



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**DIFFUSION OF DNA TESTING IN THE IMMIGRATION
PROCESS**

by

Evelyn Sahli

December 2009

Thesis Co-Advisors:

Richard Bergin
John Rollins

Approved for public release; distribution is unlimited

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 2009	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE Diffusion of DNA Testing in the Immigration Process			5. FUNDING NUMBERS	
6. AUTHOR(S) Evelyn Sahli				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE A	
13. ABSTRACT (maximum 200 words) DHS's Citizenship and Immigration Services (USCIS) is responsible for screening potential immigrants to the United States. Loopholes in the process allow fraudulent applicants, criminals and terrorists to enter and remain here undetected. Innovative DNA screening technology would help to protect against fraud, detect criminals and terrorists, facilitate inter-agency information sharing, improve customer service, and save resources. However, USCIS currently has no authority to require DNA testing. Seeking ways to utilize this technology, I conducted research employing various qualitative data collection methodologies, such as interviews, observations, and participation in a nationwide DHS-sponsored survey. The goal was to develop a policy recommendation regarding whether and how to move forward toward expanded DNA testing in the immigration process. I found that maintaining the status quo would leave us vulnerable. USCIS should highlight the benefits of DNA testing to its stakeholders and dispel any myths and fears. It should work with its national and international partners to establish standards and achieve interoperability. To protect privacy, USCIS must take great care to safeguard all personal information stored in the DNA database. A pilot testing program may offer the opportunity to implement DNA testing in phases, and to test, evaluate, and adjust the process where necessary.				
14. SUBJECT TERMS immigration, homeland security, transparency, fraud, smuggling, trafficking, crime, terrorism, DNA, technology, standards, interoperability, collaboration			15. NUMBER OF PAGES 133	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UU	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

DIFFUSION OF DNA TESTING IN THE IMMIGRATION PROCESS

Evelyn R. Sahli
Portland, Oregon Field Office Director
Department of Homeland Security, U.S. Citizenship and Immigration Services
B.S., Portland State University, 1991

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL
December 2009**

Author: Evelyn Sahli

Approved by: Richard Bergin
Thesis Co-Advisor

John Rollins
Thesis Co-Advisor

Harold A. Trinkunas, PhD
Chairman, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

DHS's Citizenship and Immigration Services (USCIS) is responsible for screening potential immigrants to the United States. Loopholes in the process allow fraudulent applicants, criminals and terrorists to enter and remain here undetected. Innovative DNA screening technology would help to protect against fraud, detect criminals and terrorists, facilitate inter-agency information sharing, improve customer service, and save resources. However, USCIS currently has no authority to require DNA testing. Seeking ways to utilize this technology, I conducted research employing various qualitative data collection methodologies, such as interviews, observations, and participation in a nationwide DHS-sponsored survey. The goal was to develop a policy recommendation regarding whether and how to move forward toward expanded DNA testing in the immigration process. I found that maintaining the status quo would leave us vulnerable. USCIS should highlight the benefits of DNA testing to its stakeholders and dispel any myths and fears. It should work with its national and international partners to establish standards and achieve interoperability. To protect privacy, USCIS must take great care to safeguard all personal information stored in the DNA database. A pilot testing program may offer the opportunity to implement DNA testing in phases, and to test, evaluate, and adjust the process where necessary.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	PROBLEM STATEMENT.....	1
B.	RESEARCH QUESTIONS	6
C.	ARGUMENT.....	6
D.	SIGNIFICANCE OF RESEARCH.....	10
II.	LITERATURE REVIEW.....	13
A.	ESTABLISHING IDENTITY	13
B.	IMMIGRATION FRAUD AND HUMAN TRAFFICKING	14
C.	CRIME AND TERRORISM.....	17
D.	FINANCIAL INCENTIVES.....	18
E.	PUBLIC BENEFIT VS. PRIVACY AND OTHER LEGAL ISSUES.....	19
F.	TECHNOLOGY, COLLABORATION AND INTEROPERABILITY	22
G.	COMPREHENSIVE IMMIGRATION REFORM	24
H.	SUMMARY OF THE LITERATURE	27
III.	RESEARCH METHOD.....	29
A.	INTERVIEWS	29
B.	HAITI.....	31
C.	NATIONAL DIALOGUE ON THE QHSR	31
D.	THEORETICAL LENS	32
IV.	ANALYSIS AND FINDINGS	35
A.	INTERVIEWS	35
1.	Matal	35
2.	Gravell	41
3.	Gray	59
4.	Overall Interview Findings	77
B.	HAITI.....	77
C.	NATIONAL DIALOGUE ON THE QHSR	83
D.	EVALUATION OF ACLU COMMENTS ON THE DOJ DNA RULE ...	88
V.	CONCLUSIONS / RECOMMENDATIONS.....	97
A.	THE BENEFITS ARE CLEAR.....	97
B.	OUTREACH AND EDUCATION—MESSAGING IS THE KEY	98
C.	WORKING WITH OUR PARTNERS TO ACHIEVE INTEROPERABILITY: STANDARDS FIRST.....	100
D.	PRIVACY: COUPLE ID MANAGEMENT WITH CYBER SECURITY	101
E.	PILOT.....	102
F.	SUMMARY	103
	LIST OF REFERENCES.....	107
	INITIAL DISTRIBUTION LIST	115

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

Figure 1.	Results of first DNA pilot test (from personal communication, 2008)....	4
Figure 2.	Proposed Process	11

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	Country of Birth of Legal Permanent Resident Population: 2008	91
----------	---	----

THIS PAGE INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

The United States has always welcomed immigrants from around the globe who are looking for a better life. Over the years, our immigration system has changed in accordance with the needs of our economy, politics and family values. Although immigrants have enriched our society and enabled our economy to grow, they can also pose a potential risk. Since 9/11, the United States has faced the need to look more carefully at loopholes in immigration laws that leave us vulnerable to fraud, human trafficking, crime, and terrorism.

DNA analysis is a cutting-edge technology that has proven value in establishing biological relationships and detecting and deterring crime. It is a perfect tool for combating immigration fraud and preventing trafficking in humans, especially children. Because DNA technology is relatively new, laws, regulations and policies surrounding DNA testing have not caught up to reflect today's needs. Current laws and regulations do not provide authority for the U.S. government to require DNA testing in the immigration process. Instead, the government can only suggest or recommend DNA testing as a last resort. This wastes valuable resources. Past barriers to streamlined DNA testing have included high costs, scarce availability of services, concerns about chain of custody, lack of authority, and privacy issues.

This thesis explores the feasibility of expanding DNA testing to establish identity, protect against fraud and human trafficking, and enhance security screening for crime and terrorism. The research included a review of the literature, interviews with various subject matter experts, observation of DNA testing in Haiti, and participation in the National Dialogue on the Quadrennial Homeland Security Review.

Research shows that DNA has unique attributes in the immigration context and that costs could be drastically reduced through volume and streamlining of DNA testing. New technology shows promise for portable testing equipment that

could bring more integrity to the chain of custody, provide consistent results, improve customer service, and make DNA analysis easy, fast, and inexpensive.

To diffuse DNA technology in the immigration process, the government must do several things. First, DHS, with the help of expert public relation professionals, should launch a social conditioning campaign. Through outreach, education, and skillful presentation, they can dispel the myths and promote the benefits of DNA technology. Outreach efforts should assure the public that USCIS would use the DNA samples only for the purposes specified, and that they will protect the DNA data. The policy and regulatory development process should be transparent. Another important thing that the government should do is invest in standards to achieve interoperability. This will allow for seamless information sharing with local, state, tribal, federal, and international partners. Third, the government should consider a pilot DNA testing program. This would allow USCIS to implement DNA testing in phases and test, evaluate, and adjust the process where necessary.

ACKNOWLEDGMENTS

I would like to express my sincere appreciation to the Center for Homeland Defense and Security for the opportunity to participate in this wonderful program with an extraordinary group of people. A special thank you to my thesis advisors, Richard Bergin and John Rollins, who encouraged me, showed extreme patience, and provided valuable feedback. All of the faculty and staff at CHDS have been amazing in their contributions and support.

Thank you to the leadership at U.S. Citizenship and Immigration Services for allowing me to participate in this program and for supporting me in my periodic absences.

Joe Matal, Bill Gravell and Marla Gray have my gratitude for agreeing to let me interview them. They were so generous with their time and their knowledge, and provided valuable insight. I would also like to thank Tom Callaghan, who educated me early in my research about DNA testing and the intricacies of the FBI's NDIS and CODIS systems.

I would like to thank Ambassador Janet Sanderson, her staff at the American Embassy in Port au Prince, and all of the people that helped shed light on the DNA collection process in Haiti.

Thank you to my fellow cohort members who have become like a family to me. I will really miss all of you and hope that we will remain lifelong friends. Each of you brought a unique perspective to the homeland security framework and we all learned a great deal from each other.

Most importantly, I never would have completed this program without the amazing support of my husband, Sharif. During the past 18 months, he nursed me through two surgeries, encouraged me, and made sure that I had no outside obligations to keep me from my studies. He turned off the TV and read so that I was not distracted. He sometimes helped with my reading assignments, summarizing them and acting as a sounding board. He never complained that

we had to give up our social life and turn down invitations because I had to study. When I began this program, I had just started a new job and near the end of the program I started yet another. We moved twice during the 18 months, the last time from Virginia to Oregon. Sharif supported me through all of this and I love him and appreciate him immensely.

For my sons, Riad and Joel, my daughter-in-law Ami, and my grandsons Alex and Dylan, I hope that my accomplishment will serve to remind you of the value of lifelong learning and encourage you to pursue your dreams.

I would also like to thank my mother and father for making me the person that I am today, and my grandfather, Fred Alt, who said, "If you love your work, life is a vacation."

Finally, I would like to dedicate this thesis to the memory of Kate Johnson, a vibrant and lovely young woman who was murdered in her University of Portland Dormitory in 2001. Her story spurred me to pursue this thesis topic.

I. INTRODUCTION

A. PROBLEM STATEMENT

The United States has always welcomed immigrants from around the world who are looking for a better life. Over the years, our immigration system has changed in accordance with the needs of our economy, politics, and family values. Immigrants have enriched our society and enabled our economy to grow, and the majority of applicants are legitimate seekers of immigration benefits. However, as technology has advanced, globalization has made us more vulnerable; the events of 9/11 painfully demonstrate the reality that some people wish us harm. Those who want to harm the United States look for loopholes that would provide relative freedom of movement to and within the United States. The United States must balance laws and policies intended to improve the processing of immigration benefits to ensure that those laws and policies also provide adequate screening to protect the American public and the security of our nation. The U.S. Department of Homeland Security (DHS) Citizenship and Immigration Services (USCIS) is responsible for adjudicating applications and petitions for immigration benefits and consequently represents an important line of defense in this context.

The vast majority of immigrants to the United States qualify based on a family relationship. Some are the direct beneficiaries of a petition filed by a U.S. citizen or permanent resident for a spouse, child, parent or sibling. Others immigrate through employment or humanitarian relief. If one includes all those who receive derivative benefits as a qualifying spouse or child of any of the above categories of immigrants, most avenues to immigration are actually family-based. U.S. citizenship is a highly valued asset, for both economic and political reasons, and fraud has long been rampant among applicants for U.S. visas and other immigration benefits. Improvements in modern technology have provided the ability for many unscrupulous vendors and applicants to create fraudulent

documents that they then use to obtain immigration benefits. Two-thirds of 94 known foreign-born terrorists operating in the United States between 1993 and 2004 entered and sought to remain in America through fraudulent means (Cato, 2008). The U.S. Department of State (DOS) issues periodic fraud bulletins that highlight family relationship fraud and the easy availability and frequent use of false documents. The Forensic Document Laboratory (FDL), operated by DHS's Immigration and Customs Enforcement (ICE) component, is overworked and cannot verify all suspect documents. Foreign governments often do not cooperate in verifying authenticity; sometimes the very officials who have issued the documents received a bribe to do so. Many foreign countries do not maintain adequate records. This places a burden on applicants and petitioners who feel obligated to obtain documents where none may exist.

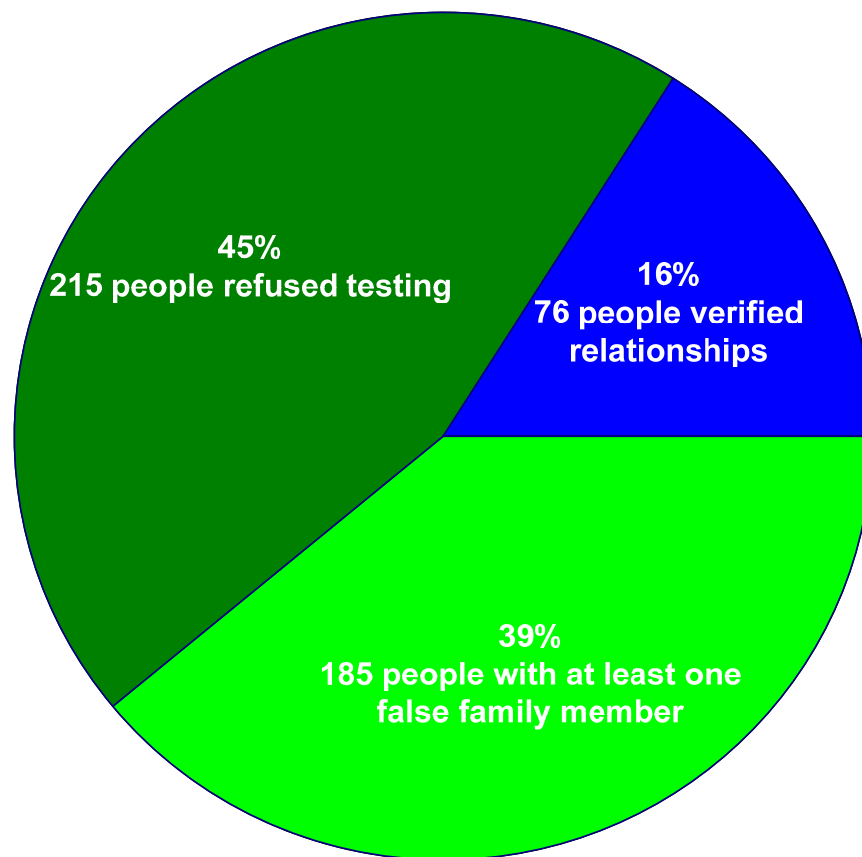
USCIS was created in 2003 as a component of the Department of Homeland Security. It derived from the adjudications segment of the former Immigration and Naturalization Service (INS), a branch of the Department of Justice (DOJ). In the past, both USCIS and the INS lagged behind in the use of innovative technology to manage the immigration process. At the same time, throughout the world, people utilize high-technology computers and printers to fabricate documents. They access the Internet, social networking sites and electronic banking to plot against us. USCIS, meanwhile, has failed to take full advantage of available technology to enhance the integrity and security of our immigration system and streamline benefits to legitimate applicants.

Leaving open loopholes that allow potential terrorists, or simply fraudulent applicants, to immigrate to the United States not only threatens our security, but also creates an economic burden. When an applicant obtains admission by fraud, he is depriving a legitimate applicant from his place in the immigration line. Detecting fraud, especially without the use of innovative technology, can be a costly and time-consuming process, often requiring multiple requests for secondary evidence and lengthy interviews, at times in faraway places.

For example, a refugee-processing circuit ride to one West African country last year resulted in only a ten percent approval rate, primarily because of relationship fraud that USCIS discovered only after extensive screening and interviewing. Most of the refugees in this particular West African caseload fell within the Priority Three (P-3) family reunification category. This category requires that a relative who is in the United States as a refugee or asylee file an Affidavit of Relationship (AOR) on behalf of the potential refugee applicant overseas. Approval of an AOR provides access to a refugee interview for the beneficiary of the AOR. The beneficiary can then usually include his entire family or household for presentation to the refugee screening process.

The State Department's Bureau of Population, Refugees, and Migration and the USCIS Refugee Affairs Division manage the U.S. Refugee Admissions Program. They base their goals on the number of refugees actually admitted to the United States each year, rather than upon the number of refugees interviewed. As a result, their success is contingent on being able to approve applicants. Denials take resources without providing any return. All refugee applicants submit to at least two interviews. One is with a DOS contractor who gathers extensive information and prepares the file; the other interview is with a USCIS Refugee Officer. Refugee officers travel all over the world to conduct thorough interviews. These interviews often take place in very remote and sometimes dangerous locations. The U.S. government cannot manage the refugee admissions program efficiently without the capability to verify family relationships early on in the process. With such capability, they could screen the fraudulent applicants off at the beginning of the process, without wasting further resources to interview and process them. The legitimate applicants would benefit because they would no longer have to wait in line behind all of the fraudulent applicants. They also would avoid the pressures, either for monetary gain or under threat of harm, to include bogus persons on their cases and thus jeopardize their safety or their eligibility. Instead, they could reunite with their families in the United States much more quickly.

In 2008, in response to reports of relationship fraud among refugees in the P-3 refugee access program, the DOS and USCIS initiated a pilot DNA testing program among refugees in East Africa (U.S. Department of State [DOS], 2008). After the initial results showed high rates of fraud, the testing expanded to other locations in East and West Africa. On average, well over 80 percent of the families failed to verify the claimed relationships. Either they refused testing or tests proved fraud in the family composition. Although no one knows for sure why over forty percent refused testing, most people with knowledge of the process believe it was because they were afraid that we would detect the fraud. Of those with proven fraud who submitted to the testing, the word on the street was that they thought they could beat the DNA tests by sharing the same lemon.



Assuming those who refused testing did so because they were afraid that fraud would be detected, the fraud rate could reach 84%

Figure 1. Results of first DNA pilot test (from personal communication, 2008)

Until last year, when USCIS brought large numbers of Iraqi refugees to the United States, Somalia represented the largest source country for refugee admissions (Kliska, 2008, p. 57). Screening from East Africa is important for our national security, as evidenced by the 1998 bombings of U.S. embassies in Kenya and Tanzania and the fact that Somalia has long been a haven for Al-Qaeda. The revelation that a Somali-born naturalized U.S. citizen blew himself up in a suicide bombing last year in Somalia has raised concerns by the FBI that young men of Somali origin are departing the United States to fight and train overseas (Spillus, 2009). These young men could conceivably return, using American passports, to commit terrorist acts on U.S. soil.

DNA has proven value in the ability to verify claimed family relationships and thus prevent human smuggling and trafficking. It also is the gold standard in solving and preventing crime and is increasingly being used to fight terrorism. Utilizing DNA testing in all of these areas would benefit the security of the United States, but USCIS currently lacks the authority to conduct routine DNA testing.

U.S. immigration laws and regulations as outlined in the Immigration and Nationality Act (INA) and Title Eight Code of Federal Regulations (8 CFR) describe evidence required to prove family relationships for immigrant visa petitions. When a person submits a document in a foreign language, he or she must include a certified English translation. Many applicants and petitioners do not possess the required documents, but try to procure them by any means. USCIS and its customers spend time and money in an effort to document claimed relationships. Relationship fraud screening interviews are time-consuming, and the combined process makes it difficult to complete adjudications within the target timeframe.

Current rules outlined in 8 CFR do not allow USCIS to require DNA testing; instead, USCIS may only request blood testing, which is outdated and unreliable. DNA testing may be “suggested” and accepted when evidence is insufficient. The process is not simple and, in reality, officers often approve petitions based on documents for which they are unable to verify the authenticity.

B. RESEARCH QUESTIONS

What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists? What are the financial incentives and the benefits of up-front DNA testing to USCIS stakeholders? What are the legal and privacy issues that USCIS must consider and what policy, regulatory or legislative changes are needed to effect such change? How can interagency collaboration play a role in this effort and benefit from it? What role might DNA testing play in any future comprehensive immigration reform?

C. ARGUMENT

Since Sir Alec Jeffries first realized the ability to create DNA profiles in 1984, DNA testing has become the gold standard not only to prove relationships but also for forensic identification. DNA testing is a valuable tool that could help DHS establish an alien's identity early in the process, prove qualifying family relationships, and screen aliens for crimes and terrorism. In the past, DNA testing has not been a feasible option because of regulatory language, high costs and logistical problems regarding the chain of custody of DNA.

DNA testing could enable USCIS to capture a person's unique identity from the time of his or her first contact with USCIS. This would protect that person from future identity theft and would help prevent impostors from successfully applying for benefits under multiple identities. It would help to ensure that beneficiaries of family-based petitions, and derivatives for all immigration benefits, have qualifying relationships for the status they are seeking. It will also make the process easier for legitimate family members. Since DNA has proven value in solving and preventing crime, USCIS should also explore the options of utilizing DNA testing to enhance the security checks currently in place in the immigration process. Before an applicant or petitioner may be required to submit to DNA testing, USCIS must change the regulations at

8 CFR to allow officers to request DNA. A possible first step toward such a change would be to publish a notice of proposed rulemaking in the Federal Register and solicit comments from the public before drafting the final rule. Congress may also amend laws to allow for DNA testing and may decide to do so in conjunction with a future immigration bill.

USCIS should look for ways to streamline the DNA process in order to reduce costs. This may involve using the USCIS Application Support Centers (ASCs) to collect DNA at the same time that they capture fingerprints and photographs from applicants. This process would enable USCIS to manage the chain of custody of the DNA samples. USCIS would need to arrange for overseas capture of DNA, possibly through agreements with the Department of State, or through expansion of ASC responsibilities overseas. USCIS should consult with the Department of Justice and the Department of Defense (DoD) on information-sharing agreements and the feasibility of using DNA to enhance security checks. For any expansion, USCIS must develop protocols and standards for storing, managing, and sharing DNA profiles and create a database to handle them.

Applicants for immigration benefits already pay a biometric fee and appear in person to provide photographs, signatures and fingerprints. Fingerprints are processed through FBI databases to detect past criminal behavior (U.S. Citizenship and Immigration Services [USCIS] “Fact Sheet,” 2006). Since DNA is often found at crime scenes when fingerprint evidence is not, DNA testing would be a valuable tool for screening potential immigrants. Following are just three examples of criminal cases that demonstrate the value such testing could bring to immigrant security checks.

Angel Resendez — Also known as the “railroad killer,” this Mexican national was believed to have killed at least 15 people in multiple states (Preston, 2007). He had numerous encounters with the law and with immigration officials, had raped many of his victims, and his DNA was found at multiple crime scenes.

If his DNA had been collected early on, many of the murders may have been prevented. Instead, he was released repeatedly.

Deniz Aydiner — This Turkish citizen brutally raped, tortured and murdered a young woman in her college dormitory (Bernstein, 2004). With no clear suspects, police took samples from approximately 500 males in the community and were finally able to identify Aydiner. He had married an American and was seeking permanent residency in the United States. Since no fingerprints were left at the scene, the routine USCIS fingerprint checks would not have identified him as the perpetrator.

Jose Juan Garcia-Perlera — This citizen of El Salvador was charged with multiple home invasion robberies of elderly citizens in the Washington, D.C., area (Morse, 2008). Investigators found his DNA at three of the crime scenes. His crimes escalated, and he murdered one of his last victims. Had his DNA been on file, the police may have caught him before he committed the murder.

Currently there are nearly seven million DNA profiles in the FBI's National DNA Index System (NDIS), and crime resolution is enhanced exponentially as the number of DNA profiles increases. The DoD has at least 80,000 DNA profiles (Eisler, 2008), many of them collected from improvised explosive devices (IEDs) and terrorism suspects, and INTERPOL's database contains another 85,000 DNA profiles from criminals and terrorists (The Hindu News, 2009 and Kellner, 2008). Utilizing DNA to enhance our security screening process could prevent criminals or terrorists from receiving immigration benefits and thereby protect the American public.

