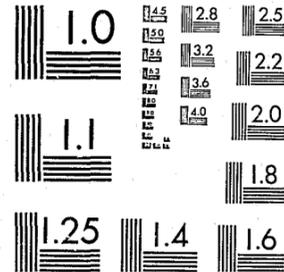


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REPORT TO THE LEGISLATURE

Recommendations on Minnesota's Automated Fingerprint Identification Network (MAFIN)

**CRIME CONTROL
PLANNING BOARD**

December, 1980

U.S. Department of Justice
National Institute of Justice

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
INTRODUCTION	1
WHAT IS THE MAFIN SYSTEM?	2
WHAT ARE THE OBJECTIVES FOR MAFIN?	3
HOW WELL DOES MAFIN WORK?	4
WHAT PROBLEMS EXIST?	5
WHAT OUGHT TO BE DONE, AND HOW MUCH WILL IT COST?	6
Recommendations	7
CONCLUDING REMARKS	9

INTRODUCTION

This report to the legislature (as mandated by legislative action in 1980)¹ discusses Minnesota's new automated fingerprint identification system, known as MAFIN. Put into operation in 1979, with federal grants from the Crime Control Planning Board, this system was the first of its kind in the world. It is operated jointly by the St. Paul Police Department, the Minneapolis Police Department, and the state Bureau of Criminal Apprehension (BCA).

MAFIN has created a small revolution in police work. It makes possible what has not been possible before: the identification of latent fingerprints, which are those recovered at the scene of a crime, when no other facts are known about the perpetrator. In other words, police in Minnesota now have a chance of solving many crimes where a fingerprint is the only clue--a common situation in many crimes, such as burglary.

The MAFIN equipment can also identify persons from the fingerprint cards taken upon their arrest if they are wanted fugitives or have prior records in any of the three agencies' files who share the use of the system. MAFIN has not replaced the traditional manual identification process for fingerprint cards, but now for the first time the participating agencies can routinely check for a criminal history record in one another's files.

With these advances in police work, Minnesota has the opportunity

¹Laws of Minnesota 1980, Chapter 614; House File 2476.

to improve the investigation of crimes, to solve crimes that would not have been solved before, and to increase the accuracy of criminal history records. How to reach this potential is the subject of this report.

The recommendations presented here are drawn from the following:

- an intensive evaluation of the first year of MAFIN's operation, which because of the report's length has been published under separate cover as "An Evaluation of Minnesota's Automated Fingerprint Identification System" (October, 1980);
- a mail survey of all sheriffs and chiefs of police in Minnesota (outside the Twin Cities) that was designed to learn the state of fingerprint identification and to solicit ideas on what improvements are needed;
- the discussions with the agencies who use MAFIN on their needs and priorities;
- the experience of the staff of the Crime Control Planning Board gained in over four years of work on MAFIN;
- the cost proposals from the system's manufacturer, Rockwell International, for selected possible additions and improvements to the system.

WHAT IS THE MAFIN SYSTEM?

MAFIN is a network of high technology electronics and special purpose computers that tries to duplicate the work of a human fingerprint examiner. MAFIN originated with equipment designed by the FBI and the National Bureau of Standards but is now manufactured by Rockwell International, the sole source of such devices.

Through either the St. Paul Police Department, where the central site of the MAFIN network is located, or the Minneapolis Police Department, or the state Bureau of Criminal Apprehension, all law enforcement

agencies in the state have access to MAFIN's fingerprint identifying capabilities.

The entire fingerprint card files of Minneapolis, St. Paul, and the BCA have been put into MAFIN's computer memory, for a total of 330,000 persons on file. An unidentified fingerprint can be compared by the computer against any or all of the fingerprints in its file at a rate of up to 250 comparisons per second.

In operation, the computer produces a list of those persons whose fingerprints are most like the unknown latent print. A trained fingerprint examiner then verifies (or rejects) the computer's selection. If a suspect is identified, that information is given to a detective responsible for investigating the crime.

WHAT ARE THE OBJECTIVES FOR MAFIN?

