



Transportation Security Administration

Final Data Report

for the

Risk Based Security (RBS) Behavior Assessment Level II/Assessor Proof of Concept (1) at Boston and Detroit

February 22, 2012

Behavior Detection and Analysis Division
Office of Security Capabilities

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Executive Summary

Overview

The Transportation Security Administration (TSA) is exploring the use of enhanced behavior detection to identify risk. Through the Assessor Proof of Concept (PoC) at Boston Logan International Airport (BOS) and Detroit Metropolitan Wayne County Airport (DTW), TSA is testing the ability of "Assessors" to perform real-time risk assessments through engagement and observation at the screening checkpoint. This report discusses data collected at the Assessor PoC between August 15 and December 15, 2011. The data collected is intended to inform decision-makers and system designers about the nature of the changes resulting from Risk Based Security (RBS) changes such as the utility of enhanced behavior detection. Specifically this report reviews the operational impact of the Assessor on checkpoint efficiency, security effectiveness and initial comparisons to other behavior analysis capabilities such as the Screening of Passengers by Observation Techniques (SPOT) program. Recommendations for future development of the Assessor capability are also discussed.

Background

Identifying potential threats and assessing risk is a major challenge in the airport environment. TSA is expanding its behavior detection and analysis capability to identify potential high-risk passengers in a real-time capacity. In the Assessor PoC, Assessors apply the enhanced skills learned during training to evaluate whether passengers pose a potential risk to aviation security. The current concept of operations (CONOPS) requires that Assessors perform document review and interviews with all transiting passengers, while observing for suspicious signs and behavioral anomalies. Based on the results of this engagement and observation, Assessors direct passengers to either standard or secondary screening. In the PoC locations significantly more passengers are being engaged and observed than ever before, which increases the chances of detecting potential high-risk passengers¹ (HRP) attempting to transit the checkpoint.

Scope and Limitations

The purpose of an experimental test such as a "Proof of Concept" is to explore the effect of a manipulation on an outcome. The purpose of the Assessor PoC is to explore the effect of APA training and Assessor-style engagement on TSA's ability to detect potential HRP. The general research strategy for evaluating the operational impact of the Assessor involves comparing checkpoint (system) performance during the pilot to performance during a baseline period. However, the designated baseline period is not a perfect comparison to the PoC period because a number of items have changed between these periods including:

¹ This is a term adopted from the Department of Homeland Security sponsored SPOT Validation Study. We recognize that this may not be the best term to denote these group of individuals as they may not pose an actual risk to aviation security. Defining this term is described in greater detail in section 5.5, and will be further explored in additional studies.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action under Federal government agencies, public disclosure is governed by 51 U.S.C. 552.~~

- Different passenger population, months, and seasons occurred;
- There was a heightened awareness of both passengers and employees during the PoC, as well as increased media coverage and signage regarding the PoC;
- The Assessor used a different placement of behavior detection resources than the SPOT program during the baseline;
- Assessors were provided with additional training and mentoring related to passenger engagement and document review;
- Passenger engagement was increased to 100% during the PoC;
- Passenger engagement style changed (use of targeted questions); and
- There was an opportunity to resolve suspicious signs before secondary screening occurred.

In this PoC it is difficult to link successes or failures to any of the individual changes because of the sheer number and degree of elements that were changed between the baseline and PoC. If the Assessor PoC is expanded, additional tests should be conducted to identify the factors resulting in the most significant changes.

Results

Training

This PoC required new classroom training provided by International Security Defense Systems, LLC (ISDS). The Aviation Passenger Assessor (APA) course discussed travel documentation, travel patterns, behavioral indicators, appearance factors, and questioning techniques that led to successful identification of potential HRP. This training was theorized to improve an Assessor's ability to engage passengers and make real-time risk assessments. The majority of students were able to successfully pass this training course (98%), boasting one of the highest achievement rates experienced by ISDS².

In addition to classroom training, students were required to pass a rigorous On-the-Job Training module (OJT) to become a certified Assessor. OJT Mentors spent over 1,800 hours mentoring potential Assessors, resulting in a total of 115 certified Assessors. This represents 88% of the potential Assessors originally enrolled in the APA course.

Efficiencies and Effectiveness

The Assessor program could be considered a success if the addition of the Assessor operation improved the system detection of HRP while maintaining or improving on operational efficiencies. A number of metrics were collected to evaluate any efficiency trade-offs, including throughput, staffing, wait times, and cycle (process) times.

² As noted in conversation.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 15.200. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 15.20, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or, if the information is from U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 1 displays the high-level data points describing the state of the checkpoints during the Assessor PoC. At BOS and DTW, Assessors were able to process a large passenger throughput, and only spend additional time questioning a small proportion of passengers (1.16%). In general, very few passengers refused to speak to the Assessor ($N = 143$). An even smaller proportion of the traveling public was considered a potential risk by the Assessor and sent to secondary screening (0.11%).

Table 1. High-Level Data Points for the Assessor Proof of Concept

Variable	BOS	DTW
Checkpoint	Terminal A (8 lanes)	Red 1 (5 lanes)
Baseline Period Dates	6/6/11-7/31/11	7/18/11-9/16/11
Proof of Concept Period Dates	8/15/11-12/15/11	10/17/11-12/15/11
Total Available Certified Assessors	66 Behavior Detection Officers (BDO)	37 BDO, 5 Transportation Security Inspectors (TSI), 5 Federal Air Marshals (FAM)
Total Throughput	360,281	323,383
Total Passengers Spoken to by an Assessor (throughput excluding employees and crew)	313,293 (87%)	287,805 (89%)
Average Assessor at TDC Cycle Time (with transit) ³	44.13 seconds	44.04 seconds
Total Passengers Receiving Additional Questioning at Podium	4,496	2,461
Total Refusals to Speak with Assessor	95	48
Total Complaints	3	8
Total Assessor Selectees	506	183

The data shows that BOS Assessors selected almost twice as many passengers for additional questioning than DTW Assessors. We do not know if this was due to true differences in the passenger populations, or if there were differences between different types of Assessors used at each location (e.g., BDO, TSI, FAM). Of the passengers who received additional questioning, BOS Assessors selected 11% (506 of 4,496) and DTW Assessors selected 7% (183 of 2,461) for secondary screening.

³This metric was collected through different methods and by different collectors at BOS and DTW. See section 4.4 for more details.

~~WAVES (TSI). This document contains Sensitive Security Information that is controlled under 49 CFR parts 15.16 and 15.20. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15.18 and 15.20, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or imprisonment. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

A number of metrics were also captured to evaluate security effectiveness of the Assessor. The primary analysis examined the ability of the checkpoint system (with or without the Assessor) to detect HRP. The term, *high-risk passenger*, was adopted from the 2011 SPOT Validation Study¹, developed by the Department of Homeland Security's Science and Technology Directorate (DHS S&T). Given the available data, three outcome variables were used to represent HRP: (1) Law Enforcement Officer (LEO) arrest; (2) possession of serious prohibited or illegal items (SPII); and (3) artful concealment. While this definition does not directly identify individuals who pose a risk to aviation security, it does provide proxies for individuals who are more likely to conceal or deceive when transiting the checkpoint.

Table 2 displays the number of HRP detections at the system level during the Assessor baseline and PoC periods. The addition of the Assessor appeared to improve system performance during the PoC, as more HRP were detected during the PoC (many of which were selected by the Assessor). This change was statistically significant at BOS; however, further testing would be required to prove that the Assessor was the exact cause of this improvement.

Table 2. Changes in Effectiveness for the Assessor Proof of Concept

Variable	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
Throughput	597,550	360,281	327,640	323,383
Assessor Selectees	n/a	506	n/a	183
Total Detected HRP ⁵	11	54	0	9
Total Detected SPII cases	11	21	0	9
Total Detected Artful Concealment cases	1	2	0	1
Total LEO Arrests	0	35	0	2

Indicators

APA training introduced 23 new suspicious signs to Assessors that could be used to assess risk. Analyses were conducted at the indicator level to evaluate how these indicators were being used and their relationship to high-risk outcomes. Assessors noted a total of 1,212 indicators over 506 referrals at BOS and a total of 440 indicators over 183 referrals at DTW. (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

¹ U.S. Department of Homeland Security, Science and Technology Directorate. (2011). *SPOT Referral Report Validation Study Final Report Volume 1: Technical Report*. Washington, DC: Author.

⁵ These are all at the system level (detected by Assessor, SPOT, and/or checkpoint). The total detected SPII, artful concealment, and LEO arrest cases do not add up to the total HRP cases, as one HRP case could have multiple outcomes (e.g., a SPII leading to an arrest).

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

Assessors were clearly assessing the same indicators in the majority of their cases, which raises questions as to whether these indicators were simply more frequent or whether Assessors were relying only on a handful of indicators.

Role of SPOT

Analyses revealed that SPOT experience and background influenced the success of the Assessor PoC. Assessors appeared to rely on APA indicators that resembled SPOT indicators and used their SPOT training to better define what they observed. Most BDOs viewed the two indicator lists as one and the same, and attempted to “fit” SPOT indicators into the Assessor categories so they could unofficially apply them⁶. During secondary screening of Assessor selectees, Assessors fell back into SPOT protocols and skills to identify HRP and decide whether LEO intervention was necessary.

The blending of SPOT and Assessor was unexpected, as the Assessor role was originally designed as a stand-alone function that could possibly be performed by a number of TSA employee types. However, it quickly became apparent that BDOs performing Assessor could not “forget” their SPOT training, nor could they easily transition between positions. If this program is expanded the role of SPOT should be more deeply considered in the development of enhanced behavior detection.

Conclusion

The Assessor PoC examined the capability of Assessors to perform enhanced behavior detection with a large population of passengers at two different checkpoints. Data collected suggests that Assessors were able to improve the security posture of the checkpoint; however, this improvement came with increased operational costs. Additional research is required to better understand the value of Assessor and better pair it with TSA’s current behavior detection and analysis capabilities. It remains unclear which factors of Assessor – e.g., training, indicators, engagement, increased presence, or SPOT – contributed to its success and to what extent. Future studies should attempt to isolate and study each factor to build an optimal capability in the most efficient manner possible⁷.

⁶ According to the Assessor SOP, Assessors could not apply SPOT indicators during the initial engagement at the TDC podium. BDOs were allowed to apply SPOT procedures during secondary screening of Assessor selectees.

⁷ For example, if SPOT and engagement are the biggest contributors to HRP detection, future deployments may not require the APA training and indicators to be successful, which would greatly reduce the cost of the program and increase the speed of deployment.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or, if deemed to be a crime, criminal prosecution. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table of Contents

- 1.0 Introduction..... 12
- 2.0 Background..... 13
 - 2.1 TSA Behavior Detection 13
 - 2.2 Behavior Detection in Risk-Based Security..... 14
 - 2.3 Development of the Assessor..... 14
 - 2.4 Proof of Concept Experimental Design 15
 - 2.4.1 Variations at Proof of Concept Airports 16
 - 2.4.2 Scope and Limitations of Experimental Design..... 17
- 3.0 Training..... 19
 - 3.1 Classroom Training 19
 - 3.2 On-the-Job Training 21
- 4.0 Efficiency Metrics..... 24
 - 4.1 Overview 24
 - 4.2 Throughput and Staffing 26
 - 4.3 Queue Wait Times..... 30
 - 4.4 Cycle Times..... 32
 - 4.4.1 BOS Cycle Times..... 32
 - 4.4.2 DTW Cycle Times 33
- 5.0 Effectiveness Metrics..... 36
 - 5.1 Overview 36
 - 5.2 Descriptive Statistics..... 38
 - 5.2.1 Assessor Referrals 38
 - 5.2.2 Law Enforcement Referrals 39
 - 5.2.3 Artful Concealment 43
 - 5.2.4 Serious Prohibited or Illegal Items..... 44
 - 5.2.5 Law Enforcement Arrests..... 45
 - 5.3 High-Risk Passenger Detection..... 47
 - 5.3.1 Comparison to Baseline Periods 47
 - 5.3.2 Comparison of Options 53
 - 5.3.3 Effect of Secondary Screening..... 55
 - 5.3.4 Comparison of SPOT and Assessor Detection Rates..... 58
 - 5.4 Referral Overlap..... 60
 - 5.5 Additional HRP Classifications 62
- 6.0 Indicator Analysis 64
 - 6.1 Overlap of SPOT and Assessor..... 65
 - 6.2 Analysis of (b)(3)49 U.S.C. § 114(f) 65
 - 6.3 Utilization..... 67
 - 6.4 Relationship to High-Risk Passengers 70
- 7.0 Discussion..... 73

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For TSA government agencies, public disclosure is governed by 51 U.S.C. 552.~~

7.1 Overview 73

7.2 Lessons Learned..... 73

7.2.1 Training Gaps..... 73

7.2.2 Operational Constraints..... 75

7.2.3 Airport Requirements..... 77

7.3 Relationship of SPOT and Assessor 78

7.3.1 Unanticipated Effects..... 78

7.3.2 Program Overlaps..... 78

7.3.3 Program Discrepancies..... 79

7.3.4 Indicator Lists..... 80

7.4 Testing Behavior Detection..... 81

7.5 Future Research Directions 82

8.0 Conclusion 83

9.0 Acronyms and Abbreviations 85

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or, if the sender is a U.S. government agency, public disclosure is governed by 51 U.S.C. 552.~~

List of Tables

Table 1. High-Level Data Points for the Assessor Proof of Concept 4

Table 2. Changes in Effectiveness for the Assessor Proof of Concept..... 5

Table 3. Comparison of Assessor Experimental Designs 17

Table 4. Aviation Passenger Assessor Classroom Training Statistics..... 21

Table 5. On-the-Job Training Statistics 23

Table 6. On-the-Job Training Time by Job Type at DTW 23

Table 7. List of Efficiency Metrics 25

Table 8. Assessor Throughput Data..... 27

Table 9. Assessor Proof of Concept Checkpoint Staffing 29

Table 10. Assessor Staffing by Throughput 30

Table 11. Queue Total Wait Times at BOS 31

Table 12. BOS Cycle Times 33

Table 13. DTW Baseline TDC Cycle Time 33

Table 14. Assessor Cycle Times by Load Status 34

Table 15. Assessor Cycle Times by Job Type 34

Table 16. Assessor Cycle Times by Passenger Type 35

Table 17. Assessor Cycle Times by Identification Type 36

Table 18. List of Effectiveness Metrics 37

Table 19. Number of Assessor Referrals 38

Table 20. Number of Assessor Referrals by Job Type at DTW 39

Table 21. Frequency of LEO Referrals at the Proof of Concept Checkpoints 40

Table 22. Frequency of and Reason for LEO Referrals..... 41

Table 23. Law Enforcement Officer Referral Outcomes 42

Table 24. Top Reasons for Assessor Law Enforcement Officer Referrals 42

Table 25. Number of Artful Concealment Cases 43

Table 26. Serious Prohibited or Illegal Item Categories 44

Table 27. SPII Discovered at the Assessor Proof of Concept Checkpoints..... 45

Table 28. Frequency and Reason for Law Enforcement Officer Arrest Cases..... 45

Table 29. System Level High-Risk Detection Rates at BOS Terminal A 48

Table 30. Referral Level High-Risk Detection Rates at BOS Terminal A 49

Table 31. High-Risk Passenger Detection at DTW McNamara Terminal..... 52

Table 32. Referral Level Comparison of High-Risk Detection in BOS Options 1 and 2 for Entire Proof of Concept 54

Table 33. Referral Level Comparison of High-Risk Detection in BOS Options 1 and 2 for First 8 Weeks..... 55

Table 34. Comparing Secondary Screening Methods at BOS 56

Table 35. Comparing Secondary Screening Methods at DTW 58

Table 36. Behavior Based High-Risk Detection at BOS during the Proof of Concept Dates 59

Table 37. Behavior Based High-Risk Detection at DTW during the Proof of Concept Dates..... 59

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action from U.S. government agencies; public disclosure is governed by 51 U.S.C. 552.~~

Table 38. Referrals Meeting Both SPOT and Assessor Thresholds During the Proof of Concept 61

Table 39. Potential High-Risk Definitions..... 63

Table 40. Overlap of APA Signs and SPOT Indicators..... 65

Table 41. SPOT Behaviors Listed as (b)(3) 49 U.S.C. § 114(f) at BOS 66

Table 42. SPOT Behaviors in (b)(3) 49 U.S.C. § 114(f) at DTW 67

Table 43. Top Five Indicators Applied at BOS 68

Table 44. Top Five Indicators Applied at DTW 69

Table 45. Top Five Indicators Applied at DTW by BDO/Assessors Alone 69

Table 46. Top Five Indicators Utilized at DTW by TSI and FAM Assessors 70

Table 47. Top Five Indicators Resulting in High-Risk Outcome 71

Table 48. Indicators With Highest Positive Predictive Value at BOS..... 72

List of Figures

Figure 1. Indicator Clustering Bell Curve..... 71

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty after action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

List of Appendices

APPENDIX 1: List of APA Indicators 87

APPENDIX 2: List of SPOT Indicators 88

APPENDIX 3: Assessor OJT Checklist..... 90

APPENDIX 4: Boston Terminal A Layout 94

APPENDIX 5: Detroit Red I Layout..... 95

APPENDIX 6: Boston Terminal A Proof of Concept Schedule..... 96

APPENDIX 7: Potential Additions to the High-Risk Case List..... 98

APPENDIX 8: (b)(3)49 U.S.C. § 114(f) BOS 100

APPENDIX 9: DTW 101

APPENDIX 10: Utilization of APA Indicators 102

APPENDIX 11: HRP Indicators 104

APPENDIX 12: Positive Predictive Value of Indicators..... 105

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 15.20. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15.110, 15.111, and 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized disclosure may result in civil penalty or criminal action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

1.0 Introduction

Each year over 600 million airline passengers travel domestically, the majority of which do not represent a threat to aviation security. However significant resources are being expended to screen low-risk passengers and this may not be the most cost-effective approach to security. Accurately segmenting passengers based on risk level and transitioning to a risk-based approach is paramount for sustaining an effective aviation security system. This type of system is focused on devoting security resources to the individuals who require the most scrutiny, while reducing system risk and improving the passenger experience.

In the current system, only a portion of the traveling public is subjected to behavior analysis screening. Transportation Security Officers (TSO) provide the primary screening of persons and baggage and uncover potential threats with the aid of screening technology [e.g., Advanced Imaging Technology (AIT), X-Ray, and Explosives Trace Detection (ETD)]. This approach places greater focus on detection of prohibited items rather than persons with intention to do harm. Searching for hostile intent de-links security effectiveness from prediction of mode of attack which in turn allows total system security performance to be more flexible and effective as our adversaries adapt. While TSOs successfully detect and confiscate prohibited items from passengers every day, the majority of these passengers do not have hostile intentions for use of those items, and thus do not represent a true threat to aviation security. This suggests that more efficient screening methods are needed to determine actual threats to aviation.

Identifying potential threats and assessing risk in the airport environment are considerable challenges. The Transportation Security Administration (TSA) is expanding its behavior detection capability to identify risk in passengers – and especially those for whom we have little information. In the Assessor Proof of Concept (PoC), currently being conducted at Boston Logan International Airport (BOS) and Detroit Metropolitan Wayne County Airport (DTW), an enhanced behavior detection capability is being deployed to perform real-time risk assessments. This capability, known as *Assessor*, involves document review and passenger engagement to detect anomalies behaviors. The current Assessor concept of operations (CONOPS) utilizes 100% passenger engagement at, or directly after, the Travel Document Checker (TDC), to detect potential high-risk passengers (HRP). Significantly more passengers are being observed and engaged using this model, which should increase the chances of detecting HRP attempting to transit the checkpoint.

This report discusses data collected at the Assessor PoC between August 15 and December 15, 2011. The data collected should inform decision-makers and system designers about the nature of the changes resulting from Risk Based Security (RBS) changes such as the utility of enhanced behavior detection. Specifically this report reviews the operational impact of the Assessor on checkpoint efficiency and security effectiveness. Recommendations for future development of the Assessor capability are also discussed.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty. The term "U.S. government agencies, public disclosure is governed by 51 U.S.C. 552~~

2.0 Background

2.1 TSA Behavior Detection

TSA's current behavior screening program is known as the *Screening of Passengers by Observation Techniques* or *SPOT* program. TSA officially adopted the SPOT program in 2006 after several years of pilot testing. The SPOT program was built off of a growing body of behavioral analysis programs that had been successfully deployed by law enforcement and security personnel around the world (e.g., Behavior Assessment Screening System; Passenger Assessment Screening System; Israel security). TSA Behavior Detection Officers (BDO) are trained in behavior analysis and look for observable behavioral cues indicating that an individual fears discovery. While some level of anxiety is expected in an airport environment, BDOs can identify behaviors that deviate from what is normal.

Since its inception, the SPOT program has been successful at identifying HRP, such as individuals transiting with serious prohibited or illegal items (SPII), fraudulent travel documents (FTD), and outstanding warrants. In all of these scenarios the passenger should have a fear of discovery, as he or she attempts to circumvent or defeat the screening process. That is why behavior observation can add an effective layer to any security program: it allows security practitioners to detect HRP based on behaviors that are difficult to falsely inhibit, and is the only layer that focuses more on a person's intent, rather than items in their possession.

Currently, SPOT is one of the only scientifically validated behavior-based security programs in the world. The Department of Homeland Security's Science and Technology Directorate (DHS S&T) recently completed a research study that examined the extent to which SPOT indicators led to correct screening decisions at the security checkpoint⁸. The study was completed in April 2011 and revealed that SPOT was significantly more effective at identifying HRP than random selection protocols. This study represents the most thorough analysis of any behavioral screening program to date: no other counter-terrorism or similar security program is known to have been subjected to such a rigorous, systematic evaluation of its screening accuracy.

Extensive academic research also indicates that behavior analysis and interviewing are effective methods for detecting hostile intent and potential HRP⁹. This suggests that using officers trained in behavior-based protocols may prove an effective use of resources for identifying this small but important segment of the traveling population. Currently, the SPOT program is the only TSA screening layer that focuses on detecting intent at the checkpoint.

⁸ U.S. Department of Homeland Security, Science and Technology Directorate. (2011). *SPOT Referral Report Validation Study Final Report Volume 1: Technical Report*. Washington, DC: Author.

⁹ For example, see DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). *Cues to deception*. Psychological Bulletin, 129, 74-112. Ekman, P. (2001). *Telling Lies: Chances to detect in the marketplace, politics, and marriage*. New York: W. W. Norton & Co. Ekman, P., O'Sullivan, M., & Frank, M. G. (1999). *A few can catch a liar*. Psychological Science, 10, 263-266.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

2.2 Behavior Detection in Risk-Based Security

RBS is comprised of three primary components: pre-screening, behavior analysis, and physical screening. Behavior analysis is a crucial layer of RBS because it can detect potential adversaries and route them to additional screening in real-time. Behavior analysis can also detect potential HRP with clean records or who were otherwise not identified through pre-screening methods.

The importance of behavior detection for RBS is very high. Incorporating additional BDO interactions could enhance the ability to segment and screen passenger populations based upon potential risk. Determining passenger risk will allow for a more efficient screening process of low-risk passengers, more effective utilization of limited resources targeted to higher risk passengers, and more effective application of unpredictable screening measures. Utilizing enhanced behavior detection methods focuses greater resources on identifying legitimate threats to aviation security by uncovering the intentions of travelers. In order to design and implement RBS safely and effectively, we must gain greater insights into this crucial part of the system.

