Department of Homeland Security
Customs and Border Protection

Biometric Entry-Exit Program

Life Cycle Cost Estimate (LCCE)

VERSION 1.1

July 19, 2017

FOIA CBP 001101

Signature Page

Approval Statement: I have read and understood the above named document and accordingly wish to formally convey approval to that document.

Submitted by: (b) (6), (b) (7)(C) July 21, 2017

Program Manager, CBP — Date

Endorsed by: (b) (6), (b) (7)(C) 16 Aug 2017

Component Acquisition Executive, CBP — Date

Endorsed by: (b) (6), (b) (7)(C) 8/14/17

Chief Financial Officer, CBP — Date

Approved by: _____ _____

Chief Financial Officer, DHS — Date

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REVISION HISTORY

This Biometric Entry-Exit Life Cycle Cost Estimate (LCCE) has been created as a living document. As such, the newly created document, changes and modifications will be recorded in the table below, satisfying change management policy, processes and procedures.

Table 1: Revision Tracking Log

Version	Date	Author	Change Description
0.1	5/15/17	(b) (7)(E)	Initial draft LCCE submitted for review
1.0	6/9/17	(b) (7)(E)	Updated based on comments and feedback from DHS stakeholders prior to ADE.
1.1	7/19/17	(b) (7)(E)	Updated based on comments and feedback from FMD, PSPD, Budget.

FOIA CBP 001103

Executive Summary

Preface

This Life Cycle Cost Estimate (LCCE) describes the development, operational, and sustainment costs required to support the proposed Biometric Entry-Exit Program. The scope of this LCCE encompasses all activities directly funded by the Biometric Entry-Exit Program (through fee funds or appropriated funds) as well as costs that can be allocated to the program. In line with the Program's acquisition strategy, Acquisition Decision Event (ADE) 2A focuses on the development of the biometric matching capability, the Traveler Verification Service (TVS), which enables biometric identity verification and real-time queries against biometric databases for air, land, and sea travel modes. [redacted] (b) (5)

A key driver for the development of a biometric entry-exit system is the Fiscal Year (FY) 2016 Consolidated Appropriations Act (P.L. 114-113), in which Congress established a biometric entry-exit fee that will provide up to $1 billion in funding over a 10-year period. A second key driver is Executive Order 13780, "*Protecting the Nation from Foreign Terrorist Entry into the United States"* issued on March 6, 2017, which directs the Department of Homeland Security (DHS) to expedite the implementation of the biometric entry-exit system.

[redacted] (b) (5), (b) (7)(E)

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LCCE Summary

The Biometric Entry-Exit Program's goal is to verify the traveler's identity upon departure from the United States. The design of the Biometric Entry-Exit Program is not limited to collecting biometric information from a departing passenger; the system must also support efforts to ensure that the passenger actually departs from the United States. CBP's top priority for deployment of Biometric Entry-Exit Program capabilities is in the air environment. Air will require the deployment of a Biometric Entry-Exit solution at or near the departure gate to provide the highest assurance of traveler departure. Working in partnership with the air travel industry, CBP will lead the transformation of air travel using biometrics as the key to enhancing security and unlocking benefits that dramatically improve the entire traveler experience. CBP will re-architect data flows and data systems to pre-stage biometrics data throughout the travel process.

CBP will partner with airlines, airports, and TSA to build a device independent, vendor neutral back-end system called the Traveler Verification Service (TVS) that allows for private sector investment in front end infrastructure, such as self-service baggage drop off kiosks, facial recognition self-boarding gates, and other equipment; this service will ultimately enable a biometric-based entry/exit system to provide significant benefits to air travel partners, in addition to establishing a biometric air exit system. The TVS will also be able to support future biometric deployments in the land and sea environments and throughout the traveler continuum. Figure 1 shows the different environments and touchpoints that will interact with the TVS.

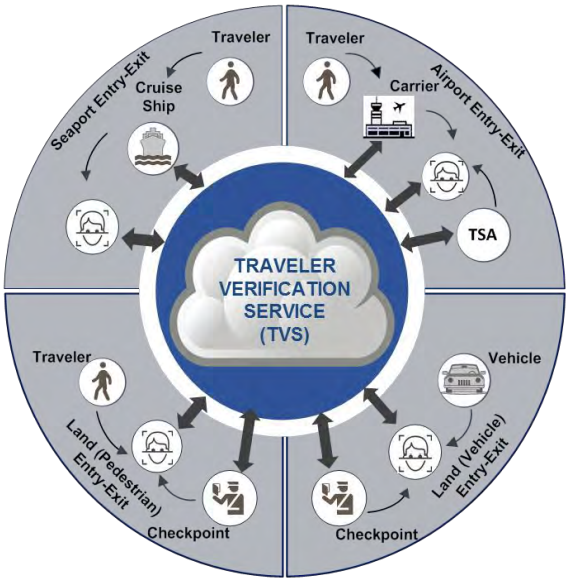

Figure 1: TVS Support across Environments

FOIA CBP 001105

Table 2 shows a high level summary of the costs from the model, in base year 2017 (BY17) dollars, then-year dollars, and then-year risk adjusted dollars.

Table 2: Summary of Biometric Entry Exit LCCE Results

WBS #	WBS Element	Prior (FY14 - 16)	2017	2018	2019	2020	2021	2022	2023	Future (FY24 - 31)	Total
Total Program Estimate – BY17 $K Point Estimate											
	Total LCCE	(b) (7)(E)		(b) (5), (b) (7)(E)							
1.0	PC&I										
2.0	O&S										
Total Program Estimate – TY $K Point Estimate											
	Total LCCE			(b) (5), (b) (7)(E)							
1.0	PC&I										
2.0	O&S										
Total Program Estimate – TY $K 50% C.L.											
	Total LCCE			(b) (5), (b) (7)(E)							
1.0	PC&I										
2.0	O&S										
Total Program Estimate – TY $K 80% C.L.											
	Total LCCE			(b) (5), (b) (7)(E)							
1.0	PC&I										
2.0	O&S										

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In addition to developing a point estimate within the cost model, a risk and sensitivity analysis was also performed in order to address uncertainty in the cost projections, as well as identify the key cost drivers that have the biggest impact on the LCCE total. The risk analysis was performed by placing a distribution around key estimating parameters in the model, and then using a risk simulation to develop a statistical analysis of the LCCE cost results. Figure 2 shows the results of that risk analysis at the total LCCE level.

(b) (5)

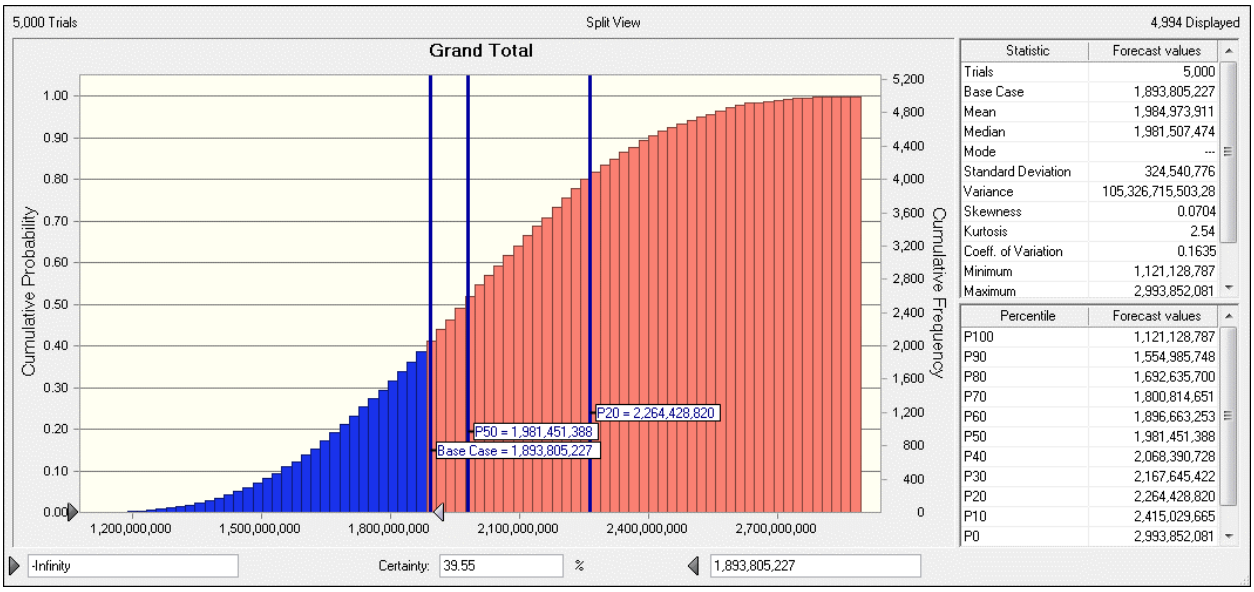

Figure 2: Risk Analysis Results for the Biometric Entry-Exit LCCE Total (TY $)

The results of the sensitivity analysis, where the impact to the total LCCE was measured by independently varying each cost driver between its upper and lower bound, are shown below in Figure 3. Also called a tornado chart, the figure shows that the cost elements that are the most sensitive in the cost model are the drivers that influence the O&S cost, especially the Biometric Enforcement risk factor. The Biometric Enforcement cost element, described further in this document, accounts for more than half of the lifecycle costs due to the large number of officers required to support the CBP mission.

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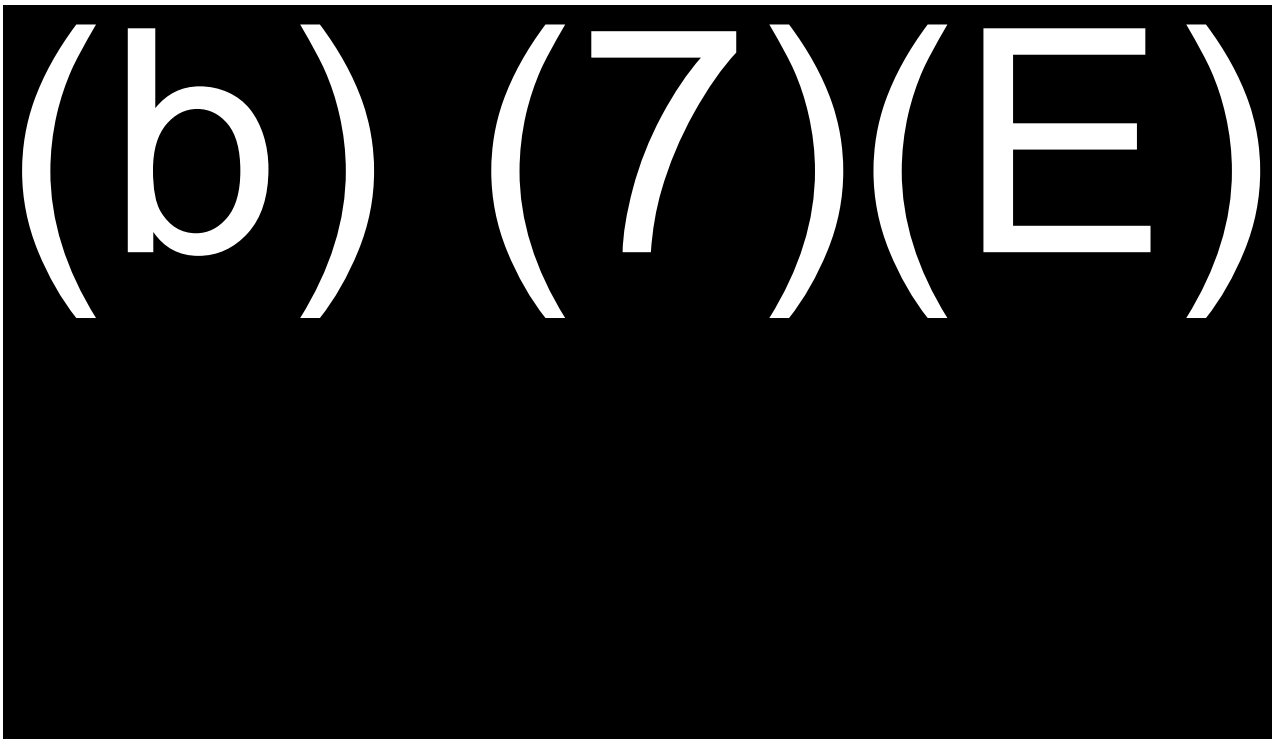

Figure 3: Top Ten Biometric Entry-Exit Cost Drivers (LCCE Total, TY $K)

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(b) (5), (b) (7)(E)

(b) (5), (b) (7)(E)

It is important to note that this analysis only covers the period of FY17-FY25, in line with the fee funding period. (b) (5)

Table 3: Comparison of Total Biometric Entry-Exit Program Funded Estimate to Program Budget

WBS Element	2017	2018	2019	2020	2021	2022	2023	Future (2024-2025)	Total
Program Funded Estimate – TY $K 50% C.L.									
Total LCCE	52,160	77,328	143,788	139,274	131,036	126,978	131,846	264,165	1,066,574
(b) (5), (b) (7)(E)									
Total Fee Funding – TY $K									
Total Fee Funding	(b) (5), (b) (7)(E)								
Surplus / (Shortfall) – TY $K									
Annual Surplus/(Shortfall)	(b) (5), (b) (7)(E)								
Total Surplus/(Shortfall)									

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1.0 Introduction

The primary mission of the U.S. Customs and Border Protection (CBP) agency is to safeguard America's borders from dangerous people and materials while enhancing the nation's global economic competitiveness by enabling legitimate trade and travel. Part of this mission is to enforce U.S. immigration laws. A key aspect of U.S. immigration laws is that most foreign nationals enter as a "nonimmigrant" or on a temporary basis with a fixed period of admission time, and are required to depart the United States before that admission time expires. In order to effectively enforce U.S. immigration law, CBP must have the ability to 1) record departures of foreign nationals from the United States and 2) do so in a way that provides the highest assurance of travelers' identity. If CBP is unable to determine if and when foreign nationals depart from the United States, its ability to enforce a major piece of existing immigration law is limited.[1] The Biometric Entry-Exit Program's goal is to verify the traveler's identity upon departure from the United States. The design of a Biometric Entry-Exit solution is not limited to collecting biometric information from a departing passenger; the system must also support efforts to ensure that the passenger actually departs from the United States.

CBP's top priority for deployment of biometric exit capabilities is in the air environment. Air will require the deployment of a biometric exit solution at or near the departure gate to provide the highest assurance of traveler departure. Therefore, the initial focus of the Biometric Entry-Exit program will be implementation in the Air environment, but will also cover Biometric Entry-Exit within the land and sea environments in the future. Working in partnership with the air travel industry, CBP will lead the transformation of air travel using biometrics as the key to enhancing security and unlocking benefits that dramatically improve the entire traveler experience. CBP will re-architect data flows and data systems to pre-stage biometrics data throughout the travel process.

CBP will use a traveler's face as the primary way of identifying the traveler and facilitating their entry to and exit from the United States, while simultaneously leveraging fingerprints for watch list checks. This will create the opportunity for CBP to transform air travel by enabling all parties in the travel system to match travelers to their data via biometrics, thus unlocking benefits that address CBP's border security mandate and enhances the entire traveler experience.

The CBP "Biometric Pathway" will utilize biometrics to streamline passenger processes throughout the air travel continuum, and will provide airport and airline entities with the opportunity to validate identities against DHS information systems using the data available. CBP will partner with airlines, airports, and TSA to build a device independent, vendor neutral back-end system called the Traveler Verification Service (TVS) that allows for private sector investment in front end infrastructure, such as self-service baggage drop off kiosks, facial recognition self-boarding gates, and other equipment; this service will ultimately enable a biometric-based entry/exit system to provide significant benefits to air travel partners, in addition to establishing a biometric air exit system.[2] The TVS will also be able to

[1] Standard Bio Entry-Exit Program Language

(b) (5)

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support future biometric deployments in the land and sea environments and throughout the traveler continuum. Figure 4 shows the different environments and touchpoints that will interact with the TVS.

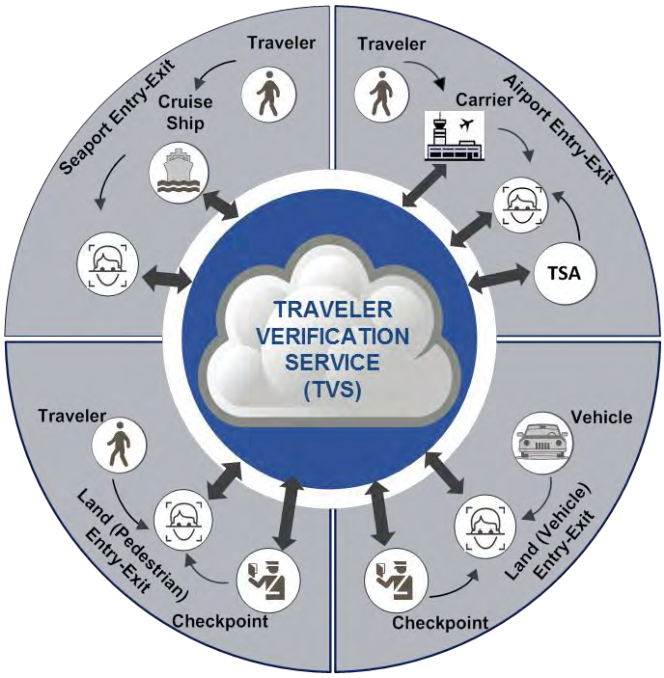

Figure 4: TVS Support across Environments

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2.0 Estimate Purpose & Scope

2.1 Estimate Purpose

This LCCE is being developed in support of the requirement to maintain an updated LCCE per DHS Acquisition and Capital Planning and Investment Control (CPIC) guidance. The request to develop a LCCE is the result of an upcoming program milestones requiring its development and approval.

2.2 Estimate Scope

The time frame of this estimate ranges from fiscal year 2014 (FY14) through FY31 which captures the sunk costs associated with the program as well as all in scope program development, and follow-on years of O&S.

The scope of this LCCE encompasses all activities directly funded by the Biometric Entry-Exit Program (through fee funds or appropriated funds) as well as costs that can be allocated to the program. These costs include system development efforts, hardware/software procurement, IT infrastructure, Office of Field Operations (OFO) and Office of Information Technology (OIT) staff that support the development, management, and enforcement of the Biometric Entry-Exit Program. A detailed description of the Biometric Entry-Exit costs can be found in Section 7.

The structure of this estimate is guided by the Standard Work Breakdown Structure (WBS) for IT systems, developed by the DHS Cost Analysis Division (CAD) within the Office of Chief Financial Officer (OCFO). The WBS is only used to the third digit (e.g. 1.1.1 Program/Project Management) to maintain continuity with documents provided by the PMO. Costs are estimated below level three, and rolled into the higher level WBS. The top level is comprised of three major program elements, which include: Air, Land and Sea. The Development portion of the costs for all three elements will conclude by FY20, where all following program related costs will be attributed to O&S. WBS detail is shown in Table 20.

[redacted] (b) (5) [redacted]

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3.0 Estimating Plan

3.1 Cost Estimating Team

The cost estimating team has worked in conjunction with CBP staff in the OFO and OIT offices to fully define the program as well as SME resources to assist in the development of cost estimates. The cost estimating team, responsible for development of the cost model and documentation, is shown below in Table 4.

Table 4: Cost Estimating Team Composition

Job Title / Role	Name	Organization	Email
Cost Team Lead	(b) (4), (b) (6)		
Cost Analyst			
Cost Analyst			
Subject Matter Expert			

3.2 Estimating Schedule

The estimating plan began with the Kickoff meeting to collect data from Biometric Entry-Exit Program representatives. This includes Biometric Entry-Exit Program Management Office contacts, OIT technical representatives, and budget personnel. (b) (7)(E)

(b) (5), (b) (7)(E)

(b) (5), (b) (7)(E)

Table 5: Estimating Schedule

Task	Due By
(b)(5), (b)(7)(E)	

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Task	Due By
(b)(5), (b)(7)(E)	

3.3 Cost Estimating Tools

The (b) (4), (b) (7)(E) Cost Estimating team used the tools identified in Table 6 to complete this LCCE.

Table 6: Estimating Tools

Software	Purpose
Microsoft Excel	This program was used to create the cost model and generate various time-phased estimates.
Crystal Ball	This program was used to perform risk and sensitivity analysis.

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4.0 Program Background and System Description

CBP will partner with the air travel industry to deploy a biometric air entry/exit solution that transforms the overall traveler experience. The four primary goals of this large-scale transformation will be to make air travel more:

- **Secure** - Providing increased certainty as to the identity of travelers at multiple points in the travel continuum;
- **Simple** - Eliminating the need for physical document and boarding pass checks;
- **Facilitative** - Establishing a clear and easily understood process that will reduce the potential for major "bottlenecks" within the air travel process; and
- **Compliant** - Employing a high integrity, biometric entry and exit system that not only increases CBP's certainty as to the identity of travelers, but also more ably holds accountable those violating terms of their admittance.[3]

(b) (5), (b) (7)(E)

- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)

(b) (5), (b) (7)(E)

.

[3] (b) (5)

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5.0 Global Ground Rules and Assumptions

As with any cost estimate, this LCCE is based on ground rules and assumptions (GR&A's) that define the estimate's constraints, scope, and baseline conditions. As a general rule, the accuracy, precision, and limitations of the overall estimate are directly tied to the GR&A's. Thus, an understanding of the estimate's GR&A's is a critical step for readers wishing to understand or assess the validity of the estimate. Each of the GR&A's described in the following sub-sections has a direct impact on one or more cost elements within the LCCE. This section only contains global GR&A's; element-specific GR&A's are identified in Section 7.0 of the LCCE document.

5.1 Program Schedule

(b) (7)(E) The high level project schedule includes timelines for the following categories of events: Air Land & Sea Acquisition Events, Air Acquisition Planning, Land Acquisition Planning, Sea Acquisition Planning, IT Infrastructure, Site Infrastructure, Operational Support, and Technical Innovation & Demonstrators. The program achieved ADE-1 in Q3 of FY17 and is slated for ADE-2A in Q4 of FY17 and Initial Operating Capability (IOC), in Q4 of FY18.

(b) (5)

- (b) (5)
- (b) (5)
- (b) (5)

(b) (5)

5.2 O&S Tail Factor

An O&S tail factor was developed and used to estimate annual O&S costs for multiple cost elements within the model. This factor was derived from LBI actual program costs as the ratio of annual O&S to total PC&I. Table 7 shows the details gathered from the LBI cost model.

Table 7: LBI O&S Tail Factor Calculation

Description	Cost
(b) (7)(E)	

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5.3 System Activity Rates

Several of the cost elements in the LCCE are driven by the "system activity", represented by either the number of passengers or the number of flights that are expected to be processed through the TVS. The cost estimating team used data collected from the Bureau of Transportation Statistics (BTS)[4] to project the total number of flights and passengers per year from 2017 through 2031.