Presently, petitioners wishing to use DNA to prove a relationship must locate an American Association of Blood Banks (AABB)-certified lab to arrange for DNA testing, which currently costs approximately \$650. By the time they have reached this point in the process, they and USCIS have wasted precious resources trying to confirm the relationship. As the use of DNA testing increases, prices will drop considerably.

With so many different labs involved in the current process, and no certification required overseas, the present DNA collection process lacks integrity and is vulnerable to fraud. If USCIS and DOS share responsibility for collection of DNA, the chain of custody issues would be resolved and the integrity of the process enhanced.

Last year, USCIS signed a five-year, \$500 million transformation contract to speed benefits determination, combat identity fraud, and reduce processing times by moving from paper-based to electronic processing (IBM, 2008). Implementing DNA testing could enhance transformation. On-line filing would prompt biometric appointment notices and DNA collected from those appointments would enable adjudication of many petitions without the need for birth certificates, marriage certificates or secondary evidence, all of which can be forged or unreliable. Although certain applications and petitions would still require documents, DNA testing to prove biological relationships would eliminate the need for documents in many cases.

The benefits of diffusing DNA testing in the immigration process are many. Streamlining the process would enable USCIS to:

- Establish identity without a doubt
- Prove qualifying biological relationships
- Relieve many petitioners of the need to submit documents
- Allow for increased electronic filing
- Speed processing times
- Enhance security checks by screening for criminals and terrorists
- Deter fraudulent petitions
- Protect against human trafficking
- Free up resources for legitimate applicants
- Decrease costs considerably, both for USCIS and its stakeholders

- Facilitate intergovernmental cooperation
- Enable law enforcement to solve more crimes and
- Enhance national security.

D. SIGNIFICANCE OF RESEARCH

One goal of this research is to determine the feasibility of sharing information with the FBI and local, state, tribal, international, and other federal partners. USCIS might accomplish such sharing through the FBI's NDIS and Combined DNA Index System (CODIS). The research will include exploration of the possibilities for sharing information with the Department of Defense and INTERPOL to enable USCIS to improve screening for terrorists and for crimes that have been committed outside the United States. Such information sharing will help USCIS determine if an alien is eligible for the benefit he or she is seeking. It will also help U.S. and international partners to solve crimes and protect the public.

Many people have written about the Constitutionality of maintaining DNA databases on criminals but not on the issue of maintaining DNA databases on immigrants. This research will consolidate views from those who are involved in creating and maintaining DNA databases, as well as from legal experts, and others whose cooperation would be necessary to the successful implementation of DNA testing in the immigration process. This will likely promote further discussion and actions on the subject, possibly in the context of future comprehensive immigration reform. DNA technology has the potential to enable seamless information sharing between DHS and federal, state, local, tribal and international partners. The outcome of this research should provide information that will guide decision makers in Congress and in the Departments of Homeland Security, State, Justice and Defense.

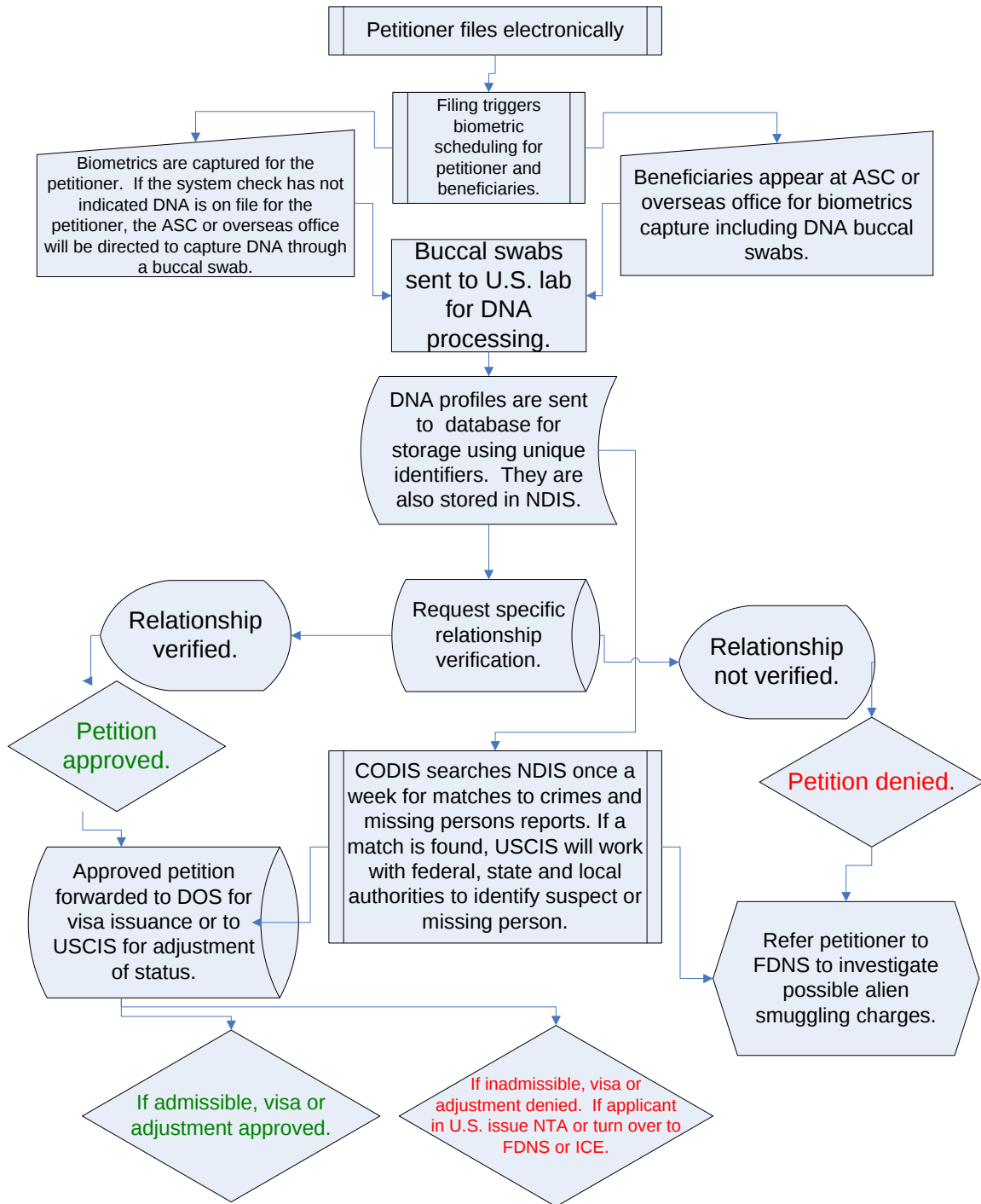


Figure 2. Proposed Process

THIS PAGE INTENTIONALLY LEFT BLANK

II. LITERATURE REVIEW

Sir Alec Jeffreys first developed the ability to create DNA profiles, or genetic fingerprints, in 1984 (Whiteman, 2004). Since then, the technology has improved rapidly, but DNA is still a relatively new and emerging technology. DNA testing is sometimes a controversial topic in the public eye, with privacy concerns competing with DNA's proven benefits in establishing biological relationships and solving and preventing crime. Literature tying DNA testing to immigration is scarce. However, some reports exist on immigration fraud and terrorism and on terrorists' use of fraud to enter and remain in the United States. Little has been written to highlight the benefits of DNA testing in the immigrations process. Literature from a variety of sources is broken down into seven categories below: Establishing identity; Immigration fraud and human smuggling and trafficking; Crime and terrorism; Financial incentives; Public benefit versus privacy and other legal issues; Technology, collaboration and interoperability; and Comprehensive immigration reform.

A. ESTABLISHING IDENTITY

The National Defense Industrial Association (NDIA) explains the use of DNA as a biometric identifier on its Web site (n.d.). It points out that the National Institute of Standards and Technology (NIST) and thousands of civil and criminal courts have established DNA as a means to link people to their actions. The NDIA considers DNA as much an identifier as fingerprints, retinal scans, face recognition and other biometrics. The Web site noted that government standardization, such as the practice of using 13 core loci established by the FBI, has ensured consistency and allowed government agencies to use automated systems such as CODIS to match DNA.

The U.S. Department of Energy's Human Genome Project Information site (n.d.) describes short tandem repeat (STR) technology that evaluates nuclear DNA. The FBI requires that DNA profiles run through the Combined DNA Index

System (CODIS) must be processed using a standard set of 13 specific STR regions (or core loci). The CODIS software program matches local, state and federal DNA profiles from unsolved crime scenes and missing persons to profiles identified as belonging to a particular person. The Web site noted that the odds that two individuals will have the same 13-loci DNA profile are about one in a billion.

It is clear that DNA testing is a valuable tool in identifying individuals and thus promoting legitimate travel while denying criminals and terrorists the anonymity that they seek. USCIS must look for ways to demonstrate DNA's value to stakeholders.

B. IMMIGRATION FRAUD AND HUMAN TRAFFICKING

In a 2008 Congressional Research Service (CRS) report, Ruth Wasem noted that immigration fraud is widespread, and pointed out the problems USCIS faces in combating fraud. Wasem criticized USCIS's security checks, including their overreliance on names and documents provided by the applicants themselves. She noted that international terrorists, organized crime syndicates and alien smuggling rings rely on fraudulent documents to minimize detection (Wasem, 2008).

The DOS also frequently highlights fraud vulnerabilities, but many of these reports are not available to the public. However, one DOS report available on the Internet that is indicative of fraud throughout the world, (U.S. DOS, Embassy of the United States Hanoi Vietnam, 2008) noted the following:

Fraudulent documents are routinely submitted by Vietnamese applicants in both non-immigrant and immigrant visa applications. These include both documents that have been fabricated outright and official documents issued improperly or based on incorrect information. Birth certificates, household registry documents, and marriage certificates can easily be purchased from corrupt local government officials or brokers.

The Center for Immigration Studies (CIS) publishes periodic reports on immigration issues. One, titled “America’s Identity Crisis: Document Fraud is Pervasive and Pernicious” (Dinerstein, 2002), pointed out that the “production and distribution of false documents has become a large and sophisticated industry.” The author advocated paying more attention to risk management, advising the federal government to follow the lead of private industry and get away from paper-based work by using technology to “control risk and ensure quality.”

Human smuggling and human trafficking differ in the sense that, at least at first, the smuggled person is a willing actor. Trafficking involves trickery or coercion to facilitate the illegal movement of people, usually against their will, and often for purposes of prostitution or forced labor. Women and children are the most common victims of trafficking. Both human smuggling and human trafficking threaten the integrity of the U.S. immigration system.

In his May 20, 2009, testimony before the U.S. Congress, John Torres, Deputy Assistant Secretary for DHS’s Immigration and Customs Enforcement (ICE), pointed out that human smuggling and trafficking are problems that ICE has tackled aggressively. He noted that organizations often charge thousands of dollars to smuggle aliens to the United States, including some aliens who pose a threat to our country. Torres said that ICE has worked to raise awareness of modern-day slavery and that they have collaborated closely with other agencies and partners to combat international smuggling, trafficking, terrorism and crime.

An Associated Press article on DNA’s value in preventing human trafficking in the international adoption arena described a mother whose baby was stolen from her at gunpoint. Fourteen months later, she spotted the child near an orphanage, just before an American couple was to adopt her. The mother insisted on DNA testing and authorities returned her daughter to her (Llorca, 2008).

The pursuit of DNA testing in the immigration context is not a new idea. USCIS currently has no authority to require DNA testing, even when fraud is highly suspected. An April 2006 memo from the CIS Ombudsman¹ to the USCIS Director recommended expansion of DNA testing to prove family relationships (Khatri, 2006). The Ombudsman noted that DNA provides conclusive scientific evidence of family relationships, and that birth records from many countries are extremely unreliable. He said that the lack of standardized DNA testing creates a burden on USCIS and its customers because of high costs for testing through private labs, and time and money spent on requests for evidence and interviews. He recommended that USCIS revise regulations to allow officers to require DNA testing, saying this would enhance national security, bring scientific certainty to USCIS adjudications, improve customer service, and increase USCIS efficiency.

A July 2006 response from USCIS Director Gonzalez indicated that USCIS was drafting updates to 8 CFR to allow USCIS to require DNA when they suspect fraud. He said that high costs and limited accessibility were reasons that DNA evidence had not been required in all cases, but that USCIS would be willing to reconsider the issue when and if DNA testing “becomes more available and affordable worldwide.”

The above-referenced literature validates the idea that fraudulent document use is widespread and creates vulnerability, and that human smuggling and trafficking pose risks to everyone. New fraud schemes are uncovered every day. As revelations of fraud surface, their exposure serves to bolster the argument for DNA testing to establish identity and prove relationships. USCIS must seek ways to highlight to its stakeholders the value of DNA in combating fraud and thus preventing human smuggling and trafficking.

¹ The Citizenship and Immigration Services Ombudsman (CIS Ombudsman) provides recommendations for resolving individual and employer problems with USCIS. As mandated by the Homeland Security Act of 2002 § 452, CIS Ombudsman is an independent office that reports directly to the Deputy Secretary of Homeland Security. The CIS Ombudsman: 1) Assists individuals and employers in resolving problems with USCIS; 2) Identifies areas in which individuals and employers have problems in dealing with USCIS; and 3) Proposes changes to mitigate identified problems.

C. CRIME AND TERRORISM

A USCIS Fact Sheet explaining the security check process (2006) describes how USCIS collects fingerprints from potential immigrants and runs them through nationwide databases to locate criminal records. An applicant convicted of certain crimes may be inadmissible to the United States, so fingerprinting is an important tool. It enables adjudicators to determine whether an applicant is eligible for the benefit that he or she is seeking. When a person is applying for U.S. citizenship, USCIS captures his or her fingerprints and runs them through FBI databases again. An applicant for citizenship must demonstrate good moral character (GMC) in order to qualify for naturalization, and the fingerprint and name checks help to assess the applicant's GMC. However, fingerprint and name checks are often not enough. Many people provide false names and take care not to leave their fingerprints at crime scenes. Often they cannot prevent leaving their DNA at the crime scene.

Much has been written about DNA's crime detection and deterrent capabilities. In a proposed rule published in the Federal Register on April 18, 2008, the U.S. Department of Justice (DOJ) mandated the expansion of DNA testing to include those merely arrested for crimes. It also required federal officers to capture DNA from non-U.S. citizens who are detained and fingerprinted (U.S. Department of Justice [USDOJ], April 2008). DOJ highlighted the value of DNA testing in bringing the guilty to justice and protecting the innocent who might otherwise be wrongly accused, noting that early collection of DNA is a valuable method of preventing and deterring crime. A June 2008 report by the National Institute of Justice (NIJ) on the effectiveness of performing DNA analysis at property crime scenes pointed out that DNA was at least twice as effective as fingerprints in identifying suspects. Highlighting DNA's international crime-fighting value, *The Washington Times* told the story of an international jewel theft ring thwarted when INTERPOL matched DNA samples taken in Dubai to those from crime scenes in Liechtenstein, leading them to the arrest of a group out of the Balkans (Kellner, 2008).

The NDIA Web site (n.d.) highlights the benefits of DNA in identifying terrorists. They pointed out, for example, that latent fingerprints and trace DNA are usually deposited on improvised explosive devices (IEDs) during construction, transport, and placement. The evidence can often survive detonation and allow for rapid identification of the individuals involved. Stating that the goal of the Department of Defense's Biometrics Task Force is to "deny our adversaries anonymity," the NDIA argued that DNA provides a strong tool in that fight.

This literature clearly shows that DNA technology would add value in the immigration context to enhance security checks. What is not clear is how USCIS might collaborate with other agencies and partners, such as the Department of Justice, the Department of Defense, and INTERPOL, to utilize the value of DNA technology in screening for crime and terrorism. How might we gain public support for changes to laws, regulations and policies that would allow for such expansion of DNA testing by USCIS?

D. FINANCIAL INCENTIVES

Although the cost to the government for DNA testing appears to be decreasing as its use expands, the cost to the public remains high. Currently, if an applicant or petitioner wishes to use DNA testing to prove a relationship, he or she must contract with an American Association of Blood Banks (AABB)-certified lab and arrange for the collection of specimens (Aytes, 2008). DNA testing arranged through private laboratories usually costs six or seven hundred dollars. For instance, Identigene laboratory charges \$649 for an immigration DNA paternity test (Identigene, n.d.). This is in stark contrast to what the government says it costs to process DNA. According to the DOJ's 2008 proposed DNA rule, the cost of a DNA buccal swab collection kit is approximately \$7.50. It costs \$28.50 to analyze the DNA sample and \$1.50 to store the sample, for a total of \$37.50. According to an Associated Press article, published April 18, 2009, wider adoption of DNA testing could increase efficiency and cut costs.

In 2008, the DHS Science and Technology Directorate (S&T) awarded three Small Business Innovation Research (SBIR) grants to develop a rapid DNA desktop prototype device to verify identity and kinship. The expected outcome will be a device able to process DNA in under an hour for less than \$50 that would aid in immigration cases and in mass casualty identifications. The device should “perform all of the necessary steps to extract, purify, amplify, separate, detect, and compare DNA without human intervention and to present a simple match or non-match result to the operator” (Goodwin, 2008). The results have been promising. It is clear that costs of DNA testing will continue to drop as the technology improves and the government takes more control over the process.

Experience shows that without the ability to verify relationships the government will continue to waste limited resources to obtain documents and conduct interviews to determine eligibility. Costs of DNA testing vary widely, but USCIS may be able to greatly reduce the current price that applicants and petitioners must pay for DNA testing. USCIS should further explore ways to streamline the process in order to reduce costs. A future cost-benefit analysis may be useful to determine at what point it becomes cheaper for USCIS to conduct DNA testing for everyone.

E. PUBLIC BENEFIT VS. PRIVACY AND OTHER LEGAL ISSUES

Although DNA has proven crime-fighting ability, privacy remains an area of concern. In *The Journal of Law, Medicine & Ethics*, Michael Smith (2006) argued that databases that are more inclusive resulted in more crime resolutions and saved time by quickly ruling out possible suspects. He said that the standard method of analyzing 13 core loci results in the ability to distinguish a person from all others except an identical twin, but does not reveal any features or traits. Expanding the DNA database to include our entire population, Smith opines, would advance not only our public safety, but also our privacy. He noted that Fourth Amendment challenges to DNA databases have not held up, and that maintenance of DNA databases is justified in the interests of the efficient

investigation of future crimes. To the argument that it is not fair to store DNA profiles of those never convicted of a crime, he pointed out that 57 percent of those arrested for rape in a given year have never been arrested on a felony charge and 42 percent have never been arrested at all. Although the author goes so far as to recommend DNA collection on everyone at birth, he argues that the government should then destroy, rather than store the samples, to prevent abuse or threats to privacy.

Robert Williamson and Rony Duncan expressed similar opinions in an article in the journal *Nature* (2002). They advocated taking DNA samples from everyone at birth, noting that DNA is a powerful technology in fighting crime and that as long as safeguards are in place there is no reason not to put all persons in the database. The safeguards they argued for are that no one should retain the DNA samples and that the police should not control the databases where the profiles are stored.

In the 2002 *BBC* article "Privacy fears over DNA database," the man who discovered genetic fingerprinting, Sir Alec Jeffreys, criticized the British Government's decision to store DNA profiles of persons arrested but not convicted of crimes. He considered it discriminatory and instead advocated for the analysis and storage of the profiles of the entire United Kingdom population. He stipulated that an independent body should manage the national DNA database. He was adamant in his opposition to allowing insurance companies access to genetic information. Two years later Jeffreys was quoted as saying that it would be "criminally irresponsible" for the British Government not to maintain the DNA profile databases, commenting that it would allow rapists and murderers to be able to continue unstopped (Whiteman, 2004). After Britain expanded its DNA collection practices to include all those arrested for a crime, whether convicted or not, the UK had the world's largest DNA database, containing five percent of the population (Slack, 2006). Some critics worried that the government might sell individuals' DNA profiles to insurance companies or mortgage brokers.

An FBI Privacy Impact Assessment (U.S. Federal Bureau of Investigation, 2004) noted that the NDIS Custodian cannot personally identify DNA records by name or other personal identifiers. Only federal, state and local crime labs performing DNA analysis can store and access the information. The labs must maintain the records in a secure government facility with limited access and protected by physical and technological safeguards to prevent unauthorized access. A U.S. Congressional bill signed into law on May 21, 2008 (H.R. 493, 2008) prohibits employment or health insurance discrimination based on genetic information. This means that insurance companies or employers are forbidden from misusing the genetic information of a person who submits to DNA testing.

In its April 2008 proposed rule, the DOJ pointed out that the FBI's method of creating the profiles, using 13 core loci, positively identifies the individual without disclosing his or her traits, disorders or dispositions. It noted that the design and legal rules of CODIS allow for law enforcement identification but prevent the unauthorized use of DNA profiles (USDOJ, April 2008).

An article discussing the recent government expansion of DNA testing (Sullivan, 2008) outlined the crime fighting benefits of the expanded DNA collection, as well as the privacy concerns. The author said that privacy laws prohibit using DNA to identify genetic traits or disorders. Following the article was a string of on-line conversations regarding the topic, both for and against the testing. One writer pointed out that years ago there was a big debate about HIV testing, and that it has not had the dire consequences some had predicted.

The above literature review indicates that many scholars advocate DNA collection for all in the interest of fairness and crime prevention. Most, however, do not believe in preserving the samples taken from individuals. In pursuing diffusion of DNA testing, USCIS must explore ways to persuade immigrants, their advocates and the public that it will not pose a threat to their privacy but instead might protect them from identity theft and other crimes. USCIS must therefore ensure that, in developing any DNA policies or regulations, privacy and protection of the database is a priority.

F. TECHNOLOGY, COLLABORATION AND INTEROPERABILITY

Governments and the public are utilizing DNA technology more and more frequently to fight crime and verify relationships. The DNA Initiative Web site (n.d.) describes two systems that manage DNA profiles in the United States. The Combined DNA Index System (CODIS), established and funded by the FBI, is the computer software program used to compare DNA profiles electronically. It compares data collected from unsolved crime scenes to samples taken from criminals, and it compares DNA samples from unidentified victims to DNA data provided as a reference by relatives of missing persons. The National DNA Index System (NDIS) is the database that stores the information that feeds into the CODIS system. The FBI provides CODIS software to all public forensic laboratories at no cost. If USCIS utilizes CODIS and NDIS to download and run DNA profiles, then this would enable an almost seamless information-sharing process using already established and trusted systems. Such sharing would help federal, state, and local law enforcement officials solve more crimes, thus protecting the American public. Utilizing NDIS and CODIS would help USCIS screen potential immigrants for crime and terrorism and verify identity and biological relationships to prevent fraud, human smuggling, and trafficking.

At the 2009 Biometric Consortium Conference, Dr. Peter Vallone of the National Institute of Standards and Technology (NIST) spoke on the NIST rapid DNA testing project. In his overview, Vallone noted that each person has unique DNA (except identical twins), that half a person's DNA comes from the mother and half from the father and that DNA remains the same throughout a person's life. He stressed that forensic scientists are not looking at genes or information such as race, predisposition to disease, eye color, hair color, etc., when typing DNA; they are only using it to uniquely identify a person. Vallone described one experimental rapid DNA project that used a 15 STR loci kit. He said the random match probability (the chance of someone else having this exact same profile) was about one in 800 trillion. He called the new technology a "lab on a chip." He said the NIST goal for rapid DNA testing technology is to shorten the processing

time to under an hour, make it portable and rugged, and require little expertise or experience. “Swab in...answer out,” he noted.