The Assessor PoC will help determine how the Assessor capability could augment this vital role. Behavior analysis has the potential to enable RBS and amplify its benefits by routing potential adversaries in the unknown and low-risk lanes to heightened screening. This routing:

- Provides real-time analysis to hedge against possible contamination of the low-risk lane;
- Hedges against potential predictability of rules-based pre-screening;
- May provide a more efficient hedging mechanism than random exclusion;
- In the long-term, may be more measurable than other forms of pre-screening; and
- The benefits are amplified as the low-risk population increases.

Although this phase of the Assessor PoC did not include other elements of RBS, it may reveal methods for real-time routing that can be applied in future RBS pilots.

2.3 Development of the Assessor

The SPOT Validation Study demonstrated that current SPOT protocols could be used to identify HRP. The current SPOT model deploys BDOs in pairs to conduct behavior observation and analysis. Although BDOs engage both low-risk and high-risk passengers in the checkpoint queue, further screening and formal questioning is limited to individuals exhibiting behavioral indicators weighted above a predetermined threshold. SPOT focuses behavior detection and analysis resources on only the most high-risk individuals. It was unknown whether varied procedures of behavior detection and analysis – specifically procedures utilizing greater passenger engagement – could also be used to detect potential HRP. In 2011 TSA designed and implemented the Assessor PoC to determine precisely that.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR part 15 and 1620. No part of this document may be released to persons without a need to know, as determined by 49 CFR part 15.301, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

In the Assessor PoC, TSA sought to evaluate the security effectiveness, operational efficiency, passenger experience, and cost of deploying a new behavior detection technique by adding 100% interaction with passengers near or at the TDC to detect HRP. Assessors underwent an Aviation Passenger Assessor (APA) classroom training course deployed by a security contractor, followed by an On-the-Job training (OJT) period to improve passenger engagement and assessment skills in the TSA environment. This training served as professional development for Assessors by improving their behavior observation skills, interview and eliciting information skills, and passenger interaction skills. During the PoC, Assessors use behavioral analysis based on comprehensive interviews, observation techniques, and review of travel documentation to assess the level of risk to aviation security posed by the individual.

The general procedures are as follows: If the Assessor observes one or more suspicious signs, he or she engages the passenger(s) in additional questioning to attempt to resolve that sign. If the Assessor is able to resolve the suspicious sign(s) then the passenger(s) is routed to standard screening. If the Assessor is unable to resolve the suspicious sign, or additional indicators are observed, then the passenger(s) is routed to secondary screening.

The Assessor is the first behavior based screening model tested by TSA that engages *every* passenger transiting the checkpoint.

2.4 Proof of Concept Experimental Design

In the Assessor PoC, Assessors are stationed at or near the TDC station and engage 100% of passengers transiting that checkpoint. This requires additional resources to perform, even when Assessors operate at the TDC. Although the Assessor function was primarily performed by BDOs, two additional TSA employee groups were briefly used during the PoC in DTW. These include Federal Air Marshals (FAM) and Transportation Security Inspectors (TSI). Data from these groups was also examined to evaluate the applicability of this training to other workforces.

During the PoC the Assessors conducted assessment interviews according to one of the following two options:

1. After a passenger was processed by the TDC TSO, the Assessor briefly interviewed the passenger and made his/her assessment (Option 1).
2. The Assessor performed the TDC function and after completing document verification, the Assessor briefly interviewed the passenger and made his/her assessment (Option 2).

Option 1 was only utilized at BOS and for a period of four weeks. This period provided preliminary data on the efficiency and effectiveness of this option. Differences in security effectiveness between these options are discussed in section 5.3.2. After four weeks Option 1 was discontinued in favor of Option 2, as it provided greater benefits in terms of operational efficiency and passenger experience.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.107-1(a)(2), except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil or criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

After the Assessor performed his/her risk assessment, he/she directed passengers to either standard or secondary screening. Two different variations of secondary screening were tested at both BOS and DTW:

- A. Passengers were handed-off to the checkpoint, at which time the checkpoint conducted *selectee screening* as per the Checkpoint Standard Operating Procedures (SOP). This included:
 - Screening conducted by a TSO
 - AIT (if available)
 - (b)(3), 49 U.S.C. § 44 Pat-Down
 - ETD of accessible property
 - Bag Search
 - Use of Checkpoint SOP LEO notification guidelines
- B. Assessors retained positive control of the passenger(s) and performed *SPOT referral screening* as per the SPOT SOP. This included:
 - Screening by the Assessor with a BDO partner
 - AIT (if available)
 - (b)(3), 49 U.S.C. § 44 Pat-Down (by a TSO)
 - ETD of accessible property
 - Bag Search
 - Casual Conversation
 - Use of SPOT SOP LEO notification guidelines¹⁰

2.4.1 Variations at Proof of Concept Airports

Although both PoC sites were testing the capability of the Assessor, there were some small variations in the designs, protocols, and constraints of each PoC checkpoint that may affect interpretation of the data. This is the general reason for presenting data from each airport separately rather than combining the data sets for analysis. Table 3 outlines the variations in deployment of the Assessor at BOS and DTW.

¹⁰ This distinction is important, as the SPOT SOP requires LEO notification for additional items uncovered in the bag search as well as behavior "signs of deception".

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15.200 and 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or the denial of U.S. government agencies; public disclosure is governed by 51 U.S.C. 552.~~

Table 3. Comparison of Assessor Experimental Designs

Variable	BOSTON	DETROIT
Assessors	BDOs	BDOs, TSIs, and FAMs
CONOPS	<ul style="list-style-type: none"> 8/15/11-9/11/11 conducted Assessor according to Option 1 9/12/11-12/15/11 conducted Assessor according to Option 2 	<ul style="list-style-type: none"> 10/17/11-12/15/11 conducted Assessor according to Option 2
Secondary Screening	<ul style="list-style-type: none"> 8/15/11-8/30/11 checkpoint selectee screening (A) Approx. 9/1/11-12/15/11 SPOT referral screening with a BDO partner (B) 	For BDOs: <ul style="list-style-type: none"> 10/17/11-11/15/11 checkpoint selectee screening (A) 11/16/11-12/15/11 SPOT referral screening with a BDO partner (B) For TSIs and FAMs: <ul style="list-style-type: none"> Only checkpoint selectee screening (A)
Weekly Schedule	PoC conducted several hours a day/shift	PoC conducted every day from 0400-1900
Assessor Shift Length	Entire AM or PM Assessor shift (usually 3-4 hours)	Entire AM or PM Assessor shift (7 or 8 hours)

2.4.2 Scope and Limitations of Experimental Design

The purpose of an experimental test such as a "Proof of Concept" is to explore the effect of a manipulation on an outcome. The purpose of the Assessor PoC was to explore the effect of APA training and Assessor-style engagement on TSA's ability to detect HRP. The general research strategy for evaluating the operational impact of the Assessor involved comparing the system level¹¹ performance during the pilot to the system level performance during a baseline period. As such, baseline data was collected prior to the PoC training and implementation.

However, certain factors could not be controlled between the baseline and PoC periods and therefore could affect the data. These factors were:

- Different passengers transited the checkpoint;
- Different flights occurred; and
- The baseline and PoC periods occurred during different months/seasons.

Although every attempt was made to control system factors other than the enhanced BDO training and Assessor engagement process, a few other variables changed between the baseline and PoC periods. They include:

- A heightened awareness of both passengers and employees regarding RBS and enhanced behavior detection;

¹¹ This includes all detections made at the checkpoint during the baseline or PoC hours.

~~SENSITIVE SECURITY INFORMATION~~
 (S) (A) (P) This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520 as part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. (U) U.S. government agencies, public disclosure is governed by 51 U.S.C. 552

- Increased signage regarding the new checkpoint procedures at the PoC checkpoint;
- Increased media attention during the PoC period; and
- A new queue configuration at the PoC checkpoint.

Additionally, the Assessor PoC itself included several variations from the baseline behavior detection process (SPOT) which may have affected the HRP detection rates. Specifically, in the PoC a number of items were different than SPOT, including:

- BDOs were provided more thorough training and mentoring regarding passenger engagement;
- More BDOs were present at the checkpoint;
- BDOs stood at podiums instead of “walking the line” or performing behavior observation from a distance;
- Other TSA employees were also engaging in behavior detection (e.g., TSIs and FAMs);
- Passenger engagement was increased to 100%;
- Passenger engagement style changed slightly (use of targeted questions); and
- There was an opportunity to resolve suspicious signs before secondary screening occurred.

These differences between the baseline and PoC periods suggest that any changes in effectiveness or efficiency discovered during the PoC process must be interpreted with the listed confounding factors. It is unknown if improvement during the PoC was the result of one of the listed changes, multiple changes, or a combination. For example, it is unknown whether an improved detection rate was the result of increasing the engagement with the traveling public, additional training and indicators for detecting risk or increased coverage of BDOs at checkpoints. Changes in effectiveness must be attributed to the new checkpoint system as a whole; successes or failures cannot be linked to any of the individual components because of the number of elements that were changed in the checkpoint and the behavior detection process with elements of the previous behavior detection process (SPOT) being rolled into the new process (Assessor).

Additionally, there were constraints on the data analysis for DTW, due to the configuration of the McNamara Terminal checkpoints and the nature of the baseline data. These included:

- Four checkpoints (Red 1, 2, 3, and 6) deposit passengers into the same sterile area. Passengers can choose which checkpoint to traverse and they have the opportunity to avoid the Assessor process during the PoC (which may reduce detection rates); and
- There were no cases of HRP detection during the baseline, providing no base rate for analysis.

Any employee performing Assessor is likely to use their background skills and training to inform their decisions when performing passenger screening and behavior detection. The data discussed

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty. The same. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

in this report reveals that BDOs performing Assessor are blending the SPOT role with the Assessor role, and may have been using suspicious indicators from both sets of training to inform their decisions. It is clear from the reports that during the PoC the BDO/Assessors have been incorporating SPOT into the process; however, it is unknown exactly when and to what degree. This also confounds the analysis and understanding of the data.

3.0 Training

3.1 Classroom Training

The APA training is a five day classroom course designed to teach the ability to identify and resolve suspicious indicators linked to potential terrorism. This training is provided by a security contractor, International Security Defense Systems, LLC (ISDS), with experience training aviation assessment worldwide. The instructors from ISDS offer examples of identifying terrorists from personal experience, which brings a level of authenticity and motivation to the students that is not often possible through other training.

The APA course discusses travel documentation, travel patterns, behavioral indicators, appearance factors, and questioning techniques that lead to successful identification of potential HRP. Additionally, students are taught customer service skills, risk evaluation, identifying deviations in identification documents, and short case studies on historical terrorist events. The criteria used to measure daily progress and successful completion of the course includes tests, active participation, and role playing scenarios.

There are several topics in the APA training course that are not covered, or are not covered in as much depth as, in SPOT training which are useful to further develop the skill for a potential Assessor. One of these key components is risk evaluation. This course teaches students to prioritize threats and understand how they change. In prioritizing risk, the Assessor will designate a passenger as threatening or not, and if so, whether they should be categorized as an

(b)(3):49 U.S.C. § 114(f)

Together, they offer behavior observation skills that focus on appearance and documentation signs to catch someone who knowingly or unknowingly is a risk to aviation.

A second key component of the APA training is the inclusion of interview techniques and practice. The instructors discuss the importance of and how to ask open-ended and direct questions when interviewing a passenger. The course offers a list of questions associated with each indicator that should help guide the Assessor to identifying whether the passenger is being deceptive or poses a risk to the aviation environment. Practice in front of the class with feedback from the instructors helps the students learn from each other and provides the opportunity to test

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

out different questioning techniques. While SPOT training does introduce some conversational and interview practice, it is not to the extent of APA's interview techniques.

While the APA training provides Assessors with several new perspectives related to anti-terrorism, the focus of the course is the list of suspicious signs¹² used to determine potential HRP. APA presents 23 total indicators that are divided into two groups: Appearance and Behavior signs ($N = 13$) and Documentation signs ($N = 10$). While most do not overlap, the APA Appearance and Behavior signs share the same scientific underpinnings as the SPOT behavior indicators¹³. This is not surprising, given that APA training influenced the development of SPOT. The APA Appearance and Behavior indicators consist of signs caused by anxiety and physical indicators. (b)(3):49 U.S.C. § 114(f) (that have been tied to past terrorism cases. The Documentation signs are strictly focused on travel documents (b)(3):49 U.S.C. § 114(f) and are a new aspect of passenger assessment that are not currently utilized in the SPOT program. Additional analysis of these indicators is discussed in section 6.0.

In addition to the suspicious signs, APA also teaches students about "positive" signs. These are indicators that are found in populations or groups of people that are less likely to pose a threat to aviation. The concept is that if one of these signs is identified by the Assessor, the Assessor should prioritize that passenger as a lower threat and spend less time on the documentation portion of his or her interview. The Assessor continues to evaluate behavior and appearance indicators even for lower risk passengers. The following groups are identified by APA as being lower risk:

- Family members traveling together;
- Diplomats;
- Designated Very Important Persons;
- Direct TSA or airline employees;
- U.S. military personnel;
- Frequent fliers;
- Passengers under the age of 12; and
- Groups that meet a certain criteria.

This categorization is relevant to RBS and these signs are intended to help understand passenger throughput in a risk-based manner.

APA training was held at BOS and DTW from July through September, 2011. In order to test the effectiveness of different TSA job types in the Assessor role, those that attended the course were BDOs, TSIs, and FAMs. From Boston, 73 BDOs were enrolled, in which two withdrew and one

¹² See Appendix 1 for complete list of APA indicators.

¹³ See Appendix 2 for complete list of SPOT indicators.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

failed the course, resulting in a 96% success rate. The second round of classes was held at DTW and included all three participant groups (BDO, TSI, FAM) with a 100% course completion rate. The total success rate of all participants for the APA course was 98%, with 128 out of 131 passing the required criteria (Table 4).

Table 4. Aviation Passenger Assessor Classroom Training Statistics

Variable	Boston	Detroit	Total
# Originally Enrolled in APA training	73 BDO	44 BDO/8 TSI/6 FAM	131 Students
# Failures or withdrawals from APA	3	0	3
Pass Rate	96%	100%	98%

Multiple criteria are required to pass APA training. Beginning on the second day of the course there is a test given each day on the previous day's lesson. If a student fails a test they must re-take it the next day in addition to that day's test, essentially having to take two. If the student fails the re-take test then they failed the course. Another criterion for passing is daily participation, allowing the instructors to judge whether someone is capable of performing the Assessor role. Lastly, there is a final exam on day five that includes most portions of the entire week-long curriculum. If a student fails the final exam they fail the entire course, however, they are allowed one re-take.

3.2 On-the-Job Training

After passing the APA course, each potential Assessor underwent a second phase of training to become a certified Assessor. This portion of the training coupled a Subject Matter Expert (SME) or chosen Mentor with a Mentee to accomplish proficiency in twenty five specific¹⁴ criteria in the TSA environment (OJT). The criteria are broken out into three sections: Communication and Demeanor, Questioning and Observation Techniques, and Resolution. These criteria are graded on a pass/fail rating and students must successfully pass each task to become a certified Assessor.

The initial group of Mentors included SMEs from the Behavior Detection and Analysis Division (BDAD) and two BDO managers who attended the course prior to the APA training being deployed at BOS. They were mentored for several weeks by BDAD's senior SME who has experience with the APA course and function of the Assessor. After the first few weeks of mentoring, the top Assessors at BOS and DTW were chosen to assist with the mentoring role. These were managers and BDOs who the SMEs determined understood the Assessor concepts best and could transition it well into the operational environment.

¹⁴ See Appendix 3.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Prior to beginning the OJT process, the Mentors briefed the new group of potential Assessors and discussed the checklist they would be graded against. There was no particular method of pairing up Mentors and Mentees, but the pairings were not necessarily the same every day. This allowed the Mentees to learn from the different styles of each Mentor, and the Mentors to make a unified decision if the Mentee was able to perform Assessor in the operational environment.

This portion of the training focused only on interviewing skills, it did not address the secondary screening process. In general Mentors evaluated potential Assessors':

- Flexibility in handling different types of situations;
- Ability to maintain proper customer service skills, such as ability to remain polite;
- Ability to see the suspicious signs when present and address properly;
- Ability to ask the proper amount of questions to the passenger; and
- Ability to make the proper determination of sending passengers to the appropriate level of screening.

Detailed notes were documented daily to track the progress of each Mentee. An OJT time range of eight to 32 hours was selected for this task. Ideally, OJT was provided on consecutive days following the APA course completion, however, this depended on both Mentor and Mentee availability. It was predicted that each Mentee would require a minimum of eight hours to practice the classroom skills in the operational setting, and a ceiling of 32 hours was implemented to bound individuals who could not pick up the required skills. If a BDO, FAM, or TSI could not pass all tasks within that allotted time frame then they were not approved to conduct the Assessor function.

OJT statistics are presented in Table 5. The BOS OJT period began August 2 and ended October 16, 2011; which resulted in a total of 66 BDO Assessors. The minimum OJT time was eight hours, with a maximum of 30.75 hours. Compared to DTW, BDOs at BOS completed the OJT process in a shorter timeframe, averaging 11.28 hours per Mentee. DTW performed OJT from September 12 to November 18, 2011, and certified a total of 49 Assessors: 37 BDO, 6 TSI, and 6 FAM. In this group, the minimum OJT time was eight hours and the maximum time was 32 hours. FAMs had the shortest maximum time spent for OJT with 16 hours, although no TSIs or FAMs completed OJT in just eight hours.

There were a total of 11 individuals who failed or withdrew from OJT. A significant amount of resources were spent on these individuals, ultimately resulting in lost hours. Mentors spent a total of 203 hours mentoring individuals who did not become Assessors.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 5. On-the-Job Training Statistics

Variable	Boston	Detroit
# Originally Enrolled in OJT	70	43 BDO/8 TSI/6 FAM
# Failures or withdrawals from OJT	3	6 BDO/2 TSI
# Certified Assessors	66	37 BDO/6 TSI/6 FAM ¹⁵
Pass Rate	66/70 (94.29%)	49/57 (85.96%)
Minimum OJT Time	8 hours	8 hours
Maximum OJT Time	30.75 hours	32 hours
Average OJT Time (standard deviation)	11.28 hours (4.55)	17.77 hours (8.19)
# Certified in 16 hours or less (proportion)	58 (87.88%)	28 (57.14%)
OJT Hours on Withdrawals/Failures	27 hours	176 hours

Table 6 provides a breakdown of average OJT times by job type. This data is for illustrative purposes only; there is not a large enough sample of TSI and FAM to conduct any formal analyses.

Table 6. On-the-Job Training Time by Job Type at DTW

Variable	BDO	TSI	FAM
# Completed OJT	37	6	6
Completion Rate	86.04%	75.00%	100.00%
Minimum Time	8 hours	10.75 hours	10.75 hours
Maximum Time	32 hours	32 hours	16 hours
Average OJT Time (standard deviation)	17.97 hours (8.47)	21.63 hours (8.51)	12.71 hours (2.40)
# Certified in 16 hours or less (proportion)	20/37 (54.05%)	2/6 (33.00%)	6/6 (100.00%)

There were a total of 131 individuals originally enrolled in the Assessor training sequence to potentially become an Assessor: 73 Boston BDO, 44 DTW BDO, 8 TSI, and 6 FAM. After the Assessor course and on-the-job certification process, there were a total of 115 certified Assessors: 66 Boston BDO, 37 DTW BDO, 6 TSI and 6 FAM. This resulted in an overall pass rate of 88%.

¹⁵ Due to scheduling and other conflicts only five TSI and five FAM Assessors were available during the PoC. ~~W-161000-20. This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know and, to the extent 49 CFR parts 15 and 1520 apply, without the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

4.0 Efficiency Metrics

4.1 Overview

Efficiency metrics describe the system's ability to provide screening in a quick and resourceful manner. Efficiency is an important component of any successful security system that screens a large number of individuals and utilizes taxpayer dollars. While a screening protocol using multiple layers and unlimited time may be extremely effective at detecting and deterring potential threats, it cannot be considered successful when most passengers do not represent threats and the system results in very low passengers satisfaction. Efficiency is also an important consideration as one goal of RBS is to expedite screening for passengers designated as low-risk.

A number of metrics were collected to evaluate any efficiency trade-offs, including: throughput, staffing, wait times, and cycle (process) times. Table 7 describes the purpose and collection procedure for each efficiency metric. The following sections discuss the analysis of these metrics. For ease, different options tested during the PoC period have been collapsed and are discussed together, unless they had a direct impact on the efficiency metric and then are specified otherwise.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.204, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 7. List of Efficiency Metrics

Metric	Purpose	Collection Procedure
1. Throughput	This data allows TSA to analyze the high-risk outcomes per number of transiting passengers.	Each hour the Supervisory Transportation Security Officer (STSO) or designee collected throughput information from all Walk-Through Metal Detectors (WTMD) and AIT.
2. Staffing	This data allows TSA to make a determination regarding the human resource required to run the current screening model.	The staffing count is recorded by both the checkpoint (screening resources) and the SPOT program (Assessor resources) to help determine the number of lanes they are able to staff.
3. Queue Wait Times	This data illustrates the impact on passenger experience as a result of the Assessor.	Data collectors provided wait-time cards to passengers and then tracked the time it took for the passenger to pass from the entry of the queue to the TDC Officer, and then from the TDC Officer to the AIT/WTMD. Passengers traveling in the first class and standard lanes were measured separately.
4. TDC Cycle Times	This data illustrates the change in TDC processing time between the baseline and PoC.	During a ten minute period a data collector counted the number of individuals who were processed by the TDC Officer. TDC cycle time was then calculated by dividing the ten minute period (600 seconds) by the number of individuals processed.
5. Assessor Cycle Times	The purpose of this metric is to understand the average length of time of the Assessor interview process. This will inform deployment and scalability.	This data was collected according to two different methods: 1. At BOS, data collectors monitored an Assessor station for ten minutes and counted the number of individuals who were processed by the Assessor. Data collectors started their stopwatch when the passengers approached the podium and stopped their stopwatch when passengers left the podium. Assessor cycle time was calculated by dividing the ten minute period (600 seconds) by the number of individuals processed. 2. At DTW, data collectors collected actual start and stop times for each party that approached the TDC. This does not include approach time as in the model above, but subsequent collections obtained approach time separately.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty of up to \$100,000. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

4.2 Throughput and Staffing

The Assessor PoC was conducted at the BOS Terminal A¹⁶ Checkpoint and the DTW McNamara Red 1 Checkpoint¹⁷. BOS Terminal A services Delta, Continental, and Alaska airlines. The Terminal A Checkpoint has a total of eight screening lanes in a two to one setup, with four WTMD and four AIT. During the baseline period (56 days), 601,437 individuals passed through Terminal A checkpoint. On average, 10,740 individuals (*SD* = 1,229) transited the checkpoint each day, with (b)(3)(49) screened by the WTMD and (b)(3)(49) screened by the AIT. 597,550 individuals transited during passenger hours¹⁸ (0400-2300).