These values were based on a linear extrapolation of data for the period of 2005 to 2015 from the BTS datasets for air carriers in the international market. (b) (5)

- (b) (5)
- (b) (5)
- (b) (5)
- (b) (5)

Table 8: Total Flights/Passengers Forecasted to be supported by TVS

Description	2017	2018	2019	2020	2021	2022	2023	...	2031
Total estimated flights per year	(b) (5), (b) (7)(E)								
Total estimated passengers per year									
Percentage of total passengers CBP expects to support (dependent on airline participation)									
Number of passengers CBP expects to support									
Number of flights CBP expects to support									

[4] https://www.transtats.bts.gov/

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5.4 Entry/Exit Infrastructure

(b) (5)

(b)(5), (b)(7)(E)

Table 9: Entry/Exit Device and Network Upgrade Quantities

Airport	Entry Device Upgrades	Possible Entry Network Upgrades	Possible Exit Network Upgrades
(b) (5)	(b) (5), (b) (7)(E)		
Total			

(b) (5)

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5.5 Work Breakdown Structure

The LCCE uses the DHS standard IT WBS published by CAD, to level three. Beyond level three are program specific cost elements where the actual estimating parameters are located. The Biometric Entry-Exit Program broke out major program elements (Land, Air, Sea) at level two to account for greater visibility into cost contributions of each element to the overall program total. The full WBS can be found in the Section 6.

5.6 Handling of Sunk Costs

All Biometric Entry-Exit Program related costs for years FY14-16 are considered sunk and cover the costs of Biometric pilots that have been run by CBP to develop and test different biometric capabilities in the field. These experiments were not funded by the program of record, but are included in the LCCE for completeness.

5.7 Base Year

Costs for this LCCE were estimated as a mixture of base year and then years costs, but always converted back to base year 2017 dollars (BY17$) for consistent treatment of inflation. Base year 2017 dollars were chosen because this is an initial LCCE and should use current year dollars.

5.8 Inflation

Costs for non-federal pay were inflated using the DHS inflation index published by the Cost Analysis Division (CAD) of the Office of the Chief Financial Officer (OCFO). Federal pay costs used an inflation index based on the historical General Schedule inflation and RAP guidance for future years. Both of these inflation indices are shown in Appendix 12.1.

5.9 Land and Sea Environments

(b) (5)

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6.0 Summary of Methodology and Data Sources

The estimating structure for this LCCE follows the standard WBS published by CAD down to the level 3 elements. Table 10 shows a summary of the methodology and data sources contained within each of the elements estimated.

The CAD IT WBS is a standard structure intended to provide a comprehensive set of elements to use across many different programs within the department. Therefore, some of the elements are not applicable or used in this LCCE and contain "N/A" in the Methodology section below. The elements are still required in the structure, however, to maintain a standard and consistent numbering.

Table 10: Summary of Methodology and Data Sources by WBS Element

WBS #	WBS Element	Methodology	Data Source
1.0	PC&I	(b) (7)(E)	
1.1	Biometric Entry Exit - Air		
1.1.1	Program/Project Management		
1.1.1.1	Acquisition and PM Support - Federal		
1.1.1.2	Acquisition and PM Support - Contractor		
1.1.1.3	Communications and Outreach		
1.1.2	Systems Engineering (or Systems Analysis)		
1.1.3	Business Process Re-engineering		
1.1.4	System Development		
1.1.4.1	TVS Development - Sprint 8 Pilot Expansion		
1.1.4.2	TVS Development - Scalable Infrastructure		
1.1.5	System Production		
1.1.6	COTS/GOTS/GFE Procurement		
1.1.6.1	Backend Matching Algorithm		
1.1.7	IT Hosting Investment		
1.1.7.1	Cloud Services Infrastructure & Hosting		
1.1.8	System Level Integration & Test		
1.1.9	System Deployment/Implementation		
1.1.9.1	Sprint 8 Pilot Expansion Hardware & Support		
1.1.9.2	Entry Device Upgrades		
1.1.9.3	Entry Network Upgrades		
1.1.9.4	Exit Network Upgrades		
1.1.10	System Documentation & Related Data		
1.1.11	Training		
1.1.12	Other PC&I		
1.2	Biometric Entry Exit - Sea		
1.3	Biometric Entry Exit - Land		
2.0	O&S		
2.1	Biometric Entry Exit - Air		

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WBS #	WBS Element	Methodology	Data Source
2.1.1	Program/Project Management	(b) (7)(E)	
2.1.1.1	Acquisition and PM Support - Federal		
2.1.1.2	Acquisition and PM Support - Contractor		
2.1.1.3	Communications and Outreach		
2.1.2	Systems Engineering (or Systems Analysis)		
2.1.3	Business Process Re-engineering		
2.1.4	Manpower		
2.1.4.1	Biometric Exit Enforcement		
2.1.5	Operations		
2.1.6	Maintenance & Tech Refresh		
2.1.6.1	Sprint 8 Pilot Expansion Hardware O&S		
2.1.6.2	Entry Device O&S		
2.1.6.3	Entry Network O&S		
2.1.6.4	Exit Network O&S		
2.1.7	Sustaining Support		
2.1.7.1	TVS O&S		
2.1.7.2	Cloud Services Infrastructure & Hosting		
2.1.7.3	Backend Matching Enterprise - Recurring		
2.1.8	Continuing System Improvement		
2.1.8.1	Technology and Innovation		
2.1.9	Indirect Support		
2.1.10	System Documentation & Related Data		
2.1.11	Support Facilities Sustainment & Maintenance		
2.1.12	Other O&S		
2.2	Biometric Entry Exit - Sea		
2.3	Biometric Entry Exit - Land		

FOIA CBP 001123

7.0 Life Cycle Cost (by WBS Element)

This section provides an overview of the cost estimating approach, by WBS element. The following subsections have been documented for each estimated level three WBS element: element number & name, definition, ground rules & assumptions, methodology, data sources, and time-phased results. Additional detailed information including assumptions, calculations, and time phased cost can be viewed in the appendix or attached cost model.

7.1 PC&I Methodology

7.1.1 Program/Project Management

1.1.1 Program/Project Management
Definition
• **Standard WBS Definition:** The program management element is defined as the business and administrative planning, organizing, directing, coordination, controlling, and approval actions designated to accomplish overall program objectives which are not associated with specific hardware/software elements and are not included in systems engineering or business process re-engineering (BPR)/change management. Examples of these activities include: cost, schedule, performance measurement management, warranty administration, contract management, data management, vendor liaison, subcontract management, etc. • **Biometric Entry-Exit Specific Definition:** This cost element captures the total cost for Acquisition and PM Support for Federal and Contractor support at OFO and OA and Federal Staff at OIT, as well as Communications and Outreach.
Methodology
• (b)(7)(E) ○ (b)(7)(E) ○ (b)(7)(E)
Ground Rules & Assumptions

FOIA CBP 001124

1.1.1 Program/Project Management

- **Acquisition and PM Support – Federal/Contractor:**
  - (b) (5)
  - (b) (5)
  - (b) (5)

(b) (5)

  - (b) (5)
  - (b) (5)
  - (b) (5)
- **Communications and Outreach:**
  - (b) (5)

(b) (5), (b) (7)(E)

  - (b) (5)
  - (b) (5)

Communications and Outreach	2017	2018	2019	2020	2021	2022	2023	2024	2025+
Percent of Communications Budget	(b) (5), (b) (7)(E)								

  - (b) (5)

Data Sources

FOIA CBP 001125

1.1.1 Program/Project Management

- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b)(6), (b)(7)(C), (b)(7)(E)

Time Phasing of Costs

- (b) (5)

Table 11: Time-Phased Cost Results for WBS 1.1.1 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.1.1	Program/Project Management	(b) (5)									
1.1.1.1	Acquisition and PM Support - Federal										
1.1.1.2	Acquisition and PM Support - Contractor										
1.1.1.3	Communications and Outreach										

7.1.2 System Development

1.1.4 System Development

Definition

- **Standard WBS Definition:** This cost element includes all resource expenditures required to develop and prototype the system.
- **Biometric Entry-Exit Specific Definition:** This cost element captures the total cost for TVS Development for Sprint 8 Pilot Expansion and Scalable Infrastructure. This element also captures cost for Entry Applications SW Upgrades.

Methodology

- (b)(7)(E)
  - (b)(7)(E)
    - (b)(5), (b)(7)(E)
    - (b)(5), (b)(7)(E)
- (b)(7)(E)
  - (b) (5)

Ground Rules & Assumptions

FOIA CBP 001126

1.1.4 System Development

- **TVS Development – Sprint 8 Pilot Expansion and Scalable Infrastructure:**
  - The costs for both TVS Developments were estimated using the current and projected contract resources (FTEs).
  - An aggregated labor rate was provided by TASPD as a weighted average of these resources.
  - A labor buildup was estimated using the FTEs, labor rate, and milestone deliverable dates.
  - Assumes 1920 hours per year.
  - TASPD provided assumptions and inputs for contract fee and overtime rates, as well as cost factors in order to account for matrixed TASPD support in addition to direct labor. These factors (configuration mgmt., security, and backend support) were estimated based on historical experience for other major projects/investments (low 10%, high 25%) by the TASPD Program Control Branch.
  - The tables below provide insight into the labor categories, FTEs used, and the assumptions and inputs that TASPD provided.

(b)(7)(E)

(b)(7)(E)

  - (b) (5)

- **Entry Applications SW Upgrades:** Costs are based on PSPD SME Judgment – Application/Interface Upgrades (Primary/Secondary/Facial Recognition Integration) and ePassport Country Certificate Validation.

Data Sources

- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

- TVS Development – Scalable Infrastructure and Entry Applications SW Upgrade costs are phased through FOC, after which the costs are captured within elements 2.1.7 and 2.1.6. TVS Development – Sprint 8 Pilot Expansion costs are phased through FY17 deliverable date, after which the costs are captured within element 2.1.7.

FOIA CBP 001127

Table 12: Time-Phased Cost Results for WBS 1.1.4 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.1.4	System Development	(b) (5), (b) (7)(E)									
1.1.4.1	TVS Development - Sprint 8 Pilot Expansion										
1.1.4.2	TVS Development - Scalable Infrastructure										

7.1.3 COTS/GOTS/GFE Procurement

1.1.6 COTS/GOTS/GFE Procurement

Definition

- **Standard WBS Definition:** This cost element includes all resource expenditures required to acquire already finished components for the system to attain system FOC. These components may include hardware, software, equipment or facilities, and are typically which is available in the commercial market.
- **Biometric Entry-Exit Specific Definition:** (b) (7)(E)

Methodology

- (b) (7)(E)

Ground Rules & Assumptions

- (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)

(b) (7)(E)

- (b) (7)(E)
- (b) (7)(E)

FOIA CBP 001128

1.1.6 COTS/GOTS/GFE Procurement
Data Sources
• (b) (7)(E) • (b) (7)(E) • (b) (7)(E)
Time Phasing of Costs
• (b) (7)(E)

Table 13: Time-Phased Cost Results for WBS 1.1.6 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.1.6	(b) (5), (b) (7)(E)										
1.1.6.1											

7.1.4 IT Hosting Investment

1.1.7 IT Hosting Investment
Definition
• **Standard WBS Definition:** This element includes all investment, or lease in lieu of investment, of IT Hosting hardware, software, or services, as required for the system to attain and maintain FOC. Include costs regardless of whether the data center is operated by another government agency, or an outsource provider. • **Biometric Entry-Exit Specific Definition:** (b) (7)(E)
Methodology
• (b) (7)(E)
Ground Rules & Assumptions

FOIA CBP 001129

1.1.7 IT Hosting Investment

- (b)(5), (b)(7)(E)
  - (b)(5), (b)(7)(E)

(b)(5), (b)(7)(E)

  - (b)(5), (b)(7)(E)

(b) (5), (b) (7)(E)

Data Sources

- (b)(6), (b)(7)(C), (b)(7)(E)
- (b)(4), (b)(7)(E)

Time Phasing of Costs

- (b) (7)(E)

Table 14: Time-Phased Cost Results for WBS 1.1.7 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.1.7	(b) (5), (b) (7)(E)										
1.1.7.1											

FOIA CBP 001130

7.1.5 System Deployment/Implementation

1.1.9 System Deployment/Implementation
Definition
• **Standard WBS Definition:** This cost element includes all costs associated with deploying the system at the operational site(s). • **Biometric Entry-Exit Specific Definition:** (b) (7)(E) .
Methodology

• (b) (7)(E)
  ○ (b) (7)(E)
  ○ (b) (7)(E)
• (b) (7)(E)
  ○ (b) (7)(E)
• (b) (7)(E)
  ○ (b) (7)(E)
  ○ (b) (7)(E)

Ground Rules & Assumptions

FOIA CBP 001131

1.1.9 System Deployment/Implementation

- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)

Data Sources

- (b)(6), (b)(7)(C), (b)(7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

- (b) (7)(E)

FOIA CBP 001132

Table 15: Time-Phased Cost Results for WBS 1.1.9 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.1.9	(b)(5), (b)(7)(E)										
1.1.9.1											
1.1.9.2											
1.1.9.3											
1.1.9.4											

7.1.6 Sea PC&I

1.2 Sea PC&I

Definition

- **Biometric Entry-Exit Specific Definition:** (b) (7)(E)

Methodology

- (b) (5)
  - (b) (5)

Ground Rules & Assumptions

- **Sea PC&I:**
  - Cost estimates are a ROM level estimate that are to be refined in the future.
  - Cruise lines will procure and maintain the front-end biometric equipment being purchased.
  - Sea/Air Ratio is potentially conservative when considering the small number of total passengers who will be considered in-scope.

FY	Air Passengers	Sea Passengers	Sea:Air Ratio
2014	112,675,745	19,712,751	17.5%
2015	117,446,456	19,796,208	16.9%

Data Sources

- (b) (7)(E)

Time Phasing of Costs

- (b) (5)

Table 16: Time-Phased Cost Results for WBS 1.2 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.2	Biometric Entry Exit - Sea	(b)(5), (b)(7)(E)									

7.1.7 Land PC&I

1.3 Land PC&I

Definition

FOIA CBP 001133

1.3 Land PC&I

- **Biometric Entry-Exit Specific Definition:** (b)(5), (b)(7)(E)

Methodology

- (b) (7)(E)

Ground Rules & Assumptions

- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E) :
  - (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
- (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)

(b) (7)(E)

Data Sources

- (b)(6), (b)(7)(C), (b)(7)(E)

Time Phasing of Costs

- (b)(5), (b)(7)(E)

Table 17: Time-Phased Cost Results for WBS 1.3 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
1.3	Biometric Entry Exit - Land	(b) (5), (b) (7)(E)									

FOIA CBP 001134

7.2 Operations and Sustainment Methodology

7.2.1 Program/Project Management

2.1.1 Program/Project Management

Definition

- **Standard WBS Definition:** This element covers the resource requirements for program management incurred after FOC at all sites of the system. Management includes the costs incurred in the process of acquiring, employing, and retraining needed personnel, i.e. fully burdened salaries, benefits, relocation expenses, retirement actuarial, required TDY, and all costs associated with the personnel of the deployed system. It also includes the services, studies and support resources needed to manage the program after FOC. Excludes systems engineering, and BPR (see CE 2.i.2 - 2.i.3).
- **Biometric Entry-Exit Specific Definition:** This cost element captures O&S related costs to Federal and Contractor Acquisition and PM Support and Communications and Outreach.

Methodology

- (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)

Ground Rules & Assumptions

- (b) (5), (b) (7)(E)

(b) (5), (b) (7)(E)

- (b) (5), (b) (7)(E)

Data Sources

- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

FOIA CBP 001135

2.1.1 Program/Project Management
• (b) (5)

Table 18: Time-Phased Cost Results for WBS 2.1.1 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.1	(b) (5)										
2.1.1.1											
2.1.1.2											
2.1.1.3											

7.2.2 Manpower

2.1.4 Manpower
Definition
• **Standard WBS Definition:** This element consists of costs associated with operators, maintainers, and other support manpower assigned to operating units. May include government and/or contractor manpower. Excludes manpower associated with general and indirect support, such as manpower supporting base level functions (2.i.9). Excludes manpower associated with program management, systems engineering and/or BPR/change management (see element 2.i.1, 2.i.2 and 2.i.3). • **Biometric Entry-Exit Specific Definition:**
Methodology
• (b) (5) ○ (b) (5) • (b) (5) ○ (b) (5)
Ground Rules & Assumptions

FOIA CBP 001136

2.1.4 Manpower

- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)

Data Sources

- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

- (b) (5)

Table 19: Time-Phased Cost Results for WBS 2.1.4 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.4	(b) (5), (b) (7)(E)										
2.1.4.1											

FOIA CBP 001137

7.2.3 Maintenance & Tech Refresh

2.1.6 Maintenance & Tech Refresh

Definition

- **Standard WBS Definition:** This element includes cost incurred in providing maintenance and repair for the system hardware and software. This includes costs associated with engineering change orders/proposals (ECO/ECP) and related testing incurred after FOC. It excludes cost related to technology refresh/upgrades (see element 2.i.8).
- **Biometric Entry-Exit Specific Definition:** This cost element includes all O&S associated with the Sprint 8 Pilot Expansion Hardware, Entry Device Upgrades, Entry/Exit Network Upgrades, and Entry Applications SW.

Methodology

- (b) (7)(E)
- (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)

Ground Rules & Assumptions

- (b) (5), (b) (7)(E)

(b) (5), (b) (7)(E)

- (b) (5), (b) (7)(E)
- (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)
  - (b) (5), (b) (7)(E)

Data Sources

FOIA CBP 001138

2.1.6 Maintenance & Tech Refresh

- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

- (b) (5)

Table 20: Time-Phased Cost Results for WBS 2.1.6 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.6	(b) (5), (b) (7)(E)										
2.1.6.1											
2.1.6.2											
2.1.6.3											
2.1.6.4											

FOIA CBP 001139

7.2.4 Sustaining Support

2.1.7 IT Hosting Investment

Definition

- **Standard WBS Definition:** This element consists of costs associated with support activities other than maintenance that can be attributed to a system and are provided by organizations other than operating units. It is intended that costs included in this category represent costs that can be identified to a specific system and exclude costs that must be arbitrarily allocated. Where a single cost element includes multiple types of support, or where the support is provided by contractors, each should be separately identified in the appropriate elements.
- **Biometric Entry-Exit Specific Definition:** (b) (7)(E)

Methodology

- (b)(5), (b)(7)(E)
  - (b)(5), (b)(7)(E)
  - (b)(5), (b)(7)(E)
  - (b)(5), (b)(7)(E)

Ground Rules & Assumptions

- (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
- (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)
  - (b) (7)(E)

Data Sources

- (b) (7)(E)
- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

- (b) (5)

Table 21: Time-Phased Cost Results for WBS 2.1.7 (BY17 $K)

#	Name	Prior	2017	2018	2019	2020	2021	2022	2023	Future	Total
2.1.7	(b)(5), (b)(7)(E)										
2.1.7.1											
2.1.7.2											
2.1.7.3											

FOIA CBP 001140

7.2.5 Continuing System Improvement

2.1.8 Continuing System Improvement

Definition

- **Standard WBS Definition:** This element consists of costs associated with hardware and software updates that occur after deployment of a system that improve a system's safety, reliability, maintainability, or performance characteristics to enable the system to meet its basic operational requirements throughout its life. These costs include government and contract labor, materials, and overhead costs. Costs should be separated into government and contractor costs within each cost element, if possible.
- **Biometric Entry-Exit Specific Definition:**

Methodology

- (b)(5), (b)(7)(E)
  - (b)(5), (b)(7)(E)
- (b)(5), (b)(7)(E)
  - (b)(5), (b)(7)(E)

Ground Rules & Assumptions

- (b)(5), (b)(7)(E)
- (b)(5), (b)(7)(E)
- (b)(5), (b)(7)(E)
- (b)(5), (b)(7)(E)

Data Sources

- (b) (7)(E)
- (b) (7)(E)

Time Phasing of Costs

- (b)(5), (b)(7)(E)

Table 22: Time-Phased Cost Results for WBS 2.1.8 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.8	(b)(5), (b)(7)(E)										
2.1.8.1											

FOIA CBP 001141

7.2.6 Sea O&S

1.2 Sea O&S
Definition
• **Biometric Entry-Exit Specific Definition:** This cost element captures ROM estimates for the operations and sustainment of Biometric Entry-Exit within the sea environment. (b)(5) (b)(5) .
Methodology
• (b) (7)(E)
Ground Rules & Assumptions
• **Sea O&S:** ○ (b) (5), (b) (7)(E) ○ (b) (5), (b) (7)(E) ○ (b) (5), (b) (7)(E) ○ (b) (5), (b) (7)(E)
Data Sources
• (b) (7)(E)
Time Phasing of Costs
• (b) (7)(E) .

Table 23: Time-Phased Cost Results for WBS 2.2 (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.2	(b) (5), (b) (7)(E)										

FOIA CBP 001142

7.2.7 Land O&S

1.2 Land O&S
Definition
• **Biometric Entry-Exit Specific Definition:** This cost element captures ROM estimates for the operations and sustainment of Biometric Entry-Exit within the Land environment. (b) (5)
Methodology
• (b) (7)(E)
Ground Rules & Assumptions
• (b) (5), (b) (7)(E) • (b) (5), (b) (7)(E) • (b) (5), (b) (7)(E)
Data Sources
• (b)(5), (b)(6), (b)(7)(C), (b)(7)(E)
Time Phasing of Costs
• (b) (7)(E)

(b) (5), (b) (7)(E)

Table 24: Time-Phased Cost Results for WBS 2.3 (BY17 $K)

#	Name	Prior	2017	2018	2019	2020	2021	2022	2023	Future	Total
2.3	(b) (5), (b) (7)(E)										

FOIA CBP 001143

7.3 Point Estimate Cross-Checks

DHS cost estimated guidance suggests providing high level cross-checks as a potential "sanity check" on the chosen estimating methodology. The cost estimating team compiled the following cross-checks with a focus on high level elements that contribute significantly to the near term LCCE investment cost for the Air environment. (b) (7)(E) .

