Air Entry/Exit Re-engineering (AEER)

International Biometrics Performance Conference
National Institute of Standards and Technology

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Science and Technology Directorate
Agenda

• Drivers for Entry/Exit Transformation
• Air Entry/Exit Re-engineering (AEER) Framework
• Challenges and Risks
• Integrated Path Forward
• Accomplishments
• Test & Evaluation Strategy
• Draft Evaluation Criteria
• Iris Device Qualification Test (IDQT)
• Notional CONOPs
• Test & Evaluation Capability
• DHS Level I Acquisition Process
Drivers for Entry / Exit Transformation

Issues

- Increased traveler volume and wait times
- Incomplete information on traveler departures
- Legislative mandate for biometric exit not met
- Air threat remains a priority

Although current legislation focuses on biometric exit, improvements must be made to the end-to-end process, from entry to exit, in order to be most effective.

Air Passengers

- Total air passenger volume is up over 21% compared to FY 09.
- Air travel expected to grow 4% - 5% annually for the next several years.

CBP Officer Staffing
Apex AEER Framework

Objectives

- Enhance current air entry operations
- Develop a cost-effective biometric air exit solution
- Integrate into existing air operations

Strategy

Build Phase
- Execute air entry/exit operational survey and analysis
- Identify operational requirements and capability gaps
- Perform economic impact analysis
- Identify biometric and non-biometric solution sets

Test & Transition Phase
- Establish Maryland Test Facility (MdTF)
- Technology qualification and process improvement
- Solution development, testing and evaluation
- Business case development

CBP Ownership Phase
- Conduct field trial of air entry and exit solutions
- Transition solutions to operators

Stakeholders

Government
- CBP Port of Entry Operators
- Office of Biometric Identity Management
- DHS Privacy Office
- DHS Office of Policy
- National Institute of Standards and Technology (NIST)

Air Associations
- Airlines for America
- Airports Council International-North America
- International Air Transport Association
- US-Travel Association

Congress
- House Committee on Homeland Security
- Senate Committee on Homeland Security and Governmental Affairs
- House and Senate Appropriations Committees

Apex AEER Team
Apex AEER Challenges and Risks

• Need to consider solutions that “Do No Harm” to current throughput and airline boarding times, and minimize airport infrastructure requirements

• Need to ensure compliance with current DHS Privacy Regulations

• Generalized recommendations based on airports surveyed

• Significant collaboration with various air travel industry stakeholders, but limited engagement with some stakeholders

• Potential changes in legislative requirements could significantly impact project scope and schedule

• Need to ensure compliance with established processes and schedules for DHS acquisitions (i.e. cannot accelerate by sole sourcing)
Integrated Path Forward

**Activities:**
- Continue to engage with airports, and international partners (e.g. UK, Netherlands, etc.) to identify best practices and lessons learned from implemented systems and gather passenger facilitation data
- Collaborate with industry stakeholders to refine biometric air exit CONOPs

**Activities:**
- Validate biometric air entry/exit CONOPs and technologies with scenario based testing
- Complete airport entry/exit analytical tools and document for transition to CBP
- Conduct performance and cost/benefit analysis of biographic and biometric exit
- Select biometric technology candidates for field evaluation

**Activities:**
- Conduct field evaluation of air entry and exit technology solutions at selected airport(s)

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**Phase 1**
- Stakeholder Engagement & Technology Foraging
- Operational Survey and Analysis
- Econ Impact Analysis
- Operational Biometric Test Bed

**Phase 2**
- Laboratory Testing
- Scenario Based Testing
- Acquisition Documentation

**Phase 3**
- Field Trial Deployed
- Piloting and Operational Evaluation
Apex AEER Accomplishments

Operational Analysis
• Completed Airport Operational Surveys visits (JFK, LAX, ORD/MDW, MIA, SFO, LAS, ATL) and documented findings in As-Is Operational Survey Report
• Developed a repeatable survey methodology with tools and applied it to airport environment
• Mapped existing Entry Processes
• Assessed Biometric Exit Options
• Drafted entry and exit capability gap assessment, including targeted areas for potential solutions

Economic Analysis
• Identified financial implications of current capability gaps for air entry
• Performed literature review of past U.S. entry/exit efforts
• Researched cost information pertaining to potential entry and exit solutions
Apex AEER Accomplishments

Biometric Technology Market Survey
• Canvassed commercially viable biometric devices
• Completed initial device capabilities and maturity report

Testing
• Established NIST Oversight role
• Conducted tech foraging and testing in collaboration with NIST
• Developed Iris Device Qualification Test (IDQT) in conjunction with NIST. IDQT is designed to measure peak imaging performance, and removes the “human factor” in laboratory qualification and testing
• Developed an Omnibus Test and Evaluation Plan
• Prepared draft Human Subject Test Protocol for IRB submission

