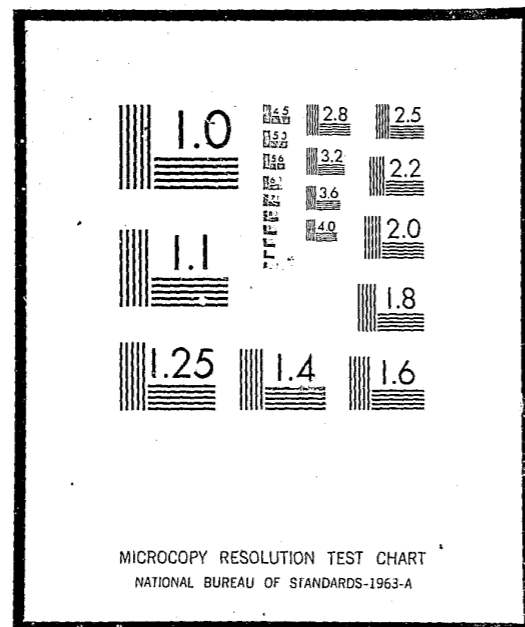


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U.S. DEPARTMENT OF JUSTICE  
LAW ENFORCEMENT ASSISTANCE ADMINISTRATION  
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LAW ENFORCEMENT ASSISTANCE ADMINISTRATION  
POLICE TECHNICAL ASSISTANCE REPORT

SUBJECT: Microdisc Information Retrieval System Regionalization Evaluation  
REPORT NUMBER: 75-63  
FOR: Pennsylvania Governor's Justice Commission

CONTRACTOR: Westinghouse Justice Institute  
CONSULTANT: Robert L. Marx  
CONTRACT NUMBER: J-LEAA-003-76  
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Foreword

This request for technical assistance was made by the South Central Region of the Pennsylvania Governor's Justice Commission (State Planning Agency). Interest was focused on a combined microfilm/computer system (the microdisc system) installed at the Harrisburg Police Department for the storage and retrieval of mug shots, arrest fingerprint cards, and rap sheets. The SPA wanted to know the expandability of the system to serve other users (smaller police departments) in the area, including the desirability of such expansion, the expansion capability of the system, a reasonable organizational format for sharing the facility, and the expected costs and benefits of such sharing.

Potential users of the system include at least 12 police departments, and possibly as many as 25, in the immediate geographical vicinity of Harrisburg. The total population served by such a shared system could be as high as 200,000, depending on the number of departments involved.

Requesting Agency (State Planning Agency): Pennsylvania Governor's  
Justice Commission,  
South Central Region,  
Mr. John Baer

LEAA Region III: Mr. Herbert Koppel, Systems Specialist

## 1. INTRODUCTION

For about 2 years, the Harrisburg, Pennsylvania, Police Department has owned and operated a 3M Corporation microdisc system for the storage and retrieval of mug shots, arrest fingerprint cards, and rap sheets. The system consists of a minicomputer (NOVA), limited disc capability (5 megabyte installed, expandable to 20 megabytes), one keyboard/CRT terminal (expandable to 15 terminals), and a 16-mm cartridge microfilm viewer/printer.

Each document in microfilm storage is originally accompanied by computer storage, entered via keyboard, of some or all of the following data elements: Last name, first initial, month of birth, year of birth, Harrisburg Police Department identification number, height range, weight range, race, sex, complexion, build, hair color, characteristics, scars and marks, occupation code, offense code (UCR coding), and fingerprint classification (six digits per finger). In cases of multiple arrests or other situations in which more than one set of microfilm records exist concerning an individual, the computer record pertaining to the earlier microfilm documents is "overwritten" and pointers (cartridge and frame number) are preserved only for the latest documents available.

The system is preprogrammed by the manufacturer, and customer modification of the software is not possible. The file is not ordered by any potential search parameters but, rather, is simply stored in sequential order of entry into the computer. A search can be conducted on any data element by specifying the acceptance criteria on that element, and the number of respondent documents in the file is indicated. By conducting serial searches further delimiting the acceptable documents (i.e., specifying more data element values), a reasonable number of documents can finally be identified. At that time, the system returns cartridge and frame numbers for the appropriate documents in a form suitable for computer-aided retrieval of individual microfilm frames on the viewer/printer. The printer is of limited utility because of the poor resolution and contrast provided.