At BOS, the PoC was conducted for significantly fewer hours per¹⁹ day than normal checkpoint operations (as in the baseline data set). During the PoC period (99 days, average six hours per day), 360,281 individuals transited the Terminal A checkpoint. On average, 3,639 individuals (*SD* = 1,658) transited the checkpoint each day of data collection, with approximately (b)(3)(49) U.S.C. § 1 screened by the WTMD and (b)(3)(49) U.S.C. § 1 screened by the AIT.

At DTW, Red 1 primarily services Delta airlines and is one of four access points to the McNamara terminal sterile area. Additional checkpoints are available on the same level (Red 2), the lower level (Red 3), and in the connected Airport Westin hotel (Red 6). The Red 1 checkpoint has a total of five screening lanes, with three WTMD and three AIT units. Over 61 baseline days, 327,640 individuals passed through the Red 1 checkpoint. On average, 5,371 individuals (*SD* = 812) transited the checkpoint each day, with (b)(3)(49) U.S.C. § 1 screened by the WTMD and (b)(3)(49) U.S.C. § 1 screened by the AIT. During the baseline period Red 1 generally operated according to the same schedule each day (0400-1900)²⁰.

At DTW, the PoC was conducted for approximately the same length of time as the baseline (60 days). During the PoC period (60 days, average 15 hours per day), 323,383 individuals transited the Red 1 checkpoint. On average, 5,390 individuals (*SD* = 889) transited the checkpoint each day of data collection, with approximately (b)(3)(49) U.S.C. § 1 screened by the WTMD and (b)(3)(49) U.S.C. § 1 screened by the AIT.

Table 8 shows the total throughput during the baseline and PoC periods as well as the total numbers of passengers affected by the Assessor process. The Assessors did not interview employees or flight crew and passengers represented 88% of the total throughput²¹. At BOS and

¹⁶ See Appendix 4 for layout.

¹⁷ See Appendix 5 for layout.

¹⁸ This is a 24 hour checkpoint, however passengers generally do not transit the checkpoint between the hours of 2300 and 0400.

¹⁹ See Appendix 6 for the BOS master schedule.

²⁰ Although sometimes the checkpoint was closed early if throughput was low.

²¹ Employees and flight crew were excluded from the PoC stage because there were no "screening benefits" to participating and TSA did not want to inconvenience these groups as they were testing the Assessor concept.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or the death of a U.S. government agency; public disclosure is governed by 51 U.S.C. 552.~~

DTW. Assessors were able to process large numbers of passengers at relatively quick rates with only spending additional time with a small proportion of passengers (1.16%). In general, very few passengers refused to speak to the Assessor ($N = 143$). An even smaller proportion of the traveling public was considered a potential risk by the Assessor and sent to secondary screening (0.11%). During the PoCs, only 689 passengers of 601,098 questioned were sent to secondary screening.

Table 8. Assessor Throughput Data

Metrics	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
Dates	6/6/11- 7/31/11	8/15/11- 12/15/11 ²²	7/18/11- 9/16/11	10/17/11- 12/15/11
Total Throughput	597,550 ²³	360,281	327,640	323,383
Proportion screened by AIT	(b)(3) 49 U.S.C. § 114(f)			
Total Spoken to by Assessor (passenger throughput)	n/a	313,293	n/a	287,805
Total Refusing to Speak with Assessor	n/a	95	n/a	48
Refusal Rate	n/a	0.03%	n/a	0.02%
Formal Complaints	n/a	3	n/a	8
Total Assessor Resolution Interviews	n/a	4,496	n/a	2,461
Total Assessor Referrals (Selectees)	n/a	506	n/a	183
Assessor Selectee Rate ²⁴	n/a	0.16%	n/a	0.06%

This data reveals some differences in passenger throughput and selection between the two PoC airports. Although the BOS terminal was larger and PoC period was longer in length, the BOS Assessors only processed 25,000 more passengers than DTW Assessors. This was due to the limited schedule conducted by BOS: on average the PoC was conducted for six hours a day at BOS (excluding some weekend and holidays) whereas the PoC was conducted for 15 hours a day at DTW (every day including holidays). Almost twice as many passengers refused to speak with Assessors at BOS, and this may be influenced by the first class line²⁵.

BOS Assessors selected almost twice as many passengers for additional questioning than DTW Assessors. We do not know if this was due to true differences in the passenger populations, or if

²² The BOS Assessor PoC was not conducted on every date during this period. See Appendix 6 for master schedule.

²³ This is the total throughput from the hours of 0400-2300. The hours of 2300-0400 were excluded as generally no passengers transited the checkpoint during that time. Additionally, the PoC was not conducted during this time (2300-0400) at any point, therefore this represents a better comparison to the PoC period.

²⁴ The Assessor Selectee rate is the number of passengers sent to high-risk screening by Assessors ($N=689$) divided by the total number of passengers spoken to by Assessors ($N=601,098$)

²⁵ BOS Terminal A has a first class line; DTW Red J does not.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

there were variations between different types of Assessors (e.g., BDO, TSI, FAM). Of the passengers who received additional questioning, BOS Assessors selected 11% (506 of 4,496) and DTW Assessors selected 7% (183 of 2,461) for secondary screening²⁶. Given that a greater proportion of passengers were subjected to a higher level of screening at BOS, it would be expected for BOS to detect a greater number of high-risk outcomes.

The addition of the Assessor should affect how screening operations staffs the checkpoint. In Option 1, the Assessor position was added *after* the TDC for passenger engagement. This resulted in no change in the required amount of checkpoint personnel to screen passengers; however it required a significant increase in behavior detection resources. In Option 2, the Assessor *replaced* the TDC resource, which should decrease the required checkpoint staff, but may increase the overall staff at the checkpoint as more Assessor stations were required than the original number of TDC stations²⁷.

Staffing data was collected at both PoC sites. At BOS, the total number of checkpoint staffing hours was collected each day. This helped estimate the staffing expense of checkpoint operations. This data point did not include the number of resources needed for unpredictable screening layers such as SPOT or Playbook; however, additional staffing data on the number of Assessors was collected separately during the PoC and is reported separately below. DTW reported staffing hours in a different manner: the DTW Coordination Center (DTWCC) reported the number of full-time and part-time personnel who were present at the checkpoint each day. Total staffing requirements were calculated by assigning each full-time employee a score of 1 and each part-time employee a score of 0.5. BOS and DTW checkpoint staffing data are not directly compared as these metrics were collected in different ways.

Table 9 shows the average required staffing per throughput during the passenger hours of the baseline and all hours of the PoC. For BOS, Options 1 and 2 are broken out separately, as they should have a direct effect on the number of Checkpoint resources. Checkpoint staffing efficiency was computed by dividing the number of checkpoint staff hours by the throughput for the hours of the baseline or that day's PoC hours²⁸. Analyses revealed significant differences in checkpoint staffing efficiency at both BOS²⁹ and DTW³⁰. At BOS, the checkpoint staffing efficiency significantly declined during the Assessor PoC Option 2. Analyses revealed no differences between the baseline and Option 1 – which was expected – however, a significant

²⁶ This should be noted as high-risk detections are discussed; one reason BOS Assessors identified more HRP than DTW Assessor may be partially caused by their high selection rate.

²⁷ Because the Assessor cycle is longer than the TDC cycle. This will either affect staffing (more staffing is required to maintain throughput) or throughput (with the same staffing passengers would be processed more slowly).

²⁸ We recognize that checkpoint staffing can change throughout the day; however, this data was not collected on an hourly basis, rather on a daily PoC basis. The data presented is an overall look at staffing during PoC times, which could have been for small (BOS) or long (DTW) periods throughout the day.

²⁹ $F(2, 143) = 8.041, p < .001$.

³⁰ $F(1, 118) = 4.091, p = .045$.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other actions by U.S. government agencies; public disclosure is governed by 51 U.S.C. 552.~~

difference between the baseline and Option 2 – which was opposite of the predicted direction. The data revealed that it took *more* checkpoint staff to screen passengers when Assessors were stationed at the TDC³¹. However, since BOS only conducted the Assessor at random days and hours, it is possible that the checkpoint continued to staff their operations as if they controlled TDC, since they may have had to take-over TDC functions mid shift³². Additionally, BOS reported using TSOs as a “queuing” officer, whose function was to manage the line and direct passengers to the open Assessor podiums. This created a new position which results in no savings in staffing. At DTW, the checkpoint staffing efficiency significantly improved during the Assessor PoC. The data reveals that staffing levels slightly reduced when the Assessor performed TDC, which was the anticipated benefit. Fewer checkpoint staff were needed to screen the same amount of passengers during the PoC at DTW.

Table 9. Assessor Proof of Concept Checkpoint Staffing

Metrics	BOS Baseline	BOS PoC Option 1	BOS PoC Option 2	DTW Baseline	DTW PoC Option 2
Dates	6/6/11-7/31/11	8/15/11-9/11/11	9/12/11-12/15/11	7/18/11-9/16/11	10/17/11-12/15/11
Average No. Hours/Day	19.00	3.90	6.47	15.00	15.03
Average Throughput	10,671	2,628	3,895	5,371	5,390
Average Daily Staffing	555 hours/day (0400-2300)	144 hours/daily PoC	226 hours/daily PoC	44 persons/day	42 persons/day
Checkpoint Staffing Efficiency (Throughput per staffing)	19.27 per staff hour	18.09 per staff hour	17.05 per staff hour	121.66 per staff per day	129.01 per staff per day

As previously noted the Assessor process adds another layer of screening as well as increases the resources required at the checkpoint. Data was also collected on the Assessor-specific staffing requirements throughout the PoC³³. Table 10 reveals that on average at BOS, each day of the PoC Option 1 required an average of 32 hours of Assessor staffing to complete the screening of approximately 2,628 individuals. This revealed that one Assessor hour was equivalent to approximately 88 individuals screened. Each day of the PoC Option 2 required an average of 48 hours of Assessor staffing to complete the screening of approximately 3,895 individuals. This

³¹ However, it is unknown if the checkpoint was overstaffing the checkpoint, or if the Assessor somehow produced this burden.

³² At times, the PoC was only scheduled for a two-hour period per shift. This would not allow the checkpoint to reduce their resources, as they would need the TDC resources for the remaining six hours of the shift.

³³ Each airport was responsible for submitting their own staffing data; although the collection requirements were outlined to each airport, it is possible that there were some differences in reporting. Data was collected for each day or shift of the PoC; although more thorough analyses could be performed if staffing was provided on an hourly basis, this type of data was not available.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

revealed that one Assessor hour was equivalent to approximately 77 individuals screened. These times are consistent with reports of Assessor interview time³⁴, in which Assessor screening *at* the TDC – which included TDC functions - took longer than Assessor screening performed *after* the TDC.

At DTW, each day of the PoC required an average of 86 hours of Assessor staffing to complete the screening of approximately 5,390 individuals. This revealed that one Assessor hour was equivalent to approximately 64 passengers screened, which is inconsistent with reports of Assessor interview time³⁵. This suggests that DTW may have had too many Assessor resources for the PoC, however, this may be caused by keeping Assessors full-shift rather than staffing to smaller blocks with consistent throughput. At DTW, Assessors were scheduled for seven or eight hour shifts and it is unknown whether these staffing levels were adjusted during peak times³⁶. In addition, DTW Assessors performed the function for longer hours, which may have resulted in the need for additional breaks to maintain focus.

Table 10. Assessor Staffing by Throughput

Metrics	BOS Option 1	BOS Option 2	DTW Option 2
Average Assessor Staffing	31.60 Assessor hours / 3.90 PoC hours	48.33 Assessor hours / 6.47 PoC hours	86.01 Assessor hours / 15.03 PoC hours
Throughput Per Assessor Staff Hour	87.90 per Assessor staff hour	76.51 per Assessor staff hour	64.01 per Assessor staff hour

4.3 Queue Wait Times

The queue wait time was collected by National Deployment Force (NDF) data collection teams stationed at each airport. Members of the collection team gathered wait time data in the first class and standard TDC queues throughout the baseline and PoC periods for BOS, and the baseline period only for DTW. Queue times were not collected for the DTW PoC period³⁷, so only data from BOS is reported. Baseline DTW queue time data is available in the DTW baseline report³⁸. Passengers traveling in the first class and standard pre-TDC queues were measured separately.

³⁴ See Assessor cycle times (4.4). 87.9 passengers per hour results in a cycle time of approximately 41 seconds. 76.51 passengers per hour results in a cycle time of approximately 47 seconds.

³⁵ See Assessor cycle times at DTW (4.4.2). A cycle time of 44 seconds (including transit time) results in approximately 82 passengers processed an hour.

³⁶ Though it is likely that they were not adjusted, as DTW used TSI and FAM as Assessors who did not have other duties in the airport they could be assigned to during slow times.

³⁷ TSA contracted TASC to collect data during the DTW PoC; in lieu of operational queue wait time collection, TASC will be modeling the effect of Assessor on queue times.

³⁸ See the *Behavioral Assessment Level II PoC Preliminary Data Report*, available October 13, 2011.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.204 and 15.205, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty and/or criminal sanction. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Average wait times are displayed in Table 11. Analyses were conducted to explore the differences in total wait times between the baseline and PoC Options; however data suggested little difference in overall wait times between these periods.

Table 11. Queue Total Wait Times at RGS

Wait Time	Baseline Mean (Stan. Dev.)	PoC Option 1 ³⁹ Mean (Stan. Dev.)	PoC Option 2 Mean (Stan. Dev.)
Minimum	0:01:00	0:01:00	0:00:00
Maximum	0:41:00	0:33:00	0:33:00
Average	0:10:40 (5:18)	0:10:25 (5:59)	0:10:38 (5:12)
AM Peak (0500-0700)	0:09:12 (5:00)	0:09:12 (3:39)	0:09:43 (4:47)
PM Peak (1530-1730)	0:11:44 (4:47)	0:17:25 (6:33)	0:13:47 (6:53)
Non Peak	0:10:53 (5:33)	0:09:24 (5:26)	0:10:18 (4:51)
First Class Queue	0:08:53 (4:24)	0:08:59 (5:30)	0:09:11 (4:37)
Standard Queue	0:12:12 (5:32)	0:11:40 (6:09)	0:11:41 (5:21)

Although there were no major differences between the overall wait during the baseline and PoC, each period showed different patterns during the peak times. While the wait time was consistent during the AM peak, it greatly varied during the PM and non-peak times. During the non-peak time, the Option 1 wait time was significantly less than the baseline wait time⁴⁰. During the PM peak, all times were significantly different⁴¹. The baseline wait time was the quickest, followed by Option 2, followed by Option 1.

These results show a few inconsistencies with wait times during Option 1 as compared to the other two periods. It is important to note that Option 1 was the first test of the Assessor CONOPS, and the airport and program office were only beginning to learn how the Assessor impacted staffing and wait times. Additionally, Option 1 was the only period in which passengers submitted to screening at an additional podium to the TDC prior to the checkpoint.

The wait times remained constant for the first class compared to standard lanes. The first class queue was a significantly shorter wait⁴², which is likely due to the fewer passengers transiting this queue.

³⁹ Very few data points were available for queue time in option 1 ($N = 199$). Only 57 data points were available during peak times.

⁴⁰ $F(2, 1055) = 4.126, p = .016$. Tukey's post-hoc reveals differences between baseline and Option 1 ($p = .012$).

⁴¹ $F(2, 257) = 12.533, p < .001$.

⁴² Univariate ANOVA of queue type vs. time period. Main effect for queue type, $F(1, 1551) = 84.090, p < .001$.

~~W. RIGHTS: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other sanctions. 100 U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

4.4 Cycle Times

4.4.1 BOS Cycle Times

Cycle time data was collected by the NDF data collection team deployed to BOS. During the baseline period, the data collection team collected TDC cycle times, and during the PoC period the team also collected Assessor cycle times when the Assessor was both after, and at the TDC. Detailed analyses of factors affecting baseline cycle times are presented in the BOS baseline report⁴³.

The purpose of these metrics is to understand the average length of time of the TDC cycle, Assessor interview, and combined TDC and Assessor processes. Table 12 provides the average cycle time of each of these processes. The TDC cycle time – defined as the time for the TDC TSO to verify travel documents – significantly increased from the baseline to the PoC. There are several possible explanations for the increase in TDC cycle time during the PoC. During the PoC, TSOs performing TDC duties experienced greater scrutiny from the public, the media, and their supervisors. Generally, each day one or more TSMs or airport Senior Leadership were onsite to observe the operation. This may have caused the TSOs to slow down and take more time with each passenger. Additionally, this was the first time the TDC experienced a line directly behind them. Having passengers queued up behind the TDC officers may have also caused them to subconsciously slow down to allow the line to shorten behind them.

The average Assessor cycle time was collected during the first four weeks of the PoC when the Assessor operated directly after the TDC Officer. During these first four weeks, Assessors spent approximately 40 seconds with each passenger. Beginning on week five (September 12, 2011), Assessors began to function as both the TDC Officer and the Assessor interviewer. Data collectors measured the TDC plus Assessor cycle time at 106 different points in time⁴⁴. This metric reveals that the combined TDC and Assessor function processes operated at about 44 seconds per passenger – only a four second increase from the Assessor function alone.

There are several possible explanations for this finding. First, the Assessor cycle time was collected at the start of the PoC, whereas the TDC plus Assessor cycle time was collected near the close. It is possible that the Assessor skill became quicker and more natural to the Assessors as they gained experience. Additionally, document review is an important part of the Assessor process. During Option 1 of the PoC, although not mandated by TSA, Assessors were performing many of the TDC functions as well; as their training directed them to review travel documents for suspicious signs. This suggests the addition of the TDC function into the Assessor process was natural and efficient.

⁴³ See *The Screening of Passengers by Observation Techniques Program's Behavioral Assessment Level II Proof of Concept Baseline Report*, available August 8, 2011.

⁴⁴ TASC was able to collect thousands of data points in DTW to construct a more detailed analysis.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Data was also collected on cycle times in the first class and standard screening queues. This data is illustrative only, as only a few data points were collected in first class. The general trend revealed shorter cycle times in the first class queue as compared to the standard queue. (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r) Another note is that frequent travelers have a shorter space to transit to the TDC and are generally prepared with their boarding documents and IDs.

Table 12. BOS Cycle Times

Metrics	Baseline	PoC Option 1	PoC Option 2
TDC Cycle Time	18.57 seconds 0:19 first class 0:18 standard	22.19 seconds 0:20 first class 0:23 standard	n/a
Assessor Cycle Time	n/a	40.48 seconds 0:35 first class 0:43 standard	n/a
TDC Plus Assessor Cycle Time	n/a	n/a	44.13 seconds 0:40 first class 0:45 standard

4.4.2 DTW Cycle Times

Cycle time data was collected by the NDF data collection team during the DTW baseline period and by TASC during the PoC. While every effort was made to standardize these procedures, there were some differences in collection methods. NDF collectors viewed TDC podiums for 10 minute periods and counted the number of passengers processed in that period. This led to a cycle time (like BOS) which included passenger transit⁴⁵. This baseline data is presented in Table 13, with more detailed analyses included in the DTW Baseline Report.

Table 13. DTW Baseline TDC Cycle Time

Metric	Baseline
TDC Cycle Time	17.04 seconds

During the PoC, TASC collectors used handheld devices and collected individual cycle times of each passenger or party at the TDC. This data should not be directly compared to BOS cycle times, since they were collected according to different methods. However, this collection method resulted in more accurate and detailed data, and can be analyzed on its own to understand

⁴⁵The passenger(s) approaching and leaving the podium.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

differences in cycle times based on a number of variables such as Assessor type, passenger type, party size, and travel document type.

Table 14 displays the overall average Assessor cycle times collected during the DTW PoC. The DTW PoC was deployed according to Option 2, so these cycle times represent the "Assessor at TDC" cycle⁴⁶. Times are separated by whether the system was "fully loaded" or "non-fully loaded". Fully loaded denotes that the passenger queue was full, and is a better representation of peak times. Non-fully loaded indicates that there were some times when an Assessor was not continuously processing passengers. The transit time represents the time the passenger(s) took to move from the front of the queue to the Assessor podium and hand over their travel documents. This metric did not change depending on load status. During fully loaded conditions, Assessors processed passengers significantly more quickly⁴⁷. This is not surprising, as officers may have felt internal and external pressure to manage throughput during busy times⁴⁸.

Table 14. Assessor Cycle Times by Load Status

Load Status	Avg. Transit (seconds)	Avg. Cycle Time Per Pax (seconds)	Total Time Per Pax (seconds)
Fully Loaded	4.04	37.92	41.96
Non-Fully Loaded	4.09	41.02	45.11
Grand Total	4.07	39.97	44.04

At DTW, three different types of TSA employees were trained and utilized as Assessors. Cycle time by different job types can be found in Table 15 (loaded conditions collapsed). Analyses revealed that BDO/Assessors performed the Assessor function significantly quicker than FAM/Assessors or TSI/Assessors⁴⁹. One reason may be that TDC was a new task for TSIs and FAMs, whereas the majority of BDOs were already TDC trained. There was no significant difference between TSIs and FAMs.

Table 15. Assessor Cycle Times by Job Type

Job Type	Avg. Transit (seconds)	Avg. Cycle Time Per Pax (seconds)	Avg. Total Time Per Pax (seconds)
BDO	4.06	38.45	42.51
FAM	4.20	42.33	46.53
TSI	4.01	41.54	45.53

⁴⁶ The Assessor performed both the TDC function and the Assessor function at one podium.

⁴⁷ 2 sample t-tests assumed unequal variances, $p < .001$.

⁴⁸ This perception was discussed in focus groups with Assessors, and this trend is also evident in TDC cycle baseline data.

⁴⁹ 2 sample t-tests assumed unequal variances, $p < .001$.

~~SENSITIVE SECURITY INFORMATION~~
This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except as may be permitted in writing by the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.

