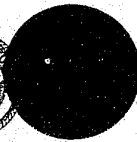


U.S. Department of Justice  
Office of Justice Programs



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# Planning for Automated Fingerprint Identification Systems (AFIS) Implementation

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**MONOGRAPH**

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# Planning for Automated Fingerprint Identification Systems (AFIS) Implementation

## Monograph

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June 1988

**U.S. Department of Justice**  
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U.S. Department of Justice  
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Automated Fingerprint Identification Systems (AFIS) represent a significant emerging technology. Dramatic results in sites where it has been employed have spawned a widespread and growing interest in the law enforcement community and have led to the allocation of Justice Assistance Act block grant resources by the states. AFIS has resulted in a radical expansion of law enforcement capability, to make effective use of crime scene evidence, and will enable criminal history repositories to respond quickly and accurately to the growing body of requests for criminal history information from criminal justice and noncriminal justice agencies.

At this stage in its development, AFIS is expensive. Given its comprehensive nature, AFIS is and will remain complex. Agencies considering what is commonly a multi-million dollar commitment will want to do so with great care. Detailed interagency planning and analysis is essential to establish the need for and applications of AFIS.

This monograph represents part of the Bureau of Justice Assistance's (BJA) response to the interest in AFIS and to the need for careful planning. It draws upon the experience of AFIS sites and upon the experience gleaned from BJA-supported technical assistance provided to sites considering AFIS. It is intended to provide a general overview of AFIS applications and to acquaint agencies considering an AFIS with the sequence of steps, from existing system examination to Request for Proposals (RFP) development, required to inform that consideration.

I hope you find it informative and helpful.

Sincerely,

A handwritten signature in dark ink, appearing to read "Charles P. Smith". The signature is fluid and cursive, written over the typed name.

Charles P. Smith  
Director

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# Introduction

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"Revolutionary technology" is a term used casually in relation to computers, and often without justification. This is decidedly not the case with Automated Fingerprint Identification Systems (AFIS). The significant capabilities of AFIS are demonstrated in the recent "Night Stalker" case, involving an alleged serial killer believed to be responsible for some 14 homicides and at least 21 assaults in California. The break in the case came when a man resembling police sketches of the Night Stalker left a fingerprint on a stolen car. Once recovered by the police, the latent print was rushed to the California Department of Justice. A new AFIS system was being installed and the print was immediately scanned and searched against the millions of prints in the master file. Within three minutes, the AFIS returned a list of possible matching fingerprints, the first of which ultimately linked Richard Ramirez to the crimes. The next day the man believed to be the Night Stalker was in police custody.

Without AFIS, the print of the Night Stalker could only have been searched against the master fingerprint file if there were a named suspect. A name allows a single fingerprint card to be pulled from the file for manual comparison with the fingerprint retrieved from the crime scene. Without a suspect's name, however, the only alternative is to conduct what is known as a cold search, i.e., the comparison of the crime scene fingerprint with all of the prints on file, one at a time. The odds against a manual cold search returning a match from a master file comprised of millions of fingerprints are staggering and render a successful search improbable. Translated into manhours, such a search in a data base of millions of fingerprints could take in excess of 50 years, which renders the cold search a practical impossibility.

Yet this is the situation facing most state and local law enforcement agencies today. Although an estimated 35 percent of crime scenes yield usable fingerprint evidence, cold searches are rarely conducted. Law enforcement personnel readily admit that fingerprints taken at a crime scene are usually filed away in the vague hope that a suspect will subsequently be identified for comparison. Law

enforcement officials also acknowledge that without a suspect, crime scene prints are often taken more as a matter of public relations than as a means of criminal identification. The public perception that law enforcement has the general capability of identifying crime scene fingerprints is largely a myth derived from television detective programs. In truth, no such general capability exists; manual cold searches rarely take place.