- **Total Air PC&I –** (b) (7)(E)
- **Contractor PM Support –** (b) (7)(E)
- **System Development –** (b) (7)(E)
- **Software License Costs –** (b) (7)(E)
- **Annual Air O&S (Less Enforcement) –** (b) (7)(E)
- **Enforcement Manpower –** (b) (7)(E)

Table 25: High Level Cross-Check Results

WBS	Name	Point Estimate	Cross Check
1.1	Total Air PC&I	(b) (7)(E)	
1.1.1.2	Contractor PM Support		
1.1.4	System Development		
1.1.6.1	SW License Costs		
2.1	Annual Air O&S		
2.4	Enforcement Manpower		

[7] Capers Jones. *Software Estimating Rules Of Thumb.* 20 March 2007

[8] http://www.m2sys.com/cloud-based-abis-automated-biometric-identification-system/

FOIA CBP 001144

8.0 Point Estimate Summary

This section summarizes the results of the point estimate described in the previous section, in both base year and then year dollars.

Table 26: Point Estimate (BY17 $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
	Total LCCE	(b) (7)(E)		(b) (5), (b) (7)(E)							
1.0	**PC&I**										
1.1	Biometric Entry Exit - Air										
1.1.1	Program/Project Management										
1.1.1.1	Acquisition and PM Support - Federal										
1.1.1.2	Acquisition and PM Support - Contractor										
1.1.1.3	Communications and Outreach										
1.1.2	Systems Engineering (or Systems Analysis)										
1.1.3	Business Process Re-engineering										
1.1.4	System Development										
1.1.4.1	TVS Development - Sprint 8 Pilot Expansion										
1.1.4.2	TVS Development - Scalable Infrastructure										
1.1.5	System Production										
1.1.6	COTS/GOTS/GFE Procurement										
1.1.6.1	Backend Matching Algorithm										
1.1.7	IT Hosting Investment										
1.1.7.1	Cloud Services Infrastructure & Hosting										
1.1.8	System Level Integration & Test										
1.1.9	System Deployment/Implementation										
1.1.9.1	Sprint 8 Pilot Expansion Hardware & Support										
1.1.9.2	Entry Device Upgrades										
1.1.9.3	Entry Network Upgrades										
1.1.9.4	Exit Network Upgrades										
1.1.10	System Documentation & Related Data										
1.1.11	Training										
1.1.12	Other PC&I										
1.2	Biometric Entry Exit - Sea										
1.3	Biometric Entry Exit - Land										
2.0	**O&S**										
2.1	Biometric Entry Exit - Air										
2.1.1	Program/Project Management										
2.1.1.1	Acquisition and PM Support - Federal										
2.1.1.2	Acquisition and PM Support - Contractor										
2.1.1.3	Communications and Outreach										
2.1.2	Systems Engineering (or Systems Analysis)										
2.1.3	Business Process Re-engineering										
2.1.4	Manpower										
2.1.4.1	Biometric Exit Enforcement										

FOIA CBP 001145

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.5	Operations	(b) (7)(E)		(b) (5), (b) (7)(E)							
2.1.6	Maintenance & Tech Refresh										
2.1.6.1	Sprint 8 Pilot Expansion Hardware O&S										
2.1.6.2	Entry Device O&S										
2.1.6.3	Entry Network O&S										
2.1.6.4	Exit Network O&S										
2.1.7	Sustaining Support										
2.1.7.1	TVS O&S										
2.1.7.2	Cloud Services Infrastructure & Hosting										
2.1.7.3	Backend Matching Enterprise - Recurring										
2.1.8	Continuing System Improvement										
2.1.8.1	Technology and Innovation										
2.1.9	Indirect Support										
2.1.10	System Documentation & Related Data										
2.1.11	Support Facilities Sustainment & Maintenance										
2.1.12	Other O&S										
2.2	Biometric Entry Exit - Sea										
2.3	Biometric Entry Exit - Land										

FOIA CBP 001146

Table 27: Point Estimate (TY $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
	Total LCCE	(b) (7)(E)		(b) (5), (b) (7)(E)							
1.0	**PC&I**										
1.1	Biometric Entry Exit - Air										
1.1.1	Program/Project Management										
1.1.1.1	Acquisition and PM Support - Federal										
1.1.1.2	Acquisition and PM Support - Contractor										
1.1.1.3	Communications and Outreach										
1.1.2	Systems Engineering (or Systems Analysis)										
1.1.3	Business Process Re-engineering										
1.1.4	System Development										
1.1.4.1	TVS Development - Sprint 8 Pilot Expansion										
1.1.4.2	TVS Development - Scalable Infrastructure										
1.1.5	System Production										
1.1.6	COTS/GOTS/GFE Procurement										
1.1.6.1	Backend Matching Algorithm										
1.1.7	IT Hosting Investment										
1.1.7.1	Cloud Services Infrastructure & Hosting										
1.1.8	System Level Integration & Test										
1.1.9	System Deployment/Implementation										
1.1.9.1	Sprint 8 Pilot Expansion Hardware & Support										
1.1.9.2	Entry Device Upgrades										
1.1.9.3	Entry Network Upgrades										
1.1.9.4	Exit Network Upgrades										
1.1.10	System Documentation & Related Data										
1.1.11	Training										
1.1.12	Other PC&I										
1.2	Biometric Entry Exit - Sea										
1.3	Biometric Entry Exit - Land										
2.0	**O&S**										
2.1	Biometric Entry Exit - Air										
2.1.1	Program/Project Management										
2.1.1.1	Acquisition and PM Support - Federal										
2.1.1.2	Acquisition and PM Support - Contractor										
2.1.1.3	Communications and Outreach										
2.1.2	Systems Engineering (or Systems Analysis)										
2.1.3	Business Process Re-engineering										
2.1.4	Manpower										
2.1.4.1	Biometric Exit Enforcement										
2.1.5	Operations										
2.1.6	Maintenance & Tech Refresh										
2.1.6.1	Sprint 8 Pilot Expansion Hardware O&S										
2.1.6.2	Entry Device O&S										
2.1.6.3	Entry Network O&S										

FOIA CBP 001147

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.6.4	Exit Network O&S	(b) (5)		(b) (7)(E)							
2.1.7	Sustaining Support										
2.1.7.1	TVS O&S										
2.1.7.2	Cloud Services Infrastructure & Hosting										
2.1.7.3	Backend Matching Enterprise - Recurring										
2.1.8	Continuing System Improvement										
2.1.8.1	Technology and Innovation										
2.1.9	Indirect Support										
2.1.10	System Documentation & Related Data										
2.1.11	Support Facilities Sustainment & Maintenance										
2.1.12	Other O&S										
2.2	Biometric Entry Exit - Sea										
2.3	Biometric Entry Exit - Land										

FOIA CBP 001148

9.0 Sensitivity Analysis

(b) (7)(E)

(b) (7)(E)

Table 28: Biometric Entry-Exit Risk Factors with 10th and 90th Percentile Bounds (Triangular Distribution)

Cost Driver	Low	Base Case	High	Source
Exit Networks Upgrade %	(b) (7)(E)			
O&S Factor				
Deployments Support Factor				
SW Development Contract Fee %				
SW Development Overtime Factor				
TASPD Configuration Mgmt Support Factor				
TASPD Security Support Factor				
TASPD Backend Support Factor				
SW Development Labor Rate				
Entry Devices - Fingerprint Scanner (FY17$)				
Entry Devices - Facial Camera (FY17$)				
Entry Devices - Document Reader (FY17$)				
Tech Refresh Cycle (Years)				
Acquisition and PM Support - Federal				
Acquisition and PM Support - Contractor				
Communications and Outreach				
Entry Applications SW Upgrades				

[9] CSRUH: Cost Schedule Risk and Uncertainty Handbook

[10] CE: Cost Estimating Judgment

[11] SME: Subject Matter Expert Judgment

[12] GSA: General Services Administration CALC Database

FOIA CBP 001149

Cost Driver	Low	Base Case	High	Source
Backend Matching Algorithm	(b) (7)(E)			
Cloud Services Infrastructure & Hosting				
Sprint 8 Pilot Expansion Hardware				
Entry Device Upgrades				
Entry Network Upgrades				
Exit Networks Upgrade				
Management Reserve				
Biometric Entry-Exit Enforcement				
Communications and Outreach O&S				
Sprint 8 Pilot Expansion Hardware O&S				
Cloud Services O&S				
Backend Matching Enterprise - Recurring				
Technology and Innovation				
Sea PC&I Risk				
Land PC&I Risk				
Land O&S Risk				

FOIA CBP 001150

(b) (7)(E)

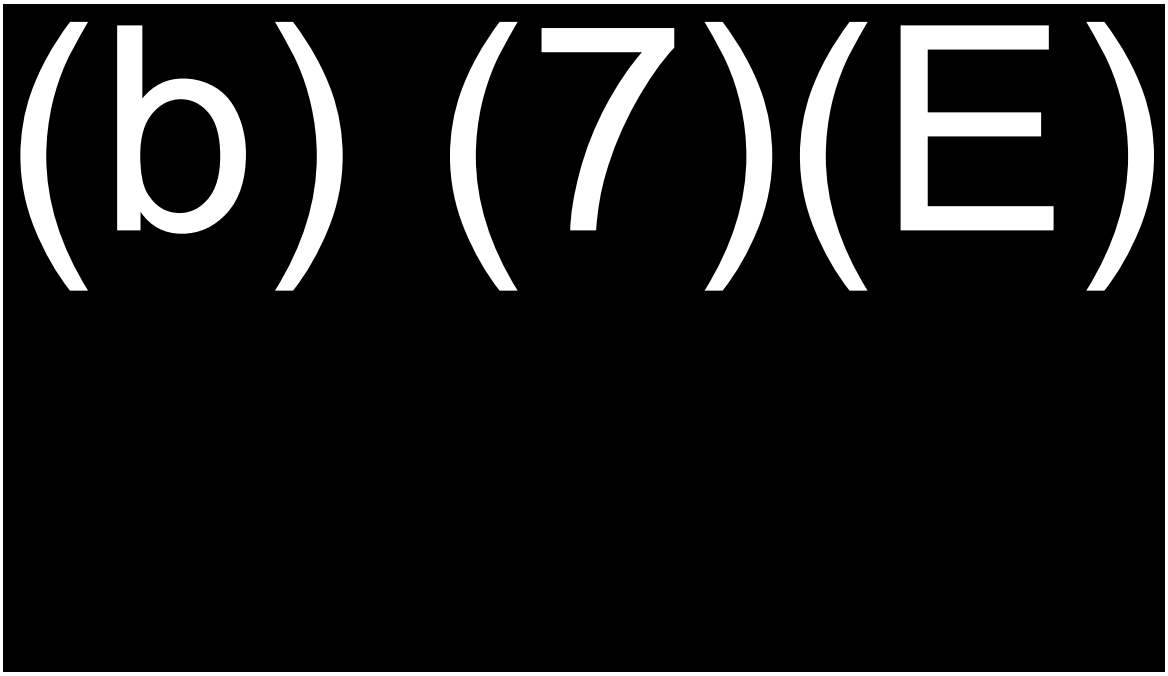

Figure 5: Top Ten Biometric Entry-Exit Program Cost Drivers (LCCE Total, TY $K)

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(b) (7)(E)

(b) (7)(E)

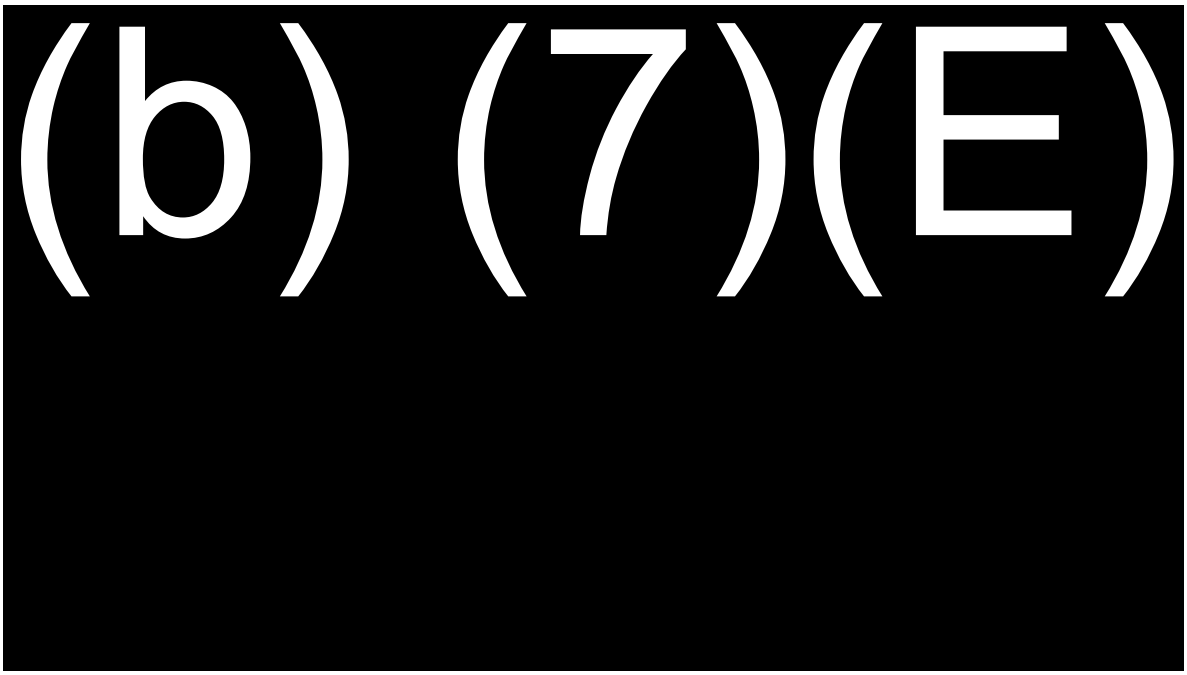

Figure 6: Top Ten Air PC&I Total Cost Drivers (TY $K)

FOIA CBP 001152

10.0 Risk and Uncertainty Analysis

(b) (7)(E)

(b) (7)(E)

(b) (7)(E)

(b) (7)(E)

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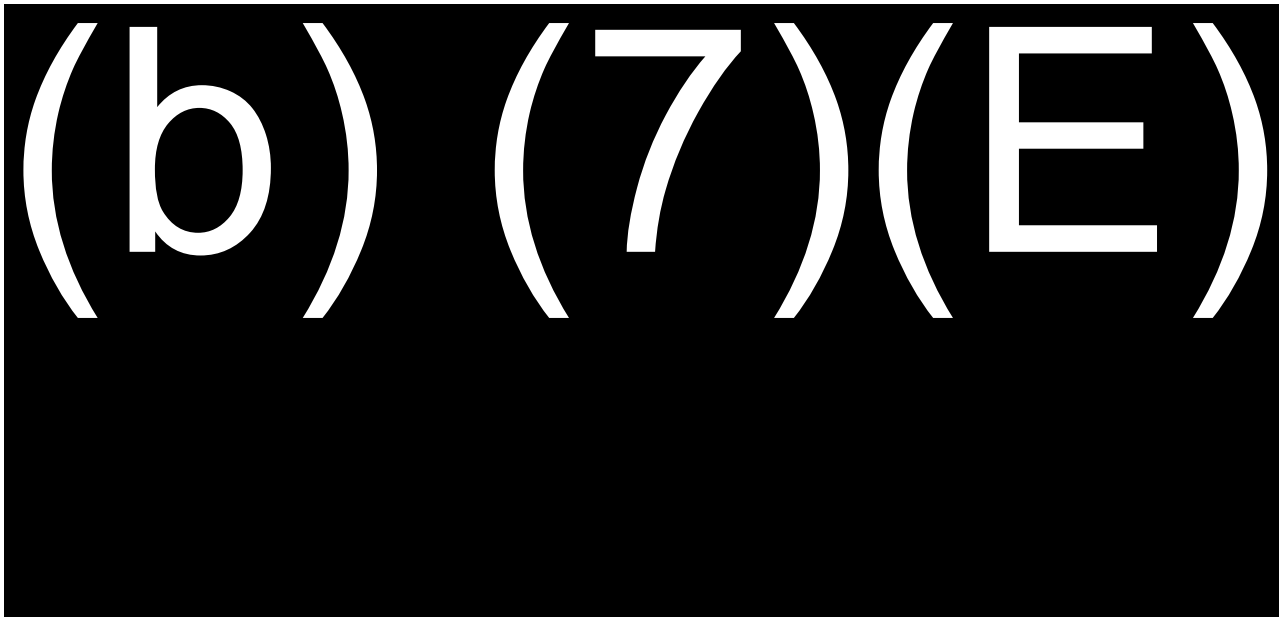

Figure 7: Total Biometric Entry-Exit Results of Monte Carlo Risk Simulation

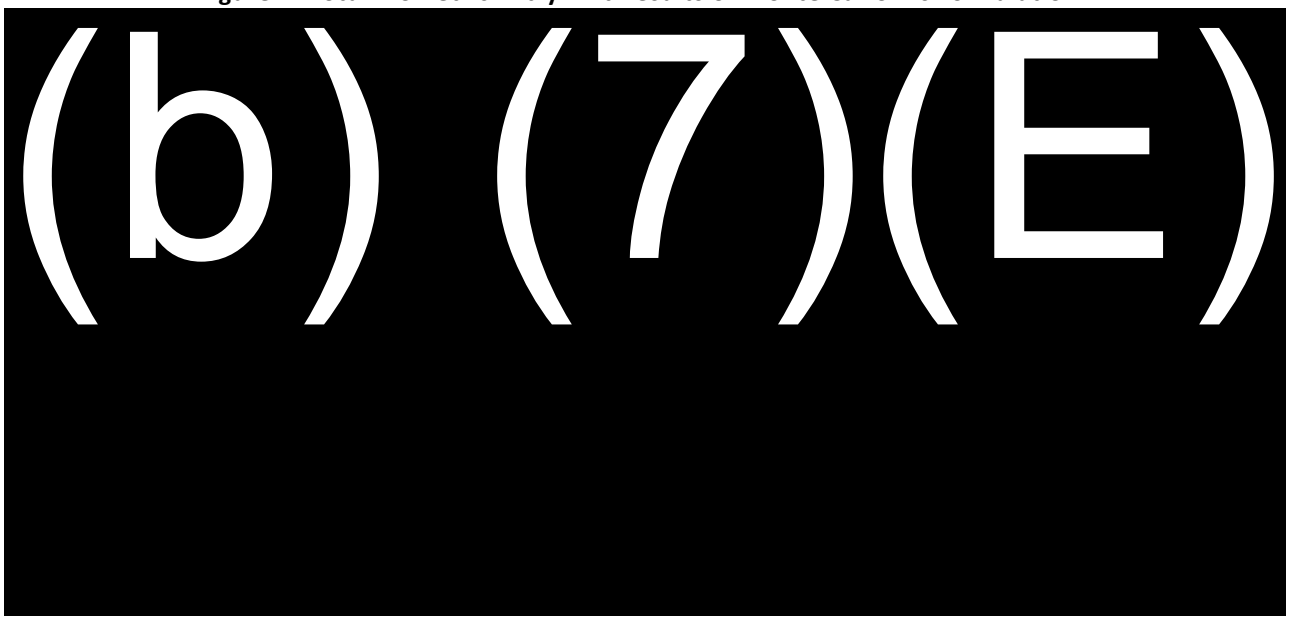

Figure 8: PC&I Biometric Entry-Exit Results of Monte Carlo Risk Simulation

FOIA CBP 001154

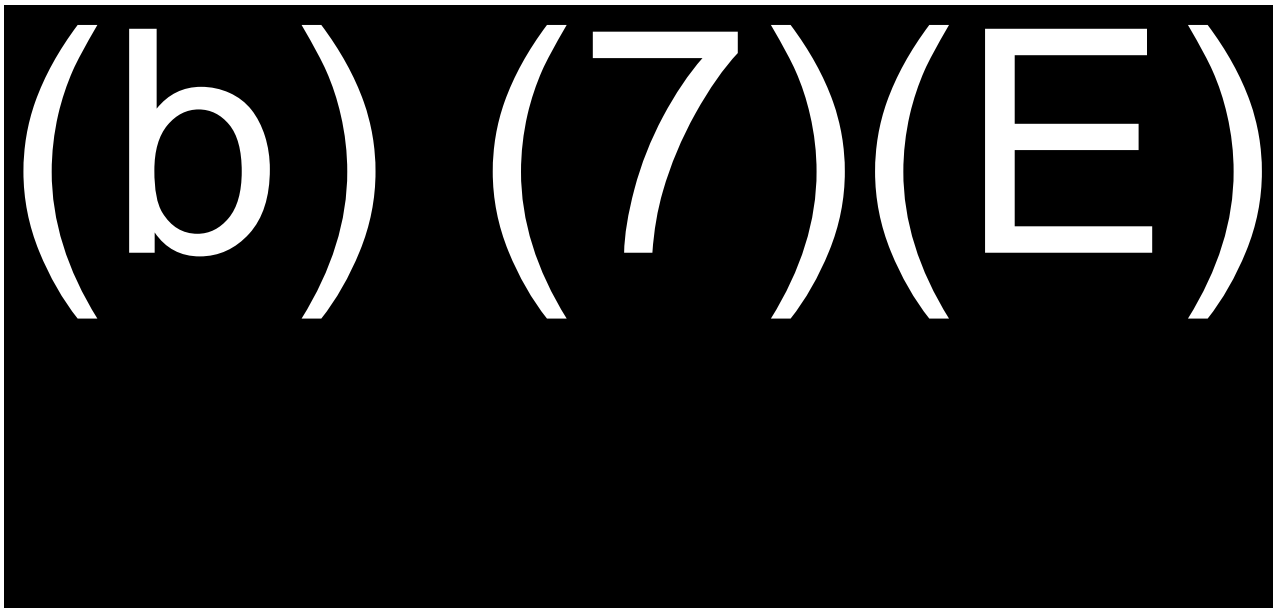

Figure 9: O&S Biometric Entry-Exit Results of Monte Carlo Risk Simulation

FOIA CBP 001155

The two tables below show the risk adjusted estimates through the end of the lifecycle at the 50% and 80% confidence level. The confidence level of these risk adjusted results is for the grand total level. The confidence level of the lower elements may be lower than the grand total in order to roll up to the target totals (50% and 80%) shown in Figure 7.