The Department of Homeland Security’s US-VISIT Program uses biometrics to facilitate legitimate travel; prevent admission of criminals, terrorists and immigration violators; and protect the privacy of visitors. US-VISIT collects, stores, and shares digital fingerprints and photographs of aliens seeking entry into the United States. This program is a successful model for biometric information sharing, and is mutually beneficial to various DHS components, as well as to state and local partners and the U.S. departments of State, Defense and Justice, to name a few (U.S. Department of Homeland Security [USDHS], n.d. and Napolitano, 2009, May 6). Although US-VISIT does not currently store DNA, they are working with other agencies on various options for a multimodality approach for biometric capture.

INTERPOL’s DNA database, the “DNA Gateway,” was created in 2002 with only one DNA profile. By the end of 2008, it contained more than 82,000 profiles from 48 member countries. On its Web site, INTERPOL pointed out that it is only the conduit for the sharing and comparison of information and does not keep any nominal data linking a profile to an individual. Instead, member countries retain ownership of the profile. INTERPOL advocates international technical standards to support successful cross-border collaboration, and said the Gateway is compatible with the FBI’s CODIS software (INTERPOL, n.d.).

Much has been written about diffusion of innovative technology, and the factors that play a role in adoption of such technology. We might apply these theories to DNA technology. In *Diffusion of Innovation*, Everett Rogers (2003) stressed the importance of “perceived attributes” in innovations, and identified those perceived attributes. *Relative Advantage* is the degree to which an innovation is perceived as being better than its precursor. *Compatibility* is the degree to which it is perceived as being consistent with the existing values, needs, and experiences of potential adopters. *Complexity* is the degree to which an innovation is perceived as being difficult to use. *Observability* is the degree to

which the results of an innovation are observable to others. Finally, *Trialability* is the degree to which an innovation may be experimented with before adoption. USCIS should keep all of these factors in mind when exploring the feasibility of moving forward with diffusion of DNA testing in the immigration process.

DNA technology is available and improving rapidly. Multiple agencies including DHS, DoD, and NIST are working on rapid DNA technology. What remains to be determined is how USCIS can work together with other agencies and tap in to established systems that are already proven and operational and already have strict privacy rules in force. We need more information on how USCIS might seek agreements on mutually beneficial arrangements to share DNA data with state, local, federal and international partners. Finally, USCIS must explore factors that might promote adoption of this innovative DNA technology.

G. COMPREHENSIVE IMMIGRATION REFORM

The United States Congress unsuccessfully attempted passage of a comprehensive immigration reform (CIR) bill two years ago. Though President Bush, Democratic leaders and centrist Republicans supported it, the attempt to overhaul immigration failed in 2007 primarily because of disagreement over the issue of amnesty. During last year's Presidential campaign, and since his election, President Obama has promised to pursue the immigration reform effort. However, health care and the economy have monopolized the agenda thus far and many believe that if Congress does not pass immigration reform before the summer of 2010, they will postpone it at least until after the November 2010 elections.

While many advocates favor some provision for a path to citizenship for the estimated twelve million people already in the United States, many others strongly oppose any sort of amnesty. There is, however, still some hope for compromise. Senator Lindsay Graham (R-SC) said he believes that we will see some give-and-take as soon as the American people are sure that the border is

secure. Senator David Vitter (R-LA) commented that Congress remains divided on this issue, but added, “I think there’s still very much the same support among the American people for getting serious first with enforcement” (Alarkon, 2009).

Senator Charles Schumer (D-NY) is a member of the Senate Judiciary Committee and is the Chairman of the subcommittee on Immigration, Refugees and Border Security. As such, he has played a major role in trying to jumpstart the immigration reform issue. A recent article on proposed Comprehensive Immigration Reform (CIR), noted that Schumer planned to introduce legislation that included a technology-driven project that would incorporate biometrics to verify identity (Strohm, 2009). Although Senator Schumer did not specifically mention DNA in advocating for expanded use of biometrics, in 2008 he announced over \$500,000 in grants for Long Island, New York to improve DNA efficiency and clear backlogs. In his press release, Schumer said, “DNA technology is the cutting-edge of criminal science.” He noted that it helped ensure swift and accurate justice and that it helps to identify the guilty and exonerate the innocent. Although it is unclear how exactly he views DNA’s role in any future immigration reform, it is apparent that Senator Schumer supports the use of biometrics in immigration and supports the use of DNA in general.

Senator Dianne Feinstein (D-CA) is another member of the Senate Judiciary Committee and of the Immigration, Refugees and Border Security Subcommittee, which Schumer chairs. Senator Feinstein has worked well in the past with Republican Senator Jon Kyl of Arizona. Joining Schumer and Feinstein on the Senate Judiciary Committee and the Immigration, Refugees and Border Security Subcommittee, Kyl also is the Ranking Member of the subcommittee for Terrorism and Homeland Security. Feinstein and Kyl have coordinated in the past on issues of both immigration and DNA testing. A 2004 press release describes a bill Senator Feinstein worked on with Senator Kyl that provided rights to victims. The bill also provided access to DNA testing for death row and other prison inmates who claim innocence, and funds to help to eliminate the backlog in rape kits and other crime scene analysis (Feinstein, 2004).

Department of Homeland Security Secretary Janet Napolitano has also historically supported technology and DNA testing. A December 2008 *USA Today* article noted that Napolitano is a big advocate of using advanced technology to support law enforcement. As Governor of Arizona, she signed a bill making Arizona one of twelve states to collect and store DNA from people accused but not convicted of certain crimes (Frank, 2008). The article indicated that Napolitano views DNA for suspects as “the modern equivalent of fingerprints.” Although Arizona’s ACLU criticized Napolitano, one state representative assured that Napolitano “looks for a balance between protecting civil liberties and ensuring safety.”

On February 25, 2009, Secretary Napolitano testified before the House Committee on Homeland Security. She stressed the importance of improving intelligence sharing with state and local partners, saying that such sharing requires a seamless network. She highlighted the necessity to protect the rights of Americans and to strengthen the system against identity fraud. Napolitano said, “Better technology can expand our capabilities and free our agents to spend their time where it is most valuable,” noting that cutting edge technology will improve all DHS capabilities, including immigration programs. Napolitano stressed that, when implementing new technology, DHS would be diligent in honoring the rights of Americans and addressing concerns raised about privacy. She said that DHS would include privacy in “everything we do.” (Napolitano, 2009)

On June 8, 2009, DHS Secretary Napolitano issued a message in the Leadership Journal to outline the Department’s five major responsibilities. Specifically, they are to: 1) protect the American people from terrorist threats; 2) secure our borders; 3) facilitate legal immigration while cracking down on those who violate our laws; 4) improve readiness for, response to, and recovery from disasters, and 5) unify and mature the Department. This last one involves DHS

components working together to more effectively carry out their mission. Secretary Napolitano discussed expanding DHS's capabilities through the deployment of science and technology.

In July 2009, a bipartisan task force co-chaired by former Florida governor Jeb Bush (R) and former Clinton White House chief of staff Thomas V. McLarty III, issued their recommendations on immigration reform. They supported a 2006 recommendation by the Migration Policy Institute to establish future immigration levels based on economic conditions, strong border enforcement and mandatory work document verification using fingerprints or eye scans. They also recommended the opportunity for "earned legalization, not amnesty" for the millions who are living in the United States illegally. Requirements for such earned legalization would include paying taxes, learning English, passing background checks, paying fines and waiting in line behind legal immigrants (Hsu, 2009).

The literature indicates that, although the main hurdle to CIR is the issue of amnesty, some compromise may be possible to allow a path to citizenship for at least some of the millions of people who currently live in the United States illegally. Any such program would require very strict screening procedures to enable USCIS to clearly identify those seeking benefits and ensure that they are not a threat to the United States. It makes sense that the bar might be higher for anyone seeking forgiveness for breaking the law than it would be for those who have played by the rules from the beginning. Since none of the leaders driving immigration reform has spoken specifically about DNA in relation to CIR, the question of whether DNA might play a role, and whether it might enable or hinder compromise, remains to be answered.

H. SUMMARY OF THE LITERATURE

The literature is not abundant in terms of linking DNA and immigration. However, it provides support for the idea that immigration fraud is a problem and that DNA can aid in verifying identity and biological relationships and in screening

for crimes and terrorism. DNA testing, however, is a controversial issue, with proponents praising its detection and deterrent values and opponents citing the possibilities of misuse. The literature has not specifically answered the question of how USCIS might integrate the use of DNA testing. More research is needed regarding the benefits of DNA testing, information-sharing possibilities, privacy and security issues, and impact DNA testing may have on proposed immigration reform.

III. RESEARCH METHOD

Very little research thus far specifically ties DNA testing to immigration. In order to further the research, I employed various qualitative data collection methodologies, such as interviews, observations, and participation in, and observation of, a nationwide DHS-sponsored survey. I conducted formal interviews with three subject matter experts in the fields of DNA technology, biometric technology in general, law, privacy, and public policy. I visited Haiti, where I observed DNA testing and gathered information about the benefits and issues associated with DNA testing. I took advantage of the National Dialogue on the Quadrennial Homeland Security Review (QHSR) to obtain anonymous feedback on the idea of utilizing DNA technology for immigration purposes. The goal was to develop a policy recommendation regarding whether and how to move forward toward expanded DNA testing in the immigration process.

A. INTERVIEWS

I conducted three formal interviews of subject matter experts who could help address issues regarding the technical, legal and information-sharing aspects of DNA testing, as well as the privacy implications and policy considerations. I wanted to discuss the feasibility of expanding DNA testing, including how it might enhance future immigration reform.

The first interview was with Joe Matal, General Counsel to Senator Jeff Sessions of Alabama, who is the Ranking Member of the Senate Judiciary Committee. The Senate Judiciary Committee handles issues concerning the Constitution, crime and justice, immigration, refugees, border security, terrorism and Homeland Security. Any expansion of DNA testing in the immigration context would affect all of these. I asked to interview Mr. Matal because he is a subject matter expert on DNA testing, especially as it relates to criminal databases. He previously worked for Senator Jon Kyl of Arizona, and assisted him in drafting key DNA legislation. Senator Kyl was the legislative author of the

DNA Fingerprint Act of 2005, which was eventually folded into the Violence Against Women and Department of Justice Reauthorization Act of 2005 (Public Law 109-162). He also played a prominent role in passage of the Adam Walsh Child Protection and Safety Act of 2006 (Public Law 109-248). Mr. Matal assisted Senator Kyl in providing comments to the Department of Justice's April 18, 2008 proposed rule to expand the collection of DNA by federal officers. The DOJ promulgated the proposed rule in part as a response to the Violence against Women and Adam Walsh acts (USDOJ, April 2008). The rule, finalized in December 2008, mandates DNA testing for all arrestees as well as non-U.S. citizens who are detained and fingerprinted (USDOJ, December 2008).

My second interview was with William Gravell, President of Diogenes Group, LLC. Mr. Gravell has long been an expert in identity management. He spent most of his naval career on government activities related to the management and protection of information. In 2007, the Navy appointed him as Special Advisor to the Secretary of the Navy for Identity Management. Mr. Gravell was the principal drafter of the *Identity Management Task Force Report, 2008*, published by the Executive Office of the President's National Science and Technology Council, Subcommittee on Biometrics and Identity Management. He has authored or contributed to numerous other reports. Mr. Gravell has also developed an Identity Management Master's program at the Naval Postgraduate School in Monterey, California. The program will soon be expanded to include an Identity Management Ph.D. program. I had the opportunity to hear Mr. Gravell speak at the 2009 Biometric Consortium Conference (BCC) and saw him as a "big-picture" thinker who carefully considered public views and reactions to identity management policies.

Finally, I interviewed Dr. Myra Gray, who is Director of the Department of Defense's Biometrics Task Force. Dr. Gray has held a variety of increasingly responsible DoD positions over the years. She holds a Master of Science degree in National Resource Strategy from the Industrial College of the Armed Forces, a Doctorate of Science degree in Research and Engineering

Management from the Southeastern Institute of Technology, a Master of Arts degree in Business Management from the Central Michigan University, and a Bachelor of Science in Mathematics from Athens State College. Dr. Gray also spoke at the BCC, and I was particularly anxious to discuss with her the DoD's rapidly expanding DNA database and the DoD perspective on how and under what circumstances they might share the information.

B. HAITI

In May 2009, I had the opportunity to visit the American Embassy in Port au Prince, Haiti. Haiti is a country where records are often unavailable. Since the U.S. government would likely deny many petitions and visa applications without sufficient documents, many people resort to DNA testing. In Port au Prince, I observed the DNA collection process and learned more about how others perceive DNA testing and how USCIS might improve and expand DNA as a tool.

The observations in Haiti helped to answer research questions on the financial incentives and other benefits of DNA testing up-front in the immigration process. Such up-front testing would help USCIS, the Department of State, the applicants and petitioners who are seeking benefits, and U.S. taxpayers. The research in Haiti also shed light on changes to DNA policies and regulations that USCIS may want to make to help ensure integrity and improve the process.

C. NATIONAL DIALOGUE ON THE QHSR

This year, the Department of Homeland Security conducted the nation's first Quadrennial Homeland Security Review (QHSR). In order to include stakeholders in the process, DHS conducted an innovative outreach effort, called the National Dialogue on the QHSR. The dialogue was a series of three different online interactive conversations, each of which covered a period of days, on various homeland security issues. From July 16 to October 4, more than 20,000 people participated in this online dialogue to help inform the development of the

QHSR (USDHS, 2009). I took advantage of this exercise to present the idea of DNA testing to the public and to receive public reaction to such a proposal.

Participation in the QHSR National Dialogue highlighted misunderstanding and fear that some people may have about DNA testing. It provided insight into issues, such as privacy and cost, which USCIS must address in any DNA expansion proposals and in any public outreach to promote and gain acceptance of such expansion.

D. THEORETICAL LENS

Strauss and Corbin refer to theoretical sensitivity as “a personal quality of the researcher.” They note that researchers come into a research environment with various levels of sensitivity that are determined by personal and professional experiences. Such experience allows researchers to develop theories that are “grounded, conceptually dense, and well integrated” (Strauss & Corbin, 1990).

Although I sought to approach my research without bias, my personal and professional experiences may have influenced not only the research but also my interpretation of the findings. In order to maintain transparency, outlined below is a summary of experiences that may have influenced this research.

Early in my government career, I worked in the Consular Section at the American Embassy in Monrovia, Liberia. There I conducted daily visa interviews, although my primary responsibility was American Citizen Services. That was my first exposure to fraud for immigration and citizenship purposes, and it opened my eyes to the lengths to which people would go to gain residency in the United States. I often encountered people claiming U.S. citizenship based on parentage. They attempted to obtain U.S. passports, but rarely succeeded in establishing eligibility. One Liberian-American woman, who appeared to be in her mid-forties, requested a U.S. passport for a newborn infant. I questioned why, when Americans living in Liberia travel to America to give birth, she would travel from America to give birth in Liberia. I requested the now-obsolete blood

tests, and never saw the woman again (this was before Sir Alec Jeffries had developed the ability to prove relationships through DNA testing). I believed that the woman was attempting to smuggle someone else's child to the United States.

In 2003 and 2004, while working with USCIS in Portland, Oregon, I assisted local authorities in bringing to justice Deniz Aydinler, the murderer of a University of Portland student. This high-profile crime was committed in May 2001, but police were not able to identify Aydinler until 2003; they were finally able to arrest him in January 2004. He was a Turkish national who had married a U.S. citizen. It was then that I realized the shortcomings in the current immigrant screening process. Our fingerprint and name checks would never have revealed that Aydinler was a murderer. He cleaned up his fingerprints at the crime scene and, though he attempted to clean up his DNA, it was hard not to leave it behind. If his DNA had been on file, the police could have identified him within hours or days of the murder. The family could have been spared the agony of nearly three years of not knowing, the community could have been reassured that the perpetrator was no longer at large, and the police would have saved more than two years of investigative resources.

Later, from 2006 until 2008, I traveled the world as a Supervisory Refugee Officer, leading teams of officers to interview applicants seeking refugee status in the United States. Although there were many very compelling cases, and I am proud that the United States has a strong humanitarian program, I was alarmed at the very apparent fraud. I realized that many people were taking advantage of the U.S. government's generosity and of its inability to verify people's identities or the veracity of the claimed relationships that were often the basis for refugee access. Some people were taking bribes of tens of thousands of dollars to include an impostor on their family tree. Some people forced others to include impostors in their claimed family group and threatened them with harm if they refused. I also was alarmed at the potential abuse and exploitation of children because of that same lack of ability to verify identities and relationships. After the 2008 pilot DNA testing that revealed extremely high fraud rates (not a

surprise to me), I witnessed the harm that this revelation created. The legitimate refugees and bona fide family members of refugees and asylees in the United States who wished to reunite with their family members suffered because of the fraud on the part of many. They faced an increased burden of proof to verify biological relationships. Unfortunately, the costs of DNA testing are high when conducted on an individual basis, and the refugees and asylees are some of the poorest and least able to pay. I saw a valid need and benefit in USCIS expansion and streamlining of DNA testing.

From mid-2008 until just recently, I was Chief of the Policy and Regulation Management Division for Domestic Operations at the USCIS headquarters in Washington, D.C. In that position I pursued changes in DNA testing policies and regulations, and realized the many challenges that USCIS must overcome in order to implement such sweeping changes.

These personal experiences propelled me to pursue this thesis topic of DNA testing in the immigration process. They provided the will and the passion to seek a solution that will improve customer service, facilitate interagency coordination and protect against fraud, human trafficking, crime and terrorism.

IV. ANALYSIS AND FINDINGS

A. INTERVIEWS

1. Matal

Joe Matal is General Counsel to Senator Jeff Sessions of Alabama, who is the Ranking Member of the Senate Judiciary Committee. Mr. Matal previously worked for Senator Jon Kyl of Arizona and assisted him in his work on expanded DNA testing for federal arrestees. I interviewed Matal in Washington, D.C., on October 8, 2009, and asked him about progress on implementation of the DOJ rule that supported the DNA Fingerprint Act of 2005 and the Adam Walsh legislation. He assured me that the government is implementing the rule but said that the testing of the non-U.S. citizens was slower to begin because of operational issues.

Matal acknowledged he had never really focused on DNA's use and effectiveness in the immigration benefit process, although he was quite involved in work on the expanded DNA testing of arrestees and detained non-U.S. citizens. He pointed out that the amendment focuses on taking DNA from people in detention because they are here illegally. The amendment focused on solving crime; it did not focus on immigration benefits fraud issues.

When asked if he was aware of similar uses of DNA for other types of federal government programs, Matal said he believed that the military has been aggressive in taking DNA from people captured in relation to the war with Al-Qaeda. He said he has mainly focused on the law-enforcement issues, and those mostly involve the states. Matal stated that though the federal DNA collection is important, the main volume of criminal cases comes from the states, and that the most important thing "we can do" is to create a platform and a standard for the states to use and allow them to use the National DNA Index System (NDIS) to compare information. He said that one of the things the 2005 Kyl amendment did

was to allow states to upload arrestee samples to NDIS. Before that amendment, states could only upload samples of those people already convicted of felonies. Matal believes that NDIS is the only practicable mechanism for comparing DNA from people sampled in one state to crime scenes in another state. He said if the states cannot use NDIS then they would have to go to all the other 49 states to test something. As a practical matter, the inability to share through NDIS would impede crime solving. Matal said that as soon as they implemented the new law the government immediately started getting cross-state hits on arrestee samples. This ability to share is important, he said, because criminals travel. They commit crimes in one state; no one solves the crimes, and then the criminals move on to another state.

I asked Matal if he believes it would be feasible to utilize DNA technology to establish identity, protect against immigration fraud and human smuggling, and enhance security checks to protect the public. He said he believed it would be useful for all those things, and pointed to the fact that at times it is impossible to establish people's identities. Matal noted that through DNA and other biometric screening our government had discovered that many people involved with Al-Qaeda in Iraq were previously arrested in the United States.

When asked what he believes are the major legal and privacy issues to consider in any expansion of DNA testing in the immigration process, Matal said there would be an inevitable Fourth Amendment challenge. Although some people make the argument that DNA testing violates the Fourth Amendment, Matal said he believes it clearly does not, for the reasons laid out in the Kyl letter (Kyl, 2008). He commented,

Once you see how this program really works and what information really is accessible, which is really nothing, and then you look at the miniscule possibility that a lab employee would actually reconfigure his equipment and risk losing his job, or jail time, it's ridiculous. It is never going to happen. Frankly, it is not that hard to get people's DNA from other means. You just pick up a coffee cup they threw in the garbage and send it to any private lab and have them test it for whatever. The privacy risks posed by the federal database are miniscule.

Although he believes the Fourth Amendment arguments are borderline frivolous, Matal believes they will be made. He said the issue might end up in the Supreme Court at some point. Matal said that 21 different states and the federal government currently take DNA samples from arrestees. He pointed out that there has never been a significant privacy violation related to convict sampling, which has been going on much longer. Matal stressed that the government has solved many horrible, violent crimes and probably prevented many others as a result. He did not believe that a court would look at this and throw it all out. Noting, "I just don't see that happening. No one who looks at the facts and what's actually gone on could possibly conclude that this is an unreasonable intrusion on your privacy."

Matal believes it is reasonable to require DNA testing as a condition of applying for immigration benefits, just as fingerprints are already a requirement. He thinks it makes sense, especially if the person has already been in the U.S. for a while. He said, "You definitely want to see if the person has committed a crime before giving that person any kind of permanent immigration status."

Matal also pointed out DNA's value in verifying familial relationships as the basis for claiming an immigration benefit. He thought it likely that in the future the government may bounce DNA against other countries' databases to see if the applicant committed a crime anywhere else.

When asked about the feasibility of sharing DNA databases with the Department of Defense and INTERPOL, Matal said he had heard of issues of interoperability and that the Europeans are using a different standard than we are. He thought the lack of standardization would be unfortunate. He said he heard the DoD was using DNA to track people's movements and establish links between terrorists through DNA left at the scene of a firefight and that left at other locations.

Matal thought the costs of integrating DNA testing into the immigration benefit process would likely be trivial. He said sampling does not cost that much,

the benefits are huge, and you save money rapidly over time. He acknowledged he does not know very much about the use of DNA in the broad immigration context. However, in the crime context, he said, just the investigation and prosecution of the violent crimes is enormously expensive, not to mention the human costs of the crime itself. DNA testing can help to prevent a rape or a murder from happening and avoid the enormous costs of investigating and prosecuting such cases. Matal said the Los Angeles police chief estimated that it costs them about a million dollars to prosecute a murder case.

The potential negative implications of implementing expanded DNA testing seemed negligible to Matal. He said he has heard every conceivable argument against DNA testing from the ACLU and similar groups, but that there is no substantial argument against it. He said the cost is trivial compared to the pay-off from using this technology. He stressed the fact that the profile created for the database for purposes of identification does not reveal anything medically sensitive. He said even if it did, it is very tightly regulated and controlled. Matal pointed out how easy it is for practically anyone to get someone's saliva if he or she really wants to, just by following that person and taking his discarded coffee cup or water bottle from the trash. He said it is not as if the government is getting some super secret material or a person's medical or FBI file, or usually inaccessible information. The FBI stores DNA in a controlled database, with professionals who would not jeopardize their careers or risk criminal sanctions.

