, VWP participants are permitted to seek asylum in the United States, or they may be able to find other forms of immigration relief in the United States.²⁵

B. DEFINING VISA OVERSTAY

Visitors who remain in the United States past their period of admission are typically referred to as “visa overstays.” The term “visa overstay” is technically a misnomer. This term refers to a nonimmigrant visitor legally admitted to the United States for a specified period who has then remained in the country after the period has expired (or has failed to maintain a certain status).²⁶ This term is still applicable even for subjects who may enter under the VWP because they still receive a finite period of admission. It also applies to subjects who may still have a valid visa in their passport; even if the visa is still valid, remaining in the United States past their period of admission is considered an overstay. Some visitors, such as students, are given a visa that is good for the “duration of their status” in the United States. However, if they fail to maintain that status—for example, if they drop out of school or change the circumstances of the visa on which they entered—they are generally identified as a visa overstay case as well. The general term “overstay” may be more accurate in this regard, but following the 9/11 Commission Report’s use of the term and continued political debates over illegal immigration, the phrase remains commonplace in our vernacular. For this thesis, “visa overstay” and “overstay” are used interchangeably and describe the circumstances outlined above, to wit, someone admitted to the United States legally who remains here in violation of immigration law.

²⁵ Visa Waiver Program for Certain Visitors, 8 U.S.C. § 1187(b)(2).

²⁶ GAO, *Overstay Enforcement: Additional Actions*, 6.

Visa overstays can be broken down into two categories, in-country and out-of-country. An in-country overstay is a nonimmigrant visitor who has remained in the United States past the statutory period of admission. An out-of-country visitor is one who has departed the United States, but did so after his or her valid admission period ended.²⁷ These distinctions seem unusual but are utilized in government reports regarding the overstay rate for some nations and to identify how many violators are currently in the United States.²⁸

Annually identifying how many visitors violate U.S. visa law by staying inside the United States has proven to be difficult. Federal law mandates that DHS (and its predecessor agencies) provide an estimate of these overstay cases to Congress every year. However, due to a lack of confidence in the data or any reliable way to definitively identify or track overstay cases, this reporting did not occur regularly from 1994 to 2015.²⁹ Even determining if a subject has overstayed his or her visa can be problematic based on current data collection, let alone locating or apprehending the subject. For those who do overstay, immigration enforcement agencies often have little to no idea where these visitors go, or what their future intentions are.

C. REASONS VISITORS OVERSTAY THEIR VISAS

There are several reasons why foreign visitors may overstay their authorized period of admission. The Government Accountability Office (GAO) reports that economic factors and opportunities motivate most visitors who overstay their visas to remain in the United States.³⁰ Changes within a visitor's country, while they are visiting the United States, could also cause the visitor to stay here past his or her admission date. For example, a coup or change in the government may make it difficult or impossible for the visitor to return home. Instead of crossing the U.S. border illegally, some visitors have used visas as a legal way

²⁷ GAO, 6.

²⁸ Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. No. 110-53 (2007), sec. 711.

²⁹ GAO, *Overstay Enforcement: Additional Actions*, 24.

³⁰ GAO, 1.

to enter the United States—and never leave—to escape violence, political turmoil, or economic strife in their home nation.³¹

Some critics argue that our current ineffective immigration system is one cause for visitors to overstay their visas. In testimony before Congress, law professor and attorney Margaret Stock testified that the vast majority of people who overstay their visas are not terrorists; they are merely remaining here hoping that their application to adjust status is approved.³² She further stated that these subjects are afraid to leave the United States for fear of not being able to return in the future, and they choose to remain rather than risk leaving.

This argument regarding visa violators seems a bit specious, however. Current law does allow visitors to apply to extend their stay and/or adjust their status while in the United States. However, it does not allow those applicants to remain inside our nation just because their application is pending. They must still abide by the terms of their visa, to wit the period of admission and must depart if their adjustment or extension is not approved before their period expires. Convenience is no excuse for breaking the law; the current immigration system, policies, and procedures should not be blamed for the conscious decisions of those who choose to violate the law. The current system includes penalties such as travel bars for overstay violators as a means to enforce the law and deter violators from breaking it.

Criminology theories may also reveal why someone might overstay a visa in violation of the law. The deterrence theory proposes that an individual's fear of being caught and prosecuted and the fear of jail will dissuade him or her from committing a crime; this results in criminal activity being deterred.³³ The rational choice theory of

³¹ Aline Barros, "After Overstaying Visas, Immigrants Face Uncertain Future," VOA, May 24, 2017, <https://www.voanews.com/a/after-overstaying-visas-immigrants-face-uncertain-future/3868473.html>.

³² *Visa Overstays: Can We Bar the Terrorist Door? Hearing before the Subcommittee on Oversight and Investigations of the Committee on International Relations, House of Representatives, 109 Cong. 2 (2006)* (testimony of Margaret Stock, Associate Professor, Department of Law, United States Military Academy), 24.

³³ Ronald L. Akers, "Rational Choice, Deterrence, and Social Learning Theory in Criminology: The Path Not Taken," *The Journal of Criminal Law and Criminology* 81, no. 3 (1990): 654, <https://doi.org/10.2307/1143850>.

criminology assumes that a sensible subject will act to avoid costs and that, by committing a criminal act, the person will weigh the rewards of action with the potential costs.³⁴ Based on the small number of resources dedicated by DHS and the low removal numbers of overstay cases (or the perception thereof), some visitors may weigh the unlikely chance of being caught against the potential economic and social rewards gained by staying. If the risk is perceived as low, they may decide to overstay their visa.

Other possible causes for visa overstay violation are U.S. enforcement policies and procedures relating to immigration law in general and visa overstay cases in particular. ICE is the agency responsible for identifying, locating, apprehending, and removing immigration violators. Enforcement and Removal Operations (ERO) and Homeland Security Investigations (HSI) are the two divisions of ICE that carry out this mission. Prior GAO reports indicate that in the recent past, ICE dedicated only about 3 percent of its resources to dealing with visa overstay cases.³⁵ The Trump administration has been reallocating funds for ICE's enforcement efforts from other agencies, but these monies have been earmarked for detention space and removal operations, not overstay enforcement specifically.³⁶ Between 2004 and 2010, HSI only arrested 20 to 27 percent of the overstay cases upon whom they initiated investigations.³⁷ All of these statistics indicate that overstay enforcement in itself is currently not a high priority for DHS immigration enforcement agencies.

As a result, a lack of DHS enforcement against overstay cases could fail to deter some visitors from complying with the law, thus leading to an increase in visa overstay violations. Between 2004 and 2010, the ICE Counterterrorism and Criminal Exploitation Unit (CTCEU) reported that it had closed 34,700 overstay cases, which resulted in 8,100

³⁴ Rachael Steele, "How Offenders Make Decisions: Evidence of Rationality," *British Journal of Community Justice* 13, no. 3 (2016): 8.

³⁵ Jessica M. Vaughan, "DHS Reports Huge Number of Visitors Overstayed in 2015," Center for Immigration Studies, January 20, 2016, <https://cis.org/Vaughan/DHS-Reports-Huge-Number-Visitors-Overstayed-2015>.

³⁶ Tal Kopan, "It's Not Just FEMA: ICE Quietly Got an Extra \$200 Million," CNN, September 12, 2018, <https://www.cnn.com/2018/09/12/politics/ice-more-money-fema-dhs/index.html>.

³⁷ GAO, *Overstay Enforcement: Additional Mechanisms*, 15.

arrests by HSI; this is relative to the estimated overstay population of 5.5 million people during that time.³⁸ That is an arrest rate of only 0.0014 percent. During fiscal year 2015, DHS reported that 527,127 nonimmigrant visitors overstayed their visa admission in that year alone. Further review by DHS analysis units indicated the suspected number of in-country overstays that year (those still in the United States) was 482,781 subjects.³⁹ HSI arrested 1,900 violators based on leads from the CTCEU. Based on these figures, through fiscal year 2015, generally speaking, a nonimmigrant visitor who overstayed his or her visa may have expected only a 0.0039 percent chance of being arrested by HSI following an investigation.

While these recent figures represent an increase over prior arrest rates for overstay cases, the likelihood of a DHS enforcement agency detaining an overstay violator is still very low. The actual number of overstay arrests each year may be slightly higher because ERO could also have encountered overstay cases and apprehended them. However, those arrest numbers are not reported to DHS headquarters using the same method.⁴⁰ As a result, identifying the total number of overstay arrests is difficult, much like determining the total number of overstays.

D. DHS AGENCY OVERSTAY POLICIES AND PROCEDURES

Multiple DHS agencies are involved in the current effort to identify, locate, apprehend, and remove visa overstay violators. CBP captures and stores biometric entry and biographic exit data from arriving foreign visitors and passenger manifests. The CTCEU is the primary division responsible for using this information to identify visa overstay case leads and referring this intelligence to HSI for further inquiry.⁴¹ HSI reviews these cases for threats to national security, public safety, or other high-risk indicators and assigns relevant cases for investigation.

³⁸ GAO, 12.

³⁹ DHS, “2015 Entry/Exit Overstay Report,” 7.

⁴⁰ GAO, *Overstay Enforcement: Additional Mechanisms*, 15.

⁴¹ GAO, 14.

Current overstay enforcement procedures generally begin with HSI's Overstay Analysis Unit (OAU), which reviews departing manifests through the Automated Passenger Information System.⁴² The OAU evaluates this data and manually compares it to the data in electronic DHS systems, including the Arrival and Departure Information System (ADIS), to identify possible overstay cases. The analysis of this information by the OAU can serve as intelligence for target location and apprehension, although it may not provide a full threat analysis of the subject. The OAU may also conduct other checks to ensure that suspected violators have not legally adjusted their immigration status or received a visa extension.⁴³

Once the OAU has identified possible overstay cases, it refers the data to CTCEU for possible investigation. The CTCEU then prioritizes these leads for research based on threat analysis of potential risk to national security or public safety.⁴⁴ An increase in nonimmigrant visitors to the United States has led to a rise in visa overstay cases, which has consequently led to an increase in leads reviewed by CTCEU for investigation. In 2005, CTCEU examined 13,000 leads and investigated 4,600; in 2012, this number increased to 212,000, but only 2,800 were referred to agents for investigation.⁴⁵ ICE's Assistant Director for National Security Investigations testified to Congress that in fiscal year 2015, ICE spent approximately 650,000 man hours investigating 971,000 visa overstay case leads.⁴⁶ Of those leads, 10,000 were determined to meet HSI priority for security or safety concerns.⁴⁷

⁴² GAO, *Overstay Enforcement: Additional Actions*, 2.

⁴³ GAO, 10.

⁴⁴ GAO, 10.

⁴⁵ *Implementation of an Entry/Exit System: Still Waiting After All These Years: Hearing before the Committee on the Judiciary*, House of Representatives, 113 Cong. 1 (2013), 81.

⁴⁶ *Overstaying Their Welcome: Security Risks Posed by Visa Overstays: Hearing before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security*, House of Representatives, 114 Cong. 2 (2016) (testimony of Craig Healey, Assistant Director for National Security, ICE), 18.

⁴⁷ Healey, 19.

The CTCEU sends visa overstay leads that do not meet HSI criteria to ERO for possible action.⁴⁸ HSI and ERO may also encounter overstay cases during normal operations, but this happens infrequently and is usually not the result of targeted enforcement operations. If a local or state law enforcement agency arrests a visa overstay violator, a scan of the violator's fingerprints may notify ERO of his or her apprehension. By interfacing with these agencies through the Criminal Alien Program or the Secure Communities program, ERO may arrest the violator and take the appropriate enforcement action.

E. CURRENT VISA OVERSTAY ENFORCEMENT IN THE UNITED STATES

The Trump administration has indicated that no class of immigration violator will be exempt from enforcement. However, previous administrations did not prioritize visa overstay cases for apprehension or custody if they did not have any other convictions, despite their violation of immigration law. For example, Amine el-Khalifi is a Moroccan citizen who entered the United States on a tourist visa in 1999 and never left; in 2012 the Federal Bureau of Investigation (FBI) arrested him after he planned a suicide attack on the U.S. Capitol.⁴⁹ Despite overstaying his visa for thirteen years, el-Khalifi was not a priority to any border enforcement agency at the time the FBI arrested him.⁵⁰ Even if immigration agencies had encountered him before he planned his attack, prior administrations would likely have not prioritized him for apprehension and removal because he had not committed any other crimes.

Several other factors can hamper overstay enforcement investigations. DHS immigration enforcement agencies have a finite number of resources available and competing priorities can pose a challenge to these efforts.⁵¹ Having limited resources means DHS agencies must prioritize cases. HSI prioritizes its resources on national security

⁴⁸ DHS, "2015 Entry/Exit Overstay Report," 6.

⁴⁹ Miller, *From the 9/11 Hijackers to Amine el-Khalifi*, 4.

⁵⁰ Miller, 4.

⁵¹ GAO, *Overstay Enforcement: Additional Actions*, 34.

and public safety threats, sending other cases to ERO. Consequently, overstay cases that are deemed “low risk” receive fewer resources than other higher-priority cases.⁵² Because many visa violators have only broken immigration laws and have not been arrested or convicted of any other crime, they generally receive low priority due to ERO’s current staffing, funding, and detention resources.

As a result, many overstay cases are not priorities to either agency. Former ICE Assistant Secretary Julie Myers Wood testified that “overstays are no one’s priorities, and when they are no one’s priorities, they become everyone’s problem because they undermine the integrity of our overall immigration system.”⁵³ As recently as 2017, the GAO reported that DHS has still not altered current enforcement priorities or actions to address potential overstays.⁵⁴

The inability to locate overstay subjects also affects visa overstay enforcement; this can be one of the most challenging tasks for enforcement agencies.⁵⁵ When foreign travelers apply for a visa (or permission to enter under the VWP), they must provide an address of their location in the United States. They must also provide information about their trip on their customs declaration upon arrival. However, there is no way to verify that the subject will reside at that address, or for how long, or if the address is even the subject’s true destination. After visitors are admitted into the United States, there is virtually no way to know where they are or where they are going. If they provided false information on their customs declaration, it will be difficult for enforcement agencies to locate them.

Data quality issues can also affect DHS’s ability to conduct enforcement against visa overstay cases. Manifest inaccuracies, name errors, incomplete exit records, or failure to confirm a traveler’s identity could result in departure verification issues or possibly

⁵² GAO, *Overstay Enforcement: Additional Mechanisms*, 23.

⁵³ *Implementation of an Entry/Exit System: Still Waiting After All These Years: Hearing before the Committee on the Judiciary*, House of Representatives, 113 Cong. 1 (2013) (testimony of Julie Myers Wood, Assistant Secretary, ICE), 81.

⁵⁴ GAO, *Border Security: DHS Has Made Progress in Planning for Biometric Exit System but Challenges Remain*, GAO-17-170 (Washington, DC: Government Accountability Office, 2017), i.

⁵⁵ GAO, *Overstay Enforcement: Additional Mechanisms*, 18.

allow an imposter to depart in someone else's place.⁵⁶ These issues also make it more difficult for the CTCEU to identify visa overstay cases or determine if they have eventually departed. A delay in the input of departure data means that agents may have to re-check old cases to see if they have later departed. This process is tedious and time-consuming and has an impact on CTCEU's ability to quickly and accurately identify overstay cases for investigation.⁵⁷

Finally, not all law enforcement agencies fingerprint every person they arrest, which would affect notifications to ICE if a suspected overstay case is arrested by a local agency. There has also been an increase in the number of "sanctuary cities" that do not cooperate or notify ICE after the arrest of a foreign national. This could cause the release of a visa overstay violator by a local agency after his or her arrest for a criminal charge. In these instances, ICE would be unable to apprehend a visa overstay violator for removal.

F. BIOGRAPHICAL ENTRY/EXIT SYSTEMS

Commercial carriers are required to provide DHS with manifests for all passengers and crew arriving and departing the United States.⁵⁸ In the past, as visually depicted in Figure 2, arriving passengers would receive a paper Form I-94 to identify themselves upon admission into the United States. CBP would keep the arrival half upon entry and contractors would later manually enter this data into computers.⁵⁹ Upon exiting the United States, carriers were required to collect the departure half for submission to CBP for database entry. Joining the two parts of the I-94 would close the visitor's record as having departed the United States. If no departure record was received, the visitor could be considered an in-country overstay. If the date on the departure I-94 was after the period of admission had expired, the visitor was considered an out-of-country overstay.

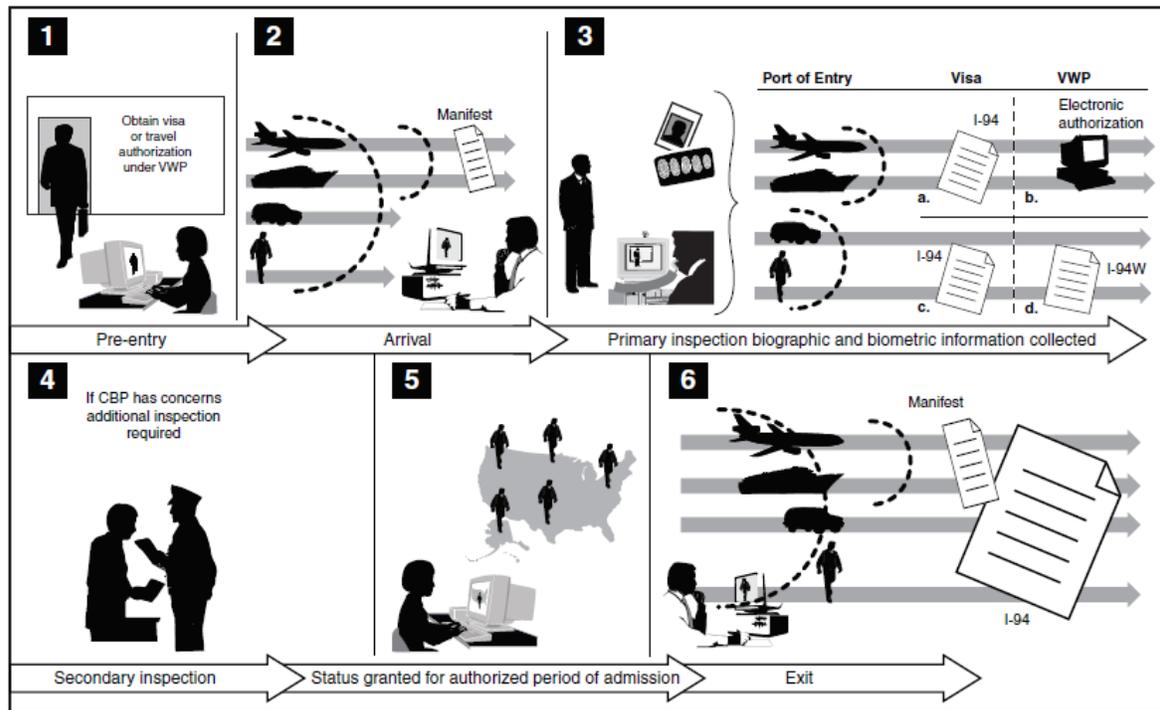
⁵⁶ *Implementation of an Entry/Exit System*, 26.

⁵⁷ GAO, *Overstay Enforcement: Additional Mechanisms*, 19.

⁵⁸ DHS, "2016 Entry/Exit Overstay Report," 3.

⁵⁹ United States Visitor and Immigrant Status Indicator Technology Program, *Air/Sea Biometric Exit Project: Regulatory Impact Analysis*, DHS-2008-0039-0002 (Washington, DC: Department of Homeland Security, 2008), 15, <https://airlineinfo.com/dhspdf/3.pdf>.

Figure 1: Process for Nonimmigrant Entry to and Exit from the United States



Source: GAO analysis of DHS information; and Art Explosion (clipart).

Figure 2. I-94 Process for Nonimmigrant Entry and Exit from the United States⁶⁰

The use of paper I-94s was fraught with problems: visitors or officials could lose the forms, resulting in a lack of departure record; illegible documents could cause the names on the two halves to be entered differently; the traveler’s name on the I-94 may not precisely match the name on the carrier’s manifest or could be misspelled; and there could be a significant delay in the time the data was entered by contractors. As a result, using paper I-94s was not a reliable method to track overstays within the United States. This is the main reason why DHS and its predecessor agencies found it difficult to provide a yearly overstay estimate, despite congressional mandates.⁶¹ As a result, electronic documents have now replaced paper I-94s.

⁶⁰ Source: GAO, *Overstay Enforcement: Additional Mechanisms*, 7.

⁶¹ GAO, *Border Security*, i.