Table 29: Risk-Adjusted Estimate at 50% CL (TY $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
	Total LCCE	12,260	55,109	82,539	149,583	145,128	132,420	128,389	133,286	1,142,738	1,981,451
1.0	**PC&I**	(b) (7)(E)		(b)(5), (b)(7)(E)							
1.1	Biometric Entry Exit - Air										
1.1.1	Program/Project Management										
1.1.1.1	Acquisition and PM Support - Federal										
1.1.1.2	Acquisition and PM Support - Contractor										
1.1.1.3	Communications and Outreach										
1.1.2	Systems Engineering (or Systems Analysis)										
1.1.3	Business Process Re-engineering										
1.1.4	System Development										
1.1.4.1	TVS Development - Sprint 8 Pilot Expansion										
1.1.4.2	TVS Development - Scalable Infrastructure										
1.1.5	System Production										
1.1.6	COTS/GOTS/GFE Procurement										
1.1.6.1	Backend Matching Algorithm										
1.1.7	IT Hosting Investment										
1.1.7.1	Cloud Services Infrastructure & Hosting										
1.1.8	System Level Integration & Test										
1.1.9	System Deployment/Implementation										
1.1.9.1	Sprint 8 Pilot Expansion Hardware & Support										
1.1.9.2	Entry Device Upgrades										
1.1.9.3	Entry Network Upgrades										
1.1.9.4	Exit Network Upgrades										
1.1.10	System Documentation & Related Data										
1.1.11	Training										
1.1.12	Other PC&I										
1.2	Biometric Entry Exit - Sea										
1.3	Biometric Entry Exit - Land										
2.0	**O&S**										
2.1	Biometric Entry Exit - Air										
2.1.1	Program/Project Management										
2.1.1.1	Acquisition and PM Support - Federal										
2.1.1.2	Acquisition and PM Support - Contractor										
2.1.1.3	Communications and Outreach										
2.1.2	Systems Engineering (or Systems Analysis)										
2.1.3	Business Process Re-engineering										
2.1.4	Manpower										
2.1.4.1	Biometric Exit Enforcement										

FOIA CBP 001156

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.5	Operations	(b) (7)(E)		(b) (5), (b) (7)(E)							
2.1.6	Maintenance & Tech Refresh										
2.1.6.1	Sprint 8 Pilot Expansion Hardware O&S										
2.1.6.2	Entry Device O&S										
2.1.6.3	Entry Network O&S										
2.1.6.4	Exit Network O&S										
2.1.7	Sustaining Support										
2.1.7.1	TVS O&S										
2.1.7.2	Cloud Services Infrastructure & Hosting										
2.1.7.3	Backend Matching Enterprise - Recurring										
2.1.8	Continuing System Improvement										
2.1.8.1	Technology and Innovation										
2.1.9	Indirect Support										
2.1.10	System Documentation & Related Data										
2.1.11	Support Facilities Sustainment & Maintenance										
2.1.12	Other O&S										
2.2	Biometric Entry Exit - Sea										
2.3	Biometric Entry Exit - Land										

FOIA CBP 001157

Table 30: Risk-Adjusted Estimate at 80% CL (TY $K)

#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
	Total LCCE	12,260	62,914	95,196	173,677	167,109	151,110	146,497	152,061	1,303,606	2,264,429
1.0	**PC&I**	(b) (7)(E)		(b) (5), (b) (7)(E)							
1.1	Biometric Entry Exit - Air										
1.1.1	Program/Project Management										
1.1.1.1	Acquisition and PM Support - Federal										
1.1.1.2	Acquisition and PM Support - Contractor										
1.1.1.3	Communications and Outreach										
1.1.2	Systems Engineering (or Systems Analysis)										
1.1.3	Business Process Re-engineering										
1.1.4	System Development										
1.1.4.1	TVS Development - Sprint 8 Pilot Expansion										
1.1.4.2	TVS Development - Scalable Infrastructure										
1.1.5	System Production										
1.1.6	COTS/GOTS/GFE Procurement										
1.1.6.1	Backend Matching Algorithm										
1.1.7	IT Hosting Investment										
1.1.7.1	Cloud Services Infrastructure & Hosting										
1.1.8	System Level Integration & Test										
1.1.9	System Deployment/Implementation										
1.1.9.1	Sprint 8 Pilot Expansion Hardware & Support										
1.1.9.2	Entry Device Upgrades										
1.1.9.3	Entry Network Upgrades										
1.1.9.4	Exit Network Upgrades										
1.1.10	System Documentation & Related Data										
1.1.11	Training										
1.1.12	Other PC&I										
1.2	Biometric Entry Exit - Sea										
1.3	Biometric Entry Exit - Land										
2.0	**O&S**										
2.1	Biometric Entry Exit - Air										
2.1.1	Program/Project Management										
2.1.1.1	Acquisition and PM Support - Federal										
2.1.1.2	Acquisition and PM Support - Contractor										
2.1.1.3	Communications and Outreach										
2.1.2	Systems Engineering (or Systems Analysis)										
2.1.3	Business Process Re-engineering										
2.1.4	Manpower										
2.1.4.1	Biometric Exit Enforcement										
2.1.5	Operations										
2.1.6	Maintenance & Tech Refresh										
2.1.6.1	Sprint 8 Pilot Expansion Hardware O&S										
2.1.6.2	Entry Device O&S										
2.1.6.3	Entry Network O&S										

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#	Name	Prior (2014 - 2016)	2017	2018	2019	2020	2021	2022	2023	Future (2024 - 2031)	Total
2.1.6.4	Exit Network O&S	(b) (7)(E)		(b) (5), (b) (7)(E)							
2.1.7	Sustaining Support										
2.1.7.1	TVS O&S										
2.1.7.2	Cloud Services Infrastructure & Hosting										
2.1.7.3	Backend Matching Enterprise - Recurring										
2.1.8	Continuing System Improvement										
2.1.8.1	Technology and Innovation										
2.1.9	Indirect Support										
2.1.10	System Documentation & Related Data										
2.1.11	Support Facilities Sustainment & Maintenance										
2.1.12	Other O&S										
2.2	Biometric Entry Exit - Sea										
2.3	Biometric Entry Exit - Land										

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11.0 Track to Prior LCCE

This is the initial LCCE for the Biometric Entry-Exit Program. [redacted]

FOIA CBP 001160

12.0 APPENDICES

12.1 Inflation Indices

Table 31: Non-Pay Inflation Index, published by CAD for DHS

Non-Pay (GDP Deflator)			
Year	Rate %	Raw	Compound Index
2002	1.53%	1.0153	0.7482
2003	1.99%	1.0356	0.7631
2004	2.75%	1.0641	0.7841
2005	3.22%	1.0983	0.8093
2006	3.07%	1.1321	0.8342
2007	2.66%	1.1622	0.8564
2008	1.96%	1.1850	0.8732
2009	0.76%	1.1940	0.8798
2010	1.22%	1.2086	0.8906
2011	2.06%	1.2335	0.9090
2012	1.84%	1.2562	0.9257
2013	1.61%	1.2765	0.9407
2014	1.79%	1.2994	0.9575
2015	1.08%	1.3134	0.9678
2016	1.40%	1.3317	0.9814
2017	1.90%	1.3570	1.0000
2018	1.80%	1.3815	1.0180
2019	2.00%	1.4091	1.0384
2020	2.00%	1.4373	1.0591
2021	2.00%	1.4660	1.0803
2022	2.00%	1.4953	1.1019
2023	2.00%	1.5253	1.1240
2024	2.00%	1.5558	1.1464
2025	2.00%	1.5869	1.1694
2026	2.00%	1.6186	1.1927
2027	2.00%	1.6510	1.2166
2028	2.00%	1.6840	1.2409
2029	2.00%	1.7177	1.2658
2030	2.00%	1.7520	1.2911
2031	2.00%	1.7871	1.3169
2032	2.00%	1.8228	1.3432

FOIA CBP 001161

Table 32: Federal Pay Inflation, published by CAD for DHS

Federal Pay (GS-Schedule)			
Year	Rate %	Raw	Compound Index
2002	4.77%	1.0477	0.7116
2003	4.27%	1.0924	0.7420
2004	4.42%	1.1407	0.7748
2005	3.71%	1.1830	0.8035
2006	3.44%	1.2236	0.8311
2007	2.65%	1.2560	0.8531
2008	4.49%	1.3124	0.8914
2009	4.78%	1.3751	0.9340
2010	2.42%	1.4084	0.9566
2011	0.00%	1.4084	0.9566
2012	0.00%	1.4084	0.9566
2013	0.00%	1.4084	0.9566
2014	1.00%	1.4225	0.9662
2015	1.00%	1.4368	0.9759
2016	1.46%	1.4577	0.9901
2017	1.00%	1.4723	1.0000
2018	1.00%	1.4870	1.0100
2019	1.00%	1.5019	1.0201
2020	1.00%	1.5169	1.0303
2021	1.00%	1.5321	1.0406
2022	2.00%	1.5627	1.0614
2023	2.00%	1.5940	1.0826
2024	2.00%	1.6258	1.1043
2025	2.00%	1.6584	1.1264
2026	2.00%	1.6915	1.1489
2027	2.00%	1.7254	1.1719
2028	2.00%	1.7599	1.1953
2029	2.00%	1.7951	1.2192
2030	2.00%	1.8310	1.2436
2031	2.00%	1.8676	1.2685
2032	2.00%	1.9049	1.2939

FOIA CBP 001162

12.2 Labor Rates

Table 33: Contractor Labor Rates – GSA Contract Awarded Labor Category (https://calc.gsa.gov/)

Labor Category	Contractor Labor Rate (FY17$/hr)
Application SME	181.00
Biometrics SME	156.00
Contracting Specialist	90.00
Data SME	184.00
Deployment	86.00
Deployment and Training Logistics	86.00
Financial Analyst	106.00
Management Program Analyst	115.00
Privacy SME	184.00
Program Manager	155.00
Program Support	82.00
Project Manager	131.00
Project Scheduler	109.00
Risk Manager	186.00
Support Analyst	78.00
Technical Writer	78.00

Table 34: General Schedule Salary Table 2017-DCB (2017$K) (https://www.opm.gov/)

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
1	23.55	24.34	25.12	25.90	26.68	27.14	27.91	28.69	28.72	29.45
2	26.47	27.10	27.98	28.72	29.05	29.90	30.75	31.61	32.46	33.32
3	28.89	29.85	30.81	31.78	32.74	33.70	34.67	35.63	36.59	37.56
4	32.43	33.51	34.59	35.67	36.75	37.83	38.91	39.99	41.07	42.15
5	36.28	37.49	38.70	39.91	41.12	42.33	43.54	44.75	45.96	47.17
6	40.44	41.79	43.14	44.49	45.84	47.19	48.53	49.88	51.23	52.58
7	44.94	46.44	47.94	49.44	50.94	52.43	53.93	55.43	56.93	58.43
8	49.77	51.43	53.09	54.75	56.41	58.06	59.72	61.38	63.04	64.70
9	54.97	56.81	58.64	60.47	62.30	64.14	65.97	67.80	69.63	71.47
10	60.54	62.56	64.57	66.59	68.61	70.63	72.65	74.67	76.69	78.70
11	66.51	68.73	70.94	73.16	75.38	77.59	79.81	82.03	84.24	86.46
12	79.72	82.38	85.04	87.69	90.35	93.01	95.67	98.32	100.98	103.64

FOIA CBP 001163

Grade	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
13	94.80	97.96	101.12	104.28	107.44	110.60	113.76	116.91	120.07	123.23
14	112.02	115.76	119.49	123.22	126.96	130.69	134.43	138.16	141.89	145.63
15	131.77	136.16	140.55	144.95	149.34	153.73	158.12	161.90	161.90	161.90

12.3 Unit Costs

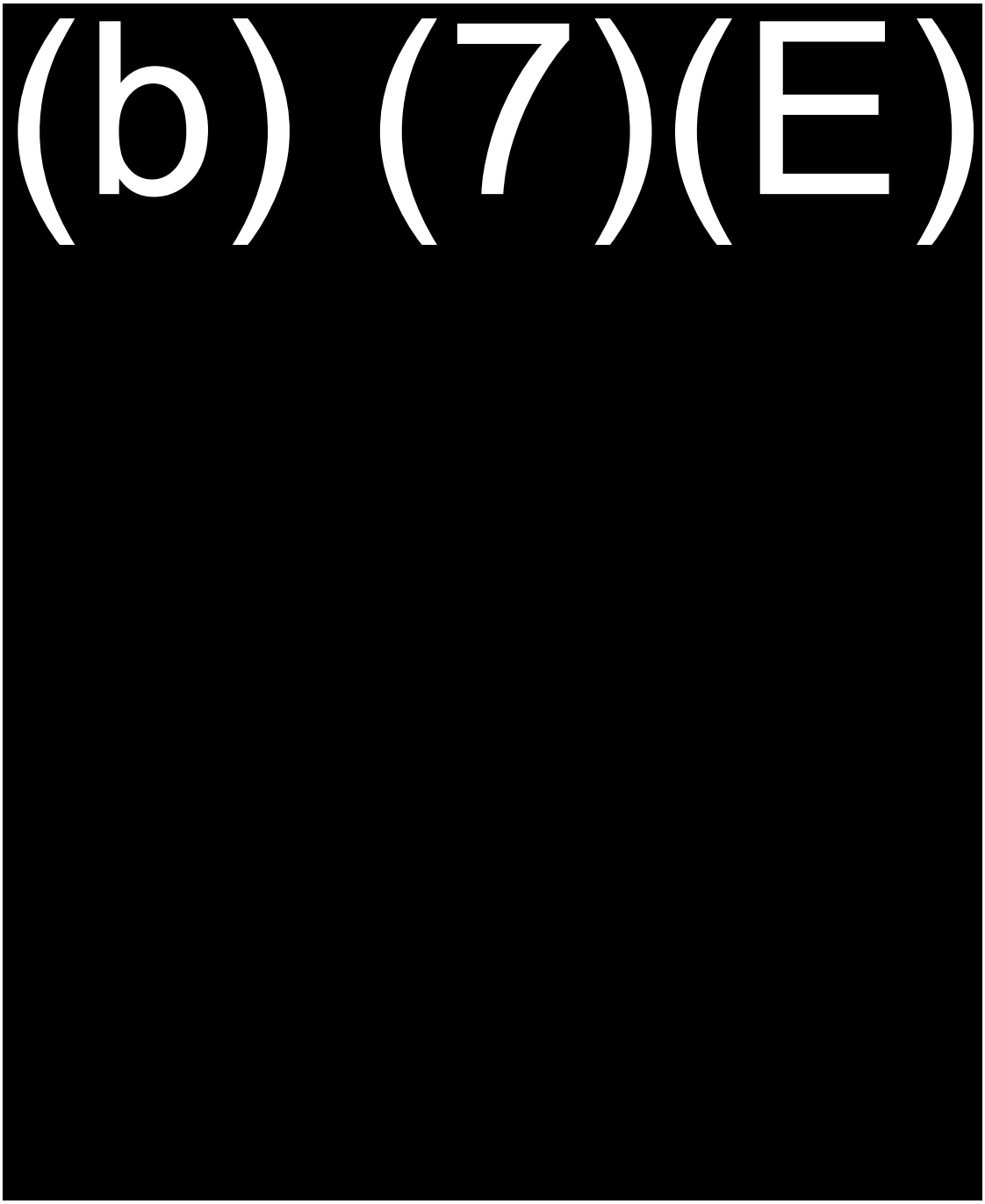
Table 35: Sample of Representative Cost for Entry Devices

Category	Vendor	Description	Unit Price (FY17$)	Price Source
Fingerprint Scanner	(b) (7)(E)			
Facial Camera				
Document Reader				

FOIA CBP 001164

(b) (7)(E)

(b) (7)(E)



(b) (7)(E)

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

SEP 20 2017

MEMORANDUM FOR: Mark Borkowski
Component Acquisition Executive
U.S. Customs and Border Protection

FROM: (b) (6), (b) (7)(C)
Acting Chief Financial Officer

SUBJECT: CBP Biometric Entry-Exit Program Life Cycle Cost Estimate

In accordance with my duties and responsibilities, I approve the U.S. Customs and Border Protection (CBP) Biometric Entry-Exit Program Life Cycle Cost Estimate (LCCE) dated July 19, 2017.

The Department of Homeland Security (DHS) Cost Analysis Division (CAD) reviewed the CBP Biometric Entry-Exit Program LCCE dated July 19, 2017. The CAD review and assessment was conducted in accordance with the DHS LCCE scoring criteria derived from the Government Accountability Office Cost Estimating and Assessment Guide. CAD's cumulative rating for the CBP Biometric Entry-Exit Program LCCE is Green, meaning that the individual LCCE characteristics and criteria either met or substantially met the requirements of a reliable, accurate, credible, and well-documented estimate.

The CBP Biometric Entry-Exit Program LCCE, as pictured in Attachment 1, totals $1,981K Then Year (TY) at the 50% Confidence Level. (b) (5)
(b) (5)
(b) (5)

I request the CBP Biometric Entry-Exit Program Office update the Program LCCE on an annual basis.

Should you have any questions, please contact (b)(6), CAD, at (b)(6)
(b)(6)

cc:
Mark Borkowski, Component Acquisition Executive
Colleen Manaher, Program Manager
(b)(6), Executive Director, Office of Program Accountability and Risk Management
(b)(6) Director, OCFO Program Analysis & Evaluation
(b)(6) Director, OCFO CAD
PARMCASR@hq.dhs.gov

Attachments:

1. CBP Biometric Entry-Exit Program Risk Adjusted LCCE results for LCCE, dated July 19, 2017
2. CBP Biometric Entry-Exit Affordability, memo signed on August 4, 2017
3. CAD CBP Biometric Entry-Exit Program LCCE Scorecard, dated August 24, 2017

Attachment #1. CBP Biometric Entry-Exit Program Risk Adjusted LCCE results for LCCE, dated July 19, 2017

Table 1 is sourced from the Biometric Entry-Exit LCCE dated July 19, 2017. Total LCCE ranges from FY14-FY31.

Table 1: Biometric Entry-Exit LCCE

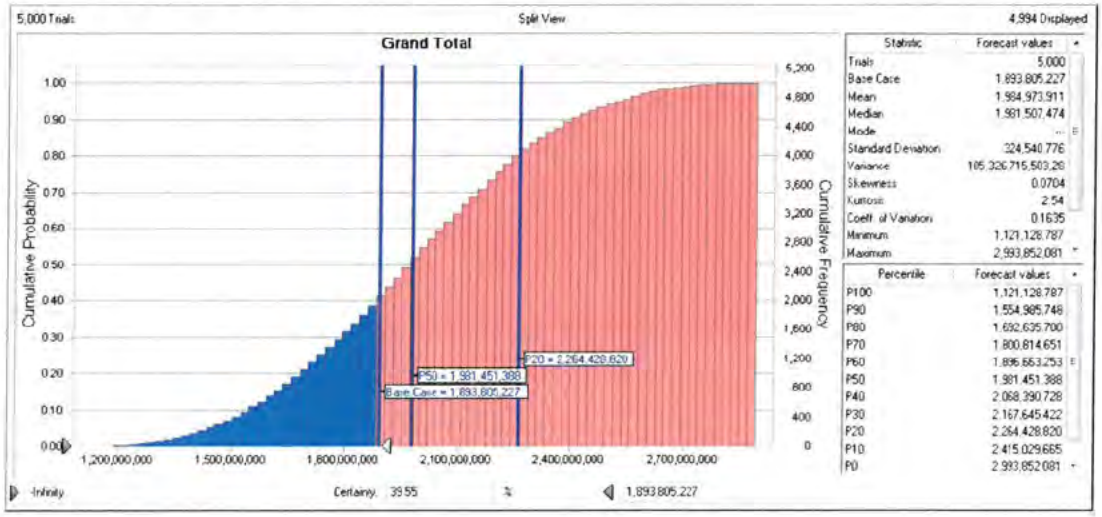
Biometric Entry-Exit LCCE		
Total Requirements	BY2017$M	TY$M
Point Estimate	$1,673	$1,893
50% Confidence Level	$1,751	$1,981
80% Confidence Level	$2,001	$2,264

BY2017$M 50% CL			
	PC&I	O&S	Total
Air	$186	$1,362	$1,548
Sea	$25	$46	$71
Land	$33	$99	$133
Total	$244	$1,506	$1,751

Figure 1 displays the Biometric Entry-Exit LCCE cumulative density function (CDF) "S-curve" in TY$ values for all Biometric Entry-Exit requirements. The program's risk adjusted estimate at the 50% confidence level is higher than the Point Estimate (at the 39.6% confidence level). The Coefficient of Variation (CV) of 16% indicates that there is a medium dispersion of possible cost outcomes across the estimate. (b) (5)

(b) (5)

Figure 1: Biometric Entry-Exit S-Curve



Attachment #2. CBP Biometric Entry-Exit Affordability, signed on August 4, 2017

Table 3 is a comparison of the Biometric Entry-Exit Fee funding with the 50% Confidence Level (TY$K) as shown in Certification of Funds signed on August 4, 2017.