What makes AFIS a truly revolutionary technology is that it gives law enforcement a capability it did not have, and it provides identification rates that truly revolutionize the fingerprint identification process. In its first year of operation, AFIS searches conducted by technicians in the San Francisco Police Department identified one out of every five latent fingerprints. The first latent print searched in San Francisco's AFIS belonged to the murderer of Miriam Slamovich, a concentration camp survivor who was killed by an intruder in her home in 1978. The perpetrator's fingerprint left at the scene had been the object of thousands of hours of manual searching over an eight year period. Once the AFIS became operational, the search took six minutes, resulting in the immediate identification of a suspect who was in custody the next day. The Slamovich case never came to trial; confronted with the irrefutable evidence of his fingerprints at the crime scene, the suspect pled guilty to first degree murder. In terms of property crime, San Francisco Sheriff's Department attributes a 35 percent reduction in the rate of burglary to the incarceration of some 900 burglars, nearly all of whom were identified largely as a result of their AFIS.

San Francisco's experience is like that of other jurisdictions that have implemented AFIS. In the State of Washington, where the state AFIS became operational in February 1988, a 21 year old man was linked to the unsolved murder of his neighbor seven years ago. Confronted with his fingerprints at the scene of the crime, the suspect pled guilty. In the Commonwealth of Massachusetts, the newly implemented AFIS immediately identified the perpetrator in a rape case by a fingerprint left at the crime scene. Clearly, AFIS is changing the odds in favor of law enforcement.

## Planning for AFIS

Notwithstanding the tremendous success of AFIS, a majority of state and local law enforcement agencies do not have an AFIS and face significant obstacles in obtaining one. AFIS implementation is a multi-million dollar expenditure, which state legislatures and local governments are often reluctant to make. Moreover, until such funds are made available, state and local law enforcement agencies normally are without the resources or expertise required to conduct the essential needs assessments and planning for the system.

AFIS planning, procurement and implementation require a specialized systems approach, one that impacts all existing identification, criminal history and crime scene system functions. AFIS is an area where technical assistance can be the difference between successful and unsuccessful implementation. For example, because AFIS is both a new and a unique application, state and local agencies that have already acquired AFIS report that they lacked the knowledge to ensure that their AFIS configuration maximized both the efficiency and effectiveness of the available technology. As with any new technology, the experiences of the pioneer states can greatly benefit other jurisdictions. In fact, in the AFIS implementations that have taken place, there is now a considerable amount of wisdom that comes only with experience.

Yet most state and local law enforcement agencies do not have direct access to that collective wisdom and experience. An agency will typically contact other law enforcement agencies that have implemented AFIS and collect successful Requests for Proposals (RFPs) to determine how others have approached the acquisition process. While an RFP may contain much valuable general information relevant to AFIS, each RFP is, in the final analysis, unique to the needs of the particular implementing agency. Without substantial and rigorous analysis to match an individual agency's needs to specific AFIS capabilities, an agency risks replicating another's system which may not adequately meet individual, local needs.

## Overview of the Report

The primary purpose of this guide is to outline a sequence of steps that will allow an agency to

determine its AFIS needs in relation to the ten-print and latent fingerprint identification processes, and to begin the procurement process. A successful implementation of an AFIS attacks the two critical problems of fingerprint identification: 1) AFIS makes ten-print identification processing faster and more accurate; and 2) AFIS provides a way to identify suspects using latent fingerprints. What follows is a brief guide to assist state and local law enforcement agencies in the initial planning stages of AFIS procurement. It contains a description of the manual process of fingerprint identification generally found in the United States -- both for state and local law enforcement agencies -- and describes how AFIS approaches the problems inherent in manual systems. The steps discussed in the guide are:

### -Examination of Existing Systems

- . Evaluation of Current Ten-Print System
- . Evaluation of Current Latent Fingerprint System

### -Functional Requirements Statement

### -Initial Vendor Briefings

### -Request for Information (RFI)

### -AFIS Justification Study

### -AFIS Impact Assessment

### -Request for Proposals (RFP)

Procurement of an AFIS is not a typical systems procurement; it is a highly complex procedure, and system costs are typically in the millions of dollars. Criminal justice agencies adopting AFIS have found technical assistance to be especially important in preparing the Request for Proposals (RFP). Since the RFP is in many ways a binding legal document, it must contain language that clearly and specifically defines the agency's requirements for the capabilities and performance of the system, the rules governing the competition, the qualifications of the vendor, the reliability and maintenance of the system, the benchmark test procedures, and acceptance testing of the system.