ICE, CBP, and USCIS also face challenges regarding the biographic nature of paper Alien Registration files (A-files). Current paper files track alien cases, benefits, and removal orders; these files are not all linked to a biometric identifier. One person could apply for benefits under various names and have several records.⁶² This is especially important when considering a visa overstay case; foreign visitors could overstay their visa and then apply for an immigration benefit using a false name. Without biometric verification, immigration agencies would not know the visitor is a violator and would not be able to take any enforcement action. Utilizing biometric identifiers will help reduce these types of cases because subjects cannot file multiple applications with false names; their biometrics will give them away.

DHS agencies still rely heavily on biographical data manifests received from commercial carriers to compile lists of who has exited the country. While the electronic data given to DHS by commercial airlines show improvement over prior paper-based systems, there is still a margin for error or the possibility that bad data may affect the homeland security mission. Congress, the 9/11 Commission, and other groups indicate that biographical inaccuracies are one reason why a biometric exit system is needed. To understand the concepts and the possible utility of such a system, a review and analysis of its capabilities, strengths, and weaknesses is required.

G. BIOMETRIC CAPTURE METHODOLOGY

A review of the relevant works regarding biometric identification systems shows the science of biometrics to be accepted and mostly uncontroversial. However, there is debate regarding the methodology used to obtain biometrics, and there are issues regarding the implementation of a biometric identification system. This section examines that discussion and looks into the discourse surrounding biometric capture methodology as well as the arguments surrounding the lack of a current biometric exit system.

⁶² Thomas R. Eldridge et al., “9/11 and Terrorist Travel: Staff Report of the National Commission on Terrorist Attacks upon the United States (report, National Commission, 2004), 155, https://permanent.access.gpo.gov/lps53197/911_TerrTrav_Monograph.pdf.

The science of biometrics has been thoroughly studied, and many works in the field agree that biometric traits can be utilized to identify a subject physiologically.⁶³ The central discourse in this subtopic surrounds the best methodology to adequately capture and use biometric data. In their book, Arun Ross, Karthik Nandakumar, and Anil Jain distinguish between unimodal and multimodal technology systems.⁶⁴ Unimodal capture systems rely on only one biometric trait, such as fingerprints, to identify someone, whereas a multimodal system combines characteristics such as fingerprints and an iris scan.⁶⁵ DHS agencies and most U.S. law enforcement organizations currently rely on fingerprints as the primary method for biometric identification. Some advocates believe that prints are the best capture method because they are most prevalent in current databases.⁶⁶ In June 2016, then-Senator Jeff Sessions seemed to echo this sentiment: “We should use fingerprints ... that’s what’s in law enforcement databases. Why create a new system?”⁶⁷

Other researchers recognize that fingerprints may not always be available to identify a suspect. Blood or DNA evidence may be the only biometric identifiers available to law enforcement. In this case, DNA testing would be the most effective unimodal capture method.⁶⁸ In other cases, using facial recognition may be the preferred single biometric identification method. In their case study, Joshua Klontz and Jain used off-the-

⁶³ See, for example, Anil K. Jain, Arun Ross, and Salil Prabhakar, “An Introduction to Biometric Recognition,” *IEEE Transactions on Circuits and Systems for Video Technology* 14, no. 1 (January 2004): 4–20, <https://doi.org/10.1109/TCSVT.2003.818349>.

⁶⁴ Arun A. Ross, Karthik Nandakumar, and Anil K. Jain, *Handbook of Multibiometrics* (New York: Springer, 2006), i.

⁶⁵ Ross, Nandakumar, and Jain, i.

⁶⁶ Ben Ball, “Why Facial Recognition Is the Wrong Choice for Biometric Exit,” *Crossmatch Identity Management Blog*, August 4, 2016, <https://blog.crossmatch.com/market-trends/facial-recognition-biometric-exit/>.

⁶⁷ Mark Rockwell, “Sen. Sessions Wants Fingerprints for Visitors Entering and Exiting the U.S.,” FCW, June 16, 2016, <https://fcw.com/articles/2016/06/16/sessions-fingerprint-biometrics.aspx>.

⁶⁸ “DNA Evidence Basics: Types of Samples Suitable for DNA Testing,” National Institute of Justice, August 9, 2012, <https://www.nij.gov/topics/forensics/evidence/dna/basics/pages/types-of-samples.aspx#paternity>.

shelf facial recognition technology to identify the Boston Marathon bombers after the fact, using a variety of pictures of the suspects, because no other identifiers were available.⁶⁹

However, Shoshana Magnet cautions that unimodal systems are not foolproof; the human body is not easily identified with biometrics because bodies are individual and change over time.⁷⁰ Magnet advises that any bodily deviance—including worn fingerprints, non-normative fingers, skin diseases affecting fingerprints, or cataracts impacting scans of the eye—might cause biometric identification failures. Furthermore, people with handicaps or disabilities may be unable to access the technology itself.⁷¹

Facial recognition scanners sometimes have difficulty identifying the elderly and people of color or distinguishing between genders. Factors including aging, the environment, and lighting may have an impact on some capabilities of facial recognition. In their article on this subject, Rama Chellappa, Pawan Sinha, and Jonathon Phillips acknowledge that in certain conditions these variables may affect a biometric system's ability to identify a traveler using only his or her face.⁷² Harrison Rudolph, Laura Moya, and Alvaro Bedoya's review of airport facial recognition technology criticizes DHS for possibly "deploying a system that will exhibit race or sex-biased decisions."⁷³ They comment that DHS has even admitted it is "unable to determine" if the accuracy of its facial scans varies based on a traveler's demographics. Their review notes that DHS has had to ask its own Privacy Committee to investigate claims that its face-scanning system is biased.

⁶⁹ Joshua C. Klontz and Anil K. Jain, "A Case Study of Automated Face Recognition: The Boston Marathon Bombing Suspects," *Computer* 46, no. 11 (November 2013): 91–94, <https://doi.org/10.1109/MC.2013.377>.

⁷⁰ Shoshana Magnet, *When Biometrics Fail: Gender, Race, and the Technology of Identity* (Durham, NC: Duke University Press, 2011), 2.

⁷¹ Magnet, 30.

⁷² Rama Chellappa, Pawan Sinha, and P. Jonathon Phillips, "Face Recognition by Computers and Humans," *Computer* 43, no. 2 (February 2010): 10, <https://doi.org/10.1109/MC.2010.37>.

⁷³ Harrison Rudolph, Laura M. Moy, and Alvaro M. Bedoya, "Not Ready for Takeoff: Face Scans at Airport Departure Gates" (report, Georgetown Law Center on Privacy & Technology, 2017), 11, <https://www.law.georgetown.edu/privacy-technology-center/publications/not-ready-for-takeoff/>.

Environmental factors, physiological issues, singular capture systems, or a lack of biometric evidence indicate that relying on one form of biometric identification may not be accurate enough. Ross, Nandakumar, and Jain state it is becoming evident that using a single biometric trait is not adequate to meet current biometric matching standards.⁷⁴ They argue that the new idea of multimodal systems is more advantageous for improving identity matching and reducing errors.⁷⁵ Such a system would capture multiple types of biometric data—such as fingerprints *with* an iris scan—from each subject, which would likely reduce the chance of having an enrollment or identification failure based on an issue or disability described by Magnet. DHS agencies have recognized that multimodal identification systems may be more advantageous for enforcement operations. The Transportation and Security Administration (TSA) has stated that it is incorporating an iris scan into its systems instead of relying solely on fingerprints because “gender, ethnicity, and age affect the qualities of fingerprints.”⁷⁶ CBP has also cautioned that one biometric system will not work at every port of entry; as a result, the agency will need to use multiple biometric capture technologies.⁷⁷

Chellappa, Sinha, and Phillips comment that the new concept of multimodal biometric systems may alleviate biometric enrollment or matching issues.⁷⁸ Advocacy groups such as the International Biometrics Identity Association have also argued in favor of a multimodal capture system that relies on more than one technology to capture biometrics.⁷⁹ Ravi Das maintains that a multimodal system “can capture the unique characteristics of a much larger and varied target population,” thereby overcoming these

⁷⁴ Ross, Nandakumar, and Jain, *Handbook of Multibiometrics*, ii.

⁷⁵ Ross, Nandakumar, and Jain, ii.

⁷⁶ Meg Fletcher, “Will Pilot Program Fly?” *Business Insurance*, May 14, 2006, <http://www.businessinsurance.com/article/20060514/STORY/100018870?template=printart./20>.

⁷⁷ Calvin Biesecker, “For Biometric Exit Checks at Airports, Human Factors, Good Instruction Are Key, Officials Say,” *Defense Daily*, May 21, 2015, <http://libproxy.nps.edu/login?url=https://search.proquest.com/docview/1700777033?accountid=12702>.

⁷⁸ Chellappa, Sinha, and Phillips, “Face Recognition by Computers and Humans,” 54.

⁷⁹ “Closing the Loop: Completing Biometric U.S. Entry-Exit,” International Biometrics Identity Association, March 2016, https://www.ibia.org/download/datasets/3340/IBIA_Exit-Paper_March%202016.pdf.

difficulties.⁸⁰ Magnet acknowledges that multimodal biometric systems can identify more “othered bodies,” or people with disabilities or other non-normative issues, than unimodal systems.⁸¹ Overall, the extensive nature of the research, studies, tests, and algorithms across biometric science literature seems to validate the use of biometrics as a valid, feasible way to identify individuals in a border security environment.

H. BIOMETRIC EXIT SYSTEM IMPLEMENTATION

The United States has passed laws mandating the use of an automated biometric exit system at the U.S. border.⁸² A review of the literature shows there is disagreement surrounding the reasons why the government has not been able to implement an acceptable system successfully.⁸³ Congressional hearings, testimonies, and reports have discussed the causes of implementation delays.⁸⁴

Some authors and government officials implicate the current infrastructure at U.S. border stations and ports as the primary impediment to installing a functional biometric exit system. For example, in his testimony to Congress, CBP Deputy Assistant Commissioner John Wagner stated that physical infrastructure poses limitations on implementing a biometric exit system.⁸⁵ A 2016 DHS report to Congress reiterated these

⁸⁰ Ravindra Das, *Biometric Technology Authentication, Biocryptography, and Cloud-Based Architecture* (Boca Raton, FL: CRC, 2015), 130.

⁸¹ Magnet, *When Biometrics Fail*, 28.

⁸² See, for example, Immigration Control and Financial Responsibility Act of 1996, H. Res. 2202, 104th Cong. (1996); Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. No. 108-458, (2004).

⁸³ Bipartisan Policy Center Immigration Task Force, “Entry-Exit System: Progress, Challenges, and Outlook” (staff report, Bipartisan Policy Center, May 2014), <https://cdn.bipartisanpolicy.org/wp-content/uploads/sites/default/files/BPC%20Immigration%20Entry-Exit%20System%20Progress%20Challenges%20and%20Outlook.pdf>.

⁸⁴ *Overstaying Their Welcome*.

⁸⁵ *Overstaying Their Welcome: Security Risks Posed by Visa Overstays: Hearing before the Committee on Homeland Security*, House of Representatives, 114 Cong., 2 (2016) (statement of John Wagner, Assistant Commissioner, CBP).

limitations.⁸⁶ The report confirms there are “major physical, logistical, and operational obstacles to collecting ... biometric data upon departure.”⁸⁷

In a report titled *Border Metrics*, Marc Rosenblum and Faye Hipsman state that a biometric exit system may not even be required; first, border agencies need better data to determine a reliable approach to securing the border.⁸⁸ They argue that if the goal of an entry/exit system is to identify visa overstays, current biographic methods are accurate enough.⁸⁹ While their report admits a biometric exit system may prevent imposters from departing the United States, they suggest that identification of criminals or terrorists should occur upon entry *into* the United States. For example, CBP agents using a newly installed facial recognition scanner in Dulles, Virginia, recently apprehended an imposter trying to enter the United States.⁹⁰ When the traveler’s facial scan did not match the image stored in his passport, it was discovered he was attempting to use a fraudulent passport to enter the United States. This illustrates one benefit of having a robust biometric system to identify foreign visitors trying to enter the United States.

Rudolph, Moy, and Bedoya also state that no rationale has been provided for a biometric exit system.⁹¹ They comment that even DHS has questioned what value biometrics add to the current biographical-based exit system. Finally, they agree that the strength of a biometric-based exit system is identifying imposters.⁹² However, they do not address the laws passed by the U.S. Congress that mandate the implementation of “an automated entry and exit control system” to provide real-time data and improve database

⁸⁶ DHS, “2016 Entry/Exit Overstay Report,” 3.

⁸⁷ DHS, 4.

⁸⁸ Marc R. Rosenblum and Faye Hipsman, *Border Metrics: How to Effectively Measure Border Security and Immigration Control* (Washington, DC: Migration Policy Institute, January 2016), 1.

⁸⁹ Rosenblum and Hipsman, 24.

⁹⁰ Meredith Carey, “Biometrics Worked! U.S. Border Patrol Celebrates Success of Early Tech,” *Condé Nast Traveler*, August 24, 2018, <https://www.cntraveler.com/story/biometrics-worked-us-border-patrol-celebrates-success-of-early-tech>.

⁹¹ Rudolph, Moy, and Bedoya, “Not Ready for Takeoff,” 2.

⁹² Rudolph, Moy, and Bedoya, 2.

search capabilities.⁹³ Nor do they comment on recommendations from the 9/11 Commission regarding an automated exit system's potential to help law enforcement identify or apprehend potential national security threats who overstay their visas.⁹⁴

Congressional hearings have explained the possible value of an automated exit system when conducting visa overstay analysis.⁹⁵ During testimony to the Senate Judiciary Committee regarding border security, Senator Chuck Grassley emphasizes that a biometric exit system is necessary. He remarks that gaps in the U.S. visa process have caused the need for an entry/exit system to know who is in the country and when they leave.⁹⁶ He asserts that without a biometric exit method, "DHS cannot ensure the integrity of the immigration system by identifying and removing" visa overstays.⁹⁷ Grassley argues against those who claim infrastructure and cost preclude an exit system. He insists that "this is a border and national security issue" that is necessary to control our borders.⁹⁸ The 9/11 Commission also concluded that exit tracking is an integral part of the U.S. border system, and it recommended that DHS complete a biometric entry/exit system.⁹⁹ The Commission noted that this system could have helped law enforcement agencies identify and search for two of the 9/11 hijackers who had overstayed their visas.

Arguments surrounding costs also present an implementation issue for border security agencies. Rosenblum and Hipsman believe that the infrastructure and personnel costs to implement a biometric exit system are not justified because a cheaper biographic system can function equally well.¹⁰⁰ A 2016 study by CBP estimated it would cost

⁹³ See, for example, Immigration Control and Financial Responsibility Act of 1996, H. Res. 2202, 104th Cong. (1996); Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. No. 108-458, (2004).

⁹⁴ National Commission, *The 9/11 Commission Report*, sec. 10834.

⁹⁵ Wagner, *Overstaying Their Welcome*.

⁹⁶ "Immigration Reform," *Congressional Record* 159, no. 87 (June 18, 2013) (statement of Chuck Grassley), <https://www.congress.gov/congressional-record/volume-159/senate-section/page/S4546-4554>.

⁹⁷ Grassley.

⁹⁸ Grassley.

⁹⁹ National Commission, *The 9/11 Commission Report*.

¹⁰⁰ Rosenblum and Hipsman, *Border Metrics*, 24.

approximately \$790 million per year in personnel costs to process departing air passengers, excluding infrastructure improvements.¹⁰¹ To offset some of these costs, Congress has authorized the collection of \$1 billion total in new visa fees to pay for the implementation of such a system.¹⁰² However, in a report for the Center for Immigration Studies, Janice Kephart argues that first-year startup costs to deploy an exit system would only cost approximately \$600 million and then decline.¹⁰³ But while she contends that an exit system will lead to savings on other immigration processes and that further visa fees could offset additional costs, she also admits these expenses do not include infrastructure improvements.¹⁰⁴

I. BIOMETRIC EXIT SYSTEM METHODS AND GOALS

There seems to be some dissent across the literature on the desire or utility of a biometric exit system. The 9/11 Commission recommended that DHS implement a biometric screening entry/exit system as quickly as possible.¹⁰⁵ Congressional hearings have discussed the conflation of visas, overstays, screening, and a biometric exit system.¹⁰⁶ In testimony before the House Committee on Homeland Security, Chairwoman Martha McSally indicated that without such a system in place, “visa holders can overstay their visa and disappear into the United States, just as 4 of the 9/11 hijackers were able to do.”¹⁰⁷

Other critics have argued that the implementation of any system must also include aggressive enforcement to apprehend and remove violators; failure to enforce the laws

¹⁰¹ Wagner, *Overstaying Their Welcome*.

¹⁰² DHS, “Comprehensive Biometric Entry/Exit Plan: Fiscal Year 2016 Report to Congress” (report, Department of Homeland Security, April 20, 2016), <https://www.dhs.gov/sites/default/files/publications/Customs%20and%20Border%20Protection%20-%20Comprehensive%20Biometric%20Entry%20and%20Exit%20Plan.pdf>.

¹⁰³ Janice Kephart, “Biometric Exit Tracking,” Center for Immigration Studies, September 9, 2013, <https://cis.org/Report/Biometric-Exit-Tracking>.

¹⁰⁴ Kephart.

¹⁰⁵ National Commission, *The 9/11 Commission Report*, sec. 10826.

¹⁰⁶ *From the 9/11 Hijackers to Amine el-Khalifi*, 31.

¹⁰⁷ *Overstaying Their Welcome*, 3.

would mean the system is only a costly illegal immigrant tracking system.¹⁰⁸ In 1997, just one year after the passing of IIRIRA, a Senate Judiciary Committee report indicated that the automated entry/exit system outlined by Congress will only be able to provide data about visa overstay cases; it will not determine the intent of overstay violators, and has nothing to do with halting the entry of terrorists at the border.¹⁰⁹ General immigration enforcement, as expressed by ICE Assistant Director John Morton in 2010, is “good national security work.”¹¹⁰ He testified that “it is important to make sure that our system has credibility” to keep terrorists and criminals out of the United States. During Congressional testimony on this issue, Former ICE Assistant Secretary Wood indicated that a biometric exit system would enhance enforcement efforts for these reasons, in addition to helping enforcement agencies prioritize overstay cases. However, she also stated, “the overall value of a robust biometric system is greatly diminished if the enforcement agencies will not enforce the violations that such a system identifies.”¹¹¹

However, the goals and methods of such a system do not seem to be clearly defined, especially regarding its prevention or deterrence of visa overstays. In 2016, the GAO made several recommendations to DHS regarding a biometric entry/exit system. These included: “develop explicit goals and objectives for biometric air exit, ... use tests to validate performance and cost estimates” and “determine whether a biometric exit is economically justified.”¹¹² The Congressional Research Service also outlined questions regarding this issue, including: Is a biographic exit system adequate or do we need to make a biometric system a priority? Is third-party biographic departure data acceptable or should it be collected only by DHS? If it is acceptable can we enhance or leverage it, or what would

¹⁰⁸ Diem Nguyen and Jena McNeil, “Biometric Exit Programs Show Need for New Strategy to Reduce Visa Overstays” (backgrounder, The Heritage Foundation, 2010), 5.

¹⁰⁹ Alden, *Visa Overstays*, 26.

¹¹⁰ Morton, *Visa Overstays*, 31.

¹¹¹ Wood, *Implementation of an Entry/Exit System*, 80.

¹¹² Rebecca Gambler, *Immigration Enforcement: Preliminary Observations on DHS’s Overstay Enforcement Efforts*, GAO-13-602T (Washington, DC: Government Accountability Office, 2013), 15, <https://www.gao.gov/products/GAO-13-602T>.

the cost be to move to a direct biometric system?¹¹³ These seem to be reasonable questions considering the possible implementation costs involved, but the literature on this subtopic does not appear to present definitive answers.

The literature does indicate some dissent, or at least differing ideas, about what the goal or outcomes of such a system should be. John Wagner testified to Congress that an entry/exit system using both biographic and biometric data is critical to support DHS's mission; he states that a biographic system "is, and will continue to be, the foundation" of such a system.¹¹⁴ He also says that CBP will further these capabilities but is committed to incorporating biometrics into the system. However, his testimony does not explicitly indicate how biometric exit processes will enhance the system or impact visa overstays.

Wood has indicated that a biometric exit system could help identify or capture criminals or suspected terrorists before leaving the United States.¹¹⁵ Exit system proponents also argue that a biometric system will prevent someone from using fraudulent documents or false biographic data to exit the United States without repercussions.¹¹⁶ These arguments do not seem to address the issue of a foreign national coming to the United States with the prior intention to never leave after his or her visa expires.