I asked Mr. Matal if he thought DNA testing might play a role in any future Comprehensive Immigration Reform (CIR), or if he believed the inclusion of expanded DNA testing would make CIR, with some path for permanent residence, more acceptable to those who currently oppose it. He said it is not merely a process issue for those who object to the substance of amnesty in general. He did say it made sense to use DNA, but he knew that many of the immigration groups are very resistant to any effective fraud prevention mechanism.

Matal did not see much difference between those people who might apply for any future amnesty and those non-U.S. citizens in detention for whom DNA collection is now authorized. He pointed out that DNA testing is a minimal privacy intrusion for a legitimate purpose. He said if used for immigration screening it would have the added benefit of verifying familial relationships.

I asked Matal how he would compare the value of fingerprint checks to the value of DNA profiles. He said DNA is much more valuable because there is a higher likelihood that a criminal would leave it behind at a crime scene. Often a criminal wears gloves, or a useable print is not obtainable. However, in many crimes, it is hard to avoid leaving DNA behind, because murderers might cut themselves, and rapists might leave DNA. Experts increasingly are able to get DNA from smaller and smaller samples. In that sense, Matal says, it is much more powerful. Although fingerprints are pretty exact, and they have never found two fingerprints that are the same, Matal says, DNA is faster, easier, and even more sure. He noted that you are much more likely to be able to get DNA than a regular fingerprint.

I asked Mr. Matal how he felt about the ability of DHS, working with the FBI, to maintain the strict privacy standards and record of integrity that the FBI has maintained with their DNA database over the past 20 years. He pointed out that in the more than twenty years that the FBI lab has been conducting DNA analysis there has never been a case in which a lab employee made an unauthorized disclosure of DNA information. He said, "This isn't some new program where we have to speculate as to whether it's going to result in privacy violations. It has a very substantial track record."

Matal said he did not know enough about the USCIS authorizing statutes to speculate about whether or not they could accomplish expansion of DNA testing in the immigration benefit process through regulation, or whether it would require legislation. He said it seemed like we should be able to accomplish this through regulation.

Mr. Matal referred me to Senator Kyl's May 19, 2008 letter providing comments to the DOJ proposed rule on DNA collection. In that letter, Senator Kyl provided very detailed arguments on the privacy issue. Matal also provided me with copies of two studies, one by the city of Chicago, and another one by the state of Maryland, documenting the effectiveness of arrestee sampling. Finally, he provided me with a copy of Senator Kyl's speech, from the Congressional Record of the Senate, dated December 16, 2005, on the DNA Fingerprint Act of 2005. .

SUMMARY OF THE FINDINGS—Interview with Joe Matal

What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists? Matal believes there are good arguments for using DNA to screen for crime and terrorism and to verify family relationships. He does not see any substantial argument against it. **What are the financial incentives and the benefits of up-front DNA testing to USCIS stakeholders?** Matal sees valid uses for DNA testing in the immigration process. He noted that DNA and other biometric screening had helped our government discover people involved with Al-Qaeda in Iraq who were previously arrested in the United States. He believes the costs of integrating DNA testing into the immigration benefit process would likely be trivial. He noted that sampling does not cost very much, the benefits are huge, and the American public actually saves money rapidly over time in crime prevention alone. **What are the legal and privacy issues that USCIS must consider, and what policy, regulatory or legislative changes are needed?** Matal said there will be an inevitable Fourth Amendment challenge and it may end up in the Supreme Court at some point. However, he insists the privacy risks posed by the federal database are miniscule, noting there have never been any significant privacy violations tied to convict sampling. He said DNA testing results in minimal privacy intrusion for a legitimate purpose and the current programs have a very

substantial record of success in protecting privacy. He said he was not sure, but believes USCIS should be able to accomplish these changes through regulation. **How can interagency collaboration play a role in this effort and benefit from it?** Matal pointed out the importance of creating a platform and a standard for the states to use and allowing them to use the National DNA Index System (NDIS) to compare information. He said NDIS has allowed the local and state agencies to solve multi-state crimes they never would have been able to solve otherwise. In regards to collaboration with Defense and INTERPOL, Matal said he had heard there are issues of interoperability and he was worried that the Europeans are using a different standard than we are. **What role might DNA testing play in any future comprehensive immigration reform?** Matal did not seem to believe those who oppose amnesty would like it any better if DNA were a factor. He thought the DNA testing makes sense, but noted some of the immigrant groups are against any type of enforcement.

2. Gravell

William Gravell is President of Diogenes Group, LLC, and is a retired naval officer with years of experience in information management and protection. He was formerly Special Advisor to the Secretary of the Navy for Identity Management. I interviewed Mr. Gravell in Arlington, Virginia, on October 14, 2009.

I explained that I was investigating the feasibility of expanding the use of DNA testing in the U.S. immigration process and examining three possible uses for DNA testing. The proposed expansion would make DNA testing a condition of applying for an immigration benefit. The DNA would help USCIS to create a person-centric identifier, prove qualifying biological relationships, and enhance security screening. I told Gravell that submission of fingerprints for security checks is already a condition of applying for many immigration benefits, and asked if he believed that submission of DNA would be different.

He pointed out that DNA has a legal character that differentiates it from other forms of biometrics. He said that in addition to permitting identification, DNA has the potential to illuminate otherwise hidden aspects of congenital health issues, ancestry, and racial composition, which is socially sensitive in various ways. He said we should rigorously examine and resolve those concerns before moving forward to be sure that expanded DNA testing is an acceptable action in policy.

I said the FBI'S standard 13 core loci do not identify any health aspects or racial aspects. Gravell stressed that public perceptions are all powerful in identity management, and said government has failed to recognize the social sensitivity of identifiability. For example, he said fingerprints are stigmatized by their association with the law enforcement process. This is in spite of the fact they have been used for other purposes for literally a century and are inherently benign. The difference, Gravell said, is not technological; it is found in messaging. He noted if you do not first consider social acceptance, you will waste all the technological effort and the effort will fail.

Gravell used the analogy of Bert the Turtle, a reference to a government ad campaign of the 1950s related to civil defense. He said the government understood at some wise level the need to assuage public concern and anxiety, to dispel ignorance and to replace it with informed, fact-based understanding. According to Gravell, "fact and understanding, delivered credibly, and before the need, will create much more value than hoping against hope that the subject never comes up and then having to try and clean up the breakage afterwards."

Gravell said we should recognize the social sensitivity; recognize that in the mind of the people, DNA is unique. He said the federal government has a poor record of credibility in its messaging on identity management. He referred me to a report he wrote last year, the *Identity Management Task Force Report, 2008*, published by the Executive Office of the President's National Science and Technology Council (NSTC), Subcommittee on Biometrics and Identity Management. The report makes the point that there are in fact two gross tracks

of identity management within the government: Screening and Efficiency. Gravell said security is an objective we can achieve by the broadest possible screening. If we make one particular transaction with a specific end-using application as efficient and secure as possible, whether it is buying a book on Amazon or filing your income taxes electronically, we can achieve efficiency, he said.

Gravell again stressed the importance of messaging. He said it is essential to do something the United States government has almost never done well, which is to recognize the importance of public messaging at the outset of major socially impactful public projects.

Gravell said you would never have a condition where everybody everywhere is satisfied or mollified. He said, "There will be people marching in Lafayette Square about biometrics that are going to be given to Martians." However, he said, once the lawyers, Congress, and most of the populace are satisfied, if you have done a reasonably good job about making the case and showing the benefit and value, then you will get two good things.

The first, he said, is the prospective sponsors. "The people who have to spend the money to run the programs will see what's in it for them and will see the benefits as expressed in the form of cash." Gravell cited the Health Care debate, saying that one of the reasons that the health care industry is on board this time rather than fifteen years ago is because, wisely, this time the administration has embraced the health care community. The government has pointed out how many more prospective clients the industry might have if they support the reform. This strategy has seemed to temper the opposition.

The second community that has to see the value in it for them, says Gravell, is the American public. That, he says, means being able to do things you could not do before, and being able to do them exceedingly simply, without having to remember things. The process should have built-in safeguards and be completely transparent. The American public knows that when they are buying a

book on Amazon, and their little padlock at the top of the screen closes, the good thing has happened and now they are safe. Now they can confidently give their credit card number because, although they do not have any idea how the system works, they know that it makes them secure, and they did not have to do a single thing. Amazon arranged all that for them. That is the model for success in identity management.

Gravell expressed support for expansion of DNA testing to establish identity, verify family relationships and enhance security screening. He noted there appears to be ample support for all of those uses. However, he warned, “Do not be seduced by the obvious benefit to government, which is visible before the fact, and to embark on that understanding alone. Recognize that to do that is to fail because you have not made the case. “

When asked about the major legal and privacy issues the government must consider in any expansion of DNA testing in the immigration process, Gravell referred me again to the NSTC report (2008). He said Pete Nast, who is a superb privacy lawyer and technologist and the DHS Chief Privacy and Technology Officer, wrote the privacy section of the NSTC report and that it's been well regarded by the privacy community. Gravell pointed out there is a minimal body of statute in case law in privacy, and that the Congressional underpinning of privacy is educed, not explicit. He said there is more explicit right to ownership of a firearm than there is for privacy in this country. Therefore, he said, the general understanding of privacy and practice must be tested situationally as new technologies appear to challenge it.

He used the analogy of telephony, saying that in the late 19th and early 20th centuries there was an understanding that the central operator was involved in every correspondence and could listen in to every word spoken on the line. There was no expectation of privacy. Gravell said that it was only when technology improved, in the 1930s, to create a technological capability to call with no intermediary involved, that the legal doctrine of expectation of privacy emerged. It was tested in court and, and as a result, Title III, the Wiretap Statute,

was enacted. The statute protects against warrantless wiretaps. Government may confiscate the protection against such wiretaps only under prescribed conditions in the statute.

The insight from this example, according to Gravell, is that technology leads policy. This means the privacy advocates will attune to the technological development and seek to understand its implications. Policies that do not exist today regarding this program and every other program will have to be created, he said. The laws and policies will codify the practice as it rolls out. Gravell advised that if we have conditioned the operating environment in the ways he mentioned, then we “may lead people wisely to the right answer and not emotionally to a spasmodic and suspicious answer.”

I asked Mr. Gravell what he believes are the main issues surrounding the use of DNA testing to screen potential immigrants against the DoD, INTERPOL and FBI databases. He pointed out the legal framework regarding identifiability in the law enforcement context is much more straightforward and much better codified, because people are put to death on the basis of forensic data collected from scenes of crimes. He noted, however, that he understood I was not talking about people who are presumed before the fact to be criminals, and that it is only in the course of the screening that we may discover fugitives from justice. Every nation has its own code of law, its own concepts of governance, Gravell said, but he believes there is a global movement toward technological standardization of data. This standardization, he said, is driven by an understanding that there is a value and a need to share data nationally within local constraints, laws and governance processes, for a variety of purposes.

Gravell talked about the voluntary aspect of the proposal to expand DNA testing for potential immigrants. He pointed out the fact that if you want to buy a fully automatic weapon in the State of Virginia, you must be fingerprinted, go through a background check, and register the weapon. That is the law, those are the terms, and people understand that is what they have to go through. He said because there is a greater degree of social risk associated with possession of

this capability, society is entitled to make higher-level demands. This, he says, falls within the category of social identifiability. He raised the issue of security investigations for clearances such as those that most federal employees have. He described the requirement to fill out forms and give out personal information, sometimes even submitting to extremely penetrating and embarrassing polygraph examinations. However, he said, "That's part of the deal. You don't have to have the polygraph, but if you want to have this job with a security clearance, you have to voluntarily submit to it. Well, we're OK with that; that's part of the deal."

Gravell stressed that he is not a lawyer, but said he assumes the same general principle would apply to potential immigrants. If people step forward voluntarily and seek something from the government, then the government is entitled to make certain demands. Those demands may include biometric capture. The privilege sought, whether it is a hunting or driving license, owning a machine gun, residence in the United States, a security clearance, or anything in between, may require identifiability. If the benefit-seeker refuses to undergo those demands, the consequence is that he does not receive the privilege.

Mr. Gravell raised the subject of the U.S. military fingerprinting people in Iraq. He pointed out that the terrorist watch lists are relatively small because we really do not encounter terrorists very often. Gravell said we know some people are good people, such as American military personnel, American government personnel, allied personnel, local police, local government, Red Cross workers, contractors, etc., and they are in the good person database. What is in the middle, he said, is the gray area. They are not convicts; they have not been accused of anything, but they are not on the known bad and not on the known good lists. They are in the "I don't know" list. Perhaps that is how one thinks about immigrants, he said. Gravell suggested that in dealing with the immigrant population, we must start with social judgment supported by a policy, and the technology regime will implement that will, once it is understood.

I asked Mr. Gravell how he viewed the ability of local, state, federal and international partners to achieve interoperability in this area. Interoperability begins with standards, he stressed. Without standards, Gravell said, there is no interoperability, no connectivity; you cannot skirt around that step. It is folly to build an architecture here and here and here, three different places, and then after the fact say, "Why don't we just now connect this?" It is hideously expensive, if possible at all, and it is enormously complicated, he warned.

At the same time, Gravell said, it is very difficult to attempt to create a single, global information-sharing architecture for identity management at the outset that embraces disparate policy regimes and different paying sponsors, with different goals. There would be issues of who would pay, and what would be the return, and on what time line. Gravell recommended everyone agree to codify a DNA sample in the same way. He cautioned, however, that standards are not always connected to technology. He gave as an example the fact that when the Federal Information Processing Standard (FIPS)-201 was promulgated as a very fine technology standard; the industrial base was incapable of manufacturing to that standard. In 2004, the President declared a very aggressive timeline for creation of a standard. Very shortly thereafter, every federal department should manufacture and issue cards to that standard. It turned out that was impossible, because the manufacturing base, which consisted then of three companies, could not manufacture cards to that standard on the mandated timeline.

I told Mr. Gravell I had just received my HSPD-12 card. He said the document signed by President Bush in August of 2004 commanded that the federal government issue the HSPD-12 cards to all federal employees within a short period of time. That was five years ago, and apparently, they are just now getting around to it. The problem, Gravell said, was no one had budgeted for it; they could not build it; and the documents were not available. This illustrates the basic point that when creating standards one should take care to ensure that the technology and implementation are achievable.

Gravell warned that if we bring standards into place after preexisting technology regimes exist and the advocates later wish to connect them they will face difficulty. Each one of them will probably build something different, and wish to impose that standard upon the collective. He said it is intuitive that the other person is not going to want to give in. Instead, he is going to want to impose his standard. The solution, according to Gravell, is to do the standards first.

I asked Mr. Gravell what he saw as the potential negative implications of implementing DNA testing in the immigration process. His response was social backlash, sensitivity, ignorance-based opposition, and personal interest-based opposition from those who want to do things their way. He reminded me that identity management and cyber security are comingled to the extent that there is some space of intersection. The problem, he said, is the space has not been mapped, so equities, activities, programs, resources, and policy authorities are in the intersecting space. Since they are unresolved, they pose one of three problems. They will be fought over and pulled apart. They will be pushed to someone else, because no one wants to be stuck to them or associated with them or have to pay for them or endure the stigma related to them. In that case, nobody will do it, even though it needs doing. Third, and most insidiously, they will both be appreciated and valued but in different ways, which is the case we are describing here. Gravell said that some person powerful enough to command an answer could resolve the first two problems. The third case, though, is much more difficult, because the stakeholders have a real investment - not just financial, but in reputation, in organizational pride and in stature and momentum. They really want to do this, but they do not want their program they so painstakingly created to lose ground, and be stalled, and redirected, so they fight and fight and fight. Gravell pointed out that this is very difficult to resolve.

Standards, he said, must come first whenever possible. He cautioned that it would not be possible in every case. For instance, the FBI already has their standards. For a hundred years, their relationship to underlying police organizations has been, "I have decided how to do this. If you want your stuff in

my database you have to provide it in this format.” He said that the FBI has successfully imposed its standards on underlying law enforcement because they are dealing with much smaller organizations in every case. Now, the FBI has stepped up to a billion-dollar, ten-year program with huge functionality. Gravell said he was a supporting contractor to the FBI in creating the definition of what the functions of that facility would be. He said he successfully made the argument that they should expand into things like training, collaborative graduate program development, collaborative research and development, virtual laboratories, and other efforts that would add functionality. He told them, “If you create this space, don’t necessarily make it a data repository; make it a genuine collaborative work space, to expand the set of deliverables, to expand the perceived value by the underlying client.” That is true to Gravell’s basic premise, that successful implementation starts with value as seen by the end user.

Gravell identified another failing of government in identity management. He said that government is accustomed to being a technology or process or service provider. Government is accustomed to seeing society as people who largely take what we give them the way that we give it to them. The people we interact with are largely vendors who desperately want government contracts.

He said there is a sycophancy that surrounds the government-not-government relationship, centered on the ability of government to distribute wealth in the form of programs and contracts that the vendors will provide for. That, he said is not the way business does business. You do not go into an auto dealership and hear, “You must buy this car because this is the car I built because I’ve decided this is what you should buy.”

Gravel mused, “We now know how that turns out eventually, don’t we?” He pointed out that Americans decided at a point in the past that they were not impressed with big fins and a lot of sheet metal and a V8, 9,000-horsepower engine. They wanted Hondas, or Volkswagens, something much more economical, much more reliable, much smaller, to fit in their parking lots

Therefore, he said, the consumer ends up controlling the auto industry. The consumer defines the requirements and declares what the nature of the product must be, or they simply decline to buy. The service provider, Detroit, does not listen, and keeps producing cars that they feel are more attractive because they are more profitable, because, they know how to build big engines, and so on. Eventually it all collapses. Well, this is the basic model in business.

In Gravell's opinion, identity management will be valued when end users see the value. First, the vendor will see the profit in providing the identity-enabled service. Gravell points out that Amazon sells more books because people are willing to give their credit cards to Amazon but are not willing to give it to somebody over the phone, for example. He said he has refused to give his credit card at stores from time to time, where if for one reason or another he just did not like the setup, did not like the place—overseas, that kind of thing. If he's in Bangladesh, for example, he won't give his credit card to a vendor in the souk, but he'll walk back to his hotel, log on to the Internet, and give that same credit card number to Amazon without hesitation. Two things occurred, he said; the vendor invested in the capability and the consumer saw the benefit.

Gravell said the government is now attempting to create an identity management strategy. However, he fears there is a risk that it will be a vast government bureaucracy, probably created by GSA, which may look a lot like their E-Gov model, which has not been widely adopted. He says they will believe this model of identity management will sweep the nation. "It will not. Full stop. It will fail. You heard it first here."

Gravell referred me to the NSTAC report that he recently authored (The President's National Security Telecommunications Advisory Committee [NSTAC], 2009) and noted that what government can and should do is to recognize the limitations in its ability to message. He suggested the government engage professional messengers, who know how to sell everything from soap powder to condos in Florida, and hire them to create a strategic messaging campaign that comes all the way back to Bert the Turtle. Simple messages, Gravell said,

targeted at people who need to have simple, repeated messages imprinted upon them. He does not believe that the government will come up with that on its own, but that Madison Avenue could come up with such a plan.

Gravell said one thing the government can do that has value is to sponsor standards activities. The United States of America sits at a table in the standards domain, he said. He explained that the “United States” is some mix of the government with technical advice from academia, industry and others. Gravell said that right now the ITU-T (the International Telecommunication Union’s Telecommunication Standardization Sector) is engaged in a yearlong effort toward identity management standards. He said that the Chinese delegation to those talks is 200 people, every time they meet, while the American delegation is about five. The risk, he pointed out, is that in a bureaucratic negotiation, the side with more heads can drown the side with fewer heads with process—with paper that has to be read, that has to be commented upon, or that has to be edited. Therefore, he said, the effort requires initiative.

Gravell said that another thing the government can do is invest in research and development. The reason that DARPA (Defense Advanced Research Projects Agency) is so successful, he said, is that DARPA is in the business of doing things that they do not necessarily know are going to work on the outset. The whole investment may be lost, but that is okay for DARPA because that is what DARPA does. In addition, they do not necessarily ever pay a return, because DARPA does that too. Sometimes, Gravell pointed out, they come up with something called the Internet, or other fantastic, amazing things. Therefore, the business model for government investment in R&D is not linked to profit. Gravell said that he was in industry for seven years and that commercial R&D is always linked to profit. He said in such a setting you do not get a dollar until you can, at the outset, declare the size of the market you are going to capture with this widget once it is created, several years from now. He said if you cannot make that case, develop, and deliver on it, you would never get any more dollars.

Therefore, according to Gravell, there is a real downside, a real limitation to commercial R&D, which government can overcome.

The third thing the government can do, Gravell said, is advocate. He said we are currently blessed with one of the most gifted communicators in a century, alongside Ronald Reagan, and his ability to project charisma and influence an audience. “We have the messenger,” says Gravell, “but he does not have this message.” Gravell believes we must create the message, hand it to the messenger, use the medium that is available to him, and we will sell this idea. “But,” he said, “Unless those three come together, it doesn’t happen.”

I asked Mr. Gravell how he would compare the value of fingerprint checks or other biometrics to the value of DNA profiles. He said the problem with fingerprints is that, notwithstanding the EBTS (Electronic Biometric Transmission Specification) and all the rest of these long-standing standards in fingerprints, we’ve still got Jesse James’s fingerprints somewhere, on a piece of yellowing paper card. He said a fingerprint is handicapped by its age, and that iris would have been a better example for me to cite. He said a commercial company called Iridian invented iris scan technology and locked the technology down hard. Iridian held those patents, locked up like a drum, and would not license them unless you made a deal. Gravell said for that reason the government banned advocacy of iris technology in program proposals by vendors because government never wants to be captive to proprietary technology. He said that through the life of the patent, Iridian refused to license it.

Gravell made the analogy to Beta versus VHS. He said Betamax, by most peoples’ opinions, was a superior technology standard, but Betamax never licensed it. They always insisted you had to buy their unique hardware with their proprietary standard. VHS, on the other hand, immediately licensed it to anybody, primarily IBM, and IBM has a long-standing business process of interoperability based on standards. Therefore, he said, VHS became a standard that took over the whole market, and Beta perished.

Although iris scan technology was extremely attractive, Gravell noted that Iridian locked everybody out of the intellectual property until the patent expired, in 2003 or 2004, at which point the iris market exploded. Gravell pointed out that at the recent Biometric Consortium Conference there were as many iris-based identity companies as anything else. He said that three years ago that was not the case; three years ago, they were down there saying, "We're starving and we're hopeful." Iris technology, Gravell says, benefits from the fact that it emerges.