In planning for the MAFIN system, fingerprint experts anticipated that it would make significant contributions in a number of areas of police work:

1. Foremost among objectives for MAFIN is the clearance (solving) of routine crimes. Burglaries, for instance, ordinarily have a very low clearance rate (about 13 percent), yet estimates suggest that latent evidence can be collected in about half of all burglaries. Over 45,000 burglaries are reported in Minnesota each year, which gives an indication of MAFIN potential.
2. Experience shows that every year police departments are faced with a small number of exceptional crimes that consume much time and expense for investigation: a murder, for example, or a string of robberies by the same suspect. Often fingerprint evidence exists for these crimes. The prospect is that from time to time MAFIN will identify a suspect early in an investigation and thereby yield a large savings. A single instance might well "pay" the cost of operating MAFIN for an entire year.

3. Because MAFIN can identify latent prints very quickly, in a matter of minutes or hours, it is possible to recover stolen goods before the thief or burglar has a chance to sell or conceal them.
4. The MAFIN network provides a check on the manual identification of arrested persons and offers the capability to search for fugitives, aliases, and prior records across agencies. This will improve the accuracy of criminal history information. Accurate and complete criminal history data has become even more important with the inception of sentencing guidelines.
5. The existence of MAFIN may, in itself, encourage the collection of fingerprint evidence, where in the past it was often neglected for want of a suspect.

HOW WELL DOES MAFIN WORK?

In its first year of operation, MAFIN achieved a measure of success in all of its objectives. Over 100 crimes were solved, the majority of them burglaries; several thousand dollars worth of stolen goods were recovered and returned to the owners; and many errors in criminal records were found and corrected.

For the St. Paul Police Department, MAFIN raised the productivity of the Crime Lab in identifying latent fingerprints by 40 percent, with no increase in personnel. Moreover, the average cost to local taxpayers for MAFIN's operating expenses was only about \$100 per latent identification. The evaluation of MAFIN's first year also showed that between 10 percent and 15 percent of latents entered into the computer can be identified; this rate is two or three times greater than what most police departments are able to reach with their traditional manual procedures that depend on suspect information. Furthermore, MAFIN has proven to be more accurate than humans in identifying persons from their fingerprint cards.

A general conclusion of the MAFIN evaluation is that MAFIN's equipment has a substantially greater capacity for identifying latent prints than yet demonstrated. To reach its full potential will require that law enforcement agencies step up their collection of latent evidence.

WHAT PROBLEMS EXIST?

1. The main need is for continued financial support for operating and improving the MAFIN network. Federal funds have largely paid for the equipment, while Minneapolis and St. Paul have also contributed in money and personnel time to setting up the system and making it work. But with the demise of the Law Enforcement Assistance Administration (LEAA), no more federal money will be available. Still, maintenance costs are increasing with inflation, and additional equipment purchases are needed.
2. The BCA needs to upgrade the type of equipment they have in order to provide the same level of service to outstate Minnesota as Minneapolis and St. Paul give their citizens. The BCA is not able to add new fingerprint cards to the system on its MAFIN terminal, which is restricted to the identification of latent fingerprints only. The BCA has "borrowed" time on the Minneapolis and St. Paul terminals for fingerprint card entry during the past year, but this arrangement has not been capable of keeping the BCA file current, and it is an extra burden on the other sites.
3. Not enough fingerprint evidence is being collected at crime scenes in Minnesota. The survey of sheriffs and police chiefs, however, showed a great interest in training for fingerprint evidence collection. Over 80 percent of the sheriffs and 70 percent of those police chiefs responding stated an interest in such training for their agencies. Moreover, local training was cited as the highest priority for improving fingerprint identification in the state. The survey also revealed that nearly half of sheriffs and police agencies still do not send fingerprint evidence to the BCA unless they have a suspect. Yet with MAFIN, suspect information is no longer required. This is a problem of communication about MAFIN.
4. Over the past year the MAFIN users have identified several changes in the system's computer programs that will increase overall speed and accuracy. Funds are needed to pay for these enhancements, which would benefit all users.

5. The number of fingerprint cards stored on the computer's four disc drive memory units is approaching capacity. The purchase of an additional disc drive would add the capacity for an additional 100,000 persons on file, giving ample room for growth and expansion.
6. It is important that people who commit crimes have their fingerprints on file, but the lack of a state file of fingerprints for juveniles who have committed felonies greatly inhibits the state in identifying latents. By contrast, in St. Paul, which does have a juvenile fingerprint file, over half of the crimes solved by MAFIN had been committed by juveniles.