The system is used within the Harrisburg Police Department for three major purposes. First, witness descriptions are keyed into the terminal and mug shots of possible suspects are returned for witness identification. Second, information concerning arrestees is keyed into the terminal in the attempt to establish identity of the offender (Harrisburg identification number) and previous local criminal history. Third, incoming latent fingerprints are computer-searched in the system to develop investigative leads. The Department is obviously happy with the

system and is willing to share its use with other law enforcement agencies to the extent that such sharing does not degrade its internal effectiveness.

During this assignment, the Consultant conducted interviews with representatives of the Harrisburg Police Department, Lower Paxton Police Department, South Central region of the Governor's Justice Commission, West Shore Council of Governments, West Shore Police Records Center, and the Pennsylvania State Police.

## 2. UNDERSTANDING OF THE PROBLEM

In this section, the problem is framed in terms of seven questions, the answers to which should provide a framework for decisions concerning the expansion of the microdisc system to include other police departments in the Southcentral Region. In Section 3, each of these questions is addressed in turn, in an attempt to provide guidance for such decisions.

The first question concerns whether the system is worthwhile. Although an evaluation of the system as it relates to Harrisburg itself is not within the scope of the present assignment, nevertheless there is no sense in extending the availability of the system unless it is providing some benefits to the primary client, the Harrisburg Police Department.

The second question concerns whether system expansion would provide symbiotic benefits. To the extent that the entire region under consideration is, in fact, a single community in which criminals move freely and often across jurisdictional boundaries, expansion of the system may provide great benefits to all law enforcement agencies in the area by providing a single integrated data base not otherwise available to any of the departments.

The third question concerns whether expansion can be justified on a pure service bureau basis. Even if the symbiotic relationship mentioned in the previous question does not exist, it may be appropriate to expand the capability of the Harrisburg system to provide access to expensive capital equipment by other departments, thereby lowering the average cost per record stored or retrieved.

The fourth question concerns whether system expansion is feasible. Under this topic should be explored the expandability of the hardware and software associated with the system. Also, a determination should be made of the effect on system performance of a large-scale increase in number of records, number of agencies, and number of terminals.

The fifth question concerns which organizational setting is best for an expanded system. Alternatives available include a pure "customer relationship" similar to that now in effect between the Harrisburg Police Department and the Lower Paxton Police Department; establishment of a separate records entity to house the expanded system under separate management; and a joint operation, with the Harrisburg Police Department as the primary member and provider of services, under the direction of a steering committee composed of the other user departments.

The sixth question concerns what costs are involved in expansion. Any expansion of the system will require procurement of additional disc storage space; in addition, there are acquisition costs of terminals for other police departments; microfilm; labor costs involved in filming, coding, and computer entry; and ongoing maintenance costs for the equipment procured.

The seventh question concerns what other factors should be taken into account. Any system expansion must be compatible with the recent regulations promulgated by the U. S. Department of Justice, as well as forthcoming Federal legislation in the security/privacy area.

It is also worthwhile to determine what positive or negative effects might occur from system expansion with respect to the consolidation of record centers and police departments, particularly on the West Shore.

### 3. ANALYSIS OF THE PROBLEM

In this section, the seven topics mentioned in Section 2 are developed in sufficient detail to guide preliminary decisions.

#### 3.1 System Performance and Benefits

Microfilm systems usually result in the destruction (or archival storage) of the paper files converted to microfilm form; this is not the case in the Harrisburg system. Fingerprint cards are held in the microfilm file, but the original cards are maintained because the film version is of insufficient quality to permit latent print examination. Mug shots are held in the microfilm system, but the original negatives are kept because no effective way exists for making copies of the mug shots for distribution to the police when needed. Rap sheets are kept on microfilm, but the original paper version is kept to ease updating by typing on the original and then refilming. Microfilm systems are sometimes used when duplicate file locations are to be established. Lower Paxton has already been provided with a complete copy of the Harrisburg Police files and, in the future, a complete copy of the merged Harrisburg/Lower Paxton files will be available to each party. There are, of course, alternative means of providing such shared file access (e.g., facsimile communications between police departments).