HSI Assistant Director Craig Healey testified before Congress that a biometric exit system would "facilitate enhanced information sharing while improving the quality of the data, thereby improving our efficiency."¹¹⁷ He further stated that a biometric exit system would simplify analysis reporting, making it easier to identify who has overstayed their visas.¹¹⁸ However, his comments do not explain how the facilitation or ease of analysis

¹¹³ Lisa Seghetti, *Border Security: Immigration Inspections at Ports of Entry*, CRS Report No. R43356 (Washington, DC: Congressional Research Service, 2015), 31, https://digital.library.unt.edu/ark:/67531/metadc501645/m1/1/high_res_d/R43356_2015Jan26.pdf.

¹¹⁴ *Overstaying Their Welcome*, 15.

¹¹⁵ *Implementation of an Entry/Exit System*, 80.

¹¹⁶ "Cost of Biometrics Down, But Still No Consensus on Airport Implementation," *Defense Daily International* 15, no. 46 (November 15, 2013), <https://search.proquest.com.libproxy.nps.edu/docview/1473877640?OpenUrlRefId=info:xri/sid:primo&accountid=12702>.

¹¹⁷ Healey, *Overstaying Their Welcome*.

¹¹⁸ *Overstaying Their Welcome*, 33.

provided by a biometric system would impact or prevent someone from overstaying a visa in the first place.

Visitors to the United States may overstay the terms of their visit for a variety of reasons, including to commit criminal or terrorist acts; this presents a possible threat to U.S. security. Enforcement rates against overstay cases have been historically low, and recent government reports seem to indicate they have not had a deterrent effect on visa violators. Proponents of a biometric exit system believe its implementation will curb overstay violations. While a review of the literature indicates consensus on the science of biometrics as a useful means to identify individuals, there is some discord on the efficacy or necessity for such a system. A review of biometric science, related identification methods, and current border enforcement systems can provide some insight into the possible operation of such an exit system.

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III. BIOMETRIC PROCESSES AND EXIT SYSTEMS

A. WHAT ARE BIOMETRICS?

The term biometrics can describe both a characteristic and a process.¹¹⁹ As a characteristic, biometrics means biological identifiers that are unique to an individual. Biometric traits can be anatomical, physiological, or behavioral. An individual's signature and voice patterns are behavioral characteristics.¹²⁰ Physiological characteristics include blood type and DNA, while anatomical features include fingerprints, the iris, and the face.¹²¹

Anatomical characteristics are the most frequently utilized biometric markers to identify people.¹²² A subject's identity can be verified by comparing previously documented traits to an existing sample.¹²³ The idea of matching exemplar samples dates back to ancient times; today's technological advancements tend to associate biometrics with the electronic devices used to measure them.¹²⁴

The biometric process refers to the methods used to collect and synthesize the characteristic data. Successfully using biometrics to verify and confirm identity requires a two-step method of capturing and matching data.¹²⁵ The first step involves entering the biometric information into a database, which may occur when a law enforcement agency arrests a subject or when someone applies for a visa overseas. During this encounter, agencies review both biographical data (name, date of birth, height, weight) and biometric

¹¹⁹ National Law Enforcement and Corrections Technology Center, "Biometrics Basics," *TechBeat* (Spring 2007), <https://www.hsdl.org/?abstract&did=479006>.

¹²⁰ "5 Basics You Need to Know about Biometrics," Baker McKenzie, October 10, 2016, <http://www.bakerinform.com/home/2015/10/21/part-1-five-basics-you-need-to-know-about-biometrics>.

¹²¹ Baker McKenzie.

¹²² Julian Ashbourn, *Practical Biometrics: From Aspiration to Implementation*, 2nd ed. (London: Springer, 2015), 3.

¹²³ Ashbourn, 1.

¹²⁴ Ashbourn, 1.

¹²⁵ Lisa S. Nelson, *America Identified Biometric Technology and Society* (Cambridge: MIT Press, 2011), 38.

identifiers (fingerprints, photo, iris scan, etc.). The agency will code the subject's data and capture it in a database with a unique identifier.¹²⁶ The system will search the database to compare the biometric data and store it for future reference. A biometric match will occur when the subject is queried in the database again.¹²⁷ For example, when a foreign national applies for a visa abroad, the Department of State collects his or her biometric data. When the foreign national arrives at the U.S. border, CBP also obtains this biometric data and searches for any matches to verify the person's identity.

The use of biometric identifiers is critical within the homeland security enterprise because it has several distinct advantages over biographical data. Biometrics are not easily lost or shared; people cannot lie about their biometrics, and they are either unchangeable or highly resistant to alteration.¹²⁸ When apprehended at the border or inside the United States, a foreign national may try to present an alias or false identification. A biometric scan can quickly locate a matching record to reveal if the person is lying about his or her identity, has been previously deported, or matches a national security database; the lack of a match could mean the person has entered the United States without inspection.¹²⁹ Relying solely on biographical data could miss this information.

B. BIOMETRIC TECHNOLOGY SYSTEMS AND CAPABILITIES

Several technological methods can capture biometric markers for entry into a database. However, in a law enforcement or homeland security environment, a biometric technology system is only as good as the size of its component database. Even the most accurate biometric identification system will be ineffective if it does not have a large dataset for comparison. Typical examples of biometric capture techniques include using fingerprints, iris/retinal scans, facial recognition, or DNA.¹³⁰

¹²⁶ "Biometrics: Frequently Asked Questions," Electronic Frontier Foundation, December 9, 2015, <https://www EFF.org/sls/tech/biometrics/faq>.

¹²⁷ "Biometrics."

¹²⁸ Ruud M. Bolle, *Guide to Biometrics* (New York: Springer, 2004), 14.

¹²⁹ "Biometrics," DHS, accessed August 9, 2017, <https://www.dhs.gov/biometrics>.

¹³⁰ Anil K. Jain, Lin Hong, and Sharath Pankanti, "Biometric Identification," *Communications of the ACM* 43, no. 2 (February 2000): 95.

1. Fingerprints

Fingerprint readers capture an image of a subject's fingerprint and mathematically encode it into a representative pattern.¹³¹ Optically scanning all ten of a subject's fingerprints (along with taking their photo) is the primary method utilized by DHS border enforcement and other law enforcement agencies to obtain an individual's biometrics.

2. Iris/Retinal Scan

Camera scans of the eye utilize an infrared image to recognize and save patterns in the iris of a subject.¹³² These scans are accurate and unique but usually require the cooperation of the individual to sit still for the scan. This process can be intrusive and difficult to obtain if the person is resistant. To date, DHS has focused primarily on obtaining fingerprints and does not have a large iris or retinal database for identity verification comparison.¹³³

3. Facial Recognition

Law enforcement agencies today generally take photos of arrestees, but facial recognition goes further to make individual measurements at different points on a person's face.¹³⁴ These data points then create a unique biometric identifier for the subject. The subject does not need to cooperate fully to undergo a facial scan, unlike a retinal scan.¹³⁵ DHS's facial recognition comparison database is also not very large compared to captured fingerprints.

¹³¹ Anil K. Jain et al., "An Identity-Authentication System Using Fingerprints," *Proceedings of the IEEE* 85, no. 9 (September 1997): 1369.

¹³² Phillip Jones, "Using Biometric Technology to Advance Law Enforcement," *Forensic Magazine*, August 1, 2006, <https://www.forensicmag.com/article/2006/08/using-biometric-technology-advance-law-enforcement>.

¹³³ Ball, "Why Facial Recognition Is the Wrong Choice."

¹³⁴ Electronic Frontier Foundation, "Biometrics: Frequently Asked Questions."

¹³⁵ Mohana Ravindranath, "DHS Wants New Facial Recognition Cameras in Airports," Nextgov, November 28, 2016, <http://www.nextgov.com/emerging-tech/2016/11/dhs-wants-cameras-can-recognize-your-face-airport/133442/>.

4. DNA

DNA sampling provides a definitive biometric indicator but it is a complicated process requiring multiple steps and is not instantaneous.¹³⁶ It is also intrusive because it involves a physical sample; the costs and result times are higher than for other biometric identifiers.¹³⁷ DNA can be useful in cases where blood or other bodily material may be the only biometric information available. For border enforcement agencies, DNA can biometrically identify someone and establish that person's relationships with other subjects, such as when familial units cross the border together or in human trafficking cases.¹³⁸

C. BIOMETRICS AND DHS

Law enforcement's use of biometric data to identify subjects is not new. The first use of fingerprints as a biometric identifier dates back to 1892.¹³⁹ The FBI's creation of a fingerprint repository dates back to 1924.¹⁴⁰ An overwhelming number of paper fingerprint cards requiring visual analysis led to the development of the Automated Fingerprint Identification System (AFIS).¹⁴¹ AFIS automated the comparison and deciphering of fingerprint card templates using computerization. Technological advancements have led to the development of optical fingerprint readers that can capture fingerprints and compare them to the AFIS database in almost real time.¹⁴²

¹³⁶ "DNA Evidence: Basics of Analyzing," National Institute of Justice, August 9, 2012, <http://www.nij.gov:80/topics/forensics/evidence/dna/basics/pages/analyzing.aspx>.

¹³⁷ "What Is DNA Fingerprinting? DNA vs. Conventional Fingerprints," All Criminal Justice Schools, accessed August 7, 2017, <http://www.allcriminaljusticeschools.com/forensics/dna-fingerprinting/>.

¹³⁸ National Institute of Justice, "DNA Evidence Basics: Types of Samples."

¹³⁹ "History of Fingerprints," Fingerprint America, accessed August 7, 2017, <http://www.fingerprintamerica.com/fingerprinthistory.asp>.

¹⁴⁰ Kenneth R. Moses et al., "Automated Fingerprint Identification System," in *The Fingerprint Sourcebook* (Washington, DC: Department of Justice, 2010), 6-4, <https://www.ncjrs.gov/pdffiles1/nij/225326.pdf>.

¹⁴¹ Moses et al., 6-9.

¹⁴² Bolle, *Guide to Biometrics*, 33.

As fingerprint capture technology developed, communication among various agencies and their fingerprint systems became difficult. To ensure effective communication between agencies, the Integrated Automated Fingerprint Identification System (IAFIS) went online in July 1999.¹⁴³ The FBI maintains IAFIS, which contains fingerprint images for 64 million people; it allows local, state, and tribal agencies to access and exchange biometric data twenty-four hours per day.¹⁴⁴ Federal agencies, including DHS border enforcement agencies, also connect to the IAFIS system.

Currently, DHS border agencies utilize the Automated Biometric Identification System (IDENT) as the primary system to capture biometric data from travelers and connect with IAFIS.¹⁴⁵ The Immigration and Naturalization Service (INS) developed IDENT in 1994 as its central biometric system. IDENT stores and processes biometric data, primarily fingerprints and photographs, as well as some facial images and iris scans. It then links these biometrics with stored data to establish and verify identities as foreign travelers enter or exit the United States.¹⁴⁶

Border agency use of travelers' biometric data propagated the need for data management and technology support. In 2004, DHS established the U.S. Visitor and Immigrant Status Indicator Technology (US-VISIT) program to serve as the steward of DHS biometric data and to support border enforcement agencies.¹⁴⁷ US-VISIT and IDENT can biometrically identify foreign nationals entering, exiting, or residing within the United States using comprehensive database searches; the resulting identifiers can then be gathered, stored, and shared among users.¹⁴⁸

¹⁴³ Moses et al., "Automated Fingerprint Identification System," 6-12.

¹⁴⁴ Moses et al., 6-12.

¹⁴⁵ DHS, "Privacy Impact Assessment for the Automated Biometric Identification System (IDENT)," (report, Department of Homeland Security, December 7, 2012), 2, <https://www.dhs.gov/sites/default/files/publications/privacy-pia-nppd-ident-06252013.pdf>.

¹⁴⁶ "Enhancing Security through Biometric Identification," DHS, December 2008, 3, https://www.dhs.gov/xlibrary/assets/usvisit/usvisit_edu_biometrics_brochure_english.pdf.

¹⁴⁷ GAO, *Strategic Solution for US-VISIT Program Needs to Be Better Defined, Justified, and Coordinated*, GAO-08-361 (Washington, DC: Government Accountability Office, February 2008), 8.

¹⁴⁸ Todd Moore, "Biometric Borders and Counterterrorism" (master's thesis, Naval Postgraduate School, 2010), 57.

Biometric technology provides DHS agencies with the capability to verify a subject's identity. This verification permits agencies to make front-line decisions regarding a foreign national's admission to the United States, eligibility for benefits, fugitive status, or threat to national security, or to determine if someone has overstayed a visa.¹⁴⁹ The IDENT system stores foreign nationals' biometric data and compares it against watch lists for terrorists, criminals, or prior immigration violators.¹⁵⁰ IDENT also reviews the entire database of fingerprints to identify the use of aliases, fraudulent documentation, or visa overstays.¹⁵¹

In 2013, the Office of Biometric Identity Management (OBIM) made US-VISIT the biometric services steward for DHS.¹⁵² As more foreign visitors travel to the United States, the IDENT system has begun to exceed its capacity. OBIM and DHS are currently collaborating to replace IDENT with the Homeland Advanced Recognition Technology (HART) system. HART will allow DHS to match, store, share, and analyze more data than IDENT.¹⁵³ It will also provide DHS with the next generation of biometric capture and identification technology by adding iris and facial recognition capabilities.

D. BIOMETRIC ISSUES AND CHALLENGES

Biometric identifiers can provide an invaluable tool for border enforcement agencies. The ability to verify an individual's identity based on previously captured traits can assist in the identification, apprehension, and removal of visa overstay violators. However, as described below, the very characteristics and attributes of biometrics could have an impact on policies and implementation related to biometric identification systems. DHS should be aware of these implications, especially, when considering the use of a biometric system to identify individuals who overstay their visas.

¹⁴⁹ DHS, "Biometrics Webinar: Joint Requirements Council Information Based Screening and Vetting Portfolio" (Webinar, October 20, 2015), 12.

¹⁵⁰ DHS, "Privacy Impact Assessment for IDENT," 2.

¹⁵¹ DHS, "Enhancing Security through Biometric Identification," 4.

¹⁵² "Office of Biometric Identity Management," DHS, accessed August 29, 2017, <https://www.dhs.gov/obim>.

¹⁵³ DHS, "Biometrics Webinar," 7.

Biometric data is only useful if agencies can share it quickly and securely. This presents a challenge if interoperability or communication issues exist between agencies. While many state and local agencies interface with federal databases, some do not. Some agencies may not have automated interface capabilities to enter an arrestee's fingerprints into the system promptly.¹⁵⁴ Even with today's technological advancements, some agencies still do not fingerprint every subject they arrest, so IAFIS may not be complete with arrestee data.

This lack of a complete biometric database in IAFIS has implications for the visa overstay problem. A critical resource for DHS's fight against overstays is the ability to identify, locate, and apprehend visa violators. If a local, municipal, or state agency arrests a visa overstay violator and captures his or her biometrics, IAFIS will automatically notify DHS. DHS can then take the appropriate enforcement action. If that agency does not fingerprint or capture the subject's biometrics, DHS will not be able to take action against that overstay violator.

Historically, using fingerprint scans as a biometric identifier has shown to be reasonably accurate and cost-effective.¹⁵⁵ However, in his thesis titled "Biometrics and Counterterrorism," Todd Moore notes that fingerprints may not work for every subject (for example, people with skin conditions or amputated fingers, or who have been in prior accidents).¹⁵⁶ Moore asserts that technological advancements may overcome this hurdle in the future. ICE frequently interacts with subjects who work in industries that could impact the viability of high-quality fingerprints. If a subject's biometrics were first enrolled with optimal prints and they are encountered with poor prints, there may not be a match in the system, which will thus fail to identify the subject correctly.¹⁵⁷

¹⁵⁴ GAO, *Information on Timeliness of Criminal Fingerprint Submissions to the FBI*, GAO-04-260 (Washington, DC: Government Accountability Office, January 2004).

¹⁵⁵ Jain, Hong, and Pankanti, "Biometric Identification," 96.

¹⁵⁶ Moore, "Biometric Borders and Counterterrorism," 26.

¹⁵⁷ Ashbourn, *Practical Biometrics*, 4.

In cases where fingerprints may be unreadable or return no match in a database, iris or facial scans may be a more accurate identifier because these biometric markers are less susceptible to environmental impacts such as employment-related injuries.¹⁵⁸ Another advantage of facial recognition technology is that fingerprints may not always be available for reference. For example, a terrorist bombing may leave behind no biometric evidence, but a surveillance camera may have captured a suspect's facial image. Iris or facial scans may provide a higher level of identification or could be utilized if fingerprints are not available.

A limited comparison dataset is also another drawback of facial recognition technology. Border enforcement agencies may not be able to identify someone if that person's face is not in the database. Fingerprints, however, are a key part of the current IDENT database since DHS has amassed a trove of data on travel history, visas, and criminal records.¹⁵⁹ Law enforcement and border agencies can utilize this data to identify an unknown individual.¹⁶⁰

Another challenge with biometric data collection methods is that these characteristics and processes are not infallible. The accuracy of a biometric match is only as good as the sample entered into the system. Data captured in a controlled setting will likely be of higher quality due to optimal conditions (for example, in a well-lit area where the subject is standing still).¹⁶¹ If the data used for verification is of poor quality, it could affect the possibility of achieving an accurate match.¹⁶² This could generate errors or false departure alerts that would require additional manpower to review and rectify; these types of issues are what having a biometric exit system is trying to avoid in the first place.

¹⁵⁸ Bolle, *Guide to Biometrics*, 43.

¹⁵⁹ Ball, "Why Facial Recognition Is the Wrong Choice."

¹⁶⁰ Ball.

¹⁶¹ Bolle, *Guide to Biometrics*, 40.

¹⁶² Jain, Hong, and Pankanti, "Biometric Identification," 95.

E. BIOMETRIC EXIT SYSTEMS

Secure borders are a critical component of a sovereign nation. In a capitalist democracy such as the United States, this need for security is balanced by the need to facilitate free trade, and the flow of goods and people both into and out of the country. A fundamental goal of immigration law is to identify and keep threats to our interests outside our borders.¹⁶³ One way for a country to manage its borders is to identify, admit, and track the foreign nationals who pass through its ports of entry.

In 1996, Congress passed the IIRIRA to partly address the issue of entry and departure verification of foreign travelers and errors created by prior systems. This act included the development of automated systems related to border security, stating:

Not later than two years after the date of the enactment of this Act, the Attorney General shall develop an automated entry and exit control system that will enable the Attorney General to identify, through on-line searching procedures, lawfully admitted nonimmigrants who remain in the United States beyond the period authorized by the Attorney General.¹⁶⁴

IIRIRA instituted the legal requirement for an automated visa entry/exit control system at the U.S. border. Its goal was to move away from the paper-driven I-94 system to quickly obtain data from departing foreign visitors and identify those who had violated their visa requirements. The implementation of IDENT and US-VISIT seemed to satisfy most of the provisions of this act. Third-party carriers were automatically transmitting passenger manifests to border agency databases for overstay review. Border agencies could conduct these queries online and remotely. Also, the automated ADIS system would close out the arrival records of departing foreign nationals to track potential overstays.¹⁶⁵

However, following the tragic events of 9/11, it was determined that the United States needed to improve its ability to identify foreign nationals crossing the border, including visa overstays.¹⁶⁶ Congress has passed multiple bills regarding border security

¹⁶³ Seghetti, *Border Security*, 2.

¹⁶⁴ Immigration Control and Financial Responsibility Act of 1996, H. Res. 2202, 104th Cong. (1996).

¹⁶⁵ GAO, *Overstay Enforcement: Additional Actions*, 2.

¹⁶⁶ National Commission, *The 9/11 Commission Report*.

and systems to track visitors at the border. Three main acts, however, provide the guidelines for a biometric entry/exit system: the Intelligence Reform and Terrorism Prevention Act of 2004, the Implementing Recommendations of the 9/11 Commission Act of 2007, and the Department of Homeland Security Appropriations Act of 2013.¹⁶⁷

The Intelligence Reform and Terrorism Prevention Act of 2004 (8 U.S.C. § 1365b) codified the requirements for a biometric exit system from five other statutes: IIRIRA, the INS Data Management Improvement Act, the Visa Waiver Permanent Program Act, the Enhanced Border Security and Visa Reform Act, and the USA PATRIOT Act.¹⁶⁸ Congress stated that “completing a biometric entry and exit data system as expeditiously as possible is an essential investment in efforts to protect the United States by preventing the entry of terrorists.”¹⁶⁹ The act states that DHS’s goal should be a biometric entry/exit system that:

- 1) serves as a vital counterterrorism tool; 2) screens travelers efficiently in a welcoming manner; 3) provides inspectors with adequate real-time information; 4) ensures flexibility of training and security protocols to most effectively comply with security mandates; 5) integrates relevant databases and plans for database modifications to address volume increase and database usage; and 6) improves database search capacities by using language algorithms to detect alternate names.¹⁷⁰

This act added the requirement for using biometric traits to identify subjects in the entry/exit system, rather than the previous standard of using only biographical information. A U.S. statute now included the recommendation from the 9/11 Commission that an entry/exit system be not only automated but biometrically based as well. As a result, there was now a differentiation between the “automated entry/exit” system as described in IIRIRA and a “biometric” exit system. Furthermore, the exit system was mandated to capture data from foreign nationals regardless of where they crossed the border.¹⁷¹

¹⁶⁷ Kephart, “Biometric Exit Tracking.”

