DRAFT Writing Guidelines for Requests for Proposals for Automated Fingerprint Identification Systems

Latent Print AFIS Interoperability Working Group

Enter Once, Search Many

OLES
LAW ENFORCEMENT STANDARDS OFFICE
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NIST
National Institute of Standards and Technology

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FOREWORD

This is one of a series of documents prepared by the Latent Print Automated Fingerprint Identification System (AFIS) Interoperability Working Group. The purpose of these documents is to provide guidance and a framework to those involved in the identification process who may be tasked to be a project leader or member of a working group for an AFIS purchase, replacement, upgrade, or move to a more biometrics-based identification process.

Each agency has its own procedures as well as policies and laws that are applicable in the procurement process. The information contained in these documents should be considered as complementary.

The Latent Print AFIS Interoperability Working Group

The lack of latent print search interoperability and the subsequent missed opportunities to make identifications have been long recognized as serious issues within the examiner community. Latent print examiners, AFIS managers, vendors, governmental agencies, and professional organizations have explored opportunities to improve interoperability. Since the introduction of AFIS systems in the 1980s and the Federal Bureau of Investigation's (FBI's) Integrated Automated Fingerprint Identification System (IAFIS) in the late 1990s, latent print identifications have risen on a hierarchical level but not on a peer-to-peer basis.

As part of a National Institute of Justice (NIJ)/National Institute of Standards and Technology (NIST) effort to address the lack of AFIS interoperability, the Law Enforcement Standards Office (OLES) formed the Latent Print AFIS Interoperability Working Group. The mission of this Working Group is to improve latent print AFIS interoperability by developing a clear understanding of the issues and challenges to latent print AFIS interoperability and to identify collaborative ways to actively address this national problem.

The first meeting of the Working Group was held in April 2008. The release in February 2009 of the National Academy of Sciences' report, *Strengthening Forensic Science in the United States: A Path Forward*,[1] gave further support to the issue at a national level.

The Working Group consists of federal, state, and local representatives as well as vendors and other members of the identification community. These include the following:

[1] National Academy of Sciences, National Research Council, Committee on Identifying the Needs of the Forensic Science Community. *Strengthening Forensic Science in the United States: A Path Forward.* National Academies Press, 2009.

State and Local Representation

Broward County, Florida, Sheriff's Office
Culver City, California, Police Department
Illinois State Police, Forensic Science Center at Chicago
Los Angeles County, California, Sheriff's Department
New Hampshire Division of State Police Forensic Laboratory
New York State Division of Criminal Justice Services
Nlets
San Francisco, California, Police Department
Santa Monica, California, Police Department
South Carolina Crime Information Center
Texas Department of Public Safety
Western Identification Network, Inc.

Federal Representation

Department of Homeland Security
FBI Criminal Justice Information Services Division
NIJ Office of Science and Technology
NIST Information Technology Laboratory
NIST Law Enforcement Standards Office

AFIS Technical Advisors and Vendor Representatives

While many individuals contributed to the success of this project, the following are noted for having made significant contributions of their time, talent, and vision:

Susan Ballou	National Institute of Standards and Technology
Anthony Clay	United States Secret Service
Joi Dickerson	Culver City, California, Police Department
Mike Garris	National Institute of Standards and Technology
Peter T. Higgins	Higgins & Associates, International
Janet Hoin	New York State Division of Criminal Justice Services
Lisa Jackson	Santa Monica, California, Police Department
Mike Lesko	Texas Department of Public Safety
Joe Morrissey	New York State Division of Criminal Justice Services
Leo Norton	Los Angeles County, California, Sheriff's Department
Beth Owens	Franklin County, Ohio, Sheriff's Office
Joe Polski	International Association for Identification (Ret.)

The objectives of the Working Group in the preparation of these documents were to:

- ❑ Define the issues and challenges to latent print AFIS interoperability
- ❑ Identify opportunities to actively address latent print interoperability

- Develop guidelines to provide guidance on technical and administrative issues

The Working Group developed this and other documents to meet the needs of latent print examiners, AFIS users, managers, vendors, and policy makers to establish interagency latent AFIS interoperability. This document is one in a series of reference documents to help agencies achieve interoperability, located at http://www.fingerprint.nist.gov/.

INTRODUCTION

This document incorporates input from AFIS practitioners, examiners, users, and vendors. It is intended to provide agencies with an overall guide to critical conditions and decisions, allowing agencies the best opportunity to have a clear and succinct Request for Proposals (RFP), detailed responses for evaluation, and the implementation of the new AFIS with a minimum amount of frustration and delay.

The document uses the term AFIS, but the reader may substitute Automated Biometric Identification System (ABIS), AFIS upgrade, or another term that will convey an enhancement over the identification technologies currently used by the agency.

Nothing in the document is intended to supersede the legal, financial, and administrative authority of the requesting agency. It is intended to provide a framework for developing the management team and for identifying the technical aspects of building a proposal, evaluating the responses, and creating a more complete and integrated identification process.

There are four major sections of this document:

- ❑ Overview of the Procurement Process
- ❑ AFIS Upgrade Phases
- ❑ Attachment I: Request for Information Template
- ❑ Attachment II: Request for Proposals Essentials

Each section can stand alone, but the reader is encouraged to review the entire document for a better understanding not only of the proposal process, but also of some of the specific items that should be considered for system improvements. An AFIS upgrade or new system is expensive in terms of both human capital and government dollars. The more complete and succinct the planning, procurement, testing, and acceptance, the better the system will be.

Because it is valuable for the reader to have a clear understanding of the proposal process, the following paragraphs will serve as a primer, or a basis, to better apply the concepts found in the next section, *Overview of the Procurement Process*.

Every procurement goes through a process or life cycle. The example in this document will summarize the four phases that:

- ❑ Establish leadership;
- ❑ Create the RFP;
- ❑ Evaluate proposals and award contract; and

- ❑ Manage procurement and implementation

Critical to success is the assignment of a talented project leader and working group coupled with a clear vision of the needs of all stakeholders.

Successful projects are built upon team efforts in which each person contributes. The RFP may result in a system that will cost hundreds of thousands, if not millions, of dollars. Commitments of funding, access to legal and administrative resources, as well as the political environment are essential for success. The agency may consider the need for an outside consultant to represent interests if the agency is not strong in these areas.

The agency should specify any administrative requirements that will affect the review of the proposal. The agency can identify key submission dates, the format and content requirement for proposals, as well as mandatory conditions of the final product. Desirable requirements are identified with the words “should” or “could,” while mandatory requirements use the terms “must,” “will,” or “shall.”

In its specifications and requirements, the agency describes in very clear terms the current operating system and what it would like the next system to include. The more clearly the agency can describe the current operation and its vision for a new or upgraded system, the better the resulting proposals will be.

The agency must be very clear on the criteria used to evaluate the proposals, such as the relative merit of cost and the technical response, the importance of the experience of the vendor, and the composition of the evaluation team. Each vendor has an expectation of fairness and recognizes that only one contract will be awarded. It becomes critically important that the evaluation process be honest, thorough, and well documented.

In addition to the technical and administrative requirements, there are other requirements that must be met for a successful agency/vendor relationship. These include governing laws, payments and warranties, and insurance. While these items may be incorporated as a standard procedure by the agency’s administrative office, it is important to be reminded of these essential elements for success.

OVERVIEW OF THE PROCUREMENT PROCESS

It is not unusual for government procurements to face a multitude of challenges. The development of a successful RFP, proposal review, contract award, and project implementation will require the talents of many individuals with specialized training and backgrounds.

The AFIS operations staff members must concern themselves with accuracy, throughput, and records. The finance office needs to know how much the project will cost, the source of funds, and the payout schedule. The legal team needs to identify relevant state and federal laws. To direct this amalgam of dedicated professionals, agency managers must appoint a project administrator to oversee the process and report on progress.

Key partners in the process may be overextended, overcommitted, or unfamiliar with the level of specificity required in an AFIS RFP. As a result, there can be a tendency to over-rely on vendor recommendations. A well-developed working group under the direction of a project leader can bring the necessary skills to the project and maintain objectivity. The working group should consider the use of a request for information (RFI) to the vendor community to collect information prior to developing the RFP. The RFI can help the working group to clarify issues, get a better sense of new technologies, and frame the RFP in a better way. The working group can make a response to the RFI a condition for further consideration in the RFP process.

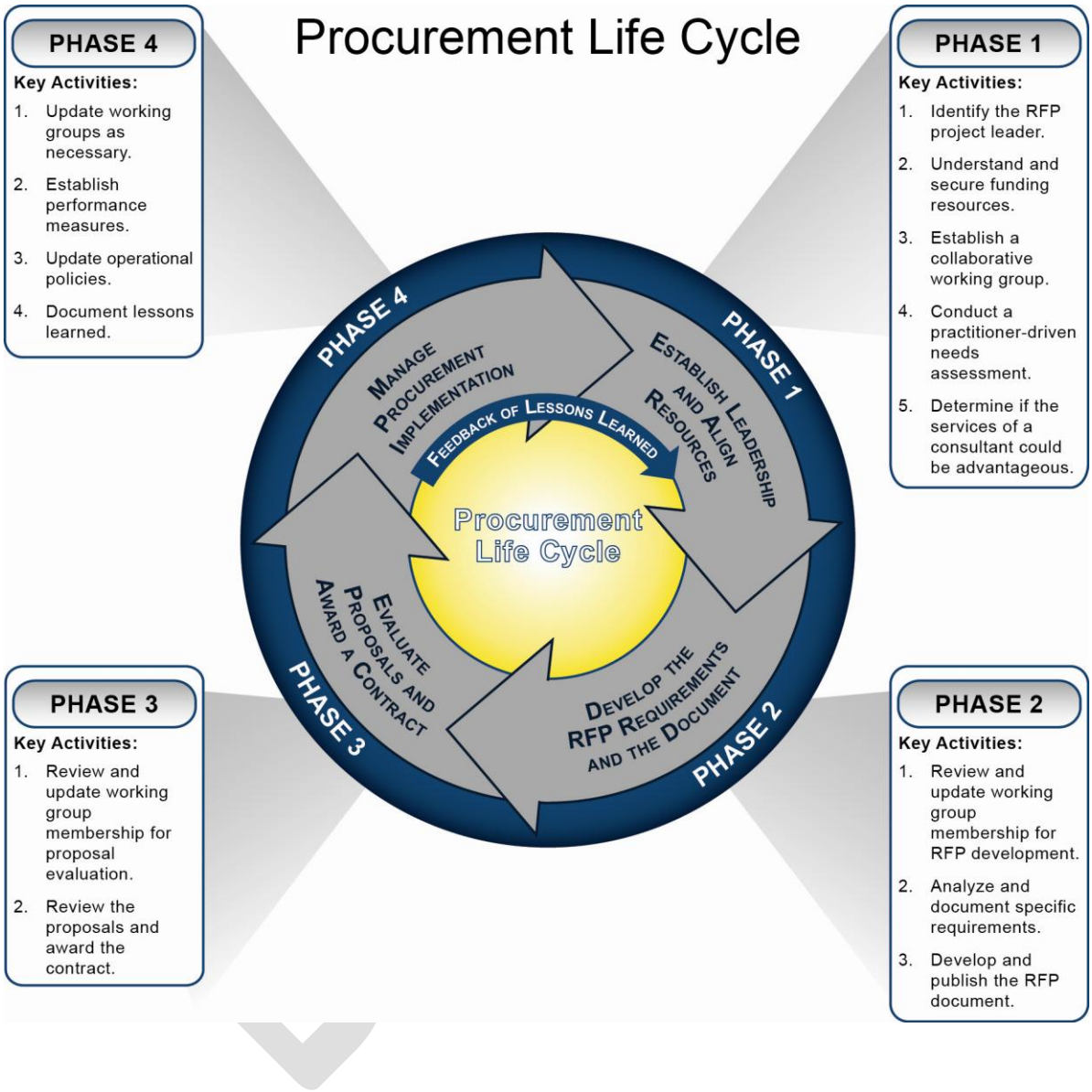
AFIS purchases are frequently limited to a specific political boundary without any attempt at interoperable solutions. Collaboration with another agency may provide greater benefit to the participants than either could achieve alone, frequently at a reduced cost. In addition, the move to collaboration in latent print searches should allow the agency to mandate conformance to the *Latent Interoperability Transmission Specification* (LITS).[2] Agencies may also require open architecture in new systems to minimize the dependency on specific hardware and the amount and type of support that must be available as backup.