In short, microfilm is a "nice-to-have" rather than essential part of the system concept.

The computer search capability, on the other hand, provides a level of service not available in manual systems, except at prohibitively large costs. For example, the cross-indexing capability required for a latent print file of the type supported by Harrisburg Police Department is simply not available in a manual system. Likewise, the ability to retrieve mug shots matching witness specification of offender characteristics is beyond the capability of any but the largest and most expensive manual files.

Measuring the cost/benefit ratio of such a system is well beyond the scope of the present assignment. Ongoing operating costs of the systems were not measured, but are probably in the neighborhood of \$10,000 per year. How much "productivity" measured by felony arrests per year must such a system show to be an intelligent investment of resources compared, say, to the hiring of another detective? Although no calculation has been made or the data collected, it is probable that 10 felony arrests a year attributed to the system would make it a "bargain" as a law enforcement tool.

For the purposes of this analysis, then, it is reasonable to assume that the system is useful for Harrisburg. It can be noted in passing, however, that system utility derives primarily from the latent fingerprint and mug shot retrieval capabilities, and only marginally from the rap sheet retrieval capability (which is somewhat forced in a microfilm system). This is important because the most vulnerable part of the system from the point of view of privacy regulations/legislation is the rap sheet portion, which sometimes contains arrests without dispositions.

#### 3.2 Desirability of a Regional System

In a true regional system, each of the participating law enforcement agencies would gain benefits not otherwise available to it through access to an integrated data base, presuming that the region in question is a true sociological region in the sense that criminals move freely throughout it, so that criminal activity does not "honor" jurisdictional boundaries. It was learned during the interviews conducted as part of this project that the West Shore communities in particular do not believe that such a regional character pervades the area, believing instead that the river acts as a natural boundary across which criminal mobility is minimal. On the other hand, Lower Paxton believes that such a regional character pervades its area and, therefore, was willing (in fact, anxious) to join the Harrisburg system.

It is a simple enough matter to determine whether regionalism does in fact exist. Using the records of the State Identification Bureau maintained by the Pennsylvania State Police, a simple statistical survey could be conducted in a few days. For example, a representational sample of a few hundred offenders from the existing Harrisburg files could be checked against the State files to determine what percentage of them also have arrest activity in other nearby local departments. If considerable "sharing" of offenders occurs, a regional system may well be valuable.

It is important to point out some limitations on the methods by which a regional system could be implemented. For this purpose, the three major outputs of the system must be distinguished: Rap sheets, latent fingerprint searches, and mug shot searches.

Criminal records (rap sheets) produced by the regional system can never be truly complete, such completeness being available only at the State or Federal (FBI) level. The maintenance of rap sheets is both naturally and by policy a State function. In the Consultant's opinion, energy invested in development of a regional rap sheet center could be better invested in convincing the State Police to provide timely and complete service for criminal histories within the region. For example, high-speed/high-resolution facsimile equipment could be installed in individual police departments linking their record centers with the State criminal history file for about the same costs as the microdisc

terminal connections to the existing Harrisburg system. In return, the local departments would get complete and accurate records in response to inquiries, and could possibly cease some of their relatively expensive recordkeeping functions.

In the case of latent fingerprint searches, such statewide services are unlikely to occur in the foreseeable future. On the other hand, it should be recognized that the latent print coding scheme developed by Harrisburg Police Department for their own purposes requires a considerable amount of expertise in fingerprint coding and, by its very nature, includes a lot of human judgment in assignment of codes to the individual fingerprints. Experience has shown that such systems work well only when one (or a very small number) of similarly trained technicians code all fingerprint cards. In practice, then, fingerprint cards should continue to be coded only by Harrisburg personnel, no matter what the source of the arrest fingerprint cards. Similarly, Harrisburg should do all the latent print examination for other departments using the system, to the extent that they want and can pay for such services.

