



Homeland
Security

OBIM and the Scientific Advancement of Face Image Quality

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- **Purpose**

- To inform attendees on the use and status of face recognition within DHS and propose next steps for its advancement

- **Agenda**

- Presidential Memorandum from January 2021
- Face Recognition within DHS
 - Growth, Metrics, Traveler Inconvenience
- Face Image Quality Standard (FIQS) Next Steps



- **The Presidential “Memorandum on Restoring Trust in Government through Scientific Integrity and Evidence-Based Policymaking” from January 2021:**
 - Directed the heads of agencies that fund, conduct, or oversee scientific research to designate a senior agency employee for the role of chief science officer, science advisor, or chief scientist;
 - Directed the heads of all agencies to designate a senior career employee as the agency’s scientific-integrity official; and
 - Directed heads of agencies to ensure those designated to serve in these roles are selected based on their scientific and technological knowledge, skills, experience, and integrity.



- **As defined in the memo, the “Chief Science Officer” will:**
 - “Serve as the principal advisor to the head of the agency on scientific issues and ensure that the agency’s research programs are scientifically and technologically well-founded and conducted with integrity; and
 - Oversee the implementation and iterative improvements of policies and processes affecting the integrity of research funded, conducted, or overseen by the agency, as well as policies affecting the Federal and non-Federal scientists who support the research activities of the agency, including scientific-integrity policies consistent with the provisions of [the] memorandum.”
- **The “Scientific Integrity Officer will:**
 - Oversee implementation and iterative improvement of scientific-integrity policies and processes consistent with the provisions of this memorandum, including implementation of the administrative and dispute resolution processes described [elsewhere in the memo].



FRT Growth within DHS

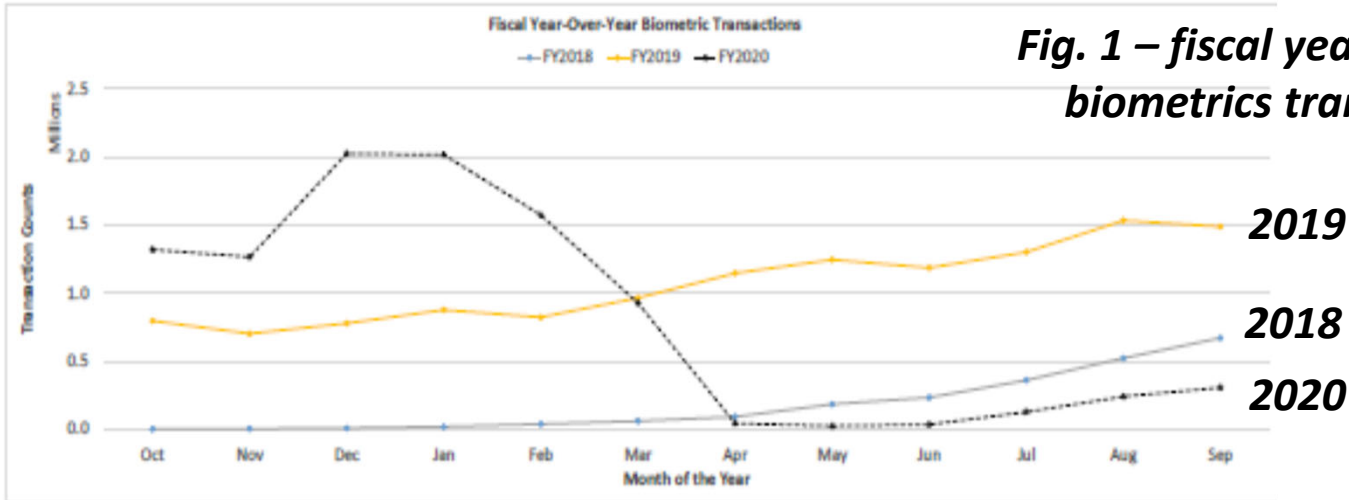


Fig. 1 – fiscal year-over-year biometrics transactions

This chart shows historical year-over-year total biometric transactions per month.
 - December 2019 was the peak month in FY2020 with total transactions of 2.02M.
 - May 2020 was the least active month in FY2020 with total transactions of 22.34K.