He explained that Iridian created the first iris database at a time when people had been thinking about iris for the many years that the patent existed. Gravell said people thought about what they would do with it and how it they could use it. He said there was a bottled up need and demand but also an ability to intellectualize without investing in infrastructure that they would later have to correct. He said from day one, they knew what they wanted and they began to go out and build it out. As a result, iris technology has developed in an enormously rapid timeline. From the beginning, all iris technology has been interoperable, because they did what Gravell suggested. During that waiting period, he said, they created a range of standards, before anybody had built any of the enabling databases, and so everyone immediately embraced the standards and every iris sample collected on earth is interoperable from the beginning. That is the model and the object lesson, Gravell says

This might not work with DNA though, Gravell pointed out, because DNA is not a singularity. There is so-called full DNA, there is mitochondrial DNA, there is nuclear; that is the problem, he said. He noted that the government must sort this out, not in technology, but in policy and standards

Gravell mentioned that the world's largest physical repository of DNA is in Rockville, Maryland. He said there are approximately 1.2 million physical DNA samples in the world's largest freezer. These samples, held by the medical community, are for DoD forensic purposes. Gravell noted that they are physical DNA samples, not coded DNA. Congress and the Army mandated such

regulation to protect the DNA from potential use for law enforcement or other purposes. The DNA is there explicitly for purposes of medical forensics and identification of remains of U.S. military personnel

When I asked if he knew if anyone had ever exploited the DNA that is stored there, Gravell stressed that law forbids its exploitation. He said it has been around for a couple of decades now. Gravell pointed out that they started with an extremely cautious and tentative understanding of the possibilities and built an extremely stringent policy regime and physical build-out around it.

I asked Gravell how he felt about the ability of DHS, working with the FBI, DoD and others, to maintain the strict privacy standards and record of integrity that the FBI has maintained with their DNA database over the past 20 years. He responded that there are competing interests in this scenario. The first is the interest in data-sharing, interoperability, basic standards. He said there is a move to bring these data environments together but it suffers from the problem that he alluded to earlier; the standards preexisted before anyone gave serious thought to making them interoperable.

Gravell said that DHS, DoD and DOJ each have relationships with external partners. DHS, for example, in the US-VISIT program, shares information with the UK Home Office, conducting a counterpart program called UK E-Borders. He said there is a deal between the two of them to permit the immediate, instantaneous sharing of border-crossing data between the United States and the United Kingdom. The deal is that these two programs will share directly and not with larger data environments. Gravell pointed out that although we can do that here, the UK Home Office also owns the criminal database and the criminal justice process. Therefore, a counterpart program, called "UK-Ident One," holds similar data. In addition, Gravell said, the British Home Office uses the criminal database to support its border-crossing program, whereas DHS is not sharing with FBI in real time, while the UK is. Furthermore, under their governance system, the British Government has leased access for its identity records to commercial enterprises to support reduction of banking fraud.

Therefore, banks can lease access, for a fee, to the UK Home Office database, which includes the criminal plus border crossing plus health care, the entire data environment, in order to reduce banking fraud, and support identifiability in banking.

Gravell pointed out that if we did something like that, people would be marching in the streets. It is a difference in the governance process. The British do that in order to reduce the costs to the government of running the system, because the banks pay fees into it in order to do this. Further, Gravell said, the British Government, as a signatory to the Schengen Agreement, has access to the 25 nations of Europe that are signatories of Schengen. These countries, he noted, have all created a regime under the Madrid declaration that by the end of 2010 there will be an interoperable, shareable database for all the European nations—the Schengen Agreement nations—for border crossing. Therefore, the British Government has far more connectivity than its counterparts do. The U.S. Department of Homeland Security has that link, but it cannot share that data with the FBI, says Gravell, so the FBI, meanwhile, works with INTERPOL and tries to obtain that data. The strongest tie is DoD/DOJ, based upon the events in Iraq. Gravell noted that as the DoD went from zero and began to build out explosively in 2003, it looked for partnerships. The FBI had always been the biggest dog in town, so the DoD immediately began to tie into the FBI. Therefore, for the DoD, DHS and DOJ to combine will complicate preexisting arrangements they have with all the other nations.

Meanwhile, Gravell noted, the DoD sponsors something called the TSCP (Transglobal Secure Collaboration Program). The United States, United Kingdom and Canada created this, he said, to collaborate on the design and building of the joint strike fighter. All those nations had to have classified access to portions of the program even while Lockheed Martin was trying to build it. The TSCP was formed as a consortium of the major integrators—Lockheed, Northrop and a

couple of others. Gravell said that these people are all cross-credentialed with British and Canadians who have access into this system, making it a unique system with differentiating standards.

Gravell added that while working on the NSTC Report they discovered that at least six cabinet-level U.S. federal departments are simultaneously engaging in identity management standards work under no commonality and generally without being aware of each other. Those include DOJ; DHS; DoD; Commerce, which owns the National Institute of Standards and Technology; the DOS, which by law supervises international relations (the ITU-T is a UN organization, so DOS oversees its identity management work); and the Intelligence Community. Therefore, he said, Justice, Homeland, Defense, Commerce, State and the IC are all simultaneously conducting international negotiation in identity management standards and information sharing, but not always in coordination with each other.

I asked Mr. Gravell how he believes we might win over opponents to expanded DNA testing who say it is a violation of Fourth Amendment rights to privacy. He pointed out that we have two kinds of people to consider. First, we have the people that have to spend money on doing it, which are a powerful voting block in their own right. Then we have the people that have to support it politically and personally, by adoption of what will ultimately be a voluntary standard. Therefore, he said, you have to frame the case in different terms but you have to do both of those things.

I pointed out that Comprehensive Immigration Reform (CIR) is on the table for discussion this year or next, and asked Mr. Gravell if he believes that DNA testing might play a role in any future CIR. He said that he did not believe that it would be a leading factor. He cannot believe that someone who seeks to enter the United States for economic or family reasons would refuse to do so because they might have their DNA taken, unless they have some history that they would not want revealed. Gravell said it just seems counterintuitive. He said that maybe those who would wish to prevent the emergence of a comprehensive

immigration policy might cite privacy considerations related to DNA as a reason for that objection, but that is a red herring. He believes the best way is to separate DNA.

Gravell said that here he thinks that Newt Gingrich was absolutely correct when he suggested that one reason that comprehensive health care is struggling is because it is comprehensive. He said that leaves too many opportunities for someone who objects on any level to any part of it to impede progress. On the other hand, he noted, if you dissected it into a set of narrowly drawn, topically specific measures, you can isolate objectors, harness beneficiaries, and check the box and get it done. Take the issues one by one. As Newt Gingrich and others point out, Gravell said, health care accounts for about sixteen percent of the GDP. How can one imagine writing a single law that profoundly affects a fifth of the whole GDP? Gravell believes that immigration reform is likely to be the same. He said there is an emotional and political sexiness to the notion that we are going have a sweeping vision that is going to resolve everything all at once. He suggests that is bad government and, although he was a political science major, he cannot point to many cases where that has ever succeeded.

Gravell recommends separating the identifiability issue and concentrating on the benefits to the nation, the individual, and the vendors. He said, "If it happens to coincide with some comprehensive immigration reform, fine."

SUMMARY OF THE FINDINGS—Interview with William Gravell

What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists? Gravell could not stress enough the importance of reaching out to the public to gain social acceptance of the idea from the beginning. He cautioned that we must recognize the social sensitivity and stigma attached to DNA and use a strong fact-based messaging campaign to assuage public concern and dispel ignorance. Gravell noted that USCIS must

do a good job of showing the many benefits of DNA testing to its stakeholders and assuring them that their information is well protected. He also said that one of the most important roles the government can play is to promote the establishment of standards, both within the United States and internationally.

What are the financial incentives and the benefits of up-front DNA testing to USCIS stakeholders? According to Gravell, “Identity management will be valued when end users see the value.” This means that USCIS stakeholders must see the benefits, and see that the process is easier, faster and more secure.

What are the legal and privacy issues that USCIS must consider, and what policy, regulatory or legislative changes are needed? Gravell noted that technology will lead policy, and that the understanding of privacy will be tested as new technologies appear. He pointed out that in telephony’s beginning no one had an expectation of privacy when speaking on a telephone; the privacy laws only changed as technology improved. Gravell said that there is little case law on privacy and that the Congressional underpinning of privacy is not explicit. He noted that the right to own a gun is more explicit than the right to privacy. He provided as an example the procedure for purchasing an automatic weapon in Virginia. If someone wants to purchase such a weapon he must submit to a background check, be fingerprinted, and register the weapon. Likewise, if someone wants to work for the government he has to undergo a similar procedure to obtain a security clearance. Gravell acknowledged that the voluntary nature of applying for an immigration benefit would be similar to those situations.

How can interagency collaboration play a role in this effort and benefit from it? Gravell noted that interoperability begins with standards, and said that everyone needs to codify a DNA sample in the same way. He cautioned that when creating standards, one should ensure that the technology and implementation are achievable. Although he acknowledged doing so may sometimes be difficult, he stressed the importance of addressing “the standards first.” Gravell believes that the international community realizes the value and the need to share data. He said that need is driving a global movement toward

technological standardization of data. Gravell believes the United States should use its influence to sponsor standards activities and to invest in research and development. He pointed out some of the complications that may arise because of various existing information-sharing agreements between separate U.S. agencies or their components, and foreign countries. **What role might DNA testing play in any future comprehensive immigration reform?** Gravell did not see any reason to tie DNA testing to immigration reform. He said to move forward on the separate DNA issue by concentrating on the benefits of DNA testing. "If it happens to coincide with some comprehensive immigration reform, fine," he said.

3. Gray

Dr. Myra Gray has been the Director of the Department of Defense's Biometrics Task Force since July 2007. I interviewed her in Arlington, Virginia on October 21, 2009. After providing background on my thesis and explaining that submission of fingerprints for security checks is already a condition of applying for many immigration benefits, I asked Dr. Gray if she believed submission of DNA would be vastly different.

Dr. Gray pointed out that the difference with DNA is that you can get more from it than just the identity of the person. She said you could get their family relationships, sometimes the regions that they are from; sometimes you can get health data on people. She stressed that an agency would definitely have to handle it with a bit more sensitivity than if they were taking only fingerprints. Dr. Gray did acknowledge, however, that DNA is the gold standard in identification. She said it is unique, and pointed out that only identical twins would have the same DNA, noting that in such a case you could differentiate with fingerprints other biometrics. Dr. Gray noted that all biometric modalities have different pluses and different minuses, which is what makes them so valuable when you work them together in a multimodal environment.

I asked Dr. Gray what she believed might be the major legal and privacy issues that must be considered in any expansion of DNA testing in the immigration process. She responded that we first must think about how the laws apply to U.S. persons. She said “U.S. persons” has a very specific legal definition; it includes people who are here for long-term residence, or U.S. citizens. However, she said if the goal in this process is immigration, and this person is applying to obtain long-term residence status with the eventual goal of becoming a citizen, you would probably have to handle it as privacy information. That, she said, is because of the different information that you can get out of DNA. She acknowledged that there might be some leeway, since such applicants are not yet in permanent immigration status. Dr. Gray thought this status might allow more flexibility to check the data against terrorist, arrest, and possibly other databases. She said there might be more prohibitions against checking such data for a U.S. person, but Dr. Gray felt that we should be able to do some prescreening or pre-checking before granting status that would give them the “U.S. person” benefits and privileges.

I mentioned to Dr. Gray a December 2008 article indicating that the Department of Defense had 80,000 terrorist profiles in their DNA database, and an October 2008 article that said INTERPOL had 85,000 DNA profiles for criminals and terrorists. I asked her, based on her role on the Biometrics Task Force, what she believes are the main issues surrounding the use of DNA testing to screen potential immigrants against the DoD, INTERPOL and FBI data sets. She said she would first want to make sure that everyone is using the same standards. She stressed the importance of identifying what portion of the DNA you are going to check. She said if one nation collects on a certain number of loci and another one checks on different loci, or they use different kinds of DNA, such as mitochondrial versus nuclear, “then you’re pretty much at loss when everything is digitized, on being able to do that magic.” She said it is like apples and oranges, even though it is DNA. Dr. Gray advised that the way around that is to try to have the most comprehensive data that you can and to settle on the

international standards and then adopt them worldwide. She said everybody should know “this is what you do.” The FBI should not be doing one thing while State does another and local law enforcement does something else, and INTERPOL uses yet another method. Dr. Gray stressed the importance of making sure that, as an international community, everyone agrees on what standards to use.

I asked her if the various entities were working on standards right now. She said she did not know if the law enforcement community was working on this issue, but she did know that the DNA community is working on it. She said they are working on standards, and on where they best apply, because certain types of DNA are better for different purposes. That is the goal, Dr. Gray said, and she believes that everyone is working toward it, but she could not say specifically what the different communities are doing.

Dr. Gray’s second recommendation would be in the policy arena; she said it is important to have the permissions to check against each other’s data. She said that, of course, applies to any modality or any database. “Just because you have data, it is not as though you can check it against anybody’s database. Nor would you want to. You are entrusted to protect this data—not just use it for your own desires.”

She said we must make sure we have the authority for every check we make. Dr. Gray pointed out we have plenty of authorities, but she cautioned not to assume authority. She noted INTERPOL and the FBI already have many agreements. She said her task force, through the FBI channel, could now also link up with INTERPOL. She said many of her connections with other databases are through the links the FBI has already set up.

I asked Dr. Gray if she believed the DoD would be willing to allow DHS to screen potential immigrants against the DoD terrorist database. Dr. Gray was quick to point out they do not have a terrorist database, per se. She said they do not call it a terrorist database because it contains many types of persons of

interest. She said they might be foreign nationals who are working for us in theater. She stressed the database consists of “non-U.S. persons,” and said the database also contains people who are on our side and helping us. Dr. Gray said part of the benefit of having an interagency construct is because no agency is a stovepipe. She stressed the only way we can have good, solid, integrated national security is if DoD has access to DHS, Department of State, Department of Justice, and vice-versa. She said we should all be able to check, as appropriate, not just carte blanche, but as appropriate, each other’s databases. For instance, she said if Customs and Border Protection picks up somebody crossing the border, it would be nice to know if they have applied for a visa, if they have an arrest warrant, or if they used to be someone who planted IEDs. All three of those are in the “other” databases.

Dr. Gray said an interagency working group exists specifically for the purpose of coming together and federating those databases. She noted, however, that each agency has its own authorities. She commented,

I don’t have the authorities to hold data on Joe the 711 robber who steals cigarettes there, but the FBI does. The FBI, they don’t have the authority to hold data on people who just apply for visas or who applied to work overseas, but I may, and the Department of State may. However, it is through that federation of saying, ‘can we check?’ that you get the true power. And we are working hard, we the community, not just DoD, but our partners in the other agencies and departments, are working very hard on this one.

Dr. Gray noted that without a cohesive U.S. government approach toward national security, we would have a problem, adding, “It is the seams between us that they sneak through.” She assured me they have had some successes in this area.

I asked Dr. Gray how she views the ability of local, state, tribal, federal and international partners to achieve interoperability in this area. She said she feels very good about it, adding, “Everyone understands the value of standards, and they are driving toward it.” She noted they still need to tweak the process

and to work out some policy issues, but she said everyone understands the value of being part of a federated approach instead of a stovepipe of excellence. She said she feels very good because everyone understands the standards are the *Rosetta Stone*. The standards make the difference between what we can communicate with each other. She is glad everyone is striving toward that. She noted they are not saying, "Well, we are INTERPOL, or we are California; we don't want you to know what we know."

Instead, she said, they are saying, "I want you to check, because you may be the person who catches my bad guy."

Dr. Gray said she has observed a bit of a paradigm shift on the willingness of agencies to share information when appropriate and when authorized. She sees the lack of standardized resources as the biggest challenge in the internal data sharing. She said, "We have all of these different areas with different, varying levels of expertise, varying funding levels; I mean, how many places are there that can afford what you see when you watch CSI?"

She said in real life it is not like CSI and in real life, some of these places do not even have a DNA capability; or if they do, they use it only on major cases. Dr. Gray quipped, "It's not automatic like you see on TV where they've got, like a kabillion swabs from everybody that's done anything."

According to Dr. Gray, the funding issues really could cripple such an endeavor. She noted that the richer districts and precincts might very well have a capability that really is not even achievable in some of the other areas. She said she does not know if the tribal communities even have that kind of databases, and thought they might just rely on the local and state authorities around them. Dr. Gray believes it is harder in the tiny, poor districts. She said at the international level there are areas where it would be harder too, but there are options. For instance, NATO is a collection of nations working together toward the common good of the world. Dr. Gray believes that through the NATO community we can agree to some standard of how we are going to process DNA.

She said, even if you do not have the entire world, you have a major portion of people already pointed in the same direction. She noted this at least provides a mechanism by which we can negotiate and determine a common path forward.

Comparing the national versus international information-sharing capabilities, Dr. Gray said we do not necessarily have something that can be achievable at the state and local level. Using the example of NATO again, she noted sometimes the richer countries help the poorer countries so they can all work together. She said she did not see such cooperation going on at the state level, where some of the richer states are saying, "Well let me send a check over to you so we can work this together."

I asked Dr. Gray what she felt are the potential negative implications of implementing such an information-sharing system with state, local, tribal, federal and international partners. She responded, "If the construct is kept where you are checking against other peoples' appropriately authorized and held data and you are not thinking you are going to take a copy of it, I don't see a thing wrong with it."

Dr. Gray reminded me that she had been discussing two important things. First, we would only store those things that our mission authorizes us to store. Second, we would only check against another database when we have an authorization to do so. If those two things come into play, she said, you will not have violations, you will not have this "Big Brother" thing, and you will not have Privacy Act problems. She stressed that those two things are what keeps things focused. She said that you run into trouble when you think just because you have a database you should put everybody in it, noting that some say, "If you're not guilty, what have you got to worry about?"

Dr. Gray pointed out that we are innocent until proven guilty, first, and secondly, there is the issue of unreasonable search and seizure. She said this is a virtual mechanism for search and seizure. She stressed the importance of ensuring that we store, match, and share only where authorized.

Specifically addressing the issue as it relates to immigration, Dr. Gray said if people were applying to immigrate to the United States, you would think they are good guys, but they may not be. She said in order to protect our nation we would want to conduct reasonable checks against the DNA that the DoD is collecting from IEDs and against the DNA that the FBI has collected from arrestees. She believes that is reasonable.

I explained to Dr. Gray that the proposed use of DNA testing for immigration purposes would cover not only initial admission requirements but also eligibility to remain in the United States. If a person commits a crime after admission, the government could remove him or her because of that crime. Later, when a permanent resident applies for U.S. citizenship, he or she must prove good moral character, so we usually take naturalization applicants' fingerprints and run them through FBI databases. I told Dr. Gray that we look at the whole period before they become U.S. citizens.

Dr. Gray responded that if DNA testing is part of the vetting process as a condition of the benefit, and if we have vetted this policy through our lawyers, there should be no problem with it. She seemed to think that as long as DNA testing is not arbitrary, as long as it is not personal, it should be considered within the bounds of the law. We should follow standard procedures, she advised, and follow them for everybody, not just with some. Dr Gray sees the need to consider very seriously the legal and policy decisions to determine what should happen once a person becomes a citizen. Should we remove their data? She commented,

Well, I know what my opinion would be; it would be of course you do, because my data is not in there and I am a U.S. citizen, and if that person has passed the ticket... But the world is a weird place and I am going to leave that up to the smarter people. I'm thankful I don't have to address that one, because if it was me, I'd want that data out when I become a citizen so that I'm not undergoing illegal search and seizure. Hopefully the vetting process is good and we get rid of the non-positives before we get to the point of having them sworn in.

I asked Dr. Gray to compare the value of fingerprint checks or other biometrics to the value of DNA profiles. She pointed out that each modality has its positive and each modality has its weakness. She said some modalities lend themselves to very quick throughput, and she used as an example iris scans. She said with iris scans you can have a whole lot of people come through a door really fast, just looking, and it lets them in. She said a fingerprint is also good for that, but not as good as an iris. She pointed out the weakness in iris is when people commit crimes they do not leave their iris behind. She said they leave DNA, they leave fingerprints, and sometimes cameras capture videos or pictures, for instance, from an ATM camera. That, she said, is where facial recognition comes in, if it is good enough video, and where the fingerprints come in, pulling latents and matching to others; that is where your DNA comes in. However, she said, "You wouldn't use DNA for access, because then it would be like that movie, *Gattaca*, where, coming through, you get your finger poked every day. That's ridiculous."

Dr. Gray said you receive the real benefits of biometrics when you link the modalities together in a multimodality construct. She said you may be 90 percent sure that this iris belongs to this person, and 90 percent sure that this fingerprint belongs to this person, but if you have both their iris and their fingerprint, you can be 99 percent sure that you have the right person. So, she says, if someone wants access to some super secret underground nuclear bunker, you would want to check fingerprints, irises, voice, face, and do the whole thing. DNA, she said, cannot be collected at a distance, so may not be appropriate in this particular instance.

I asked Dr. Gray how she felt about the ability of DHS, working with the FBI, DoD and others, to maintain the strict privacy standards and record of integrity that the FBI has maintained with their DNA database over the past 20 years. I clarified that as far as I know, as far as I have read, nobody at the FBI has sold anybody's DNA information to anybody or abused it. They have kept the privacy standards. They have strict rules for storing, accessing and

protecting the data. Dr. Gray said she felt very good about this. She said she does not think there is a problem at all, as long as you look at the standards and apply them appropriately. She noted that there is one set of standards when you are going to go to court and another set of standards when you are just trying to identify. Therefore, the standards themselves, she said, may be different.

She said that protecting the data might be a little different too. For instance, she may have a database that includes fingerprints of people who want to walk through that door. “Well, I certainly want to have that database. I don’t want somebody to tell me I can’t have it because some of my employees are U.S. persons, or I can’t have it in this space because I’m not under armed guard or something.”

Dr. Gray said you have to apply the reasonability test. She said in general, when you talk about protecting the data, it is not just about protecting the rights of the individuals you have the data on; it is also about protecting the mission of the organization holding the data. She warned about the possibility of entities damaging the DHS mission by messing with the integrity of the DHS database, letting out copies of the database, or adding unauthorized information to the database. Dr. Gray stressed that protecting the integrity of the database is “the lifeblood of this business, because you have to be able to trust it and trust it fully.”

Dr. Gray believes all the other agencies and departments could be just as successful as the FBI in protecting DNA data.

Reportedly, the Department of Defense has collected DNA samples from U.S. soldiers for many years, for use in identifying casualties. I asked Dr. Gray about this, and about whether there had been complaints from the soldiers regarding the requirement to submit their DNA. She said she has never heard of any complaints. I asked if the data had ever been misused. She said no, and pointed out that it has a very specific use. She said the way the process works is

when they have a casualty then they run a DNA sample to make sure that it really is the person that they think it is and that there is no mix-up. They want to make sure someone did not put the uniform on a local national or something. Dr. Gray assured me that they are very focused, and that they do not use the DNA for medical experiments or for anything like that. “It’s specifically used in this case, and we need that,” she said

I asked if she would say that the DoD has a good record for protecting DNA samples or profiles. She said DoD has a great record, and pointed out that is because they have very tight rules on that. Dr. Gray identified two kinds of DNA records that DoD has. First, they keep DNA on their service members. Second, they keep a database of non-U.S. persons. These people might work for us, or they may be detainees or other persons of interest. Dr. Gray stressed the service member and non-U.S.-person databases are two separate types of records and are never mixed.

I questioned Dr. Gray further on the non-U.S. persons’ database. She said they do not tag the persons as “good” or “bad.” She pointed out any biometric is agnostic, noting a biometric does not tell you if a person is good or bad; it just tells you an identity. She said somebody else has to apply that judgment on it. As an example, she said maybe the Intel community is saying, “This is a bad guy” because they have a modality identifying him from an IED, or “this is a good guy” because this person is telling us things.

Dr. Gray stressed that the data is strictly agnostic. It will help to identify. Then you have to verify. She said it is the associated data or the contextual data that makes a difference.

When I asked Dr. Gray if she believes we could expand DNA testing for immigration purposes while still considering the privacy concerns of the immigrant population, she said she needed more information about the current process. I explained that right now we take photographs and run name checks

for all applicants for permanent residence or citizenship and that we just take fingerprints for those people between certain ages.