(b)(3):49 U.S.C. § 114(r)

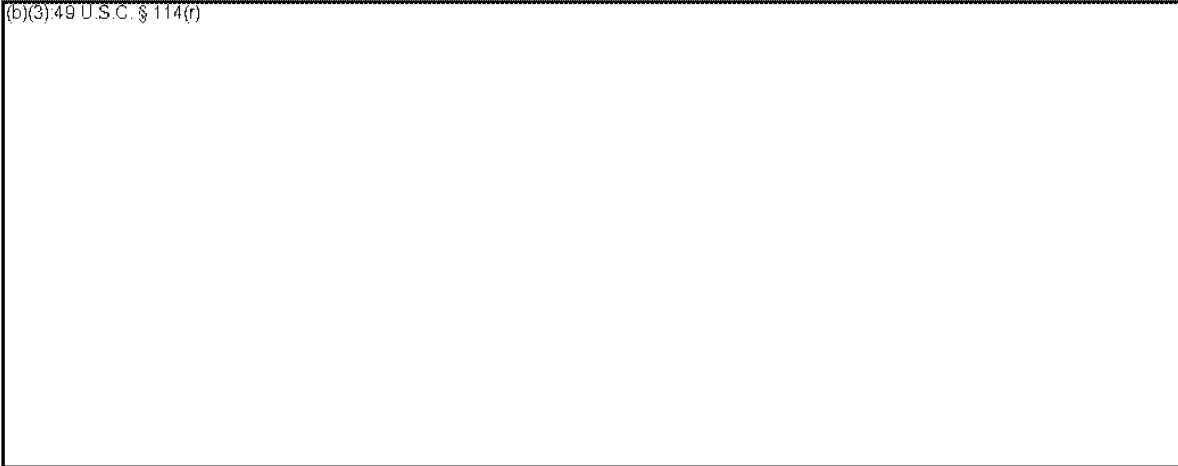


Table 16. Assessor Cycle Times by Passenger Type

(b)(3):49 U.S.C. § 114(r)	Percent of Population	Avg. Party Size	Avg. Transit	Avg. Cycle Time Per Pax	Avg. Total time Per Pax
	0.59%	1.22	3.72	31.78	35.50
	3.79%	1.66	4.28	41.84	46.12
	6.62%	3.56	4.23	24.51	28.74
	89.00%	1.27	4.05	41.10	45.15

When possible, data collectors also noted the identification (ID) type the passenger(s) presented to the Assessor. This allows TSA to evaluate whether cycle time was dependent on ID type which in turn informs deployment of Assessor to different terminals which may be prone to a particular set or variety of IDs. Analyses were conducted to evaluate differences between groups for the four ID types with sufficient data: 1) U.S. Driver's License ($N = 7,590$, $M = 39.15$), 2) U.S. Passport ($N = 989$, $M = 41.05$), 3) International Civil Aviation Organization (ICAO) Non-U.S. Passport ($N = 793$, $M = 49.75$) and 4) Other ID ($N = 373$, $M = 33.27$). Analyses revealed significant differences between non-U.S. Passports and all other groups⁵⁰. Assessor cycles on individuals submitting non-U.S. passports took significantly longer (approximately 10 seconds) than the other ID types. Other ID was significantly different than all other ID types⁵¹. It should be noted that one subgroup of the "other ID" were military personnel providing military ID.

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

There was also a

⁵⁰ 2 sample t-tests assumed unequal variances, $p < .001$.

⁵¹ 2 sample t-tests assumed unequal variances, $p < .001$.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

significant difference between U.S. licenses and passports⁵², revealing that Assessors took longer to verify passports than driver's licenses.

Table 17. Assessor Cycle Times by Identification Type

ID Type	N	Percent of Population	Avg Party Size	Avg Cycle Time Per Pax
U.S. Driver's License	7590	77.87%	1.34	39.15
U.S. Passport	989	10.15%	1.58	41.05
ICAO Non-U.S. Passport	793	8.14%	1.71	49.75
Other ID	373	3.83%	2.32	33.27
None (Minor)	2	0.02%	1	54.00
Grand Total	9747	100.00%	1.43	39.98

There are several possible reasons for these differences. (b)(3):49 U.S.C. § 114(f)

(b)(3):49 U.S.C. § 114(f)

5.0 Effectiveness Metrics

5.1 Overview

Effectiveness analyses should describe the system's ability to detect threats to security such as HRP. Effectiveness is critical in security; any security measure should be able to detect what it purports to detect. The Assessor is a security measure put in place to detect and accurately route potential threats to additional screening such as HRP.

A number of metrics were collected to evaluate the effect of Assessor on security effectiveness, including: Assessor and LEO referral rates and outcomes, detection of SPII, artfully concealed items, and passenger arrests. These metrics are examined at both the system-wide level (comparing baseline system to PoC system) as well as at the level of the referral. Some comparisons to SPOT referral rates and outcomes were also conducted. Table 18 lists the

⁵² 2 sample t-tests assumed unequal variances. $p = .005$.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

purpose and collection procedure for each effectiveness metric. The subsequent sections discuss the analysis of these metrics. For ease, different options tested during PoC period have been collapsed and are discussed together, unless they had a direct impact on the metric and then are specified otherwise.

Table 18. List of Effectiveness Metrics

Metric	Purpose	Collection Procedure
1. Assessor Referrals	This data allows TSA to examine the rate of referral to selectee procedures as a result of the PoC, as well as understand the types of indicators leading to a referral and ultimately detection of HRP.	All Assessors complete a Referral Report for each person that was referred to secondary procedures as the outcome of the Assessor process.
2. Law Enforcement Officer (LEO) Referral	This data allows TSA to examine the change in rate of referral during the PoC as well as the proportion of outcomes per referrals.	An incident report is completed each time a LEO is called to the checkpoint. This information is also noted in SPOT and Assessor referral reports.
3. Serious Prohibited or Illegal Items (SPII)	TSA is interested in the detection of SPII. These items represent a potential threat to aviation security and warrant a LEO notification.	Since a LEO is notified when a SPII is discovered at the checkpoint, the checkpoint must complete an incident report when these items are found.
4. Artful Concealment	Artful concealment may represent intent to hide items from checkpoint security. Although individuals who artfully conceal items may not intend to do harm with the items, they are attempting to defeat the screening process, and should possess a fear of discovery.	The checkpoint requires LEO notification for any situation in which artful concealment occurs.
5. LEO Arrest	The frequency and rate of LEO arrest is an important high-risk outcome because it denotes the seriousness of the event.	LEO arrests are documented on the SPOT Referral Reports, Assessor Referral Reports and Checkpoint Incident Reports.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, or without the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

5.2 Descriptive Statistics

The following sections provide an overview of the effectiveness metrics. These metrics were tracked in both the baseline and PoC time periods, and are sometimes broken out by “owner” of that detection (e.g., Assessor, SPOT, checkpoint, or total system).

5.2.1 Assessor Referrals

During the PoC Assessors engaged over 600,000 passengers. When Assessors observed one or more suspicious signs, they asked additional questions to try and resolve that sign, prior to submitting any passenger to additional screening. However, when an Assessor was unable to resolve the observed sign – or further confirmed the sign – then the Assessor referred that passenger (b)(3)49 U.S.C. § 114(f) to secondary screening.

During the PoC, Assessors referred 689 passengers to secondary screening (Table 19). This represented 0.11% of the traveling population during the PoC and 9.9% of the passengers receiving additional questioning at the podium ($N = 6,947$).

Table 19. Number of Assessor Referrals

Metric	BOS	DTW	Total
Total Assessor referrals	506	183	689
Avg. number of referrals/Day	5.11	3.05	4.33
Avg. number of referrals/Hour	0.86	0.20	0.46

Referrals by Job Type are broken out in Table 20. Five FAMs and five TSIs conducted Assessor in the DTW PoC. These individuals performed Assessor five days a week, whereas a BDO/Assessor at DTW generally performed Assessor three days a week. During the DTW PoC BDO/Assessors referred 142 passengers, TSI/Assessors referred 23 passengers, and FAM/Assessors referred 18 passengers to secondary screening. The only high-risk cases were detected in BDO/Assessor referrals; this may be due to the different secondary screening procedures used by the different groups⁵³ or dependent on the sheer number of referrals. At DTW, BDO/Assessors only uncovered one HRP for every 28.4 referrals; this suggests that TSIs and FAMs potentially may not have referred enough passengers to detect even one HRP. TSI and FAM Assessors referred very few passengers overall.

⁵³ High-risk outcomes were only uncovered in BDO/Assessor referrals when BDO/Assessors engaged in SPOT referral screening with their selectees. No high-risk outcomes were uncovered at DTW when BDO/Assessors handed their selectees over to the checkpoint.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 20. Number of Assessor Referrals by Job Type at DTW

Metric	BDO	TSI	FAM
Total Assessor referrals	142	23	18
Proportion of Total Assessor referrals	77.6%	12.6%	9.8%
Total Assessor LEO Referrals	5	0	0

5.2.2 Law Enforcement Referrals

Law Enforcement Officers (LEO) are notified to assist checkpoint screening when alarms cannot be resolved, passengers are uncooperative, the checkpoint discovers certain prohibited items, or when other potential threats are discovered⁵⁴. According to TSA procedures, an incident report must be completed when a LEO notification is made, even if the LEO does not respond. Tables 21-24 and the corresponding sections describe LEO referrals that occurred at the checkpoints during the baseline and PoC periods. This includes Assessor LEO referrals as well as SPOT or Checkpoint Screening LEO referrals.

At BOS Terminal A, there were a total of 20 LEO referrals during the baseline period and 154 LEO referrals during the PoC period. This represented a 13 times increase in proportion of passengers referred to LEOs from the baseline period. The majority of these LEO referrals originated from the Assessor ($N = 137$), but there was also an increase in SPOT LEO referrals during the PoC as well.

At DTW Red 1, there were a total of four LEO referrals during the baseline period and 21 LEO referrals during the PoC period. This represented a five times increase in proportion of passengers referred from the baseline period. Only five of these LEO referrals were from the Assessor, revealing a sizable increase in checkpoint LEO referrals as well.

⁵⁴ See *Screening Checkpoint SOP*.

~~Whenever this document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520, no part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15.001-15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty of up to \$100,000. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 21. Frequency of LEO Referrals at the Proof of Concept Checkpoints

Metric	BOS	BOS	DTW	DTW
	Baseline	PoC	Baseline	PoC
Throughput	597,550	360,281	327,640	323,383
Total LEO Referrals	20	156	4	21
Proportion of Throughput referred to LEO	0.003%	0.043%	0.001%	0.007%
Total SPOT Referrals	74	95	48	46
Total SPOT LEO Referrals	8	14	0	3
Proportion of SPOT referrals that escalate to a LEO referral	10.81%	14.74%	0.00%	6.52%
Total Assessor Referrals	n/a	506	n/a	183
Total Assessor LEO Referrals	n/a	137	n/a	5
Proportion of Assessor referrals that escalate to a LEO referral	n/a	27.08%	n/a	2.73%

Overall the rate of LEO notifications increased during the PoC and this trend can be seen in Assessor, SPOT and Checkpoint operations. One reason for the increase at BOS was the increase in BDO teams present at Terminal A⁶⁵ as well as the increased presence of LEOs at the checkpoint. The Massachusetts State Police (MSP) stationed one local LEO at Terminal A for the entirety of the PoC, which improved the LEO response. The increase in overall LEO notifications at DTW is unknown, but may be linked to their increased vigilance.

Table 22 displays the reasons for LEO notification during all time periods and PoC locations. The trends differ between locations and the baseline and PoC periods. At BOS during the baseline, the most common reasons for LEO referral were the discovery of SPII, SPOT Signs of Deception, and other prohibited items (such as box cutters). During the PoC period, the most common reasons for referral were illegal citizenship status (b)(3):49 U.S.C. § 114(r). Several reasons for referral (b)(3):49 U.S.C. § 114(r) (b)(3):49 U.S.C. § 114(r) which suggests that the Assessor may add a new detection element to the layers of security at the checkpoint. It is interesting to note that while more than half of LEO referrals that occurred during the baseline were the result of discovered items (SPII, other prohibited items), during the PoC proportionally more passengers were referred to LEO because of their behavior or something said in conversation (b)(3):49 U.S.C. § 114(r) (b)(3):49 U.S.C. § 114(r).

At DTW during the baseline period, all four LEO referrals (b)(3):49 U.S.C. § 114(r) (b)(3):49 U.S.C. § 114(r) During the PoC period, the most common reasons for referral (b)(3):49 U.S.C. § 114(r) (b)(3):49 U.S.C. § 114(r) There are no commonalities between LEO referrals

⁶⁵ There was generally always one BDO team performing SPOT which helped provide breaks for Assessors. ~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined in 49 CFR parts 15 and 1520, except with the express permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For TSA government agencies, public disclosure is governed by 51 U.S.C. 552.~~

that occurred during the baseline and PoC periods at DTW, however, there were very few overall to evaluate.

Table 22. Frequency of and Reason for LEO Referrals

Reason for LEO Referral	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
(b)(3):49 U.S.C. § 114(r)				

As Assessors are given additional document training, (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r) In general, the differences in referral trends that occurred between the baseline and PoC periods suggest that the Assessor provided a new layer of security to the checkpoint. However, it is unknown how this layer affected other screening measures, (b)(3):49 U.S.C. § 114(r)

Data was also collected on the outcomes of the LEO referrals (Table 23). These outcomes were directly linked to the reasons for referral, (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r) However, during the PoC period the LEOs appeared to get more involved by conducting more National Crime Information Center (NCIC) checks on passengers, some of which resulted in LEO arrests.

* Early data collection did not allow for collection of this metric.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 23. Law Enforcement Officer Referral Outcomes

LEO Resolution	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
LEO confiscated or disposed of prohibited item	7 (35%)	6 (4%)	0	5 (24%)
LEO questioned and released individual ⁸⁷	4 (20%)	100 (64%)	0	3 (14%)
LEO responded but did not question individual	0	5 (3%)	0	0
LEO verified passenger's identity and passenger was cleared to Fly	0	0	3 (75%)	2 (10%)
Passenger cleared to fly	5 (25%)	2 (1%)	1 (25%)	3 (14%)
LEO had passenger destroy FTD in his presence	1 (5%)	2 (1%)	0	1 (5%)
LEO arrested individual	0	35 (22%)	0	2 (10%)
NCIC checks revealed warrants but LEO did not arrest	0	2 (1%)	0	1 (5%)
LEO told passenger to leave airport (b)(3):49 U.S.C. § 114(f)	1 (5%)	0	0	0
Checkpoint reopened (after breach)	2 (10%)	0	0	0
Other	0	1 (1%)	0	4 (19%)
Unavailable	0	3 (2%)	0	0

The majority (80%) of these LEO referrals during the PoC originated as Assessor referrals. The data revealed that Assessors notified LEOs (b)(3):49 U.S.C. § 114(f) (Table 24).

Table 24. Top Reasons for Assessor Law Enforcement Officer Referrals

Reason For LEO Referral	BOS	DTW
(b)(3):49 U.S.C. § 114(f)	53	0
	37	2
	12	2
	7	1
	6	0
	5	0
	3	0
	14	0

⁸⁷ In most of these cases the LEO also conducted NCIC checks.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

5.2.3 Artful Concealment

Artful concealment occurs when a device/bag/artifact (b)(3)49 U.S.C. § 114(r)
(b)(3)49 U.S.C. § 114(r)

(b)(3)49 U.S.C. § 114(r) The checkpoint requires LEO notification for any situation in which artful concealment occurs. While there is no direct measure of “intention to deceive”, artful concealment may represent intention to conceal items from checkpoint security. Although individuals who artfully conceal items may not intend to do harm with the items (e.g., a person may artfully conceal a knife in his or her bag because it is an heirloom), they are attempting to defeat the screening process, and should possess a fear of discovery resulting in observable behavior changes.

At BOS there was one artful concealment detection during the baseline. The case involved a SPOT BDO who found illegal pills in a tie tac container during SPOT referral screening. The passenger also displayed Signs of Deception during the referral. The passenger was referred to a LEO who questioned and released the passenger.

At BOS there were two artful concealment detections during the PoC. The first case was a SPOT referral in which the BDO discovered a piece of aluminum foil containing four white pills in a passenger’s shoe. The LEO who responded confiscated the pills and released the passenger. The second case was an Assessor referral in which U.S. Currency was found sewn into the passenger’s pants. The passenger’s behavior escalated when questioned about the artfully concealed money and a LEO was notified. After conducting an NCIC check, which returned negative, the LEO questioned and released the passenger.

At DTW there were no artful concealment detections during the baseline. During the PoC, there was one detection that occurred in an Assessor referral. During the property search a suspected controlled substance was discovered in the passenger’s boots. Local LEOs were notified and arrested the passenger for possession of narcotics.

Table 25. Number of Artful Concealment Cases

Metric	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
Number of Artful Concealments	1	2	0	1

All artful concealment detections occurred in SPOT or Assessor referral cases. This provides support for the use of behavior detection – over other screening methods – for detecting artful concealment. The concept behind artful concealment is to intentionally target the perceived weaknesses of screening technology to get an item past security. Unless the perceived weakness is incorrect, behavior detection is the best method to discover the intent, and thus the item.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.201, without the express, written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil or criminal penalties. The receipt, use, and dissemination of this information by government agencies, public disclosure is governed by 51 U.S.C. 552.~~

5.2.4 Serious Prohibited or Illegal Items

TSA is interested in the detection of SPII. All SPII listed below are considered "serious" because of their status as an asterisk prohibited item or "possible evidence of criminal activity," all requiring LEO notification, per the Screening Checkpoint SOP⁵⁸. This list includes (b)(3)49 U.S.C. § 114(r) items that could be used to facilitate or execute a crime or terrorist act. The list of items has been condensed from the list that DHS S&T used in the SPOT Validation Study to provide more meaningful categorization, as well as add additional fields that warrant a LEO referral due to its relationship to suspected criminal activity.

The categorization of SPII below was developed from the Checkpoint SOP asterisk item list and additional items of concern from the SPOT Validation Study (b)(3)49 U.S.C. § 114(r) and is available in Table 26.

Table 26. Serious Prohibited or Illegal Item Categories

SPII Categories
(b)(3)49 U.S.C. § 114(r)

Both airport sites increased their number of SPII detections (by either 9 or 10) at the PoC. For BOS, all but one of these PoC detections occurred in an Assessor referral, for DTW, Assessors detected one third of the SPII cases. Both airports detected similar proportions of FTD during the PoC, however DTW discovered more cases of ammunition, and BOS discovered more cases of large sums of currency. In most cases the passengers were questioned and released, however in a few cases the items were confiscated or the passenger was arrested.

⁵⁸ Can be located throughout the SOP, but some specific sections are: 13.5.M and attachment 18-1 in Rev 9 Change 3.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.107, without the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties under the terms of U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 27. SPII Discovered at the Assessor Proof of Concept Checkpoints

Type of SPII	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
(b)(3)49 U.S.C. § 114(f)	0	1 (5%)	0	4 (44%)
	2 (18%)	7 (33%)	0	3 (33%)
	2 (18%)	0	0	0
	4 (36%)	1 (5%)	0	1 (11%)
	1 (9%)	1 (5%)	0	1 (11%)
	2 (18%)	11 (52%)	0	0
TOTAL SPII	11	21	0	9

5.2.5 Law Enforcement Arrests

As the subtitle suggests, this variable refers to a law enforcement arrest of an individual made following the referral of that individual to a LEO. The frequency and rate of LEO arrest is an important high-risk outcome because it denotes the seriousness of the event. At the checkpoint, LEO arrests may occur when the checkpoint discovers SPII, FTD, the passenger is disorderly, or the passenger has outstanding warrants. In all cases this passenger could potentially be high-risk; and therefore it is critical to understand the system's ability to identify these passengers.

LEO arrests are documented on the SPOT Referral Reports, Assessor Referral Reports and Checkpoint Incident Reports, which were sent to a data collection lead for review. Table 28 reveals that no passengers were arrested at Terminal A or Red 1 during the baseline periods, and 36 passengers were arrested during the PoC periods. The majority of these arrests occurred at BOS and involved immigrations violations. An additional reason there may have been significantly more LEO arrests at BOS was because there were significantly more Assessor LEO referrals (137 compared to five at DTW) and in general LEOs were very responsive.

Table 28. Frequency and Reason for Law Enforcement Officer Arrest Cases

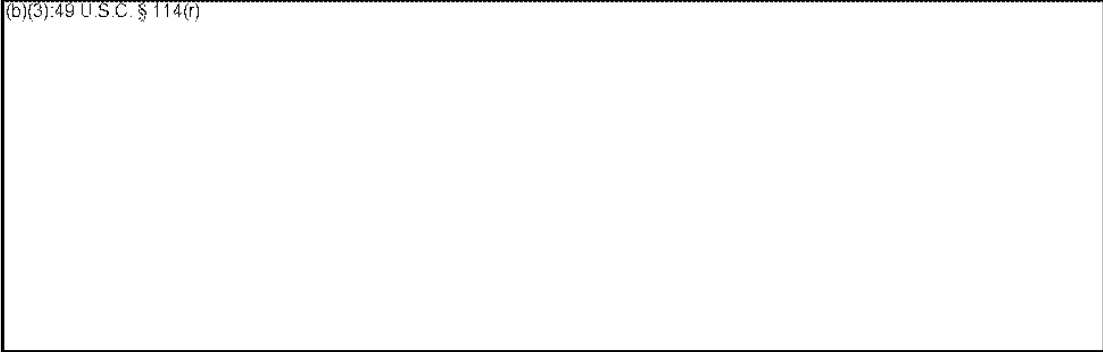
Reason for Arrest	BOS Baseline	BOS PoC	DTW Baseline	DTW PoC
Immigrations Violations	0	28 (80%)	0	0
Outstanding Warrants	0	6 (17%)	0	0
Multiple reasons	0	1 (3%)	0	0
Narcotics Possession	0	0	0	1 ⁵⁹ (100%)
TOTAL LEO Arrests	0	35	0	1

⁵⁹ This passenger also had an outstanding warrant, but was not arrested as the jurisdiction failed to respond.

The data reveals that arrests for immigrations violations were quite high in the BOS PoC. Assessor is more direct than previous behavior detection methods, so it makes sense that Assessor questioning would cause an illegal immigrant to feel stress and nervousness.

(b)(3):49
U.S.C. § 114(f)

(b)(3):49 U.S.C. § 114(f)



While LEO Arrest is a useful and important metric, this metric may actually be underreported due to the following limitations. One of its limitations is that the outcome of the LEO's involvement is not always immediately known. That is, many cases of LEO involvement may not result in immediate arrest, although the case may still have been quite serious. For example, the LEO may collect information but let the traveler proceed although an arrest occurs later (and is therefore not reported to SPOT); or the LEO may not inform the Assessor of the outcome of the case. In addition, the LEO may decide to let the traveler proceed to his or her flight even though the individual was in possession of a SPII, which was confiscated.

In some cases, although a LEO is called, he or she may not show up and therefore the traveler cannot be not arrested by default. This issue began to manifest itself in the Assessor testing at BOS where word was received that Customs and Border Patrol (CBP) would be lowering their response rate to potential cases of illegal aliens. Data shows that 28 of the 35 arrests during the Assessor PoC at BOS were made due to illegal alien status and an additional 35 cases occurred in which the referred passenger stated to the Assessor or MSP that he or she was in the U.S. illegally and no arrest occurred. The last of the arrests was made on November 20, 2011. This change may have been influenced by immigration policy set forth by the Obama administration in August, in which new guidelines were issued to defer cases of deporting individuals who did not appear to pose a threat to public safety⁶¹. While the policy was set back in August, its implementation and enforcement at BOS may not have gone into effect until late November. Regardless, referral reports have indicated as of recent that CBP had resorted to NCIC checks

⁶⁰ According to the Assessor SOP, Assessors are unable to use translators during the Assessor process. This made it very difficult for Assessor to resolve suspicious signs, so these individuals were often referred to secondary screening, where Assessor did use translation.

⁶¹ Keating, Joshua. "The Stories You Missed in 2011: Number 5, The U.S. Immigration Crackdown," Foreign Policy, http://www.foreignpolicy.com/articles/2011/11/28/the_stories_you_missed_in_2011?page=0,4, December 2011

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

only and not questioning travelers, which is likely to trend in lower arrests of illegal aliens transiting the checkpoint.

5.3 High-Risk Passenger Detection

The dependent variable of HRP was adopted from the 2011 SPOT Validation Study, developed by DHS S&T. The Validation Study defined HRP as “individuals who are knowingly and intentionally attempting to defeat the airport security process”, and measured this outcome through detections of individuals in possession of SPII, false or fraudulent travel or identification documents, and those arrested resulting from discovery during referral screening. These individuals are not necessarily terrorists; rather, they are individuals that are likely attempting to avoid detection due to the unusual nature or severity of the item they carry or their eligibility for being arrested.