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# Examination of the Existing System

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Planning for AFIS implementation begins with a careful examination of an agency's existing system of ten-print and latent print identification operations to determine current capabilities and to identify how AFIS might remedy existing deficiencies. An examination of the existing system of fingerprint identification should, at a minimum, include the kinds of fingerprint searches conducted, file sizes, processing time, manhour costs, backlogs, accuracy rates, missed identifications, latent capabilities, projected growth rate of files, and remote capabilities. The assessment should include an examination of both the current ten-print and the current latent fingerprint identification systems.

## Evaluation of Current Ten-Print System

The ten-print to ten-print fingerprint search is designed to determine if a criminal suspect or an applicant for some special position of trust has a criminal history record. After a candidate has been fingerprinted, a search of the master name index is conducted. On a national basis, it is estimated that over half of the arrestee name searches (50-55 percent) produce a match, indicating that the candidate has a record in the criminal history file and a fingerprint card in the master fingerprint file. For these matches, a comparison is made of the newly taken fingerprint card with the fingerprint card in the master file. This process is known as name search verification. When a match is not made on the name search, or when the fingerprint verification does not find a match, a full "technical fingerprint search" is instituted for the remaining 45-50 percent of new arrestees and applicants. For these cases, the incoming arrestee or applicant fingerprint card is classified according to a version of the Henry<sup>1</sup> system and compared to the fingerprint cards of the same classification in the master fingerprint file. It is important to note here that this classification is based on the patterns of all ten fingers, and, therefore, its utility is primarily related to ten-print searches rather than latent searches.

In examining the existing fingerprint identification system, an agency must first look to the present workload volume, as well as its expected growth rate. Many states are now experiencing significant growth in the volume of fingerprint identifications, resulting not only from a rise in new arrestees and recidivists, but also from a dramatic rise in noncriminal justice agency access to criminal history records. Each year, more and more noncriminal justice agencies appeal to legislatures to make criminal records open to positions of special trust, such as day care centers. Moreover, the implementation of the federal Security Clearance Information Act (SCIA) (Pub. L. No. 99-169, 99 Stat. 1009, codified in part at 5 U.S.C. - 9101) gives a number of federal noncriminal justice agencies access to state and local criminal history records, and widens the scope of noncriminal justice agency access nationally. Finally, a major increase in state and local workload will result from the testing and implementation of the new FBI/NCIC Interstate Identification Index (III). Under this new system, state and local agencies will be responsible for the provision of criminal history information which, up until now, has been provided by the FBI. The need to verify criminal history records released (i.e., to ensure that accurate records are linked with the right person) will bring with it a much greater number of technical fingerprint searches. The additional accommodation of noncriminal justice agency access, via the III, will strain the resources of many state and local agencies.

The critical factors to be examined in ten-print fingerprint processing are workloads, backlogs, turnaround time, and accuracy rates.

Workloads: Searching manual ten-print systems is a very labor-intensive process. An agency should be able to determine the cost of conducting manual ten-print searches by calculating the time it takes to conduct a single average search, calculating the associated personnel cost for that search, and multiplying the cost per search by the number of searches conducted on a weekly, monthly and yearly basis. In an agency with a high volume of transactions, requiring large numbers of personnel, an AFIS can be of significant benefit.



A portrait of the workload should be developed by counting the fingerprint cards processed in various categories over a period of time, e.g., a month. The total number of cards processed should be divided into categories by subject year of birth in five year increments (e.g., year-of-birth 1940-44). Each of these year-of-birth categories should then be divided into two subcategories, depending on purpose of the submission (arrest, application or licensing), and each of these subcategories further divided by search outcome (name search verification, fingerprint search identification, fingerprint search non-identification). If possible, such a portrait should be performed for the workload of each of the five previous years; the results will be useful in projecting workload into the future, which is required in determining the size of the proposed AFIS.

Turnaround Time: Most state and local agencies are governed by statutes, regulations or policies mandating an acceptable turnaround time for processing both criminal and applicant ten-prints. States typically allow a suspect to be held for a limited amount of time on suspicion and prior to formal charging, while courts need verification of identification before setting bail or releasing a suspect on his own recognizance. Most state and local agencies also experience significant turnover in personnel with associated time loss because of the amount of training required to bring new personnel to an acceptable level of competence in ten-print processing. If an agency can determine that it is not able to meet acceptable turnaround times because of uneven workflow or fluctuations in staffing levels, then AFIS becomes a significant tool to automate processes otherwise dependent on human labor.