Staff members have to anticipate the impact the new AFIS will have on existing and future operations and must be prepared to handle the administrative and human effects. Recognizing the impact of a new AFIS in its totality and conveying that vision through a carefully defined RFP will benefit the agency, the prospective bidders, and the identification process.

It is important to understand what are recognized as the Four Phases of the Procurement Life Cycle. While there are many examples, the Department of Homeland Security

[2] Noblis. *Latent Interoperability Transmission Specification*, Draft v0.3. Nobils, November 3, 2011. http://noblis.org/MissionAreas/nsi/Services/IdentityDiscoveryandManagement/BiometricsandForensics/Pages/Interop.aspx, accessed December 8, 2011.

SAFECOM project will be referenced in this section.[3] The intent is to provide the reader with a relatively simple concept that contains the major elements of a very complex process.



Phase 1: Establish Leadership and Align Resources

Phase 1 sets the foundation for the entire project. If this phase is not well developed, the success of the project will be reduced. By clearly identifying potential personnel, legal, and

[3] See "Enhancing Communications Interoperability: Guidelines for Developing Requests for Proposals (RFPs)," page 3; SAFECOM, Department of Homeland Security, March 31, 2006.

administrative issues at the beginning of the process, the working group and project leader will build a successful enterprise and will meet the expectations of project stakeholders.

1. Identify the RFP Project Leader

This most critical step is made by the agency sponsoring the project. Management identifies the project leader who will manage and oversee the project, protect the interests of the stakeholders, and work collaboratively with other agency and non-agency personnel.

The project leader will have to understand the political environment of stakeholder organizations that will be affected by the project. The project leader must build working relationships with other leaders in the administrative, budget, and legal process. The project leader will be responsible for the project schedule and the review periods, understanding the contracting and procurement process and reporting on progress to agency management. The project leader should also understand budget cycles, regulations, and standard or "boilerplate" language used in every RFP and contract.

2. Understand and Secure Funding Resources

The project leader will be responsible for cost estimates, budgetary issues, and the rules and regulations associated with government procurement. While the agency budget office will have overall responsibility for financial matters, the more clearly the project leader can identify, correct, and resolve budget issues, the more smoothly the project will advance.

3. Establish a Collaborative Working Group

The working group consists of relevant stakeholders to support all phases of the procurement and implementation processes. The working group can provide overall guidance and direction, ensuring early buy-in and easing possible delays. By producing a written charter, the working group identifies the project objectives, timeline, and issues. This becomes invaluable to keeping the project on track and provides a reference point for both inside and outside interests.

4. Conduct a Practitioner-Driven Needs Assessment

With the appointment of a working group and creation of a charter, the group turns its attention to developing a needs assessment. While there may be a consensus that the current system needs to be upgraded or replaced, a well-developed needs assessment will identify the specific requirements of a new system and potential services and solutions that will meet them. The assessment must not only address current needs, but it must also look toward the future. For example, if the current AFIS does not collect palm prints or mug shots, these might be desirable in a future system as agencies embrace more biometrics in the identification realm.

5. Determine if the Services of a Consultant Could be Advantageous

Creating an RFP for an AFIS may be a once-in-a-career event. As such, agency individuals who participated in the original project may no longer be available, resulting in a project that could be challenging and possibly filled with avoidable pitfalls. Agencies should consider the value of an experienced consultant to provide guidance.

Phase 2: Develop the RFP Requirements and the Document

With the appointment of the project leader, movement from the working group to secure funding sources, and the completion of the needs assessment, the RFP writing can begin in earnest. The critical steps in this phase are as follows.

1. Review and Update Working Group Membership for RFP Development

The team that was established at the beginning of Phase 1 may have changed by this point in the process. Other assignments, administrative changes, and retirements are just a few of the examples of how membership can change. As a result, it is important that the project leader and working group re-examine its membership periodically and make changes as necessary. The skills needed for RFP development may differ from the skills needed in Phase 1. New people brought into the working group will have to be briefed on the mission, their responsibilities, and the status of the project to date.

2. Analyze and Document Specific Requirements

The requirements documents explain to prospective vendors what issues the agency seeks to address with the new AFIS. These documents also provide a point of reference for the agency and working group as to the scope of the problem the agency seeks to resolve with newer technology. The working group should be mindful of the needs of all stakeholders, particularly the needs of the identification operations group, which includes practitioners from the latent and ten-print communities. It may be useful to identify specific terms or definitions in a Glossary of AFIS Terms (see Attachment 3) to make the intent more easily understood by other members of the working group as well as prospective vendors.

The working group may also wish to consider the use of an RFI to collect information from vendors about possible solutions. The RFI is a formal request for specific information about current technologies and processes. This information may be useful to the agency in finalizing the RFP. An RFI may be beneficial because it:

- ❑ Identifies technical challenges and cost drivers
- ❑ Identifies potential vendors and their capabilities
- ❑ Allows appropriate adjustments to mandatory and optional requirements
- ❑ Obtains cost estimates

- ❑ Obtains scheduling estimates
- ❑ Updates budget cycle
- ❑ Updates vendor qualification requirements

The project leader and working group must determine if the expected benefits of an RFI is worth the investment in resources to develop the RFI and review the responses. More detail is found in Attachment 1.

3. Develop and Publish the RFP Document

Using the information gathered, the working group prepares the RFP according to the agency requirements. It may prove useful to contact colleagues in other agencies to learn from their experience in developing an RFP and to solicit suggestions for improvements. More detail on the essential elements of an RFP is included in Attachment 2.

Phase 3: Evaluate Proposals and Award a Contract

A well-crafted RFP should result in well-crafted proposals from vendors. The more clearly the working group can define its vision and support it with dates, tables, and charts, the more succinct the proposals will be.

1. Review and Update Working Group Membership for Proposal Evaluation

The working group will need to shift gears from a developmental posture to an evaluative stance. The membership of the working group may change as this new role is developed, or a special subcommittee of the group may be chartered to evaluate the proposals.

2. Review the Proposals and Award the Contract

When reviewing proposals, evaluators must ensure fairness, consistency, documentation, and confidentiality. Some evaluations have two review teams: one for the technical aspects and another for the cost analysis. The evaluation methods, scoring, forms, and weighting should be agreed to prior to beginning the evaluations. At the conclusion, the agency should announce the winning proposal and debrief the vendors not selected.

Phase 4: Manage Procurement Implementation

1. Update Working Groups as Necessary

As the project moves from planning to an implementation stage, this is a good time to re-examine the makeup of the working committees and to make changes as appropriate.

2. Establish Performance Measures

Performance measures ensure that the project is on track, on schedule, and beneficial to all parties. The agency makes a commitment to the vendor to test and accept the system if the measures are met. The vendor makes a commitment, backed by a performance bond, that the system installation will meet the contractual requirements on performance and installation time.

3. Update Operational Policies

The new system will require new operations and tasks. Updating the operational policies to embrace the new processes will codify tasks and expectations and will serve as a reference point to resolve issues.

4. Document Lessons Learned

The Procurement Life Cycle could last a few months or several years. It will be useful to document the lessons learned in the process. This documentation can prove beneficial in the next procurement or upgrade, particularly if there are changes in the working group and/or a new working group.

By understanding the Procurement Life Cycle, the project leader and members of the working group have a clearer understanding of the complexity of procurement as well as the opportunities to make the process more efficient. As a cycle, the end of the process leads to the beginning of the process. The end of the AFIS procurement may lead to another procurement process, and the lessons learned will prove valuable in future efforts.

AFIS UPGRADE PHASES

In other sections of this document, the reader has been introduced to the Procurement Life Cycle, a template for an RFI (Attachment I), and the essentials of an RFP (Attachment II). This section contains very specific information that should be considered when developing an AFIS upgrade RFP and managing the phased implementation.

The team preparing the RFP must secure a funding commitment, gain support of the requesting agency's management, and collaborate with other specialists (e.g., legal) who will be critical in the successful implementation of the project.

Developing Business Case for New Procurement

There are many reasons why an agency might be considering an upgrade to the existing AFIS. Some of these reasons include:

- ❑ Age of installed base (e.g., obsolescence)
- ❑ New functionality (e.g., latent interoperability, improved accuracy, more biometrics)
- ❑ Growth in transactions (e.g., system capacity)

Phases of the Upgrade

1. Project Management Phase

Successful projects, like successful companies, are a combination of good staff members and good management. Having the right mix of talents, abilities, and skills is essential to completing a successful upgrade or acquisition on time within budget and meeting the expectations of stakeholders.

Stakeholders

There are many parties interested in the current and future AFIS. Their interest and participation are vital to the overall success of the project. These stakeholders include:

- ❑ Policy makers
- ❑ Customers
- ❑ Key influencers
- ❑ Outside stakeholders (e.g., chief of police, advisory boards, or chief information officer)

The chart below can help agencies determine and agree upon who their key stakeholders are. Depending on the agency type, not all the sources in the chart may need to provide input.

	Decision-Makers	Requirements Developers	Reviewer
Finance			
Legal			
Contracts			
Information Technology			
Ten-print			
Latent			
Outside Stakeholders			
Consultants			
Corrections			

Use of Consultants

As stated in a previous section, the use of a consultant should be considered when specialized expertise and experience are not available within the working group. A consultant can provide varying levels of input ranging from advisory roles to full-time management support of the procurement process. This expertise can be useful in:

- ❑ Market and trend research
- ❑ Needs assessment
- ❑ RFP development, evaluation, and/or award
- ❑ RFP compliance oversight
- ❑ Implementation oversight

Project Leader

The selection of the project leader may be one of the most important activities in the project life cycle. The project leader can seek information about the procurement from other sources such as peers, vendor user groups, professional associations, and trade shows.

Work Products of the Working Group

Source Selection Plan

The evaluation team should adhere to an approved Source Selection Plan to include the following:

1. Evaluation schedule
2. Roles and responsibilities (with specific names of those involved)
3. Evaluation plan
    a. Adherence to submission instruction (e.g., page limits and graphics)
    b. Inclusion of mandatory items (checklist)
    c. Structure scoring plan (relative weight of major categories and individual requirements)
    d. If feasible and needed, scheduling of:
        i. Benchmark testing
        ii. Oral presentations by the vendors
        iii. Demonstration
    e. Sample rating criteria:
        i. Non-responsive – Not fully responded to; omitted, misunderstood, or is closer to a repetition of the original requirement than to a clear, thoughtful response
        ii. Satisfactory response – Shows that the intent of the requirement has been satisfied
        iii. Well-defined response – Provides a strong level of confidence that the vendor can and will satisfy this requirement quite well
        iv. Outstanding response – Provides a very strong level of confidence that the vendor can and will more than satisfy this requirement
4. Approval authority (structured approval process that includes several groups reviewing different sections)

The Example of a Rating Criteria Form, below, illustrates one way in which the working group can organize the strength of the responses. The work group evaluates and scores each requirement based upon response given.

Example of a Rating Criteria Form

Factor	Section	Requirement	Criteria	Weight	Score
Technical/ Management	RFP—C-102	**Workflow Document—** Allocation of tasks for ten-printing, latent, and administrative use for remote users, other investigative users, forensic users, and system administrators to include backup and restore of system and its databases	**Non-responsive –** Not fully responded to; omitted, misunderstood, or is closer to a repetition of the original requirement than to a clear, thoughtful response	0.01	
			Satisfactory response – Shows that the intent of the requirement has been satisfied	0.05	
			Well-defined response – Provides a strong level of confidence that the vendor can and will satisfy this requirement quite well	0.08	
			Outstanding response – Provides a very strong level of confidence that the vendor can and will more than satisfy this requirement	0.10	

2. Planning Phase

The planning process may require a minimum of 6 months and can last as long as several years. Much of the time depends on political support for the project and the budgetary cycle.