While this definition does not directly identify individuals who pose a risk to aviation security, it does provide *proxies* for individuals who are more likely to have an intent to conceal or deceive. This approach has been used previously, and is not dissimilar from TSA’s operational efficiency testing approach which uses proxy measures such as “divest time” to measure “passenger experience”. Given the available data, three outcome variables - described in the previous section - were used to represent HRP: (1) LEO Arrest; (2) Possession of SPII; and (3) Artful Concealment.

5.3.1 Comparison to Baseline Periods

The first set of analyses focused on comparing HRP detection between the baseline and PoC periods. Each airport is presented separately as each airport was evaluated against their own baseline.

BOSTON

Table 29 displays the frequency and rate of HRP detection at the system level during BOS’s baseline and PoC periods. This includes detections made by the checkpoint, SPOT teams, and Assessor teams. Detection rates are computed by dividing the frequency of detection by the total throughput. This data tells us the proportion of the traveling public which was identified by TSA with high-risk outcomes. The high-risk outcomes are broken out individually in each row as well as in presented in total. It is possible for one HRP to have multiple high-risk outcomes (e.g., in possession of a SPII and is arrested), which is why the individual components may not add up to the total HRP (in which each passenger is only counted once).

At BOS, the checkpoint system detected 11 HRP from nearly 600,000 individuals during the baseline period. In comparison, the new checkpoint system at the PoC detected 54 HRP from approximately 360,000 individuals (nearly five times as many HRP with 60% of the baseline throughput). When detections were controlled for throughput, this revealed that the checkpoint

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may be subject to civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

system with the Assessor (PoC) detected eight times more HRP than the baseline checkpoint system. When the individual components of HRP were broken out, the pattern still revealed an improvement from the baseline to the PoC, which included three times more detections of both SPII and artful concealments during the PoC period.

Fisher's Exact Tests were conducted to determine whether statistically significant differences occurred between the baseline and PoC periods⁶². Analyses revealed that during the PoC period the system detected significantly more HRP than during the baseline. This finding was consistent for total detected SPII and total LEO arrests, but not artful concealments. These results should be interpreted cautiously as the PoC was not a highly controlled experimental design.

Table 29. System Level High-Risk Detection Rates at BOS Terminal A

Threat Type	System-level Metrics			
	Baseline	PoC	Fisher's Exact Test, P-value*	Odds Ratio (95% C.I.)
Dates	6/6/11 - 7/31/11	8/15/11 - 12/15/11		
Throughput	597,550 Passengers	360,281 Passengers		
Number of High-Risk Passengers	11 (0.002%)	54 (0.015%)	0.000	8.14 (4.21, 17.27)
Number of SPII	11 (0.002%)	21 (0.006%)	0.001	3.17 (1.46, 7.27)
Number of Artful Concealments	1 (0.0002%)	2 (0.0006%)	0.318	3.32 (0.17, 195.7)
Number of LEO Arrests	0 (0.000%)	35 (0.010%)	0.000	∞

‡ Note: Results are provided for informational purposes only and should be interpreted cautiously. Subjects are allocated to experimental and control groups through a non-random, time-based procedure. As a result, one cannot be certain that group differences are due solely to the Assessor implementation.

* Fisher's Exact Test, one-tailed, Confidence Level=95%

Upper and Lower Fisher Exact 95% Confidence Limits are reported for Odds Ratios.

Table 30 displays the frequency and rate of HRP detection by different behavior detection procedures. This table compares outcomes at the level of referral for SPOT referrals during the

⁶² Fisher's exact test can be applied even with a baseline of zero cases. However, one cannot bound an estimate for the odds ratio (since the upper bound is unlimited).

baseline and Assessor referrals during the PoC. It was not surprising that there were significantly more (Assessor) referrals during the PoC. Although SPOT was also conducted during the PoC period, it is not specifically listed here because it may have operated differently with the addition of Assessors in the checkpoint. The high-risk outcomes are broken out individually in each row as well as in total.

Some differences were seen between behavior detection referral outcomes during the baseline and the PoC at the level of the referral. The Assessor detected approximately two times more HRP; however, this was largely due to the increase in LEO arrests, as detection of other high-risk outcomes decreased during the PoC period. Fisher's Exact Test revealed that the rate of LEO arrest was the only high-risk outcome that significantly increased from the baseline to PoC period. Something about the Assessor process⁶³ increased the odds of LEO arrest at the checkpoint.

Table 30. Referral Level High Risk Detection Rates at BOS Terminal A

Threat Type	Referral-level Metrics			
	Baseline (SPOT)	PoC (Assessor)	Fisher's Exact Test, P-value*	Odds Ratio (95% C.I.)
Dates	6/6/11 - 7/31/11	8/15/11 - 12/15/11		
Number of Referrals	74 SPOT Referrals	506 Assessor Referrals		
Number of High-Risk Passengers	4 (5.41%)	52 (10.28%)	0.129	2.00 (0.70, 7.86)
Number of SPII	4 (5.41%)	20 (3.95%)	0.820	0.72 (0.23, 2.98)
Number of Artful Concealments	1 (1.35%)	1 (0.20%)	0.984	0.14 (0.00, 11.5)
Number of LEO Arrests	0 (0.00%)	35 (6.92%)	0.007	∞

‡ Note: Results are provided for informational purposes only and should be interpreted cautiously. Subjects are allocated to experimental and control groups through a non-random, time-based procedure. As a result, one cannot be certain that group differences are due solely to the Assessor implementation. In addition, comparisons between

⁶³ This could be talking to each passenger, addition of officers at the checkpoint, the Assessor indicator list, or enhanced document review.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1552. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.101 and 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or imprisonment. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

SPOT and Assessor at the referral-level may be confounded by the fact that Assessors may ask questions of passengers before deciding to refer whereas SPOT BDOs need to refer in order to ask questions.

⁴ Fisher's Exact Test, one-tailed, Confidence Level=95%

Upper and Lower Fisher Exact 95% Confidence Limits are reported for Odds Ratios.

This data suggests that the addition of the Assessor has improved the ability of the checkpoint to detect HRP, although Assessor referrals were only more productive than SPOT referrals in detecting passengers resulting in arrest. There were no LEO arrests during the baseline period, while Assessors selected 35 individuals who resulted in arrests during the PoC.

It should also be noted that there was also a reduction in checkpoint detections of HRP during the PoC period. During the baseline period, the checkpoint was responsible for the detection of seven HRP, whereas during the PoC the checkpoint had only detected one HRP (the one additional detection was made by a SPOT team). It is possible that the Assessors were detecting the same HRP that the checkpoint was catching during the baseline, but this is not known.

DETROIT

Tracking the effectiveness of the Assessor at DTW was difficult due to the layout of the chosen checkpoint. At BOS, the checkpoint that was chosen represented a single point of entry into the sterile area; if a passenger was outbound on a Delta flight they could only be processed through the Terminal A checkpoint. On the other hand, DTW has several smaller checkpoints that all access the same sterile area; this means that passengers could *choose* which checkpoint they traversed. This design created problems for evaluation because the layout provided passengers with the opportunity to *avoid* the Assessor process during the PoC, which could artificially reduce detection rates, preventing an operation from appearing effective.

Therefore HRP detection was tracked at the PoC checkpoint (Red 1) as well as all other Red Checkpoints, to understand how the Assessor at checkpoint Red 1 was affecting passenger throughput and high-risk patterns. This also helped provide preliminary trends regarding whether the level of malfeasance increased at other access points as a result of the Assessor.

Table 31 displays the frequency and rate of HRP across the entire McNamara terminal and the "owner" of that detection. The detection rates for SPOT, Assessor, and the screening operations are listed next to each checkpoint, with totals listed at the bottom of the table. The detection rates for the *screening operations* and the *total checkpoint* have been calculated based on the total throughput, whereas the behavior based screening detection rates have been calculated at the level of referral⁶⁴.

⁶⁴ The Assessor and SPOT detection rates could also potentially be calculated by dividing the detections by their throughput; although their throughputs are different than the overall system. Assessors do not interview employees and flight crew, which would reduce the total throughput by approximately 10%. The SPOT throughput is unknown. ~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.101-1.1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

This table reveals significant differences in the HRP detection and base rates experienced during the baseline and PoC periods at both the PoC checkpoint (Red 1) and all adjacent checkpoints. During the baseline period there were no HRP detections across all checkpoints within McNamara, but during the PoC period there was an increased detection at *all* checkpoints and by *all* parties. During the PoC the overall detection rate for McNamara was 0.0021% which was very similar to the BOS baseline detection rate (0.0018%). While the system detection rate did improve during the PoC, the role of the Assessor is less clear than in the case of BOS. While 96% (52/54) of the PoC detections occurred in Assessor referrals at BOS, only 33% (3/9) of the PoC detections at Red 1 and 17% (3/18) of the overall detections occurred in Assessor referrals at DTW. Further, all areas of all checkpoints appeared to catch on average 4.5 more HRPs during the PoC.

as it is not known 1) how many hours BDOs were stationed at these checkpoints, and 2) how many passengers BDOs were able to observe when they were present at the checkpoint.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 15.206. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15.206 and 15.207, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 31. High-Risk Passenger Detection at DFW McNamara Terminal

Checkpoint	Detector	Baseline 7/18-9/16/11			Proof of Concept 10/17-12/15/11		
		Throughput	HRP	Detection Rate ⁶⁵	Throughput	HRP	Detection Rate
Red 1	Screening ⁶⁶	327,640	0	0.0%	323,383	5	0.0015%
	SPOT	48 referrals	0	0.0%	46* referrals	1	2.17%
	Assessor	n/a	n/a	n/a	183* referrals	3	1.64%
	TOTAL	327,640	0	0.0%	323,383	9	0.0028%
Red 2	Screening	306,295	0	0.0%	289,280	3	0.0010%
	SPOT	35 referrals	0	0.0%	13 referrals	2	15.38%
	TOTAL	306,295	0	0.0%	289,280	5	0.0017%
Red 3	Screening	278,480	0	0.0%	221,943	4	0.0018%
	SPOT	28 referrals	0	0.0%	9 referrals	0	0.0%
	TOTAL	278,480	0	0.0%	221,943	4	0.0018%
Red 6	Screening	45,120	0	0.0%	40,324	0	0.0%
	TOTAL	45,120	0	0.0%	40,324	0	0.0%
Total	Screening	956,535	0	0.0%	874,930	12	0.0014%
	SPOT	111 referrals	0	0.0%	69 referrals	3	4.35%
	Assessor	n/a	n/a	n/a	183* referrals	3	1.64%
	TOTAL	957,535	0	0.0%	874,930	18	0.0021%

*One of these incidents was both a SPOT and Assessor Referral.

The Assessor HRP detections included two cases of SPII detections, and one case that involved an artfully concealed SPII and the passenger was arrested. Statistically, the analyses are inconclusive given the very low base rate of high-risk outcomes.

During the baseline period there were no detections of HRP. However, during the PoC, there was a significant increase in HRP detection at all DTW Red checkpoints. This change raises several questions such as:

- *Did the workforce become more energized?* DTW is currently operating RBS pilots at both Red 1 (Assessor) and Red 2 (PreCheck) – two of its largest checkpoints. In preparation for these pilots the workforce received new and recurrent trainings, which

⁶⁵ Screening and total detection rates are calculated as a product of throughput. SPOT and Assessor detection rates are calculated at the level of the referral. Assessor could also be calculated as a product of the passengers spoken to, which is approximately throughput*89%.

⁶⁶ Primarily detected by X-Ray screening.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty under the authority of U.S. government agencies; public disclosure is governed by 51 U.S.C. 552.~~

may have increased their skill and/or motivated them to perform at higher standards. These pilots have also brought additional oversight and focus, which may have also affected productivity. (b)(3):49 U.S.C. § 114(f)

(b)(3):49 U.S.C. § 114(f) Results shown to DTW leadership after the study may have motivated higher standards for screening.

- *Are there seasonal differences in HRP?* The SPOT Validation Study tracked the base rate of HRP across several months of collection, and revealed seasonal peaks in both travel and detection. The increased productivity during the PoC period may be due to the increase in targets among the population.
- *What other factors may have affected detection?* There were additional influences on the detection rate, some which are known. For example, the SPOT program appeared to be more productive during the PoC than the baseline. However, two of the three HRP detection cases occurred with referrals assisted by BDOs from another airport who were onsite to assist with Assessor mentoring.

5.3.2 Comparison of Options

During the BOS PoC two different placements were used for the Assessor. Option 1 was conducted from August 15 to September 11, 2011, and placed Assessors at a new set of podiums between the TDC officer and the divest area where they interviewed all passengers. Option 2 was conducted from September 12 to December 15, 2011 and placed the Assessor at the TDC podium, who conducted both the TDC function and the Assessor interview.

Table 32 displays the HRP detection rates at the level of the referral for Options 1 and 2. The data reveals a three-fold increase in HRP detection rate from Option 1 to Option 2. Fisher's Exact Test revealed that this was a statistically significant difference; however, this result should be interpreted cautiously, as there were some uncontrolled differences between Option 1 and Option 2.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or, if the person is a U.S. government agency, public disclosure is governed by 51 U.S.C. 552.~~

Table 32. Referral Level Comparison of High Risk Detection in BOS Options 1 and 2 for Entire Proof of Concept

Threat Type	Referral-level Metrics			
	PoC Option 1	PoC Option 2	Fisher's Exact Test, P-value*	Odds Ratio (95% C.I.)
Dates	8/15/11 - 9/11/11	9/12/11 - 12/15/11		
Number of Assessor Referrals	76	430		
Number of High-Risk Passengers	3 (3.947%)	49 (11.395%)	0.030	3.13 (0.97, 16.09)
Number of SPII	1 (1.316%)	19 (4.419%)	0.169	3.47 (0.53, 146.0)
Number of Artful Concealments	0 (0.000%)	1 (0.233%)	0.850	∞
Number of LEO Arrests	2 (2.632%)	33 (7.674%)	0.079	3.08 (0.76, 26.97)

‡ Note: Results are provided for informational purposes only and should be interpreted cautiously. Subjects are allocated to experimental and control groups through a non-random, time-based procedure. As a result, one cannot be certain that group differences are due solely to the Assessor implementation.

* Fisher's Exact Test, one-tailed, Confidence Level=95%

Upper and Lower Fisher Exact 95% Confidence Limits are reported for Odds Ratios.

The first variable – which we could not control – was Assessor experience. The first Option was only conducted for the first four weeks of the PoC when Assessors were least experienced. It is logical that experience could have improved the Assessors' ability to identify potential HRP. Although there is no way to identify whether this was a contributing factor in this data set, Table 33 compares only the first four weeks of Option 2 to Option 1, which may provide a better (but not perfect) comparison of experience levels. Although Assessors are still more experienced in this dataset, they are only four weeks more experienced as compared to several months.

While the *trend* holds when looking at the shorter time period – that Option 2 was better at detecting HRP than Option 1 – it is no longer statistically significant. However, it should be noted that the odds ratio remain larger the same, and there were only a small number of referrals available for this analysis which limits the power of the test.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.201 and 15.202, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 33. Referral Level Comparison of High Risk Detection in BOS Options 1 and 2 for First 8 Weeks

Threat Type	Referral-level Metrics			
	PoC Option 1	PoC Option 2	Fisher's Exact Test, P-value*	Odds Ratio (95% C.I.)
Dates	8/15/11 - 9/11/11	9/12/11 - 10/7/11		
Number of Assessor Referrals	76	127		
Number of High-Risk Passengers	3 (3.947%)	13 (10.236%)	0.087	2.77 (0.72, 15.63)
Number of SPII	1 (1.316%)	6 (4.724%)	0.190	3.72 (0.44, 173.3)
Number of Artful Concealments	0 (0.000%)	1 (0.787%)	0.626	∞
Number of LEO Arrests	2 (2.632%)	7 (5.512%)	0.278	2.16 (0.40, 21.76)

‡ Note: Results are provided for informational purposes only and should be interpreted cautiously. Subjects are allocated to experimental and control groups through a non-random, time-based procedure. As a result, one cannot be certain that group differences are due solely to the Assessor implementation.

* Fisher's Exact Test, one-tailed, Confidence Level=95%

Upper and Lower Fisher Exact 95% Confidence Limits are reported for Odds Ratios.

A second variable that changed between Options 1 and 2 was the use of different types of secondary screening described in section 5.3.3 below. Since the secondary screening process changed during the middle of the PoC, and involved more intensive screening during all of Option 2 it may not be fair to compare the success of Option 1 to Option 2. Potential differences that may have occurred due to secondary screening are discussed in the following section.

5.3.3 Effect of Secondary Screening

During the Assessor PoC two different referral screening methods were utilized. At BOS, this change in referral methods was a natural process directed by the airport, whereas at DTW, the use of specific referral screening methods was carefully selected and regulated.

BOSTON

At the start of the Assessor PoC in Boston, referral screening was typical selectee screening as performed by checkpoint staff according to the Checkpoint SOP and consisted of a (b)(3)49
1,8,2,8,4 pat down, bag search, and ETD of accessible property by screening operations (TSOs). This was

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

method was utilized from August 15-31, 2011. However, shortly after the start of the PoC Assessors were allowed to follow their referrals through the secondary screening process to obtain the outcome/resolution for data collection purposes. Around September 1, 2011, BOS leadership requested greater involvement of the Assessors in the referral screening process, and Assessors began to perform the bag search which then changed into Assessors performing SPOT referral screening with the assistance of a SPOT BDO available at the checkpoint. Although this change was marked "natural" by the Assessors and screening staff, it is possible that these changes to the referral screening process affected the security effectiveness data points. It is possible that the increased training and scrutiny that comes with two BDOs performing referral screening and further engaging the passenger also affected the success of the PoC⁶⁷.

Evaluation of the effect of changing these procedures at BOS is difficult, because the first method of referral screening – use of checkpoint selectee procedures – was only utilized for the first 12 days. Table 34 compares the 12-day use of selectee procedures to the following 12-day use of SPOT referral procedures. Analysis at the level of referral revealed no significant differences between effectiveness when selectee screening and SPOT referral screening was used. However, very few data points were available for this analysis (three and two detections respectively), warranting further evaluation.

Table 34. Comparing Secondary Screening Methods at BOS

Variables	Selectee Screening	SPOT Referral Screening
Dates	8/15/11-8/31/11	9/1/11-9/15/11
# Days / Hours	12 / 48	12 / 46
Throughput	34,010	29,881
# Referrals	56	39
# HRP (total)	3 (5.36%)	2 (5.13%)
HRP Description	<ul style="list-style-type: none"> • 1 SPII (large sum of currency) • 2 LEO arrests (immigrations violations)⁶⁸ 	<ul style="list-style-type: none"> • 1 LEO arrest (outstanding warrants) • 1 LEO arrest (immigrations violations)

The analysis team took a closer look at the list of 52 total HRP at BOS to identify which of these cases potentially could have been detected by the checkpoint if selectee procedures would have been in place instead of SPOT referral procedures. After the team eliminated items found through conversation or LEO referrals based on SPOT specific procedures, a total of 11 cases remained involving SPII which potentially would have also been detected by Checkpoint

⁶⁷ More Assessor referrals received SPOT referral screening at BOS than at DTW.

⁶⁸ LEOs were present at the checkpoint and intervened when the passenger stated that he/she was in the country illegally.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

selectee procedures alone (21% of the Assessor detections). This is important to note as future pilots may change the referral screening process which could have a direct effect on security effectiveness and pilot success.

DETROIT

The DTW PoC began approximately two months after the start of the BOS PoC and the experimental design was planned based on some lessons learned at BOS. Due to competing beliefs regarding the value of SPOT referral screening procedures (as compared to checkpoint selectee procedures), the PoC was designed to specifically test these differences. The original PoC was designed for 60 days, which was divided by the design team into two 30-day periods. For the first 30 days (October 17-November 15) the design required BDO/Assessors⁶⁹ to hand off their referrals to the checkpoint for selectee screening. For the second 30 days (November 16-December 15) the design required BDO/Assessors to maintain control of their referrals and perform SPOT referral screening on these passengers (to replicate the BOS experimental design). This is not a perfect design, because one could argue that BDO/Assessors were also more experienced during the SPOT referral period; but the order of these manipulations was purposefully decided, because the design team felt that as soon as SPOT referral methods were integrated into the Assessor it would be difficult for BDO/Assessors to ignore or remove their SPOT training.

Table 35 compares the outcomes of selectee screening to SPOT Referral screening for BDO/Assessor referrals at DTW. During the first 30 days there were no HRP detections, and during the second 30 days there were three HRP detections. These three HRP detections were all made by BDO/Assessors. While there is not enough data here to show a significant difference, the trend does suggest that SPOT Referral screening paired with the Assessor screening process resulted in more HRP detections.

(b)(3) 49 U.S.C. § 114(r)
(b)(3) 49 U.S.C. § 114(r)

⁶⁹ TSI and FAM Assessors are not included in this analysis. TSI and FAM Assessors always handed their referrals over to the checkpoint for selectee screening.

(b)(3) 49 U.S.C. § 114(r)

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty, if applicable. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 35. Comparing Secondary Screening Methods at DTW

Variables	Selectee Screening	SPOT Referral Screening
Dates	10/17-11/15/11	11/16-12/15/11
# Hours	450.75	451.00
Throughput	161,052	162,331
# Referrals (all)	126 (0.08% referral rate)	57 (0.05% referral rate)
# BDO/Assessor referrals	109 (87.00% of referrals ⁷¹)	33 (58.00% of referrals)
# HRP (total/rate)	0 / 0.00%	3 / 5.26%
HRP Description	n/a	<ul style="list-style-type: none"> • 2 SPII (1 ammunition, 1 FTD) • 1 artful concealment of narcotics which resulted in a LEO arrest

5.3.4 Comparison of SPOT and Assessor Detection Rates

Although Assessor is being tested primarily with SPOT trained BDOs, the actual SPOT program and Assessor procedures and selection methods are different. BDOs operating according to SPOT protocols are positioned near the passenger queue and look for 43 indicators that could indicate that a passenger possesses a fear of discovery. These indicators are a combination of behavior and appearance factors that scientific research suggests the passenger is feeling stress, fear, or is being deceptive. When BDOs see a clustering of indicators they refer a passenger to secondary screening (SPOT referral screening).

The Assessor directly engages passengers to identify suspicious signs (b)(3)49 U.S.C. § 114(f) (b)(3)49 U.S.C. § 114(f)

When an Assessor observes a suspicious sign and is unable to resolve it, he/she refers the passenger to secondary screening (either checkpoint selectee screening or SPOT referral screening). This involves a different process (direct engagement) than traditional BDO, a different set of indicators, as well as a different threshold for referral. However, both processes can be considered behavior-based methods for identifying potential HRP.

Tables 36 and 37 display the Assessor and SPOT referral rates and outcomes during the dates of each Assessor PoC. SPOT referrals are broken out by referrals that occurred at the PoC checkpoint while the PoC was ongoing, and all other SPOT referrals. This provides preliminary data on the value of SPOT when performed at the same time as the Assessor.