If fingerprint cards entering the identification bureau are not already being dated when received, this practice should be instituted. The date of receipt must be the date actually received, not when the cards are first taken from the input queue to begin the processing cycle. Cards should also be dated when the processing is complete (the process is complete when the appropriate response has been sent to the submitting agency and the card itself has been filed, returned or disposed). A profile of recent turnaround time should be constructed by reviewing a substantial sample (about 500) of cards and determining the turnaround time for each. These data should then be broken into categories (arrest, applicant) and within these categories into search

outcome (name search verification, fingerprint non-identification, fingerprint identification). The resulting performance profile will be useful in specifying the AFIS performance requirements.

Backlogs: Given fluctuations in workload flow and staffing levels, state and local agencies are often faced with significant backlogs in workload. When an agency can determine that the frequency and sizes of its backlogs are impairing the effective functioning of law enforcement identification processing, then AFIS should be considered for its ability to absorb workload fluctuations. If the backlogs of the bureau are decentralized (i.e., if every workstation usually has its own backlog); the procedures should be changed to minimize the number of backlogs to perhaps six (1) awaiting initial processing, 2) awaiting name search, 3) awaiting name search verification, 4) awaiting fingerprint search, 5) awaiting data entry, and 6) awaiting final filing and disposition). These backlogs should be counted daily and charted regularly. Besides providing impetus for improving the present system, these backlog sizes are important in determining the size of the AFIS required.

Accuracy Rates: On a national basis, the average accuracy rate for manual ten-print processing is approximately 75 percent.<sup>2</sup> Accuracy rate is a measure of the ability to match a new suspect print with prints in the master file. Manual systems are error-prone for a variety of reasons, including misclassification of either the new suspect print or the file print and faulty personnel techniques in searching the master file. Moreover, manual searching is repetitive and painstaking, and such human activity by its very nature tends to have high error rates. Some agencies achieve higher accuracy rates based on training and the way in which the master file is organized for more discriminating searches. Missing one out of every four searches may be unacceptable simply on the grounds of system effectiveness, and the situation can be exacerbated by time-consuming and expensive legal actions resulting from missed identifications.

AFIS technology can raise the accuracy rate to levels of 98-99 percent on ten-print searches. If an agency desires to test its own accuracy rate, the greatest care is needed in the design of the test method, since accuracy rates are substantially higher when the searchers are under no production quotas and when it is clear that they are being tested. If a

bureau intends to stay in a manual mode for a long time, it may be worthwhile to test accuracy periodically, and to use the results for in-house training, personnel supervision and management, and system improvement. If, however, a bureau intends to move toward AFIS procurement relatively quickly, it is sufficient to use the nationwide figures quoted above rather than carry out internal testing.

### **Evaluation of Current Latent Fingerprint System**

In latent fingerprint identification processing, there are three types of latent searches: latent to ten-print, ten-print to latent, and latent to latent.

Latent to Ten-Print Search: The critical problem faced in latent fingerprint identification is the lack of an effective means of conducting a "cold search" of the files (i.e., searching without a list of suspects). When a fingerprint is found at a crime scene, the challenge facing the investigator is finding its match in the master file of ten-prints. Most manual systems, however, employ some variation of the Henry system, which is a full ten-print classification not structured to enable the searching of a single latent print. The Henry system functions only when a suspect or list of suspects has been identified, thereby enabling the investigating agency to compare the fingerprint cards of the suspects with the latent crime scene print. Because there is no effective means of cold searching a Henry system, cold searches are rarely, if ever, conducted in state and local law enforcement agencies with manual fingerprint systems.

