Defining AFIS Latent Print “Lights-Out”
**AFIS 10-Print Lights-Out**

**Arrest – Booking Process**
- Booking Officer performs 10-Print fingerprint capture and transmitted electronically to AFIS
- Adherence to ANSI/NIST ITL 1-2007 standard

**10-Print Operations**
- Central site receives and processes 10-print record with no human intervention; AFIS classifies, filters repository, extracts minutiae and performs search. Automatic Hit/No Hit decision. Record is updated or created.

**Court**
- Booking Officer and 10-print Examiner testify
- 10-print examiner reviews record, compares all fingerprints, verifies as being same person. Prepares report. Testifies in court.

- Arrest record is available upon request.
- Request for records testimony
- Notification of results is returned to submitting agency
“It is important to distinguish AFEM-based latent fingerprint identification from the general concept of *lights-out identification*. *Lights-out* identification refers to a system requiring minimal or zero human assistance in which an image is presented as input, and the output consists of a short candidate list. For ten-print search applications, this list may be: 1) empty, 2) contain a single candidate, or rarely 3) have more than one candidate. Event (3) will occur only in cases when the matcher produces more than one candidate with a significant computed probability of being a true mate. *Lights-out* matchers are currently in operation for rolled fingerprint search systems, and are emerging for plain impressions. Latent fingerprints are much more difficult, and no *lights-out* matchers are currently in operational service. Furthermore, the *ELFT07 Concept of Operations (CONOPS)* asserts that a fully *lights-out* latent fingerprint matching capability represents too large of a single step from current practices.”
Crime Scene Investigator (CSI); not a latent print expert, but knows how to collect evidence for submission to the Laboratory and to process evidence for latent prints that can not be removed.

Latent Print Expert (LPE) performs exam of all evidence, analyzes all latent prints, and decides which latent prints are to be AFIS searched.

AFIS - latent print is searched using LPE’s designated criteria against database and a candidate list is generated.

LPE enters AFIS search criteria; orientation, image enhancement, filtering, and minutiae.

LPE receives AFIS candidate list and makes comparisons.

Identifications are verified by a second LPE.

LPE sends report to Investigator and on to Prosecutor.

CSI & LPE testify in court.
Crime Scene Investigator (CSI); not a latent print expert, but knows how to process evidence for latent prints.

CSI is trained on how to scan and launch latent prints for AFIS search.

CSI is not trained on latent print orientation, image enhancement, finger position determination, fingerprint classification, etc.

AFIS automatically extracts latent print features (“lights-out”) and search is performed.

AFIS predefined threshold score determines identification decision; no LPE involved (“lights-out”).

Identifications are verified by a second and different AFIS matcher in a 1:1 mode; no LPE involved (“lights-out”).

LPE sends report to Investigator and on to Prosecutor.

CSI & LPE testify in court.
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CSI is trained on how to scan and launch latent prints for AFIS search.

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Crime Scene Forensic Laboratory

AFIS automatically extracts latent print minutiae and search is performed in all rotations and against entire data base.

Latent print expert (LPE) receives AFIS candidate list and makes comparisons.

Identifications are verified by a second LPE.

LPE sends report to Investigator and on to Prosecutor.

CSI & LPE testify in court.
Crime Scene Investigator (CSI); not a latent print expert, but knows how to collect evidence for submission to the Laboratory and to process evidence for latent prints that can not be removed.

Latent Print Expert (LPE) performs analysis of all latent prints and submits AFIS searches in proper orientation, image enhanced, using search filters but uses automatic minutiae extraction.

AFIS automatically extracts latent print minutiae and search is performed using LPE’s designated orientation, image enhancement, and filtering.

LPE receives AFIS candidate list and makes comparisons.

Identifications are verified by a second LPE.

LPE sends report to Investigator and on to Prosecutor.

CSI & LPE testify in court.
Crime Scene Investigator (CSI); not a latent print expert, but knows how to collect evidence for submission to the Laboratory and to process evidence for latent prints that can not be removed.

Crime Scene

AFIS automatically extracts latent print minutiae and search is performed in all rotations and against entire data base.

Forensic Laboratory

Latent Print Expert (LPE) performs analysis of all latent prints and submits AFIS searches without regard to proper orientation, no image enhancement, does not use filtering and uses automatic minutiae extraction.

Latent print expert (LPE) receives AFIS candidate list and makes comparisons.

Identifications are verified by a second LPE.

LPE sends report to Investigator and on to Prosecutor.

 CSI & LPE testify in court

Court
Crime Scene Investigator (CSI); not a latent print expert, but knows how to collect evidence for submission to the Laboratory and to process evidence for latent prints that can not be removed.

Latent Print Expert (LPE) performs analysis of all latent prints and submits AFIS searches in proper orientation, image enhanced, using search filters but uses automatic minutiae extraction.

AFIS predefined threshold score determines identification decision; no LPE involved ("lights-out")

LPE sends report to Investigator and on to Prosecutor.

Identifications are verified by an LPE.

AFIS automatically extracts latent print minutiae ("lights-out") and search is performed using LPE’s designated orientation, image enhancement, and filtering.

CSI & LPE testify in court
AFIS "Semi Lights-Out" Searching and Latent Print "Lights-Out" Verification

Crime Scene

Crime Scene Investigator (CSI); not a latent print expert, but knows how to collect evidence for submission to the Laboratory and to process evidence for latent prints that can not be removed.

Forensic Laboratory

AFIS automatically extracts latent print minutiae ("lights-out") and search is performed using LPE’s designated orientation, image enhancement, and filtering.

Latent Print Expert (LPE) performs analysis of all latent prints and submits AFIS searches in proper orientation, image enhanced, using search filters but uses automatic minutiae extraction.

LPE receives AFIS candidate list and makes comparisons and identification decision.

Identifications are verified by a second and different AFIS matcher in a 1:1 mode; no LPE involved ("lights-out")

LPE sends report to Investigator and on to Prosecutor.

Court

CSI & LPE testify in court
Crime Scene Investigator (CSI); not a latent print expert, but knows how to collect evidence for submission to the Laboratory and to process evidence for latent prints that can not be removed.

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CSI & LPE testify in court
Which scenario is the ELFT Phase II test?
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CSI & LPE testify in court.

Crime Scene

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Court

CSI & LPE testify in court.
What is the demand for each scenario?

Where is the market now? Future?

What needs to be tested next?