¹⁶⁸ Kephart.

¹⁶⁹ Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. No. 108–458, 1 (2004).

¹⁷⁰ Intelligence Reform and Terrorism Prevention Act of 2004.

¹⁷¹ Intelligence Reform and Terrorism Prevention Act of 2004.

One aim of the Intelligence Reform and Terrorism Prevention Act was to complete a biometric entry/exit system to “protect the United States by preventing the *entry* of terrorists.”¹⁷² It merely provides guidelines for DHS and biometric entry/exit system goals. It does not outline specifics for enforcement, nor does it address how DHS or its component agencies will address visa overstays; neither “enforcement” nor “visa overstays” appear anywhere in the act itself.

Before 9/11, border officials would often not know who was coming to the United States until receiving a biographical manifest, usually only a few hours before the flight arrived. This was especially true with visitors coming from nations included in the Visa Waiver Program (VWP). Travelers from VWP nations could travel to the United States without the need for a visa (and the requisite screening that comes with obtaining one).¹⁷³ As a result, border enforcement agencies would not know who was attempting to enter the country until the last minute.

The Implementing Recommendations of the 9/11 Commission Act of 2007, section 711, sought to address the weaknesses in the VWP and border controls identified by the 9/11 Commission. Section 711 specifies the creation of the Electronic Travel Authorization System (ETAS) to “collect such biographical and other information ... to determine, in advance of travel ... whether there exists a law enforcement or security risk” of a particular individual traveling to the United States under the VWP.¹⁷⁴ This act also placed the onus of collecting passenger biometric exit data and transmitting arrival and departure information on commercial carriers.¹⁷⁵ The last subsection of section 711 also delineates system requirements for an exit system, which was to have been established by 2008. Congress dictated that the system shall match biometric identifiers taken from foreign

¹⁷² Emphasis added; Intelligence Reform and Terrorism Prevention Act of 2004 § 7208.

¹⁷³ “Visa Waiver Program,” Department of State, accessed April 24, 2018, <https://travel.state.gov/content/travel/en/us-visas/tourism-visit/visa-waiver-program.html>.

¹⁷⁴ Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. No. 110-53, § 286 (2007), <https://www.congress.gov/110/plaws/publ53/PLAW-110publ53.pdf>.

¹⁷⁵ Kephart, “Biometric Exit Tracking.”

nationals against terrorist and immigration watchlists, and also compare them to air carrier departure manifests to ensure that visitors depart the United States.

The Homeland Security Appropriations Act of 2013 (Public Law 113-6) further streamlined the agencies responsibilities for implementing a biometric entry/exit system. This bill replaced US-VISIT with OBIM as the primary biometric identity program for the U.S. government.¹⁷⁶ As a result of this realignment, CBP now holds the responsibility for planning and deploying a biometric exit system, while visa overstay analysis has shifted to ICE.¹⁷⁷ By separating the duties regarding biometric exit development, data management, and overstay analysis, congressional appropriators moved border enforcement agencies to act and again reaffirmed the legal requirement to implement a biometric exit system.

F. DHS/CBP BIOMETRIC EXIT SYSTEM PILOT PROGRAMS

Following the restructuring of responsibilities for biometrics at the border, CBP developed several exit test programs beginning in 2015. These initial tests would evaluate the use of biometric exit technology and processes.¹⁷⁸ An efficient biometric exit system should meet several criteria, such as accurately matching subjects to existing databases; should be intuitive and easy to use by the traveling public; be stable enough to handle any changes in biometric characteristics over time; and complete biometric matching rapidly to avoid unnecessary delays.¹⁷⁹ The goal of CBP's pilot projects was to utilize biometric technology in a realistic border environment to identify implementation issues and aid in the development of an efficient biometric exit solution.

¹⁷⁶ *Implementation of an Entry/Exit System.*

¹⁷⁷ Consolidated and Further Continuing Appropriations Act of 2013, Pub. L. 113-6, 113th Cong., (2013), 241.

¹⁷⁸ DHS, "Comprehensive Biometric Entry/Exit Plan."

¹⁷⁹ Nedap Security Management, "Selecting the Appropriate Biometric Technology," Vitani, accessed December 11, 2017, <http://vitaniigroup.com/wp-content/uploads/2016/03/Whitepaper-Biometrics.pdf>.

1. BE-Mobile Fingerprint Program

In 2015, CBP piloted the BE-Mobile exit program at high-volume airports in the United States.¹⁸⁰ CBP officers in airport jetways scanned the fingerprints of departing foreign nationals. CBP officials noted that the technology was capable of capturing, matching, and validating information in the biometric databases; however, they also stated that time and staffing considerations did not make this a viable solution for all departing flights.¹⁸¹

The BE-Mobile pilot indicated that using fingerprints for a biometric exit system could accurately match subjects contained in a database; the system also appears to work relatively intuitively for subjects. However, the CBP study indicated that thoroughly conducting the exit verification of even a moderate-size flight using 2015 technology was too time consuming. Also, while there is an extensive database of fingerprints to search for violators, fingerprints can degrade with age, type of work, injury, weight, or other issues. Other types of biometric capture technology may alleviate the problems of speed and stability.

2. Departure Information Systems Test

In 2016, CBP piloted the Departure Information Systems Test. This pilot tested the ability of facial recognition technology to match the photograph of a departing subject to existing database images.¹⁸² During this test, passengers boarding selected outbound flights in Atlanta, Georgia, presented their boarding pass and had a picture of their face captured. The system then compared the departing photograph to images within DHS passport, visa, and enforcement databases (however, this program only performed the image matching after the flight had departed).¹⁸³ For this test, CBP selected a flight leaving from a gate with ample space for the capture technology to be set up, something that may

¹⁸⁰ DHS, “Comprehensive Biometric Entry/Exit Plan,” iii.

¹⁸¹ GAO, *Border Security*, 20. Note: GAO officials noted that it took a team of six CBP Officers forty-five minutes to complete the process for seventy-five passengers.

¹⁸² GAO, 17.

¹⁸³ GAO, 18.

not be possible everywhere; CBP also selected a flight that departed during a “lull” so staffing of the system would not be an issue.¹⁸⁴ In the same report, CBP also noted that incorporating a second biometric indicator in conjunction with the facial scan would be a good backup if no match was found.

Like the fingerprint biometric exit pilot, the facial recognition pilot appears to have accurately matched records in a database. However, this technology could pose some challenges for ease of use and may require staffing to assist travelers. When instructed to “look at the camera” for a facial scan, many travelers looked at any camera they could see (CCTV, etc.) rather than the actual scan camera.¹⁸⁵ Facial recognition programs can be affected by age just like fingerprints; they can also be impacted by alterations to the face, including glasses, facial hair, or clothing.¹⁸⁶ Also, the dataset size of facial scans for comparison could have an impact on accuracy.

3. Border System Iris Scans

CBP also conducted a pilot at the Otay Mesa land border crossing in California in 2016 to test the efficacy of biometric systems in an outdoor land environment.¹⁸⁷ This test collected biographic and biometric information using facial and iris scans of subjects crossing into Mexico. CBP indicated that space and environmental weather considerations would be factors in a “live” scenario using biometric technology.¹⁸⁸ Another drawback to iris scans is the current lack of a sizable database for comparison.

4. CBP AEER—Apex Air Entry/Exit Re-engineering Program

To continue biometric entry and exit system testing in an environment with real people, CBP developed AEER—the Apex Air Entry/Exit Re-engineering Program. This 25,000 square foot facility allows fifty live test subjects to simulate border processing at a

¹⁸⁴ GAO, 18.

¹⁸⁵ Biesecker, “Biometric Exit Checks at Airports.”

¹⁸⁶ Chellappa, Sinha, and Phillips, “Face Recognition by Computers and Humans.”

¹⁸⁷ DHS, “Comprehensive Biometric Entry/Exit Plan,” 19.

¹⁸⁸ DHS, 21.

port of entry. The DHS Science and Technology Directorate reports that using live subjects to test human interaction with the technology is critical for success.¹⁸⁹ The facility can test both entry and exit processing to help CBP further hone exit systems for utilization in a real airport.¹⁹⁰ Testing multiple technology systems allows CBP to improve efficiency while continuing to research and develop biometric processes for an exit system.

5. Air Exit/TSA Screening Pilot

In 2009, DHS conducted a biometric exit test for international passengers in Atlanta. This project used TSA officers to screen departing foreign passengers biometrically.¹⁹¹ TSA officers used scanners to capture the biometrics of departing foreign passengers as they passed through TSA checkpoints. This project successfully identified 30,000 legitimate exiting foreigners while screening 500,000 total passengers. However, the primary issue was separating departing foreigners from other domestic passengers.¹⁹² The use of separate screening lines could alleviate that issue, although capturing data on departing passengers away from the gate could lead to false departure records if a passenger passes security but does not board the plane.

6. Facial Recognition Airline Boarding

Commercial airlines have recently begun incorporating biometric technology into the boarding process for international flights. This procedure expedites the boarding process and helps airlines satisfy the Implementing Recommendations of the 9/11 Commission Act by collecting exiting passengers' biometric data.¹⁹³ Several foreign and domestic carriers have installed facial recognition technology at boarding gates in various airports. This program is similar to the 2016 Departure Information System test conducted

¹⁸⁹ Biesecker, "Biometric Exit Checks at Airports."

¹⁹⁰ "Apex AEER," DHS, April 8, 2015, <https://www.dhs.gov/science-and-technology/apex-aeer>.

¹⁹¹ Seghetti, *Border Security*.

¹⁹² Seghetti.

¹⁹³ Grant Martin, "Lufthansa Installs Facial Recognition Stations in Los Angeles to Speed up Airplane Boarding," *Forbes*, March 25, 2018, <https://www.forbes.com/sites/grantmartin/2018/03/25/lufthansa-installs-facial-recognition-stations-in-los-angeles-to-speed-up-airplane-boarding/>.

by CBP. However, technological improvements now allow this to occur in real time. This scan also serves as the boarding pass for the plane, streamlining the boarding process while transmitting biometric exit verification data to CBP.¹⁹⁴ Exit verification upon boarding also helps to ensure the subject departs, rather than doing so at check-in or the TSA checkpoint when the traveler could still leave the airport.

Recent DHS tests indicate that biometric technology is capable of conducting exit verifications of foreign visitors. Collaboration with commercial carriers at some airports shows that implementing an automated biometric exit system is feasible in a real-world environment, without detrimental effects on aviation operations. Other nations also deal with visa overstay enforcement issues, and some have implemented biometric immigration systems as a result. A review of other nations' actions on these issues could provide the United States with a head start on policy issues when dealing with visa overstays and efforts to combat them.

¹⁹⁴ Elizabeth Armstrong Moore, "JetBlue to Test Face Scanning to Replace Boarding Passes," Fox News, June 1, 2017, <http://www.foxnews.com/travel/2017/06/01/jetblue-to-test-face-scanning-to-replace-boarding-passes.html>.

IV. COMPARATIVE ANALYSIS OF VISA OVERSTAY ENFORCEMENT AND BIOMETRICS IN OTHER NATIONS

The United States is not the only sovereign nation balancing border security with the flow of legitimate trade and travelers to its shores, nor is it the only nation that has to address visa overstay enforcement as a matter of immigration policy. It is also not the only nation working on the use of a biometric technology system to enforce immigration laws at the border. Many of these nations are similar to the United States in regard to number of international travelers, technological capabilities, and democratic form of government, including the United Kingdom and members of the European Union.

Other nations, though they may not match the United States in size or type of government, have also implemented biometric exit systems. In contrast, autocratic government immigration policies can focus on regime stability, and their deportation procedures are geared toward expeditious removals of foreign visitors.¹⁹⁵ As a result, such governments do not offer a useful comparison to issues faced by representative democracies, where immigration violators are afforded due process and other protections. A comparative analysis of other democratic nations' efforts could shed light on the effectiveness of biometric exit systems and visa overstay enforcement.

A. EUROPEAN UNION

In 1985, France, Germany, Belgium, Luxembourg, and the Netherlands signed the Schengen Agreement with the goal of creating a Europe without internal borders.¹⁹⁶ The establishment of the European Union (EU) and the later addition of twenty-one other nations means that countries in the Schengen Area no longer conduct internal border security checks. However, removing these frontiers has resulted in the increased need for cooperation among EU nations. The European Commission explains that establishing

¹⁹⁵ Adrian J. Shin, "Tyrants and Migrants: Authoritarian Immigration Policy," *Comparative Political Studies* 50, no. 1 (January 1, 2017): 14–40, <https://doi.org/10.1177/0010414015621076>.

¹⁹⁶ Conor Gaffey, "Five Things You Need to Know about the Schengen Agreement," *Newsweek*, September 14, 2015, <http://www.newsweek.com/schengen-agreementschengen-visaschengen-systemschengen-areaschengen-600307>.

common rules regarding border inspections, visa issuance, and immigration enforcement is important for EU border control and security.¹⁹⁷

In 2016, the EU sought to centralize border controls and established FRONTEX, the European Border and Coast Guard Agency.¹⁹⁸ FRONTEX's goal is to coordinate border security systems between EU and non-EU nations.¹⁹⁹ FRONTEX allows each member nation to maintain a national border force, as well as make refugee and migration decisions under the universal EU plan. FRONTEX can supplement a nation's border force with rapid response teams but it does not replace national border guards.²⁰⁰ For example, Poland deploys national patrols to conduct visa checks at train stations and other public places with the goal of identifying visa violators.²⁰¹

The European Union has begun incorporating technology into border security and visa overstay enforcement efforts. The Schengen Information System (SIS) allows nations to share information on persons using biometric identifiers to increase functionality and reduce instances of fraud, forged documents, or altered biographical information.²⁰² The SIS is also invalidating travel documents of suspected foreign terrorist fighters traveling abroad.²⁰³ Biometrics in an exit control system can identify foreign fighters trying to depart the EU using an alias or fraudulent documents. If their identity and biometrics are known, a biometric exit system could alert authorities before they leave the EU.

¹⁹⁷ European Commission, *Borders and Security: Building an Open and Safe Europe* (Luxembourg: European Union, 2013), 3.

¹⁹⁸ "Frontex," accessed April 24, 2018, <https://frontex.europa.eu/>.

¹⁹⁹ Rick "Ozzie" Nelson et al., *Border Security in a Time of Transformation* (Washington, DC: Center for Strategic and International Studies, July 2010), 11.

²⁰⁰ Frontex.

²⁰¹ Nelson et al., *Border Security in a Time of Transformation*, 14.

²⁰² European Commission, "Stronger and Smarter Information Systems for Borders and Security" (report, European Commission, April 6, 2016), 7, https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/policies/securing-eu-borders/legal-documents/docs/20160406/communication_on_stronger_and_smart_borders_20160406_en.pdf.

²⁰³ European Commission, "The European Agenda on Security" (report, European Commission, April 28, 2015), 5, https://ec.europa.eu/home-affairs/sites/homeaffairs/files/e-library/documents/basic-documents/docs/eu_agenda_on_security_en.pdf.

The European Council also implemented the Visa Information System (VIS), which contains biometric data related to Schengen visa applications. This standard system, consisting mainly of fingerprints, allows member nations to access biometric data to verify visa holders, detect fraud, or identify visa overstays.²⁰⁴ These technology systems will enable EU member nations to enhance their immigration screening efforts.

In 2008, the European Commission identified the need to create an automated Entry/Exist System (EES) to secure the EU's external borders further. This system would automatically record the entry and exit data of all third country nationals at the EU border to identify visa overstay cases, as well as conduct other database security checks.²⁰⁵ The EES would utilize biometric identifiers and interface with the VIS and SIS systems; if a third country national's visa expired without proof of departure in the database, the proper authorities would be alerted.²⁰⁶

In 2009, the European Parliament released a report regarding the EES and the next steps needed for border management in the European Union.²⁰⁷ Parliament indicated there is little definitive data to identify how many visa overstay violators were currently in the EU. While this report mentioned an estimated 8 million illegal immigrants inside the EU in 2006, Parliament called for better clarification of the problem. Furthermore, Parliament doubted the absolute need to implement a biometric exit system given the expected costs needed to achieve it.

The same report also indicated Parliament's belief that the EES system alone would not work; "further contact with law enforcement agencies is still necessary for an individual who overstays" to be apprehended.²⁰⁸ Parliament further commented that while the

²⁰⁴ European Commission, *Borders and Security*, 4.

²⁰⁵ European Commission, "On an Entry/Exit System at the External Borders of the European Union, Facilitation of Border Crossings for Bona Fide Travellers, and an Electronic Travel Authorisation System" (report, European Commission, 2008), 4, <http://www.statewatch.org/news/2008/feb/eu-com-exit-entry.pdf>.

²⁰⁶ European Commission, 4.

²⁰⁷ Jeanine Hennis-Plasschaert, "Report on the Next Steps in Border Management in the European Union and Similar Experiences in Third Countries" (report, European Parliament, February 17, 2009).

²⁰⁸ Hennis-Plasschaert, 5.

proposed system might provide some deterrence, they did not believe “that the proposed system will put an end to the overstay phenomenon as such.”²⁰⁹ Academics in the EU also echoed this point. The EES system is primarily focusing on those leaving who present themselves for departure *at* the border; it would not be able to catch those choosing to remain in the EU past their visa date who do not report at a border to leave.²¹⁰ As a result, “the objective of the EES to catch visa-overstayers is not entirely viable.”²¹¹

Further review of the EES by the European Commission led to the proposal of the “Smart Borders” initiative in 2013.²¹² This initiative refined the 2008 proposal as a way to improve border management, provide information on visa overstays, and facilitate border travel while improving security. The new system would improve checks on third country nationals at external borders, identify those in the Schengen area illegally, and combat terrorism and transnational crime.²¹³ The European Agency for the operational management of Large-Scale IT Systems in the area of freedom, security, and justice (eu-LISA) would administer the new EES database containing visa, criminal, immigration, and biometric information.²¹⁴

A 2015 Smart Borders pilot test examined several biometric capture methodologies and system types. The pilot found that capturing fingerprints was feasible at all kinds of borders and that taking four prints took less time than ten. The pilot report showed a 99.3 percent matching accuracy using four fingerprints and a known database; using eight fingerprints took twice as long to process and to verify ten prints took almost three times

²⁰⁹ Hennis-Plasschaert, 5.

²¹⁰ Vildana Sulić Kenk et al., “Smart Surveillance Technologies in Border Control,” *European Journal of Law and Technology* 4, no. 2 (October 2, 2013): 7, <http://ejlt.org/article/view/230>.

²¹¹ Anita Orav and Alessandro D’Alfonso, “Smart Borders: EU Entry/Exit System” (briefing, European Parliamentary Research Service, January 12, 2018), 9, [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI\(2016\)586614](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2016)586614).

²¹² “Smart Borders,” European Commission, December 6, 2016, https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/smart-borders_en.

²¹³ “Smart Borders Package Improves EU Border Management,” Finland Ministry of the Interior, accessed May 30, 2018, <http://intermin.fi/en/border-management/smart-borders>.

²¹⁴ Finland Ministry of the Interior.

as long.²¹⁵ The report also assessed that commercial-off-the-shelf systems were sufficient enough to capture facial images for face verification, especially when comparing a live image to one stored on an e-type passport.

Testing by eu-LISA also found iris scans were a viable biometric identifier in conjunction with fingerprints or facial scans. The test indicated the capture success was high for enrolling iris data and it added only a limited amount of time and can use current technologies. However, iris scans were affected by certain environmental conditions and types of border crossings. Weather conditions, direct sun, dust, sand, and wind could all impact an outdoor iris scan system.²¹⁶

B. UNITED KINGDOM

The U.K. Home Office is the lead department for immigration enforcement, border security, and visa issuance, and for defending the U.K. from terrorism.²¹⁷ Home Office agencies responsible for these enforcement efforts include the Border Force, Immigration Enforcement (IE), and U.K. Visas and Immigration. The Border Force secures the U.K.’s border while facilitating the travel of people and goods, much like CBP. IE is responsible for tracking and apprehending immigration offenders, including visa overstay cases.²¹⁸ IE functions much like U.S. ICE, but IE officers also work at airports and seaports. The U.K. Visas and Immigration office issues visas to foreign visitors and handles citizenship and asylum decisions; it has roles similar to USCIS.