The California Department of Justice has estimated that in one case of a hit on its CAL-ID AFIS system, it would have taken 67 years of manual searching against its file of 7.6 million fingerprint cards. CAL-ID now conducts cold searches in a matter of minutes.<sup>3</sup> In the case of the California "Night Stalker," the alleged serial killer was identified in only three minutes of AFIS file searching. Research conducted by Rand Corporation, and later research by the San

Francisco Police Department, indicates that the identification of latent crime scene fingerprints by local law enforcement agencies range from only four to nine percent of total searches. Without AFIS, a law enforcement agency's chances of hitting a "cold make" against thousands or millions of fingerprints in a file are improbable. Crime scene latent prints are stored in a file normally called the Unsolved Latent File, where they are kept in the event that a future lead will produce a suspect for comparison and result in an identification and a case clearance.

Ten-Print to Latent Search: In the ten-print to latent search, a new suspect or applicant fingerprint card is compared to the file of unsolved latent prints to determine whether the person can be linked to an unsolved crime. The ten-print to latent search is seldom done in state and local agencies because it requires the time-consuming manual process of comparing each finger on the ten-print card to each print in the Unsolved Latent File. Given increasing file sizes and associated search times, most manual systems do not engage in this kind of search. This is unfortunate because recidivism statistics make it likely that an offender who has escaped arrest in one crime, but has been fingerprinted in another, could be linked to the unsolved crime through latent fingerprint identification. An AFIS can provide the capability of searching each new suspect against all unsolved crime scene prints in a matter of minutes.

Latent to Latent Searching: In a latent to latent search, an agency compares a new latent crime scene print to all of the latent prints in the Unsolved Latent File. While such a search does not produce the identification of a suspect, it does identify a single perpetrator with multiple crimes, as with a serial murderer, rapist, or burglar. Latent to latent searching is rarely conducted in manual systems, while an AFIS provides it in a matter of minutes. Although most vendors of AFIS are willing to provide this capability, few law enforcement agencies have decided that the ability to search latent prints against other latent prints is of sufficient operational benefit to justify the additional cost.<sup>4</sup>

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# Functional Requirements Statement

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Having conducted an examination of its existing ten-print and latent identification systems, an agency is prepared to define its general AFIS requirements. A formal Functional Requirements Statement is recommended for this purpose.

A Functional Requirements Statement uses the findings of the analysis of the existing identification and criminal history systems to determine the file and workload sizes, to determine the information processing flow of the systems, and to identify areas of concern that will need to be addressed prior to AFIS implementation. Its purpose is to identify the AFIS functions necessary to overcome problems with the existing systems, and to make the entire criminal identification process more responsive to the needs of law enforcement.

The Functional Requirements Statement includes an estimate of the workload that will come to a state agency from remote AFIS installations, or to a local agency from remote booking stations. The intention to interface other computer systems, such as Computerized Criminal History (CCH) records, should also be included. The statement must also incorporate an examination of state and local law, and make recommendations on file purging. Most state and local agencies have many aged and irrelevant fingerprint records and unsolved latent fingerprints that do not need to be converted for AFIS usage. A successful Functional Requirements Statement must allow for fluctuations in personnel and workloads, and for anticipated growth.

The profile of existing workload, described earlier, should be projected forward at least five to seven years to establish the size of the AFIS. This projection should be based on age-specific current arrest rates, age-specific population projections for the state, and known and estimated changes in the criminal statutes and in fingerprinting laws concerning applicants and licensees. This exercise will produce a good estimate of future master fingerprint file size and workload. From these

projected profiles, decisions can be made concerning a cut-off year of birth for AFIS conversion, and for specifications to be placed on the AFIS.

This profiling exercise, however, will not tell the host agency whether remote stations are needed for input of arrest fingerprint cards to the processing site, or whether identification verification will be done at the central site or at remote sites. These and other important questions will only be answered by intensive interaction between the host agency and its "customers."

Profiling will not tell much about the projected need for latent print capabilities. The inability to conduct cold searches holds down the "apparent demand" for latent services, so they can be expected to rise sharply with the advent of AFIS. One approach to getting a useful projection of latent print requirements is to conduct a survey of a few hundred crime scenes, chosen randomly, to develop an estimated proportion of crime scenes, by crime type, at which searchable latent prints could be found. By using these figures, applied to projected crime occurrence by type, it is possible to develop a reasonable estimate of the future demand for latent print services and of the size and power of AFIS needed to service that demand.