⁷¹ The TSIs and FAMs did not begin until 10/31, which is why the BDO/Assessors had a much higher proportion of the referrals during this time period.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

As noted earlier, at BOS 506 Assessor referrals resulted in the detection of 52 HRP. This results in a detection rate of 10.28% for Assessor referrals. The SPOT detection rates were lower when SPOT was conducted both at the PoC (1.05%) and outside the PoC (1.63%).

Table 36. Behavior Based High-Risk Detection at BOS during the Proof of Concept Dates

Variables	Assessor	SPOT at Terminal A (PoC hours only)	SPOT at BOS outside PoC
# Referrals	506	95	368
# LEO Referrals	137 (27.08%)	16 (16.84%)	38 (10.33%)
# HRP	52 (10.28%)	1 (1.05%)	6 (1.63%)

At DTW, 183 Assessor referrals resulted in the detection of 3 HRP. This results in a detection rate of 1.64% for Assessor referrals. Alternatively, the trend for SPOT detection rates appeared higher than Assessor when SPOT was both conducted at the PoC (2.17%) and outside of the PoC (9.09%).

Table 37. Behavior Based High-Risk Detection at DTW during the Proof of Concept Dates

Variables	Assessor	SPOT at Red 1	SPOT at Red 2 & 3
# Referrals	183	46	22
# LEO Referrals	5 (2.73%)	3 (6.52%)	3 (13.64%)
# HRP	3 (1.64%)	1 (2.17%)	2 (9.09%)

The varying patterns of SPOT effectiveness provide inconsistent views of SPOT performance. First, it should be noted that most of the BOS Assessor referrals occurred with SPOT referral screening tacked onto the process. Therefore the "Assessor" numbers really represent an integration of SPOT and Assessor, as both processes may have played a role in detecting the 52 HRP. During secondary screening Assessors used SPOT LEO notification procedures – which included SPOT Signs of Deception – and observation of these SPOT indicators may have resulted in the HRP detection.

Second, the majority of the Assessor detections at BOS were LEO arrests, and most of these arrests occurred for immigrations violations. In many of these cases the passenger did not have documentation errors, but rather stated to the officer at some point in the process that they were in the country illegally. The Assessor process relies on direct engagement rather than observation (SPOT) which may increase the odds of detecting a HRP. It is possible that SPOT paired with more engagement could produce similar results.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15.201 and 15.202, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Third, BOS used their best BDO resources to be Assessors; whereas they utilized significant NDF BDO resources to support their SPOT operations. This may have also contributed to a decrease in effectiveness of SPOT during the PoC, if the higher skilled officers were performing Assessor and officers without Assessor skills and unfamiliar to the BOS airport environment were performing SPOT.

The increase in SPOT detection in DTW also must be taken with a caveat; the two HRP detections that occurred at Red 2 and 3 occurred with the assistance of BOS BDOs who were onsite to help with Assessor mentoring. These BOS BDOs helped with the engagement and observation of these cases and spoke with LEOs during the referral. It is possible that the use of these more experienced BDOs improved the DTW detection rate during the PoC.

5.4 Referral Overlap

Both airports had BDO teams conducting SPOT at the PoC checkpoint during most of the PoC. When SPOT was in operation, it was possible for a passenger to be both a SPOT and an Assessor referral, if the passenger was observed by both parties⁷² and met each independent set of thresholds⁷³. Although there is some overlap between the two sets of indicators, this only occurred four times in BOS and one time at DTW.

Table 38 displays the case information for the five SPOT *and* Assessor referrals. Although two of five referrals resulted in LEO notifications, no case involved a high-risk outcome⁷⁴.

(b)(3);49 U.S.C. § 114(f)	(b)(3);49 U.S.C. § 114(f)
---------------------------	---------------------------

⁷² Just because a BDO team was present does not mean that they were able to observe every passenger.

⁷³ In these cases passengers received SPOT Referral Screening – no passenger received secondary screening twice.

⁷⁴ A detection would not be expected in such a small dataset.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15.204 and 15.205, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 38. Referrals Meeting Both SPOT and Assessor Thresholds During the Proof of Concept

Airport	Date	SPOT Indicators (b)(3) 49 U.S.C. § 114(f)	Assessor Indicators	LEO	Outcome/Resolution
BOS	8/25/11 11:33	(b)(3) 49 U.S.C. § 114(f)		No	Passenger completed screening and was cleared to fly.
BOS	9/13/11 14:30			Yes	Passenger's behavior warranted a LEO referral, BDOs notified MSP, NCIC checks came back negative and the passenger was cleared to fly.
BOS	12/1/11 9:10			Yes	(b)(3) 49 U.S.C. § 114(f)
BOS	12/1/11 10:12			No	Passenger completed screening and was cleared to fly.
DTW	11/20/11 13:50			No	Passenger completed screening and was cleared to fly.

It is surprising that only five cases overlapped during the PoC period given the detailed SPOT behavior descriptions provided by BDO/Assessors in the Assessor referral case notes. However, there was not always a SPOT team present during the PoC and one SPOT team could not possibly observe all passengers at all times whereas Assessor engaged all passengers during the time period. If Assessors had been able to make SPOT referrals based on observed indicators, it is possible there would have been more SPOT and Assessor referral overlaps.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in paragraph 15.204 of this part, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

5.5 Additional HRP Classifications

The current classifications of high-risk outcomes may not be the best way to measure all incidents in which a passenger intentionally attempts to defeat the security process. Some of the current classifications merit additional discussion to determine the extent to which each correctly assesses the effectiveness of the capability. There are potential additional classifications that could be added to ensure the best measurement of effectiveness, such as dry runs, local airport SPII not included nationally (b)(3)49 U.S.C. § 114(f) and NCIC. Additional classifications may be discovered from the Independent Working Group (DHS S&T funded) or further TSA discussions.

During the Assessor PoC there were several potentially arrest worthy offenses and significant incidents which could be added as a measurement of HRP. In order for any of these potential classifications to be added, they would need to have a strong and defensible justification. It is recommended that any metric used to measure HRP should be an *intentional action* of deceiving the security process for which there should be the fear of discovery. Based on that need, the analysis team compiled a list of potential incidents⁷⁵ based on plausible potential definitions. The most noteworthy aspect of the list is that several of the incidents can be loosely tied to current classifications, but with a weak connection as the LEO did not arrest the passenger or confiscate the item. It is still likely that the passengers associated with these events would have a fear of discovery.

One of the most intriguing events listed in the Appendix involved an NCIC hit for an outstanding warrant. The NCIC hit indicates an arrest justification, but it was not exercised at BOS, though CBP at John F. Kennedy International Airport (JFK) was notified of the transiting passenger. While it is unknown what action CBP had taken once the passenger arrived at JFK, the NCIC hit represented a situation in which the passenger would want to avoid detection due to the ramifications of being discovered by security. At times, a positive NCIC hit may be for a warrant in another jurisdiction for which extradition is not sought for by the applicable authorities and thus not indicated as a successful detection. By the definition of potential HRP, the situations of an NCIC hit should be included as a detection metric.

There are a few options on how to classify HRP based on information gleaned from the PoC. These options are not collectively exhaustive or mutually exclusive, but are designed to help foster discussion on HRP classifications. Any change to the classifications of high-risk outcomes will increase/decrease the number of recorded incidents that are befitting to potential HRP. A quick calculation on some of the different potential classification options resulted in the breakdown described in Table 39.

⁷⁵ See Appendix 7 for some relevant examples.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty. The term "U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 39. Potential High-Risk Definitions

Definition of High-Risk Passengers	BOS (N = 506) Freq./Proportion	DTW (N = 183) Freq./Proportion
<i>Current Assessor definition:</i> Expanded SPII list, artful concealment, or LEO arrest	52 (10.28%)	3 (1.64%)
<i>SPOT Validation Study definition:</i> Modified SPII list or LEO arrest	41 (8.10%)	3 (1.64%)
<i>Proposal 1:</i> Expanded SPII list, artful concealment, LEO arrest or Suspicious Packaging	53 (10.47%)	3 (1.64%)
<i>Proposal 2:</i> Expanded SPII list, artful concealment, LEO arrest or NCIC hit	54 (10.67%)	3 (1.64%)
<i>Proposal 3:</i> Expanded SPII list, local SPII rules , artful concealment, or LEO arrest	54 (10.67%)	3 (1.64%)
<i>Proposal 4:</i> Expanded SPII list, local SPII rules , artful concealment, LEO arrest, NCIC hit , or Suspicious Packaging	57 (11.26%)	3 (1.64%)
<i>Proposal 5:</i> "Smuggling" : expanded SPII list or artful concealment	21 (4.15%)	3 (1.64%)

The first two rows show the current (Assessor) definition of HRP, as well as the SPOT Validation Study definition of HRP. As noted earlier, the Validation Study definition did not include the SPII item of "large sums of currency" or artful concealment. This data allows some comparisons to Validation Study data – although the Validation study data is aggregated to view SPOT program performance as a whole.

(b)(3) 49 U.S.C. § 114(f)

The second proposal adds NCIC hits to the current definition. These cases are dependent on LEO response and participation, but they occur when a LEO conducts an NCIC check which comes back positive, but the individual is *not* arrested. This has occurred several times when the LEOs from the jurisdiction of the warrant did not want to respond or pay to extradite the individual. However, this is an arrest-worthy event.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1550. No part of this document may be released to persons without a need to know, as defined by 49 CFR parts 15 and 1550, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

The third proposal adds local LEO notification rules for serious items, not included on TSA's asterisk item list. This occurred in a few cases at DTW for certain types of knives, and at BOS for box cutters. These local airports have decided that these items warrant LEO intervention, which implies seriousness to the event. One difficulty with this definition is that it would vary based on local laws and procedures; and it may be a stretch to assume that a passenger traveling outside of his or her home airport would be knowledgeable in local laws.

The fourth proposal incorporates all of the additions in proposals one, two, and three. If the HRP definition was updated to include all of these items or events, the detection rate would have been significantly higher at both locations. However, significant discussion is required before changes that would potentially inflate detection rates are made.

Proposal five recommends *removal* of items or events from the current definition of HRP. Proposal five suggests that only events where *items* are found, labeled here as "smuggling", should be counted as high-risk outcomes. This releases TSA from the reliance on LEO intervention, as this definition would include detection of any SPII or artful concealment only. If this definition were adopted, more cases would be required to procure statistical significance between baseline and PoC groups. However, this definition may have greater application if the checkpoint becomes the primary method of secondary screening, as their protocols focus more heavily on looking for items and for intent.

When considering potential classifications of HRP, the outcome should imply the seriousness of the event. If a LEO chose not to intervene, or returned a travel document to a passenger that was thought to be fraudulent, this should not be included as a serious or high-risk event.

6.0 Indicator Analysis

As described in section 2.0, the Assessor's role is to complete a risk assessment of a passenger by conducting a thorough interview utilizing observation techniques and purposeful questioning. This assessment is based on whether the passenger displays any of the 23 suspicious signs defined by APA training. Passengers who display at least one of the indicators will receive additional questioning from the Assessor in an attempt to resolve the indicator(s). If the Assessor is unable to resolve the indicator, the indicator is confirmed, or an additional indicator is displayed, then the Assessor refers the passenger to secondary screening. As such, the indicators are the primary grounds on which the Assessor can route passengers based on the perceived risk.

The following sections examine the APA indicators utilized to assess risk in the Assessor PoC. This is the first test of APA indicators, and TSA must evaluate the utility and unique value of each indicator to determine whether they should be adopted (individually or as a group) into the TSA behavior detection process.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

6.1 Overlap of SPOT and Assessor

The SPOT and Assessor models are similar in that each depends on a set of indicators to determine which passengers should be routed to secondary screening. Several of the APA indicators and SPOT indicators overlap. (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

Specifically, five of the thirteen APA Behavior and Appearance signs correspond to SPOT indicators⁷⁶ (Table 40). As seen in the table, the APA indicators match SPOT indicators in each of the Stress, Fear, and Deception Factors types. (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

Table 40. Overlap of APA Signs and SPOT Indicators

APA Sign	SPOT Indicator (and Type)
(b)(3):49 U.S.C. § 114(r)	

6.2 Analysis of

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

In order to get a better understanding of how the indicator was assessed, BDAD requested that when this indicator was used Assessors describe why they assessed this indicator. It was expected that the BDOs would list SPOT related behaviors to help define this indicator, however, it was unknown whether the interpretation of this indicator would be consistent across BDOs.

(b)(3):49 U.S.C. § 114(r)

~~THIS DOCUMENT CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1552. NO PART OF THIS DOCUMENT MAY BE RELEASED TO PERSONS WITHOUT A NEED TO KNOW, AS DETERMINED BY 49 CFR PARTS 15 AND 1552, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASES MAY RESULT IN CIVIL PENALTY AND/OR ACTION FOR U.S. GOVERNMENT AGENCIES. PUBLIC DISCLOSURE IS GOVERNED BY 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)

Table 41. SPOT Behaviors Listed (b)(3):49 U.S.C. § 114(r) at BOS

SPOT Behavior	Frequency	Percentage
(b)(3):49 U.S.C. § 114(r)		

The referral reports completed by BDO/Assessors during the DTW PoC did not provide as many cases as from BOS for analysis (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

The full list can be found in Appendix 9. (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

During normal SPOT operations, these signs are only to be assessed during the SPOT Referral Screening process.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For all government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 42. SPOT Behaviors in (b)(3) 49 U.S.C. § 114(r) at DTW

SPOT Behavior	Frequency	Percentage
(b)(3) 49 U.S.C. § 114(r)		

(b)(3) 49 U.S.C. § 114(r)

6.3 Utilization

This section describes the frequency of which the APA indicators were applied to selectees. The utilization of the APA indicators was calculated by examining all of the submitted referral reports. The calculations of frequency are based solely on those passengers who were Assessor referrals. The complete breakdown of APA indicators at both BOS and DTW can be found in Appendix 10.

BOSTON

(b)(3) 49 U.S.C. § 114(r)

The five most frequently applied indicators at BOS are listed in Table 43 along with their percentage of utilization of the total referrals. (b)(3) 49 U.S.C. § 114(r)

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.201-15.202, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or criminal action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

Table 43. Top Five Indicators Applied at BOS

Indicator	Freq.	% of Referrals
(b)(3):49 U.S.C. § 114(r)	280	55.34
(b)(3):49 U.S.C. § 114(r)	204	40.32
(b)(3):49 U.S.C. § 114(r)	188	37.15
(b)(3):49 U.S.C. § 114(r)	91	17.98
(b)(3):49 U.S.C. § 114(r)	81	16.01

(b)(3):49 U.S.C. § 114(r)

DETROIT

(b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

The five most frequently applied indicators at DTW are listed in Table 44 along with their percent utilization out of the total referrals. The top indicator was assessed three times more often than the next closest indicator, suggesting *primary* reliance on only one APA indicator.

⁴⁹ After the assessment has been made (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

⁵⁰ The same mean as calculated at BOS.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Table 44. Top Five Indicators Applied at DTW

Indicator	Freq.	% of Referrals
(b)(3) 49 U.S.C. § 114(r)	135	73.77
	45	24.59
	41	22.40
	41	22.40
	37	20.22

(b)(3) 49 U.S.C. § 114(r)

Additional analyses were conducted to examine APA usage by BDOs alone. (b)(3) 49 U.S.C. § 114(r)

(b)(3) 49 U.S.C. § 114(r)

Table 45. Top Five Indicators Applied at DTW by BDO Assessors Alone

Indicator	Freq.	% of Referrals
(b)(3) 49 U.S.C. § 114(r)	104	73.24
	33	23.24
	30	21.13
	28	19.72
	26	18.31

Indicator utilization by TSIs and FAMs was combined due to the low number of referrals made by each group. (b)(3) 49 U.S.C. § 114(r)

(b)(3) 49 U.S.C. § 114(r)

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 15.30. No portion of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 15.30, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For all government agencies, public disclosure is governed by 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)

Table 46. Top Five Indicators Utilized at DMW by TSI and JAVI Assessors

Indicator	Freq.	% of Referrals
(b)(3):49 U.S.C. § 114(r)	31	75.61
	17	41.46
	15	36.59
	11	26.83
	8	19.51

6.4 Relationship to High-Risk Passengers

While utilization conveys the reliance of the indicators by Assessors, the relationship to HRP conveys their value. High value indicators should have a strong relationship to HRP detection, while low value indicators will have a weak or non-existent relationship. Measuring the relationship between the indicators and HRP detection provides insight to the decision rules employed by Assessors and informs the adoption and use of certain indicators going forward.

The relationship between indicators and HRP was measured by examining the presence of indicators in referrals with high-risk outcomes. Two analyses provide this needed insight. The first analysis examined the frequency of indicators present in HRP and the second analysis looked at the positive predictive value of each indicator.

At BOS, Assessors detected 52 HRP from the 506 referrals. (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

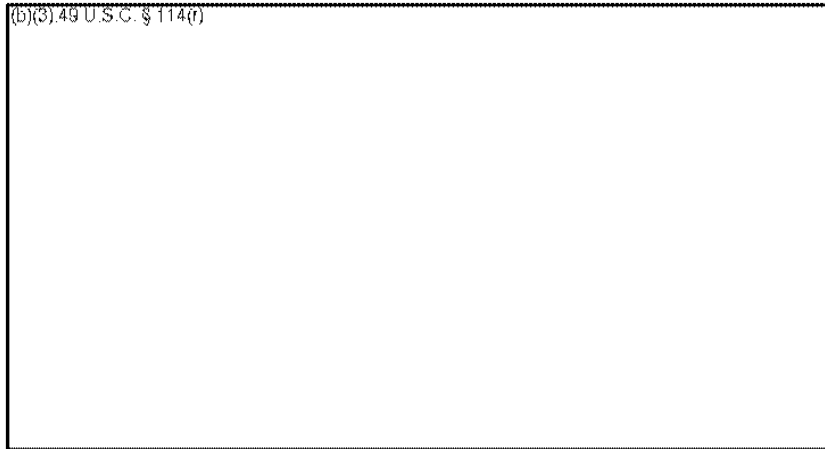
⁵¹ Based on the assumption that FAMS would use a more direct questioning style as per law enforcement background.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR sections 15.201 and 15.203, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or, if the recipient is a U.S. government agency, public disclosure is governed by 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)

Figure 1. Indicator Clustering Bell Curve

Indicator Clustering



The indicators that were most often assessed in HRP cases are shown in Table 47⁸² (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

Table 47. Top Five Indicators Resulting in High-Risk Outcome

Indicator	Freq.	% of High Risk Outcomes
(b)(3):49 U.S.C. § 114(r)	35	67.31
(b)(3):49 U.S.C. § 114(r)	31	59.62
(b)(3):49 U.S.C. § 114(r)	28	53.85
(b)(3):49 U.S.C. § 114(r)	24	46.15
(b)(3):49 U.S.C. § 114(r)	9	17.31

⁸² See Appendix 11 for the frequency list of all APA indicators present in HRP cases at BOS.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal liability. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Positive predictive value describes of the indicator's strength in predicting a high-risk outcome. The indicators with the highest positive predictive value are shown in Table 48⁸³. The positive predictive value was calculated by dividing the indicator's frequency in HRP by the indicator's frequency in all referral reports. Two of these indicators, (b)(3):49 U.S.C. § 114(f)

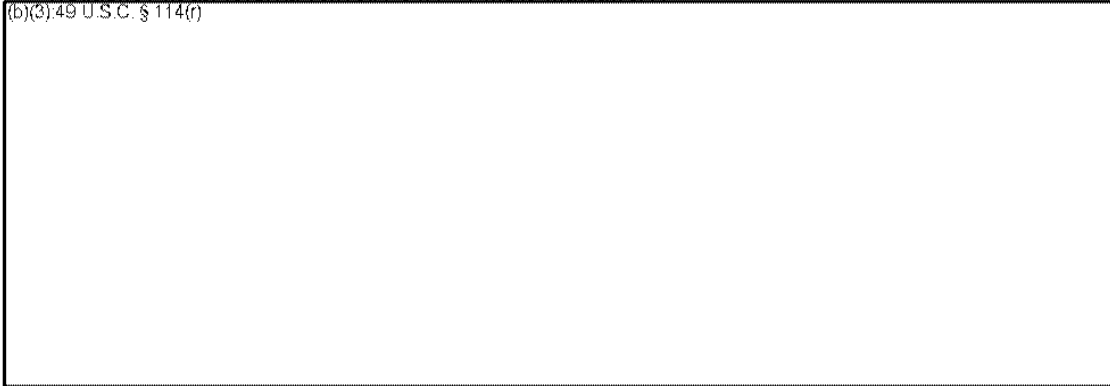


Table 48. Indicators With Highest Positive Predictive Value at BDOs

Indicator	Freq.	Predictive Value (%)
(b)(3):49 U.S.C. § 114(f)	4	50.00
	24	26.37
	5	26.32
	31	15.20
	3	15.00



⁸³ See Appendix 12 for full list.

⁸⁴ All assessed by BDO Assessors.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty under section 105 of U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

7.0 Discussion

7.1 Overview

The purpose of the Assessor PoC was to examine the capability of officers to make real-time risk assessments of passengers at or near the TDC. Metrics were collected to evaluate the training, operation efficiency, and security value of the program. This program was found to be successful, as checkpoint systems with the Assessor detected more HRP than the baseline systems. However further study is warranted to improve the program's efficiency, including changes to the training and process that better integrate the SPOT behavior analysis capability with the Assessor.

7.2 Lessons Learned

A PoC is designed to demonstrate the feasibility of an idea and verify its potential of being implemented. The Assessor PoC has provided several lessons learned which should be considered when development plans and procedures for future pilot sites. These lessons will help create a smoother implementation process and help foster better development of the enhanced behavior detection model.

7.2.1 Training Gaps

APA COURSE

APA training provided a means of expanding the behavioral analysis skill set for Assessors with new indicators and techniques for identifying potential HRPs. However, there were training gaps between the APA course and the Assessor function which could be addressed in future deployment.