She suggested for immigration purposes to use fingerprints, face, and a DNA swab. Depending upon what the legal community said, once the intending immigrant becomes a “U.S. person” we might want to put it inactive or something like that, she added. Dr. Gray thinks those three modalities would probably be all we would need. She did not think that we would need some of the other more bizarre modalities.

Dr. Gray said one good point about DNA is it can verify familial ties. She noted it could be especially useful in the immigration context since we often grant immigration benefits based upon relationships. I mentioned that I was concerned about the number of 13-year-old girls we interviewed in Africa whose alleged fathers had petitioned for them. These girls had never met, and knew practically nothing about their alleged fathers. Dr. Gray acknowledged the value of DNA testing in the immigration arena because it helps add strength to fraud prevention and human smuggling. She said, though, that she would only do swabs, rather than blood samples to obtain DNA.

Dr. Gray also acknowledged the potential value to our intelligence community of DNA testing in the immigration process. She said, for instance, that the IC could say, “This is Saddam’s three sons and here is what they are doing.”

I asked Dr. Gray how she believes we might win over opponents to expanded DNA testing who say it is a violation of Fourth Amendment rights to privacy. First, she said she would codify the exact process for checking the data. She said that we have to assure the public this is not just a random check whenever we feel like it. Instead, she said, we must show we have a certain set of authorities that we use and we will only check the data in those cases. Dr. Gray said these measures would comfort people, knowing that we are not going to collect their DNA and then use it to hunt them down for the rest of their lives.

She raised the question of what Hitler might have done with this kind of data. She said that he could have been much more effective in his reign of terror. Dr. Gray pointed out that people have an innate fear of turning over their very identity.

Second, Dr. Gray said she would implement the expansion in phases. She suggested, for instance, starting with people from a certain region of the world, possibly a region where there is a critical need to be able to verify family relationships. She said to run it as a trial, see what happens, and then expand it from there.

I asked Dr. Gray if, given all of these issues, she believes it is feasible to implement DNA technology to establish identity, protect against immigration fraud and human smuggling, and enhance security checks that will protect the public. Her response was,

Absolutely, but, one of the things that will have to really be strengthened is chain of custody on the samples. You have to figure out where you are going to take the samples, and then from that point on, have positive control. Otherwise, they're going to take a sample, you're going to get 48 samples that are just alike because they took them all from the neighborhood boy who is sitting down there selling newspapers or something. You have to have the utmost of integrity on chain of custody on that data or it will not be worth anything.

I told Dr. Gray the plan was for the people who are already in the United States to go to the USCIS Application Support Centers (ASCs) where people go now to be fingerprinted and photographed for their benefits. The ASC would take their fingerprints, photographs and DNA swabs at the same time, to tie them all together. Such people may already be in the United States for one reason or another and are applying for adjustment of status or petitioning for a child, parent, sibling or another family member overseas.

Dr. Gray was concerned that we may have trouble collecting and linking DNA from "U.S. persons" to other databases. I suggested that we could possibly

specify that for U.S. citizens we would only use the sample to prove the relationship. She thought that might be a good solution. I said if we had already taken a petitioner's DNA when he immigrated to the United States, we would have it on file and would not need to take a new sample when he petitions for other family members. Instead, we could just match it against the person for whom he is petitioning. We could say, "Oh, yes, this is definitely your mother. Your petition is approved."

Dr. Gray said our legal people would really have to work through this area of U.S.-citizen DNA. I pointed out that we already have the authority to fingerprint some U.S. citizen petitioners under the Adam Walsh laws because some people petition for women who have children in order to bring them here and then abuse the children. Dr. Gray said that is something to keep in mind and again stressed the importance of using our legal team. She said they are able to give you the necessary capabilities if you need to put U.S. persons in the database. There are certain times when you would want to put a U.S. person in the database. Get legal authorization for it before you do it and then you can.

Dr. Gray said there might be times, under special circumstances, when we would want someone in the database who would not traditionally be in it. She said if a soldier disappears overseas or becomes missing in action, the DoD would want to have the soldier's data available in case someone comes upon him. She said, "Just get Legal to help you walk through it. They'll be your best friends."

I told Dr. Gray that currently no regulations exist to allow USCIS or the Department of State to require DNA testing in immigration or visa cases. Instead, applicants and petitioners submit DNA on a voluntary basis, usually as a last resort, when the evidence is insufficient and it appears that the government will deny the application or petition otherwise. So it is being used at times, I said, but there have been problems with the chain of custody. I mentioned that DOS has just amended the Foreign Affairs Manual (FAM) in an effort to strengthen the integrity of the process overseas. DOS now requires that overseas collection of

DNA samples take place at the U.S. embassy in the presence of a cleared American employee (U.S. Department of State [USDOS], 2009). Dr. Gray agreed this process would be a big improvement over the current one.

She raised the issue of one state with a law that forbids denying benefits or hampering someone's ability to go into work by virtue of a person refusing to provide biometrics. She said there was a person who actually had a DoD badge in that state without a picture on it. Dr. Gray thinks that policy was unreasonable and believes that they eventually reversed it. I said I thought every U.S. government employee must submit to fingerprinting. She said the case in point was a bizarre case that was guided by state law, and believes that particular case might have been pre-911. She noted that she did not believe the law applied to obtaining a driver's license, thinking a case on that issue came down to the notion of a privilege versus a right. They said, "If you want to drive, you have your picture taken."

In closing, Dr. Gray again stressed the importance of working closely with our lawyers. She said, "They will be your greatest nemesis and your best friend, because they'll make you think through the hard issues. But don't let them say 'No'; Make them help you get to 'Yes.'"

She said counsel's first answer would probably be that we could not do any of this. She advised us to then lay out our objectives and point out that we need DNA to prove familial relationships, and ask them to tell us how to do it. Then, she said, we should make them walk us through it with the right procedure, the right constraints, whatever it is. She said we should make them do the hard work to come up with the scenario where we can use this capability, but not abuse it, and get what we need to do our mission.

"And you will get there," Dr. Gray said. "You will get there. It is very exciting. I certainly hope that they do this."

She warned that we would have to do this very sensitively because some people may be scared of these environments. She pointed out that immigrants

often come from places where there is no freedom, there is a lot of fear, and there is tyranny. Some of them, she said, may think that the government will track them. However, she noted, that is not how it is.

Dr. Gray feels much depends on how you present the idea, and said we might want to present it as a benefit or an enabler. "You are enabling somebody to become a citizen. That is what you are doing." She thought such an approach would be better than saying, "We're going to check you out, because we know that you're bad," and then, "Oh, by the way, we're going to keep hunting you down later."

Dr. Gray advised me to focus on the presentation. She said we might want to twist it a little, and explain how we will help them prove they have a valid family member who deserves to come over here and be with them. She said we should assure them we are going to help them bring the family member and that DNA testing is going to enable it. Then, she said, we must tell them the circumstance under which we will use that data and how we will get rid of it when they become a U.S. citizen, or whatever the legal decision turns out to be.

I pointed out that there are legitimate applicants who live in countries where birth certificates are very unreliable or where many of the births are never registered. Those people might really welcome the ability to go straight to DNA testing and get it over with, instead of wasting time and money trying to buy fake documents that we keep rejecting.

Dr. Gray agreed, and said the other thing she wanted to stress was the importance of chain of custody. She said the number one thing is going to be protecting the DNA and the database. As soon as somebody tampers with it then the integrity of the database and everything you do with it comes under questioning.

Dr. Gray said she thinks that expansion of DNA testing in the immigration process is an exciting endeavor, and she hopes that we can get it working. She said the next step would be to figure out how we can check against the DoD data.

I asked if the DoD currently shares with or checks against the FBI databases. She said the FBI is her closest associate in the interagency construct, noting that her task force works with the FBI CJIS (Criminal Justice Information Services) database. She pointed out that DNA is not as mature a modality as fingerprints and if we have a fingerprint and we already know some of the linkages with the other modalities, the results are a lot better. However, she said, “We do have the capability to do DNA; it is just not as standard to run everything through the database all the time.

I let Dr. Gray know we had been working with DHS Science and Technology lately on the rapid DNA project and said I understood DoD had also been working on it. She said she is very excited about that new technology because the processing for DNA is so different. She said right now, you end up with spit or blood instead of a print that you can instantly just stick in the computer. She thought the possibility of up-front processing with the rapid DNA machines is very promising.

SUMMARY OF THE FINDINGS—Interview with Dr. Myra Gray

What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists? Dr. Gray noted that DNA is the gold standard in identification but said because DNA can provide more personal information than just identity we must handle the information carefully. She pointed out that USCIS must implement policies specifically outlining what the permissions are for collecting and using DNA. She advised working carefully with our lawyers to ensure that the policies, procedures and regulations are

carefully developed. If the public is to entrust the government to protect the data, the government must ensure they have the authority to access the data each time they do so. She said codifying the process and assuring people that it will only be used for the stated purposes would help to comfort people, and acknowledged that some people have an innate fear of turning over their very identity. She recommended implementing DNA testing in phases; for instance, she said to start out with a trial based on a critical need and see what happens and expand from there. Dr. Gray added that before beginning, USCIS must be able to assure integrity in the chain of custody. She stressed that much of the success of implementing the DNA testing will depend on how we present the idea. **What are the financial incentives and the benefits of up-front DNA testing to USCIS stakeholders?** Dr. Gray pointed out each biometric modality has its benefits and each has its weakness. She said we could realize the real benefits of biometrics in a multimodality construct, where, for instance, we combine fingerprints, iris scans and DNA. She noted a person does not leave his or her iris scan behind at a crime scene, and you cannot prove biological relationships with iris scans, but DNA is useful for those things. On the other hand, at least for now, you cannot test the DNA of people as they pass through a doorway. Gray believes in order to protect this nation, if someone is applying to immigrate to this country, it is reasonable to check their DNA against a database of DNA collected from IEDs or against the FBI's criminal database. She said DNA has added value because it can verify relationships that are the basis for immigration benefits and that could also assist our intelligence community. Dr. Gray considers the DNA expansion for immigration an exciting project and hopes that it will succeed. **What are the legal and privacy issues that USCIS must consider, and what policy, regulatory or legislative changes are needed?** Dr. Gray thought it was reasonable, especially regarding people seeking "U.S. person" status, for USCIS to have the right to screen them before granting such status. She thought the issue became less clear once an applicant becomes a U.S. permanent resident or citizen. Stressing the importance of establishing

protocol, she said we should only store what our mission authorizes us to store and only check against other databases when we have the authorization to do so. She said if we meet these two criteria, there should be no violations, no “Big Brother” accusations, and no Privacy Act problems. To avoid accusations of unlawful search it is important to ensure that we store, match and share only where authorized. Dr. Gray said if we continue to keep immigrants in the DNA database even after they become permanent residents, she thinks that is fine, as long as the process has been vetted, and as long as it applies to all in that situation. However, she believes we should look carefully at the question of what to do with the profiles after the people have become U.S. citizens. Dr. Gray sees no reason why DHS cannot be as successful as the FBI has been for years in protecting the databases and noted that protecting the integrity of the database is of the utmost importance. She said the DoD has been storing DNA for U.S. military personnel for many years with no objections and no problems. **How can interagency collaboration play a role in this effort and benefit from it?** The first priority for Dr. Gray would be that everyone is using the same standards worldwide. She said without standards, information sharing is difficult if not impossible. She noted that the FBI already has multiple agreements for information sharing, and said that her organization uses the long-established FBI links to connect to INTERPOL. The FBI is her closest associate in information sharing and Gray would like to see USCIS be able to check against the DoD database as well. Noting that no agency is a stovepipe, Dr. Gray believes the only way we can have good, solid, integrated national security is if the myriad U.S. agencies are able to check each other’s databases. She said, “It is the seams between us that they sneak through.” Gray pointed out, however, that the agencies should only check where appropriate and authorized. She is confident that local, state, federal and international partners can achieve interoperability in this area, and said they continue to work toward this. The parties are seeking common standards because they realize the benefits. Dr. Gray believes some of the smaller jurisdictions, including the tribal authorities, may need financial and

other assistance to achieve capability in this area. She thinks it might even be easier to achieve internationally because of foreign aid programs.

4. Overall Interview Findings

All of the experts interviewed agreed that it is feasible to expand the use of DNA testing in the immigration process while still maintaining a reasonable expectation of privacy. Here are some of the common themes:

- The importance of establishing standards, and of coordinating the effort with partners to ensure interoperability;
- The importance of cyber security and protecting the databases;
- The importance of public perception and marketing, making sure to focus on the benefits of the project;
- The importance of maintaining integrity in the chain of custody;
- The reality that current laws and regulations do not guide DNA testing in the immigration process and those will evolve as the technology is used and challenges arise; and
- Although the FBI and the DoD have stored DNA samples for decades, they have never exploited or misused those samples because there are strict laws and safeguards in place to protect against the possibility.

B. HAITI

In Haiti, an unusually large percentage of applicants and petitioners resort to DNA testing. For that reason, I visited Port au Prince in May 2009. Approximately forty percent of the births in Haiti are never registered. In order to meet documentary requirements to provide a birth certificate, most Haitians try to obtain one by any means possible. Often they are the victims of document vendors who charge high prices and provide documents that USCIS or DOS

reject as fraudulent. Most legitimate applicants in such situations would prefer to go straight to DNA instead of wasting money to purchase documents that will not help them. However, they often have to make every effort to provide birth certificates first and then resort to using other secondary documentary evidence. They usually can only volunteer for DNA testing as a last resort. This means they waste money procuring documents and having them translated when they know that USCIS or the Department of State will probably reject them. This process wastes the time of USCIS, DOS and their customers.

The USCIS and DOS employees I spoke with in Haiti thought legitimate applicants as well as the officers who adjudicate the applications and petitions would welcome expansion of DNA testing early in the process. Fraud in Haiti is rampant and almost no document can be trusted. Officials there have discovered high rates of fraud through DNA testing. When a consular officer suggests DNA testing in Haiti, the results, on average, verify approximately 30% of the relationships and disprove 30 percent, while 40 percent of the people never follow through with the testing. This failure to follow through could be because the applicants or petitioners know DNA will reveal the fraud or it could be because they cannot afford the costs of the test. Some people voluntarily provide the DNA, not realizing the power of the technology and believing that they can beat the test by chewing on a certain type of leaf. The only down side any of the officers saw was the cost, because currently the costs using the AABB labs are very high. DNA testing is valuable not only for visa cases but also for citizenship cases, where the child is seeking U.S. citizenship based on parentage.

DNA testing is also useful in Haitian adoption cases in order to verify that the alleged parent who has given a child up for adoption is actually the parent of the child. Adoptive parents (many of them American) pay \$15,000-\$30,000 for an adoption. Some adoption lawyers in Haiti see this as a lucrative business and often obtain documents through fraud. They encourage the Americans to bond with the child even though they know the child is not legitimately available for

adoption. Sometimes people kidnap children and sell them for adoption, and the person claiming to be the biological parent who is giving the child up is not even related.

I visited an orphanage in Port au Prince and spoke with the director about the use of DNA in adoption procedures. The children's biological parents, who are too poor to care for them, often leave them in the orphanage so that someone will feed and educate them. Sometimes the biological parents give their children up for adoption in order for the children to have a better life. The orphanage director said the children adopted from her orphanage go to one of three countries: the Netherlands, France or the United States. The Netherlands requires DNA testing early in the process for all children to ensure that the claimed parents who are relinquishing their children are truly the parents. France does not require DNA testing. For the U.S. cases, USCIS suggests DNA testing late in the process and in probably forty percent of the cases, she said.

USCIS requires an informed consent interview with the birth parent(s) before processing the orphan petition in cases where a child's parent is still alive and has relinquished the child. During the interview, USCIS tells the biological parents they might never see their child again and that the child will never be able to petition for them. This interview usually takes place late in the process. Sometimes the biological parents change their minds about relinquishing the child. Often by this time, however, the prospective adoptive parents have visited the child in Haiti several times; they have become emotionally attached. They do not want to accept that the adoption papers may not be legitimate or that the person who has relinquished the child is not even that child's parent. Most of these American prospective parents are not involved in fraud; they are just naive. It is clear USCIS should require the informed consent interview and DNA testing earlier in the process.

One of the petitions USCIS officers adjudicate in Haiti is the I-730 Refugee/Asylee Relative Petition. A refugee or asylee in the United States may file this form to bring a spouse or child to the United States as a derivative asylee

or refugee. In Haiti, the case size averages 6–10 children and approximately 80 percent of the I-730s on behalf of children eventually lead to DNA testing.

When requesting documents in Haiti, USCIS officials always tell people to go to government offices to obtain documents, not to a third party. Often, however, someone outside the government office tries to “help” them and sells them documents. U.S. officials reject such fraudulent documents. Even if applicants seek the documents from a government office, USCIS says people in Haiti are often at a disadvantage because of the lack of availability of legitimate documents. Sometimes the relationship is valid, but often by the time the person is able to prove it, it is too late. DNA testing early in the process would help these people.

For example, one following-to-join son of a HRIFA (Haitian Refugee Immigration Fairness Act) applicant came back with three different fraudulent documents. He finally turned 21 and aged out, so was no longer eligible. DHS tried to verify the document with the Haitian authorities and found that his birth was never on record. However, it is estimated that possibly 40 percent of the births in Haiti are not recorded. DNA could have proven this young man’s relationship to his parent, as long as the relationship existed.

It is costly for USCIS to attempt to verify documents in Haiti. Sometimes a USCIS officer has to drive six hours to reach a site, attempt to verify the documents, spend the night and drive back. This takes officer time away from other cases, requires use of a government vehicle and the costs of a driver, gas, hotel and meals. DNA testing early in the process would save such resources.

The U.S. Government could save other resources with up-front DNA testing because it would not forward the visa petition files to the overseas locations if the DNA has already proven that the relationship does not exist. The cost of shipping and storing files, not to mention the security implications of possessing those files in case of evacuation, are tremendous.

Every consular officer I spoke with agreed that DNA is a big deterrent to fraud. Some said they are concerned about the integrity of the collection process in the U.S. They wanted to know if government employees witness the collection of DNA samples in the United States, as they soon will be required to do in Haiti.

American Association of Blood Banks (AABB)-certified labs in the United States use two facilities in Haiti to collect DNA samples for U.S. immigration relationship testing. I visited one of those labs, which works with approximately a dozen of the U.S.-based AABB-certified labs. The AABB labs contract with the local Haitian facilities to collect the samples and send them to the United States. I observed a number of points in the process where vulnerabilities existed that could threaten the integrity of the chain of custody. However, since that time, The Department of State (USDOS, 2009) has amended Chapter Nine of its Foreign Affairs Manual (9 FAM) to require that all DNA collection overseas take place at the U.S. embassy in the presence of a cleared American employee. This change should greatly improve the integrity of the chain of custody of DNA at all overseas collection locations.

SUMMARY OF THE FINDINGS—Visit to Haiti

What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists? The observations in Haiti highlighted the benefits of expanded DNA testing early in the immigration process. Bringing these benefits to light could boost the case to the public; as several experts have pointed out, social acceptance is essential to expansion of DNA testing. Most people I spoke with believed legitimate Haitian applicants and petitioners would welcome routine DNA testing early in the process. **What are the financial incentives and the benefits of up-front DNA testing to USCIS stakeholders?** Up-front testing would help applicants verify their claimed relationships and process their cases more quickly. It would deter fraud and

human trafficking, including trafficking of children. DNA testing early in the process would also save money and time in file movement and storage, interviews, and investigations. It would enable applicants and petitioners to avoid the cost of procuring, translating and delivering fraudulent documents in an attempt to meet the documentary requirement when no legitimate document is available. The only down side most people observed to up-front DNA testing was that currently DNA testing is very expensive. Expanded DNA testing, with the government controlling it, would greatly reduce costs and increase the integrity of the chain of custody. DNA would also be valuable in screening for crime, as many Haitians have already spent time in the United States. In neighboring Dominican Republic, criminals come from all over and pay thousands of dollars to obliterate their fingerprints using plastic surgery. Many do this to hide their past crimes and change their identities so they can travel to other countries (Singh, 2008). People cannot alter their DNA, as they can alter fingerprints or other biometrics, like iris and face. **What are the legal and privacy issues that USCIS must consider, and what policy, regulatory or legislative changes are needed?** Observations in Haiti highlighted the fact that we must change policies and procedures to better control the chain of custody of DNA. We should also allow for DNA testing early in the process, as primary evidence of a relationship. **How can interagency collaboration play a role in this effort and benefit from it?** In Haiti, it was clear that the Department of State and USCIS are already cooperating in the limited DNA collection efforts currently under way. Such cooperation is mutually beneficial to both agencies. The DOS will enhance the integrity of the DNA collection process with their new guidance that requires DNA sample collection to take place in the consular section in the presence of a cleared American. **What role might DNA testing play in any future comprehensive immigration reform?** In considering immigration reform, with some path for regularizing the status of a portion of the 12 million people who are currently in the United States illegally, one must consider people from countries like Haiti. Haiti is not alone in the world in lacking

adequate and reliable legal civil registries. DNA testing of illegal aliens seeking legal status would enable USCIS to lock in a person's claimed identity, and that identity would stay with him from that time on. If the person claims beneficiaries, the DNA could support the claimed relationships. It could also help to screen the applicants for crimes and terrorism, to protect the American public. Any proposed program to regularize status would require careful screening of applicants. DNA is a valuable screening tool that would help to ensure the U.S. government does not grant leniency to those who are undeserving. With Haiti's proximity to the United States, it is likely that many of those applying to regularize their status in light of an immigration reform bill may be from Haiti. A recent article estimated that there are currently more than 32,000 Haitians living in the United States illegally (Sacchetti, 2009).

C. NATIONAL DIALOGUE ON THE QHSR

This year the Department of Homeland Security conducted the first Quadrennial Homeland Security Review (QHSR). The goal was to establish the strategic foundation for homeland security activities over the next four years. The National Dialogue was a series of three online, interactive conversations in which DHS sought to engage stakeholders and other partners in the QHSR process. Participants in the dialogue were able to submit ideas, vote on other peoples' ideas, and provide comments to those ideas. The possible scores for voting ranged from one (poor) to five (excellent). I took advantage of this opportunity to raise the subject of DNA testing and receive public reaction through anonymous feedback. My first submission, on September 3, 2009, during the second dialogue, read as follows:

DNA testing as a condition of filing for an immigration benefit.

DNA is a valuable tool that would assist DHS in providing the right benefits to the right people. It can establish qualifying biological relationships of petitioners, beneficiaries and derivatives, and thus prevent alien smuggling while improving customer service to legitimate applicants. It is a unique identifier that can protect against impostors and identity theft. Already, one of the conditions

for filing for an immigration benefit is fingerprinting. DNA profiles are the fingerprints of the 21st Century. Unlike fingerprints, however, DNA is easy to collect from persons of all ages. Its added value would enhance the security screening process, enabling DHS to determine admissibility and screen out criminals and terrorists. It has proven value in solving and preventing crimes.

Why the contribution is important

DNA testing could enable DHS to meet many of its mission goals and objectives.

Goal 1: Effectively administer our immigration laws and efficiently make decisions with fairness and integrity.

- **Make Good, Prompt Decisions** -- DNA testing can establish qualifying family relationships, meaning that decisions can be reached with more certainty, using less resources and providing better customer service.
- **Ensure Real-time, Cross-agency Information**—Utilizing the FBI's CODIS program, DHS would enhance information-sharing with local, state, federal and international partners. Strict privacy policies such as those already in place would protect every person's privacy.