In 2017, a Scottish government minister echoed the prevailing sentiment that “the biggest problem the U.K. has is people overstaying their visas.”²¹⁹ Like the United States,

²¹⁵ European Agency for the operational management of large-scale IT systems, “Testing the Borders of the Future: Smart Border Pilot Results in Brief” (report, European Commission, 2015), 5, https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/policies/borders-and-visas/smart-borders/docs/smart_borders_pilot_-_executive_summary_en.pdf.

²¹⁶ European Agency, 8.

²¹⁷ “About Us,” Gov.UK, accessed June 12, 2018, <https://www.gov.uk/government/organisations/home-office/about>.

²¹⁸ Gov.UK.

²¹⁹ Claire Milne, “How Many People Overstay Their Visas?” Full Fact, January 30, 2017, <https://fullfact.org/immigration/how-many-people-overstay-visas/>.

the U.K. has had difficulty determining how many people are residing there without legal right. Estimates place the number around 618,000 people living illegally in the U.K. since 2007; researchers generally concur that many of them have overstayed their visas, but the U.K. Home Office does not publish exact figures on this data.²²⁰

U.K. immigration laws empower police officers to conduct immigration checks while performing other duties. During a traffic stop, for example, police are expected to perform immigration checks if they are not satisfied with a subject's lawful status.²²¹ Beginning in 2012, the Home Office started "Operation Nexus" to improve the apprehension and removal of persons deemed to be risks to the public or who did not have lawful presence in the U.K. by placing IE officers at police stations.²²²

Operation Nexus was not without its critics, and it generated some discord among police officers who felt the immigration checks impacted their normal police work.²²³ Even still, a 2014 Home Office report reported the program did show some success.²²⁴ Operation Nexus led to a 37 percent increase in the number of immigration violators identified by local police and a 158 percent increase in the number of violators who left the U.K. after a police encounter. The report also noted the removal of eighty-five high-profile offenders identified during the operational timeframe. In 2016, 39,626 foreign nationals were removed from the U.K. or voluntarily left after being encountered by U.K.

²²⁰ "Irregular Migration in the UK: Definitions, Pathways and Scale," Migration Observatory, accessed May 18, 2018, <http://www.migrationobservatory.ox.ac.uk/resources/briefings/irregular-migration-in-the-uk-definitions-pathways-and-scale/>.

²²¹ Ben Bowling and Sophie Westenra, "Racism, Immigration, and Policing," in *Race, Criminal Justice, and Migration Control: Enforcing the Boundaries of Belonging*, ed. Mary Bosworth, Alpa Parmar, and Yolanda Vázquez (Oxford, England: Oxford University Press, 2018), 70.

²²² Independent Chief Inspector of Borders and Immigration, *Inspection Report on Immigration Enforcement Activity, December 2014* (London: Independent Chief Inspector of Borders and Immigration, 2014), <https://www.gov.uk/government/publications/inspection-report-on-immigration-enforcement-activity-december-2014>.

²²³ Mary Bosworth, Alpa Parmar, and Yolanda Vázquez (eds.), *Race, Criminal Justice, and Migration Control: Enforcing the Boundaries of Belonging* (Oxford, England: Oxford University Press, 2018), 116.

²²⁴ Independent Chief Inspector of Borders and Immigration, *Inspection Report*.

immigration officials.²²⁵ Operation Nexus also helped establish a link between Home Office and police identity databases. It enabled immigration officials in the U.K. to utilize biographic identity documents to confirm nationality in conjunction with Home Office biometric database checks.²²⁶

Local IE teams work to conduct criminal and administrative arrests of foreign nationals who are not legally present in the U.K.²²⁷ These teams also perform workplace enforcement operations to ensure employers are complying with immigration law and to apprehend and remove immigration violators, including visa overstays. However, U.K. IE has been criticized for lack of enforcement against employment violators. A 2018 article by *The Guardian* indicated that IE only visited 20 percent of employers in recent years and that the agency “lacks the information needed . . . to ensure that rules are complied with.”²²⁸ The article further states that IE does not currently enforce rules ensuring that employers make sure their workers or recruits leave at the expiration of their visa. Immigration Minister Damian Green indicated he wants action taken against employers who violate immigration law so they will lose their ability to sponsor future migrants. “I want enforcement and compliance to be the cornerstone of our immigration system,” Green stated.²²⁹

In recent years, the U.K. has taken new measures to increase enforcement efforts against immigration violators. The 2014 Immigration Bill aimed to “create a really hostile environment for illegal migrants.”²³⁰ Some elements of the bill include allowing

²²⁵ “Deportations, Removals and Voluntary Departures from the UK,” Migration Observatory, accessed May 23, 2018, <http://www.migrationobservatory.ox.ac.uk/resources/briefings/deportations-removals-and-voluntary-departures-from-the-uk/>.

²²⁶ Alpa Parmar, “Policing Belonging,” in *Race, Criminal Justice, and Migration Control: Enforcing the Boundaries of Belonging*, ed. Mary Bosworth, Alpa Parmar, and Yolanda Vázquez (Oxford, England: Oxford University Press, 2018), 113.

²²⁷ Bowling and Westenra, “Racism, Immigration, and Policing,” 68.

²²⁸ Alan Travis, “UK Border Agency ‘No Grip’ on People with Expired Visas,” *Guardian*, May 16, 2011, <http://www.theguardian.com/uk/2011/may/17/uk-border-agency-expired-visas>.

²²⁹ Travis.

²³⁰ “Illegal Migrants Face New Crackdown,” BBC, October 10, 2013, <http://www.bbc.com/news/uk-politics-24469584>.

deportation of subjects prior to case appeal decisions; sharing police victim and witness information with IE; requiring banks, employers, landlords, and health care providers to check immigration databases on subjects; making it illegal to “drive whilst unlawfully in the U.K.”; and restricting bail decisions for some immigration detainees. The Home Office circulated “Go Home” vans in some London neighborhoods to advertise programs that overstay violators could contact for assistance to return home (the Home Office eventually ended the controversial program).²³¹ To help prevent visa overstays, then Home Secretary Theresa May directed non-EU foreign students to depart the U.K. immediately after finishing their courses, and required students to return home and apply for a new U.K. visa if they wanted to change their course of study or get a job.²³²

U.K. border enforcement agencies have begun utilizing biometric exit systems at some of their airports. At the Manchester Airport, travelers have their facial images taken on arrival into the terminal and again upon entering their departing flight.²³³ Other airports in the U.K. are expanding these systems as well. This departure process ensures that foreign travelers leave the U.K.

C. INDIA

The Government of India has implemented a large-scale biometric program to provide every resident of India with a unique identifier to eliminate aliases and false names, and rapidly authenticate identification.²³⁴ This program relies on the government to capture and store ten fingerprints, two retinal scans, a photograph, and essential biographical data for every resident of India. The implementation of the Unique

²³¹ Parmar, “Policing Belonging,” 119.

²³² Anita Gopal, “Visa and Immigration Trends: A Comparative Examination of International Student Mobility in Canada, Australia, the United Kingdom, and the United States,” *Strategic Enrollment Management Quarterly* 4, no. 3 (October 2016): 7, <https://doi.org/10.1002/sem3.20091>.

²³³ Kephart, “Biometric Exit Tracking.”

²³⁴ “Vision & Mission,” Unique Identification Authority of India | Government of India, accessed May 31, 2018, <https://www.uidai.gov.in/about-uidai/about-uidai/vision-mission.html>.

Identification Number (UID, or Aadhaar) is the largest biometric identity project in the world, currently containing 1.3 billion individuals.²³⁵

Residents of India will use the UID as identity confirmation for government benefits, online identity verification, and international travel.²³⁶ While immigration checks and faster security clearance at airports are one benefit of the UID system, it was not explicitly developed as an entry/exit system for foreign travelers. However, the vast size of the Aadhaar biometric repository indicates that it is able to capture, store, and utilize biometric identifiers from a large populace. It demonstrates that fingerprints and iris scans could be used quickly as a way to perform a verification to confirm the identity of a subject.

D. OTHER BIOMETRIC EXIT SYSTEMS ABROAD

Other nations have also implemented biometric exit systems at their borders. Some of these nations may only have one sizeable international airport requiring an exit system, or their traveler volume makes it easier to process every passenger exiting the country without serious delays. Many European and newer African airports were designed to incorporate exit system infrastructure in their terminal design, unlike U.S. airports where international and domestic flights may depart in the same terminal. However, these systems demonstrate that biometric exit technologies are feasible at a border.

The United Arab Emirates (UAE) was one of the first nations to implement a biometric exit control system to ensure deported foreign nationals did not return using fake biographic data.²³⁷ The UAE has tested biometric boarding gates that will scan passengers' faces and irises as they board the plane to verify the departure of foreign nationals.²³⁸ Saudi Arabia has implemented a similar system to prevent overstays and identify possible

²³⁵ Govindraj Ethiraj, "Aadhaar Is Not All about Subsidies: 5 Uses for India's Biometric IDs You Didn't Know About," *Quartz* (blog), August 13, 2014, <https://qz.com/248866/aadhaar-is-not-all-about-subsidies-5-uses-for-indias-biometric-ids-you-didnt-know-about/>.

²³⁶ Ethiraj.

²³⁷ Kephart, "Biometric Exit Tracking."

²³⁸ Haneen Dajani, "Dubai Airport's New Virtual Aquarium Tunnel Scans Your Face as You Walk through It," *The National*, October 8, 2017, <https://www.thenational.ae/uae/transport/dubai-airport-s-new-virtual-aquarium-tunnel-scans-your-face-as-you-walk-through-it-1.665406>.

security threats during the Hajj pilgrimage.²³⁹ Senegal’s biometric exit system verifies the departure of all foreign passengers, as there is no other way to exit the airport. However, Dakar only has one international airport with infrequent departures and a moderate volume of passengers requiring exit processing. Other nations, including Latvia, New Zealand, and the Netherlands, have begun using biometric exit gates for security and when passengers board departing flights.²⁴⁰ Each of these nations relies on facial recognition or fingerprints to automatically confirm a subject’s identity at the boarding gate and compare it to his or her airline reservation and e-Passport before allowing the passenger to board.

E. SUMMARY

The homeland security experiences of other countries can help identify effective practices for modification within for the United States. Applying this data to U.S. border enforcement agencies provides a starting point for policy development, rather than having to begin from scratch. Such a comparative review of foreign overstay enforcement efforts and biometric systems can provide policy guidance options and analysis for U.S. decision makers on these issues.

Some of the advantages of a biometric exit system are evident in the EU and other nations around the globe. Many countries are beginning to move away from biographic identifiers to the use of biometric identification. This shift improves a nation’s ability to improve border management and immigration enforcement. For example, the SIS system in the EU could use biometric identifiers to identify potential terrorist fighters before they leave the country to fight, or upon return, if their biometrics are known. Other nations have started implementing biometric-based airline boarding gates that could incorporate similar exit control systems.

However, some critics, including the European Parliament and scholars, have indicated that enforcement is still necessary to address visa overstay cases and other immigration violations. Immigration officials in the U.K. have also stressed the need for

²³⁹ Kephart, “Biometric Exit Tracking.”

²⁴⁰ Kephart.

enforcement and compliance to uphold immigration law and border sovereignty. They state that technology alone will not address subjects who willfully refuse to depart upon the expiration of their visa; law enforcement will still need to identify and interact with these violators to ensure they are apprehended and removed. A biometric system alone will not provide this enforcement interaction.

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V. POLICY OPTIONS AND ANALYSIS

Various policy options are available for DHS to effectively address the problem of visa overstay violators. DHS border enforcement agencies could maintain the status quo, relying on biographical exit-based systems with the occasional “surge” of biometric systems at some airports. DHS could complete the installation of a biometric-based exit system at air and seaports across the United States while maintaining current enforcement levels. Or DHS could create a combination of these methods by installing biometric exit systems while simultaneously increasing enforcement against visa overstay violators.

A biometric exit system can be a useful tool for enforcing U.S. immigration laws. Fifteen airports across the United States currently utilize some form of biometric exit system, primarily facial recognition scans for boarding, as previously described. While the installation of these systems has increased, many locations use them only for specific flights or during certain times of the day.²⁴¹ Proponents of a biometric exit system tout its ability to diminish time spent chasing false leads, prevent future visitors from overstaying their visas, and rapidly identify visa overstays cases. Biometrics would also address the possibility of an imposter using someone else’s name to depart from the country, or a national security target trying to leave without authorities receiving any notice.²⁴² To be sure, these benefits appear valuable for helping DHS enforce immigration law and protecting our nation. A biometric exit system could have a positive impact on several weaknesses surrounding visa overstay enforcement.

Even with these positive impacts, a biometric exit system will not drag overstay violators to the border and make them physically depart the United States, nor will it help enforcement agencies locate and apprehend them. Indeed, some opponents to an exit system have argued that the goal of border enforcement should be to prevent terrorists and

²⁴¹ Barbara Peterson, “The Future of Biometrics at the Airport,” *Condé Nast Traveler*, September 20, 2018, <https://www.cntraveler.com/story/the-future-of-biometrics-at-the-airport>.

²⁴² *Implementation of an Entry/Exit System*, 80.

criminals from even entering the United States.²⁴³ Without a commitment to enforcing visa overstay laws, technology alone will not likely have an impact on people who choose to overstay their visas in violation of the law. Failing to apprehend and remove these violators will not dissuade others from doing the same, thus leaving a gap in homeland security. Consequently, implementing an exit system will not have a dramatic impact on overstay violators without additional enforcement action by DHS.

A. POLICY OPTION A—STATUS QUO

Under a status quo policy, exit departure verification procedures would remain the same. CBP would utilize existing biometric exit technology that has already been tested, purchased, and installed at some locations. CBP would continue to conduct spot checks on various flights or at multiple airports using existing mobile biometric data terminals to establish baseline compliance and visa exit data for annual reporting. The transmission of biographic manifests by carriers would provide the primary data for overstay analysis. Existing interior enforcement procedures would also stay in place. ICE would identify overstay cases via the CTCEU and refer national security threats to HSI for possible investigation. ERO would receive other overstay cases for location, apprehension, and removal but would not specifically target visa overstay cases.

The current biographical exit verification system has been in place for well over a decade. This system does have some positives; CBP and other DHS enforcement agencies already use it in their efforts to enforce U.S. immigration law. Commercial aviation and sea carriers routinely transmit arriving and departing passenger manifests for review. DHS computer systems can automatically check this data for wanted criminals or terrorists who may be trying to evade the law or escape the United States.

Maintaining the status quo with a biographic-based exit system would incur little to no additional cost to DHS. Database systems for manifest review and visa research are already in place. These systems require regular upgrades and maintenance, but there would be no new costs for installing biometric exit technology. Likewise, potentially expensive

²⁴³ Rosenblum and Hipsman, *Border Metrics*.

modifications to airports, seaports, and the land border would not be necessary to facilitate the flow of people and goods departing the United States. Training and staffing costs would also be minimal with existing systems, as it would not be necessary to hire new officers. While staffing levels may increase due to a natural increase in passenger traffic, additional staff would not be required to conduct biometric exit operations or assist passengers in the departure process.

Enhancements to the biographical exit system have improved DHS's ability to address previous data backlogs to identify overstay violators.²⁴⁴ This has allowed DHS to integrate automation and match relevant data across law enforcement systems to "quickly and accurately identify overstays ... to reduce their occurrence in the future."²⁴⁵ Continued biographic system enhancements will allow DHS to eliminate future case backlogs, target overstay cases of concern, and automatically close out cases.

The current biographical exit system has also had previous success in identifying terror suspects trying to alight from the United States. In 2015, CBP arrested 379 airline passengers with outstanding arrest warrants based on electronic data received from carriers.²⁴⁶ In another example, in 2010 CBP apprehended Faisal Shahzad, the suspected Times Square bomber, after receiving a departure manifest from an airline.²⁴⁷ Shahzad and other criminals are frequently apprehended by CBP without the use of a biometric system upon departure.

CBP has also enhanced its biographic exit-based systems. For example, CBP has now automated the I-94 arrival/departure record to maintain entry and exit data electronically.²⁴⁸ Foreign visitors can access their information online as needed. The

²⁴⁴ *From the 9/11 Hijackers to Amine El Khalifi: Terrorists and the Visa Overstay Problem: Hearing Before the Subcommittee on Border and Maritime Security of the Committee on Homeland Security, House of Representatives, 112 Cong. 2 (2012)* (statement of John Cohen, DHS Deputy Counter-Terrorism Coordinator, and Peter Edge, HIS Deputy Associate Director), 13.

²⁴⁵ Cohen and Edge, 13.

²⁴⁶ Wagner, *Overstaying Their Welcome*, 7.

²⁴⁷ Wagner, 7.

²⁴⁸ "I-94 Automation Fact Sheet," Customs and Border Protection (CBP), November 2015, 1, <https://www.cbp.gov/sites/default/files/assets/documents/2016-Mar/i-94-automation-fact-sheet.pdf>.

electronic I-94 will be updated to show the visitor has left once the carrier transmits the passenger manifest to CBP. This eliminates the possibility of lost forms or improperly entered data, which increases the accuracy of the biographic exit data used for overstay analysis.

Finally, CBP has launched new initiatives to gain traveler compliance from foreign visitors. VWP participants can utilize the CBP website to check their visa status while in the United States; CBP will also email VWP travelers ten days before the expiration of their admission period as a reminder.²⁴⁹ This system may eventually include all visitors with a visa. Efforts such as this may increase overstay compliance using existing data and information, possibly reducing the need for a biometric-based system.

Foreign nationals who arrive in the United States via an airport but then leave across the land border pose a unique challenge for tracking overstay cases. Since 2012, the Beyond the Border partnership between the United States and Canada has addressed some exit verification issues on the northern border using a biographic-based system.²⁵⁰ Under this agreement, when a non-U.S. or non-Canadian citizen leaves the United States and crosses into Canada, the Canadian border authorities transmit this data electronically to DHS. As a result, an “entry” into Canada serves as the “exit” from the United States and the departure is automatically recorded.²⁵¹ This process happens with existing biographic systems, without the need for biometrics.

However, reliance on biographic exit data has potential drawbacks that could have implications for homeland security efforts. One weakness in biographical systems is the possibility of data errors or fraud affecting enforcement operations. Biographical systems rely on traditional terminologies, such as name, date of birth, identification number, or passport number ascribed to an individual by a government entity. Because biographical

²⁴⁹ “CBP Reminds Travelers of Time Remaining in the U.S. with Expanded I-94 website Feature and Email Notifications,” CBP, accessed August 27, 2018, <https://www.cbp.gov/newsroom/national-media-release/cbp-reminds-travelers-time-remaining-us-expanded-i-94-website>.

²⁵⁰ “Beyond the Border,” DHS, December 5, 2011, <https://www.dhs.gov/beyond-border>.

²⁵¹ “Perimeter Security and Economic Competitiveness—Addressing Threats Early,” Canada Border Services Agency, November 30, 2012, https://www.cbsa-asfc.gc.ca/btb-pdf/ate-atpem-eng.html#_s2.

exit systems rely on this type of data, an imposter could leave the United States in someone else's place to avoid visa overstay regulations.

Even with improvements in spelling software, incorrect or misspelled names continue to pose a challenge to border enforcement agencies. Name errors on biographic passenger manifests could result in false departure data, or missed opportunities to identify possible terrorists or criminals. This can be seen by the fact that the nineteen hijackers on 9/11 had over 300 spelling variations of their names.²⁵² Whether by pure mistake, cultural translation, or nefarious intent, the anomalies in misspelled names continue to vex software designed to identify and correct these issues.²⁵³ For example, when Tamerlan Tsarnaev traveled to Russia in 2012, he was not sufficiently identified on terror watchlists because his biographic data did not translate from Cyrillic precisely as entered in the database.²⁵⁴ As a result, the FBI was unaware of a potentially crucial piece of intelligence.²⁵⁵

President Obama emphasized international tourism to the United States during his administration, with the goal of 100 million visitors coming annually by 2021.²⁵⁶ If this is ever attained, just maintaining the current overstay rate of 1.17 percent means the natural effect of the status quo would result in over one million foreign nationals overstaying their visas every year. A lack of enforcement efforts against these cases would result in a continued aggregate increase in the number of visa violators remaining inside the United States.