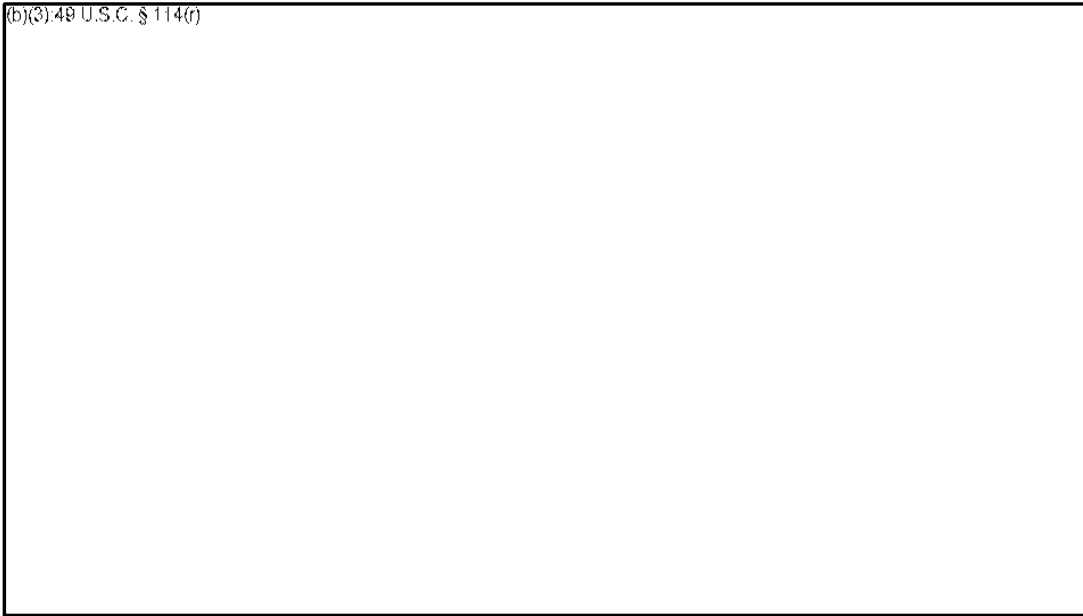
A significant gap between the APA course and the TSA environment is the use of a risk engine to help identify the suspicious signs and determine the risk level of a passenger. ISDS has developed a risk engine that is used by airlines and security companies in several international locations, but is currently unavailable to TSA. In the APA course, ISDS teaches to the risk engine, and many of the suspicious signs can be identified by the risk engine – without reliance on the Assessor. In the TSA environment Assessors *are* the risk-engine; therefore, they must be equipped with proper behavioral training to identify whether a passenger is being truthful. This suggests that, 1) Assessors must have strong behavior observation and analysis skills, and 2) perhaps the APA indicator list can be reduced, as there are some indicators that a person cannot identify⁸⁵. If a risk engine becomes available in the future, it would assist the Assessors in determining the risk level and improve the efficiency of their questioning⁸⁶.

⁸⁵ (b)(3):49 U.S.C. § 114(r)

⁸⁶ As Assessors can immediately ask questions towards the identified suspicious signs.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other actions. For TSA government agencies, public disclosure is governed by 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)



While APA training does cover brief definitions of each suspicious sign, additional and/or improved explanations would help the Assessors better understand them in the TSA operational environment. As we have seen with the SPOT behaviors, providing a guide with in-depth descriptions and several examples of what the behaviors are and are not is a very useful reference and refresher tool. This guide is something that should be developed as Assessor progresses. One example of an (b)(3):49 U.S.C. § 114(r), which can incorporate several different other behaviors.

Although the positive signs follow in the same direction as TSA's RBS initiatives, there are still some groups listed above that TSA has not officially designated low-risk. This may cause conflict with performing Assessor and abiding by TSA policies. Moving forward, additional direction should be given as to how to handle these specific groups. ISDS instructs to strictly move to the next passenger once one of these signs is found, but the Assessor SOP states that every passenger must be interviewed. There is no specific length of time designated for the interviews, which may cause confusion over expectations.

Despite gaps in the APA course that are either not currently suited for use by TSA or that need further development, the APA training is still a tool that could improve Assessors' behavior analysis and engagement skills along with increasing their chances of detecting HRP.

ON-THE-JOB TRAINING

SPOT SMEs provided mentorship to Assessors during both the OJT training phase and the length of the operational PoC. Generally one to two SMEs were deployed to the PoC for the first

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty. If the recipient is a U.S. government agency, public disclosure is governed by 51 U.S.C. 552.~~

two months to ensure that Assessors were correctly applying their APA training and engaged in effective questioning within the TSA context.

During the OJT phase SMEs noted spending significant time with a portion of the potential Assessors on basic engagement skills. Although the SPOT basic course discusses "casual conversation", this style of questioning is different than Assessor engagement. Further, these skills are applied in casual conversation, which only occurs when a BDO has referred a passenger to secondary screening. This type of event may not happen every day. Together this reveals a training gap that is necessary for the Assessor task. During the APA course, students were not assessed on their engagement skills. Students could pass the course through memorization techniques, resulting in some students who may not have been prepared to be Assessors.

During the PoC SMEs continued to observe the operation and provide feedback to the Assessor team. SMEs noted that some of the Assessors asked too many questions, irrelevant questions, or conducted their interviews/engagements in a manner that was not consistent with the Assessor training or SOP. There appear to be some differences in speaking to passengers in the mentoring setting rather than in the operational context. With a mentor, there is a debrief of each passenger, and mentors ask, "why didn't you ask this or that question", therefore, some of the Assessors became used to asking more questions than were necessary. This suggests that the OJT phase should be extended into the operational phase, with a possible probationary period for Assessors. Given the novelty of this role, additional oversight may be required during the early stages of deployment.

BDAD has also identified that continuous oversight and mentoring is necessary during the roll-out of any new program, such as the Assessor. Oversight should be present during all hours of operation to ensure that the procedures are being followed correctly, answer questions, and assist with referrals. Those who can perform oversight for Assessor at the pilot site should be identified prior to the start of the pilot. These individuals should preferably be Supervisory Transportation Security Managers (STSMs) or, if more are needed, the best Assessors as identified by local management/SMEs. The early identification should be accompanied with the guidelines for how to perform the position correctly and ensure compliance. Those performing oversight should engage in the daily in and out briefings in which they can recap the day's events, answer questions, and address feedback immediately. There is a need to provide critical oversight of Assessor to ensure the program runs properly and conduct quality control, which is originally conducted by the SMEs.

7.2.2 Operational Constraints

Operational constraints have the ability to pose major issues for the implementation of Assessor. The biggest operational constraint in of the Assessor PoC was the ability of screening operations

~~W. ARISHU. This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15.200 and 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

to adequately staff Assessor operations. While there are some insights to the resource trade-offs, it will be awhile before they are concretely understood. Continued testing of the current and additional CONOPS of Assessor is needed in order to understand the resource trade off matrix. As the current CONOPS for Assessor involves 100% passenger interaction, the number of required personnel at the checkpoint increased from baseline operations to the PoC. In Option 1, the increase was steepest as the Assessors performed their role after the TDC, requiring both TDC and Assessor personnel. In Option 2, there was still an increase in required resources, though it was lower than in Option 1 as the Assessor also performed the TDC function. The increase in required personnel placed constraints on the ability of the airport to staff the Assessor PoC during all operational hours as well as provide behavior detection resources across the airport. Each airport only deployed Assessor at one of its many checkpoints across the airport, leaving other areas of the airport more vulnerable. This operational constraint will exist at any future site the Assessor model is tested with 100% engagement of the population. BDO resources from the NDF helped alleviate some of the constraint, but resulted in a lack of resources for NDF to support other airports.

In regards to the training, the resources required to conduct and complete OJT of Assessors was unexpected. Although mentors placed a ceiling of 32 hours for the OJT process, it was not expected that the Assessor group as a whole would take that much time. The OJT Mentor group began with only five mentors, three of which were BDAD SMEs with other responsibilities, and one of which was also running SPOT operations at BOS. If the Assessor follows a similar training curriculum in the future, additional methods for staffing OJT or meeting the training gaps should be explored. SMEs stated that a significant portion of their time was spent on basic interview skills with students during OJT; if this training gap can be addressed in the classroom portion that may decrease the time needed for OJT.

OJT Mentors were also overwhelmed by the sheer volume of APA course graduates. In prior conversations with ISDS, the contractor suggested the APA course pass rate hovered around 50%. BDAD believed that the APA course would be a good determiner of Assessor ability, however, the vast majority of APA students passed the course (98%). BDAD was unprepared for the number of potential Assessors to be mentored.

The Assessor also presents new challenges for operational spacing in the checkpoint. With a cycle time of approximately 40 seconds, significantly more Assessors are required than traditional TDC podiums exist, if Assessors are going to operate at TDC. Most checkpoints are designed for a 15-20 second TDC cycle – or one TDC for every two lanes – and there are severe limitations in the operational spacing. As TSA transitions to use of the Credential Authentication Technology/Boarding Pass Scanning System (CAT/BPSS) at TDC, it remains to be seen if this will help or further constrain the space around the checkpoint. These factors should be considered when designing the next pilot or CONOPS.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.201, and it is to be controlled and disposed of in accordance with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in criminal penalties. The receipt, for U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

7.2.3 Airport Requirements

The Assessor PoC lives within each airport's operation; therefore the airport must provide adequate management and oversight to the PoC. In the Assessor PoC, BOS and DTW handled the day to day operations based on direction provided by Office of Security Operations (OSO) and with SME feedback from BDAD. Feedback from each airport revealed greater insight to the challenges of conducting Assessor, and helpful observations that can improve the deployment and execution of Assessor at new pilot sites.

First, the airports identified that public outreach could be improved at the beginning of the pilot. This was emphasized at DTW, where only one small sign was posted at the checkpoint to indicate the change in the security process. Assessors spent significant time explaining the new process to passengers, which affected operational efficiency. Additional public outreach may also improve the passenger demeanor as they approach the podium.

Airports also identified positive benefits of beginning the PoC slowly and learning along the way. The Assessor function is a labor intensive task, on which success is dependent on quality interactions with the passenger(s). In the beginning the Assessors are still learning and require constant oversight and feedback. Managers are unable to do this when the operation lasts the entire day. Reduced times could be accompanied with daily in and out briefs, in which issues could be addressed and communication could be improved within the group. Shorter deployments could also allow managers to review Referral Reports for potential issues with indicator use or questioning techniques. Implementation could start with two to four hour time frames to help reduce fatigue⁸⁷ for the Assessors, as well as the SMEs doing oversight, and help foster the skills development of the Assessors. The shorter time frames would give a more concentrated SME oversight during the initial Assessor start up.

The Assessor PoC was conducted with only local BDOs at BOS, but additional TSA employees were deployed to DTW to act as Assessors. TSIs were deployed from various airports nationwide and FAMs were deployed from the Detroit Field Office. This resulted in confusion regarding the ownership or authority for oversight of these non-BDO groups. Feedback from the groups involved revealed that there was not enough communication prior to the PoC that focused on the reporting structure, contact list, and the expectations of their involvement. If this situation occurs in the future, the communication and coordination for these employees can be improved with the appointing of a Site Lead for Assessor operations.

⁸⁷ Fatigue was an issue as the Assessors had to adjust to 100% passenger engagement, employ new indicator sets and thresholds, and conduct TDC functions. The fatigue also comes from physically components such as Assessors standing in the same spot without moving for long periods of time. Behavior observation and analysis is a mentally draining task, however, it is expected that the associated fatigue decreases with time and experience.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.203, and is not to be disseminated without the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in criminal penalties or civil action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

7.3 Relationship of SPOT and Assessor

7.3.1 Unanticipated Effects

Referral report analyses suggest that SPOT played a lead role in the success of the Assessor PoC. Assessors tended to use indicators that resembled SPOT indicators, and used their SPOT training to better define what they observed. During secondary screening of Assessor selectees, Assessors fell back into SPOT protocols and skills to identify high-risk outcomes and decide whether LEO intervention was necessary. The data in sections 5.3.3 and 5.5 also support that SPOT referral screening was a more thorough method of screening than selectee methods, further emphasizing the value of SPOT.

The blending of SPOT and Assessor was unexpected, as this PoC was originally designed as a stand-alone function that could be possibly performed by a number of TSA employee types. However, it became quickly apparent that BDOs performing Assessor could not “forget” their SPOT training, nor could they easily transition between positions. In December 2011, interviews with 45 BDOs provided critical information regarding how these two capabilities are influencing each other⁸⁸.

In addition to Assessors using SPOT protocols for secondary screening of Assessor referrals and notification of LEOs, SPOT also affected which indicators Assessors used and how they defined them. Most BDOs viewed the two indicator lists as one and the same, and attempted to “fit” SPOT indicators into the Assessor categories so they could apply them. Assessors believed that you needed a behavior detection background to perform their role, because it was their background training and experience that defined what they observed. Generally, the only new skills or indicators the Assessors reported learning were documentation signs, and how to more directly question passengers.

The current experimental designs limits our ability to clearly dictate the extent to which PoC improvements were caused by “SPOT” and by “Assessor”, however, the data through observation and interview suggests that SPOT played a significantly role in the Assessor success. Future studies should attempt to better understand how these two capabilities can work together, but studying how Assessor works both with and without SPOT.

7.3.2 Program Overlaps

In the Assessor PoC, the SPOT and Assessor programs were not distinct; BDOs performing Assessor noted that it was very difficult to separate SPOT and Assessor skills and procedures. This should not be surprising given that these officers were asked to conduct Assessor and SPOT

⁸⁸ See *Integrating SPOT and Assessor: Report and Recommendation*, available January 19, 2012.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR 15.115 and 15.116. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.115, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil or criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

during the same shift⁸⁹, and sometimes even on the same passenger within that shift (during Assessor referral screening).

It was surprising that so few referrals met both the SPOT and Assessor referral thresholds at the PoC (five total), however, this number may be underestimated since many Assessors also noted observation of SPOT behaviors in their reports⁹⁰. Seventeen percent (17.13%) of reports mentioned SPOT indicators specifically. Due to this unofficial overlap, the BDAD revised the Assessor referral report starting on January 1, 2012 to have Assessors specifically list any observed SPOT behaviors while performing Assessor. Additional analyses can be conducted to understand where SPOT may play a role in the Assessor process.

Interviews with BDOs have revealed that these two capabilities are combining at the PoC airports. More specifically:



- BDOs stated that it was very difficult to transition into SPOT after conducting Assessor. Assessors are using SPOT referral screening as part of their process so they have to continuously switch roles between BDO and Assessor. This can be confusing and some BDOs are beginning to see the two programs as one.

This suggests that these two programs are naturally merging; however, since this was unexpected not every BDO/Assessor is integrating his or her skills in the same way. Future analysis should be conducted to evaluate and address these factors. If the Assessor PoC continues with SPOT BDOs, the Assessor will require greater guidance on how these two capabilities fit together.

7.3.3 Program Discrepancies

Although SPOT and Assessor appear to be naturally merging, fundamental elements of each program conflict with each other. This is causing some confusion for the BDO/Assessors in both their application of SPOT and Assessor, and may also be one of the reasons the Assessor training is being applied in different ways.

⁸⁹ BDOs were generally scheduled to perform Assessor for 3-4 hours a shift and SPOT for the remainder at BOS.

⁹⁰ They just did not count this person as a SPOT referral because they were not conducting SPOT at the time.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15.001-15.020. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.001-15.020, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty. The terms "U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

(b)(3):49 U.S.C. § 114(r)

Second, when conducting SPOT, BDOs only refer passengers to secondary screening when they observe a cluster of suspicious behaviors, and these weighted behaviors reach a predetermined threshold. When conducting Assessor, these officers can refer passengers to secondary based on (b)(3):49 U.S.C. § 114(r) Given that the majority of HRP detected by Assessors (b)(3):49 U.S.C. § 114(r) this may be an important component to add to the program. This becomes especially confusing when a BDO/Assessor sees an indicator that could be applied in both the APA and SPOT contexts. BDO/Assessors have to keep two similar lists of indicators with different applications straight, and provide great customer service.

This is confusing for the BDOs, because there are conflicts between the two processes as to how to define indicators, when indicators can be applied, and what the rules for referral are. It is possible that the similarities between the APA and SPOT indicator lists were not fully understood or considered before this PoC, as this training was meant to enhance BDO skills, it was not intended to confuse the two processes. Going forward, TSA will likely have to adapt one or both programs, because there are fundamental differences between these two behavior detection programs, and we are asking the same people to operate under two different rule-sets. The SPOT program will have to make some decisions as to the benefit of these changes to their program and whether they want to see these changes (b)(3):49 U.S.C. § 114(r)

(b)(3):49 U.S.C. § 114(r)

7.3.4 Indicator Lists

(b)(3):49 U.S.C. § 114(r)

If BDOs specifically are going to continue as Assessors, the APA and SPOT indicator lists should be revisited and redefined to work with each other. APA indicators are labeled in general

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or a fine of up to \$500,000. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

terms which allows for open interpretation and inconsistency in their application. The APA workbook does not provide descriptions or examples of the indicators and it is unknown to what extent they were discussed in training. (b)(3)49 U.S.C. § 114(r)

(b)(3)49 U.S.C. § 114(r) The interviews revealed that BDOs are attempting to "fit" SPOT indicators into Assessor categories to understand them. Since BDOs see many SPOT indicators fitting within the Assessor list, this has resulted in Assessors referring passengers for secondary screening (b)(3)49 U.S.C. § 114(r)

(b)(3)49 U.S.C. § 114(r)

(b)(3)49 U.S.C. § 114(r)

Now with Assessor,

some of these indicators – such as withholding information – can be applied at the podium. As seen in this example, this is problematic because it has resulted in inconsistent application of indicators.

7.4 Testing Behavior Detection

In the deception and hostile intent detection research literature, an observer's success is easily evaluated because the scientist knows the "ground truth" of the person in question. While the observer may not know whether a target is lying, and may have to make judgments based on interview or the target's behavior, the scientist does know the truthfulness of the target and effectiveness can be rated on pass/fail scale.

Testing judgments in operational contexts presents a greater challenge for behavior detection. BDOs are trained to assess a person's risk through observation of behavior, analysis of conversation, and evaluating the totality of the situation. Essentially, BDOs are looking to evaluate a person's intent, and ensure he or she does not pose a risk to the security of aviation. While intent can be measured in laboratory studies – by the deceiver providing his or her true intent to the scientist - it cannot be directly measured in the real world – as a person with true intent to conceal or avoid detection will not directly state this to an officer.

While science continues to research this paradigm and uncover better measures of success, the current systems cannot go untested. However, to date, only the SPOT program has been rigorously evaluated. In the 2011 DHS S&T SPOT Validation Study, BDO referral methods were compared to random referral methods to provide a comparison for success. This study – which examined the outcomes of 71,000 random referrals against a comparison of 23,000 behavior-based referrals – revealed that behavior observation and analysis was exponentially more effective than random screening protocols at identifying HRP. The metrics and outcomes

(b)(3)49 U.S.C. § 114(r)

(b)(3)49 U.S.C. § 114(r)

(b)(3)49 U.S.C. § 114(r)

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

defined in this study have also been reviewed by a panel of scientists independent to DHS S&T. This study represents the most thorough analyses of behavioral screening programs to date: no other counter-terrorism or similar security program is known to have been subjected to such a *rigorous*⁹², systematic evaluation of its screening accuracy.

The only other available behavior detection program validation data comes from the United Kingdom. The British Passenger Assessment Screening System (PASS) program provided TSA with its validation report in 2011. The study was conducted at one airport over three months and examined the outcomes of 221 referrals. This study did not evaluate detection of only high risk outcomes – but rather lower level criminal activity (e.g., exceeding cigarette allowances). This is appropriate given the purpose of the PASS program is to reduce the risk of terrorist attack at British airports and to disrupt and deter criminal activity within the airports. This study used *frequency of secondary referrals* as their success metric and found that PASS was significantly more effective in obtaining this outcome. However, little data is provided on the outcomes/quality of these referrals, as the PASS BDOs hand these referrals off to another entity for screening.

What is clear is that how “success” or effectiveness is defined when testing behavior detection is still up for debate. While the previous studies provide good foundations, it is possible that additional metrics are yet to be identified. The data presented in section 5.5 suggests that additional classifications for HRP exist, and each definition could have a significant effect/change the results on the outcome of the study. TSA should continue to engage with DHS S&T, the scientific community, and government partners to establish outcome metrics that clearly identify the strengths and weaknesses of behavior detection, as well as metrics supported by research and the public.

7.5 Future Research Directions

This PoC provided interesting preliminary data regarding the ability of Assessors to detect potential HRP. Additional studies should be conducted to better understand the value of Assessors and other behavior detection and analysis capabilities. It remains unclear which factors of Assessor – e.g., training, indicators, engagement, increased presence, or SPOT – contributed to its success and to what extent. Future studies should attempt to isolate and study each factor to build an optimal capability in the most efficient manner possible⁹³.

In the short term, the program could evaluate the value of stationing more BDOs at the checkpoint, and/or increasing engagement of BDOs. This could be done with little training, as BDOs would use their current skill set to assess passenger risk at the airport. Some methods in

⁹² The US SPOT Validation Study examined 1,444 times more data points than the UK PASS Validation Study.

⁹³ For example, if SPOT and engagement are the biggest contributors to HRP detection, future deployments may not require the APA training and indicators to be successful; which would greatly reduce the cost of the program and increase the speed of deployment.

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by DHS, and is to be controlled, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

which increased engagement could be tested by 1) stationing more BDOs at the checkpoint, 2) positioning BDOs at TDC, 3) changing SPOT procedures to engage X% of passengers through either random or behavior based decision rules, or 4) lowering the threshold for referral.

The current PoC also measures the effectiveness of Assessors who speak to 100% of passengers. It is possible that Assessors could maintain the same effectiveness yet improve their efficiency by selecting fewer passengers for interview. This selection could be done randomly (by employing both Assessors and TSOs at TDC), based on behavior (such as SPOT or Assessor indicators), or based on risk group (such as “positive signs” as taught in Assessor training or focus on “Unknowns”). These are all potential options which could be developed for the current PoC airports.

This data suggests an overlap between SPOT and Assessor duties and reveals potential areas for collaboration of the two programs. In the short term BDAD should also focus on understanding the overlap between the SPOT and Assessor programs and create potential strategies for merging the programs. BDOs at both BOS and DTW are trained in both SPOT and Assessor, and additional pilots at these sites can be created to improve the compatibility of the two programs. This may include merging of the two behavior detection processes, indicator lists, and screening processes.

To scientifically “validate” the Assessor concept, future studies should explore the use of different types of control groups – such as TSOs at TDC – or collect control data simultaneously (e.g., one day on one day off). This will mitigate the current design problems with officer motivation and awareness, and different types of passenger flows and months/seasons that occur in the baseline and PoC.

Long-term research strategies or questions should include examining the effect of different cycle times or engagement proportions on effectiveness, revision of indicator lists, possible reweighting of behaviors and consideration of different thresholds for engagement and referral, fatigue of officers and effect of rotations and duty cycles, how the Assessor concept could be expanded to other areas of the airport, which elements of Assessor are valuable to other types of officers, reliability of the program, and integration with a risk-engine or screening rules. This list is not exhaustive and should be prioritized within the agency.

8.0 Conclusion

The use of technology to screen for the means to do harm should be coupled with the human interaction element to screen for intent. These complementing layers of security are imperative for success in securing our nation and safeguarding the world against terrorism. The added ability to elicit more information and gather relevant facts while interviewing travelers increases the ability to further combat terrorism and to work with other agencies, thereby increasing

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. 100 U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

intelligence gathering efforts.