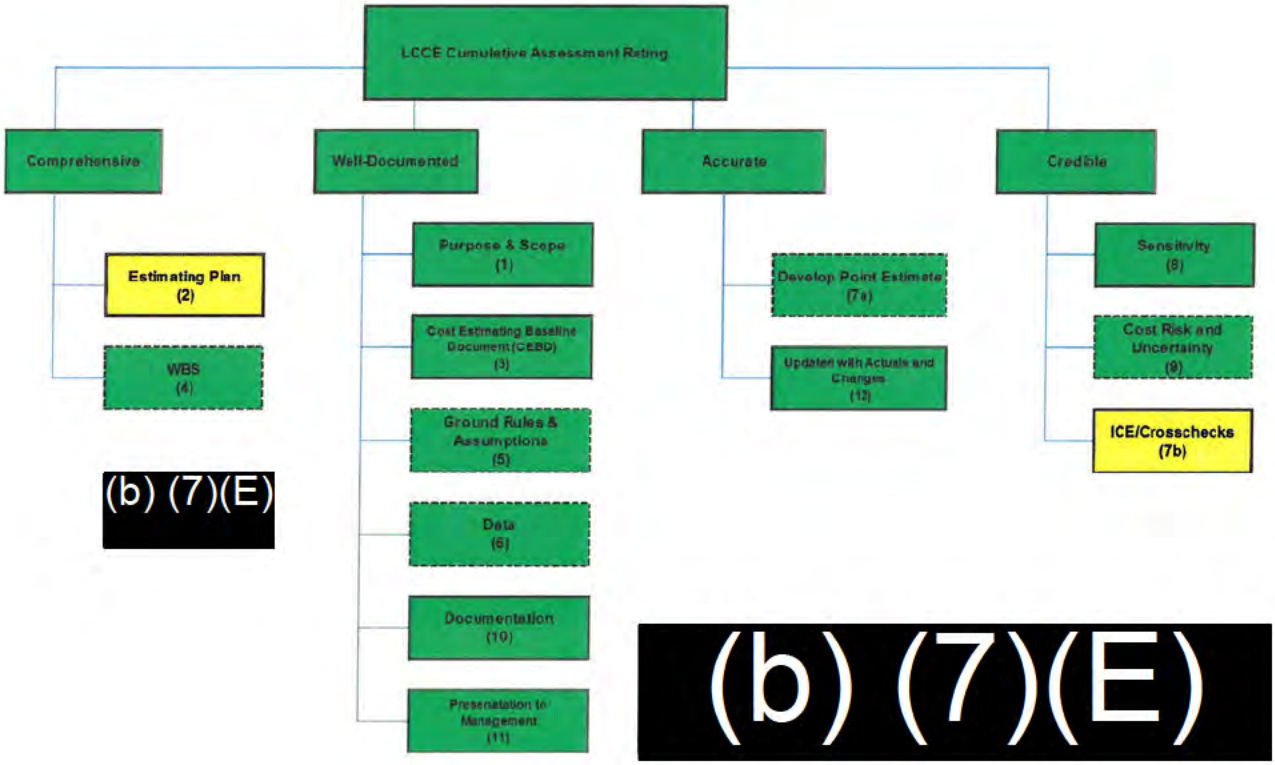
Table 3. Affordability

Biometric Entry/Exit Budget, Cost and Programming Status ($ in thousands)	
	(b) (7)(E) (b) (5), (b) (7)(E)
Total Budget Authority	
FYHSP	
Fee Funding	
Obligated	
Unobligated Balance (Total Budget Authority - Obligated)	
Life Cycle Cost Estimate, TY$ @ 50% C.L. [Biometric Entry-Exit LCCE, 19 July 2017]	
**Excluded Cost Elements	
1.1.1.1 Acquisition and PM Support - Federal	
2.1.1.1 Acquisition and PM Support - Federal	
2.1.8.1 Technology and Innovation - Sunk	
Adjusted LCCE	
$ Surplus/Shortfall (Budget Authority - Adjusted LCCE)	
% Surplus/Shortfall to Budget Authority	
$ Total Surplus/Shortfall	

Attachment #3. CAD CBP Biometric Entry-Exit Program LCCE Scorecard, dated August 24, 2017

CBP Biometric Entry-Exit Program

Prepared by: (b) (6), (b) (7)(C)
Assessment Date: 8-24-2017



CFO CAD LIFE CYCLE COST ESTIMATE SCORECARD - SUB-CRITERIA

Program/Project	CBP Biometric Entry-Exit Program
Date	8/24/2017
Prepared By	(b) (6), (b) (7)(C)

LCCE Documentation File:	(b) (7)(E)
LCCE Cost Model File:	
CBBD File:	

Section 1
Summary of 12 GAO Cost Estimating Practices/Steps

Criterion (GAO Step)		Sub-Criterion Description	Practice Met?	Status	Justification
Purpose & Scope (1) **Are the cost estimate's purpose and scope defined and documented?**		(b) (5) (b) (7)(E)			
Characteristic:					
Well-Documented					
Estimating Plan (2) **Did the team develop a comprehensive plan?**					
Characteristic:					
Comprehensive					
Cost Estimating Baseline Document (3) **Were program characteristics described?**					
Characteristic:					
Well-Documented					
WBS (4) **Was the estimating structure determined?**					
Characteristic:					
Comprehensive					

Ground Rules & Assumptions (5) **Were ground rules and assumptions identified?**	
Characteristic:	
Well-Documented	
Data (6) **Were valid and useful historical data collected?**	
Characteristic:	
Well-Documented	
Point Estimate & ICE (7a, 7b) **Was the point estimate developed and compared to an independent cost estimate?**	
Characteristic:	
Accurate (a)	

Credible (b)	
Sensitivity (c) **Was a sensitivity analysis conducted?**	
Characteristic:	
Credible	

(b) (5) (b) (7)(E)

Risk and Uncertainty Analysis (9) **Was a risk and uncertainty analysis conducted?**	
Characteristic:	
Credible	
Documentation (10) **Was the estimate documented?**	
Characteristic:	
Well-Documented	
Presentation to Management (11) **Was the estimate presented to, and approved by management?**	
Characteristic:	
Well-Documented	
Updated with Actual and Changes (12) **Is the estimate updated to reflect actual costs and program changes?**	
Characteristic:	
Accurate	

Section 2:

Sub-Criterion Rating Rules:

Criterion Rating Rules:

(b) (5)

(b) (7)(E)

(b)(5), (b)(7)(E)

(b) (7)(E)

(b)(5), (b)(7)(E)

(b) (7)(E)

SDRD 8561

Office of Information and Technology

Service Delivery Requirement Document

Emerging Technologies Team Support – PARE 2.0

CBP Originating Office: Office of Field Operations

Originating Office Point of Contact (POC) (name): (b) (6), (b) (7)(C)

Originating Office POC phone number: (b) (6), (b) (7)(C)

Date of request: July 9, 2018

Detailed description of requirements:

Pre-Arrival Readiness Evaluation System (PARE) 2.0:

Original business need: PARE 2.0 is an automated traffic management system for commercial vehicles departing Canada, designed to optimize traffic flow for the Buffalo Peace Bridge, during a planned three-year bridge resurfacing project. This is a multi-energy portal includes the capability of comparing an x-ray of a containers contents against its original description and inventory. Three pilots have been deployed to date: Buffalo CBP Headquarters, Buffalo CBP Field Office, and the Canadian Peace Bridge Authority. PARE allows the Public Bridge Authority (PBA) to send license plate numbers and state information to the CBP Mobility CEE TRIP Application, enabling queries to the ACE SAP Truck Manifest System to determine if an Manifest has been filed and commercial fees have been paid.

Funding source

The Office of Field Operations agrees to provide the current year and recurring costs for current year and out year funding identified below for the requirements described above. (b) (5)

(b) (5)

Cost Element	FY2018	FY2019	FY2020	FY2021	FY2022
Emerging Tech Team	$1,105,218.24	(b) (5)			
CSD ISSO	$93,600.00				
CSD ISSE	$67,500.00				

Cloud Infrastructure	$19,671.40	(b) (5)
PSPD Integration		
CSD Software	$12,750.00	
TOTAL with 3% escalation	**$1,289,739.64**	

Detailed description of Government Position: (include number of FTE, grade, and description of work to be performed): Not applicable

Detailed description of new investment cost (for each FY as applicable):

Emerging Technology Team costs include costs for developer and for emerging technology team's portion of CBP cloud infrastructure (CACE).

Cost also includes the PARE 2.0 app portion for dedicated ISSO and ISSE support as well as cost for cyber related software and tools. ISSO and ISSE support will include coordination with other systems/program offices for system boundaries already documented in existing ATO's. Cost does not include efforts by ISSO/ISSE in existing applications.

Costs also include integration with PSPD applications. Cost for PSPD integration represents integrations with existing PSPD systems and interfaces (e.g. vehicle and person crossing, trusted traveler program, person/vehicle queries, writing of crossing records, and I-94); cost estimate does not include efforts to develop new systems and/or interfaces. Integration with PSPD may impact schedules for PSPD applications.

New investment: This SDR will support development on facial recognition capabilities to verify driver and passenger identity against an existing image sources.

Operations and Maintenance costs include troubleshooting and fixing software issues and defects, application monitoring, and design, test and deploy of updates to software only within applicant function. (b) (5)

(b) (5)

O&M is based on retention of half the new investment efforts from emerging technologies team (labor). PSPD integration costs are also represented as a portion of emerging technologies team labor to troubleshoot/update interfaces with PSPD systems.

Approved by Originating Office: Name (b) (6), (b) (7)(C) Date Aug 10 2018

Signature of approval from Originating Office: (b) (6), (b) (7)(C) Date 8/10/2018

Approved by Originating Office HQ Budget Officer: Name (b)(6) Date 8/10/18

Signature of approval from originating office HQ Budget Officer

Alignment to CBP Major/non-major investment (to be completed by funding offices budget officer:

To be used by OIT below the dotted line

(b) (5)

(b) (5)

(b) (6), (b) (7)(C)

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U.S. Department of Homeland Security
U.S. Customs and Border Protection
U.S. Transportation Security Administration

Transportation Security Administration Pilot with TVS Phase II
Concept of Operations
May 31, 2018
Version 1.2

Approval: (b)(6);(b)(7)(C) 6/8/18
Date

Director
Biometric Exit Strategic Transformation
Planning, Program Analysis, and Evaluation
Office of Field Operations
U.S. Customs and Border Protection

Approval: (b)(6);(b)(7)(C) 6/11/18
Date

Matthew Graviss
Biometrics Lead
Office of Requirements and Capabilities Analysis
Transportation Security Administration

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1.0 Background

In 2013, Congress transferred the biometric exit mission from the Department of Homeland Security (DHS) to the U.S. Customs and Border Protection (CBP). Working in partnership with the air travel industry, CBP is leading the transformation of air travel using biometrics as the key to enhancing security and improving the entire traveler experience from curb to gate. The use of facial recognition technology as the biometric exit mechanism presents an opportunity for CBP and the Transportation Security Administration (TSA) to collaborate and work together to streamline and strengthen passenger screening operations.

TSA's Office of Requirements and Capabilities Analysis (ORCA) and CBP's Office of Field Operations (OFO) is coordinating a facial recognition Proof of Concept pilot using CBP's Traveler Verification Service (TVS) at the TSA checkpoint. The TVS is a cloud-based facial biometric matching service that uses existing traveler data provided by airlines via the Advance Passenger Information System (APIS) to create temporary photo galleries for passengers on all departing and arriving U.S. flights. There will be three phases of the pilot:

- Phase I: Data collection in order to determine the feasibility of using biometric facial recognition technology for identity verification at the TSA checkpoint.
- Phase II: Incorporate "no match" adjudication by CBP Officers (CBPOs) assigned to a TSA checkpoint and the use of CBP's match response to eliminate the document check by TSA.
- (b)(5) [redacted]

The collaborative efforts between CBP and TSA support the ultimate goal of traveler facilitation with enhanced security. Biometric identity verification, (b)(5) [redacted], has the potential to reduce the necessary number of TDCs and allows TSA to reallocate those resources to screening and behavior analysis.

2.0 Phase I

On October 11, 2017, CBP and TSA implemented a pilot in Terminal 7 at John F. Kennedy International Airport to evaluate the use of facial recognition at the TSA checkpoint for identity verification. The pilot lasted for 30 days, through November 10, 2017. The first phase of the pilot focused on data collection to determine the feasibility of capturing photos at the TSA checkpoint to biometrically identify travelers on international flights. During Phase I, the TSA TDC captured photos of in-scope travelers. The TSA document check procedures did not change. The TDC continued to check boarding passes and identity documents. If a traveler did not match a photo in the CBP-created photo gallery, no action was taken in real-time. There was no risk introduced because manual identity verification still occurred. CBP analyzed and evaluated photo capture, matching rate results, and "no matches" after the encounter.

Throughput the pilot, CBP processed 4,000 travelers identified as in-scope for biometric collection. In-scope travelers are comprised of international travelers falling within an age range of 14 to 79. The Technical Match Rate (TMR) for Phase I of the pilot was (b)(7)(E) [redacted] at the

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threshold CBP utilizes for biometric exit at departure gates. The image below depicts the passenger process for Phase I of the CBP/TSA pilot.

Figure 1. Phase I Pilot Process Overview

3.0 Phase II

Phase II provides an avenue for further collaboration between TSA and CBP to enhance security. Continuing the TSA/CBP partnership on biometric identity verification, CBP and TSA will deploy Phase II of the pilot at the Tom Bradley International Terminal at Los Angeles International Airport. The purpose of Phase II will be to collect additional data on the feasibility of biometric facial recognition technology for identity verification, as well as test the scalability of the technology by deploying it to a larger checkpoint. Phase II of the pilot introduces a CBPO response to adjudicate no matches, examining the impact of exception processing for travelers at the TSA checkpoint that do not match a photo in the gallery. Additionally, Phase II will eliminate the need for the TDC to perform a document check on all in-scope travelers who are a match to a photo in the gallery, potentially leading to efficiencies at the TDC checkpoint. CBP and TSA will have a jointly-approved Standard Operating Procedure (SOP) document that will detail passenger processing at the TDC. Phase II is currently planned to launch in August 2018 and will run initially for a period of 30 days. Additionally, Phase II processing will occur at four TDC podiums, which will operate Monday through Friday from 6:30 a.m. to 10:30 a.m. hours. The potential to expand the number of TDC podiums, the hours of operation, and the pilot's overall length will be reviewed by CBP and TSA based upon the initial operational results.

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3.1 TSA Procedures

During Phase II operations, the TDC will begin the process by examining the travelers' boarding pass to determine eligibility for the pilot. For all travelers whose flights depart to domestic destinations, the TDC process will not change; processing will occur in accordance with current TSA SOPs. Travelers whose flights depart to foreign destinations will be directed to the camera to have their photo captured. The TDC will scan a CBP provided Quick Response code on the camera to initiate the photo capture process. After the camera has captured the photo, the matching response, limited biographic information (b)(7)(E), and the captured photo will appear on a (b)(7)(E) provided to the TDC (see the below image for a representation of the TDC (b)(7)(E)). Based upon the response sent to the (b)(7)(E) the TDC will take the following actions:

- If the image is a match, the TDC will confirm that the biographic data returned by CBP matches the biographic data on the boarding pass. If the data matches, the TDC will scan the boarding pass to determine the (b)(7)(E) and the traveler will proceed to the appropriate screening lane.
- If the image is a match but the biographic data from CBP does not match the boarding pass, the TDC will process the traveler per TSA SOPs and the traveler will proceed to the appropriate screening lane.
- If the image is not a match, the TDC will process the traveler per TSA SOPs and refer the traveler to the CBP officer for adjudication.

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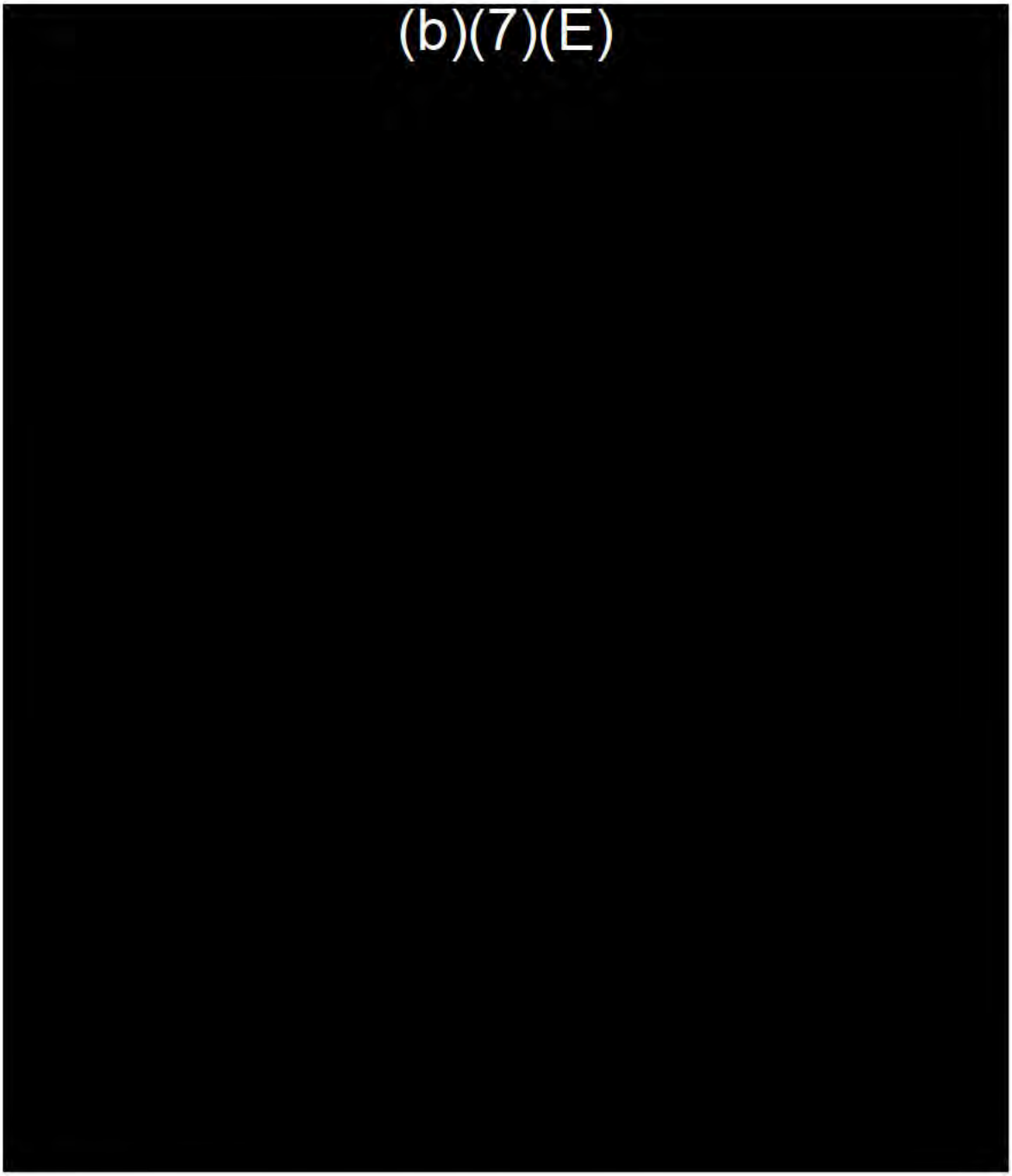

3.2 CBP Operations

During Phase II, CBPOs assigned to the TSA checkpoint will adjudicate TSA referrals originating from the TVS process. CBPOs will be equipped with Biometric Exit Mobile Application (BEMA) devices. All TVS no matches will be referred to BEMA for processing. The CBPO will request travel documents from the traveler and examine the documents to verify authenticity and determine identity and citizenship. For non-U.S. citizens, CBP will access the referral in BEMA. CBPOs will determine the appropriate Course of Action as outlined in this

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document for biometric capture or exemption.

3.2.1 U.S. Citizens

For the purpose of this pilot, U.S. citizens will have their photo captured for identity verification at the TDC. If a U.S. citizen does not match a photo in the TVS gallery and is referred to CBP for exception processing, the CBPO will:

- Request the travel document.
- Conduct a manual examination of the document to determine authenticity.
- Establish U.S. citizenship and verify identity.
- If satisfied the traveler is a U.S. citizen, allow the traveler to proceed to the appropriate screening lane.
- If at any time, the CBPO determines that the subject is an imposter, the passport was obtained through fraud, or there is any other reason that may require adverse or law enforcement action, the CBPO will follow current SOPs.

U.S. citizens may choose to opt out of the photo capture process. When this occurs, the TDC should process the traveler per TSA SOPs and refer the traveler to the CBPO for adjudication.

3.2.2 Lawful Permanent Residents (LPR), Non-immigrants, Refugees, Asylees, Parolees

If an LPR or other alien does not match a photo in the TVS gallery and is referred to CBP for exception processing, the CBPO will:

- Request the travel document, to include passport if applicable. In the case of LPRs, enroll the biographic data from the resident card.
- Verify validity and authenticity of the documents.
- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)

3.2.3 Diplomats, Canadians, and Visa Exempt Countries

For the purpose of this pilot, diplomats, Canadian citizens (traveling as non-immigrants), and visa exempt countries will provide photos for identity verification at the TDC, but are exempt from the collection of additional biometrics or biographic data. If the alien does not match a photo in the TVS gallery and is referred to CBP for exception processing, the CBPO will:

- Request the travel document.
- Conduct a manual examination of the document to determine authenticity.
- Establish citizenship and identity verification.
- If satisfied that the traveler is in lawful status, allow to proceed to the appropriate screening lane or gate depending on CBP's location at the checkpoint.
- (b)(7)(E)

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(b)(7)(E)

3.2.4 Entry Without Inspection

(b)(7)(E)

3.3 Staffing Considerations

TSA is responsible for staffing related to normal TSA operations and the TDC staff, which includes TVS camera operations. CBP is responsible for staffing CBPOs during Phase II operations. CBP is also responsible for providing staffing for escorts, arrests, or other law enforcement responses.

3.4 Required Equipment

CBP will provide (b)(7)(E) cameras and signage at the TSA checkpoint. CBP Headquarters will provide BEMA or other mobile devices to the CBPO assigned to checkpoint operations. TSA will provide mobile devices to the TDCs at the TSA checkpoint.

4.0 Phase III and Future Pilots

Phase III timelines and procedures (b)(5)

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Traveler Verification Service

(Cloud-Based Matching)

Technical Reference Guide – Identify API for Air Exit

U.S. Customs and Border Protection

April 2019

Version 1.2

FOIA CBP 001185

Change Control Log

Revised By	Revised Version Number	Date	Description of Revisions
CBP OIT	V1.0	09/19/2018	Initial Document
CBP OIT	V1.1	01/23/2019	IATA char update
CBP OIT	V1.2	04/03/2019	1. Revised Photo specifications (Section 5) 2. Revised Identify Request and Response element tables (Section 4.1.1 & 4.1.2) 3. Updated Identify API request to include Request Header

FOIA CBP 001186

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FOIA CBP 001187

1. Introduction

1.1 Background

The U.S. Customs and Border Protection (CBP) is transforming the way it identifies and verifies travelers by shifting the key to unlocking the passenger profile from biographic to biometric identifiers. The CBP Office of Field Operations (OFO) has developed a comprehensive strategy to implement a Biometric Entry-Exit solution for travelers departing by air, land, and sea as well as to provide enhancements for existing biometric entry capabilities. This strategy addresses the operational requirements aligned with the needed capabilities to enhance CBP's ability to execute its border security mission:

- **Verify Traveler Identity**: The ability to capture, review, analyze, search, and match travelers' biometric information with Government biometric and biographic records when entering and exiting the U.S. for the purposes of verifying identity
- **Create and Manage Biometric Records**: The ability to record, store, and disseminate biometric information and metadata collected from non-U.S. Citizen Travelers entering and exiting the U.S.
- **Generate Metrics and Reports**: The ability to measure and report the effectiveness of the biometric entry-exit system

In 2016, CBP Office of Information and Technology (OIT) concluded the initial phases of a set facial recognition feasibility studies. Facial recognition was chosen as the primary biometric verification tool based upon operational viability, the availability of existing traveler photos, and successful feasibility studies utilizing facial recognition. The Traveler Verification Service (TVS) is the next transitional step towards deployment of reliable and repeatable biometric verification capabilities in the Air Exit/Entry, Sea Exit/Entry, and Land environments.

1.2 Overview and Purpose

CBP provides a TVS Web Service for external stakeholders to use for submission of traveler photos through an internet facing Application Program Interface (API) Gateway: Biometric Gateway API. The Biometric Gateway API provides a set of services to allow authenticated users the ability to perform biometric verification operations with CBP. There are two primary services involved: Authentication and Identify. The purpose of this document is to provide the interface specifications for the Authentication API between TVS and external stakeholders for various modalities within the CBP external environment. This document will be used in conjunction with the Technical Reference Guide for the Identify API, provided separately. CBP OIT will work closely with each stakeholder in developing, testing, and implementing the software.