A prior lack of enforcement priority for visa overstay violators has also affected efforts to apprehend and remove these cases. In many instances, nonimmigrant visitors in the United States who overstay their visas are afforded a hearing before an immigration

²⁵² Kephart, "Biometric Exit Tracking."

²⁵³ Kephart.

²⁵⁴ Eric Schmitt and Michael S. Schmidt, "Tamerlan Tsarnaev, Bomb Suspect, Was on Watch Lists," *New York Times*, April 24, 2013, <https://www.nytimes.com/2013/04/25/us/tamerlan-tsarnaev-bomb-suspect-was-on-watch-lists.html>.

²⁵⁵ Kephart, *Implementation of an Entry/Exit System*, 24.

²⁵⁶ "75 Million Tourists Visited U.S. in 2014," ShareAmerica, September 24, 2015, <https://share.america.gov/75-million-tourists-visited-us-2014/>.

judge. Depending on their length of overstay, flight risk, criminal history, and other factors, ICE may hold the visitor in custody pending this hearing. However, ICE could release the visitor with instructions to report to a trial in the future, which could be several years away.²⁵⁷ As a result, with the low prioritization of visa overstay cases, an unintended consequence of apprehending a violator could be that the person is allowed to remain longer inside the United States—the exact outcome the person sought by overstaying the visa. Making visa overstays a priority for apprehension, custody, and detention until removal would have an impact on this consequence, as violators would not be able to remain free while their cases are heard; their immigration violation would not be rewarded by being released.

Maintaining current exit verification processes and enforcement levels will have little impact on reducing visa overstay violations. Even at present overstay rates, the number of visa violators is likely to increase each year due to the growing number of visitors to the United States. A status quo policy would utilize existing systems and methods to identify overstay violators, and would not generate additional costs for added enforcement or a biometric exit system. However, sustaining existing enforcement levels against visa violators will not decrease the number of overstay cases still present, nor will it deter future violators.

B. POLICY OPTION B—BIOMETRIC EXIT SYSTEM WITH CURRENT ENFORCEMENT

Completing the installation of a biometric exit system at all U.S. departure points and maintaining current enforcement efforts is another policy option to address visa overstay cases. Past DHS pilot programs established the ability to biometrically record the exit of foreign visitors without complications.²⁵⁸ Fully implementing a biometric exit system would satisfy congressional mandates, improve HSI's database review for overstay violators, and allow ICE to more rapidly identify visitors who have violated the period of admission for their visas. Under this policy, CBP would work with commercial carriers to

²⁵⁷ 8 C.F.R. 236.1(c)(3).

²⁵⁸ Kephart, *Implementation of an Entry/Exit System*, 9.

collect biometric data from passengers simultaneous to the boarding process. Airlines would then transmit this data to CBP and OBIM for automatic exit verification review using biometric data.

This option would require the installation of biometric collection technology at all departure points in the United States. The installation or redesign of infrastructure to accommodate departure inspections that do not currently exist would be needed. Additional staff would be required to facilitate the flow of people and goods departing the United States; officer training on new biometric technological systems would also be needed. However, additional interior enforcement staffing and detention support would not be needed, as existing enforcement procedures and staffing levels are maintained under this option.

In 2008, US-VISIT conducted a study that compared biographic-only exit systems to a system using biometrics. The goal of this analysis was to enable DHS to track more reliably the departure of foreign nationals using biometrics.²⁵⁹ This analysis also identified several desired outcomes from using a biometric exit system. For example, using a biometric exit system would automatically record a departure on the subject's entry/exit record; the system will make it easier to identify a person who has overstayed his or her visa for possible enforcement action.²⁶⁰ Finally, the study indicated a biometric system would provide complete immigration records for travelers, allowing agencies to allocate resources and expedite entry of compliant travelers.

Incomplete immigration records based on biographic data can be problematic for overstay enforcement. Poor biographic exit data could inadvertently identify a foreign traveler as an overstay, causing them problems for future travel. If a carrier improperly transmits biographical data to DHS, the records may not be appropriately matched.²⁶¹ A biometric system would eliminate these issues with automatic matching and case closure

²⁵⁹ US-VISIT, *Air/Sea Biometric Exit Project Regulatory Impact Analysis*, DHS-2008-0039-0002 (Washington, DC: Department of Homeland Security, April 2008), 9, <http://airlineinfo.com/dhspdf/3.pdf>.

²⁶⁰ US-VISIT, 19.

²⁶¹ GAO, *Overstay Enforcement: Additional Actions*, 26.

upon departure. Biometric exit systems are also advantageous when analyzing passenger data to identify overstays. DHS officials have reported to Congress that significant staffing considerations are required to research multiple possible visa overstay cases.²⁶² In the same testimony, ICE also stated that implementing a biometric exit system would improve data quality, efficiency, and effectiveness in its efforts to identify and remove overstay violators.

Additionally, biometric exit systems could provide a better method to identify fugitive aliens that have departed the United States. The current process to identify self-deporting fugitive aliens requires manual review of airline manifests. Inaccurate names or aliases could once again pose an issue. If an alien using a false name later becomes an immigration fugitive and self-deports using his or her real name and passport, a biographic manifest will not identify that subject. However, if ICE captured the subject's fingerprints, a biometric exit system could alert ICE to close the case because the person has departed. This automation could save resources, as it would prevent ICE from searching for people who are no longer in the United States.

Visa overstay data is a critical factor in determining which countries may remain in the VWP based on the compliance rates of travelers from each nation.²⁶³ Statutes also require that DHS submit an annual report detailing the amount of visa overstay cases for that year.²⁶⁴ The law has required this submission since 1998. However, DHS and legacy agencies did not submit a visa overstay report until 2015. One primary reason for this delay in submission has been DHS's lack of confidence surrounding the accuracy of its overstay data.²⁶⁵ This data is crucial if Congress and agency leaders are going to make decisions about resource allocation, budgeting, and risk assessment related to the issuance of visas. Rapid access to data and the ability to verify violators automatically using biometrics will

²⁶² *Overstaying Their Welcome*, 18.

²⁶³ GAO, *Overstay Enforcement: Additional Actions*, 24.

²⁶⁴ Data on Nonimmigrant Overstay Rates, Pub. L. No. 105-173, 2, 8 U.S.C. 1376 (1998), [http://uscode.house.gov/view.xhtml?req=\(title:8%20section:1376%20edition:prelim\)](http://uscode.house.gov/view.xhtml?req=(title:8%20section:1376%20edition:prelim)).

²⁶⁵ GAO, *Overstay Enforcement: Additional Actions*, 24.

enable managers and agencies to make informed decisions based on overstay rates. The implementation and use of a biometric exit system would provide this data.

When legislation first mandated a biometric exit system, installation and infrastructure costs were a legitimate concern.²⁶⁶ In the years following the IIRIRA bill, biometric technology was expensive, with initial system costs estimated between \$3–6 billion.²⁶⁷ However, more extensive use of biometric technology by federal and other agencies has driven prices down. Biometric technology proponents indicate that prior estimates are no longer accurate, and installation of an affordable exit system with little disruption to trade or travel is possible.²⁶⁸

Despite the advantages of biometrics, prior overstay enforcement efforts and removal data indicate that routine overstay cases are not a priority. If the flaw of not prioritizing overstay cases for enforcement action is built into the deployment of a biometric exit system, the outcome may not be any different from the status quo. The use of biometric exit technology will merely allow the CTCEU or OAU to more easily identify overstay violators and provide targeting intelligence to enforcement agencies. Technology will have no real effect if violators are not physically located and removed according to existing law.

Another challenge to a nationwide exit system may have nothing to do with technology. DHS has already shown that current biometric technology can efficiently identify foreign nationals upon entry into the United States. The crux of the implementation issue is the plan to use it for exit verification. Current U.S. regulations require airports and commercial carriers to provide processing areas for international arrival inspections; there has never been a similar mandate for departure inspections.²⁶⁹ Airport layout and design has environmental effects on the ability to process exiting passengers based on the physical

²⁶⁶ *Overstaying Their Welcome*, 15.

²⁶⁷ US-VISIT, *Air/Sea Biometric Exit Project*.

²⁶⁸ *Defense Daily International*, “Cost of Biometrics Down.”

²⁶⁹ *Overstaying Their Welcome*, 15.

placement of the technology.²⁷⁰ DHS officials have recommended that biometric exit equipment be as close to the departure gate as possible to avoid identifying someone as “exiting” who then does not depart.²⁷¹ In addition, land border exit verification presents a significant challenge for DHS border agencies. The nature of land border crossing precludes CBP’s ability to stop every car to scan outgoing passengers for non-citizens without dramatically impeding traffic or the flow of trade.

Modern airports, seaports, and land border crossings do not have the required space, physical infrastructure, or staffing to support exit processing operations. In 2016, CBP estimated it would cost approximately \$790 million per year for staffing to process biometrics of 95 percent of departing air passengers (not including infrastructure costs).²⁷² To address this cost, Congress has authorized the collection of \$1 billion total in new visa fees to offset some of the development and implementation costs of the biometric exit system.²⁷³

DHS policymakers and border agency managers must be cognizant that not every exit system is perfect in every environment. A one-size-fits-all biometric exit approach is problematic given the variety of border departure environments in our nation.²⁷⁴ There may not be a “best biometric capture system,” only the most suitable one for a particular situation or environment, which is especially relevant when considering a biometric exit system.²⁷⁵ Weather, topography, existing infrastructure, and the type of exit point will all have impacts on the use and implementation of a biometric exit control system. DHS has been moving toward a multi-modal approach to capturing biometric data. This approach

²⁷⁰ Holly Watt, “Setting Sun Blinds Hi-Tech Cameras at Stansted Border Control,” *Guardian*, July 11, 2016, <http://www.theguardian.com/uk-news/2016/jul/11/stansted-setting-sun-blinds-border-control-hi-tech-cameras>.

²⁷¹ *Overstaying Their Welcome*, 8.

²⁷² *Overstaying Their Welcome*, 16.

²⁷³ DHS, “Comprehensive Biometric Entry/Exit Plan,” 18.

²⁷⁴ Biesecker, “Biometric Exit Checks at Airports,” 2.

²⁷⁵ Ashbourn, *Practical Biometrics*, 4.

would allow entry and exit data to be obtained efficiently regardless of the place of departure or other environmental factors.²⁷⁶

The DHS “Fiscal Year 2017 Entry/Exit Overstay Report” documented that the amount of foreign visitors overstaying their visas decreased by 0.14 percent between 2016 and 2017.²⁷⁷ However, in the same report, DHS admitted that no specific cause could be directly attributed to this decrease. The report cites possible contributing factors as “*improvements in immigration enforcement, and border security operations, and country-specific changes to political, infrastructure, or humanitarian conditions.*”²⁷⁸ The report does not define “border security operations,” nor does it explicitly mention the continuing installation of biometric exit technology as a possible factor for the overstay decline. It says explicitly that increased enforcement is a contributing factor to the overstay decline rate, indicating that biometric technology had no measurable effect on the recent reduction, or at least no more so than increased enforcement or maintaining the status quo.

An additional exit implementation issue is the need for more than just the technology. In a 2016 report to Congress, CBP advised “merely placing biometric devices” in a port environment without the requisite support “is unlikely to advance an overall biometric arrival/departure system.”²⁷⁹ While the installation of a biometric exit system would satisfy congressional mandates, any such system must have the funding, support, staffing, and commitment of U.S. border enforcement agencies and transportation partners to make it work. The advent of a biometric exit system would enhance DHS’s ability to quickly identify overstay violators and generate target intelligence, but it would do nothing to help locate or apprehend overstay violators. The ability to quickly identify overstay cases using biometrics is superfluous if enforcement actions are not taken to remove current violators or deter future ones.

²⁷⁶ Ross, Nandakumar, and Jain, *Handbook of Multibiometrics*.

²⁷⁷ DHS, “Fiscal Year 2017 Entry/Exit Overstay Report,” iii.

²⁷⁸ Emphasis added; DHS, v.

²⁷⁹ DHS, “Comprehensive Biometric Entry/Exit Plan,” 20.

C. POLICY OPTION C—BIOMETRICS COMBINED WITH INCREASED ENFORCEMENT

A combination policy for combatting visa overstay violations would join an automated biometric exit system with increased enforcement levels against overstay violators. This approach would see the installation of a biometric exit system at U.S. points of departure. CBP and ICE would utilize the biometric data gathered during the exit process to identify, apprehend, and remove overstay violators who remain in the U.S. interior.

The implementation of this policy would require the technology and infrastructure updates of Option B as well as an increase in staffing, or at least reassignment of resources, dedicated to overstay violator location and apprehension. Another consequence of this choice is the need for additional detention space and removal assets to address the increase in detained immigration violators. Overstay violators would need to be held pending an immigration hearing; commercial or charter aviation assets would be required to repatriate those violators ordered to be removed from the United States.

A biometric exit system alone will not necessarily have an impact on overstay levels without proactive enforcement actions conducted by DHS agencies. Even if a fully implemented biometric exit system instantly notifies DHS of an overstay violation, the number of violators in the country will not diminish if they are not apprehended and removed. A correlating increase in enforcement efforts against overstay cases will reduce the number of violators currently present and would serve as a deterrent to potential violators.

This policy would combine the advantages of the biometric exit system described above with the removal efforts and deterrent effect from increased visa overstay enforcement. Such an enforcement increase would allow the removal of current overstay violators as well as deter potential future violators from remaining here past their admission period. Recent executive orders from the Trump administration regarding interior immigration enforcement indicate that increased enforcement leads to an increase in arrests

and has a resulting deterrence effect.²⁸⁰ Visa overstay and immigration enforcement efforts in other nations also support this argument.

The EU's Smart Borders program has many similarities with the United States' goal of a biometric entry/exit system, though the systems differ. EU member states seem more accustomed to conducting routine immigration status queries of foreign visitors within their internal borders. Member states also seem more likely to capture fingerprints of suspected criminals or immigration cases, which would alert enforcement agencies to possible violators. As a result, the EU appears more likely to identify and apprehend visa violators if all member state enforcement agencies utilize linked databases.

As in the United States, a foreign visitor might enter the EU and decide not to leave when his or her admission period is over. Even with an alert from a biometric exit system, law enforcement officials would still need to track down and apprehend violators to bring them to justice. The European Parliament has recognized that law enforcement action is still necessary even with the EES system. EU academics have also pointed out a technology-based method for catching visa overstay cases is not viable because it only identifies violators as they cross the border to exit the EU. A biometric EES at airports or land borders will not detect or deter subjects who wish to remain in the EU after overstaying their visa if they are not trying to depart.²⁸¹

Strict immigration enforcement regulations like the U.K.'s may have an impact on illegal immigration in general, and visa overstays in particular, if implemented in the United States. Making sure that visitors depart the United States to adjust their status, as the U.K. does, could increase overstay enforcement and border security by making sure foreign nationals actually leave the country and go through background and security checks again. The U.K. practice of removing aliens before completing their appeal could also speed up the removal process and possibly act as a deterrent for visa violators.

²⁸⁰ "Fiscal Year 2017 ICE Enforcement and Removal Operations Report," Immigration and Customs Enforcement (ICE), accessed October 16, 2018, <https://www.ice.gov/removal-statistics/2017>.

²⁸¹ Kenk et al., "Smart Surveillance Technologies in Border Control," 2.

Requiring police agencies to share victim and witness information with U.S. immigration agencies would provide an additional source of information to identify and locate visa overstay violators. However, as more local police agencies and communities in the United States refuse to cooperate with DHS and ICE (so-called “sanctuary cities”), they have declined to share data regarding criminals. Therefore, the notion of them doing so for victims and witnesses seems unlikely. Agencies in these communities would also be less likely to conduct immigration status checks on individuals they encounter, whereas in the U.K. such queries are obligatory.

To date, the U.K.’s immigration enforcement efforts appear focused more on law enforcement and compliance than technology. The U.K. Parliament has passed strong immigration laws that make it difficult for illegal immigrants or visa overstay violators to acclimate in the U.K. While the U.K. has begun implementing some biometric exit control features at some airports, the implementation of strong immigration laws appears to be the cornerstone of U.K. immigration policy. Given the current U.S. political situation surrounding the immigration issue, however, it is unlikely that Congress would pass a bill containing strict enforcement provisions like those found in the U.K.’s 2014 immigration law.

Locating visa overstay cases in the United States is one of the primary challenges of effective overstay enforcement. As discussed previously, a biometric exit system will not provide the location of an overstay violator; it will only alert authorities to the violator’s illegal presence in the country. Under U.K. immigration law, employers, banks, and landlords query U.K. databases about the immigration status of new customers and applicants. Doing this in the United States would allow DHS to identify and locate visa overstay cases for apprehension based on information from these data queries.

Another way to possibly locate overstay violators could be a program such as Australia’s Community Status Resolution Service (CSRS). This program provides aid to visitors in Australia who may violate their visas. It allows subjects to seek assistance regarding their status and offers an alternative to detention if they are working with the

service to adjust their illegal visa status.²⁸² A comparable plan enacted by USCIS could help identify current visa overstay cases, update their location, and monitor them while they address their immigration status. DHS already has alternatives to detention programs in place that could supervise these cases. However, instituting a program whereby immigration violators get “another chance” may be detrimental to enforcement efforts; it might send the message that overstaying your visa is okay. A program such as CSRS may be most productive only in limited cases to ensure that overstay enforcement efforts remain an essential priority for U.S. homeland security.

India’s Aadhaar program presents another possible enforcement opportunity for U.S. border enforcement agencies. Recalcitrant nations can sometimes make it difficult for DHS to repatriate their citizens by refusing to issue travel documents.²⁸³ While more countries have begun cooperating with removals under the current administration, it is still sometimes difficult to secure a travel document for removal because nations may argue someone is not a citizen of their country (even those who previously entered the United States with a passport but overstayed their visa).

The Department of State already collects photographs and fingerprints of visa applicants who desire to come to the United States. Adding biometric collection like Aadhaar (full fingerprints, iris scans, and photographs) into a subject’s visa application and maintaining that data could allow DHS to positively verify that the person in question came from that nation. If people “lose” their passports, they would no longer be able to deny their identity because their fingerprints and iris scans would not change, even if they were apprehended years later. Ideally, these biometric identifiers would act as a self-passport so that a travel document is not even needed. If implemented, DHS could likely speed up removals of visa overstay cases and deter future overstays because foreign nationals could no longer hide their identity to circumvent deportation.

²⁸² “Status Resolution Service,” Australian Government Department of Home Affairs, accessed September 5, 2018, <https://www.homeaffairs.gov.au/trav/visa/visa-about-to-expire-or-expired/status-resolution-service>.

²⁸³ “Visa Sanctions against Four Countries Pursuant to Section 243(d) of the Immigration and Nationality Act,” ICE, accessed June 2, 2018, <https://www.ice.gov/visasanctions>.

As in the U.K., U.S. enforcement agencies conduct worksite employment enforcement operations to ensure employers are complying with immigration law. The Trump administration has recently increased worksite enforcement operations to investigate criminal activity and apprehend immigration violators while instilling a culture of compliance among employers.²⁸⁴ In fiscal year 2017, HSI conducted 1,716 worksite inspections and made 139 criminal and 172 administrative arrests. Through July 20, 2018, HSI had conducted 6,093 worksite investigations and made 675 criminal and 984 administrative arrests.²⁸⁵ This shows a significant increase in U.S. worksite enforcement operations. While visa overstay cases may not be specific targets, these efforts send a message that immigration enforcement is essential. These enforcement efforts could act as a deterrent for visa overstays if they cannot find illicit employment or believe they may be apprehended during a worksite enforcement operation.

Despite the recent decrease in the percentage of overstay cases, certain visa types continue to have higher overstay rates than others, including certain student visas.²⁸⁶ As a result, the Trump administration has taken action to increase the penalties for these types of visa violators.²⁸⁷ These particular visas are good for the duration that someone is in the proper status inside the United States; they do not have a specific departure date. As such, a biometric exit system would be of no use to identify these violators because they have no admission period; they would not be present at a border crossing for a biometric system to annotate a late departure. This particular policy shift addresses enforcement explicitly against visa violators and impacts the ability of these violators to enter or adjust their status in the United States in the future. Such a change in policy illustrates the outcome of an

²⁸⁴ “ICE Delivers More than 5,200 I-9 Audit Notices to Businesses across the U.S. in 2-Phase Nationwide Operation,” ICE, accessed September 5, 2018, <https://www.ice.gov/news/releases/ice-delivers-more-5200-i-9-audit-notices-businesses-across-us-2-phase-nationwide>.

²⁸⁵ ICE.

²⁸⁶ U.S. Citizenship and Immigration Services, “Accrual of Unlawful Presence and F, J, and M Nonimmigrants,” Policy Memo 602-1060.1 (memo, Department of Homeland Security, August 9, 2018), 2.