Technology and Test Capability
• Site selected in Upper Marlboro, MD
• Completed Test Bed architectural drawings; submitted drawings to PG County Permit Office for approval
Stakeholder Engagement

- Serve as Vice-chair of International Air Transport Association (IATA) Passenger Experience - Biometrics Multidisciplinary Group
- Engaged air industry stakeholders to discuss project goals, gather operational requirements, and address potential concerns
- Conducted air entry/exit webinar with Airports Council International-North America (ACI-NA) to discuss notional CONOPs
- Completed January 2014 ACI-NA, Airlines for America and U.S. Travel Association working session to further discuss pros and cons of notional CONOPs
## Test & Evaluation Strategy

<table>
<thead>
<tr>
<th>Test &amp; Evaluation</th>
<th>Laboratory Tests</th>
<th>Scenario-based Tests</th>
<th>Field Trials</th>
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</thead>
<tbody>
<tr>
<td><strong>Laboratory Tests</strong></td>
<td>• Ensure biometric devices can perform with current air entry/exit operations</td>
<td>• Assess CONOPS performance</td>
<td>• Evaluate systems performance</td>
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<td>• Determine biometric-device applicability for each CONOP</td>
<td>• Assess human-to-system issues in air entry/exit processes</td>
<td>• Identify and mitigate observed impacts to operational processes</td>
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<td>• Model potential impacts to operational processes</td>
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**Iris Capture Process**

**Fingerprint Capture within the FIS**
## Draft Evaluation Criteria

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<tbody>
<tr>
<td>SDK/API Integration</td>
<td>CONOPS Integration</td>
<td>Systems Integration</td>
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<tr>
<td>Data Standards Conformance</td>
<td>Transaction Time/Throughput</td>
<td>Biographic/Biometric Matching Performance</td>
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<td>Biometric Data Quality</td>
<td>Usability</td>
<td>Aircraft Turn Time</td>
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<tr>
<td>Third Party Certification/Test Review</td>
<td>Biometric Performance</td>
<td>Airport Connection Time</td>
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<tr>
<td>Capture Conditions Assessment</td>
<td>Exception Handling</td>
<td>Gate Utilization</td>
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<tr>
<td>Biometric Capture Assessment (FTA, FTP, acquisition time)</td>
<td>Network Bandwidth and Latency</td>
<td>Operations Impact Assessment</td>
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<td>Interoperability/Intraoperability</td>
<td>Footprint and Weight</td>
<td>Traveler Experience and Satisfaction</td>
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<td>Staffing Levels</td>
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*Homeland Security Science and Technology*
Iris Device Qualification Test (IDQT)

- Developed by DHS S&T Directorate and NIST

- Provide evaluation and qualification tests of iris cameras, to support down selection decisions of devices prior to human-in-the-loop testing for US Government applications.

- Develop “Appendix F-like” iris device qualification testing tools and procedures which:
  - Minimize biases between devices
  - Minimize modification to intended device operation on real human subjects
  - Measure “peak” imaging performance… degradation from realistic operations should be revealed in subsequent evaluation stages
  - Should be simple enough to be practically conducted by a third party testing facility
Notional Biometrics Self-Boarding Gate
Notional Centralized Capture (ABC)
Notional Irregular/Mobile Operations
Notional Passenger Loading Bridge
Test & Evaluation Capability

Maryland Test Facility (MdTF) - Controlled environment for laboratory and scenario-based testing to evaluate biometric technologies and other operational processes under simulated airport entry and exit conditions

- Over 25,000 sq. ft. of office and laboratory space
- Designed to support 3 tests and 50 test subjects concurrently
DHS Level I Acquisition Process

- Deliberate acquisition process reduces risk and increases oversight

- Apex AEER outputs inform each phase of a future CBP acquisition process and, as a result, provide the component with a “jump start” that could compress elements of the schedule

## Major Activities

### Phase 1: Need
- Determine Need
- Site Surveys
- Data Collection

**Goal:** Program need is validated; solution set investigation

### Phase 2: Analyze / Select
- Solution Engineering
- Laboratory Testing
- Scenario Testing
- Economic Analyses

**Goal:** Tech approved as best of competing solutions (performance, costs, & risks.)

### Phase 3: Obtain
- Requirements Definition
- Design/Development
- Integration and Field Testing
- Implementation

**Goal:** Specific capabilities tested; program is approved to go into production

### Phase 4: Produce / Deploy/ Support
- Acquisition activities
- RFP Process

**Goal:** Production capability rolled out to first airport after contract award
Questions?