Planning

Planning for a new AFIS is a lengthy process that can begin as early as 2 years before an RFP is released. This time may be needed to develop budget estimates, to visit other sites that have a newer AFIS, and to look for differentiators. The working group has to be cognizant of procurement regulations regarding commercial off-the-shelf (COTS) hardware and software and must identify tradeoffs for integrating government-furnished COTS hardware and software. These tradeoffs include:

- ❑ Impact to schedule
- ❑ Delivery cost
- ❑ Hidden management costs
- ❑ Maintenance responsibilities

The working group should develop a Concept of Operations document and have a written acquisition strategy.

Budgeting

The budgetary cycle can be 1, 2, or 3 years long depending on the legislative process. The funding can be contingent on many factors including:

- ❑ User fees, such as driver's licenses, applicant processing, court fees, parking tickets, criminal history searches, and lottery taxes
- ❑ Government budget
- ❑ Perceived value to the community, which is connected to the business case for procuring a new system
  - – Cost benefit analysis
  - – Reduction in crime

The key document is the budget submittal (cost benefit analysis, if required).

3. Solicitation Phase

Depending on an agency's procurement policies, the vocabulary may vary (i.e., RFP, request for offer, etc.). The steps include the following:

1. Prepare draft RFP
2. Review with working group
3. If appropriate, release RFI
   a. Benefits of RFI
      i. Identifies technical challenges and cost drivers
      ii. Identifies potential vendors and their capabilities
      iii. Allows appropriate adjustments to mandatory and optional requirements
      iv. Obtains cost estimates
      v. Obtains scheduling estimates
      vi. Updates budget cycle
      vii. Updates vendor qualification requirements
   b. Review responses and update RFP
4. Gain necessary approval, which will vary by locality (the time frame to obtain approvals can vary from 1 to 6 months or longer)
5. Ensure that the requirements are complete

a. Functional requirements, including the ability to search and match fingerprints and to maintain current case management data
b. Performance requirements, such as the ability to search 100 fingerprint records per hour
c. Interface requirements, such as the ability to ingest and process National Police Services, NIST Interface Control Document (NPS-NIST-ICD MAP) transactions
d. Form and fit requirements (type, make/model, or physical size/capacity), such as specifying an Intel dual-core processor that runs on Windows 7 with a 500-gigabyte hard drive and a 20-inch monitor
e. Reliability, maintainability, and availability requirements, such as a 10,000-hour mean (or median) time to failure of the disk drive
f. Environmental requirements, such as a specification that the system shall operate in a range of 0 to 37 degrees Celsius

6. Release the RFP through the appropriate government representative (most likely a contracting officer)
    a. The approval process for a released package usually contains:
        i. Statement of Work (SOW)
        ii. Requirements specifications
        iii. Schedule
        iv. Terms and conditions
            - Legislative mandates
            - Local policies and standards
        v. Outline of source-selection factors
    b. Managing bidder inquiries
        i. Bidder's conference (optional)
        ii. Question and answer period (mandatory), which is typically conducted via the Internet and limited to no more than 25% of the proposal response period; questions and answers are sent to all registered bidders
        iii. Site visit by vendor to deployment locations (optional)

4. Evaluation/Negotiation Phase

As mentioned above, the evaluation team should adhere to an approved Source Selection Plan to include the following:

- ❑ Evaluation schedule
- ❑ Roles and responsibilities (with specific names of those involved)
- ❑ Evaluation plan

- ❑ Approval authority (structured approval process that includes several groups reviewing different sections)
- ❑ Contract negotiation plan (usually focused on schedule, weaknesses identified in the proposal evaluation, and Bill of Material [BoM] details)

The evaluation of submissions must be fair and consistent. Consider the following as examples of this approach:

1. Management approach
    a. Typically: Approach to operations and maintenance (O&M) support to fielded system, etc.
    b. Weakness: Sample plans often pathetic
2. Technical
    a. Typically: Approach to priority management
    b. Typically: Results of a benchmark
    c. Weakness: Failure to respond to all requirements
3. Cost
    a. Typically: Amount of total cost
    b. Cost evaluated separate from technical proposal (benchmark and oral presentations can be limited to bidders with the best technical/management scores for cost savings)
    c. Weakness: Too expensive
4. Prior experience
    a. Typically: Degree of satisfaction reported by appropriate references called
    b. Weakness: Caught stretching the truth

5. Development or Integration Phase

Design

Consider requesting a preliminary Design Specification in the SOW section of the RFP.

1. Vendor updates Design Specification document (also known as a Technical Specification document)
    a. Customer should provide feedback during this process (meetings, draft review)
        i. Should include architecture, workflows, BoM, interfaces, etc.
        ii. Should map the requirements to the solution
    b. This design phase culminates in a formal design review with approval from appropriate government representative

2. Design Specification is put under configuration control
    a. Changes should be formally documented
    b. Appropriate authority required for approval
3. Agency should deliver government-furnished equipment (GFE) to vendor prior to next phase

Vendor Integration

1. BoM commodities purchased by vendor
    a. Vendor – Obtain BoM items through internal procurement process
    b. Agency – Verify receipt of materials (consider creating checklist)
        i. This process may involve the accounting department, project lead, or Information Technology (IT) representatives
        ii. Documentation is usually required for audit purposes
2. Software customization
    a. Vendor – Implement requirements in conformance with Design Specifications and test
    b. Agency – Track progress and respond promptly to questions
3. Integration of GFE, where applicable
    a. Vendor – Provide detailed product specifications to government representative
    b. Agency – Procure the items as agreed (e.g., software licenses, hardware)
4. File conversion
    a. Vendor – With the following specifications, scan fingerprint and palm print cards while maintaining chain of custody and demonstrate that images can be exported in an American National Standards Institute (ANSI)/NIST format:
        i. In a non-proprietary standard format (refer to ANSI/NIST-ITL 2011 standard)
        ii. Using FBI-certified scanners
        iii. At a minimum of 500 pixels per inch (ppi)
    b. Agency – Provide the vendor with fingerprint and palm print cards
    c. Electronic conversion of existing AFIS database to new vendor format, if applicable (Note: If the legacy database is stored in a proprietary manner that is inconsistent with new vendor technology, this option may not be available. It will become necessary to rescan all existing paper files as in step a.)
        i. Vendor – Conduct file conversion and demonstrate data integrity
        ii. Agency – Conduct audit to ensure data integrity

   d. Unsolved latent file conversion (Note: If the legacy database is stored in a proprietary manner that is inconsistent with new vendor technology, this option may not be available. It will become necessary to rescan all existing paper files as in step a. The project leader will need to coordinate with the current vendor to convert the AFIS records into a standard format. Also, note that this process may lead to the loss of case management data.)
      i. Vendor – Conduct file conversion and demonstrate data integrity
      ii. Agency – Conduct audit to ensure data integrity

5. Building of system at vendor site
   a. Vendor – Build system, load database, and test functionality and performance
   b. Agency – Track progress and respond promptly to questions

Factory Acceptance

The Factory Acceptance Test (FAT) allows the vendor to run a test of the proposed system at its own site with its own staff. The agency prepares the test data and oversees the test. Both parties have responsibilities for the test.[4]

1. Vendor
   a. Develop and submit a FAT plan
   b. Run test
   c. Provide plan and timeline for remediating deficiencies, if applicable
2. Agency
   a. Review and approve the FAT plan
   b. Prepare test data for FAT
   c. Oversee the test (agency representative must be present during testing)
   d. Develop system deficiency list
   e. Approve system shipment

Delivery of System

For system delivery, the vendor prepares an inventory and packs and ships components. The agency prepares the site and supports receiving, clearance, and storage.

[4] Depending on the severity of the items identified in the deficiency report, the agency may need to conduct a second FAT.

Installation of System

When the system is ready for installation, the vendor installs the hardware, sets up initial user accounts, connects the system to local and national networks, remote devices, etc., and conducts an informal system readiness test. The vendor also converts and adds new AFIS records.

The agency provides local logistical support (e.g., IT, access to facility, etc.) and provides new AFIS records for conversion.

Site Acceptance Test

During the Site Acceptance Test (SAT), the vendor tests functionality and performance.

1. Agency
    a. Update the FAT plan to include testing of issues identified during the FAT phase
    b. Ensure that interface testing is included
    c. Conduct SAT (agency representative must be present during testing)
    d. Develop system deficiency list
    e. Document test results and approves SAT

Training

To maximize the benefits of the new system, examiners need to be well trained on the system. Again, both the vendor and agency have responsibilities to ensure the process is thorough and complete.

1. Vendor
    a. Submit a training plan and material
        i. Forensic user training
        ii. Ten-print examiner training
        iii. Manager training
        iv. System administrator training
        v. Training on basic report generation capabilities
    b. Deliver training and manuals
2. Agency
    a. Review and approve the training plan and materials
    b. Handle logistics and scheduling for personnel

6. Operations and Maintenance

The O&M phase is also known as the “burn in” or “user acceptance testing” phase. This phase typically starts 30 days after the SAT. All training and test data should be removed. During this period, the system should be restored from backup files to test functionality.

Warranty services and onsite support begin per the requirements outlined in the contract. The vendor-provided help desk services should be online and tested.

The successful conclusion to the user acceptance testing marks the end of the procurement process. Staff and management should conclude the process with a lessons learned document that will be relevant for the next upgrade or procurement. Each person now carries the unique knowledge that can only come through participating in the procurement process.

Attachment I:

Request for Information Template

This template contains specific information and suggestions that can be inserted into a Request for Information (RFI). The working group should consider the merits of an RFI as well as the work required to develop a successful one. The working group must be committed to a thorough review of the responses and to maintaining confidentiality and trade secrets.

Example Language

1. Purpose of the RFI

The purpose of this RFI is to gather information about how best to approach replacing the current automated fingerprint identification system (AFIS) with a more robust system or an automated biometric identification system (ABIS) for the *[insert agency name]*, hereafter referred to as the Requesting Agency.

To acquire an AFIS that best meets the needs of stakeholders, the Requesting Agency is seeking information from integrators and/or AFIS vendors who have the capability and experience to bring this large-scale, mission-critical project to successful completion.

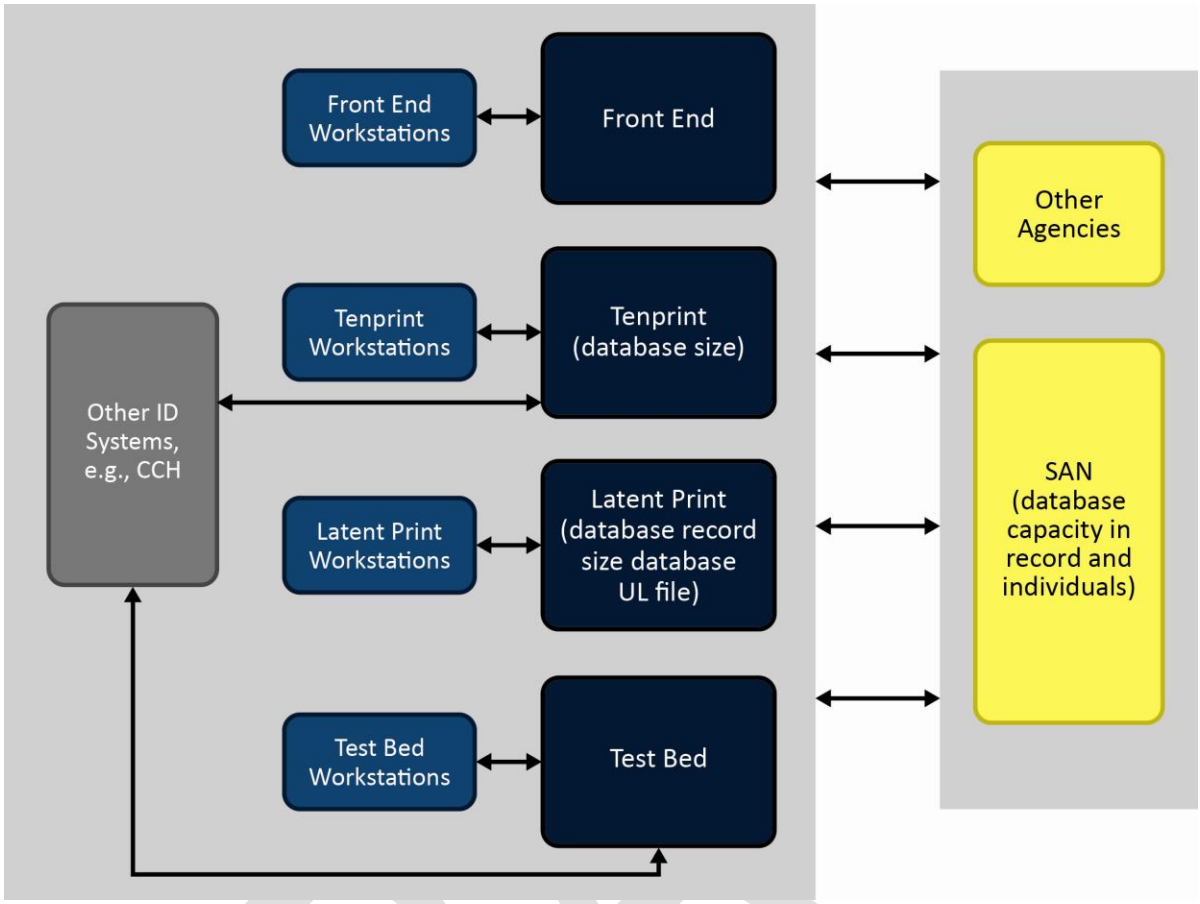
Using information gathered from responses to this RFI, the Requesting Agency may issue a Request for Proposals (RFP) to bidders interested in providing an AFIS. **Nothing in this document shall be construed as obligating the Requesting Agency to issue an RFP. No contract will be awarded based on responses to this RFI.**