A thorough Functional Requirements Statement will list all of the functions that the AFIS will be required to perform (e.g., "search XX arrest fingerprint cards per eight-hour shift, with XX percent of the cards arriving via high resolution facsimile from dial-up machines"). It will also point out unusual system features required (e.g., must connect to an existing microwave network operating at 53,200 bits per second). The subject matter of the Statement is similar to that which will later be placed in the Request for Proposals, but the tone is more technical, more communicative, less legalistic. With a completed Functional Requirements Statement, an agency has the preliminary information it needs to begin discussing AFIS with vendors.

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# Initial Vendor Briefing

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An initial vendor briefing allows an agency to see how each of the vendors would approach the agency's needs as delineated in the Functional Requirements Statements, and to provide initial cost estimates that allow the agency to propose a budget allocation for AFIS. AFIS terminology differs significantly among vendors, and there is risk of much miscommunication at the outset. There is a vendor briefing as part of the RFP process, but that is a rather late point in the process to ensure that all functions and requirements are understood by both parties. The initial vendor briefing is the first opportunity for both the vendor and the agency to begin the process of understanding each other, and as such, it is an invaluable step.

The vendor briefings should involve several people

from the host agency and several from the prospective "customer" agencies of AFIS. Each vendor should be interviewed separately. The vendor should be given considerable latitude as to the content and format of the meeting, although the vendor should be asked to comment specifically on the contents of the Functional Requirements Statement. Each vendor should also be asked to describe the "ideal" AFIS configuration in light of the functional requirements, and be encouraged to offer specific changes to the Statement if deemed appropriate.

The initial vendor briefing is a real opportunity to speak informally with the vendors, and to begin to understand the similarities and differences of the vendors' offerings.

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# Request For Information (RFI)

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The Request for Information (RFI) is a useful precursor to the Request for Proposals (RFP). Where an RFP is in many ways a legally binding document, an RFI, in a non-binding manner, allows an agency to elicit from the vendor approximate costs and AFIS features, even perhaps optional approaches to the system configuration, and to ensure that the agency and the vendor clearly understand what each is trying to communicate. An RFI allows an agency to obtain preliminary information on staffing requirements, space allocation, and system costs for procurement, maintenance and operation. It also provides an opportunity for potential vendors to point out areas in which their approaches are markedly different, and perhaps superior, to other vendors, and to identify areas in the forthcoming RFP that are critical to their approach.

Much of the raw material from which the RFI is to be constructed already exists in the Functional Requirements Statement. This is also the point, however, at which the agency should look forward to the Request for Proposals, which will soon be needed. It is also a time to become familiar with the procurement regulations of the agency. The purpose of the RFI is to tell the vendors everything that is known about the forthcoming AFIS, its features, size, performance, and its procurement. Nothing is gained by "holding back" information from the vendors, unless this is required by the procurement law and regulations under which the agency is working (e.g., it may be impermissible to

reveal the amount of money appropriated for AFIS).

The format of the RFI can be similar to that of the future RFP if that has been determined, or it may differ considerably. It is prudent to specify with some rigor the format of the response being requested, so that the various responses can be compared. Vendors are reluctant to provide detailed pricing information at this point of a procurement, but may be willing to provide approximations. Vendors will expect some assurance that data which they consider proprietary or confidential will be protected. A formal statement that the agency will not make copies of the responses and will not release their contents to persons outside the procurement committee will go far to encourage the vendors to provide detailed and useful information, which the agency will use to refine its thinking and to prepare for the RFP.

At this point in the procurement process, the criminal justice agency has acquired a much more detailed understanding of how AFIS works and how it can remedy existing problems. Should funding still need to be secured, the information gathered to this point in the process should be invaluable in documenting problems with the existing situation and the capabilities of AFIS to remedy those problems. If the funding is not an issue at this point, the agency should be careful in not rushing from the RFI to the RFP without assessing the impact of AFIS on existing methods of operation.