Mug shot retrieval has separate considerations. The State has no plan for the foreseeable future to provide a statewide mug shot retrieval capability, nor do mug shots require substantial human judgment in coding for storage and retrieval. Therefore, in this case, a true regional system with remote input of data is technically feasible.

In summary, there is no way at present to know whether the area surrounding Harrisburg represents a true region in which a regional records capability would be desirable and beneficial. The means to determine whether such a region exists are directly available, and the results could be obtained with little effort, based on the assumption that the State Identification Bureau would cooperate.

### 3.3 Service Bureau Concept

The Harrisburg Police Department has about \$80,000 invested in capital equipment supporting the present microdisc system. Additional police departments joining the system would incur only a capital cost in the neighborhood of \$20,000 for terminal equipment and additional disc storage at the Harrisburg site. Thus, substantial capital equipment savings seem to be available through joining the Harrisburg system, regardless of whether regionalization as described above exists. This assumes, of course, that individual department desire the services provided by Harrisburg Police Department, need such services for their law enforcement functions, and are willing/capable of paying for them. Only capital costs are involved as savings, since the ongoing costs of the system (labor costs for coding, filming, loading, materials costs for film and disc space) are basically proportional to the total number of documents filed.

If system expansion is based on this ground, however, a much different relationship between Harrisburg Police Department and other police departments involved can be foreseen. Harrisburg would be in the position of sharing resources it already owns, with no attendant benefits to itself in return. In such a case, it is reasonable to assume that Harrisburg will maintain iron control over the input to the system and its use, probably requiring (and justly so) that only Harrisburg Police Department has a right to input data on behalf of the other clients, and to limit usage of the system to a "not-to-interfere" basis with Harrisburg internal system use. Establishment of cost would also be justly done in way so that Harrisburg benefits (makes a slight profit) from the participation of other police departments.

Participation in such a service bureau operation would, of course, be completely voluntary on the part of each police department, subject only to possible limitation of funding from the South Central Region for competing and noncompatible technologies. Since the other departments are so much smaller than the Harrisburg P.D., they may have much less need for the latent print and mug shot capabilities and, therefore, may not be able to justify participation in the system for purely internal law enforcement purposes.

### 3.4 System Expansion Feasibility

Expandability of the system is limited by the capability of the system to accept additional disc storage capability for the computer, additional microfilm cartridges, and additional user terminals. At the present, the disc capability of the system, as installed, is approximately 5 megabytes, about half of which is already used. The ultimate expansion capability of the system is to 20 megabytes. By taking out of the system the oldest and least useful data on a continuing basis, this 20 megabytes capacity should be sufficient for the entire region over an extended period of time (at least 10 years and probably much more). Therefore, the disc capacity of the system does not present a constraint on feasibility for an expanded regional system.

The number of microfilm cartridges in use in the system is not a real constraint to system expandability. There will be several hundred active microfilm cartridges (i.e., cartridges containing frames that have computer addresses in the microdisc system) at the time the disc capacity is reached. Therefore, size of the microfilm file need not be considered in an expandability analysis.

The number of terminals on the system is now one (now being expanded to a second terminal in the Lower Paxton police department). The vendor indicates that up to 15 terminals can be placed on the system. This is subject to some interpretation, however. As mentioned earlier, the disc

file for the system is unordered and nonindexed, which implies that the entire file must be passed through the central processing unit for each inquiry; as the disc file size grows to its capacity, the time required for the initial inquiry of a search process can be expected to hit 40 seconds or so. If at the same time the number of terminals has grown from one to 15, the amount of CPU time required for handling the terminals logged onto the line will also grow substantially. The result may well be unacceptable response time for users at the remote terminal sites. The exact interaction between number of terminals and size of disc file affecting performance time is unknown. For the sake of conservative estimation, however, it is suggested that the number of terminals on the system should never exceed five or six, especially if the disc file is projected to reach 10 megabytes or more.

### 3.5 Organizational Setting

There is a tendency in regional criminal justice information systems to establish boards of directors with broad managerial powers over the policies and operations of the record center. Depending on the characteristics of an eventual center based on the Harrisburg microdisc system, such an organizational relationship may or may not be appropriate.