2. Introduction

The Requesting Agency is requesting information on replacing the current AFIS that is used in conjunction with other systems to process ten-print identification and latent print identification transactions. The Requesting Agency is also requesting information on additional biometrics to be used in a multimodal (palm, facial recognition, etc.) system. Interoperability with international, federal, state, and local AFIS databases will be a requirement for the new AFIS.

3. Current AFIS Description

The current AFIS is heavily integrated with the Requesting Agency's computer system. The AFIS hardware is composed of *[specify #]* servers and *[specify #]* workstations, which will not be used in a new AFIS. All networking is the responsibility of the Requesting Agency. The following diagram provides an overview of the current AFIS configuration in Requesting Agency.



Ten-Print Identification Subsystem

The ten-print identification subsystem processes over *[specify #]* criminal and civil fingerprint transactions per year. More than *[specify #]* of the fingerprint transactions are received digitally, with the remainder received on paper fingerprint cards. For all transactions, the paper cards or printed copies of the digital cards are stored for archival purposes. Digital transactions are sent to the AFIS front end workstation using *[specify how sent]*. Digital processing includes the assignment of fingerprint patterns and an image quality rating by both a fingerprint examiner and the AFIS front-end workstation. The AFIS front-end workstation also performs sequence checking and minutia encoding. If quality control (QC) is necessary, a fingerprint examiner performs QC editing on an AFIS workstation.

Each transaction is launched against the identification target database that contains the *[specify #]* fingerprints of approximately *[specify #]* individuals, one record per person. It searches the minutiae of the *[specify #]* fingerprints against those individuals with the same fingerprint pattern on all ten fingers. Gender may also be used as a search criterion. A fingerprint examiner verifies the match candidates, and a second fingerprint examiner independently validates the first fingerprint examiner's decisions. AFIS relays the results to a Requesting Agency system.

Latent Print Identification Subsystem

The latent print identification subsystem performs more than *[specify #]* latent print searches per year. The latent prints are entered from *[insert locations]*. A latent print examiner uses AFIS to enhance the image, and minutia placement is performed automatically or manually. Non-AFIS software from *[specify vendor]* provides case management, image enhancement, and export capabilities.

The latent print target database contains all ten fingers of approximately *[specify #]* individuals, one record per person. Criminal fingerprints are stored in the latent print target database. A latent print examiner can filter a search by such demographic data as *[specify filters, if any]*.

If a latent print is not identified to an individual, the latent print and associated data can be placed into the unsolved latent print database. This database contains *[specify current storage]* and can hold up to *[specify capacity]*.

As new images are placed in the latent print target database during ten-print identification processing, AFIS searches them against all unsolved latent prints with the same demographic data. Candidates are queued for latent print examiner verification.

Examiners may choose to search a latent print against the unsolved latent print database.

[State any other latent print activities that are relevant.]

Other Agency Subsystem

[Describe any subsystem that utilizes either ten-print or latent print searches, e.g., jail, state corrections, or Department of Motor Vehicles.]

Test Bed Subsystem

[Include description if the Requesting Agency currently has a smaller replica of its system that is used as a test bed.]

Data

AFIS has mirrored copies of the target databases; however, the images are stored on a Requesting Agency Storage Area Network (SAN). AFIS logs and produces reports on transaction processing including user and workstation utilization.

4. Current AFIS Performance

The ten-print identification subsystem is able to process at a peak throughput of *[specify #]* transactions per hour. At least *[specify #]* percent of the high-priority transactions have a complete identification and statewide criminal history response in under 1 hour, and at least *[specify #]* percent are responded to in under *[specify #]* hours. High-priority transactions compose more than *[specify #]* percent of total transactions. The Requesting Agency estimates that the AFIS ten-print search has an accuracy rate of at least *[specify #]* percent.

The latent print system is able to process a peak throughput of *[specify #]* transactions per hour.

The system currently grows at approximately *[specify #]* new individuals per year.

The system is available 24/7 with an uptime exceeding *[specify #]* percent. Each portion of the system is recoverable from any failure within a *[specify #]*-hour period.

5. Information Requested

Respondent is to provide a narrative that explains the company's ideas for a new AFIS. The narrative should discuss approaches regarding a multivendor solution; models of ownership and operation of the system; system implementation, including transition plans; open interfaces and interoperability; system and user administration and security; accuracy versus cost ratios; high availability and disaster recovery; and an ideal identification workflow. Respondents should include an estimated level of effort and propose a process for converting digital and paper records.

Ideas and Suggestions

The Respondent's narrative may also include ideas regarding the storing and searching of:

- ❑ Various fingers
- ❑ Slaps/plain impressions
- ❑ Composite/virtual cards
- ❑ Multiple target records per person
- ❑ Palm prints
- ❑ Multimodal biometrics
- ❑ Other

Opinions

Respondent may also include opinions on the use of:

- ❑ Pattern and/or topological classification
- ❑ Level 3 Detail
- ❑ Latent print image enhancement
- ❑ Other

Current Customers

Respondents are asked to submit a list of customer sites with contact and system information.

6. Instructions for Responding to the RFI

Diverse insights are critical for the replacement of the AFIS. All integrators and/or AFIS vendors who have the capability and experience to bring this large-scale, mission-critical project to successful completion are encouraged to submit responses to this RFI.

Vendors must transmit their response by *[specify date]* via electronic mail to the Requesting Agency Procurement Officer at *[specify email address]*. The electronic copy should be in machine-readable format (typically American Standard Code for Information Interchange [ASCII], Microsoft® Word, WordPerfect®, or Adobe® PDF format).

Any questions regarding the RFI may be directed only to the Requesting Agency contact listed above at any time before close of business *[specify date]*. Each question submitted by a vendor and the subsequent Requesting Agency answer will be available for all vendors to review.

The Requesting Agency requests that providers responding to this RFI designate a single contact within the organization for receipt of all subsequent information regarding this RFI. The Requesting Agency will not reimburse vendors for any costs in connection with their responses to this RFI.

To fully comprehend the information contained within a response to this RFI, the reviewing group may seek further clarification on selected areas of the response.

This is NOT a Request for Proposals. No contract will be awarded based on responses to this RFI.

Attachment II:

Request for Proposals Essentials

Purpose of the Request for Proposals

There are many models of a successful Request for Proposals (RFP). When writing an RFP for a new or updated automated fingerprint identification system (AFIS), the agency should be guided by the processes that proved successful in the past with a consideration for the unique requirements of the current identification community. Wherever possible, the RFP should cite collaboration and agency interoperability as a goal. The citations may include descriptions of desirable features as well as specific references to national standards and policies, such as the *Latent Interoperability Transmission Specifications* (LITS).

1. Introduction Section

In the Introduction section, the agency should provide a description of the current system and explain what is expected from the new system. While this information may be well known to the agency, prospective vendors may have little or no knowledge of the operations. The more the agency can describe its current condition and expectations, the better the vendors can respond with a succinct proposal.

In the body of the RFP, the agency can provide more specificity as to its current and anticipated operations. The use of appendices can provide a vehicle for more details, such as standards, conversion plans, training, process descriptions, and relevant National Institute of Standards and Technology (NIST) standards. The vendor can respond to the questions/statements in the appendices, which will make the review and evaluation more complete.

The introduction to the RFP, at a minimum, should include the following:

- ❑ An overview of the agency's mission and role in the criminal justice process
- ❑ The purpose of the RFP
- ❑ A description of the current AFIS and subsystems to include:
  - Ten-print identification processing
  - Any other agency that relies on this ten-print processing
  - Latent print processing
- ❑ An overview of what is desired in the new AFIS
- ❑ Other information that may help the vendors to respond in a concise manner

2. Other Requirements and Information Section

This section of the RFP discusses the requirements that may not be technical or budgetary, but remain a critical part of the RFP. The agency must decide which requirements are mandatory and which are optional. Once the RFP has been submitted, the agency is committed to the statements in the RFP.

For example, the RFP could have a mandatory requirement that the proposals be delivered as two paper copies and four electronic copies, one copy on each of four CDs. If a prospective bidder delivered four paper copies and only two electronic copies on CD, the bid has to be rejected outright for not meeting an RFP mandatory requirement. Among others requirements, information in this section could include the following:

- ❑ Mandatory requirements
  - – Pre-bid conference
  - – Notice of Intent to Bid
- ❑ Delivery time of proposals
- ❑ Proposal format and content requirements
  - – Technical proposal
  - – Financial proposal
- ❑ Contract term
- ❑ Prime contractor and subcontractors
- ❑ Trade secrets
- ❑ Costs incurred prior to contract approval
- ❑ Price protection

3. Evaluation Criteria Section

The RFP should provide responders with information as to the elements on which the proposals will be evaluated. While price plays an important consideration, the lowest bid is not necessarily the most technically sound. By specifying this information in the RFP, the agency may avoid post-award challenges by pointing to these specifications for consideration in evaluation.

For example, the agency could require that the proposal include the following:

- ❑ Technical specifications
  - – Executive summary
  - – Offerer experience and customer references
  - – Mandatory base requirements for offerer's proposed AFIS solution
  - – Optional features
  - – Project plan
- ❑ Cost specifications
  - – Proposed fixed purchase price for mandatory base system
  - – Maintenance and support price for mandatory base system
  - – Optional professional services price list

- Total proposed cost of ownership for offerer's mandatory base system
- Proposed fixed-price milestone deliverable payment schedule
- Detailed optional features price list
- Component purchase and maintenance price list
- Optional services price list

❑ Administrative specifications

- Firm offer letter and conflict of interest disclosure
- Contract administration team
- Mandatory requirement, e.g., bid bond, fair employment, etc.
- Proposed subcontractors
- Key subcontractor certification
- Consultant disclosure

4. Evaluation and Scoring Methodology Section

In this section, the agency describes how the proposal will be reviewed and scored. This will ultimately determine which vendor's proposal is awarded a contract that could be worth millions of dollars. Although the vendor selected as the winner will be congratulated, the vendors not selected will have made a substantial investment in resources with no compensation.

A vendor not awarded the contract may initiate a challenge or legal action against the agency if there is a belief that the evaluation was not impartial. A challenge to an award could delay the project start by months, if not by years, and cost a great deal. The stakes are high, and adhering to the evaluation process will mitigate challenges and ensure fairness in the evaluation. Evaluation teams must ensure consistency, fairness, and documentation throughout the evaluation process and must include the evaluation criteria in the RFP.