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# AFIS Justification Study

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If funding has not already been secured by this point in the process, the RFI and Functional Requirements Statement provide the information necessary to produce an AFIS Funding Justification document which provides critical information on the costs and benefits of an AFIS. The document will provide data on cost savings, improved response times, improved accuracy in both ten-print and latent identifications (including partial/unclassifiable arrest fingerprints and cold searches of crime scene latent fingerprints), the ability to search all applicant and new arrestee fingerprints against a file of unsolved latent prints, the ability of local law enforcement agencies to search the master fingerprint file for both ten-print and unsolved latent fingerprints, the ability to share both ten-print and latent fingerprints with agencies in other states, decreased turnaround time, improved file maintenance and enhancement, decreased backlogs, the virtual elimination of missed identifications, impact on reducing court costs, and the recovery of stolen property.

Very significant data can also be brought to the subject of case clearances, resulting from intensified efforts on the part of crime scene investigative personnel. An AFIS, in essence, is one component of an identification system that begins at the crime scene and ends as evidence in the court room.

In addition, this document can describe the benefits and cost savings to be derived by AFIS in light of the increased demands for technical fingerprint searching, from both criminal and noncriminal agencies on a national basis, that will result from the implementation of SCIA and the implementation of the III. Again, in terms of ten-print identification, there is much supporting data to demonstrate the increased efficiency derived from an AFIS, and in terms of latent fingerprint identification, there is ample data to justify an AFIS as an effective crime solving tool.

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# AFIS Impact Assessment

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An AFIS Impact Assessment document examines the ways in which AFIS will affect the operations and methods of existing identification processing, as well as the relationships of identification with the criminal history system and crime scene analysis. Most state and local administrators have found that implementation of an AFIS has dramatic impacts on existing systems and methods of operations -- AFIS changes the way an agency conducts its operations.

Without an awareness of these impacts, there can be serious problems with personnel, in terms of their

responsibilities and the methods they will have to adopt to make the AFIS function properly. There also can be problems if the existing identification and CCH systems are not operationally and functionally integrated with the AFIS. The impact document should contain a set of recommendations on how to address the impacts on the existing structure and system functions of a given state or local agency, as well as those of the local law enforcement agencies that will have remote terminal access to AFIS.

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# Request For Proposals

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With the information gained from the responses to the RFI, an agency can proceed with the Request for Proposal (RFP), the document that states the needs of the agency and all of the binding terms of the procurement approach, testing and acceptance of the system, and the terms of the contract between the agency and the vendor.

The RFP specifies the file sizes to be accommodated, the number of times per day each function is to be performed, the permissible response time for each function, minimum acceptable accuracy rates for each function, and a method for presentation of vendor proposals to assure strict comparability of the proposals. A sound approach is to develop a performance/capabilities Request for Proposals, stipulating the functions that must be done and the time frames in which the functions must be accomplished. The vendor is expected to bid whatever hardware and software is necessary to accomplish an agency's requirements. The alternative approach, which attempts to specify the numbers and types of equipment rather than the functional requirements, is much more difficult to prepare without introducing, perhaps unintentionally, an aspect of "sole source" to the procurement. Nevertheless, if an agency finds certain features which are needed to meet their legitimate functional requirements, it should have no hesitation in demanding those features in the AFIS to be procured, even if the number of bidders is thereby reduced.

Other technical portions of the RFP will include: the format for estimating the staff required for each function; the method to propose system requirements for space, utilities, and maintenance needs; and file size estimates for the master fingerprint file and the unsolved crime scene fingerprint file for the state, including growth rate estimates for each of these files. It should include workload estimates broken down by local jurisdictions that may have remote access to the AFIS, including file maintenance and file inquiry modes associated with these files.

Preparation of the RFP will require certain critical policy decisions. The goal of an AFIS is to provide

the most effective identification and crime solving mechanism possible. Ideally, an agency might want to include all classes of offenders, all types of offenses, all applicants for governmental positions, and all ten fingerprint images for every subject in the AFIS. Notwithstanding these desires, however, states often have to make tough policy decisions about the functions and capabilities of the AFIS based on system costs and manpower availability. The following examples, which are by no means exhaustive, indicate the kind of policy decisions that an agency will face.