Goal 2: Eliminate the conditions that allow and encourage aliens to illegally enter and remain in the United States, [to include providing tools for employers to ensure a legal workforce, while holding accountable those employers who violate the laws].

- **Prevent Fraud**—Many applicants and petitioners claim qualifying family relationships that actually do not exist. DNA testing will detect the fraud and will ensure that benefits are granted only to eligible persons.
- **Eliminate Systemic Vulnerabilities**—Relying so heavily on paper documents, especially when such documents are unavailable or unreliable in many countries, creates vulnerability and threatens the integrity of the U.S. immigration system.

Goal 3: Identify, prevent admission, and remove criminal, fugitive, dangerous and other removable aliens from the United States while providing safe and humane conditions and respecting the rights of those in our custody.

- **Remove Dangerous People**—The FBI's CODIS program runs a search of its database on a weekly basis. If DNA from a crime scene is matched to the DNA of a person in the DHS DNA database, DHS would work with the appropriate law enforcement agencies to apprehend and eventually remove the perpetrators.
- **Stop Admission of Dangerous People**—Before someone is admitted to reside in the United States, a search would be conducted of criminal and terrorist DNA databases to rule out a match.
- **Utilize International Partners**—In our global environment, sharing information is essential. Sources of information-sharing, such as the INTERPOL DNA Gateway have helped to solve crimes around the world.

By the time the dialogue closed this idea had received 9 comments and 14 votes, which averaged 3.2 points. The comments varied widely. Two commenters felt U.S. immigration law should expand the definition of “family” to include informally adopted children and others who have the equivalent of family relationships but may not be blood relatives. Two of the commenters expressed concerns about the costs of DNA testing. Several commenters pointed out the benefits of DNA testing, such as its value in detecting fraud, verifying identity, solving cold cases, exonerating the innocent, preserving resources and enhancing information sharing. One person did not actually comment on DNA testing, but only expressed an opposition to all immigration. One person called it a “marvelous idea.” However, from the comments it was hard to tell whether this person was being sarcastic or if he or she truly wanted expansion of DNA testing beyond what I had suggested.

For the third and final dialogue, I submitted two ideas. On September 28, 2009, I submitted an idea that was nearly the same as the first one outlined above, although in somewhat different order, and with “as a Condition of Filing for” eliminated from the title. It received 11 comments and 19 votes, with votes averaging 2.7 points. After reading the first seven comments, I realized the

commenters might need more information. Although two of the seven were completely in favor of the ideas presented, five of them felt DNA testing was cost prohibitive. Several others expressed their opinions that the current security checks were adequate and faster than DNA would be. One person said DNA testing is an invasion of privacy. On September 30, I submitted the eighth comment myself, describing how the costs were coming down, how some people spend so much money trying to obtain documents and noting that fraud interviews are expensive. I pointed out those who are unable to pay may request fee waivers. I also pointed out both fingerprints and DNA are needed and useful in verifying identity and detecting crime, and criminals sometimes obliterate their fingerprints. Two of the three comments that followed clearly favored the idea of DNA testing. One commenter said she works in an organization where DNA testing costs \$30 per person. She does not believe DNA testing is an invasion of privacy "as long as it continues to be handled in the confidential manner in which it is now." A third commenter provided information on the United Kingdom Border Agency's DNA testing of asylum seekers.

To try a different approach, on October 3, 2009 I submitted a more generic idea of biometric collection. However, I was careful to include DNA in the tag lines. The idea read as follows:

Screen using biometrics

All intending immigrants (maybe even any non-U.S. citizen planning to spend more than 90 days in the United States) should be screened using all reasonably available biometrics databases, including those held by US-VISIT, DoD, DOJ, INTERPOL and others.

According to Homeland Security Presidential Directive 24, "Biometrics" refers to the measurable biological (anatomical and physiological) and behavioral characteristics that can be used for automated recognition; examples include fingerprint, face, and iris recognition.

Why the contribution is important

This would help to protect us against terrorists, criminals and impostors. Many people use false names to travel and this would provide one more layer of defense.

This idea received no comments, but received two votes, averaging four points.

SUMMARY OF THE FINDINGS—QHSR National Dialogue Results

What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists? Overall, the votes averaged out to indicate that this was a “good” idea. Most of the negative comments appeared to result from a lack of understanding about the costs or a lack of information about fraud and the value of fingerprints and DNA. I did not specifically label the last idea submitted as “DNA,” even though I tagged it that way. Participants voted this last one as a “very good” idea. That may mean people are less receptive to DNA than they are to other biometrics. All of this supports the idea that it is imperative to reach out to the public to educate them about the benefits and the process and to dispel any myths and fears. **What are the financial incentives and the benefits of up-front DNA testing to USCIS stakeholders?** Some people saw this as a valuable tool to combat fraud and screen for crime. One said it would “reduce paper trail clutter as well.” Many commenters feared this would be a costly undertaking, when, really, it should save money in the end. One person noted the cost of DNA testing “is many hundreds of dollars per person.” Once people see that the cost can be considerably reduced they may change their minds about DNA testing. **What are the legal and privacy issues that USCIS must consider, and what policy, regulatory or legislative changes are needed?** Only one person called DNA testing an invasion of privacy. Another person said it is not “an invasion of privacy as long as it continues to be handled in the confidential manner in which it is now.” **How can**

interagency collaboration play a role in this effort and benefit from it? Some people spoke of DNA's value in helping law enforcement to solve crimes and in exonerating the innocent. It is clear this would be beneficial to our justice system. One person noted DNA has applications that would be valuable to many agencies to enable identification of individuals. **What role might DNA testing play in any future comprehensive immigration reform?** Some of the participants do not appear to want any type of program to regularize the status of illegal aliens in the United States, with or without DNA. Others did not speak directly to the immigration reform issue.

D. EVALUATION OF ACLU COMMENTS ON THE DOJ DNA RULE

My attempts to arrange an interview with the ACLU to discuss possible expansion of DNA testing in the immigration process were unsuccessful. In an effort, however, to gain insight into the ACLU's concerns with DNA, I reviewed their comments to the Department of Justice's 2008 proposed rule to expand DNA testing by federal officers (American Civil Liberties Union [ACLU], 2008). The DOJ rule related mostly to arrested criminals, but also to non-U.S. citizens who are detained and fingerprinted. One major difference between the DNA testing in the DOJ rule and the proposed DNA testing for immigration purposes is that the DNA testing for immigration purposes would be voluntary. It is voluntary in the sense that the person knows it is one of the requirements and can choose to apply for immigration benefits or not. The DNA testing in the DOJ rule, on the other hand, is "forcibly collected," as pointed out by the ACLU.

The ACLU objected to the expanded DNA testing, saying, "the collection and retention of DNA from innocent people is an unacceptable and unnecessary intrusion into their privacy and places them at future risk of being stigmatized or discriminated against..." However, the ACLU's explanation of how DNA testing would stigmatize or discriminate against such people was not clear. It discussed the possibility that the FBI might be able to determine genetic predispositions or traits, such as diabetes. The ACLU did not explain how this might happen, how it

would harm the person or why the FBI would want the information in the first place. They also expressed concern about the possibility of expanded “familial searching.” There may be benefits as well as adverse factors surrounding familial searching, but a good example of a case in which familial searching was valuable was the “BTK” killer (Nakashima, 2008). Officials were able to identify the BTK killer through his daughter’s DNA. Had they not been able to do so, he may have continued to torture and kill innocent people.

Comments from the ACLU expressed concern that law enforcement may take the DNA samples and extract more than the thirteen core loci that the current DNA analysis process measures. The commenter worried that law enforcement would try to gain more information, such as insights into disease, physical attributes and ancestry. In the next paragraph, however, the ACLU pointed out that Congress had just passed the Genetic Information Nondiscrimination Act of 2008, which strictly prohibits misuse of a person’s genetic information. The protections are clearly in place.

Two of the ACLU’s comments may have merit, but need further exploration in the immigration context. One is the concern with allowing federal agencies to contract out DNA collection to multiple agencies or organizations. The ACLU pointed out that this may result in inconsistent approaches to handling and safeguarding DNA samples. This is a valid point, but if USCIS expands DNA testing for immigration purposes, it is not likely that it would contract it out to multiple organizations. The ACLU suggested destroying the actual DNA samples once they have been analyzed. Although it appears that measures are already in place to prevent any misuse of DNA samples, this is a topic that policymakers may want to discuss when exploring options for expanded use of DNA testing in the immigration process.

The ACLU also stated that the expanded DNA testing violated the Fourth Amendment right to be free from unreasonable searches and seizures, likening it to a warrantless search. However, DNA testing for immigration purposes would be voluntary as it would merely be a condition of applying for a benefit. There

would be no expectation of privacy as it relates to DNA testing; instead, the expectation would be that it is a required condition of applying for the immigration benefit. The applicant has a choice whether to apply for a U.S. immigration benefit or not. The ACLU spoke about the difference between taking DNA from convicted felons versus from those convicted of misdemeanors, and mentioned the loss of other rights when convicted of a felony. However, the ACLU made it appear as if submission of DNA is a form of punishment when, in fact, it is a crime prevention and identity management tool.

One of the ACLU's complaints was that collection from arrestees would "exacerbate existing racial bias in the criminal justice system." They worried that this would increasingly skew the DNA database to include an inordinate number of blacks, making them more likely than others to be implicated in future crimes. However, DNA would only implicate someone if his DNA were found at a crime scene. On the positive side, DNA might prove a person's innocence earlier in the process when his DNA is already on file.

If USCIS expands DNA testing for immigration purposes and adds the DNA profiles to the national database, this would improve the balance and positively alter the current racial skew. According to the 2008 Yearbook of Immigration Statistics (USDHS, 2009), the approximately 12.6 million permanent residents in the United States come from a variety of countries, representing wide racial variations. Mexico has the largest representation by far, with 26.9 percent, or 3.4 million. The next two countries with the highest number of U.S. permanent residents are the Philippines and India. In fact, out of the top 20 countries, 7 are from Asia, representing 19.3 percent of the 12.6 million total, and Canada, United Kingdom, Germany and Poland are also in the top 20, representing 7.6 percent combined. Adding all immigrants would bring more racial balance to the database. We would not target certain groups, but instead would test all immigrants.

Table 1. Country of Birth of Legal Permanent Resident Population: 2008

Country of Birth of Legal Permanent Resident Population: 2008				
Legal permanent residents			Legal permanent residents eligible to naturalize	
Country of birth	Number	Percent	Number	Percent
Total	12,600,000	100.0	8,160,000	100.0
Mexico	3,390,000	26.9	2,720,000	33.3
Philippines	570,000	4.5	300,000	3.7
India	520,000	4.1	220,000	2.7
China, People's Republic	510,000	4.0	200,000	2.5
Dominican Republic	420,000	3.3	290,000	3.6
Cuba	350,000	2.8	220,000	2.7
El Salvador	340,000	2.7	260,000	3.2
Canada	330,000	2.6	260,000	3.2
Vietnam	330,000	2.6	200,000	2.5
United Kingdom ..	290,000	2.3	230,000	2.8
Korea	270,000	2.1	170,000	2.1
Haiti	230,000	1.8	140,000	1.7
Jamaica	230,000	1.8	150,000	1.8
Colombia	220,000	1.7	110,000	1.3
Germany	180,000	1.4	150,000	1.8
Guatemala	180,000	1.4	110,000	1.3
Poland	160,000	1.3	100,000	1.2
Peru	130,000	1.0	70,000	0.9
Japan	130,000	1.0	100,000	1.2
Pakistan	120,000	1.0	60,000	0.7
Other	3,700,000	29.4	2,100,000	25.7
Note: Detail may not sum to totals because of rounding. Source: U.S. Department of Homeland Security.				

One of the ACLU's complaints was that the proposed rule would disproportionately affect immigrant communities. The ACLU described the unfair registration program implemented after 9/11 that targeted mostly the Middle

Eastern population, requiring them to complete a detailed registration process. The difference in the proposed program is that USCIS will collect DNA from all immigrants who are applying for long-term benefits; it would not target any particular group. The ACLU did not adequately describe the negative impact that having their DNA in the database would create for immigrants. It would have very little negative impact on them at all; it would only affect them if they committed a crime and left their DNA at the scene.

In its comments, the ACLU criticized the forcible nature of the DNA testing as outlined in the 2008 proposed rule. As mentioned earlier, this would not be an issue in any expanded DNA testing in the immigration process because the DNA submission would be voluntary, as a condition of the application for immigration benefits.

The ACLU also commented that expansion of DNA collection to the “innocent” (in this case, arrestees and non-U.S.-citizen detainees) is unnecessary and unlikely to make us safer. They believe that such people should not be in the database. They said that adequate procedures are already in place for law enforcement to obtain a warrant for DNA or to gather DNA with probable cause and exigent circumstances. However, as Michael Smith mentioned in a 2006 article, 57 percent of those arrested for rape in a given year have never been arrested on a felony charge and 42 percent have never been arrested at all. Many other reports indicate similar findings. One case that highlights how more widespread DNA collection could assist law enforcement is that of Deniz Aydinler. After he brutally tortured, raped and murdered a young woman in her dormitory room (Bernstein, 2004), it took police nearly three years to bring him to justice, but not for lack of trying. With no clear suspects, police took DNA samples from approximately 500 males in the community before they were finally able to identify Aydinler.

The ACLU noted that the collection and retention of DNA from millions of innocent people is unlikely to further the cause of justice. They said, “As the database expands to people convicted of minor offenses or those merely

arrested or detained, the chances that any given profile in the database will help resolve a future crime diminish.” To the contrary, many studies have shown the value of placing arrestees into the database. For instance, the City of Chicago conducted a study in 2005 that tracked eight criminals. After their first arrests, these eight men went on to commit a combined total of 22 murders, 30 rapes, 1 attempted rape and 1 aggravated kidnapping. Had authorities collected DNA at the time of the first arrests, they could have prevented the subsequent rapes and murders. Some of the first arrests of these eight men were for crimes such as theft, drug possession and burglary.

Laboratory backlogs were another concern of the ACLU. They asserted that the rule might undermine law enforcement as a result. However, many law enforcement backlogs are due to funding issues. If USCIS expands DNA testing in the immigration process, it would add the costs, which should be minimal, to the current biometric fee. Funding would not be an issue and as long as funding is available, they can expand lab capacity to accommodate the need.

The ACLU pointed out that, because the 2008 DOJ proposed rule provided too many exceptions, it failed to clearly specify who would be required to provide DNA samples. This failure to specify, the ACLU asserted, violates due process, Congressional intent, the APA (Administrative Procedure Act), and the Privacy Act. The issue is certainly worthy of careful consideration when USCIS promulgates rules to expand DNA testing in the immigration process. However, it is unlikely to be a problem because the proposal is to obtain DNA from all applicants who are applying for long-term benefits. Although USCIS makes exceptions and often waives fingerprint requirements for such reasons as age or amputations, they would not need to make exceptions for DNA collection, as it is easy to obtain from persons of all ages, and amputations have no relevance.

Other concerns that the ACLU raised also merit consideration when USCIS develops policies and procedures for expanded DNA testing. The DNA testing guidance should clearly specify exactly whom USCIS will test, who will conduct the testing, where they will conduct the testing, and what protocols they

must follow. It should also address conditions, such as requiring USCIS to capture the photograph, fingerprint and signature at the same time that they capture the DNA. Requiring simultaneous biometric capture would avoid the need for people to provide samples multiple times. If USCIS can verify through a fingerprint that the person's DNA is already on file then his DNA will not be captured a second time. USCIS will develop rules governing challenges to the results or procedures to confirm a match when someone's DNA matches to a crime scene

Standards were another concern of the ACLU. It is clear that standards must be a priority in any expansion of DNA testing in the immigration arena.

Finally, the ACLU expressed concern about storage of the actual DNA samples. There may be good arguments for storing them, and there may be good arguments against this. USCIS will have to weigh these issues, with input from all stakeholders, and carefully consider them before making a final decision.

SUMMARY OF THE FINDINGS—Evaluation of ACLU Comments

Without the ability to interview a representative from the ACLU, one can only presume the answers to the following two questions, based on this evaluation. **What factors might promote the diffusion of innovative DNA technology to help USCIS establish identity, protect against immigration fraud and human trafficking, and enhance security checks that will protect the public against criminals and terrorists?** USCIS may have an opportunity to promote to the ACLU the positive benefits of expanded DNA testing in the immigration process. The ACLU complained that the current DNA database is racially skewed because it contains a disproportionate number of blacks. Adding all immigrants would bring more racial balance to the database, so the ACLU may see this as a positive. On the other hand, they may object to the large proportion of immigrants in the database. The ACLU complained about the forcible nature of the DOJ-mandated DNA testing. Since the U.S. government does not force anyone to apply for immigration benefits, DNA testing in the

immigration process would be voluntary. The ACLU complained about the possibility of familial testing to solve crimes, but USCIS can point out that familial testing has the potential to reunite families. The ACLU may like the idea that DNA testing up front in the process, with costs built into the USCIS fee schedule, would especially help refugees, asylees, and those applicants from countries where legitimate documents are hard to obtain. DNA testing will help to speed benefits and reduce costs for everyone, and those who cannot afford the biometric fee can apply for a fee waiver. The only applicants it will not help are the fraudulent applicants and the criminals. **What are the legal and privacy issues that USCIS must consider, and what policy, regulatory or legislative changes are needed?** The ACLU is clearly concerned about privacy and other Constitutional issues. USCIS must be just as concerned about such matters. In their comments to the DOJ proposed rule, the ACLU complained that the rule violated due process, the APA and the Privacy Act, because it failed to clearly specify who will be required to provide DNA samples. USCIS must build strict protocols into any potential DNA program. They must clearly identify whom they will test, how they will protect the data, and how they will use, store and share it.

THIS PAGE INTENTIONALLY LEFT BLANK

V. CONCLUSIONS / RECOMMENDATIONS

A. THE BENEFITS ARE CLEAR

One of the five variables that determine the rate of adoption of innovative technology is *Perceived Attributes* (Rogers, 2003). Although all biometric modalities have merit in establishing identity, DNA has unique attributes in the immigration context for several reasons. One is the fact that no one can alter DNA and it does not change over time, as fingerprints, facial features or irises might. Another is that DNA may be easily collected from persons of all ages, regardless of physical impairment. Probably DNA's greatest value is its utility in verifying family relationships that are the qualifying basis for a large portion of immigration benefits. Applicants and petitioners would benefit because streamlined DNA testing would speed the immigration process and, in many instances, help to establish eligibility without the need for documents.

DNA cannot verify every relationship that USCIS may encounter. For instance, it would not verify a stepparent-stepchild relationship, although verifying a group of alleged stepchildren as siblings would help to bolster the stepparent's claim. If the petitioner is also filing for the children of his or her spouse, USCIS can verify the relationship between the spouse and the claimed children. Sometimes people attempt to bring nieces or nephews as their children or even attempt to bring other people's children as theirs, with the intent of using them as household slaves. DNA testing would help to stop such practices. Although the government does not often use DNA testing to verify marriage, at times it has shown that the alleged husband and wife were actually brother and sister, resorting to fraud to bring the sibling to the United States.

DNA already has proven value in solving and preventing crimes and governments are increasingly using it to combat terrorism. Screening immigrants through DNA would protect the American public, enhance national security and

protect immigrants against identity theft or false accusations. DNA has other benefits as well. It is useful in disaster recovery. It could aid in reuniting refugee children with their families. Sometimes in war or other disasters, children are split from their families, and later the child and the parent unknowingly travel separately to the United States. DNA has the capability to bring them back together. With all of these attributes, it would seem foolish not to utilize DNA technology for immigration purposes.

B. OUTREACH AND EDUCATION—MESSAGING IS THE KEY

People fear change. In order to effect change successfully, especially something as innovative and sensitive as DNA testing, the Department of Homeland Security must successfully reach out to its stakeholders to convince them of the immense benefits that DNA testing will provide. Through outreach, education and skillful presentation, DHS, with the help of expert public relations professionals, can dispel the myths and promote the benefits of such change. Such social conditioning will pave the way to move forward in this endeavor. It is important for the government to maintain transparency throughout the policy and regulatory development process.

This recommendation, for outreach and education, correlates to three of the variables (*communication channels, social systems* and *promotion efforts*) that Rogers asserts influence the adoption of innovative technology (2003).

Stakeholders who would benefit from DNA testing in the immigration process include the following:

- Legitimate immigrants and their relatives—DNA testing provides a means to prove entitlement to family-based benefits, to show admissibility, and to help protect them from identity theft. It would save money and time.
- DHS components—DNA testing would help USCIS, ICE and CBP determine eligibility for benefits and establish admissibility,

removability, and eligibility for naturalization. It would help FEMA identify victims in a disaster recovery operation, and save money and time.

- DOJ/FBI and other federal, state, local, and international law enforcement partners—DNA testing would help to uniquely identify individuals, find missing persons, solve and prevent crimes, and protect against terrorism. It would save time and money and enhance information sharing.
- American Immigration Lawyers Association (AILA)—DNA testing would help AILA assist clients in establishing eligibility.
- Health and Human Services (HHS), United Nations High Commission for Refugees (UNHCR) and other refugee assistance organizations—DNA testing would make the job of resettling refugees easier and faster. They could screen imposters out of the process early on and prevent them from traveling to the United States. The legitimate refugees could move to the front of the line. This would save time and money and would further humanitarian efforts.
- Advocates for Comprehensive Immigration Reform (CIR)—The evidence is not clear, but the inclusion of DNA testing in the immigration process may lead to some compromise on this issue. Certain groups want stricter enforcement and screening while others want some form of amnesty for illegal aliens already in the United States. Perhaps DNA testing, combined with higher standards regarding past crimes, would lead to a compromise agreement on immigration reform.

- American Public—DNA testing would prevent imposters from availing themselves of benefits that the American taxpayers fund, help to protect the public against crime and terrorism, and save time and money.
- The innocent—DNA testing would protect the innocent from being wrongfully accused of a crime by exonerating them early on, protect them from being victims of a crime or terrorism, and save them time and money.

C. WORKING WITH OUR PARTNERS TO ACHIEVE INTEROPERABILITY: STANDARDS FIRST

Every expert agrees that standards are by far the most important first step in establishing an innovative process that will be interoperable and, therefore, benefit all partners. In order for DNA testing in the immigration context to provide the most benefit to all, USCIS must consult with numerous partners from the outset to ensure that they establish standards and protocols that allow for seamless information sharing. The list of partners should include, but may not necessarily be limited to the following:

- U.S.-VISIT—A component of DHS, US-VISIT uses biometrics to help prevent the use of fraudulent documents, protect visitors from identity theft and prevent criminals, immigration violators and impostors from entering the United States. US-VISIT already successfully manages biometrics for DHS and shares information as appropriate with state, local, federal and international partners.
- FBI—The Federal Bureau of Investigation, a component of the Department of Justice, is planning to expand beyond its focus on fingerprints to develop a new biometric system that will include fingerprints, DNA, facial imaging, palm prints, voice and iris scans (Messmer, 2009).