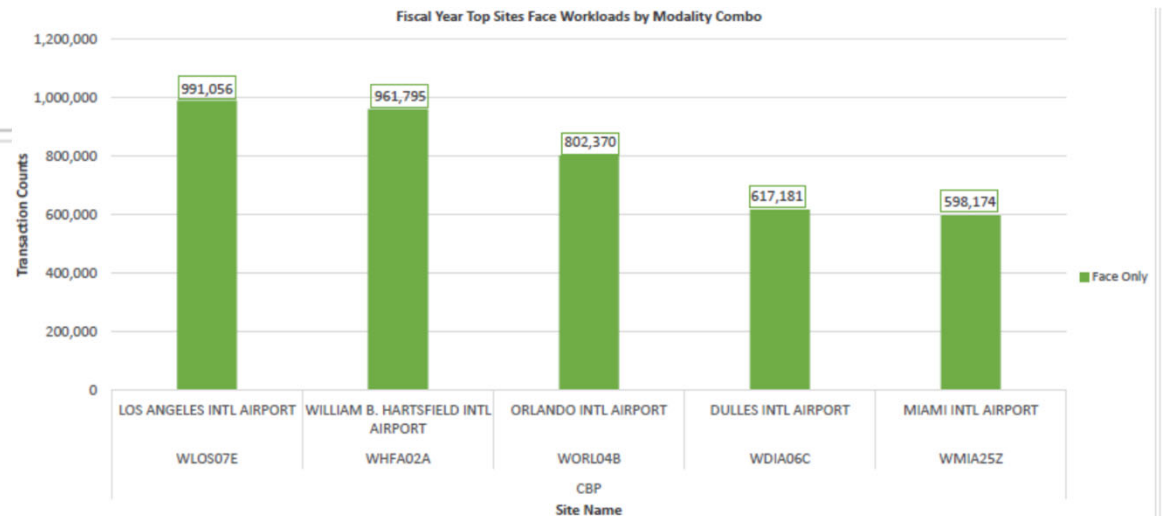


Fig. 2 – fiscal year top sites face workloads



Available Face Image Quality Metrics

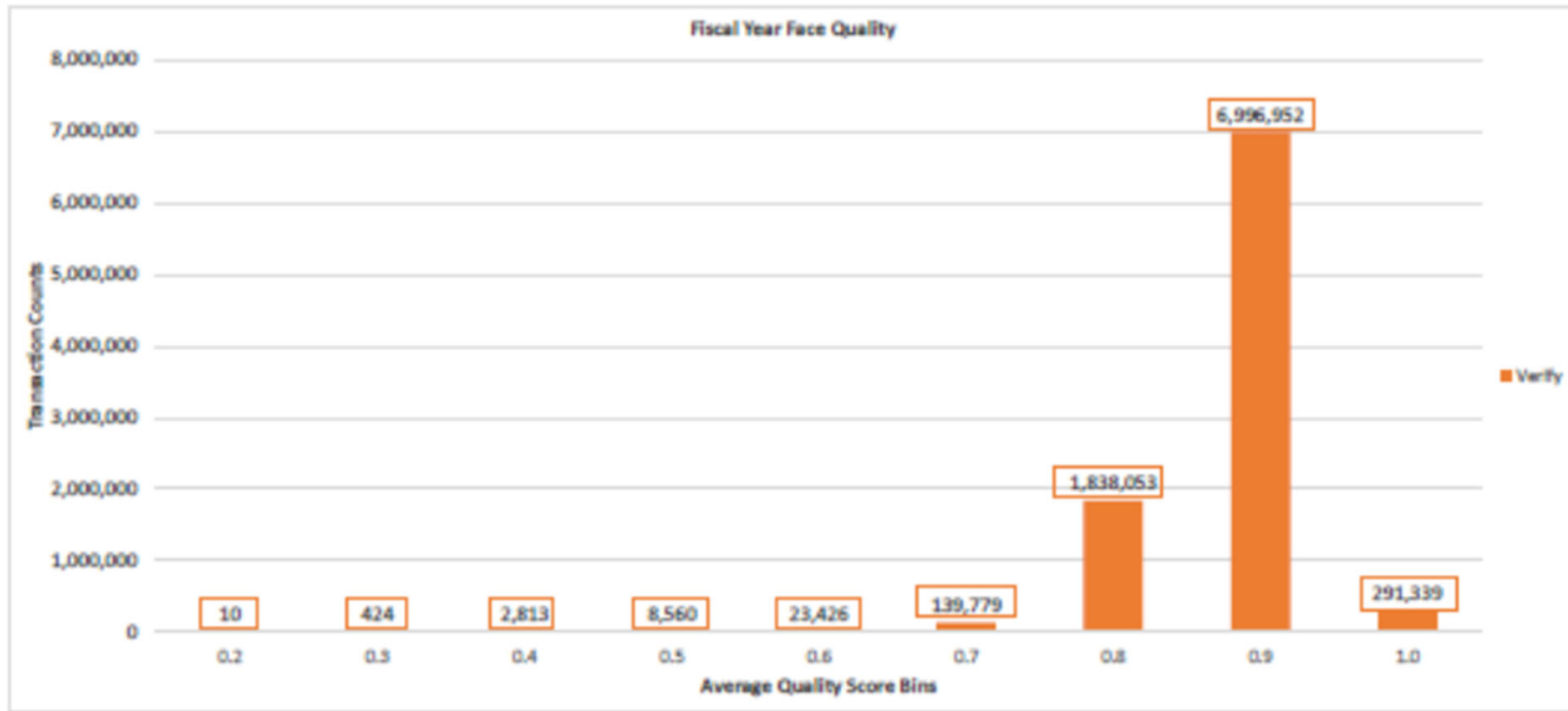


Fig. 3 – Fiscal Year Face Quality



OBIM Operational Performance Metrics

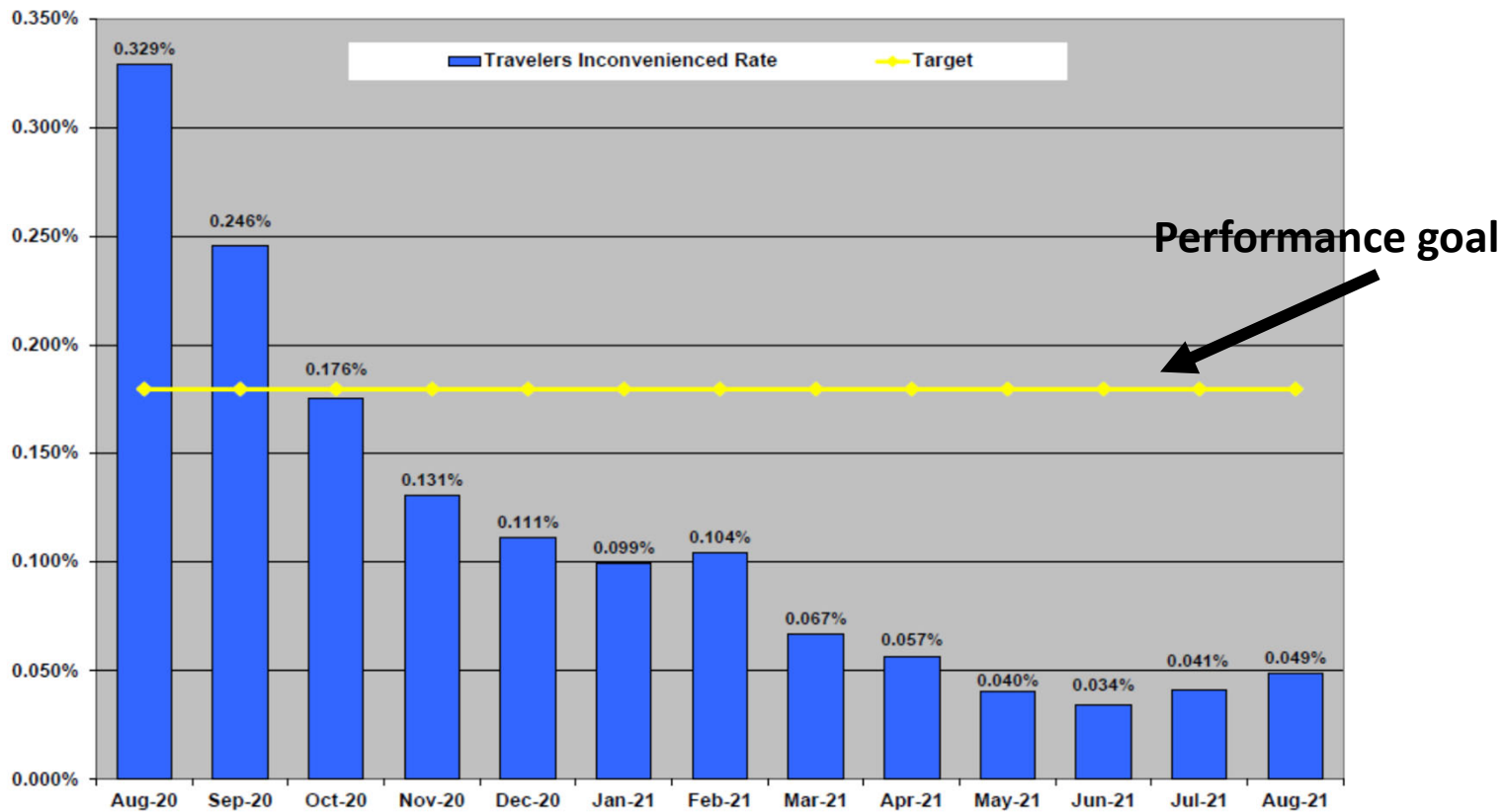
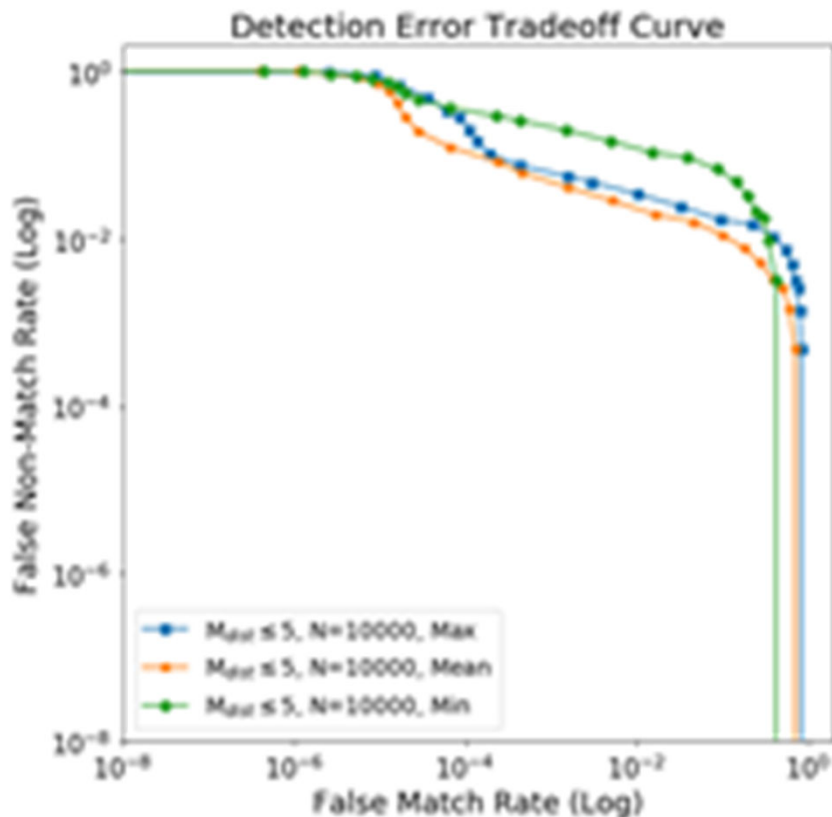