Although state law (Section 299 C.10) apparently requires law enforcement agencies to fingerprint juveniles arrested for felonies and to send those fingerprint cards to the BCA, the BCA does not, in fact, accept or retain such cards. As a result of this practice by the BCA, only a few law enforcement agencies in Minnesota routinely fingerprint juveniles arrested for felonies.

The survey of sheriffs and police chiefs showed that 83 percent of the sheriffs and 67 percent of the police chiefs responding would submit juvenile felony cards to the BCA if that agency maintained a statewide file of juvenile fingerprint records. (No sheriff responded that he would not forward such cards; several were uncertain at this time.) The survey also indicated that having a complete state fingerprint file that would include adult felony and misdemeanor arrests and juvenile felony arrests was the second highest priority among sheriffs, and third among police chiefs, for improving fingerprint identification in Minnesota.

The new sentencing guidelines and the changes in the referencing of certain juveniles to adult trial court also suggest the need for a comprehensive fingerprint-based criminal history file at the state level. These changes in the law require that juvenile and misdemeanor records be used in referencing and sentencing decisions. Yet, at the present time, juvenile and misdemeanor records are not uniformly kept in the state, thereby making it hard to ensure that all defendants are treated fairly in regard to their past records.

WHAT OUGHT TO BE DONE, AND HOW MUCH WILL IT COST?

The Crime Control Planning Board's study of MAFIN leads to the recommendations proposed here. The first two proposals are of equal

importance; and they are both essential for the system to become truly a statewide service to all Minnesotans. The other proposals are important but of lesser priority and may depend on adoption of the first two recommendations.

RECOMMENDATIONS

1. The state ought to pay for all of the ongoing expenses for operating and maintaining the MAFIN network. This policy would extend to MAFIN the existing commitment under law of the state to pay the basic operating expenses for the criminal justice teletypewriter communications network administered by the BCA.

The BCA currently contributes one-third of the ongoing costs for MAFIN, but the St. Paul and Minneapolis police departments have made substantial additional contributions in setting up and housing the MAFIN equipment. So an increased state share would balance the heavier local expenses made to date.

The cost for the maintenance contract is estimated to be \$50,000 for 1981, and this amount will increase automatically (by contract) with the cost of living. The state should also pay the electric bill and the cost of telephone lines to the central computer site. This would add approximately \$10,000 to the state share per year. These monies can be paid or appropriated to the city of St. Paul, which in turn pays the bills on behalf of all the users under the existing contract arrangement. Or, if it is decided to purchase the equipment recommended here, a new maintenance contract with the vendor might be drawn up with the state. This would have the advantage of consolidating the various maintenance costs for the separate pieces of equipment into a single, easier to administer, contract.

2. The state ought to purchase for the BCA a terminal of the same capability as that of Minneapolis and St. Paul. This terminal and ancillary equipment will allow the BCA to enter fingerprint cards onto the computer at its own building, something that cannot now be done. Without this equipment the long-term participation of the BCA in the MAFIN network is seriously in doubt.

Rockwell International has given a fixed price proposal valid through August 1, 1981, for the necessary equipment at \$672,500. Maintenance for this equipment is quoted at

\$64,200 per year for the first year following installation, which would take place about sixteen months after the purchase agreement. The cost of site preparation at the BCA is extra.

This terminal at the BCA would have the added benefit of being able to replace the microfilm-based system currently used for card identification; this microfilm equipment is now seven years old and is becoming more difficult to maintain. The MAFIN equipment would also allow a potential expansion of criminal history files, as recommended below, and make it possible for law enforcement agencies in outstate Minnesota to have small latent fingerprint terminals of their own at some future time.

3. The users of the MAFIN system have collectively recommended and ranked a list of ten modifications to the computer software programs of the existing system that will improve its effectiveness. The total cost of these changes is about \$77,000. All or part of this might be funded by the state in that all of the users stand to benefit. The more important of these changes would cost at least \$30,000, which we recommend as a minimum funding level. The addition of a new terminal at the BCA will make certain of these changes particularly important. The purchase of an additional disc drive to expand the system's file capacity is also recommended. This will cost \$25,150 with maintenance in the first year at \$2,880.
4. If the state is to purchase the terminal for the BCA, as recommended above, we further urge that the BCA begin planning for the establishment of a juvenile fingerprint card file to be set up in two years, when the new MAFIN terminal would go into operation. If necessary, the legislature might then in 1983 review the plans for juvenile fingerprint identification records and approve any supplemental funding to establish the state file. An expanded state file might require the expansion of MAFIN's memory capacity through the purchase of additional disc drives; this would have to be studied in the interim.
5. Also contingent upon the purchase of a terminal by the BCA is the addition of remote latent-only terminals at selected law enforcement agencies in Minnesota outside of the Twin Cities. This type of terminal, which can transmit fingerprint data over an ordinary telephone line to the central computer site, is available at a cost of \$124,400, with an annual maintenance cost of \$16,800. The reason this terminal is contingent upon the BCA terminal is that the fingerprint cards from the remote site must still be entered through the BCA terminal.