If it is found that the area surrounding Harrisburg is a "region" for criminal mobility purposes, and if the law enforcement agencies serving that region decide in concert to pool resources for a joint recordkeeping function, then some organized, formal board of directors is undoubtedly appropriate. The members of the board would be the chiefs of police of the participating localities, who would elect their own chairman, executive committee, and possibly other operating committees. The Harrisburg Police Department would simply be a single member of that board but would, in addition, supply some or all of the resources necessary for system operation (including hardware, coding and filming, labor, etc). For such purposes, Harrisburg would act as a single contracting agency and would, in turn, be reimbursed by the participating localities for goods and services rendered.

If there are no data to indicate that a region exists, or even if it does exist but no consensus emerges among the localities surrounding Harrisburg that a joint records approach is necessary and desirable, then a much simpler organizational structure is appropriate for operation of the Harrisburg site. Should some locality decide to join the Harrisburg system, and be invited to, a simple contractual relationship should result. Harrisburg would undoubtedly continue to run the system in the best interests of Harrisburg, and expect the other locality to "fit in" into its procedures, practices, and policies. The contracting locality, on the other hand, would expect to be protected against unwarranted cancellation of services once they have begun, and to have a clear and contractual understanding of costs for the service provided, including cost projections into the foreseeable future. Otherwise, no special management organization function would be expected.

### 3.6 Costs of Expansion

The brief and preliminary nature of the present assignment made it impossible to collect detailed information concerning the component cost of system expansion. However such costs can easily be obtained from the system vendor, and a rough estimation of them can be made from general experience in the field. The cost of each additional terminal for system is approximately \$14,000, but additional costs for disc storage and the historical microfilm file copy may bring total entry costs to about \$20,000.

In addition to these entry costs, a participating agency can expect to assume annual maintenance costs on the terminal (about \$1500), leased telephone line costs (about \$600 per year), filming costs (about \$0.05 per frame), and coding/input labor costs (perhaps \$1.00 per arrest).

Whether this amount of money is appropriately directed toward the recordkeeping process in any individual police department, as apart from spending an equivalent amount of money on some other part of the law enforcement function, is a matter for individual consideration within the departments concerned.

### 3.7 Other Factors

Although a final ruling is not yet available, it seems likely that the U.S. Department of Justice will interpret regional, shared record centers as "disseminating" records to their members when applying the terms of the new Regulations on Security and Privacy for Criminal Justice Information Systems. This means that all arrests would have to show dispositions, a situation that does not presently exist. This applies directly to the rap sheet portion of the system concept, although it may also apply to the latent fingerprint search technique, since offense category (Uniform Crime Reports offense codes) is used as a delimiter of the fingerprint search. Harrisburg Police Department may already be subject to the terms of the administrative regulations by virtue of having accepted LEAA funds for implementation of the system (depending on the exact date of the award of the grant as compared to the effective date of the administrative regulations). In this case Harrisburg will have to provide a plan for the regular and complete reporting of dispositions onto its rap sheets in the relatively near future. Even if not under the jurisdiction of the regulations by Federal fund award, however, Harrisburg would probably come under those regulations by virtue of sharing its data with other police departments in a regional concept.

Forthcoming Federal legislation on security and privacy of criminal justice information systems may be even more restrictive in the types and amount of data that can be disseminated (shared) than are the present administrative regulations. The bills presently before Congress

differ greatly in the types of restrictions imposed. It is probable that some form of Federal legislation will be passed in early 1976, and should be reviewed at that time for its applicability to the Harrisburg system.

A nonquantitative but potentially important fact influencing expansion of the area of coverage of the Harrisburg system is related to the status of police consolidation efforts in Cumberland county. The Police Records Center operated by the West Shore Council of Governments for eleven police departments within its area seems to have become a center for discussion of consolidation of all police activities within Cumberland County, or at least substantial areas thereof. Any move to expand the Harrisburg system into the West Shore Council of Government area might have unforeseen and disruptive effects on the delicate progress of study and negotiation leading to consolidation of police functions on the West Shore. People in Cumberland County may be willing to band together with people in other communities such as themselves for consolidated police services, but may at the same time be unwilling to be absorbed into a much larger entity that is perceived by them to be under the de facto dominance of Harrisburg.