- DOS—The Department of State, as the overseas visa-issuing authority, must work closely with DHS and USCIS on this project.
- DoD—The Department of Defense is currently expanding its collection of DNA samples overseas. USCIS should be able to search against the DoD database to ensure that an intending immigrant has not been involved in violent activity against the United States.
- DHS/S&T—The DHS Science and Technology Directorate is currently overseeing research and development projects for rapid DNA testing.
- NSTC—National Science and Technology Council, Executive Office of the President. (Subcommittee on Biometrics and Identity Management)
- NIST—the National Institute of Standards and Technology, a component of the Department of Commerce.
- INTERPOL—International Criminal Police Organization
- Other international partners
- Note: American state, local and tribal partners currently follow FBI standards.

D. PRIVACY: COUPLE ID MANAGEMENT WITH CYBER SECURITY

In order to ensure the privacy of every person in the DNA database, USCIS must take great care to protect it. The FBI has already demonstrated the ability to protect DNA in its database, the National DNA Index System (NDIS) and in its program, the Combined DNA Index System (CODIS). Very few people actually have access to the information related to the profiles. Only when there is a match to a profile does the agency with the suspect sample contact the agency with the match and ask for identification.

Likewise, the Department of Homeland Security also already follows strict guidelines to protect personally identifiable information (PII). DHS employees currently may utilize password protection or PKI (public key infrastructure) technology to protect PII. However, the sensitive nature of DNA may warrant precautions that are more extensive; in fact, it makes sense to use biometrics to protect biometric data. DHS should explore the feasibility of requiring employees who access DNA databases to use their own biometrics, such as a single fingerprint, in order to access the databases. This would add a measure of control and a level of assurance to those who have submitted DNA samples to DHS.

In pursuing policy or regulatory changes to expand DNA testing in the immigration process, the DHS Office of Privacy and the DHS Office of Civil Rights and Civil Liberties must play an active role. USCIS should work closely with those offices and carefully develop a privacy impact assessment.

E. PILOT

USCIS may not be able to implement DNA testing for every applicant all at once. It would be an overwhelming task, and require USCIS to work out all of the potential problems in advance. It therefore may be wise to implement DNA testing gradually, using a trial, or pilot program. Pilot programs are advantageous because they offer the opportunity to implement in phases, and to test, evaluate, and adjust the process where necessary (Jowell, 2003). A DNA testing pilot would give USCIS the opportunity to measure the benefits and results of the DNA testing. USCIS could observe the effect on processing times, the number of fraudulent applicants or criminals they prevent from entering the United States, and the public reaction to the process.

In selecting the target pilot group USCIS might want to choose those with more immediate need than another group for the DNA testing. For instance, they could select people from countries where births are rarely registered, where fraud is prevalent, or where we have concerns about terrorism. USCIS should also

attempt to ensure that the target test group has a reasonable racial balance. For instance, USCIS may decide to request DNA testing for all I-730 petitions filed on behalf of children. This means petitions filed by refugees or asylees in the United States who wish to gain derivative status for their children, who are usually overseas, but sometimes are present in the United States. Such people come from all over the world, but are often from countries where legitimate documents are unavailable or where fraud is prevalent. Alternatively, USCIS may decide to conduct DNA testing for all application types from a select but diverse group of countries; for example, they may be comprised of those from:

- Somalia (lack of documents, high fraud rates, terror concern);
- China (prevalence of high quality fraudulent documents);
- Yemen (high fraud rate, lack of documents, terror concern);
- Haiti (lack of documents, high fraud, proximity to the United States).

No matter what group or groups participate in the pilot, USCIS should carefully monitor the results and make any needed improvements to the process. There should be a plan for removing DNA profiles from the database should that need arise.

According to Everett Rogers in *Diffusion of Innovation* (2003), *Trialability* and *Observability* are two qualities that support more rapid adoption of technology. A pilot DNA testing program as described above would enable DHS to first experiment with DNA testing on a limited basis and dispel uncertainty about the idea. The measured results and outcomes would be made available to the public.

F. SUMMARY

DNA's many benefits are clear. Continuing to maintain the status quo, where DNA testing is strictly voluntary as a last resort, is not a viable path for the future. USCIS, in its transformation project, aims to move away from

overreliance on documents (IBM, 2008); DNA testing could help to accomplish that. Maintaining the status quo prevents USCIS from streamlining the process or collecting DNA samples. That means that a heavy burden will remain on the applicants to provide documents and that applicants, petitioners and the government will waste precious resources on requests for evidence and lengthy fraud interviews. When applicants do wish to submit DNA tests, the costs will be high because streamlining and high-volume cost reductions cannot occur.

Maintaining the status quo leaves the United States vulnerable to fraud and to the admission of terrorists and criminals. It also prevents USCIS from accomplishing its humanitarian mission to assist refugees. The U.S. government spends large sums of money every year to screen, interview and process refugees, only to discover, after many hours, that some are impostors. The 2008 DNA testing pilot showed that alarming numbers of people, much more than USCIS has been able to detect without DNA testing, are involved in fraud. Because of those findings, the State Department and USCIS temporarily halted the refugee family reunification resettlement program (Jordan, 2008). This group is least able to meet their burden to prove a relationship and least able to afford the costs of DNA testing. Implementation of DNA testing throughout the immigration process would greatly benefit refugees who wish to verify their family relationships.

USCIS should no longer lag behind in the utilization of innovative technology to accomplish its mission. DNA profiles are the fingerprints of the 21st Century, and USCIS owes it to the American people to take advantage of DNA technology to improve efficiency, protect against fraud and human trafficking, and enhance national security. Standardizing the collection of DNA samples for immigration benefits would enable USCIS to meet its goals and objectives as outlined in the *USCIS Strategic Plan 2008-2012* (USCIS, n.d.).

In order to utilize DNA technology for immigration purposes, however, the government must do several things. First, through outreach, education and skillful presentation, DHS, with the help of expert public relations professionals,

can dispel the myths and promote the benefits of such change. Such social conditioning will pave the way to move forward in this endeavor. It is important to build trust, and maintaining transparency throughout the policy development process will help in this regard. Part of the public outreach efforts will be to assure the public that USCIS will use their private information only for the purposes specified and will protect it. DHS may want to consider utilizing biometrics to protect the DNA data. Another very important thing the government should do is invest in standards to achieve interoperability. This will allow for seamless information sharing with local, state, tribal, federal and international partners. Third, the government should consider beginning with a pilot DNA testing program. This would allow USCIS to implement DNA testing in phases, and test, evaluate, and adjust the process where necessary.

Diffusion of DNA testing in the immigration process would streamline benefit delivery to legitimate applicants and protect the United States from those who threaten our public safety and security. America has the opportunity to be a change agent by promoting the expansion of this innovative technology for immigration purposes. One of the five important variables outlined by Rogers as key to promoting acceptance of innovative technology is *decision makers* (2003). Our decision makers can seize this opportunity now.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Alarkon, W. (2009, October 11). Democrats stymie Republican efforts to pass immigration reform measures. *The Hill*. Retrieved October 30, 2009 from <http://thehill.com/homenews/senate/62585-democrats-stymie-gop-efforts-to-pass-immigration-measures>
- American Civil Liberties Union. (2008, May 19). Letter to David Karp, U.S. Department of Justice, in regards to RIN 1105-AB24 Proposed Rule, DNA-Sample Collection under the DNA Fingerprint Act of 2005 and the Adam Walsh Child Protection and Safety Act of 2006. Retrieved January 20, 2009 from <http://www.regulations.gov/search/Regs/home.html#docketDetail?R=DOJ-OAG-2008-0009>
- Associated Press. (2009, April 18). DNA testing can cut health care costs. *Stltoday.com*. Retrieved April 19, 2009 from <http://www.stltoday.com/stltoday/news/stories.nsf/sciencemedicine/story/8008BF86784B86F08625759C007DF2E7?OpenDocument>
- Aytes, M. (2008, March 19). *Genetic Relationship Testing; Suggesting DNA Tests*. Retrieved August 12, 2008, from http://www.uscis.gov/files/pressrelease/genetic_testing.pdf
- BBC. (2002, September 12). Privacy fears over DNA database. *BBC News World Edition*. Retrieved September 8, 2008, from http://news.bbc.co.uk/2/hi/in_depth/sci_tech/2002/leicester_2002/2252782.stm
- Bernstein, M. (2004, January 20). Red tape cut to get UP suspect. *The Oregonian*, pp. B1, B8.
- Cato. (2008, February). The Weaponization of Immigration, *Center for Immigration Studies*. Retrieved <http://www.cis.org/articles/2008/back108.html#author>
- Citizenship and Immigration Services Ombudsman. (n.d.) Retrieved October 25, 2008, from http://www.dhs.gov/xabout/structure/editorial_0482.shtm
- City of Chicago. (2005). *Chicago's Study on Preventable Crimes*. Study completed by the City of Chicago and presented to the State Legislature in 2005.

- Dinerstein, M. (2002, April). America's identity crisis: document fraud is pervasive and pernicious. *Center for Immigration Studies*. Retrieved on October 6, 2008, from <http://www.cis.org/articles/2002/back302.html>
- DNA Initiative: Advancing Criminal Justice through DNA Technology*. (n.d.). Retrieved April 19, 2009, from <http://www.dna.gov>
- Eisler, P. (2008, December 12). Pentagon database swells to 80,000 DNA profiles. *USA Today*, pp. 5A.
- Eminent inventor of DNA fingerprinting gains new recognition. (n.d.) *Bio Medicine*. Retrieved on September 8, 2008, from <http://news.bio-medicine.org/biology-news-3/Eminent-inventor-of-DNA-fingerprinting-gains-new-recognition-6915-1/>
- Feinstein, D. (2004, October 10). *Congress Approves Kyl/Feinstein Crime Victims' Rights Bill*. Press Release. Retrieved October 7, 2009, from <http://feinstein.senate.gov/04Releases/r-vicrights-final.htm>
- Frank, T. (2008, December 29). Napolitano backs security tech. *USA Today*. Retrieved October 3, 2008, from http://www.usatoday.com/tech/news/surveillance/2008-12-29-hitechgov_N.htm
- Gonzalez, E. (2006, July 5). Response to Recommendation #26, DNA Testing. USCIS Memo. Retrieved August 20, 2008, from http://www.dhs.gov/xlibrary/assets/CISOmbudsman_RR_26_DNA_USCIS_Response-07-05-06.pdf
- Goodwin, J. (2008, December 2). Latest SBIR round lists seven technical challenges. *GSN Magazine*. Retrieved October 7, 2009, from <http://www.gsnmagazine.com/cms/market-segments/bio-terrorism/1181.html>
- The Hindu News Update Service. (2009, March 23). Pak shares DNA profiles of 26/11 terror suspects with INTERPOL. Retrieved March 29, 2009 from <http://www.hindu.com/thehindu/holnus/001200903231817.htm>
- H.R. 493: Genetic Information Nondiscrimination Act of 2008. Retrieved on November 22, 2008, from <http://www.govtrack.us/congress/billtext.xpd?bill=h110-493>

- H.R. 3860: To amend the Immigration and Nationality Act to require the use of DNA testing for purposes of confirming a biological relationship, and for other purposes. Retrieved on November 22, 2008, from <http://www.govtrack.us/congress/bill.xpd?tab=summary&bill=h110-3860>
- Hsu, S. (2009, July 8) Task Force to Recommend Overhaul of U.S. immigration system. *The Washington Post*. Retrieved July 8, 2009, from <http://www.washingtonpost.com/wp-dyn/content/article/2009/07/08/AR2009070800030.html>
- IBM Press Release. (2008, November 6). IBM awarded U.S. Citizenship and Immigration Services transformation contract to improve national security, customer service and operational efficiency: USCIS to move to a new centralized and consolidated electronic environment. Retrieved November 16, 2008, from <http://www-35.ibm.com/services/us/index.wss/summary/imc/a1030645?cntxt=a1000055>
- Identigene. (n.d.) DNA Paternity Testing: Immigration DNA Tests. Retrieved on April 19, 2009, from <http://www.dnatesting.com/dna-paternity-testing/immigration.php>
- INTERPOL. (n.d.) DNA Profiling Fact Sheet. Retrieved December 5, 2009, from <http://www.interpol.int/Public/ICPO/FactSheets/FS01.pdf>
- Jordan, M. (2008, August 20). Refugee program halted as DNA tests show fraud. *The Wall Street Journal*. Retrieved August 20, 2008, from http://online.wsj.com/article/SB121919647430755373.html?mod=googleneWS_WSJ
- Jowell, R. (2003, December). "Trying it Out: The Role of 'Pilots' in Policy-Making." United Kingdom Government Chief Social Researcher's Office. London: Crown Copyright.
- Kellner, M. (2008, October 1). Database expands reach of INTERPOL: Technology connects cases around globe. *The Washington Times*, pp. A11.
- Khatri, P. (2006, April 12). Recommendation to accept DNA test results as secondary evidence of family relationship, to grant authority to directors to require DNA testing and to initiate a DNA testing pilot project to study the impact of requiring DNA testing as evidence of family relationship. CIS Ombudsman Memo. Retrieved on August 20, 2008, from http://www.dhs.gov/xlibrary/assets/CISOmbudsman_RR_26_DNA-04-13-06.pdf

- Kliska, Jennifer (2008). *The Strategic Value of Humanitarian Immigration Policy toward Homeland Security*. Master's thesis, Naval Postgraduate School, Monterey, California.
- Kyl, J. (2008, May 19). Letter to David Karp, U.S. Department of Justice, in regards to OAG Docket Number 119. Retrieved January 20, 2009, from <http://www.regulations.gov/search/Regs/home.html#docketDetail?R=DOJ-OAG-2008-0009>
- Llorca, J. C. (2008, July 31). US couple almost adopted stolen Guatemalan baby. *Associated Press*.
http://www.boston.com/news/world/latinamerica/articles/2008/07/31/us_couple_almost_adopted_stolen_guatemalan_baby/
- Messmer, E. (2009, September 23). FBI building system that blows away fingerprinting. *Network World*. Retrieved October 1, 2009, from <http://www.networkworld.com/news/2009/092309-fbi-biometrics.html?ts>
- Morse, D. (2008, October 18). Md. Man charged in home invasions: Electrician also faces murder count. *The Washington Post*, pp. B1, B4.
- Nakashima, E. (2008, April 21). From DNA of Family, a Tool to Make Arrests. *The Washington Post*. Retrieved December 1, 2009, from <http://www.washingtonpost.com/wp-dyn/content/article/2008/04/20/AR2008042002388.html>
- Napolitano, J. (2009, February 25). Testimony of Secretary Napolitano before the House Committee on Homeland Security, "DHS: The Path Forward." Retrieved February 25, 2009, from http://www.dhs.gov/ynews/testimony/testimony_1235577134817.shtm
- Napolitano, J. (2009, May 6). Testimony of Secretary Napolitano before the Senate Committee on the Judiciary, "Oversight of the Department of Homeland Security." Retrieved June 10, 2009, from http://www.dhs.gov/ynews/testimony/testimony_1241706742872.shtm
- Napolitano, J. (2009, June 8). Leadership Journal: The Department's Five Responsibilities. Retrieved June 10, 2009, from <http://www.dhs.gov/journal/leadership/2009/06/departments-five-responsibilities.html>

- National Defense Industrial Association. (n.d.). DNA as an identifier. Retrieved November 7, 2009 from <http://www.ndia.org/Divisions/IndustrialWorkingGroups/IndustrialCommitteeForProgramManagement/Documents/Content/ContentGroups/IndustrialWorkingGroups/IndustrialCommitteeonBiometrics/PDFs34/DNA%20AS%20AN%20IDENTIFIER%20final.pdf>
- National Institute of Justice. (2008, June). Findings from the DNA Field Experiment. *DNA Initiative*. Retrieved on April 19, 2009, from <http://www.dna.gov/solving-crimes/property-crimes/field-experiment>
- National Science and Technology Council Subcommittee on Biometrics and Identity Management. (2008, September). "Identity Management Task Force Report 2008." Retrieved November 9, 2009, from <http://www.ostp.gov/galleries/NSTC%20Reports/IdMReport%20Final.pdf>
- The President's National Security Telecommunications Advisory Committee. (2009, May 21). NSTAC Report to the President on Identity Management Strategy. Retrieved November 9, 2009, from <http://www.ncs.gov/nstac/reports/2009/NSTAC%20IDTF%20Report.pdf>
- Preston, J. (2007, February 5). U.S. set to begin a vast expansion of DNA sampling. *The New York Times*. Retrieved October 25, 2008, from <http://www.nytimes.com/2007/02/05/washington/05dna.html?pagewanted=print>
- Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). New York: Free Press.
- Sacchetti, M. (2009, May 13). US implored to stop deporting Haitians. *The Boston Globe*. Retrieved December 9, 2009, from http://www.boston.com/news/nation/articles/2009/05/13/us_implored_to_stop_deporting_haitians/
- Schumer, C. (2008, September 16). Schumer announces over \$500,000 for Suffolk and Nassau County DNA backlog reduction programs. Press release. Retrieved October 7, 2009, from http://schumer.senate.gov/new_website/record.cfm?id=303099
- Singh, K. (2008, October 27). *Altered Fingerprints*. INTERPOL General Secretariat, Lyon. Retrieved October 7, 2009, from <http://www.INTERPOL.int/Public/Forensic/fingerprints/research/alteredfingerprints.pdf>

- Slack, J. (2006, January 5). Big Brother Britain has world's biggest DNA database. *Mail Online*. Retrieved October 20, 2008, from <http://www.dailymail.co.uk/news/article-373249/Big-Brother-Britain-worlds-biggest-DNA-database.html?printingPage=true>
- Smith, M.E. (2006, Summer). Let's make the DNA identification database as inclusive as possible. *The Journal of Law, Medicine & Ethics*, 34, 2, pp. 385-389.
- Spillus, A. (2009, March 13). US facing home-grown Islamic terror threat. *Telegraph.co.uk*. Retrieved March 17, 2009, from <http://www.telegraph.co.uk/news/worldnews/africaandindianocean/somalia/4987199/US-facing-home-grown-Islamic-terror-threat.html>
- Strohm, C. (2009, June 25). Schumer proposes biometric screening of U.S. workers. *Nextgov CongressDaily*. Retrieved October 7, 2009, from http://www.nextgov.com/nextgov/nq_20090625_5400.php
- Strauss, L. A. & Corbin, J. (1990). *Basics of Qualitative Research: Grounded theory procedures and techniques*. London: Sage.
- Sullivan, E. (2008, April 17). Feds to collect DNA from every person they arrest. *The Associated Press*. Retrieved November 11, 2008, from <http://www.commongroundcommonsense.org/forums/lofiversion/index.php/t91075.html>
- Torres, J. (2009, May 20). Statement of John P. Torres, Deputy Assistant Secretary, U.S. Immigration and Customs Enforcement, Department of Homeland Security, regarding a hearing on "Securing the borders and America's points of entry, what remains to be done." Before the United States Senate Committee on the Judiciary, Subcommittee on Immigration, Refugees and Homeland Security. Retrieved December 5, 2009, from www.ice.gov/doclib/pi/news/testimonies/torres_05_20_09.doc
- U.S. Citizenship and Immigration Services. (2006, April 25). *Fact Sheet: Immigration Security Checks – How and Why the Process Works*. Retrieved October 25, 2008, from http://www.uscis.gov/files/pressrelease/security_checks_42506.pdf
- U.S. Citizenship and Immigration Services. (n.d.). *USCIS Strategic Plan 2008-2012*. Retrieved July 7, 2008, from http://www.uscis.gov/files/nativedocuments/USCIS_Strategic_Plan_2008-2012.pdf

- U.S. Citizenship and Immigration Services. (n.d.) "How do I Get My Spouse or Children Derivative Asylum Status in the United States?" Retrieved October 25, 2008, from <http://www.uscis.gov/portal/site/uscis/menuitem.5af9bb95919f35e66f614176543f6d1a/?vgnextoid=8e0d6c854523d010VgnVCM10000048f3d6a1RCRD&vgnnextchannel=3a82ef4c766fd010VgnVCM1000000ecd190aRCRD>
- U.S. Department of Energy, Human Genome Project. (n.d.). DNA Forensics. Retrieved December 5, 2009, from http://www.ornl.gov/sci/techresources/Human_Genome/elsi/forensics.shtml
- U.S. Department of Homeland Security. (2009, August). "2008 Yearbook of Immigration Statistics." Office of Immigration Statistics. Retrieved October 15, 2009, from http://www.dhs.gov/xlibrary/assets/statistics/yearbook/2008/ois_yb_2008.pdf
- U.S. Department of Homeland Security. (2009). A National Dialogue on the Quadrennial Homeland Security Review. Retrieved November 22, 2009, from <http://homelandsecuritydialogue.org/>
- U.S. Department of Homeland Security. (n.d.) US-VISIT Biometric Identification Services. Retrieved December 5, 2009, from http://www.dhs.gov/files/programs/gc_1208531081211.shtml
- U.S. Department of Justice "DNA – Sample Collection Under the DNA Fingerprint Act of 2005 and the Adam Walsh Child Protection and Safety Act of 2006, Proposed Rule." *Federal Register*, Vol. 73, No. 76 (18 April 2008) pp. 21083-21087.
- U.S. Department of Justice "DNA – Sample Collection and Biological Evidence Preservation in the Federal Jurisdiction." Final Rule. *Federal Register*, Vol. 73, No. 238 (10 December 2008) pp. 74932-74943.
- U.S. Department of State. (2009, September 25) *Foreign Affairs Manual Volume 9 – Visas*. "9 FAM 42.44 Notes. Retrieved October 6, 2009, from <http://www.state.gov/documents/organization/130607.pdf>
- U.S. Department of State, Bureau of Population, Refugees and Migration (DOS/PRM). (2008, November 18). Fraud in Africa Priority Three (P-3) Program. Fact Sheet. Retrieved November 22, 2008, from <http://www.state.gov/g/prm/refadm/rls/fs/2008/111973.htm>

- U.S. Department of State, Embassy of the United States Hanoi Vietnam. (2008)
Retrieved on October 7, 2008, from
http://vietnam.usembassy.gov/irreg_adoptions042508.html
- U.S. Federal Bureau of Investigation (2004, February 24). *Federal Bureau of Investigation Privacy Impact Assessment: National DNA Index System (DNS)*. Retrieved September 6, 2008, from <http://foia.fbi.gov/ndispia.htm>
- Vallone, P. (2009, September 23). Overview of rapid DNA testing. Briefing at the 2009 Biometric Consortium Conference. Tampa. Retrieved November 15, 2009, from
http://www.itl.nist.gov/iad/894.03/BCC_Talks/Vallone_Rapid_DNA_Testing.pdf
- Wasem, R.E. (2008, April 3). Immigration Fraud: Policies, Investigations, and Issues. *CRS Report for Congress*. Retrieved October 6 2008, from
<https://www.hsdl.org/homesec/docs/crs/nps39-050208-18.pdf&code=aa2f3b33d113ab6e9e99c1f303646830>
- Whiteman, B. (2004, September 7). *A History of Genetic Fingerprinting at the University of Leicester [includes Profile of Professor Sir Alec Jeffreys and thumbnail sketch of his discovery]: The man who put the fingerprint in genetics*. University of Leicester, Press and Publications. Retrieved September 10, 2008, from <http://www.le.ac.uk/press/geneticshistory.html>
- Williamson, R and Duncan, R. (2002, August 8). DNA testing for all. *Nature*, vol. 418, pp. 585-586.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California
3. Alejandro Mayorkas
U.S. Citizenship and Immigration Services
Washington, D.C.
4. Richard Bergin
NPS Center for Homeland Defense and Security
Monterey, California
5. John Rollins
NPS Center for Homeland Defense and Security
Washington, D.C.
6. Mark Krikorian
Center for Immigration Studies
Washington, D.C.