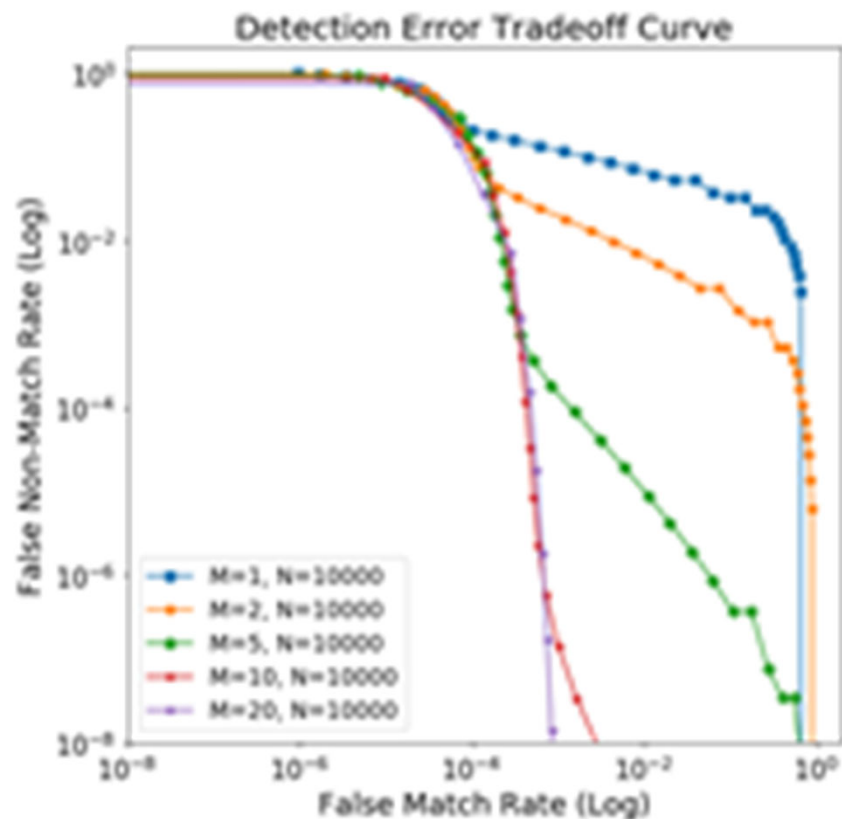


Fig. 4 – % of travelers inconvenienced by biometric errors



Implementation of FRT “one-to-few” Comparison



Source: D. Halfen, S. Rajaraman, J. Wayman. “Biometric Recognition in a Multi-sample Multi-Subject Facial Image Database: The 1:M:N System Model”, BIOSIG 2021 Conference, Darmstadt, September 19, 2021

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Please list the source for the data in the chart.

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Next Steps for Face

- **Objective** – Reduce traveler inconvenience, as well as fraud, due to biometric errors
- **Problem** – Difficulty reducing errors when we do not control or own the collection of the reference image (e.g., passport photo)
- **Remedy** – Advance the international FIQS (i.e., ISO/IEC 29794-5)
- **Next Step** – Provide the additional information required to fully develop the FIQS
 - How do we **define** quality, **measure** quality, and **use** quality?



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