Elements in the evaluation and scoring section typically include the following:

❑ Overall proposal evaluation process
❑ Completeness review
❑ Prior experience
❑ Technical mandatory evaluation (pass/fail)
❑ Technical preferred evaluation (e.g., 80 points)
❑ Financial (cost) evaluation (e.g., 20 points)
❑ Calculation of combined evaluation score

5. Other Terms and Conditions Section

This section addresses items that are not easily located in the previous sections but that are essential for a successful vendor/agency relationship.

Included in this section, for example, would be the following:

- ❑ Governing law
- ❑ Ongoing reports and documentation
- ❑ Standby letter of credit
- ❑ Maintenance bond
- ❑ Insurance
- ❑ Title and legal interests
- ❑ Payments
- ❑ Warranties
- ❑ Escrow
- ❑ Force majeure

6. Appendices to the RFP

The appendices provide venues for more specificity in current process description, e.g., processing flows, current hardware, NIST standards, Criminal Justice Information Services (CJIS) specifications, universal latent workstation (ULW) and Latent Print Interoperability Specifications. The appendices may also include the format in which the vendors are to present the proposals.

While there are numerous items that can be included as appendices, this example will focus on the three most common: the contractual requirements, informational documents, and offerer response forms.

The *Contractual Requirements* appendices may include the following:

- ❑ Standard clauses for agency contracts
- ❑ Conversion plan requirements
- ❑ Acceptance testing requirements
- ❑ Training requirements
- ❑ Production reports requirements
- ❑ New AFIS standby letter of credit form
- ❑ Consultant disclosure legislation forms

The appendices for *Informational Documents* may include the following:

- ❑ Agency contract award protest procedure
- ❑ Customer reference questionnaire
- ❑ New AFIS informational tables
- ❑ Diagrams
- ❑ Current AFIS hardware
- ❑ Change request form
- ❑ Glossary of terms

The appendices included in *Offerer Response Forms* provide the form and format for the vendor to respond to the RFP. It may include pre-bid registration forms, non-disclosure forms, and forms for client references, among other items. The documents in this section allow the vendor to respond to mandatory requirements and optional features and, of course, price.

Other appendices in this section may include the following:

- ❑ Maintenance and support price for mandatory base system
- ❑ Optional professional services price list
- ❑ Proposed fixed-price milestone deliverable payment schedule
- ❑ Detailed optional features price list
- ❑ Component purchase and maintenance price list
- ❑ Optional services price list
- ❑ Bid bond form
- ❑ Proposed subcontractors
- ❑ Key subcontractor certification
- ❑ Addendum

7. Interoperability Requirement

To support latent print interoperability, the following information, provided by Noblis,[5] on compatibility with the Federal Bureau of Investigation's (FBI's) and CJIS's *Electronic Biometric Transmission Specification (EBTS)*[6] should be considered, and the suggested RFP compliance requirement should be included in the RFP.

[5] Information available at http://noblis.org/MissionAreas/nsi/Services/IdentityDiscoveryandManagement/BiometricsandForensics/Pages/Interop.aspx.

[6] Federal Bureau of Investigation, Criminal Justice Information Services. *Electronic Transmission Specification (EBTS)*, IAFIS-DOC-01078-9.2, Federal Bureau of Investigation, Criminal Justice Information Services, May 13, 2011.

Compatibility with EBTS v9.3

Draft EBTS v9.3 contains the preliminary technical changes necessary for FBI/CJIS to execute Next Generation Identification (NGI) Increment 3 (latent processing capability), which is due to be implemented during spring 2013. As CJIS moves forward into the Increment 3 testing phase, areas requiring additional technical changes may be discovered. These technical changes would be presented within the next draft version (EBTS v9.4), to be released during fall 2012. Thus, the future EBTS v9.4 could potentially contain Increment 3 modifications.

LITS will be compatible with EBTS v9.3. The development of LITS is closely linked to the EBTS development, and changes affecting latent transactions and processing are updated as they are received. It is expected that EBTS v9.3 will be published in final form in April 2012. While some changes are anticipated, the requirements for Profile 0 (Image Only Search—Latent Fingerprint Image Search [LFIS]) and Profile 2 (Quick Minutiae Search—Latent Fingerprint Feature Search [LFFS]) have been defined for use by NGI and by the LITS-compatible systems and are not expected to change.

Suggested RFP LITS Compliance Requirement

A compliant AFIS shall accept LFIS and LFFS transactions as latent searches and BDEC transactions as decision notifications as specified in EBTS v9.3. A compliant AFIS shall return Search Result Latent transactions as responses to LFFS or LFIS searches. All these transactions shall comply with LITS version 1.0 (or later). LFFS searches shall comply, at a minimum, with Extended Feature Set (EFS) Profile 2 as defined in *Extended Feature Set Profile Specification*[7] version 1.0 (or later); other profiles may be implemented optionally. This capability shall be demonstrated at delivery. These transactions shall be implemented for latent fingerprints; implementation for palm prints, extreme fingertips, or lower joints of the fingers is optional.

Compliant latent print workstation software shall be capable of: 1) importing LFFS latent feature searches compliant with LITS without loss of defined features and 2) exporting LFFS latent feature searches compliant with LITS without loss of defined features. Such import and export functions shall be incorporated into the software and shall not rely on the use of the FBI's Universal Latent Workstation software for translation. Note that LITS is an extension of the FBI's EBTS v9.3, and therefore the exported LFFS files will be capable of being directly searched against the FBI's NGI system (when latent services are available in early 2013).

[7] Noblis. *Extended Features Set Profile Specification*, Draft Version 0.8. Noblis, November 3, 2011. Available at http://noblis.org/MissionAreas/nsi/Services/IdentityDiscoveryandManagement/BiometricsandForensics/Pages/Interop.aspx, accessed December 9, 2011.

8. Conclusion

The contents in this RFP description are only one of many options for developing an RFP. This is illustrative of the complexity of the RFP and the need for precision and clarity. The agency must have a clear vision for the new system, and this vision must be conveyed by the RFP. The vendors use the RFP in developing their proposals. The more clear and detailed the RFP, the better the proposals will be in response.

Attachment III:
Glossary of AFIS Terms

FOREWORD

This Glossary was developed from many sources. To support the standardization of use, wherever possible the acronyms, abbreviations, and their definitions were extracted from federal- and industry-recognized sources. There is no single nationally or internationally recognized glossary of AFIS terms. Like the differences between dictionaries, each source presents a slightly different wording for the same concept.

For example, there are differences in the definition of the word "glossary" between the *Merriam-Webster Online* ("a collection of textual glosses or of specialized terms with their meanings"), *Webster's New World College Dictionary* ("a list of difficult, technical, or foreign terms with definitions or translations, as for some particular author, field of knowledge, etc., often included in alphabetical listing at the end of a textbook"), and the *Oxford Dictionaries Pro Online* ("an alphabetical list of terms or words found in or relating to a specific subject, text, or dialect, with explanations; a brief dictionary"). Is one right and the others wrong?

The reader is encouraged to refer to additional sources such as the Scientific Working Group on Friction Ridge Analysis, Study and Technology and other nationally recognized authoritative sources for complementary descriptions. Definitions that were pulled in whole or in part from other sources include a reference to that source in parentheses. A list of acronyms follows the definitions of terms.

ACCEPTANCE TESTING—1: A thorough test of an AFIS prior to taking ownership and making payment. 2: Those tests that are intended to determine that all equipment and software functions and complies with the contract specifications and to determine the reliability of the system. (ANSI/IAI)

ACCESS RIGHTS—Profile of a user composed of options to enable specific AFIS functions. For example, ten-print staff members cannot access latent print functions unless granted access rights to those functions.

ACCURACY—1: A software quality metric that provides those characteristics for required precision in calculations and outputs. 2: A measure of the AFIS's ability to place the correct mate within a specific position on the candidate list as a result of the matching process. (ANSI/IAI) 3: The closeness of agreement between the AFIS-generated representation of a fingerprint compared with the fingerprint it represents. (ANSI/IAI)

ACE-V—The process for identifying latent fingerprints, which involves Analysis, Comparison, Evaluation, and Verification:

- *Analysis* is the qualitative and quantitative assessment of Level 1, Level 2, and Level 3 Details to determine proportion, interrelationship, and value for individualization.
- During *Comparison*, the latent print examiner looks at the attributes noted during analysis for differences and agreement between the latent print and the known exemplar.
- *Evaluation* follows extensive comparison by making a determination if two impressions were made by the same source, not from the same source, or if the information is inconclusive. (A determination is made as to the results of the Comparison process. The fingerprint community accepts three conclusions: (a) the latent print and known exemplar were made by the same source, (b) the latent print and known exemplar were not made by the same source, or (c) a conclusive comparison could not be determined. This could be due to a lack of comparable area in the known exemplar or lack of clarity due to improperly recorded known exemplars.)
- *Verification* occurs when a second qualified examiner does an independent assessment of the latent print and known exemplar, utilizing the ACE process.

ACTIVITY LOG—A continuously updated record of system activity. (ANSI/IAI)

ALGORITHM—1: Mathematical routine used in computer processing. In AFIS processing, the matcher algorithm searches for relationships between the search print and ten-print. 2: Mathematical routine used in computer processing, e.g., an AFIS matching algorithm establishes the correlation of Level 2 Detail between fingerprints. (SWGFAST) 3: A step-by-step computational procedure for solving a problem. The system computer and other system

components use algorithms to make decisions required to process and handle information. (ANSI/IAI)

ALPHANUMERIC—Non-image information related to a person, ten-print card, or latent case; may also be referred to as demographic data.

AMERICAN NATIONAL STANDARDS INSTITUTE—Institute founded in 1918 that administers U.S. voluntary standardization and conformity assessment.

ANALYSIS—1: The qualitative and quantitative assessment of Level 1, Level 2, and Level 3 Details to determine proportion, interrelationship, and value for individualization. 2: The first step in the ACE-V process.

ANSI/NIST STANDARD—Standard proposed by NIST and adopted by ANSI. For example, the ANSI/NIST-ITL standard *Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information* is used by law enforcement, intelligence, military, and homeland security organizations throughout the world. The first version of this standard dates to 1986. Over the years, it has been updated and expanded to cover more biometric modalities beyond the original record type of fingerprint minutiae. (NIST)

ARTIFACT—1: Any distortion or alteration not in the original friction ridge impression produced by an external agent or action. 2: Any information not present in the original object or image inadvertently introduced by image capture, processing, compressions, transmission, display, or printing. (SWGFAST 2011)

AUTHENTICATION—1. A process to determine whether a digital image has been altered in any way since its capture. 2: A process used to determine whether an electronic file has the correct association, as with unique identifier, name, images, and criminal history record.

AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM—1: An automated, minutiae-based identification system that may consist of two or more distinct databases comprising two-finger identification records and ten-finger latent cognizant records (records of individuals more likely to be found at crime scenes, for example, burglars). 2: A computer-based system for reading, cataloguing, searching, matching, and storing fingerprints and related data. (ANSI/IAI) 3: A generic term for a fingerprint matching, storage, and retrieval system. (SWGFAST 2011)

AXIS—One of two intersecting lines superimposed on a displayed fingerprint image, used as a reference point to indicate orientation in a side-by-side comparison.

BENCHMARK TESTING—Standardized testing of a device or software to evaluate performance against some standard.