The Assessor PoC examined the capability of Assessors to perform active behavior detection with a large population of passengers at two different checkpoints. Data collected suggests that Assessors were able to improve the security posture of the checkpoint, however, this came with operational costs. Additional research is required to better understand the value of Assessor and to better pair it with TSA's current behavior detection capabilities.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined in accordance with 49 CFR 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in criminal penalties or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

9.0 Acronyms and Abbreviations

AIT	Advanced Imaging Technology
ANOVA	Analysis of Variance
APA	Aviation Passenger Assessor
BDAD	Behavior Detection and Analysis Division
BDO	Behavior Detection Officer
BOS	Boston Logan International Airport
CONOPS	Concept of Operations
CBP	Customs and Border Patrol
DCL	Data Collection Lead
DHS S&T	Department of Homeland Security Science and Technology
DTW	Detroit Metropolitan Wayne County Airport
ETD	Explosives Trace Detection
FAM	Federal Air Marshal
FTD	Fraudulent Travel Document
HRP	High-Risk Passengers
ICAO	International Civil Aviation Organization
ID	Identification
ISDS	International Security Defense Systems
JFK	John F. Kennedy International Airport
LEO	Law Enforcement Officer
NCIC	National Crime Information Center
NDF	National Deployment Force
OJT	On-the-Job Training
OSO	Office of Security Operations
PASS	Passenger Assessment Screening System
PMIS	Performance Measurement Information System
PoC	Proof of Concept
RBS	Risk Based Security
SME	Subject Matter Expert
SOP	Standard Operating Procedures
SPOT	Screening of Passengers by Observation Techniques
SPII	Serious Prohibited or Illegal Items
STSO	Supervisory Transportation Security Officer
STSM	Supervisory Transportation Security Manager
TDC	Travel Document Checker

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or other action. For all government agencies, public disclosure is governed by 51 U.S.C. 552.~~

TSA	Transportation Security Administration
TSI	Transportation Security Inspector
TSM	Transportation Security Manager
TSO	Transportation Security Officer
WTMD	Walk Through Metal Detector

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty and/or criminal sanctions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX I. List of APA Indicators

APPEARANCE & BEHAVIOR SIGNS

(b)(3) 49 U.S.C. § 114(r)



DOCUMENTATION SIGNS

(b)(3) 49 U.S.C. § 114(r)

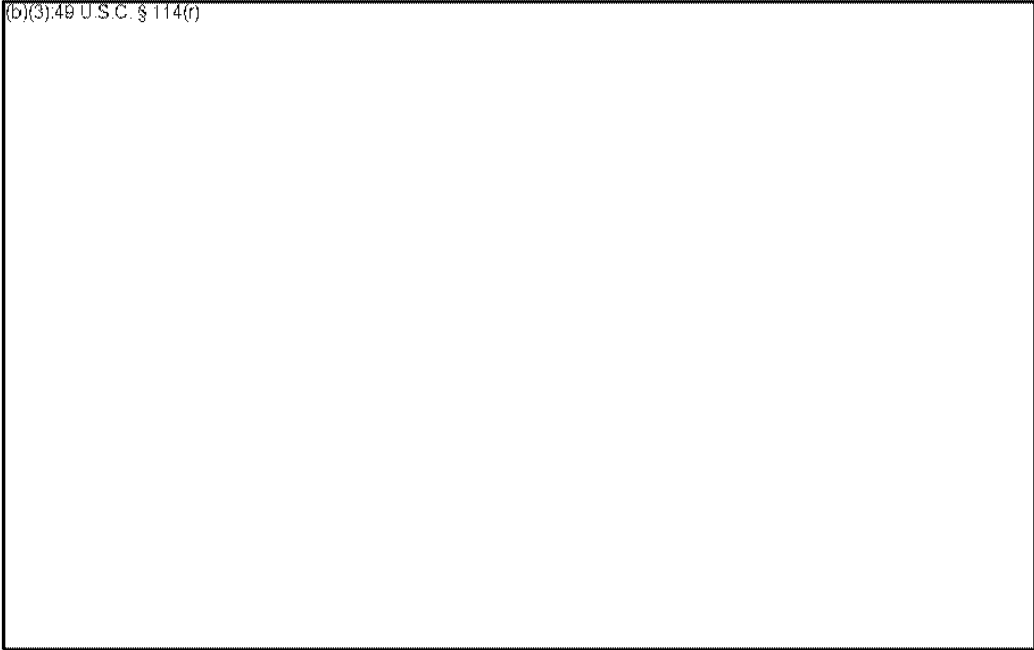


~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR part 15.91, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other remedy. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 2. List of SPOT Indicators


STRESS FACTORS

(b)(3), 49 U.S.C. § 1114(f)



FEAR FACTORS

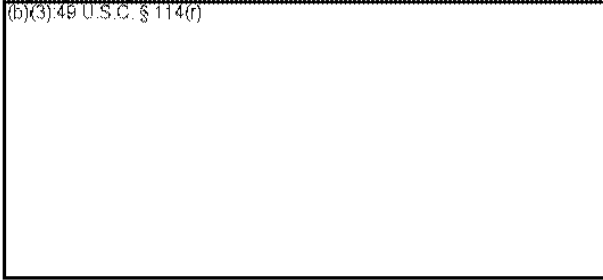
(b)(3), 49 U.S.C. § 1114(f)



~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.101-1, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty, or, if a person, 100 U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

DECEPTION FACTORS

(b)(3)49 U.S.C. § 114(f)



~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil or criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 3. Assessor OJT Checklist

Behavior Assessment Level 2 Evaluation/Checklist

Upon the completion of the proficiency checklist, the BA2 will sign the applicable line indicating that he or she was observed and provided the results of the evaluation.

Process

A. During and immediately following the observation, the evaluator will assess and document the BA2's performance by initialing the corresponding columns on the BA2 Proficiency Checklist. The BA2 will be given a rating in each BA2 task. Written comments are required to support each section of the checklist.

B. If the BA2 receives a rating of meets standards or better on all checklist items, additional evaluations are not required and the BA2 is certified to perform BA2.

C. If the BA2 does not meet standards on any item on the checklist during the observation, the BA2 will not be able to perform BA2 duties. The rating official will provide evaluative data (regarding BA2 performance) based on the results of the evaluation. Written comments are required to support each section of the checklist.

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.204, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For TSA government agencies, public disclosure is governed by 5 U.S.C. 552.~~

Behavior Assessment Level 2 Evaluation/Checklist

BA2 Name: _____ Airport/Office: _____

Observation Date: _____ Evaluator: _____

Location: _____

Performance Objective: Demonstrate the BA2 process at a public transportation facility in accordance with the Assessor Training

Directions: Comments are required to support all rating sections

BA2 Tasks	RATING	
	PASS	FAIL
A. BA2 communicates in a clear, courteous and professional manner.		
B. Communicates with BA2 team members and others in a clear and respectful manner to develop an operational strategy for BA2 activities.		
C. BA2 gains passenger cooperation by building a rapport.		
D. BA2 allows the passenger to provide answers to questions posed.		
E. Conducts BA2 interview in a professional, non-confrontational/unintimidating manner.		
F. BA2 listens effectively and follows up with appropriate questions based on answers.		
G. BA2 maintains control and poise.		
H. Addresses public politely and courteously.		
I. is tactful and demonstrates ability to handle contentious passengers appropriately.		

Reviewer Comments:

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in parts 15.201 and 15.202, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Behavior Assessment Level 2 Evaluation Checklist

BA2 Tasks	RATING	
	PASS	FAIL
QUESTIONING AND OBSERVATION TECHNIQUES		
A. BA2 asks (b)(3)49 U.S.C. § 114 (b)(3)49 U.S.C. § 114(r) to determine appropriate level of screening		
B. BA2 effectively elicits pertinent information from passenger		
C. BA2 does not ask questions that are unrelated to the situation or are unproductive		
D. BA2 asks (b)(3)49 U.S.C. § 114 (b)(3)49 U.S.C. § 114(r) (b)(3)49 U.S.C. § 1		
E. Accurately identifies individuals exhibiting anomalous behaviors		
F. (b)(3)49 U.S.C. § 114(r)		
G. Accurately identifies suspicious document signs		
H. BA2 asks questions (b)(3)49 (b)(3)49 U.S.C. § 114(r)		
I. BA2 asks for (b)(3)49 U.S.C. § 114(r) (b)(3)49 U.S.C. § 114(r)		
J. BA2 performs (b)(3)49 U.S.C. § 114(r) (b)(3)49 U.S.C. § 114(r)		

Reviewer Comments:

~~W. AIRPORT. This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know as determined by 49 CFR parts 15 and 1520. Except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation, unauthorized release may result in civil penalty or the receipt for U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Behavior Assessment Level 2 Evaluation Checklist

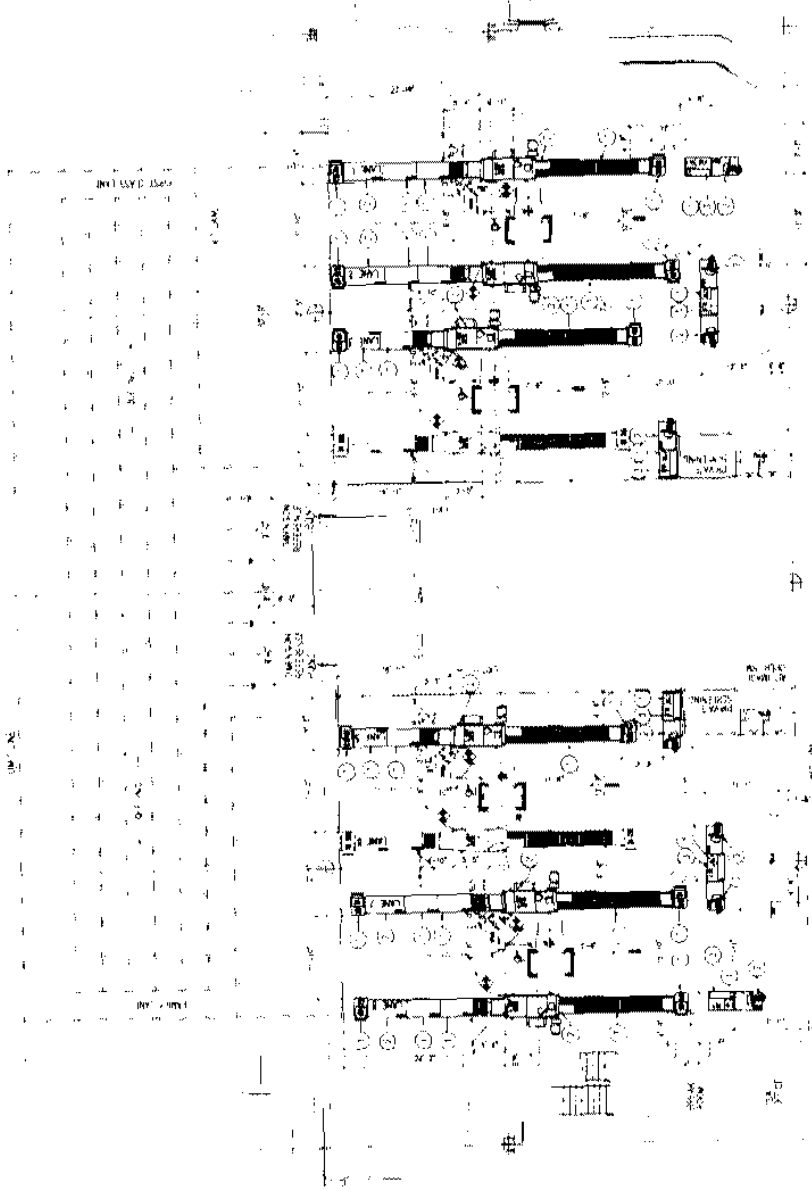
BA2 Tasks	RATING	
	PASS	FAIL
A Correctly identifies anomalous/suspicious indicators that may require additional questioning and/or screening		
B Effectively communicates identifies suspicious or anomalous indicators to Assessor/BA2		
C Determines and directs individual to appropriate level of screening/questioning.		
D Discreetly notifies the Checkpoint personnel that passenger requires selectee screening.		
E Correctly identifies situations requiring automatic LEO response		
F Effectively communicates pertinent information to responding LEO		

Reviewer Comments:

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined in accordance with 49 CFR part 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties and/or criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX J: Boston Terminal A Layout

GENERAL INFORMATION

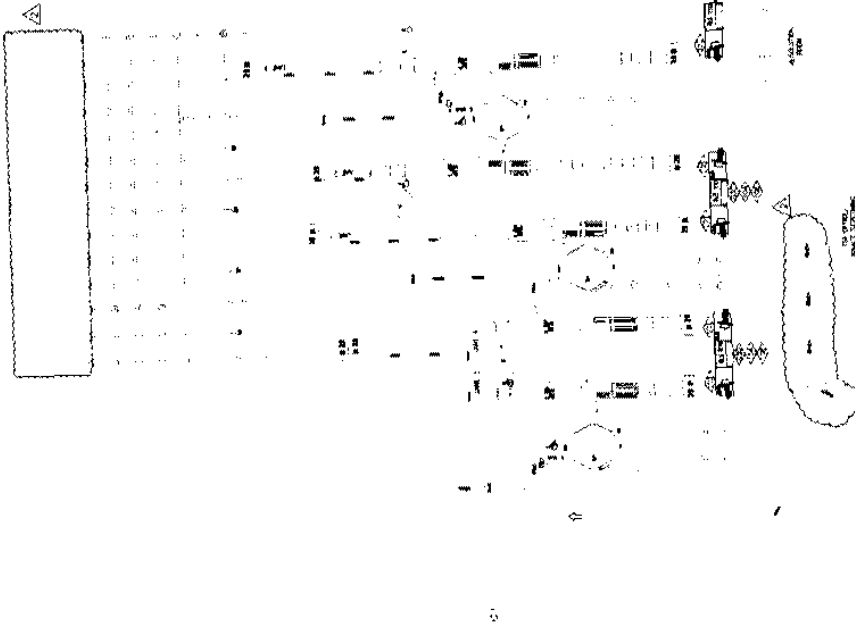


01
TERMINAL A CHECKPOINT A1
FLOOR PLAN - FINAL
DATE: 05/17/04



WARNING: This document contains sensitive information that is not to be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except as authorized by the Transportation Security Administration or the Secretary of Homeland Security. Disclosure is governed by 5 U.S.C. 552, which may result in civil penalty or other action for U.S. government agencies, public disclosure is governed by 5 U.S.C. 552.

APPENDIX 5: Detroit Red 1 Layout



1 MCNAMARA TERMINAL CHECKPOINT RED 1 EQUIPMENT PLAN - FINAL

WARNING: This document contains information that is controlled under E.O. 13526. No part of this document is to be released or disclosed, in any form or by any means, without a need to know, as defined in 49 CFR parts 15 and 1520, except as authorized by the Transportation Security Administration. Unauthorized release may result in criminal or civil penalties. For U.S. Government agencies, public disclosure is governed by 5 U.S.C. 552.

APPENDIX 6: Boston Terminal A Proof of Concept Schedule

Date	Time	Total Hours				
8/15/2011	1100-1500	4		10/5/2011	0800-1300	5
8/16/2011	1100-1500	4		10/6/2011	0430-1230	8
8/17/2011	1500-1900	4		10/7/2011	0800-1200/1300-1600	7
8/18/2011	1500-1900	4		10/10/2011	0700-1100/1500-1900	8
8/19/2011	0700-1100	4		10/11/2011	0430-2000	15.5
8/22/2011	1500-1900	4		10/12/2011	0500-0900/1300-1700	8
8/23/2011	0700-1100	4		10/13/2011	0700-1100/1730-2100	7.5
8/24/2011	0400-0800	4		10/14/2011	0700-1530	8.5
8/25/2011	1100-1500	4		10/17/2011	1200-2000 minus some times	6.58
8/26/2011	1100-1500	4		10/18/2011	0430-2000	15.5
8/30/2011	1000-1200/1400-1600	4		10/19/2011	0430-1600	11.5
8/31/2011	1000-1200/1300-1500	4		10/21/2011	0800-1630	8.5
9/1/2011	0900-1100/1300-1500	4		10/22/2011	1000-1800	8
9/2/2011	0500-0700/1500-1700	4		10/24/2011	0800-1600	8
9/5/2011	0700-0900/1900-2100	4		10/25/2011	0430-0830/1200-1500	7
9/6/2011	0500-0700/1800-2000	4		10/26/2011	0800-1100/1200-1500	6
9/7/2011	0800-1000/1400-1600	4		10/27/2011	0700-1100/1200-1500	7
9/8/2011	0700-0900/1500-1700	4		10/28/2011	0800-1500	7
9/9/2011	0900-1100/1700-1900	4		10/29/2011	0600-1000/1400-1800	8
9/11/2011	1030-1230	2		10/30/2011	0600-1000	4
9/12/2011	0900-1100/1300-1500	4		10/31/2011	0800-1100/1200-1500	6
9/13/2011	1000-1200/1400-1600	4		11/1/2011	0430-1030/1300-1600	9
9/14/2011	1000-1200/1300-1500	4		11/2/2011	0530-1000/1700-2000	7.5
9/15/2011	0900-1100/1500-1700	4		11/3/2011	0800-1500	7
9/16/2011	0900-1100/1200-1400	4		11/4/2011	0700-1100/1200-1500	7
9/19/2011	0700-0900/1700-1900	4		11/5/2011	0800-1200/1400-1800	8
9/20/2011	0900-1100/1800-2000	4		11/6/2011	0700-1100	4
9/21/2011	0800-1000/1400-1600	4		11/7/2011	0800-1200/1400-1800	8
9/22/2011	0700-1000/1400-1700	6		11/8/2011	0500-0900/1500-1900	8
9/23/2011	0900-1200/1700-2000	6		11/9/2011	1200-1500	3
9/26/2011	0900-1200/1600-2000	7		11/10/2011	0500-0900	4
9/27/2011	0800-1200/1500-1800	7		11/11/2011	0800-1200/1700-2000	7
9/28/2011	0500-0800/1300-1600	6		11/12/2011	1400-1800	4
9/29/2011	0800-1100/1200-1500	6		11/13/2011	0600-1400	8
9/30/2011	0700-1100/1200-1515	7.25		11/14/2011	1200-2000	8
10/3/2011	0800-1100/1300-1600	6		11/15/2011	0800-1600	8
10/4/2011	0800-1600	8		11/16/2011	1200-2000	8
				11/17/2011	0500-1230	7.5

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.107, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

11/18/2011	0500-1230	7.5	12/3/2011	1300-1600	3
11/19/2011	0800-1600	8	12/4/2011	0600-1000/1200-1500	7
11/20/2011	0700-1500	8	12/5/2011	0800-1100/1300-1600	6
11/21/2011	0800-1600	8	12/6/2011	0500-0900	4
11/22/2011	0700-1300	6	12/8/2011	0500-0900/1200-1500	7
11/23/2011	0800-1400	6	12/9/2011	1700-2000	3
11/26/2011	0800-1600	8	12/10/2011	0800-1100/1300-1700	7
11/28/2011	1200-1500	3	12/11/2011	0600-0900	3
11/29/2011	0500-0800/1230-1500	5.5	12/12/2011	1300-1600	3
11/30/2011	0600-0900/1600-1900	6	12/13/2011	0700-1000/1600-1900	6
12/1/2011	0800-1100/1200-1500	6	12/14/2011	0900-1500	6
12/2/2011	0500-0800	3	12/15/2011	1200-1500	3

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties or criminal action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 7: Potential Additions to the High-Risk Case List

This list of cases is illustrative and by no means exhaustive. There are other potential events that could be considered potential high-risk based on discussion.

Airport	Date	Resolution	Potential Classification	Description (reduced)
BOS	9/1/2011	Referred for Selectee Screening	(b)(3) 49 U.S.C. § 114(r)	
BOS	11/14/2011	Questioned and Released by LEO		
DTW	11/16/2011	LEO ran NCIC		
BOS	12/5/2011	Questioned and Released by LEO		
BOS	12/8/2011	Referred for Selectee Screening		

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, and with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalties or other actions. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

BOS	12/10/2011	Questioned and Released by LEO	(b)(3);49 U.S.C. § 114(r)
BOS	12/14/2011	Questioned and Released by LEO	

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15.101-15.201, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty or a fine for non-FSA government agencies; public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 8: (b)(3) 49 U.S.C. § 114(r) BOS

(b)(3) 49 U.S.C. § 114(r)			
	12	12.50%	
	45	46.88%	
	14	14.58%	
	1	1.04%	
	1	1.04%	
	3	3.13%	
	2	2.08%	
	7	7.29%	
	11	11.46%	
	54	56.25%	
	2	2.08%	
	2	2.08%	
	2	2.08%	
	1	1.04%	
	1	1.04%	
	2	2.08%	
	3	3.13%	
	1	1.04%	
	1	1.04%	
4	4.17%		
1	1.04%		
1	1.04%		

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in a civil penalty under section 101 of U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 9: (b)(3):49 U.S.C. § 114(r) DTW

SPOT Behaviors in (b)(3):49 U.S.C. § 114(r) at DTW by BDOs

(b)(3):49 U.S.C. § 114(r)	8	57.14%
	4	28.57%
	2	14.29%
	1	7.14%
	1	7.14%
	1	7.14%
	1	7.14%

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.204, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 10: Utilization of APA Indicators

Overall Indicators in BOS Referrals

(b)(3):49 U.S.C. § 114(f)	280	55.34
	7	1.38
	22	4.35
	1	0.20
	28	5.53
	3	0.59
	59	11.66
	0	0.00
	19	3.75
	81	16.01
	204	40.32
	0	0.00
	20	3.95
	57	11.26
	188	37.15
	22	4.35
	27	5.34
	14	2.77
	91	17.98
	72	14.23
7	1.38	
2	0.40	
8	1.58	

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in 49 CFR 15.204, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

Overall Indicators by Employee Type in DTW Referrals

(b)(3) 49 U.S.C. § 114(f)	28	19.72	17	41.46
	2	1.41	0	0.00
	9	6.34	11	26.83
	0	0.00	0	0.00
	12	8.45	5	12.20
	1	0.70	0	0.00
	14	9.86	1	2.44
	5	3.52	1	2.44
	1	0.70	6	14.63
	33	23.24	8	19.51
	104	73.24	31	75.61
	0	0.00	0	0.00
	4	2.82	2	4.88
	17	11.97	4	9.76
	26	18.31	15	36.59
	11	7.75	2	4.88
	9	6.34	7	17.07
	2	1.41	1	2.44
	6	4.23	3	7.32
	30	21.13	7	17.07
0	0.00	1	2.44	
2	1.41	0	0.00	
2	1.41	0	0.00	

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as determined by 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unintentional release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 11: HRP Indicators

Indicators in High-risk Outcomes in BOS Referrals

(b)(3):49 U.S.C. § 114(r)	35	67.31
	1	1.92
	1	1.92
	0	0.00
	4	7.69
	0	0.00
	8	15.38
	0	0.00
	5	9.62
	5	9.62
	31	59.62
	0	0.00
	3	5.77
	8	15.38
	28	53.85
	3	5.77
	3	5.77
	2	3.85
	24	46.15
	9	17.31
0	0.00	
0	0.00	
4	7.69	

~~WARNING: This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 16. No part of this document may be released to persons without a need to know, as defined in 49 CFR 16.107, or to the public without the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~

APPENDIX 12: Positive Predictive Value of Indicators

Indicators' Positive Predictive Value at BOS

(b)(3):49 U.S.C. § 114(r)		
	35	12.50
	1	14.29
	1	4.55
	0	0.00
	4	14.29
	0	0.00
	8	13.56
	0	N/A
	5	26.32
	5	6.17
	31	15.20
	0	N/A
	3	15.00
	8	14.04
	28	14.89
	3	13.64
	3	11.11
	2	14.29
	24	26.37
9	12.50	
0	0.00	
0	0.00	
4	50.00	

~~This document contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this document may be released to persons without a need to know, as defined in part 15.201, and is to be controlled in accordance with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in criminal penalties. For U.S. government agencies, public disclosure is governed by 51 U.S.C. 552.~~