#### 4. FINDINGS AND CONCLUSIONS

Five findings can be identified following the brief study conducted during the present assignment:

- From a technical viewpoint, the Harrisburg microdisc system almost surely can be expanded to provide a capability sufficient to handle all of the fingerprint cards, rap sheets, and mug shots from localities in its immediate area.
- If the system is expanded to a point near its ultimate capacity of 20 megabytes of storage and 15 terminals, severe degradation of response time may be experienced on the system.
- Use of the system for rap sheet storage and retrieval is the least important aspect of the system in terms of operational benefit derived, but may be its major source of problems with respect to security/privacy regulations and legislation, especially if data from outside Harrisburg Police Department is included.
- The microdisc system is so inflexible in terms of data element storage and new applications that few options are open in terms of priorities, policies, procedures, and operations of the system. For this reason, an elaborate management scheme for an expanded Harrisburg system is probably not necessary.
- No governmental or police representative of clients of the West Shore Council of Governments Police Records Center interviewed showed any interest in joining the Harrisburg system. On the other hand, Lower Paxton has already joined the system, and other communities on the East Shore have apparently indicated preliminary interest in joining.

In light of the analyses performed and the findings listed above, the following four conclusions are presented:

- There is no overwhelming reason to push regionalization of records in light of the lack of documentary evidence that the area constitutes a true sociological region.



- If individual law enforcement agencies in the area want to join the Harrisburg system on the basis of a contractual relationship with Harrisburg Police Department, they should be allowed to do so. Implicit in this conclusion are the proviso that the Harrisburg Police Department accepts the added workload, whatever degradation of internal services rendered is caused by the additional use of the system.
- If another law enforcement agency wants to join the system and requests LEAA funding to do so, the opportunity should be used to determine the costs and benefits of membership in the system. In its simplest form, such a study would determine all costs associated with joining the system, determine the average cost of a felony arrest within the candidate agency at the present (basically the total operating costs of the police department excluding clearly non-law-enforcement costs, divided by the number of felony arrests per year), estimate the projected number of felony arrests attributable to the system in the future by study of Harrisburg experience, and determine from these data whether the cost per additional felony arrest is lower than the average costs per felony arrest now experienced in the department. If it is, the system is probably a good buy.
- Special care should be taken in the approval of additional members to the Harrisburg system to ensure that provision of services by Harrisburg Police Department does not hinder or retard consolidation of police services in the communities involved.

## 5. RECOMMENDATIONS

The following recommendations are offered:

- A study should be conducted to determine the patterns of criminal mobility in the greater Harrisburg area. This study should be conducted using data from the State Identification Bureau concerning arrests by jurisdiction and should result in a determination concerning the extent to which regionalism in police records would be valuable.
- The Harrisburg Police Department and 3M Corporation should be requested to submit cost figures concerning system expansion. These cost figures should include the costs of additional disc space in 5-megabyte increments, the cost of terminals in quantities of one and five, the annual cost of maintenance of the equipment specified above, the costs of encoding and entering a single record into the system, micro-filming costs, leased telephone line costs per mile and per termination point, and any other costs associated with system expansion. These costs should be made available through Harrisburg Police Department to other law enforcement agencies that may consider joining the system.
- A thorough review should be made by the South Central Region of the Federal administrative regulations as they pertain to the Harrisburg system, to result in publication of a clear procedures manual in line with the regulations.
- Usage of the system by Lower Paxton Police Department should be evaluated approximately 8 months after Lower Paxton joins the systems. This evaluation should include a determination of the costs incurred by Lower Paxton, the use of the system by that department, and the benefits to Lower Paxton and Harrisburg by having the merged files available.

- Any further expansion of the system to include police departments should be delayed at least until the results of the Lower Paxton experience can be determined. At that time, the South Central Region should take a leadership position in encouraging expansion of the system if the results of the criminal mobility study indicate that true regionalism exists, or the region should refrain from such a leadership position if true regionalism does not exist, except to the extent that individual police departments request membership in the system along with LEAA funding for implementation.

**END**