BIFURCATION—1: A point on a finger image where the friction ridge divides into two ridges. 2: The point at which one friction ridge divides into two friction ridges. (SWGFAST 2011)

CANDIDATE— 1: A master file record selected as a possible match to a current minutiae record, which results from either an automated name search or an automated (fingerprint) technical (AFIS) search. 2: A selection made by AFIS as a result of a search inquiry. (ANSI/IAI)

CANDIDATE LIST—The list of potential mates listed in descending order of their matching scores as determined by the matching process within the fingerprint minutiae matcher. A candidate list can also be produced by an Interstate Identification Index automated subject search. (ANSI/IAI)

CARD SCAN—1: An electronic scanning method of transmitting inked fingerprint impressions that meet local standards and the Federal Bureau of Investigation's image quality specifications and that are suitable for Store and Forward processing. 2: Electronic recording of friction ridge impressions (fingers and/or palms) from fingerprint cards, palm print cards, etc.; sometimes referred to as dead-scan or flat-bed scanner. (SWGFAST)

CHARGED-COUPLED DEVICE—1: An electronic chip capture device used in optical recording devices to convert light into electrical current. AFIS applications include digital cameras, card scans, Livescan, and other imaging equipment that captures fingerprint images on a chip. 2: An electronic chip capture device used in optical recording instruments that converts light energy into electrical current, e.g., the chip in a digital camera or scanner for capturing friction ridge impressions. (SWGFAST 2002)

COMPUTERIZED CASE HISTORY or **COMPUTERIZED CRIMINAL HISTORY**—Online case history information management system that lists all the criminal and non-criminal events that the identification agency is authorized to release to an inquiring agency; also referred to as the Rapsheet.

CRIMINAL JUSTICE INFORMATION SERVICES—A division of the Federal Bureau of Investigation.

CERTIFIED LATENT PRINT EXAMINER—A latent print examiner certified by the Latent Print Certification Board of the International Association for Identification.

CODER—Term for hardware, software, or both used to detect minutiae in a fingerprint image.

COMPARISON—1: The process of evaluating fingerprint images to be classified and/or identified for proper identification per user request. 2: The second step of the ACE-V method. 3: The observation of two or more impressions to determine the existence of discrepancies, dissimilarities, or similarities. (SWGFAST 2009)

COMPRESSION RATIO—Ratio of original file size as compared to the compressed file size. For AFIS, a 15:1 ratio is most often used.

CONCLUSION—Determination made during the Evaluation stage of ACE-V, including identification, inconclusive, or exclusion.

CONSOLIDATION—1: The merger of two or more records that are filed under more than one Federal Bureau of Investigation Number or identification number when it is determined that all pertain to one subject.

CORE—1: A well-defined center or focal point of a fingerprint image. 2: The approximate center or focal point of a friction ridge image (SWGFAST 2011). 3: A specific formation within a fingerprint pattern, defined by classification systems such as Henry.

CONTROL TERMINAL AGENCY—A state or territorial criminal justice agency on the National Crime Information Center system providing statewide or equivalent service to its criminal justice users. There is only one Control Terminal Agency per state or territory, and each operates under the supervision of a terminal agency coordinator.

DATABASE—A collection of data of a particular type, organized for efficient storage and retrieval (e.g., fingerprint minutiae data, fingerprint image data, or mugshot image data).

DELTA—That point on a ridge of a fingerprint image at or nearest to the point of divergence of two type lines and located at or directly in front of the point of divergence; also known as a tri-radius. (SWGFAST 2011)

DIGITAL IMAGE RETRIEVAL SYSTEM—An AFIS subsystem that contains the electronic fingerprint images.

DOWN SAMPLING—Process of representing an image with a smaller number of samples; may also be referred to as sub-sampling.

ELECTRONIC BIOMETRIC TRANSMISSON SPECIFICATON—A standard published by the Federal Bureau of Investigation for electronically encoding and transmitting biographic, biometric, and disposition information between federal, state, and local users and the Federal Bureau of Investigation, which specifies file, record content, format, and data codes.

ELECTRONIC FINGERPRINT TRANSMISSION SPECIFICATION (EFTS)—A standard published by the Federal Bureau of Investigation for electronically encoding and transmitting fingerprint images and identification and arrest data between federal, state and local users and the Federal Bureau of Investigation, which specifies file, record content, format, and data codes.

ELECTRONIC TEN-PRINT SUBMISSION—An electronic submission that originates at a Livescan booking terminal or card scanner at either the federal, state, or local level and is transmitted via the Criminal Justice Information Services wide area network to the Integrated Automated Fingerprint Identification System for processing. This type of electronic transaction contains

fingerprint images and personal descriptor data. Processing of the transaction, including image comparison and the conclusion, is performed by Federal Bureau of Investigation personnel.

ELIMINATION FINGERPRINTS—1: Fingerprint images taken from persons with legitimate access to evidence under examination for latent fingerprint. 2: Exemplars of friction ridge skin detail of persons known to have had legitimate access to an object or location. (SWGFAST 2011)

ENCODING—AFIS process used to record minutiae.

ERRONEOUS EXCLUSION—The incorrect determination that two areas of friction ridge impressions did not originate from the same source. (SWGFAST 2011)

ERRONEOUS INDIVIDUALIZATION—The incorrect determination that two areas of friction ridge impressions originated from the same source. (SWGFAST 2011)

EURODAC—An AFIS formed by the European Union to track asylum seekers who apply for benefits.

EVALUATION—1: A determination by a latent print examiner about whether two impressions were made by the same source or different sources or if the information is inconclusive. 2: The third step in the ACE-V process.

EXCLUSION—The determination by an examiner that there is sufficient quality and quantity of detail in disagreement to conclude that two areas of friction ridge impressions did not originate from the same source. (SWGFAST 20111)

EXEMPLAR—1: An impression or image of friction ridge skin purposely collected with the knowledge of the subject. 2: The prints of an individual associated with a known or claimed identity deliberately recorded electronically, by ink, or by another medium (also known as known prints). (SWGFAST 2011)

EXPUNGEMENT—The process of either fully or partially purging data from a subject's record in the subject criminal history file. It results in the removal of all charges associated with the arrest covered by expungement while retaining the date of arrest and submitting originating agency identifier. Expungement requests are submitted by arrest or judicial agencies when an individual has been exonerated after initial arrest or released without charge and recorded as "detention only" or when so ordered by a court of appropriate jurisdiction.

FALSE CANDIDATE—A candidate selected by an AFIS search as a possible match, which is subsequently determined not identical.

FEATURES EXTRACTION—The system capability to identify from a scanned fingerprint digital image separately definable attributes, which may be discretely stored and used to classify and uniquely identify that fingerprint.

FEDERAL BUREAU OF INVESTIGATION NUMBER—A unique identifying number assigned by the Federal Bureau of Investigation to a subject of a fingerprint record of arrest who has not been identified as a previous offender in a search of the files.

FINGERPRINT—An impression of the friction ridges of all or any part of the finger. (SWGFAST 2011)
FINGERPRINT CHARACTERISTICS—Any aspects of fingerprints that can uniquely identify them.

FINGERPRINT CLASSIFICATION—1: A method for describing the common pattern fingerprint characteristics (e.g., pattern types or ridge counts) for the purpose of subdividing a fingerprint file into "classes" or groups having the same general characteristics so as to reduce the amount of the file needed to be searched to locate the mate (within the Integrated Automated Fingerprint Identification System, this may involve either Henry classification or pattern-level classification). 2: Grouping fingerprints according to shape and size for the purpose of filing and retrieving.

FINGERPRINT FEATURES—Unique physical characteristics of a fingerprint that are used to perform automated fingerprint searches.

FINGERPRINT FEATURES MASTER FILE—The set of all records on which fingerprint feature data exists.

FINGERPRINT IMAGE—A representative two-dimensional reproduction of the ridge detail of a fingerprint.

FINGERPRINT MATCHER SCORE—An AFIS-generated numerical score that indicates the approximate relationship between a latent print and an exemplar.

FINGERPRINT MINUTIAE—Unique identifying characteristics of fingerprints (e.g., beginning and ending points of ridges).

FINGERPRINT MINUTIAE MATCHER—The matching subsystem equipment that compares the minutiae data-based features of a search print with fileprints and selects the fileprint that comes closest to matching the search print. It will also perform a Minutiae Verification Match.

FINGERPRINT MINUTIAE MATCHER ACCURACY—1: A measure of the matcher subsystem's ability either to identify the correct candidate as a result of the matching process or to report that no candidate is selected if the mate is not in the fileprint database being searched. 2: The closeness of agreement between the matcher subsystem's generated representation of a fingerprint compared with the fingerprint it represents.

FINGERPRINT MINUTIAE MATCHER RELIABILITY—1: The probability that the mating fingerprint will be selected as the primary candidate by the matcher subsystem if that mate is in the

fileprints being searched or that no candidate will be selected if the mate is not in the fileprints being searched. 2: The probability that an entity will perform its intended functions for a specified interval under stated conditions.

FINGERPRINT MINUTIAE MATCHER SELECTIVITY—The function of selecting the candidate, both correct and incorrect, and its relationship to other close candidates based upon minutiae scoring algorithms within the matcher subsystem.

FINGERPRINT PLAIN IMPRESSIONS—Fingerprint impressions taken by simultaneously capturing all of the fingers of each hand and then the thumbs without rolling, using a pressed or flat impression. See also, *plain, touch, or flat impression*.

FINGERPRINT REPOSITORY—A term for the AFIS/Federal Bureau of Investigation capability to store fingerprint characteristics data and perform database-like functions, such as storage retrieval, search, and update. The AFIS/Federal Bureau of Investigation Segment has at least three subcategories of repository:

(1) The *Federal Bureau of Investigation Criminal Repository* contains one entry for each subject meeting retention criteria. The data included are extracted from criminal ten-print submissions. At a minimum, the Federal Bureau of Investigation Criminal Repository contains fingerprint characteristics for all ten fingers.
(2) The *Unsolved Latent Repository* contains single latent fingerprints not identified to any subject in the criminal fingerprint repository. It is used to provide leads for unsolved criminal cases.
(3) The *Special Repositories* have separately defined uses and data. Each has its own sponsor who controls its use. The data in each repository may be used for either ten-print and latent fingerprint searching or for specially defined fingerprint searching.

FINGERPRINT ROLLED IMPRESSIONS—The impressions created by individually rolling each inked finger from side to side in order to obtain all available ridge detail. See also, *inked rolled print*.

FAST FOURIER TRANSFER ALGORITHM—An algorithm used in digital image processing to decompose and compose a signal.

FLATS—Fingerprint plain impressions. See also, *plain, touch, or flat impression.*

FRICTION RIDGE—1: The ridge-shaped skin on a finger or palm surface that makes contact with an object. 2: A raised portion of the epidermis on the palmar or plantar skin, consisting of one or more connected ridge units. (SWGFAST 2011)

GRAY-SCALE IMAGE—An image using more than two radiometric values, i.e., 256 shades of gray in an 8-bit image. Not a strictly black/white image.

GROUP IV FAX—A facsimile transmitted fingerprint card suitable for identification processing.

HENRY CLASSIFICATION—An alphanumeric system of fingerprint classification named after Sir Edward Richard Henry used for filing, searching, and retrieving ten-print records. (SWGFAST 2011)

HIT RESPONSE or **HIT ON FINGERPRINT SEARCH**—An identification of minutiae-based data of a fingerprint image with minutiae-based data from another fingerprint image as being a mate for the finger of the same person.

INTEGRATED AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM—The Federal Bureau of Investigation's national AFIS. (SWGFAST 2011) IAFIS provides: (a) repository maintenance services, such as receipt, storage, and retrieval; (b) powerful search functions that attempt to match submitted fingerprints with fingerprints in the repository; and (c) fingerprint characteristics processing capability to derive unique aspects of fingerprints for storage and matching.

INTERNATIONAL ASSOCIATION FOR IDENTIFICATION—Professional association whose members are engaged in forensic identification, investigation, and scientific examination of physical evidence.

IDENTIFICATION—1: The positive match of a current ten-print or latent fingerprint card to a prior fingerprint card stored in the fingerprint files, made on a comparison of one set of fingerprints to another. 2: In some forensic disciplines, the similarity of class characteristics. (SWGFAST 2011) See also, *individualization*.

INDIVIDUALIZATION—The determination by an examiner that there is sufficient quality and quantity of detail in agreement to conclude that two friction ridge impressions originated from the same source. (SWGFAST 2011)

IMAGE—Processed or stored fingerprint images from a ten-print card or latent lift.

INKED ROLLED PRINT—An inked fingerprint impression taken by physically rolling the inked finger from side to side (nail to nail) on the fingerprint card stock. See also, *rolled impression*.

INTEROPERABILITY—The ability of two or more AFIS networks, systems, devices, applications or components to exchange information between them and to use the information so exchanged correctly and with minimal loss of accuracy.