²⁸⁷ Jorge Cancino, “Trump Toughens Penalties for Foreign Students Who Overstay Visas,” Univision News, August 10, 2018, <https://www.univision.com/univision-news/immigration/trump-toughens-penalties-for-foreign-students-who-overstay-visas>.

enhanced immigration enforcement policy, particularly one where a biometric system would have had little impact.

Policy Option C provides DHS with the most significant opportunity to combat visa overstays effectively. It would combine the technological benefits of biometrically identifying visa violators with the enforcement resources needed to apprehend and remove them. The advantages of a biometric exit system would enhance DHS's ability to rapidly identify overstay violators in an accurate manner. It would also provide decision-makers with data needed to make critical decisions regarding visas, enforcement, and also the VWP program. Recent increases in interior immigration enforcement have demonstrated that such efforts can remove immigration violators and possibly deter others from abusing the U.S. immigration system. The installation of an exit system nationwide will generate infrastructure and technology costs. Likewise, additional enforcement staffing to apprehend, detain, and remove violators will also require funding. However, the United States should continue the development and implementation of a biometric exit system while increasing interior enforcement efforts against visa overstay violators in an effort to close this vulnerability in defense of our nation.

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VI. RECOMMENDATIONS AND CONCLUSION

A concerted enforcement effort to locate and remove visa overstay cases will not only reduce the number of immigration violators present in the United States but will also serve as a deterrent to future violators. These enforcement efforts can be performed in conjunction with information rapidly gleaned from a biometric system and analyzed by the CTCEU and OAU. ERO and HSI can then act on this data to apprehend visa overstay violators who remain within the United States. In addition, DHS and other immigration enforcement agencies should review other possible measures to ensure the enforcement of U.S. visa laws.

A. RECOMMENDATIONS

1. Visa Overstay Threat Analysis

The current threat analysis surrounding visa overstays has come primarily from congressional testimony, GAO reports, and partisan think tank reviews. A study by the CATO Institute in 2016 indicated that the chance of being killed by a foreign-born terrorist who is in the United States on a tourist visa is 0.00003 percent.²⁸⁸ However, this study did not break down the threat on valid visitors versus visa overstay cases. A comprehensive risk analysis of the overstay threat conducted by the U.S. intelligence community has not been found to date; the intelligence community should conduct such an analysis. Such data would assist DHS in further identifying the threat posed by visa overstays from counter-terrorism, criminal, and economic perspectives. This intelligence assessment would provide value to DHS and its respective agencies for a cost-benefit analysis of immigration enforcement efforts vis-à-vis overstay violators and the expenditures associated with apprehending them, as well as the cost of their presence in the United States.

²⁸⁸ Alex Nowrasteh, "Terrorism and Immigration: A Risk Analysis," CATO Institute, September 13, 2016, <https://www.cato.org/publications/policy-analysis/terrorism-immigration-risk-analysis>.

2. Locating Overstay Violators Using Technology and Other Methods

As mentioned previously, locating overstay cases can be challenging for enforcement agencies. DHS should continuously review new or improved technologies for possible methods to identify, track, or find visa overstay cases. CBP has already begun using the internet to remind certain visitors when their period of admission is up. Utilizing Radio Frequency Identification (RFID) chips, which are often contained in passports, may be another technique to locate an overstay case. However, current RFID technology limitations mean violators would have to have their passport with them to be located, and they cannot be located from long distances.²⁸⁹ Other technological methods for location should be continually analyzed and reviewed for feasibility. However, there is the likelihood that some of these methods may have privacy implications, which could complicate their implementation.

Besides students or temporary workers who may be here for several years, the need for most foreign visitors to open a bank account here seems minimal. Proof of U.S. citizenship is not required to start a bank account under current federal guidelines.²⁹⁰ However, most foreign travelers visiting the United States on a visa are only admitted for up to a six-month period of admission and should not require a U.S. bank account. Current technology such as ATMs, credit cards, internet banking, and mobile phone banking mean that visitors should be able to access their home bank without having to open a U.S. account.

Thus, banks could collect identification from foreign nationals opening accounts or conducting large transactions. This data could be shared automatically through DHS and OBIM databases to identify overstay violators for possible enforcement action. Some U.S. banks already have policies to collect this information, though they do not appear to be

²⁸⁹ Mandeep Kaur et al., "RFID Technology Principles, Advantages, Limitations & its Applications," *International Journal of Computer and Electrical Engineering* 3, no. 1 (February 2011): 152, <https://doi.org/10.7763/IJCEE.2011.V3.306>.

²⁹⁰ Rob Wile, "Bank of America Freezes Account after Asking Proof of Residency," *Miami Herald*, August 31, 2018, <https://www.miamiherald.com/news/business/article217095125.html>.

directly sharing it with DHS.²⁹¹ An executive order could order the Office of the Comptroller of the Currency to mandate collection and automatic sharing of this data with DHS; this data could be used to locate and apprehend visa overstay violators. These notifications may raise privacy issues, however, even if the banks or customers are not notified of any query results.

3. Leveraging Federal Immigration Enforcement

Leveraging the private sector or state and local agencies for immigration overstay information would also enhance DHS's ability to identify and locate overstay cases. However, private companies and state or local agencies may not be inclined to provide a client or customer's immigration status to DHS given today's political climate. Nonetheless, the executive branch could generate policies to ensure that *federal* agencies identify or collect immigration status when dealing with foreign nationals. Federal agencies, such as the Internal Revenue Service, could obtain this information any time they interact with a foreign national and interface with DHS for database review. If database queries identify the subject as an overstay case, enforcement agencies could respond appropriately using this data. This alert could take place without either the inquiring agency or the subject knowing there is an immigration issue; the database alert could be addressed solely by DHS. However, many federal agencies rely on the use of biographic data rather than biometric data, so an alias or a misspelled name presents the same challenges as a biographic departure system.

4. Worksite Enforcement

The Trump administration has recently increased worksite immigration enforcement to identify employees and employers who are violating U.S. immigration law.²⁹² ICE should continue these efforts using its three-pronged approach of compliance, enforcement, and outreach.²⁹³ Increased worksite enforcement is one method to reduce a

²⁹¹ Wile.

²⁹² ICE, "ICE Delivers More than 5,200 I-9 Audit Notices."

²⁹³ ICE.

potential draw for visitors to overstay their visas: illicit employment. Compliance and outreach functions will allow ICE to partner with employers and elicit voluntary compliance regarding the employment of authorized immigrants.

DHS should also consider enhancing or increasing immigration reporting tools, such as E-Verify, to help employers identify illegal workers. The use of such systems would have an impact on visa overstays who are seeking illicit employment. E-Verify currently relies on biographical information, rather than biometrics, to identify possible violators. This can cause violators to not be properly identified in the system.²⁹⁴ DHS should enhance E-Verify to include a biometric capability and direct notifications to ICE when an overstay case is queried in the system. The system would then provide the violator and employer information to ICE for response and possible enforcement action. This process could be done automatically without letting the employer or subject even know there is a possible immigration violation.

5. Changes in Adjustment of Status Law

Section 245(a) of the Immigration and Nationality Act allows inspected and admitted foreign visitors to potentially adjust their status to a U.S. Lawful Permanent Resident. While there are several conditions and eligibility factors related to this change, overstaying a visa is not an immediate disqualifier for adjustment of status. This presents a potential incentive for visitors to violate their period of admission. Immigration enforcement proponents suggest that denying residency to visa violators will have an impact on overstay violations.²⁹⁵ Changing the law to eliminate adjustment in these cases may deter visitors from breaking the law, knowing they would not be able to adjust their status in the United States in the future. This deterrent would cause visitors to return home and reapply to visit or change their status in the United States.

²⁹⁴ Alex Nowrasteh, “E-Verify Wouldn’t Have Prevented Mollie Tibbetts’ Murder,” Cato Institute, September 7, 2018, <https://www.cato.org/blog/e-verify-wouldnt-have-prevented-mollie-tibbetts-murder>.

²⁹⁵ Neil Munro, “Nine Ways Trump Is Solving the Illegal-Migration Problem (Aided by Jeff Sessions),” Breitbart, September 19, 2018, https://www.breitbart.com/big-government/2018/09/19/nine-ways-trump-is-shrinking-illegal-immigration/?utm_campaign=Feed%3A+breitbart+%28Breitbart+News%29&utm_medium=feed&utm_source=feedburner.

6. Beyond the Mexican Border

The cooperative relationship between Canada and the United States in the Beyond the Border program presents an important takeaway for U.S. border management. This collaborative enterprise is a critical component of visa overstay enforcement for the United States and Canada. However, visitors who depart via the Mexican border may not have their departure information captured; they could be falsely considered visa overstays because such an agreement does not currently exist with Mexico. Capturing this data is difficult due to incompatible database systems, infrastructure issues at border crossings, possible corruption, and inconsistent data capture for every non-U.S. citizen entering Mexico.²⁹⁶

If subjects who have legally departed the United States at any departure point can be identified, vital resources will not be wasted searching for someone who left via the land border. Expanding the Beyond the Border initiative to the U.S.–Mexico border will have a positive impact on immigration enforcement, especially concerning visa overstay cases. Without a collaborative entry/exit border agreement with Mexico, foreign nationals could fly into the United States, depart over land via the southern border, and still appear on U.S. overstay lists as an in-country overstay. This lack of information impacts the ability of DHS border agencies to conduct overstay analysis and accurately identify visa violators.

B. CONCLUSION

Identifying, locating, apprehending, and removing visa overstay violators is critically important to the U.S. homeland security enterprise. Enforcing immigration laws, including visa overstay laws, can impact terrorism, crime, gangs, and drug trafficking in the United States. This enforcement can also positively affect the other social and economic impacts that a large illegal alien population has on society. Terrorists have shown the willingness and ability to exploit flaws or gaps in our security; the high number of nonimmigrant visitor overstays every year represents such a gap.

²⁹⁶ GAO, *Overstay Enforcement: Additional Actions*.

Enforcement and removal efforts against visa overstay cases have been historically low, despite the continued increase in the number of overstay violators. This gap indicates that enforcement against many overstay cases is not a priority. As a result, there is little to dissuade potential visa violators, who may realize that their likelihood of apprehension and removal is low despite remaining in the United States in violation of the law. Based on current immigration laws and policies, even if overstay violators are apprehended, they still may have the opportunity to stay in the United States while they fight their cases.

The implementation of a biometric exit system alone will not address the problem of visa overstay violations. The threat of being identified by a technological system as a visa overstay rings hollow if there is no risk of repercussion for such a violation. Even with the advantages of a biometric system, enforcement agents will still be needed to locate, apprehend, and remove violators. Congressional testimony and government accounts echo this finding, including a recent DHS report that acknowledges increased enforcement as a possible factor for the overstay rate decline in 2017. DHS officials have also commented that immigration enforcement is good for national security and that a biometric system's viability is reduced if action is not taken to apprehend violators identified by that system.

The actions and comments of other nations, including the EU and U.K., also indicate that immigration enforcement is critical to address visa overstays and immigration law. Australian legislators have commented that the number of foreign nationals who have overstayed Australian visas for over 20 years “makes a mockery” of Australian border protection and overstay enforcement efforts.²⁹⁷ Even with the addition of biometric exit systems, other nations recognize the need for enforcement efforts in conjunction with technology to administer immigration laws.

Maintaining the status quo for visa overstay enforcement in the United States by relying on biographic exit systems, minor biometric system implementation via “surges” at specific airports, and poor interior overstay enforcement would likely leave the United States with the same visa overstay security gap. Additional capital expenditure would not

²⁹⁷ “How Many People Are Staying in Australia Illegally on Expired Visas?” Visa Solutions, November 9, 2017, <http://www.visasolutions.com.au/news-blog/posts/how-many-people-are-staying-in-australia-illegally-on-expired-visas>.

be required but, barring changes in some other variable, the rate of overstay cases will likely not decrease. Even if the percentage of annual overstays violators remains the same, the number of violators may increase as international passenger traffic increases.

Full implementation of a U.S. biometric exit system could be costly in light of training, increased enforcement staffing, infrastructure costs, and expenditures for biometric technology at all ports of entry. However, such a system would help DHS enforcement agencies quickly identify overstay cases and alleviate some of the current issues found with biographical exit systems. Nevertheless, a biometric exit system alone will not determine where a violator is or help authorities locate the violator; it will only notify DHS, which can be done now using biographic means. Also, implementing such a system without a commensurate increase in enforcement efforts may not have the desired impact on the overstay gap; violators will not be identified, apprehended, and removed. This may fail to deter future overstay violators. As such, a combination policy of biometrics and increased enforcement will have the most significant impact on combating visa overstay cases. This policy will ensure that foreign visitors depart as required by law, identify cases for apprehension, and deter future violators from overstaying their visas.

Even with increased enforcement operations, policy changes, and the implementation of a biometric exit system, reducing visa overstay violations requires resources and support from all levels of DHS and the executive branch. DHS border enforcement agencies must send a message that the integrity of our immigration system is paramount and that U.S. immigration laws will be enforced. A commitment to enforcement, in combination with technology, will demonstrate that visa overstay cases are important and need to be addressed as a matter of U.S. immigration law and as part of the homeland security enterprise.

C. FUTURE RESEARCH

1. Legal Changes for Visa Overstay Violations

One area for future research is related to criminalizing the offense of overstaying a visa. Currently only crossing the border without inspection is a criminal offense. Other federal immigration violations, including overstays, are handled administratively. There

have been recent efforts in Congress to add visa overstay violations to federal criminal statutes as well. One proposed bill would make the first overstay offense a criminal misdemeanor and subsequent offenses a felony.²⁹⁸ This change would have an impact on locating and apprehending violators from a criminal, rather than administrative, perspective. The threat of jail time and a criminal conviction would deter potential violators from overstaying their visas—but, again, only if such a criminal statute is enforced by DHS.²⁹⁹ An examination of these possible impacts could result in beneficial policy recommendations.

2. Local and State Law Enforcement and Immigration

The overall role of state and local law enforcement in federal immigration enforcement may also warrant further research. The limited number of ICE agents and deportation officers means that local and state law enforcement officers are more likely to encounter a visa overstay case during routine police work. This thesis does not address the current policies of these interactions, or how possible procedural improvements could be made to leverage local law enforcement assets to assist DHS and ICE in dealing with visa overstay cases. Further research or analysis could address such enhancements, examine the impact of sanctuary cities and political issues on immigration enforcement, and identify possible legislative solutions for cooperation and collaboration between DHS and law enforcement on immigration enforcement.

²⁹⁸ “Barletta Bill Makes Overstaying Visa Criminal Offense,” Congressman Lou Barletta, January 27, 2017, <https://barletta.house.gov/media-center/press-releases/barletta-bill-makes-overstaying-visa-criminal-offense-0>.

²⁹⁹ “Fox Contributor and Former Acting Director of ICE Calls for Criminalizing Visa Overstays,” Media Matters for America, August 28, 2018, <https://www.mediamatters.org/video/2018/08/28/fox-contributor-and-former-acting-director-ice-calls-criminalizing-visa-overstays/221127>.

LIST OF REFERENCES

- Akers, Ronald L. "Rational Choice, Deterrence, and Social Learning Theory in Criminology: The Path Not Taken." *The Journal of Criminal Law and Criminology* 81, no. 3 (1990): 653–76. <https://doi.org/10.2307/1143850>.
- All Criminal Justice Schools. "What Is DNA Fingerprinting? DNA vs. Conventional Fingerprints." Accessed August 7, 2017. <http://www.allcriminaljustice.schools.com/forensics/dna-fingerprinting/>.
- Ashbourn, Julian. *Practical Biometrics: From Aspiration to Implementation*, 2nd ed. London: Springer, 2015.
- Australian Government Department of Home Affairs. "Status Resolution Service." Accessed September 5, 2018. <https://www.homeaffairs.gov.au/trav/visa/visa-about-to-expire-or-expired/status-resolution-service>.
- Baker McKenzie. "5 Basics You Need to Know about Biometrics." October 10, 2016. <http://www.bakerinform.com/home/2015/10/21/part-1-five-basics-you-need-to-know-about-biometrics>.
- Ball, Ben. "Why Facial Recognition Is the Wrong Choice for Biometric Exit." *Crossmatch Identity Management Blog*, August 4, 2016. <https://blog.crossmatch.com/market-trends/facial-recognition-biometric-exit/>.
- Barletta, Lou. "Barletta Bill Makes Overstaying Visa Criminal Offense." January 27, 2017. <https://barletta.house.gov/media-center/press-releases/barletta-bill-makes-overstaying-visa-criminal-offense-0>.
- Barros, Aline. "After Overstaying Visas, Immigrants Face Uncertain Future." VOA, May 24, 2017. <https://www.voanews.com/a/after-overstaying-visas-immigrants-face-uncertain-future/3868473.html>.
- BBC. "Illegal Migrants Face New Crackdown." October 10, 2013. <http://www.bbc.com/news/uk-politics-24469584>.
- Biesecker, Calvin. "For Biometric Exit Checks at Airports, Human Factors, Good Instruction Are Key, Officials Say." *Defense Daily*, May 21, 2015. <http://libproxy.nps.edu/login?url=https://search.proquest.com/docview/1700777033?accountid=12702>.

- Bipartisan Policy Center Immigration Task Force. "Entry-Exit System: Progress, Challenges, and Outlook." Staff report, Bipartisan Policy Center, May 2014. <https://cdn.bipartisanpolicy.org/wp-content/uploads/sites/default/files/BPC%20Immigration%20Entry-Exit%20System%20Progress%2C%20Challenges%2C%20and%20Outlook.pdf>.
- Bolle, Ruud M. *Guide to Biometrics*. New York: Springer, 2004.
- Bosworth, Mary, Alpa Parmar, and Yolanda Vázquez (eds.). *Race, Criminal Justice, and Migration Control: Enforcing the Boundaries of Belonging*. Oxford, England: Oxford University Press, 2018.
- Bowling, Ben, and Sophie Westenra. "Racism, Immigration, and Policing." In *Race, Criminal Justice, and Migration Control: Enforcing the Boundaries of Belonging*, edited by Mary Bosworth, Alpa Parmar, and Yolanda Vázquez. Oxford, England: Oxford University Press, 2018.
- Canada Border Services Agency. "Perimeter Security and Economic Competitiveness—Addressing Threats Early." November 30, 2012. https://www.cbsa-asfc.gc.ca/btb-pdf/ate-atpem-eng.html#_s2.
- Cancino, Jorge. "Trump Toughens Penalties for Foreign Students Who Overstay Visas." Univision News, August 10, 2018. <https://www.univision.com/univision-news/immigration/trump-toughens-penalties-for-foreign-students-who-overstay-visas>.
- Carey, Meredith. "Biometrics Worked! U.S. Border Patrol Celebrates Success of Early Tech." Condé Nast Traveler, August 24, 2018. <https://www.cntraveler.com/story/biometrics-worked-us-border-patrol-celebrates-success-of-early-tech>.
- Chellappa, Rama, Pawan Sinha, and P. Jonathon Phillips. "Face Recognition by Computers and Humans." *Computer* 43, no. 2 (February 2010): 46–55. <https://doi.org/10.1109/MC.2010.37>.
- Customs and Border Protection. "CBP Reminds Travelers of Time Remaining in the U.S. with Expanded I-94 Website Feature and Email Notifications." Accessed August 27, 2018. <https://www.cbp.gov/newsroom/national-media-release/cbp-reminds-travelers-time-remaining-us-expanded-i-94-website>.
- . "I-94 Automation Fact Sheet." November 2015. <https://www.cbp.gov/sites/default/files/assets/documents/2016-Mar/i-94-automation-fact-sheet.pdf>.
- Dajani, Haneen. "Dubai Airport's New Virtual Aquarium Tunnel Scans Your Face as You Walk through It." *The National*, October 8, 2017. <https://www.thenational.ae/uae/transport/dubai-airport-s-new-virtual-aquarium-tunnel-scans-your-face-as-you-walk-through-it-1.665406>.

Das, Ravindra. *Biometric Technology Authentication, Biocryptography, and Cloud-Based Architecture*. Boca Raton, FL: CRC, 2015.

Defense Daily International. “Cost of Biometrics Down, But Still No Consensus on Airport Implementation.” Vol. 15, no. 46 (November 15, 2013). <https://search.proquest.com.libproxy.nps.edu/docview/1473877640?OpenUrlReflId=info:xri/sid:primo&accountid=12702>.

Department of Homeland Security (DHS). “Apex AEER.” April 8, 2015. <https://www.dhs.gov/science-and-technology/apex-aeer>.