1.3 Scope

The scope of this document covers the Identify API for Air Exit within the CBP external environment. The Air Exit environment covers biometric verification of traveler identities for any foreign international outbound flight leaving the US. For other modalities please see the specific TVS Technical Reference Guide.

2. Project Planning

All projects start with initiating an engagement and committing to implementing a biometric verification process. Generally, each project takes the following steps from initiation to implementation.

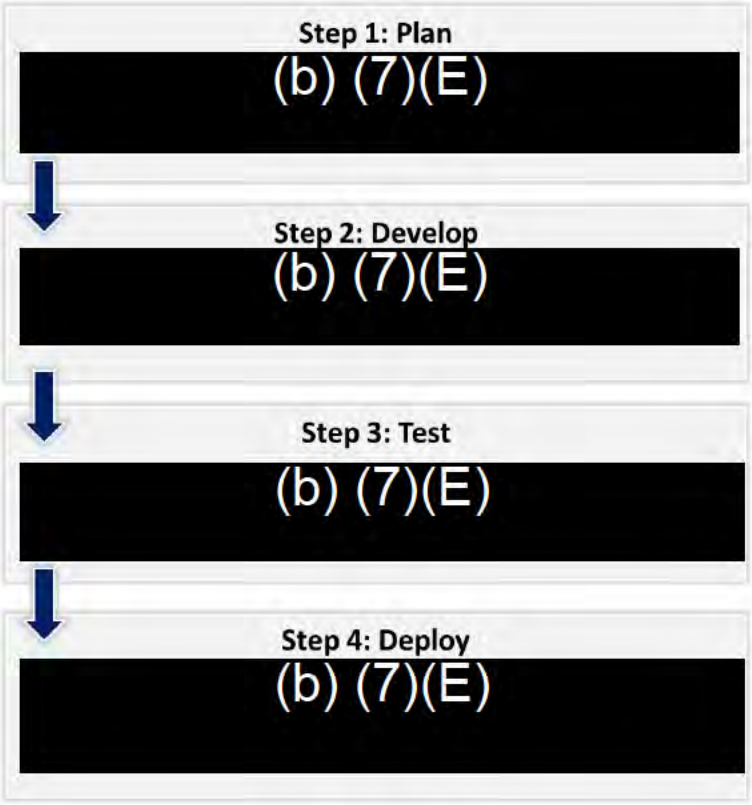

Figure 1: TVS Project Plan

2.1 Step 1: Plan

Like all projects, the objective of the planning step is to take the necessary steps to initiate engagement with CBP and lay out a way forward. Identify the points of contact (POCs) and establish engagement. CBP and stakeholders will collaboratively define, document, and reach a consensus on the project requirements, scope, and modalities. These technical reference documents then serve as the blueprints for development activities. A vital output from the planning step is a schedule that includes dates for development, testing, deployment, and launch.

2.2 Step 2: Develop

TVS comprises web services and a gateway to submit photos through an internet API. In the Development Step, (b) (7)(E)

FOIA CBP 001189

2.3 Step 3: Test

Upon completion of development activities, (b) (7)(E) . The intent of this testing is to use the safe test environment to simulate operations, identify, and resolve any issues. (b) (7)(E) (b) (7)(E)

2.4 Step 4: Deploy

Upon successful completion of the Test Step, the solution is ready for deployment. (b) (7)(E) (b) (7)(E)

3. Internet Connectivity

3.1 Networking

(b) (7)(E) (b) (7)(E)

3.1.1 (b) (7)(E)

3.1.2 (b) (7)(E)

3.2 (b) (7)(E)

(b) (7)(E)

3.2.1 (b) (7)(E)

3.3 (b) (7)(E)

(b) (7)(E) .

FOIA CBP 001190

(b) (7)(E)

4. Identify Service for Air Exit

(b) (7)(E)

(b) (7)(E)

4.1 Identify API

(b) (7)(E)

(b) (7)(E)

4.1.1 Identify Request Message Elements

(b) (7)(E)

(b) (7)(E)

4.1.2 Identify Response Message Elements

(b) (7)(E)

(b) (7)(E)

4.2 Identify Service Errors

(b) (7)(E)

(b) (7)(E)

5. Photo Specifications

(b) (7)(E)

A facial recognition quality photo shall have reasonable compliance with the ANSI/NIST ITL 1-2011 Type 10 standards and subject acquisition profile levels 10-20 for frontal images. The only allowable departure from the standard's requirements is the presence of mild pose variations around frontal.

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6. TVS Environments

6.1 TVS in a Box

(b) (7)(E)

6.2 SAT Environment

(b) (7)(E)

6.3 Production Environment

(b) (7)(E)

7. Contact Information

Send questions and comments related to this reference guide to (b) (7)(E)

Include in the email:

- Stakeholder CBP POC
- Stakeholder Name
- Port Name
- Description of the Issue
- POC with Email

FOIA CBP 001195

U.S. Customs and Border Protection

PLANNING, PROGRAM ANALYSIS, AND EVALUATION

Biometric Exit: Evaluating Bias and Performance Metrics

FOIA CBP 001196

Biometric Bias | Problem Statement and Overview

Problem statement

- Various biometric facial recognition algorithms have been known to be biased against Race/Ethnicity, Age and/or Gender. CBP run Biometrics facial recognition needs to be evaluated for potential bias.

Results

- Our analysis suggests that currently there is no detectable bias (or effects are negligible) in regards to biometric matching based on Race/Ethnicity, Age or Gender.
- (b)(5), (b)(7)(E)
- CBP is participating in a joint DHS, NIST initiative to evaluate facial recognition performance (b)(7)(E)
- (b)(7)(E)

FOIA CBP 001197

Biometric Bias | (b)(7)(E)

U.S. Customs and Border Protection

Matching improves over time

- (b)(7)(E)
- Matching has improved over time
- (b)(7)(E)
- (b)(7)(E)

(b)(7)(E)

(b)(7)(E)

Match rates are improving over time, all (b)(7)(E) *are now above 97% match.*

FOIA CBP 001198

Biometric Bias | (b)(7)(E)

U.S. Customs and Border Protection

- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)

(b)(7)(E)

(b)(7)(E)

Match rates continue to improve. (b)(7)(E)

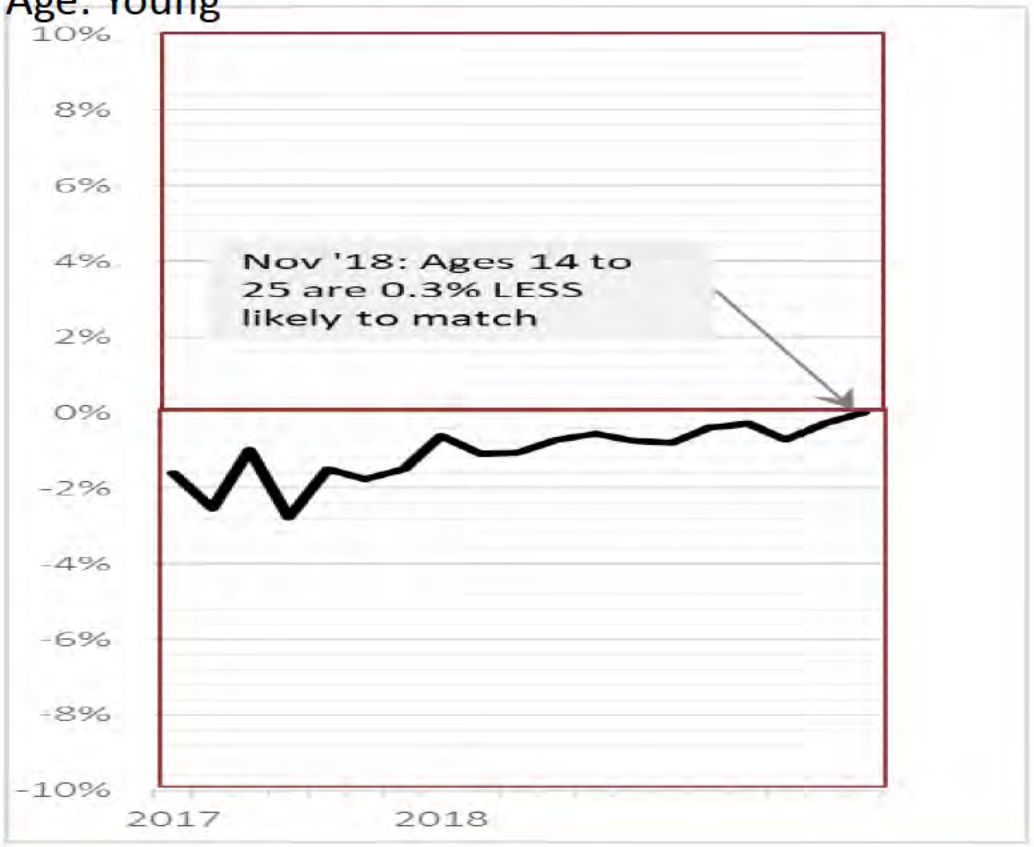
FOIA CBP 001199

Biometric Bias by month | (b)(7)(E) (b)(7)(E)

U.S. Customs and Border Protection

- (b)(7)(E)

Age: Young



Age: Old

(b)(7)(E) *bias has decreased over time and now is negligible.*

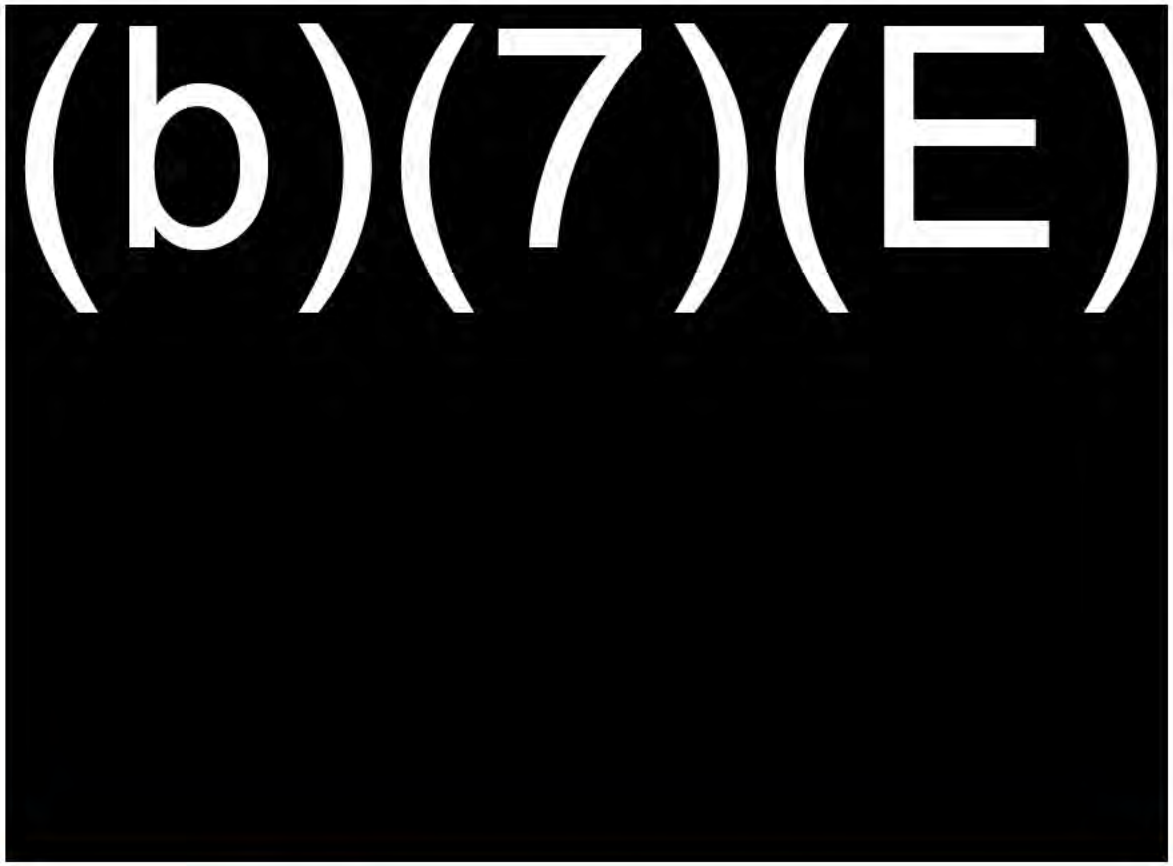
FOIA CBP 001200

Biometric Bias | (b)(7)(E)

U.S. Customs and Border Protection

(b)(7)(E)

- (b)(7)(E)



(b)(7)(E) *bias has reduced over time and is now negligible.*

FOIA CBP 001201

Biometric Performance | Metrics and Statistics

Air Exit

13,717
exit flights processed

1.99 M
exit passengers

98.5%
exit biometric match rate

Air Entry

86,621
entry flights processed

7.08 M
entry passengers

99.1%
entry biometric match rate

Air Preclearance

14,182
preclearance flights processed

1.87 M
preclearance passengers

99.0%
preclearance biometric match rate

Land

1.38 M
pedestrian entries processed

97.1%
pedestrian match rate

68
pedestrian imposters detected

TSA

15K
exit flights processed

330 K
exit passengers

86.8%
exit biometric match rate

Sea

129
vessels processed

409 K
sea passengers

82.7%
exit biometric match rate

For Official Use Only

FOIA CBP 001202

Biometric Performance | Matching Enhancements

U.S. Customs and Border Protection

- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)

FOIA CBP 001203

CBP Biometric Program Summary

From inception through: January 7, 2020

Modality	Locations	Flights / Vessels	Biometrically Processed Travelers	Technical Match Rate
Air Entry	12	232,499	18,375,962	98.9%
[1] Air Exit	26	68,478	9,873,847	97.8%
Air Preclearance	4	28,842	3,996,063	99.0%
TSA	4	45,798	944,713	84.4%
PED Entry	9		6,194,921	97.9%
Sea Closed Loop	6	958	3,403,925	83.8%
Total	**61**	**376,575**	**42,789,431**	

Note* Start dates by modality differ (for reporting)

- Entry/Preclearance numbers - January 2018
- Exit numbers - June 2017
- SEA numbers - July 2018
- TSA numbers - August 2018
- PED numbers - September 2018

Overstays

26,377	overstays have been confirmed via TVS - June 2017
16,477	overstays have been confirmed via BEMA - June 2016
42,854	overstays have been biometrically confirmed on Exit

Imposters

Modality	Location	Count
Air Entry	IAD	3
Air Entry	SJC	2
Air Entry	JFK	1
Air Entry	SAN	1
PED Entry	Nogales	185
PED Entry	San Luis	42
PED Entry	El Paso	5
PED Entry	Laredo	5
Total		**244**

Note* Start dates by modality differ (for reporting)

- Air Entry started Jan 2018
- San Diego Airport (SAN) first imposter was on Apr 17, 2019
- San Luis started Sep 24 2018
- Nogales started Oct 31 2018
- El Paso started Oct 08 2019
- Laredo started Nov 05 2019

Average per day between: Dec 25, 2019 and Jan 7, 2020

Modality	Locations	Flights / Vessels	Biometrically Processed Travelers	Technical Match Rate
Air Entry	12	500	39,957	98.4%
Air Exit	22	313	43,103	97.1%
Air Preclearance	4	42	5,852	99.0%
[2] TSA	1	77	576	83.6%
PED Entry	9		36,267	98.8%
Sea Closed Loop	5	6	20,185	88.5%
Total		**937**	**145,939**	

Note:

[1] Beginning November 14, 2018, CBP instituted sampling to assess the technical match rate and other metrics. Sampling encompasses two flights per airport per week and is constructed on a 90-day moving average, ensuring 95% confidence interval for all reported metrics.

[2] TSA numbers include Domestic travelers which will not have a photo in gallery. Due to not having boarding pass information/being able to determine identity, these travelers count against our match rate because they cannot be distinguished from international travelers which should have a photo in gallery.

Definitions

Locations- Places where there is or has been biometric processing of travelers

Flights / Vessels – Total amount of flights that had at least 1 match on board (not all flights are always biometrically processed).

Biometrically Processed Travelers - This is all in scope travelers for technical match that have an encounter and gallery photo.

Technical Match Rate – Is a measure of how well the matching algorithm identifies and verifies individual travelers.

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

MEMORANDUM FOR: See Distribution (b)(6), (b)(7)(C)

FROM: David P. Pekoske
Administrator
Transportation Security Administration

Kevin K. McAleenan (b)(6), (b)(7)(C)
Commissioner
U.S. Customs and Border Protection

SUBJECT: Joint TSA/CBP Policy on Use of Biometric Technology

The advancement and adoption of biometric technology for identity management in the airport environment offers U.S. Customs and Border Protection (CBP) and Transportation Security Administration (TSA) the opportunity to both improve security and transform the passenger air travel experience. Biometric technology is transforming processes in both commercial and public sectors by providing a more secure and seamless customer experience. A unified government approach for common identity assurance standards and biometric data collection at enrollment, harmonized with the development and deployment of identity verification tools in airports is critical to enhance security, leverage taxpayer and private sector investment, and meet mission goals. A joint approach will also improve the passenger experience and instill confidence in our airline and airport security partners, the public, and the Congress that CBP and TSA will not choose divergent solutions for airport operations.

This joint memorandum provides direction regarding the continued development and implementation of biometric technology at airports and identifies lead offices within TSA and CBP. The designated agency leads for implementation of seamless travel initiatives using biometric technology are Keith Goll, Assistant Administrator (Acting), Office of Requirements and Capabilities Analysis (ORCA) for TSA, and Colleen Manaher, Executive Director, Planning, Program Analysis, and Evaluation, Office of Field Operations for CBP.

Each lead office will be responsible for coordinating across their respective agency. The lead offices will form integrated project teams to ensure close agency-to-agency collaboration, and are directed to:

- (b)(5)

- (b)(5)
- (b)(5)
- (b)(5)

Background

The foundation of identity for the U.S. Department of Homeland Security's (DHS) current internal and external security systems is fingerprint biometrics. For foreign travelers CBP encounters for the first time, fingerprints will continue to serve as the primary biometric for law enforcement and administrative procedures. CBP uses fingerprints in a law enforcement capacity to validate identity; search derogatory records such as criminal history, terrorist watch lists, and past immigration violations; link interactions with people to past encounters; record encounters with subjects seeking admission to the United States or applying for immigration benefits; and facilitate the movement of known, low risk individuals. Similarly, for TSA credentialing programs, including the TSA Pre✓® Application Program, applicants submit fingerprints as the primary biometric for identification and criminal history checks.

However, CBP has determined facial biometrics offers practical advantages over fingerprint biometrics in the airport environment and provides ease of use for the traveling public. Both agencies will continue to work together on piloting various biometric systems for identity verification purposes for biometric validation of exit, TSA checkpoint operations, baggage drop, Trusted Traveler enrollment, and CBP entry processes, in partnership with private sector entities, as applicable.

Pilot Path Forward

TSA and CBP will continue piloting efforts currently underway using the CBP Traveler Verification Service (or successor services or systems) to implement facial recognition for identity verification for international travelers at select TSA checkpoints. TSA and CBP will continue to build on past efforts to develop and design pilots at TSA checkpoints that streamline and automate all or part of the Travel Document Checker process. CBP and TSA will focus on on-going efforts and on airport locations where airport stakeholders have committed to making their own investments to streamline the travel continuum by funding facial recognition technology.

CBP and TSA will work together to develop a plan ensuring CBP Officers can be co-located at TSA checkpoints to perform biometric exit exception processing and any resulting law enforcement functions. As TSA checkpoints are redesigned to accommodate biometric technology, TSA and CBP will work to limit the impact to passenger wait times and TSA operations. Similarly, CBP and TSA will seek mechanisms to utilize shared Trusted Traveler biometrics to provide a more expedited checkpoint experience for Trusted Travelers. To the extent that these activities result in unplanned costs for TSA, both agencies will provide

(b)(5)

(b)(5)

Working together, CBP and TSA have a unique opportunity to enhance security across the travel continuum while advancing a more seamless air travel experience for millions of airline passengers.

CBP Distribution:
(A) Deputy Commissioner
Chief Counsel, U.S. Customs and Border Protection
Executive Assistant Commissioner, Office of Field Operations
Executive Assistant Commissioner, Office of Enterprise Services
Executive Assistant Commissioner, Operations Support
Deputy Executive Assistant Commissioner, Office of Field Operations
Assistant Commissioner, Office of Information Technology
Executive Director, Policy, Program Analysis, and Evaluation, OFO
Executive Director, Admissibility and Passenger Programs, OFO

TSA Distribution:
Deputy Administrator
Chief of Staff
Executive Assistant Administrator, Operations Support
Chief Counsel
Assistant Administrator, ORCA
Assistant Administrator, Office of Intelligence and Analysis
Assistant Administrator, Civil Rights & Liberties, Ombudsman, and Traveler Engagement
Assistant Administrator, Office of Acquisition Program Management
Assistant Administrator, Office of Information Technology
Assistant Administrator, Office of Security Operations
Assistant Administrator, Office of Security Policy and Industry Engagement

U.S. Customs and Border Protection & Transportation Security Administration

Biometric Entry/Exit Update	January 2020

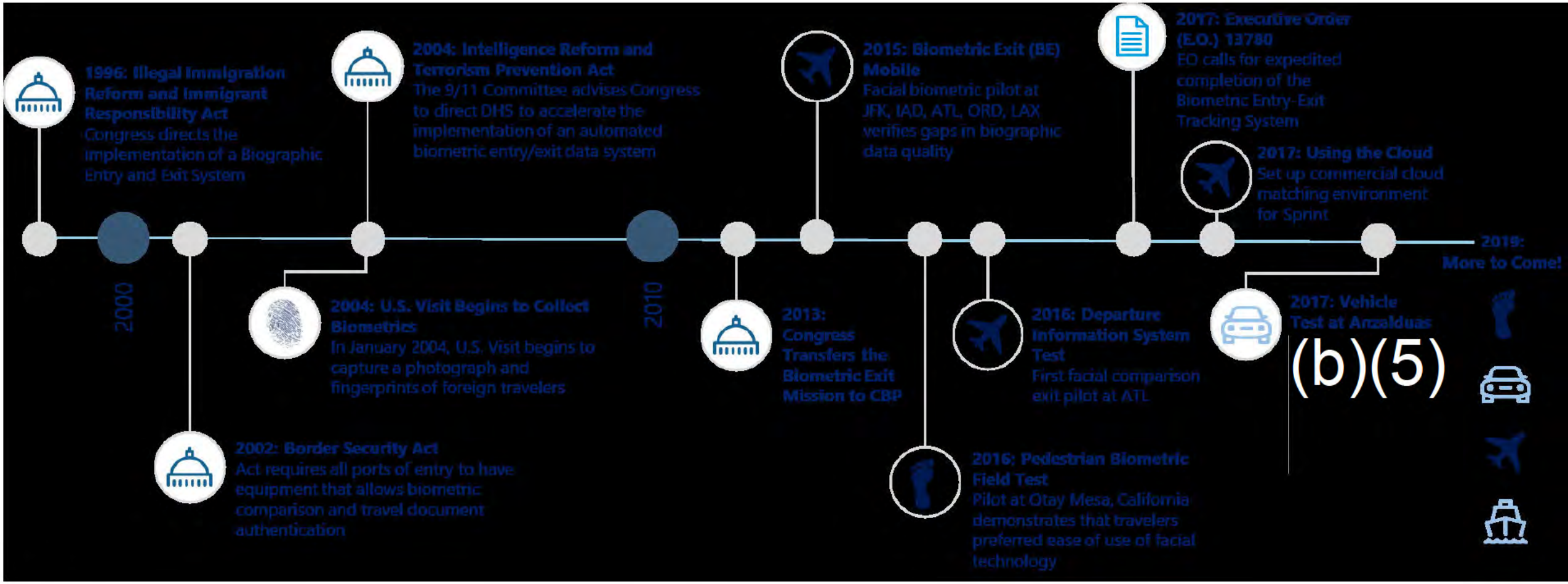
U.S. Customs and Border Protection

~~For Official Use Only~~

Transportation Security Administration

FOIA CBP 001208

CBP BIOMETRICS | How Did We Get Here?