INTERPOL—Originally the International Police Commission, established in 1923 with the first headquarters in Vienna, Austria. With the General Secretariat now in Lyon, France, Interpol focuses on international crimes that threaten public safety, especially those involving terrorism,

criminal organizations, drugs, finances and technology, and trafficking in human beings, and provides fugitive investigative support.

INTERSTATE IDENTIFICATION INDEX—A national network for the exchange of criminal history records, which includes elements of participating state systems, the National Crime Information Center System, the Identification Automated Services of the Federal Bureau of Investigation, the National Law Enforcement Telecommunications Network, and the U.S. Postal Service, among other systems.

IMAGE QUALITY SPECIFICATION—Element of the Electronic Fingerprint Transmission Specification that has two components, Appendix F and Appendix G.

JOURNAL OF FORENSIC IDENTIFICATION—A publication of the International Association for Identification.

JPEG—1: An acronym for the Joint Photographic Experts Group. 2: A compression file format with the ".jpg" file extension, most of which use lossy compression.

LATENT COGNIZANT DATABASE—Fingerprint features records of all ten fingers of a subset of criminals in the ten-print database, used for matching latent fingerprint submissions, which may be partial fingerprints. Includes fingerprint data from certain crime categories (e.g., bank robbery or terrorism).

LATENT PRINT—1: Transferred impression of friction ridge detail not readily visible. 2: Generic term used for unintentionally deposited friction ridge detail. (SWGFAST) 3. The reproduction of the friction ridges on an item that is touched when the ridges come in contact with any contaminant.

LATENT PRINT SUBMISSION—A submission to the Federal Bureau of Investigation or other agency that contains a latent fingerprint search request accompanied by the latent fingerprint information, either electronic or hardcopy.

LATENT PRINT LIFT—1: A reproduction of the friction ridge detail of a latent print. 2: An adhesive or other medium used to transfer a friction ridge impression from a substrate. (SWGFAST 2011)

LATENT PRINT SEARCH—A comparison of the fingerprint features extracted from a latent fingerprint with the fingerprint features contained in a fingerprint features file to determine whether a latent fingerprint has a potential mate on file within the AFIS repository.

LATENT PRINT SPECIALIST—Law enforcement agency employee who performs latent print processing.

LATENT PRINT SUBMISSION—One image and associated descriptor data received by latent processing services, which may be part of a case.

LAW ENFORCEMENT ONLINE—National, interactive communications system maintained by the Federal Bureau of Investigation exclusively for law enforcement.

LIGHTS OUT—An AFIS search without any human intervention at Verification.

LIVESCAN PRINT—A fingerprint image that is produced by scanning a live finger with Livescan technology.

LIVESCAN—An electronic method of taking and transmitting fingerprints without using ink, which produces fingerprint impressions of high quality to perform identification processing.

LOCAL MODE—Process by which a workstation can perform some function independent of AFIS (function may be limited to acquisition of new records).

LATENT/LATENT SEARCH—A search of a latent print against other latent prints, which are usually stored in the Unsolved Latent File, and which has the potential to link crimes committed by same person, even though that person is as yet unidentified. Also referred to as a latent/unsolved latent search.

LATENT/TEN-PRINT IDENTIFICATION DATABASE SEARCH—A search of a latent print against the ten-print identification database.

LATENT/TEN-PRINT LATENT COGNIZANT SEARCH—A search of a latent print against the ten-print latent cognizant (ten-finger) database.

LATENT/UNSOLVED LATENT SEARCH—See latent/latent search.

MASTER NAME INDEX—A subject identification index maintained by criminal history record repositories that includes names and other identifiers for each person with a record in the database.

MATCH—Condition of retrieving a file subject that, because of matcher score, falls within selection criteria for the probability of a mate to a search suspect.

MATCHER—An AFIS component that compares the minutiae database features of a search print with fileprints and selects the fileprint that comes closest to matching the search print.

MATCHER ACCURACY—A measure of the matcher subsystem's ability to place the correct mates as the selected candidate as a result of the matcher process, or a measure of the matcher subsystem's ability to select no candidate if the mate is not in the database.

MATCHER RELIABILITY—1: The probability that the mate fingerprint will be selected as the primary candidate by the matcher if it is in the file being searched, or that no candidate will be selected if the mate is not in the file being searched. 2: The probability that the matcher will function as intended for a specified interval under specific conditions.

MATCHING SCORE—The numerical result of comparing the minutiae data of two fingerprint digital representations.

MATE—1: A fingerprint that matches another impression from the same finger. 2: A fingerprint that is another impression from the same finger. (ANSI/IAI)

MINUTIAE—1: Friction ridge characteristics that are used to individualize the print and that occur at points where a single friction ridge deviates from an uninterrupted flow. Deviation may take the form of ending, dividing into two or more ridges, or immediately originating and terminating. (ANSI/IAI) 2: Events along a ridge path, including bifurcations, ending ridges, and dots (also known as Galton details). (SWGFAST)

MINUTIAE DATA—The data representing the relative position, orientation, and in some cases, the relationship and/or types of the minutiae in a fingerprint image. (ANSI/IAI)

MINUTIAE SEARCHING—The process of comparing the search print against the fileprints by scoring the match of minutiae data in the prints and ranking the scores either to produce one candidate with the highest score who is the potentially identical mate for the same finger, or to produce no candidate when the potentially identical print does not exist within the fileprint database.

MINUTIAE VERIFICATION MATCH—The process of comparing minutiae data from a subject's previously entered single fileprint with minutiae data from a single incoming search print and, thereafter, comparing the resultant match score with a threshold to determine if the prints are potential mates.

MATCHER QUALITY INDEX—Value representing the sum of the "equivalent number of minutiae" for fingers 2 and 7 (generally the search fingers). The index is a complex metric that weights the actual minutiae count using local image quality and the number of neighbors in computation. On the average fingerprint, the Integrated Automated Fingerprint Identification System produces about 88 minutiae, and the average value for the equivalent number of minutiae is about 56. Images with higher matcher quality index values are more likely to be successfully matched by the Integrated Automated Fingerprint Identification System.

NAIL-TO-NAIL ROLL—See *rolled impression*.

NAME SEARCH—A routinely searched database program/file that can yield the State Identification Number of individuals in the database if they have used the same descriptive information for a prior event.

NATIONAL CONSORTIUM FOR JUSTICE INFORMATION AND STATISTICS—See *SEARCH*.

NATIONAL CRIME INFORMATION CENTER—A computer system established in 1967 to provide criminal record history, fugitives, missing persons, and stolen property information to local, state, and federal agencies. Succeeded by National Crime Information Center 2000.

NATIONAL CRIME INFORMATION CENTER 2000—Successor to National Crime Information Center, a network that provides information to local, state, and federal criminal justice agencies through computer terminals and mobile applications.

NATIONAL FINGERPRINT FILE—A component of the Interstate Identification Index that decentralizes interstate exchange of criminal history records by containing fingerprints from all federal offenders but only one first-arrest set of fingerprints from select state offenders with other biometric data, requiring states to maintain the criminal history.

NATIONAL INCIDENT-BASED REPORTING SYSTEM—An outgrowth of the uniform crime report and a byproduct of the state and local incident-based reporting systems, which collects specific crime information on 22 offense categories consisting of 46 specific crimes collectively called Group A offenses, including data on victims, offenders, and circumstances. For the 11 offensive categories known as Group B, only arrest information is captured.

NATIONAL INSTANT CRIMINAL BACKGROUND CHECK SYSTEM—A non-fingerprint-based search database accessible through the Internet and required before purchasing a firearm. Federal Firearms Licensees record descriptive information on the Bureau of Alcohol, Tobacco, Firearms and Explosives' Form 4473.

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY—Formerly known as the National Bureau of Standards, this division of the U.S. Department of Commerce ensures standardization in non-defense government agencies.

NEXT GENERATION IDENTIFICATION—Program to advance the Federal Bureau of Investigation's biometric identification services, providing an incremental replacement of current Integrated Automated Fingerprint Identification System technical capabilities, while introducing new functionality across a multi-year timeframe.

NLETS—An outgrowth of Law Enforcement Teletype System, Nlets was incorporated in 1970 as a not-for-profit organization. Nlets provides an international, computer-based message system that links local, state, and federal criminal justice agencies for information exchange and provides information services support for justice-related applications by supporting data communications links to state networks using commercial relay services.

NON-IDENTIFICATION—A determination that two fingerprints do not belong to a particular person or that no mate is found as the result of a fingerprint comparison.

ORIGINATING AGENCY IDENTIFIER—An identification number assigned by the National Crime Information Center or the Integrated Automated Fingerprint Identification System to each agency that may submit information into, or receive information from, either system. The format of this number varies from agency to agency, except that the first two characters always designate the state, territory, province, or country of the contributor.

PALM PRINT—1: An inked and rolled or Livescan of the palms of both hands. May also include the side of the hand referred to as the writers palm. 2: An impression of the friction ridges of all or any part of the palmar surface of the hand. (SWGFAST 2011)

PATTERN CLASSIFICATION—Characterization of a fingerprint as containing one of seven fingerprint patterns: arch, tented arch, right-slant loop, left-slant loop, whorl, amputation, or scar. The Integrated Automated Fingerprint Identification System will provide for both pattern-level and Henry classifications.

PROCESS CONTROL NUMBER—A temporary identifier of a ten-print record until matching State Identification Number is found (by locating a match in the database) or a new State Identification Number is assigned (if there is no match on the database).

PEAK MINUTE—A minute during which a system must process a statistically significantly greater number of user support functions than it is required to process during an average minute.

PIXEL—The smallest element of a picture that is digitized as an entity. (ANSI/IAI)

PLAIN, TOUCH, OR FLAT IMPRESSION—Impressions of all four fingers from each hand, taken simultaneously, and of the thumbs, taken without rolling, which appear at the bottom of the fingerprint card and serve to verify the proper sequence of the rolled (or Livescan) impressions and to provide additional ridge detail for comparison. (ANSI/IAI)

PROTOTYPE—A simulation of a program, report, menu, or system.

QUALITY CONTROL—1: Editing of fingerprint minutiae to improve accuracy for identification, automatically determined for ten-prints. 2: Measures that are taken to ensure that an acceptable level of system performance is maintained. (ANSI/IAI)

RADIOMETRIC RESOLUTION—Number of intensity levels (i.e., shades of gray or color values) in a digital image.

RELAUNCH—Searching a latent print case after the initial latent/ten-print latent cognizant database search using different search parameters while maintaining the same case identifiers and images.

RELIABILITY—The probability that the mating fingerprint will be a candidate if the mate is in the file being searched.

REMOTE TEN-PRINT FINGERPRINT FEATURE SEARCH (NATIVE MODE)—A search request transmitted to the Federal Bureau of Investigation originating outside the Identification Tasking and Networking workstations containing fingerprint characteristics derived by an AFIS in a similar manner to those derived by the Integrated Automated Fingerprint Identification System and containing the necessary fingerprint classifications and other data. The search request is performed automatically by the Integrated Automated Fingerprint Identification System without human involvement.

REVERSE SEARCH—See *ten-print/unsolved latent search*.

REMOTE FINGERPRINT EDITING SOFTWARE—Software package from the Federal bureau of Investigation to perform remote searches on the Integrated Automated Fingerprint Identification System, which supports remote Integrated Automated Fingerprint Identification System transactions including image- and features-based searches for latent and ten-print applications. Succeeded by Universal Latent Workstation.

ROLLED IMPRESSION—Fingerprint impressions created by individually rolling each finger from side to side (nail to nail) to obtain all available friction ridge detail. The images appear in the individual print boxes on the ten-print card.

SCANNER—Capture device to create a digital image. New scanners that connect to the Federal Bureau of Investigation must meet the standards outlined in Appendix F of the *Electronic Biometric Transmission Specification*.

SEARCH SELECTIVITY—The total number of incorrect candidates divided by the total number of searches conducted during the time period; that is, it is the number of incorrect candidates, averaged over time periods, produced for comparison per search at the operating point at which search reliability is measured.