An agency may elect to store all ten fingers (or eight) for all criminal and applicant subjects, thereby allowing all unsolved latent fingerprints to be searched against the entire fingerprint file; or, the state may elect to create a latent-cognizant file, which stores ten (or eight) fingerprints only for persons that have committed certain criminal offenses. All other subjects then have only two fingers (usually thumbs) stored to conduct ten-print to ten-print searches; latent searches cannot be conducted on this file. Research and statistical data should be used to underscore the positive and negative aspects of such a structure, showing the impact on file sizes and associated costs.

In searching a crime scene latent fingerprint against the file of ten-print images, there is a policy decision to be made on the number of prints from the inked ten-print cards that will be stored in the AFIS. Some states have elected to store all ten images while others have elected to store only eight by eliminating the little fingers. Such a policy determination is based on research indicating the frequency that little fingerprints are found at crime scenes balanced against the costs associated with file sizes and computer storage.

As another policy decision, an agency may elect to include or exclude a function that searches a latent print against a file of unsolved latents. Such a search can match an unidentified latent fingerprint from a new crime scene with fingerprints in the unsolved latent AFIS file, thereby indicating the existence of a repeat or serial offender, but such a



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search cannot provide the identity of the subject. Again, it will be important to provide research data supporting the positive and negative aspects of including or excluding such a search capability, including the value of the information to crime scene investigations and the costs associated with file size and computer storage.

In implementing its AFIS, an agency may elect to establish a year-of-birth cutoff to limit the records that will be included in the system. Such a policy decision is based on research that supports the argument that subjects beyond a certain age are predominantly no longer active in crime or that their numbers are not sufficient to justify the costs associated with their inclusion in an AFIS. Establishment of a policy by an agency to purge non-serious offenders from an AFIS after a specified amount of time is another decision that can be supported by research and statistical data.

The inclusion of juvenile fingerprints in an agency's AFIS is a critical policy decision. Research data can show the amount and frequencies of crimes (especially property crimes, which produce the greatest number of AFIS hits) committed by juveniles.

The RFP should include a detailed plan for a benchmark test, the purpose of which is to assure the state that the assertions in the proposal concerning accuracy, throughput, response time and other technical measures of system performance are justified. Sometimes the benchmark testing is done only for the vendor which has been (provisionally) selected; other times it is done for all proposing vendors. The positive and negative aspects of these alternatives should be explored. What is most important is that the benchmark test be consistent and each vendor be tested on the same terms.

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## Conclusion

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The successful initial planning for AFIS procurement results from a careful, systematic process that begins with an accurate assessment of existing systems, proceeds to the development of a clear statement of the agency's identification processing needs, and culminates in the release of a detailed Request for Proposals. The sequence and number of steps briefly outlined in this guide are intended to assist a state or local law enforcement agency in understanding the procurement process. Each AFIS procurement will in

many ways be unique, and an agency will need to adjust its planning process accordingly.

If the procurement and implementation of an AFIS is executed with care, an agency can expect the same revolutionary results that other agencies have experienced. While the process will be painstaking and expensive, its eventual outcome can be measured in terms of crimes solved and prevented.

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# Endnotes

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1. Sir Edward Henry, Inspector General of Police in Bengal and Commissioner of London's Metropolitan Police, instituted his classification system for criminal identification in England and Wales in 1901. It was adopted by the FBI in 1924. The Henry system assigns an alphanumeric designation reflecting the pattern characteristics of all ten fingers. Therefore, it cannot search on an individual finger. With modifications, the Henry system remains the predominant system for fingerprint identification.

2. See Terry Lindh and Stephen Ferris. Fingerprint Identification Systems (Paper prepared for presentation at the Automated Fingerprint Identification Seminar, University of Tennessee Space Institute, April 15-17, 1985), p.28. In a national survey, Lindh and Ferris found a 60-65 percent manual accuracy rate. Inspector Ken Moses, Crime Scene Investigation Unit, San Francisco Police Department, conducted a national survey in 1979 and found a 74 percent manual accuracy rate. Experts agree that the range in percentage is largely attributable to the degree of thoroughness of the actual comparisons of the suspect print with the file prints.

3. SEARCH, Automated Fingerprint Identification Systems: Technology and Policy Issues, United States Department of Justice, Bureau of Justice Statistics (1987), at 14.

4. Automated Fingerprint Identification Systems: Technology and Policy Issues, at 17.