FOIA CBP 001209

CBP BIOMETRICS | Understanding the Process

NTC Vetting Occurs Constantly

APIS Transmission	*TVS Builds Gallery*	*Travelers Queue*	*Photo Taken and Match*	*Board Aircraft*

WHAT IS THE TRAVELER VERIFICATION SERVICE?

The Traveler Verification Service (TVS) is the backend system that performs the facial comparison function.

1

Gallery Creation

Using flight manifest data collected from APIS, TVS builds a gallery of traveler images collected from passports, visas, and other DHS encounters.

2

Using Cloud

The biometric templates of the collected images are stored in an encrypted Virtual Private Cloud (VPC).

3

Take Photo

After the passenger photo is taken, it is compared to the gallery of collected templates.

4

Match Response

A "match" or "no-match" is returned to the camera and airline agents can continue with the boarding process.

1:n Matching *occurs when the live photo will be matched against a gallery of photos.*

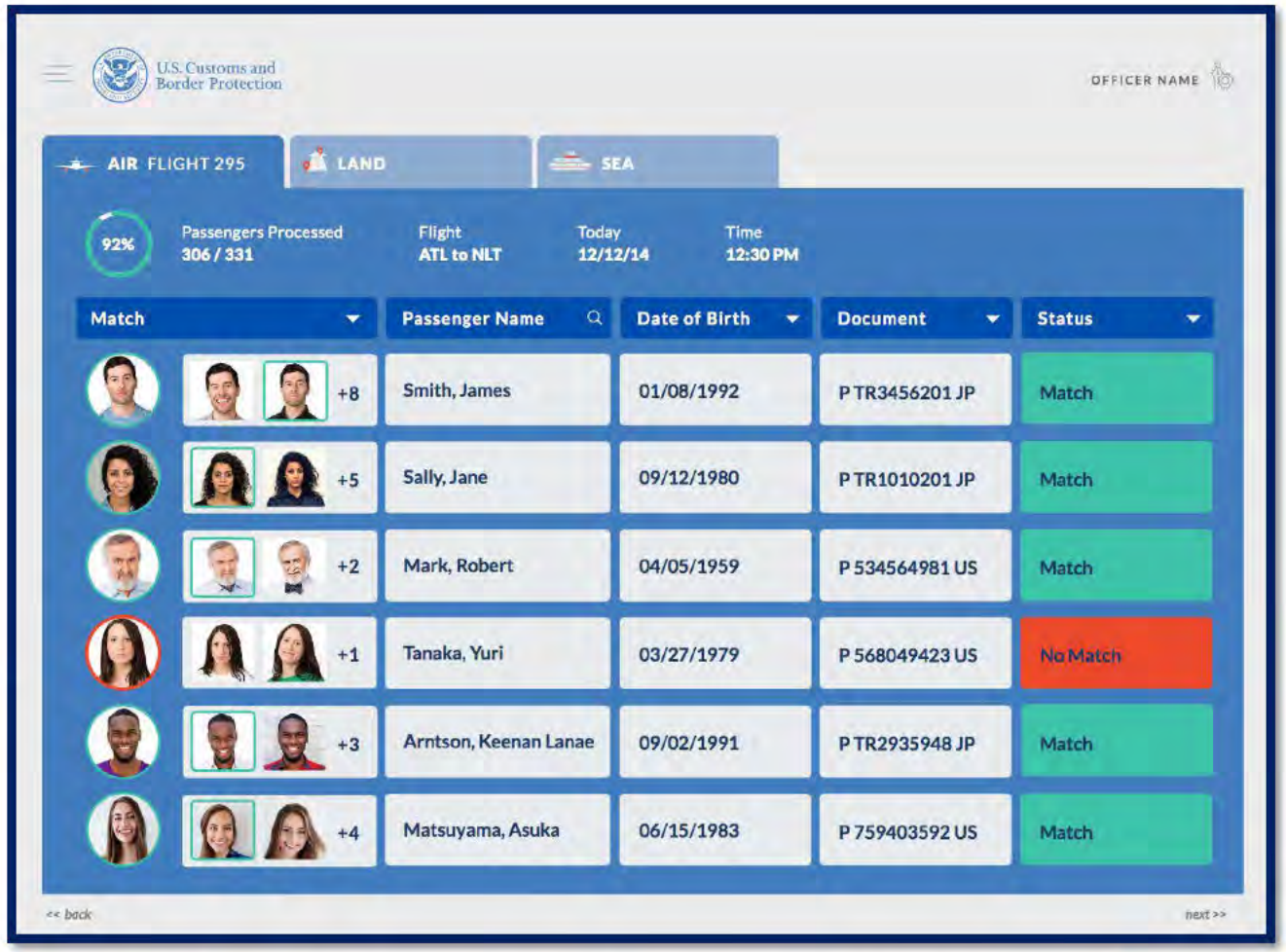
1:1 Matching *occurs when a 1:n match fails. The live photo will be matched to the document photo.*

FOIA CBP 001210

CBP'S INVESTMENT | A Facial Matching Service

WHY IT WORKS

- Uses existing traveler biometrics
- Matches one to few utilizing cloud infrastructure
- Token-less processing
- Integrates into existing airport infrastructure
- Extends to land and sea environments



*CBP's Matching Service enables travel partners to achieve **Simplified Travel** while meeting the Biometric Exit Mandate*

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FOIA CBP 001211

CBP ENTRY EXIT UPDATE | Program Highlights

- CBP reengineered how biometrics can be used (b)(7)(E) (b)(7)(E)
- Data sources used include (b)(7)(E) etc.
- *United States citizen biometric data not retained within CBP
- Foreign national data transmitted and held within (b)(7)(E)

*Retention limited to 12 hours for operational use

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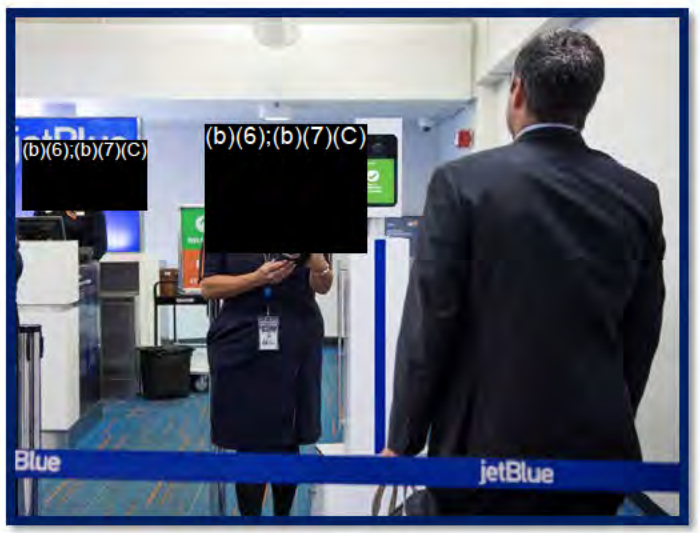
FOIA CBP 001212

CBP ENTRY EXIT UPDATE | Air Exit Update

- 29 commitments from major airlines and airports
- Partners are leveraging CBP technology utilizing unique approaches based on hardware solutions: cameras, gates, tablets
- Currently processing an average of 300 departures per day
- 64,102 flights and 9.2 million travelers biometrically processed across 26 airports*
- Technical match rate is 97.9%



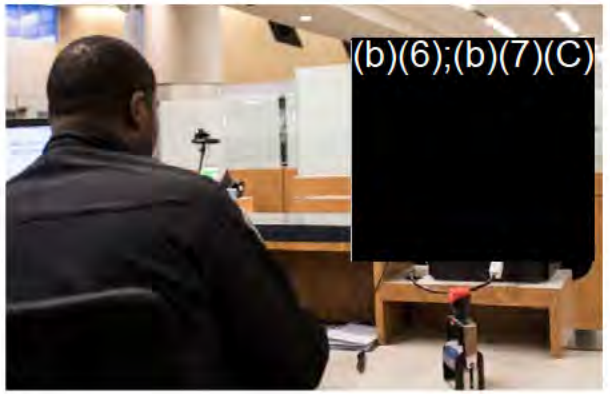
*As of December 24, 2019

FOIA CBP 001213

CBP ENTRY EXIT UPDATE | Air Entry Update

- **Upgrading fingerprint devices and cameras** to improve photo quality for more effective biometric match at inspection
- **Streamlined arrival process** by removing the requirement for presentation of passport or fingerprinting of in scope travelers
- **Deployed facial comparison in 16 locations**: Atlanta, Miami, JFK, LAX, San Diego, San Jose, Orlando, Fort Lauderdale, Houston Hobby, Houston Bush, Washington Dulles, Detroit, Dublin, Shannon, Abu Dhabi and Aruba
- 253,760 flights and 21.7 million travelers biometrically processed with **technical match rate of high 90s (99%)**
- **7 imposters identified** to date
  - 3 Washington Dulles,
  - 2 San Jose,
  - 1 New York – JFK and
  - 1 San Diego.

*As of December 24, 2019



FOIA CBP 001214

CBP BIOMETRIC PROCESSING | Privacy & Security

- **Transparency Efforts:**
  - Annual Briefing Sessions for Privacy Advocates and Stakeholders in 2017-19 in Washington, DC and San Francisco
  - DHS Data Privacy and Integrity Advisory Committee Meeting
    - September 2017 in DC
    - July 2018 (tour of Orlando airport and briefing)
    - February 2019 (release of DPIAC Report)
  - Presentations at RSA Conference, March 2019 (San Francisco), IAPP Conference, May 2019 (Washington), and Federal Privacy Summit in December 2019 (Washington) provided an overview on CBP's privacy protections
- **Notice to the Public:**
  - Privacy Impact Assessments
    - 10 PIAs have been published relating to CBP facial comparison efforts, available at: www.dhs.gov/privacy
    - A new comprehensive TVS PIA was published November 14, 2018. Appendix updates published on January 8, 2020.
  - Online Content at CBP.GOV
    - Fact Sheets
    - Frequently Asked Questions
  - Signage at Demonstration Sites, Tear Sheets and Gate Announcements in many locations
  - All Public Notices clarify that U.S. Citizens who do not wish to have a photo taken may request an alternative means of verifying their identities

FOIA CBP 001215

CBP BIOMETRIC PROCESSING | Privacy & Security

- **Limited Retention of Facial Images:**
  - *CBP Systems:* New facial images of U.S. Citizens are securely stored for up to 12 hours for continuity of operations purposes.
  - (b)(7)(E): Photos of in-scope travelers are securely stored in (b)(7)(E) to meet the biometric exit requirement and to ensure the accuracy of future matching encounters at the border with the TVS.
  - *Airline/Airport Partners:* CBP has developed Business Requirements which do not allow approved partners to retain the photos they collect—for purposes of identity verification through the TVS—for their own business purposes. These partners must purge the photos—once they are transferred to CBP—and must allow CBP to audit compliance.
- **Enhanced Security Measures:**
  - *Encryption:* Strong encryption is used for data, both in transit and at rest.
  - *Access Controls:* Access to the collection device is granted only to authorized CBP personnel and representatives.
  - *Security of Biometric Matching Service:* The TVS creates irreversible templates of the historic and newly-captured photos and uses a unique identifier to connect travelers' biographic information with their facial images. An audit trail is created. The TVS is walled off from the APIS biographic data, which has been required since 2005.
- **Monitoring Algorithm Performance:**
  - *Algorithm:* CBP continually monitors TVS algorithm for performance. The TVS was developed using diverse training sets and matches against a limited set of faces on the flight manifest.
  - *NIST:* A recent NIST algorithm vendor test found significant gains (i.e., 20 times) in accuracy in the past five years. NIST found that with high quality photos, the most accurate algorithm can identify matches with only a .2% error rate.
  - *CBP Partnerships on Testing and Evaluation:* CBP is collaborating with NIST, the DHS Science & Technology (S&T), and Office of Biometric Identity Management (OBIM) to test technologies and to evaluate algorithms.

FOIA CBP 001216

BIOMETRIC PROCESSING | Resources

- **CBP Biometrics:** www.cbp.gov/biometrics
- **TSA Biometrics:** www.tsa.gov/biometrics-technology
- **DHS Privacy Compliance:** www.dhs.gov/privacy
- **NIST Study:** https://www.nist.gov/news-events/news/2018/11/nist-evaluation-shows-advance-face-recognition-softwares-capabilities and https://www.nist.gov/news-events/news/2019/12/nist-study-evaluates-effects-race-age-sex-face-recognition-software

FOIA CBP 001217

Transportation Security Administration

January 2020

U.S. Customs and Border Protection

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Transportation Security Administration

FOIA CBP 001218

TSA | Overview

The TSA and the US Customs and Border Protection (CBP) have partnered on a facial recognition pilot that leverages CBP's TVS.

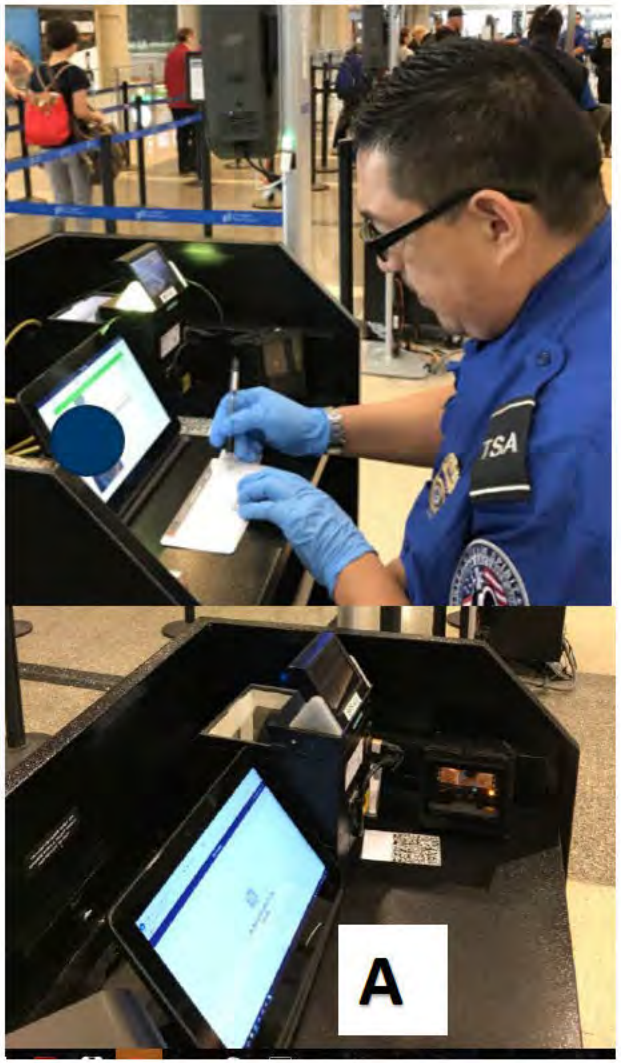
- TSA and CBP are exploring biometrics for the purpose of identity verification because it has the potential to:
  - Increase security by using technology to ensure a traveler matches their claimed identity
  - Improve screening processes by reducing the time taken to verify identity
  - Enhance the traveler experience by creating a seamless process
  - TSA is evaluating 1:n facial recognition solutions for Trusted Travelers in pursuant to Goal 1 "Partner with CBP on Biometrics for International Travelers" outlined in the TSA Biometrics Roadmap

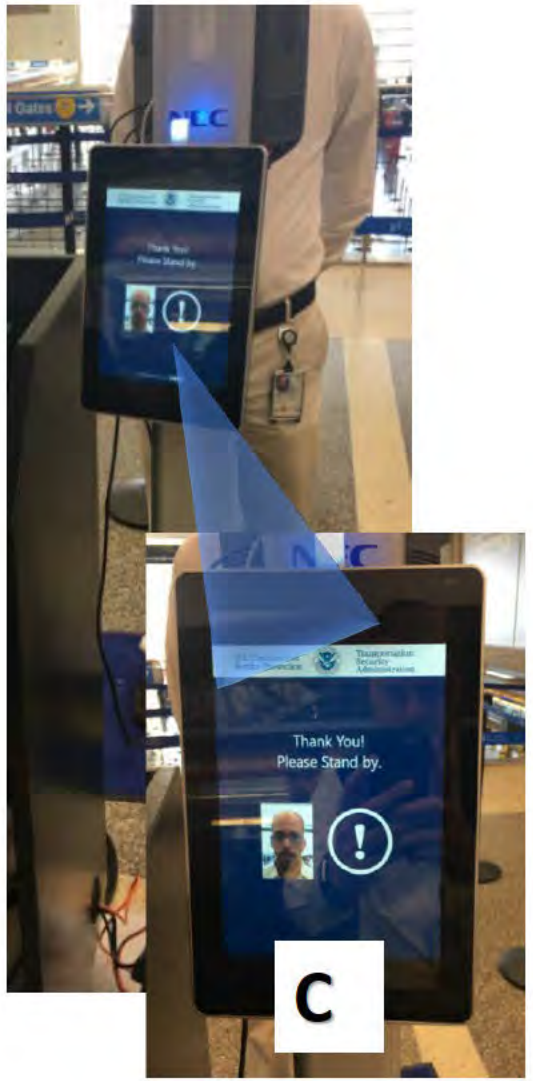
The traveler's participation in this pilot is **voluntary.** This pilot is for the International Travelling Passengers population.

Passengers may opt out and any traveler wishing to opt out of the process will be screened per the current-day Travel Document Check SOP.

FOIA CBP 001219

TSA | System Images





FOIA CBP 001220

TSA | Desired TSA Checkpoint End State

The below outlines the various functions that will be automated via biometrics at the airport checkpoint.

Automation of Travel Document Checker (TDC) Functions via Biometrics

Prior to physical screening, TSA must:

1. Verify the authenticity of the presented form of identification
2. Verify the passenger and his/her form of identification are a match
3. Validate passenger flight reservation status
4. Verify passenger's secure flight vetting status
5. Direct the passenger toward the path of receiving the right level of screening
6. Resolve any non-matches and security issues manually

Solution Space	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Current Process (manual + boarding pass scanner (BPS))	Manual	Manual	▭	▭	Manual	Manual
Near Term: Credential Authentication Technology (CAT)	✓	Manual	✓	✓	Manual	Manual
Interim: Biometric ID Verification w/ SF integration	✓	✓	✓	✓	Manual	Manual
Future: Biometric ID Verification System w/ SF integration and e-Gate	✓	✓	✓	✓	✓	Manual

Key: ✓ Automated ▭ Partially Automated

TSA will evaluate 1:n facial recognition solutions for Trusted Travelers in pursuant to Goal 1 "Partner with CBP on Biometrics for International Travelers" outlined in the TSA Biometrics Roadmap.

FOIA CBP 001221

(b)(6);(b)(7)(C)

Director, Policy and Planning

Office of Field Operations
U.S. Customs and Border Protection

(b)(6);(b)(7)(C)

&

Kelli Biegger

Identity Management Team Member

Requirements and Capabilities Analysis

Transportation Security Administration

(b)(6);(b)(7)(C)

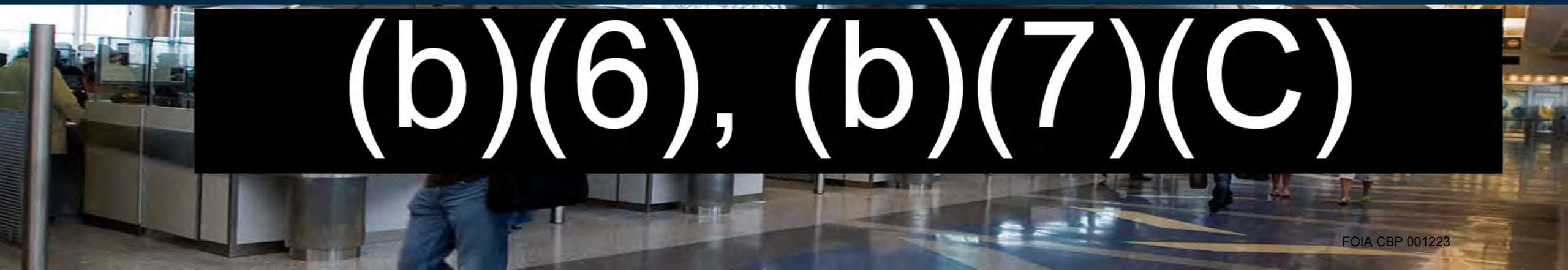
FOIA CBP 001222

Traveler Verification Services

Field Support Standard Operating Procedure (SOP)

TSA Version

(b)(6), (b)(7)(C)



FOIA CBP 001223

Field Support SOP: Purpose of This Document

Objective:

- U.S. Customs and Border Protection (CBP) and the Transportation Security Administration (TSA) partnered to evaluate identity verification utilizing facial recognition at the TSA checkpoint. Utilizing biometrics for the purpose of identity verification has the potential to increase security by using technology to ensure a traveler matches their claimed identity, improve screening processes by reducing the time taken to verify identity, and enhance the traveler experience by creating a tokenless process.