In the survey of sheriffs and police chiefs, we sought to determine which agencies might have a use for a latent-only terminal. The criteria we adopted for a preliminary

selection are three: 1) the agency must have a trained fingerprint examiner, 2) the agency must maintain a local fingerprint card file of at least 1,000 cards, and 3) the agency must process at least 100 crime scenes for evidence each year. The survey showed that the following agencies meet the criteria: Hennepin County Sheriff, Duluth Police Department (which could also serve the St. Louis County Sheriff), and the Otter Tail County Sheriff. In fact, all of these agencies substantially exceed the minimum criteria suggested here. The Stearns County Sheriff and St. Cloud Police lack only a trained expert to make them a viable site as well, as does the Willmar Police.

The Hennepin County Sheriff, Duluth Police Department, and Otter Tail County Sheriff have already expressed an interest in obtaining latent terminals for their agencies.

Although it might be argued that these sites can send all of their latent work to the BCA, the fact is that this is not happening and, indeed, their case volume potentially exceeds what the BCA can handle.

To establish remote terminal sites will, to be most productive, require the BCA to make changes in its procedures so that fingerprint cards from separate regions of the state are kept as separate subfiles of the MAFIN system. In designing the MAFIN system provision was made for exactly this eventuality. Local files will allow agencies to search for suspects among local criminals more effectively than in a single statewide file.

The St. Paul Police Department can also benefit from the addition of this type of latent terminal, which can enable latent prints of poorer quality to be entered into MAFIN. St. Paul is the only site of the three not to have a terminal specifically designed for latent fingerprints.

CONCLUDING REMARKS

The costs for the various recommendations on equipment purchase or maintenance are given in Table 1 along with a total. The costs are shown according to the fiscal year in which the purchase is made. However, the payment for purchase of a BCA terminal would be scheduled over a sixteen-month period. The total for the biennial budget ranges from about \$932,000 to \$979,000 depending upon what options among the computer

improvements are selected. The ongoing cost for running the system will be about \$139,000 per year for the recommended system.

TABLE 1 COSTS FOR MAFIN EQUIPMENT AND MAINTENANCE BY FISCAL YEAR		
	1 9 8 2	1 9 8 3
Maintenance and Operating Costs of Current System	\$ 63,000 ^a	\$ 71,000 ^a
<u>BCA Terminal:</u>		
Purchase	672,500	
Maintenance		64,200
<u>Disc Drive Memory Unit:</u>		
Purchase	25,150	
Maintenance	2,880	3,500 ^a
<u>System Computer Software Improvements</u>	30,000 to 77,000	
TOTAL	\$ 793,530 to \$ 840,530	\$ 138,700
TWO-YEAR TOTAL	\$ 932,230 to \$ 979,230	
<u>Optional Remote Latent-Only Terminal:</u>		
Purchase	\$ 124,400	
Maintenance	16,800	
^a Estimated; will vary with cost of living index.		

This is a crucial time for the MAFIN network. It is the judgment of this evaluation that if the state does not make a commitment of strong financial support in 1981, the future of MAFIN as a statewide system is in jeopardy. Up to this time, the work of developing MAFIN has fallen almost completely on Minneapolis and St. Paul; it is time for the state to do its share.

Although the cost of MAFIN equipment is substantial, we should look at it in the perspective of the cost for the total system. By being the

first state to acquire such a system, Minnesota obtained a very favorable price on the original equipment (funded primarily by federal grants) and long-term maintenance agreement. Over a ten-year period these savings would amount to \$3.5 million in comparison with current purchase and maintenance costs. Even though the prices have gone up, the system as a whole will remain a "good buy" for the money spent.

END