———. “Beyond the Border.” December 5, 2011. <https://www.dhs.gov/beyond-border>.

———. “Biometrics.” Accessed August 9, 2017. <https://www.dhs.gov/biometrics>.

———. “Comprehensive Biometric Entry/Exit Plan: Fiscal Year 2016 Report to Congress.” Report, Department of Homeland Security, April 20, 2016. <https://www.dhs.gov/sites/default/files/publications/Customs%20and%20Border%20Protection%20-%20Comprehensive%20Biometric%20Entry%20and%20Exit%20Plan.pdf>.

———. “Enhancing Security through Biometric Identification.” December 2008. https://www.dhs.gov/xlibrary/assets/usvisit/usvisit_edu_biometrics_brochure_english.pdf.

———. “Fiscal Year 2015 Entry/Exit Overstay Report.” Report, Department of Homeland Security, January 19, 2016.

———. “Fiscal Year 2016 Entry/Exit Overstay Report.” Report, Department of Homeland Security, April 20, 2016. <https://www.dhs.gov/sites/default/files/publications/Entry%20and%20Exit%20Overstay%20Report%2C%20Fiscal%20Year%202016.pdf>.

———. “Fiscal Year 2017 Entry/Exit Overstay Report.” Report, Department of Homeland Security, August 7, 2018.

———. “Privacy Impact Assessment for the Automated Biometric Identification System (IDENT).” Report, Department of Homeland Security, December 7, 2012. <https://www.dhs.gov/sites/default/files/publications/privacy-pia-nppd-ident-06252013.pdf>.

Department of State. “Visa Waiver Program.” Accessed April 24, 2018. <https://travel.state.gov/content/travel/en/us-visas/tourism-visit/visa-waiver-program.html>.

- Eldridge, Thomas R., Susan Ginsburg, Walter T. Hempel II, Janice L. Kephart, and Kelly Moore. "9/11 and Terrorist Travel: Staff Report of the National Commission on Terrorist Attacks upon the United States. Report, National Commission, 2004. https://permanent.access.gpo.gov/lps53197/911_TerrTrav_Monograph.pdf.
- Electronic Frontier Foundation. "Biometrics: Frequently Asked Questions." December 9, 2015. <https://www.eff.org/sls/tech/biometrics/faq>.
- Ethiraj, Govindraj. "Aadhaar Is Not All about Subsidies: 5 Uses for India's Biometric IDs You Didn't Know About." *Quartz* (blog), August 13, 2014. <https://qz.com/248866/aadhaar-is-not-all-about-subsidies-5-uses-for-indias-biometric-ids-you-didnt-know-about/>.
- European Agency for the operational management of large-scale IT systems. "Testing the Borders of the Future: Smart Border Pilot Results in Brief." Report, European Commission, 2015. https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/policies/borders-and-visas/smart-borders/docs/smart_borders_pilot_-_executive_summary_en.pdf.
- European Commission. *Borders and Security: Building an Open and Safe Europe*. Luxembourg: European Union, 2013.
- . "The European Agenda on Security." Report, European Commission, April 28, 2015. https://ec.europa.eu/home-affairs/sites/homeaffairs/files/e-library/documents/basic-documents/docs/eu_agenda_on_security_en.pdf.
- . "On an Entry/Exit System at the External Borders of the European Union, Facilitation of Border Crossings for Bona Fide Travellers, and an Electronic Travel Authorisation System." Report, European Commission, 2008. <http://www.statewatch.org/news/2008/feb/eu-com-exit-entry.pdf>.
- . "Smart Borders." December 6, 2016. https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/smart-borders_en.
- . "Stronger and Smarter Information Systems for Borders and Security/" Report, European Commission, April 6, 2016. https://ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/policies/securing-eu-borders/legal-documents/docs/20160406/communication_on_stronger_and_smart_borders_20160406_en.pdf.
- Fingerprint America. "History of Fingerprints." Accessed August 7, 2017. <http://www.fingerprintamerica.com/fingerprinthistory.asp>.
- Finland Ministry of the Interior. "Smart Borders Package Improves EU Border Management." Accessed May 30, 2018, <http://intermin.fi/en/border-management/smart-borders>.

- Fletcher, Meg. “Will Pilot Program Fly?” *Business Insurance*, May 14, 2006. <http://www.businessinsurance.com/article/20060514/STORY/100018870?template=printart./20>.
- Gaffey, Conor. “Five Things You Need to Know about the Schengen Agreement.” *Newsweek*, September 14, 2015. <http://www.newsweek.com/schengen-agreementschengen-visaschengen-systemschengen-areaschengen-600307>.
- Gambler, Rebecca. *Immigration Enforcement: Preliminary Observations on DHS’s Overstay Enforcement Efforts*. GAO-13-602T. Washington, DC: Government Accountability Office, 2013. <https://www.gao.gov/products/GAO-13-602T>.
- Gopal, Anita. “Visa and Immigration Trends: A Comparative Examination of International Student Mobility in Canada, Australia, the United Kingdom, and the United States.” *Strategic Enrollment Management Quarterly* 4, no. 3 (October 2016): 130–41. <https://doi.org/10.1002/sem3.20091>.
- Government Accountability Office (GAO). *Border Security: DHS Has Made Progress in Planning for Biometric Exit System but Challenges Remain*. GAO-17-170. Washington, DC: Government Accountability Office, 2017.
- . *Information on Timeliness of Criminal Fingerprint Submissions to the FBI*. GAO-04-260. Washington, DC: Government Accountability Office, January 2004.
- . *Overstay Enforcement: Additional Actions Needed to Assess DHS’s Data and Improve Planning for a Biometric Air Exit Program*. GAO-13-683. Washington, DC: Government Accountability Office, 2013. <http://www.gao.gov/assets/660/656316.pdf>.
- . *Overstay Enforcement: Additional Mechanisms for Collecting, Assessing, and Sharing Data Could Strengthen DHS’s Efforts but Would Have Costs*. GAO-11-411. Washington, DC: Government Accountability Office, 2011.
- . *Strategic Solution for US-VISIT Program Needs to Be Better Defined, Justified, and Coordinated*. GAO-08-361. Washington, DC: Government Accountability Office, February 2008.
- Hennis-Plasschaert, Jeanine. “Report on the Next Steps in Border Management in the European Union and Similar Experiences in Third Countries.” Report, European Parliament, February 17, 2009.
- Immigration and Customs Enforcement (ICE). “Fiscal Year 2017 ICE Enforcement and Removal Operations Report.” Accessed October 16, 2018. <https://www.ice.gov/removal-statistics/2017>.

- . “ICE Delivers More than 5,200 I-9 Audit Notices to Businesses across the U.S. in 2-Phase Nationwide Operation.” Accessed September 5, 2018. <https://www.ice.gov/news/releases/ice-delivers-more-5200-i-9-audit-notice-businesses-across-us-2-phase-nationwide>.
- . “Visa Sanctions against Four Countries Pursuant to Section 243(d) of the Immigration and Nationality Act.” Accessed June 2, 2018, <https://www.ice.gov/visasanctions>.
- Independent Chief Inspector of Borders and Immigration. *Inspection Report on Immigration Enforcement Activity, December 2014*. London: Independent Chief Inspector of Borders and Immigration, 2014. <https://www.gov.uk/government/publications/inspection-report-on-immigration-enforcement-activity-december-2014>.
- International Biometrics Identity Association. “Closing the Loop: Completing Biometric U.S. Entry-Exit.” March 2016. https://www.ibia.org/download/datasets/3340/IBIA_Exit-Paper_March%202016.pdf.
- Jain, Anil K., Lin Hong, and Sharath Pankanti. “Biometric Identification.” *Communications of the ACM* 43, no. 2 (February 2000): 90–98.
- Jain, Anil K., Lin Hong, Sharath Pankanti, and Ruud Bolle. “An Identity-Authentication System Using Fingerprints.” *Proceedings of the IEEE* 85, no. 9 (September 1997): 1365–88.
- Jain, Anil K., Arun Ross, and Salil Prabhakar. “An Introduction to Biometric Recognition.” *IEEE Transactions on Circuits and Systems for Video Technology* 14, no. 1 (January 2004): 4–20. <https://doi.org/10.1109/TCSVT.2003.818349>.
- Jones, Phillip. “Using Biometric Technology to Advance Law Enforcement.” *Forensic Magazine*, August 1, 2006. <https://www.forensicmag.com/article/2006/08/using-biometric-technology-advance-law-enforcement>.
- Kaur, Mandeep, Manjeet Sandhu, Neeraj Mohan, and Parvinder S. Sandhu. “RFID Technology Principles, Advantages, Limitations & its Applications.” *International Journal of Computer and Electrical Engineering* 3, no. 1 (February 2011): 151–57. <https://doi.org/10.7763/IJCEE.2011.V3.306>.
- Kenk, Vildana Sulić, Janez Križaj, Vitomir Štruc, and Simon Dobrišek. “Smart Surveillance Technologies in Border Control.” *European Journal of Law and Technology* 4, no. 2 (October 2, 2013). <http://ejlt.org/article/view/230>.
- Kephart, Janice L. “Biometric Exit Tracking.” Center for Immigration Studies, September 9, 2013. <https://cis.org/Report/Biometric-Exit-Tracking>.

- . *Immigration and Terrorism: Moving beyond the 9/11 Staff Report on Terrorist Travel*. Washington, DC: Center for Immigration Studies, 2005.
- Klontz, Joshua C., and Anil K. Jain. “A Case Study of Automated Face Recognition: The Boston Marathon Bombing Suspects.” *Computer* 46, no. 11 (November 2013): 91–94. <https://doi.org/10.1109/MC.2013.377>.
- Kopan, Tal. “It’s Not Just FEMA: ICE Quietly Got an Extra \$200 Million.” CNN, September 12, 2018. <https://www.cnn.com/2018/09/12/politics/ice-more-money-fema-dhs/index.html>.
- Magnet, Shoshana. *When Biometrics Fail: Gender, Race, and the Technology of Identity*. Durham, NC: Duke University Press, 2011.
- Martin, Grant. “Lufthansa Installs Facial Recognition Stations in Los Angeles to Speed up Airplane Boarding.” *Forbes*, March 25, 2018. <https://www.forbes.com/sites/grantmartin/2018/03/25/lufthansa-installs-facial-recognition-stations-in-los-angeles-to-speed-up-airplane-boarding/>.
- Media Matters for America. “Fox Contributor and Former Acting Director of ICE Calls for Criminalizing Visa Overstays.” August 28, 2018. <https://www.mediamatters.org/video/2018/08/28/fox-contributor-and-former-acting-director-ice-calls-criminalizing-visa-overstays/221127>.
- Miami Herald*. “Bank of America Freezes Account after Asking Proof of Residency” accessed September 6, 2018, <https://www.miamiherald.com/news/business/article217095125.html>.
- Migration Observatory. “Deportations, Removals and Voluntary Departures from the UK.” Migration Observatory. <http://www.migrationobservatory.ox.ac.uk/resources/briefings/deportations-removals-and-voluntary-departures-from-the-uk/>.
- . “Irregular Migration in the UK: Definitions, Pathways and Scale.” Accessed May 18, 2018. <http://www.migrationobservatory.ox.ac.uk/resources/briefings/irregular-migration-in-the-uk-definitions-pathways-and-scale/>.
- Milne, Claire. “How Many People Overstay Their Visas?” Full Fact, January 30, 2017. <https://fullfact.org/immigration/how-many-people-overstay-visas/>.
- Moore, Elizabeth Armstrong. “JetBlue to Test Face Scanning to Replace Boarding Passes.” Fox News, June 1, 2017. <http://www.foxnews.com/travel/2017/06/01/jetblue-to-test-face-scanning-to-replace-boarding-passes.html>.
- Moore, Todd. “Biometric Borders and Counterterrorism.” Master’s thesis, Naval Postgraduate School, 2010.

- Moses, Kenneth R., Peter Higgins, Michael McCabe, Salil Probhakar, and Scott Swann. "Automated Fingerprint Identification System." In *The Fingerprint Sourcebook*, 6-1-6-33. Washington, DC: Department of Justice, 2010. <https://www.ncjrs.gov/pdffiles1/nij/225326.pdf>.
- Munro, Neil. "Nine Ways Trump Is Solving the Illegal-Migration Problem (Aided by Jeff Sessions)." Breitbart, September 19, 2018. https://www.breitbart.com/big-government/2018/09/19/nine-ways-trump-is-shrinking-illegal-immigration/?utm_campaign=Feed%3A+breitbart+%28Breitbart+News%29&utm_medium=feed&utm_source=feedburner.
- National Commission on Terrorist Attacks upon the United States. *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States*, 1st ed., Kindle. New York: W. W. Norton, 2004.
- National Institute of Justice. "DNA Evidence: Basics of Analyzing." August 9, 2012. <http://www.nij.gov:80/topics/forensics/evidence/dna/basics/pages/analyzing.aspx>.
- . "DNA Evidence Basics: Types of Samples Suitable for DNA Testing." August 9, 2012. <https://www.nij.gov/topics/forensics/evidence/dna/basics/pages/types-of-samples.aspx#paternity>.
- Nedap Security Management. "Selecting the Appropriate Biometric Technology." Vitani, accessed December 11, 2017. <http://vitanigroup.com/wp-content/uploads/2016/03/Whitepaper-Biometrics.pdf>.
- Nelson, Lisa S. *America Identified Biometric Technology and Society*. Cambridge: MIT Press, 2011.
- Nelson, Rick "Ozzie", Heather A. Conley, Teresita C. Schaffer, Ben Bodurian, Jamie Kraut, T.J. Cipoletti, Uttara Dukkupati, and Robin J. Walker. *Border Security in a Time of Transformation*. Washington, DC: Center for Strategic and International Studies, July 2010.
- Nguyen, Diem, and Jena McNeil. "Biometric Exit Programs Show Need for New Strategy to Reduce Visa Overstays." Background, The Heritage Foundation, 2010.
- Nowrasteh, Alex. "E-Verify Wouldn't Have Prevented Mollie Tibbetts' Murder." Cato Institute, September 7, 2018. <https://www.cato.org/blog/e-verify-wouldnt-have-prevented-mollie-tibbetts-murder>.
- . "Terrorism and Immigration: A Risk Analysis." CATO Institute, September 13, 2016. <https://www.cato.org/publications/policy-analysis/terrorism-immigration-risk-analysis>.

- Orav, Anita, and Alessandro D'Alfonso. "Smart Borders: EU Entry/Exit System." Briefing, European Parliamentary Research Service, January 12, 2018. [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BR I\(2016\)586614](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BR I(2016)586614).
- Parmar, Alpa. "Policing Belonging." In *Race, Criminal Justice, and Migration Control: Enforcing the Boundaries of Belonging*, edited by Mary Bosworth, Alpa Parmar, and Yolanda Vázquez. Oxford, England: Oxford University Press, 2018.
- Pestano, Andrew V. "Illegal Border Crossings from Mexico into U.S. up 23 Percent from 2015." UPI, October 18, 2016. https://www.upi.com/Top_News/US/2016/10/18/Illegal-border-crossings-from-Mexico-into-US-up-23-percent-from-2015/7331476791148.
- Peterson, Barbara. "The Future of Biometrics at the Airport." Condé Nast Traveler. September 20, 2018. <https://www.cntraveler.com/story/the-future-of-biometrics-at-the-airport>.
- Riley, K. Jack. *Border Security and the Terrorist Threat*. Santa Monica, CA: RAND, 2006. <https://www.rand.org/pubs/testimonies/CT266.html>.
- Ravindranath, Mohana. "DHS Wants New Facial Recognition Cameras in Airports." Nextgov, November 28, 2016. <http://www.nextgov.com/emerging-tech/2016/11/dhs-wants-cameras-can-recognize-your-face-airport/133442/>.
- Rockwell, Mark. "Sen. Sessions Wants Fingerprints for Visitors Entering and Exiting the U.S." FCW, June 16, 2016. <https://fcw.com/articles/2016/06/16/sessions-fingerprint-biometrics.aspx>.
- Rosenblum, Marc R., and Faye Hipsman. *Border Metrics: How to Effectively Measure Border Security and Immigration Control*. Washington, DC: Migration Policy Institute, January 2016.
- Ross, Arun A., Karthik Nandakumar, and Anil K. Jain, *Handbook of Multibiometrics*, New York: Springer, 2006.
- Rudolph, Harrison, Laura M. Moy, and Alvaro M. Bedoya. "Not Ready for Takeoff: Face Scans at Airport Departure Gates." Report, Georgetown Law Center on Privacy & Technology, 2017. <https://www.law.georgetown.edu/privacy-technology-center/publications/not-ready-for-takeoff/>.
- Sands, Geneva. "Immigration Arrests Spiked, Illegal Border Crossings Dropped in 2017: DHS." ABC News, December 5, 2017. <https://abcnews.go.com/US/immigration-arrests-spiked-illegal-border-crossings-dropped-2017/story?id=51599510>.

- Schmitt, Eric, and Michael S. Schmidt. "Tamerlan Tsarnaev, Bomb Suspect, Was on Watch Lists." *New York Times*, April 24, 2013. <https://www.nytimes.com/2013/04/25/us/tamerlan-tsarnaev-bomb-suspect-was-on-watch-lists.html>.
- Seghetti, Lisa. *Border Security: Immigration Inspections at Ports of Entry*. CRS Report No. R43356. Washington, DC: Congressional Research Service, 2015. https://digital.library.unt.edu/ark:/67531/metadc501645/m1/1/high_res_d/R43356_2015Jan26.pdf.
- Select USA. "Travel, Tourism & Hospitality Industry Spotlight." Accessed June 26, 2018. <https://www.selectusa.gov/travel-tourism-and-hospitality-industry-united-states>.
- ShareAmerica. "75 Million Tourists Visited U.S. in 2014." September 24, 2015. <https://share.america.gov/75-million-tourists-visited-us-2014/>.
- Shin, Adrian J. "Tyrants and Migrants: Authoritarian Immigration Policy." *Comparative Political Studies* 50, no. 1 (January 1, 2017): 14–40. <https://doi.org/10.1177/0010414015621076>.
- Steele, Rachael. "How Offenders Make Decisions: Evidence of Rationality." *British Journal of Community Justice* 13, no. 3 (2016): 7–20.
- Travis, Alan. "UK Border Agency 'No Grip' on People with Expired Visas." *Guardian*, May 16, 2011. <http://www.theguardian.com/uk/2011/may/17/uk-border-agency-expired-visas>.
- Unique Identification Authority of India, Government of India. "Vision & Mission." Accessed May 31, 2018. <https://www.uidai.gov.in/about-uidai/about-uidai/vision-mission.html>.
- United States Visitor and Immigrant Status Indicator Technology Program. *Air/Sea Biometric Exit Project: Regulatory Impact Analysis*. DHS-2008-0039-0002. Washington, DC: Department of Homeland Security, 2008. <https://airlineinfo.com/dhspdf/3.pdf>.
- U.S. Citizenship and Immigration Services. "Accrual of Unlawful Presence and F, J, and M Nonimmigrants." Policy Memo 602-1060.1. Memo, Department of Homeland Security, August 9, 2018.
- . "If You Are Thinking about Changing Your Nonimmigrant Status." Accessed June 16, 2018. <https://www.uscis.gov/visit-united-states/change-my-nonimmigrant-status-category/change-my-nonimmigrant-status>.
- U.S. Department of State. "Visitor Visa." Accessed June 16, 2018. <https://travel.state.gov/content/travel/en/us-visas/tourism-visit/visitor.html>.

- US-VISIT. *Air/Sea Biometric Exit Project Regulatory Impact Analysis*. DHS-2008-0039-0002. Washington, DC: Department of Homeland Security, April 2008. <http://airlineinfo.com/dhspdf/3.pdf>.
- Vaughan, Jessica M. "DHS Reports Huge Number of Visitors Overstayed in 2015." Center for Immigration Studies, January 20, 2016. <https://cis.org/Vaughan/DHS-Reports-Huge-Number-Visitors-Overstayed-2015>.
- Visa Solutions. "How Many People Are Staying in Australia Illegally on Expired Visas?" November 9, 2017. <http://www.visasolutions.com.au/news-blog/posts/how-many-people-are-staying-in-australia-illegally-on-expired-visas>.
- Watt, Holly. "Setting Sun Blinds Hi-Tech Cameras at Stansted Border Control." *Guardian*, July 11, 2016. <http://www.theguardian.com/uk-news/2016/jul/11/stansted-setting-sun-blinds-border-control-hi-tech-cameras>.
- Wile, Rob. "Bank of America Freezes Account after Asking Proof of Residency." *Miami Herald*, August 31, 2018 <https://www.miamiherald.com/news/business/article217095125.html>.

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