Intent:

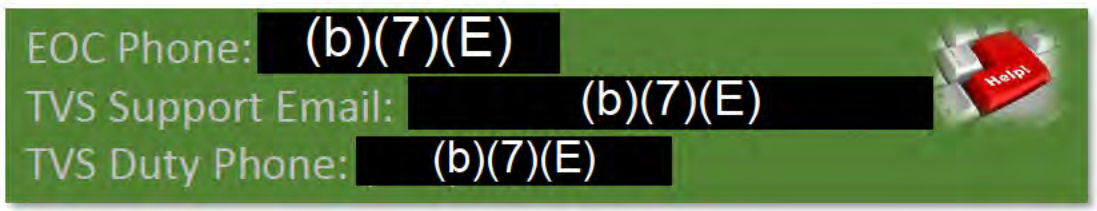
- CBP TVS supports operations at airports for both CBP owned devices as well as airport/airline owned devices.
- TVS supports 3 primarily services: gallery generation, match services, and return match response.
- The intent of this SOP is to provide "just in time" guidance needed to verify the critical components of daily operations, services, and equipment to proactively minimize impediments and or prevent service interruptions.

Scope:

- CBP strongly recommends a series of steps that can be taken to proactively monitor and resolve any potential issues prior to processing traveler(s) at TDCs checkpoint
- The scope of this SOP includes steps that can be taken to:
  - Monitor and report potential issues with the gallery generation process prior to processing travelers
  - Verify and report potential issues with CBP owned equipment prior to processing travelers
  - Verify and report potential issues with the match response service prior to processing travelers

Task:

- Prior to processing each session that requires TVS services, use the check list provided in this SOP to verify each critical component to identify and report any issues or potential issues discovered during the verification process.
- Work with TVS team to assure issues are resolved immediately prior to processing the session if possible.
- Report issues that impede operations as soon as possible to the **EOC :** (b)(7)(E)
- Report issues that do not impede but can improve operations to the **TVS Support Email:** (b)(7)(E)



Device Setup

(b)(7)(E)

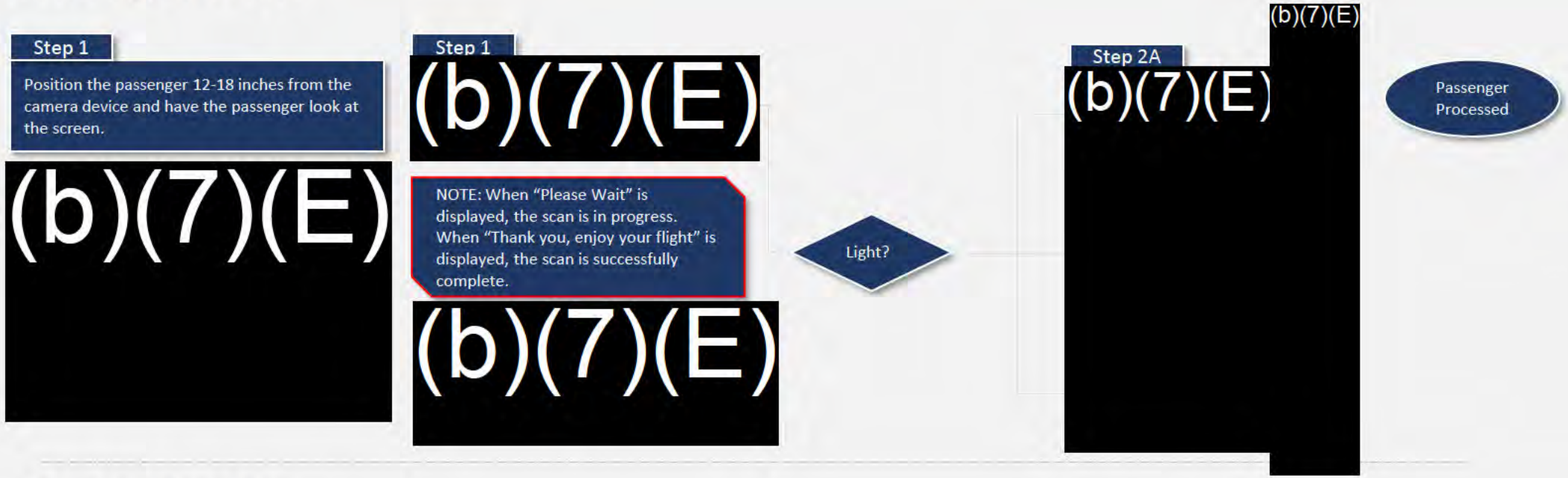
Device Login

(b)(7)(E)

(b)(7)(E)

EOC Phone: (b)(7)(E)
TVS Support Email: (b)(7)(E)
TVS Duty Phone: (b)(7)(E)

Boarding Process



Device Shut Down

(b)(7)(E)

Biometric Exit Mobile Application (BEMA) Overview

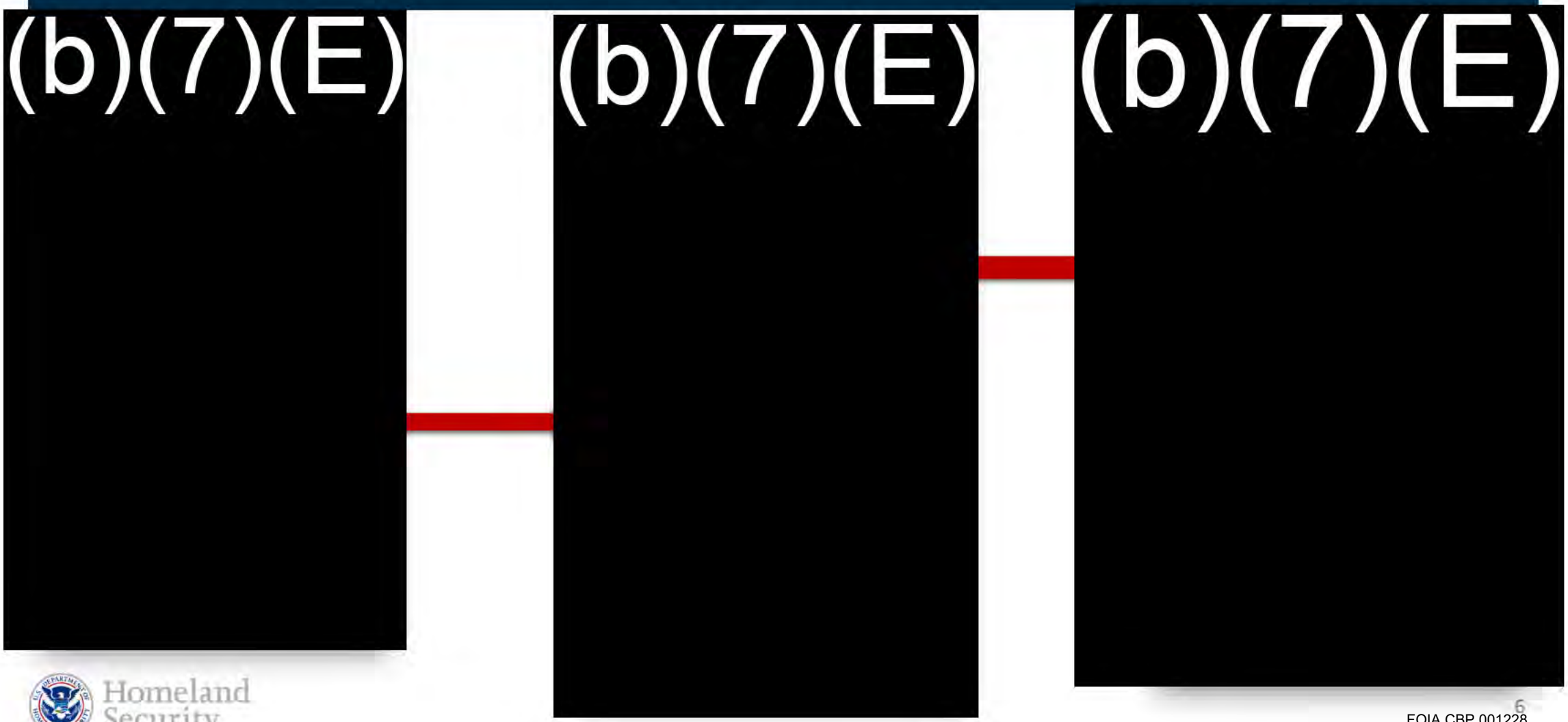
(b)(7)(E)

- BEMA is a (b)(7)(E).
- BEMA (b)(7)(E)
  - (b)(7)(E)
  - (b)(7)(E)
- BEMA transactions are recorded (b)(7)(E) (b)(7)(E).
- BEMA (b)(7)(E).
- With BEMA, a CBPO can confirm the departure of travelers by scanning their passports and capturing fingerprints.

Homeland Security

FOIA CBP 001227

BEMA Notifications for no-match passengers



Homeland Security

FOIA CBP 001228

Checklist: Daily Operation Readiness Checklist

Camera Readiness

- ❑ Verify the camera is set up appropriately
- ❑ Verify the camera is configured (b)(7)(E)
- ❑ Verify the camera has a reliable source of power to support the duration of the operation
- ❑ (b)(7)(E)
  (b)(7)(E)
- ❑ Verify the camera is paired with proper foot mats and signage for additional awareness.

Camera Connectivity Readiness

- ❑
- ❑
- ❑
- ❑ (b)(7)(E)
- ❑ Process initial photo and take necessary action.

Camera Response

- ❑ Using QR code, take 2-3 photos of non-travelers and monitor the results.
- ❑ For CBP owned equipment: (b)(7)(E)
  (b)(7)(E)

NOTE: for CBP owned equipment: **Refer to the NEC NeoFace Express User Manual for detailed information.**

(b)(7)(E)

(b)(7)(E)

(b)(7)(E)

Help Desk Support Contact Information:

(b)(7)(E)

Traveler Verification Services

Field Support User Guide
Version 1.0

When troubleshooting, follow the steps below:

Step 1: Analyze the issue – Use the NEC User Guide provided to conduct basic analysis and troubleshoot to identify a potential root cause and solution or workaround.

Step 2: Identify Workaround – Based on the findings, identify any potential workarounds.

Step 3A: If a workaround is found, send a detailed email to TVS Support.

Step 3B: If a workaround is not found, call EOC Support (b)(7)(E) (b)(7)(E) mmediately; When calling, be prepared to provide details of the issue encountered.

EOC Phone: (b)(7)(E)
TVS Support Email: (b)(7)(E)
TVS Duty Phone: (b)(7)(E)

When emailing TVS Support (b)(7)(E), include the following elements:

Title:
Should include – Port – TSA Terminal - Departure Date – Summary

For example: IAD – TSA Terminal 2 - 5/31/2018 – No Gallery

Reported Issue:
An objective summary of the reported issue. Should not include any analysis, opinions, or solutions.

Steps to Replicate the Issue:
List the exact steps taken when the issue was discovered. This includes data as well as navigation. This helps to replicate the issue.

Attachments:
Attach all pertinent supporting artifacts including UIs, images, worksheets, etc.

POC contact info:
Include a good POC contact info for follow up purpose.

FOIA CBP 001230

U.S. Department of Homeland Security
U.S. Customs and Border Protection
Transportation Security Administration

Transportation Security Administration Pilot with Traveler Verification Service
Phase II
Protocol for Operations
August 3, 2018
Version 1.0

(b)(6), (b)(7)(C)
U.S. Customs and Border Protection Signature

8/3/2018
Date

Transportation Security Administration Signature

Date

FOIA CBP 001231

TABLE OF CONTENTS

1. Background

U.S. Customs and Border Protection (CBP) and the Transportation Security Administration (TSA) have partnered to test CBP's Traveler Verification Service (TVS) capability at the TSA security checkpoint. Generally, the goal of the pilot is to test a seamless, efficient process to use facial recognition biometrics to verify identity of international travelers departing the United States on commercial aircraft, consistent with TSA's responsibility for identity verification and in support of CBP's entry/exit mission. CBP and TSA have developed a pilot in three phases:

- **Phase I (completed November 2017):** Explored the feasibility of using CBP's biometric facial recognition technology for identity verification at the TSA checkpoint, including connectivity of the facial recognition equipment with TVS in a TSA checkpoint environment. Phase I of the pilot was conducted at John F. Kennedy International Airport.
- **Phase II (scheduled August 2018):** Incorporate the use of CBP's match response to reduce the number of instances in which manual identity document check must be conducted by TSA. Travelers will be provided with notice of the opportunity to voluntarily participate in the program and by choosing to participate are consenting to the collection of biometrics and understand that additional identity verification may be performed by CBP. Phase II of the pilot will be conducted at Tom Bradley International Terminal at Los Angeles International Airport (LAX).
- **Phase III (TBD):** Receive and integrate data from Secure Flight into TVS to allow TSA and CBP data sources regarding traveler biographic information to be used at the checkpoint.

2. Traveler Verification Service (TVS)

In order to support its biometric mission, CBP developed TVS. TVS is a matching service utilized by CBP, and TVS may be made available to other authorities, such as TSA. CBP diligently works to ensure the accuracy and reliability of the TVS matching algorithm is always as precise as possible. Data is analyzed on a daily basis to assess any potential modifications that could improve the matching algorithm. It is partly owing to this diligence that the current technical match for Air Exit is 99.2% and the "false accept" rate is (b)(3) 49 U.S.C. CBP also works to ensure the false accept rate stays below .10%, and will be implementing assessments that will ensure the matching algorithm remains below the .10% false accept rate. In the air travel environment, CBP uses traveler data provided by the carrier via the Advance Passenger Information System (APIS) to identify travelers on a flight manifest. Biographic data from the APIS manifest is used to create a photo gallery of persons traveling on each commercial flight. The photos are sourced and compiled from various government holdings, (b)(7)(E) (b)(7)(E) U.S. Citizenship and Immigration Services, Department of State passport and visa databases, Trusted Traveler Programs, and CBP's Automated Passport Control. Each gallery is built several hours prior to the corresponding flight's scheduled departure. (b)(7)(E) minutes prior

to departure, each gallery is staged and ready for processing. Once a gallery is staged, it is updated (b)(7)(E) (b)(7)(E) boarding/verification process and compares it against the TVS gallery formed for a given flight or location to find a match. For purposes of Phase II, a match indicates a verification of the passenger's identity, commensurate with TSA's existing process that relies upon a published list of acceptable forms of passenger identification required to board a commercial aircraft.

There may be instances when photos are not loaded into the gallery on travelers because of (b)(7)(E) (b)(7)(E)

- (b)(7)(E)
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- (b)(7)(E)
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3. Definitions

3.1 Biometric

A biometric refers to a method of identification based on anatomical, physiological, and behavioral characteristics or other physical attributes unique to a person that can be collected, stored, and used to verify the identity of a person that can be collected, stored, and used to verify the identity of a person, e.g., fingerprints, photographs, iris, DNA, and voice print.

3.2 Biometric Matching

Biometric Matching is the process of comparing biometrics collected in real time to biometrics collected from previous encounters in order to verify identity.

3.3 Biometric Exit Mobile Application (BEMA)

BEMA is a handheld device that can perform queries and capture biometrics on travelers as necessary. (b)(7)(E)

3.4 Matching Exceptions

A matching exception is when the result of the biometric matching by means of TVS reveals that there is either no match to a photo gallery, or photo matching could not occur due to poor image quality.

3.5 Photo Gallery

The photo gallery is a compilation of photos pulled from Department of Homeland Security (DHS) and other U.S. Government holdings based on biographic information used for identity verification and matching.

3.6 Transportation Security Officer (TSO)

A TSO is an individual who is trained, certified, and authorized by TSA to inspect individuals, accessible property, and/or checked baggage for the presence of explosives, incendiaries, weapons, or other threat items.

3.7 Travel Document Checker (TDC)

The TDC is a TSO or other member of the TSA Federal Security Director's staff, to include administrative personnel, trained, and assigned the function of checking travel documents and identification. A TDC podium is the podium where the TDC is assigned.

3.8 U.S. Customs and Border Protection Officer (CBPO)

Throughout this document, CBPO refers to any CBP officer assigned to the TSA checkpoint area in the TBIT terminal of LAX for purposes of the Phase II pilot. CBPOs will encounter travelers who have consented to collection of biometrics and an encounter with CBP and who meet a matching exception.

3.9 Quick Response (QR) code

A machine-readable code consisting of an array of black and white squares that will be scanned on the camera to initiate the photo capture process.

4. Camera Setup

TVS equipment will be set up at each designated TDC podium at the TSA checkpoint (more complete setup and log-in information can be found in the TVS Field Support Guide). Initially, TVS equipment will be located at four TDC podiums.

This includes:

- Camera Set-Up:
  1. (b)(7)(E)
  2. (b)(7)(E)
- System Log-In:
  1. (b)(3)
  2. (b)(3)
  3. (b)(7)(E)
- Placement of signage and communication material to ensure each traveler who chooses to participate has provided informed consent to participate in the biometrics pilot and a consensual encounter with a CBPO, as appropriate.

5. Travel Document Checker (TDC) Procedures

5.1 Setting up

When the TSO begins his/her rotation at a TDC podium equipped with a TSA laptop and camera, they will follow the below steps to get setup:

1. (b)(7)(E)
2. (b)(7)(E)
3. From the (b)(7)(E)
4. (b)(7)(E)
5. (b)(7)(E)
6. From the (b)(7)(E) which corresponds to the camera located adjacent to the TDC podium at which the TSO will be working.

5.2 Operations

The traveler's participation in this pilot is voluntary. The traveler may opt out at any point, (b)(7)(E) (b)(7)(E). Any traveler wishing to opt out of the process will be processed according to the opt out procedures identified below. The TDC will be equipped with a camera and TSA laptop and will follow the steps below to process travelers consenting to participate in the biometric pilot:

1. Review the boarding pass. A traveler's eligibility for this pilot will be determined based upon the destination of their next flight as detailed below.

   a. **Foreign Destinations**: If the traveler does not opt out from the pilot, request the traveler move to the camera to have their photo captured. Proceed to Step 2.
   b. **Domestic Destinations**: Screen the traveler per the current Travel Document Check Standard Operating Procedures (SOPs) by checking the Identification (ID) and scanning the boarding pass with the Boarding Pass Scanner (BPS). Direct the

traveler to the appropriate screening lane. The traveler will not participate in the pilot.

2. (b)(7)(E)

3. (b)(7)(E)

a. **Yellow Light**: If the camera displays a yellow light, it means the quality of the photo is too low to attempt a match.
   1) In this occurrence, the TDC must scan the QR code again to initiate a recapture. The TDC may make two additional attempts to capture the photo.
   2) If the quality of the photo remains too low to attempt a match, the TDC must process the traveler per the Travel Document Check SOP.
   3) The TDC will direct the traveler to proceed to the appropriate screening lane.

b. **Blue Light**: If the camera displays a blue light, no match was identified and a (b)(7)(E) (b)(7)(E) will be sent to the (b)(7)(E) (b)(7)(E)
   1) (b)(7)(E)
   2) Once the response appears on the (b)(7)(E), the TDC must process the traveler per the Travel Document Check SOP.
   3) The TDC will direct the traveler to proceed to the appropriate screening lane. Following physical screening of the passenger, CBP may conduct identity and citizenship verification as appropriate.

c. **Green Light**: If the camera displays a green light, a match was identified and a biographic response has been sent to the (b)(7)(E).
   1) (b)(7)(E)
      a) (b)(7)(E)
      b) (b)(7)(E)
      c) (b)(7)(E)
      d) (b)(7)(E)
   2) Once the response appears on the (b)(7)(E) the TDC will confirm that the biographic data returned by CBP matches the biographic data on the boarding pass.
   3) If the data matches, the TDC will process the traveler by scanning the boarding pass with the BPS to determine vetting status and allow the traveler to proceed to the appropriate screening lane.
   4) If the biographic data returned by CBP does not match the data reflected on the boarding pass, the TDC must process the traveler per the Travel Document Check SOP.

4. Any traveler may choose to opt-out of the photo capture process. When this occurs, the TDC must screen the traveler per the Travel Document Check SOP and direct the traveler to the appropriate screening lane.

5. If disabilities, religious headwear, or medical surgical masks impede the ability of the TSO to capture a photo, TSA must process the traveler per the Travel Document Check SOP and direct the traveler to proceed to screening.

6. In appropriate circumstances, TSA may request law enforcement or other identity verification assistance from CBP in accordance with TSA procedures and CBP authority.

6. CBPO Procedures

Any traveler whose TVS response is a blue light will be processed according to the following procedures. The CBPO will be equipped with a BEMA device to adjudicate those travelers as necessary, post screening. (b)(7)(E) In the course of a consensual encounter, the CBPO will first request travel documents from the traveler. The CBPO will examine the identification, and may return or conduct further inquiries. Once the CBPO completes his or her examination, the CBPO will allow the traveler to proceed. Consistent with the foregoing, the CBPO will determine the appropriate course of action as outlined below.

6.1 U.S. Citizens

The CBPO will perform the following actions to process a person claiming to be a U.S. citizen whose photo(s) results in a no match response or who chooses not to opt in to the photo capture process:

- (b)(7)(E)
- (b)(7)(E)
- If satisfied that the traveler is a U.S. citizen, allow the traveler to proceed.
- (b)(7)(E) .

6.2 Lawful Permanent Residents (LPRs) and Other Aliens

The CBPO will perform the following actions to process LPRs, non-immigrants, refugees, asylums, or parolees whose photo(s) results in a no match response:

- (b)(7)(E) .
- (b)(7)(E)
- (b)(7)(E) .

- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)

6.3 Diplomats, Canadians, and Visa Exempt Countries

The CBPO will perform the following actions to process diplomats, Canadian citizens, and citizens from visa exempt countries whose photo(s) results in a no match response:

- (b)(7)(E)
- (b)(7)(E)
- If satisfied that the traveler is an alien in lawful status, allow the traveler to proceed.
- (b)(7)(E)

6.4 Entry Without Inspection (EWI) Processing

(b)(7)(E)

- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)
  - (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)
- (b)(7)(E)

(b)(7)(E)

(b)(7)(E)

7. Equipment Failure and Other Technical Issues

If the CBP equipment fails or there are other technical issues, TDCs will notify the nearest CBPO and then revert to traditional processing until such a time as the equipment issues are resolved. The CBPO should make an attempt to reset or restart the equipment. If the camera or equipment still does not operate properly, the CBPO will notify his/her supervisor immediately. After supervisor notification, the CBPO should contact the Office of Information and Technology Enterprise Operations Center as follows:

- Emergencies should be reported to (b)(6), (b)(7)(C)
- Routine requests should be made via email to (b)(7)(E)

Emergencies are defined as (b)(7)(E) (b)(7)(E)

Routine issues relate to problems or questions that need to be resolved but do not prevent biometric matching from occurring.

8. Other Law Enforcement Assistance

Nothing in this document precludes TSA from requesting law enforcement or other identity verification assistance from CBP in accordance with TSA procedures and CBP authority.