SEARCH or **THE NATIONAL CONSORTIUM FOR JUSTICE INFORMATION AND STATISTICS**—A nonprofit membership organization dedicated to better criminal justice information management, effective identification technology, and responsible law and policy.

SEGMENT—One of the constituent parts into which an automated system may be logically divided.

STATE IDENTIFICATION NUMBER—Number assigned to each individual on a state file.

SUBJECT MATTER EXPERT—Person who exhibits the highest level of expertise in performing a specialized job, task, or skill.

STATEMENT OF WORK—Describes the tasks and responsibilities for a project.

SPATIAL RESOLUTION—Relationship of the individual pixels to the size of the actual area represented.

SPECTRAL RESOLUTION—Color bands of light detected during image acquisition.

STATE-OF-THE-ART TECHNOLOGY—The highest level of development of a device or technique achieved at any particular time.

STORE AND FORWARD—A system capable of electronically receiving and processing fingerprint cards at the state and then sending the fingerprints electronically into AFIS and to the Federal Bureau of Investigation.

SUBJECT SEARCH—A search, using biographical and/or physical data, to identify a list of candidates having records that match the descriptors specified; can be based upon name, gender, date of birth, Federal Bureau of Investigation Number, State Identification Number, Social Security Number, or other biographical or physical data (e.g., height, weight, age) or combinations of these characteristics.

SCIENTIFIC WORKING GROUP ON FRICTION RIDGE ANALYSIS, STUDY AND TECHNOLOGY—A group of local, state, and federal law enforcement officials and members of the community who establish guidelines for the development and enhancement of friction ridge examiners' knowledge, skills, abilities, methods, and protocols; who establish guidelines for quality assurance; and who cooperate with national and international standards organizations to disseminate their findings.

TERMINAL AGENCY COORDINATOR—Individual in the control terminal agency who is responsible for monitoring system use, enforcing system discipline, and ensuring National crime Information Center operating procedures are followed.

TECHNICAL SEARCH—Using AFIS, a minutiae-based fingerprint search, usually with the index fingerprints of the ten-print record but sometimes with the thumbs or a combination of index fingers and thumbs.

TEN-PRINT—A fingerprint card (or fingerprint card equivalent) containing rolled and plain impressions from the ten fingers of an individual. The standard format contains 14 impressions: one rolled fingerprint impression of each finger, plain fingerprint impressions of each thumb, and plain impressions of the four fingers of each hand simultaneously.

TEN-PRINT CARD SUBMISSION—A fingerprint card submitted to the Federal Bureau of Investigation by mail, facsimile, or other electronic method for the purpose of identification and possible incorporation into the Federal Bureau of Investigation's Fingerprint Repository.

TEN-PRINT IMAGE SEARCHES—An electronic transaction submitted to the Federal Bureau of Investigation, which contains fingerprint images, classification information as required by the Integrated Automated Fingerprint Identification System, or remotely extracted fingerprint characteristics. The subsequent search will be conducted automatically with no additional manual editing or processing. If candidates are identified, the candidates' Federal Bureau of Investigation Numbers are returned to the transmitting agency along with fingerprint images from the highest scoring candidates.

TAGGED IMAGE FILE FORMAT—An image file format with the ".tif" file extension, which can be either lossless or lossy.

TEN-PRINT/TEN-PRINT IDENTIFICATION DATABASE SEARCH—Search of a ten-print record against the records in the ten-print identification database.

TEN-PRINT/UNSOLVED LATENT SEARCH—Search of a new ten-print record against the records in the unsolved latent file in expectation that the owner of the latent print did not have a record in the ten-print database at the time of the latent/ten-print search. Also referred to as a reverse search.

TEN-PRINT IDENTIFICATION DATABASE—Database consisting of two finger images, usually the index fingers but sometimes the thumbs.

TEN-PRINT LATENT COGNIZANT DATABASE—Database consisting of all ten finger images, which may be a subset of the ten-print identification database.

TRANSPOSITION—Incorrect position of hands on the ten-print card (e.g., images of the right hand appear in boxes for the left hand). In the past, identification staff would visually inspect the rolled impressions against the plain impressions for consistency. Livescan software for extraction and comparison reduce this burden on digitally retrieved images.

TECHNOLOGY WITHOUT AN IMPORTANT NAME—Image acquisition and output protocol commonly used between computers, printers, and image capture devices.

UNIFORM CRIME REPORT—Voluntary reporting of crimes (including murder, non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny-theft, motor vehicle theft, and arson) to the Federal Bureau of Investigation's Criminal Justice information Services Division.

UNSOLVED LATENT/UNSOLVED LATENT SEARCH—A search of the unsolved latent print file using another unsolved latent print to determine if latent images from the same subject are on file even if the subject remains unknown. May be used to determine a serial offender and for sharing information with another agency.

UNIVERSAL LATENT WORKSTATION—Software program developed by the Federal Bureau of Investigation's Criminal Justice information Services Division that, when installed on a commercial off-the-shelf computer, allows the operator to create a native feature set for AFIS vendors by which the Integrated Automated Fingerprint Identification System can receive and search an ANSI/NIST-formatted record.

UPGRADE—Introduction of new software and/or hardware into an existing system. The upgrade may be to fix certain known problems unique to one AFIS customer, to fix known problems applicable to all customers, to provide an improvement to the AFIS system not related to a problem, or to enable a move to a new platform (such as from Microsoft® Windows® to Linux, or Windows® 98 to Windows® XP). The upgrade may require extensive on-site testing prior to installation on the live system.

VALIDATION—Process of comparing data or images against a previously verified set of data; a double check of the verification that confirms the accuracy of a system prior to use.

VERIFICATION—1: Process of visually comparing a search fingerprint with a candidate fingerprint to determine if there is a match after another latent print examiner has already reached a conclusion. 2: The fourth and final step in the ACE-V process.

WIDE AREA NETWORK—A network that interconnects geographical entities, such as cities and states, generally covering a distance of 50 miles or greater.

WAVELET SCALAR QUANTIZATION—A lossy compression algorithm used to reduce finger or palm print images size.

ACRONYM LIST

ABIS—Automated Biometric Identification System
AFIS—Automated Fingerprint Identification System
ANSI—American National Standards Institute
APB—Advisory Policy Board
ARG—Attributed Relational Graph
ASCII—American Standard Code for Information Interchange
ATB—Automated Fingerprint Identification System Test Bed
BCI&I—Bureau of Criminal Identification and Investigation
BoM—Bill of Material
CAN—Criminal Ten-Print Submission (No Answer Necessary)
CAR—Criminal Ten-Print Submission (Answer Required)
CARC—Criminal Ten-Print Card Scanning Service Submission (Answer Required)
CAXI—Core and Axis Independent
CCD—Charged-Coupled Device
CCH—Computerized Case History or Computerized Criminal History
CJIS—Criminal Justice Information Services
CLPE—Certified Latent Print Examiner
CMF—Criminal Master File
CNAC—Criminal Ten-Print Card Scanning Service Submission (No Answer Necessary)
CODIS—Combined DNA Index System
CONOPS—Concept of Operations
COTS—Commercial Off-the-Shelf
CSS—Card Scanning Service
CTA—Control Terminal Agency
DCJS—New York State Division of Criminal Justice Services
DEU—Unknown Deceased
DIRS—Digital Image Retrieval System
DMS—Data Management System
DNA—Deoxyribonucleic Acid
DPS—Department of Public Safety
EBTS—Electronic Biometric Transmission Specification
EFCON—Electronic Fingerprint Converter
EFTS—Electronic Fingerprint Transmission Specification
EFS—Extended Feature Set
FANC—Federal Applicant – No Charge Federal Agency Name Check
FAR—False Acceptance Rate
FAT—Factory Acceptance Test
FAUF—Federal Applicant User Fee
FBI—Federal Bureau of Investigation
FFT—Fast Fourier Transfer
FIC—Fingerprint Image Comparison
FIMF—Fingerprint Image Master File

FNCC—Federal Applicant Card Scanning Service Submission (No Charge)
FNU—Federal Bureau of Investigation Number
FPF—Focal Point Filtering
FPT—Fast Fourier Number
FpVTE—Fingerprint Vendor Technology Evaluation
FUFC—Federal Applicant Card Scanning Service Submission (User Fee)
GFE—Government-Furnished Equipment
IAFIS—Integrated Automated Fingerprint Identification System
IAI—International Association for Identification
IBR—Incident-Based Reporting
ICD—Interface Control Document
IDAS—Identification Automated Services of the Federal Bureau of Investigation
III—Interstate Identification Index
IISS—Identification and Investigative Services Section of Criminal Justice Information Services Division
IMAP—Internal Miscellaneous Applicant Civil
IQS—Image Quality Specification
IRC—Indeterminate Ridge Count
IT—Information Technology
ITL—Information Technology Laboratory
ITN—Identification Tasking and Networking
JFI—Journal of Forensic Identification
JPEG—Joint Photographic Experts Group
LDIS—Local DNA Index System
LEIF—Law Enforcement Interconnecting Facilities
LEO—Law Enforcement Online
LETS—Law Enforcement Teletype System
LFFS—Latent Fingerprint Feature Search
LFIS—Latent Fingerprint Image Search
LITS—Latent Interoperability Transmission Standard
LT—Latent Print
LT-ARG—Latent-Attributed Relational Graph
MAP—Miscellaneous Applicant Civil
MAPC—Miscellaneous Applicant Card Scanning Service Submission (No Charge)
MCAXI—Modular Core and Axis Independent
MCS—Minutiae Comparison Standard
MOU—Memorandum of Understanding
MPR—Missing Person
MQI—Matcher Quality Index
N-FACS—National Fingerprint-Based Applicant Check Study
NCIC—National Crime Information Center
NCIC 2000—National Crime Information Center 2000
NDIS—National DNA Index System
NFF—National Fingerprint File

NFFC—Non-Federal Applicant Card Scanning Service Submission (User Fee)
NFUF—Non-Federal Applicant User Fee
NGI—Next Generation Identification
NIBRS—National Incident-Based Reporting System
NICS—National Instant Criminal Background Check System
NIJ—National Institute of Justice
NIST—National Institute of Standards and Technology
NOE—Non-Operational Environment
NPS—National Police Services
NSOR—National Sex Offender Registry
NYSIIS—New York State Identification and Intelligence System
O&M—Operations and Maintenance
ODRC—Ohio Department of Rehabilitation and Correction
OE—Operational Environment
OLES—Law Enforcement Standards Office
ORI—Originating Agency Identifier
PC/RC—Pattern Class/Ridge Count
PCN—Process Control Number
POC—Point of Contact
PPI—Pixels per Inch
PSS—Public Safety Strategy
QC—Quality Control
RFES—Remote Fingerprint Editing Software
RFI—Request for Information
RFP—Request for Proposals
RRI—Repository Retrieval Index
SAN—Storage Area Network
SAT—Site Acceptance Test
SDIS—State DNA Index System
SID—State Identification
SME—Subject Matter Expert
SMT—Scars, Marks, and Tattoos
SoS—System-of-Systems
SOW—Statement of Work
SP/CR—System Problem/Change Report
SSN—Social Security Number
SWGFAST—Scientific Working Group on Friction Ridge Analysis, Study and Technology
TAC—Terminal Agency Coordinator
TAR—True Acceptance Rate
TBD—To Be Determined
TIFF—Tagged Image File Format
TOT—Type of Transaction
TP—Ten-Print Record
TP-CMF-CAXI—Ten-Print Criminal Master File Core and Axis Independent

TP-ARG—Ten-Print-Attributed Relational Graph
TPid—Ten-Print Identification Database
TPIS—Ten-Print Image Search
TPlc—Ten-Print Latent Cognizant Database
TWAIN—Technology Without an Important Name
UCR—Uniform Crime Report
UL—Unsolved Latent
ULF—Unsolved Latent File
ULW—Universal Latent Workstation
UP—Unsolved Palm
USSS—United States Secret Service
VPN—Virtual Private Network
WAN—Wide Area Network
WDS—Workflow Distribution Server
WIN—Western Identification Network
WSQ—Wavelet Scalar Quantization