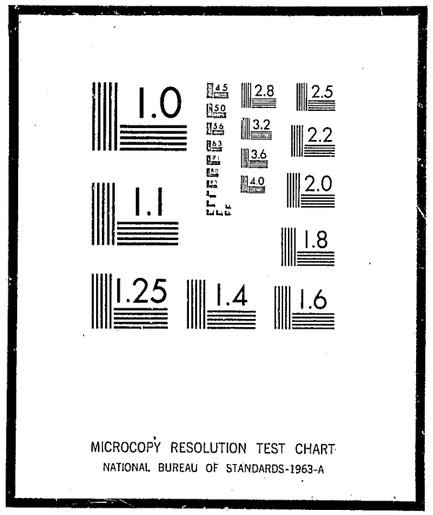
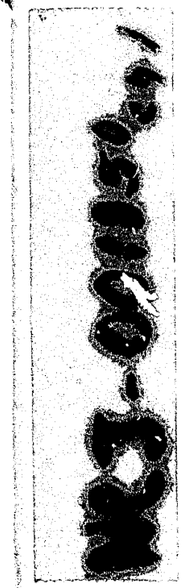


Cat T

A COMPREHENSIVE INFORMATION COMMUNICATION SYSTEM

COURTHOUSE REORGANIZATION & RENOVATION PROGRAM



The Courthouse Reorganization and Renovation Program assumes full responsibility for the views and findings contained in this series of monographs. The series does not necessarily represent the views of participating organizations, including those which follow:. The Law Enforcement Assistance Administration and the National Institute of Law Enforcement and Criminal Justice, U.S. Department of Justice; The Rockefeiler Brothers Fund; The Municipal Services Administration of the City of New York; The Port of New York Authority; The Appellate Divisions, First and Second Judicial Departments, and the New York County courts.

U.S. DEPARTMENT OF JUSTICE
Law Enforcement Assistance Administration
National Institute of Law Enforcement and Criminal Justice

A COMPREHENSIVE INFORMATION COMMUNICATION SYSTEM

TABLE OF CONTENTS

COURTHOUSE REORGANIZATION & RENOVATION PROGRAM 111 CENTRE STREET SUITE 922 NEW YORK NEW YORK 10013

PROGRAM BACKGROUND

The Courthouse Reorganization and Renovation Program, sponsored by the Appellate Divisions, First and Second Judicial Departments, State of New York, was conceived early in 1970 to develop alternative solutions for critical space and manpower requirements through the year 2000 for structures within and related to the urban court complex of New York City's Foley Square. The Program, serving beyond Foley Square as a demonstration project with nationwide implications, has resulted in imaginative, low-cost, space use concepts designed to improve the efficiency of court administration. It is hoped, that continuing facility improvements based on these concepts will bring the administration of justice closer to its ideal.

The Program was funded to the end of March, 1972, by the U.S. Department of Justice through the Law Enforcement Assistance Administration (LEAA). Additional project support has been provided by the Rockefeller Brothers Fund and by the Municipal Services Administration of the City of New York. The Appellate Divisions and the various courts under their jurisdiction provided necessary grantee contributions. The Port of New York Authority has contributed substantially to manpower planning studies. A supplementary LEAA grant made to the project in April, 1971, has funded a courthouse security study. Under terms of the original grant, the program staff is preparing a handbook on courthouse planning, reorganization and renovation for national distribution to administrators, architects and planners at the conclusion of the project. The handbook, containing information gathered from more than thirty states, will report findings of both the space management and security studies.

Dr. Michael Wong, Director of the Courthouse Reorganization and Renovation Program, is known widely for his contributions to courthouse and law-enforcement facilities planning, design and renovation.

Dr. Wong was Associate Director of the Court Facilities Study at the University of Michigan, 1968-1970. Undertaken to establish minimum standards for court facilities, this study was sponsored by the American Bar Association and the American Institute of Architects.

A registered architect from Australia, Dr. Wong holds a Ph.D. in Architectural Science and degrees in Architecture and Urban Planning.

This series of monographs has been prepared primarily for court administrators involved in facility design and renovation projects. It is felt, however, that architects, engineers and others expecting to embark on such an undertaking will benefit from much of the information contained in the series. Included in the monograph are the following topics:

Space Management Concepts and Applications
Space Management Methodology
Space Standards and Guidelines
Manpower Projection and Planning
A Systems Approach to Courthouse Security
Space Management and Courthouse Security
A Comprehensive Information Communication System
Program Administration and Cost Planning

General editor for the series is Peter Inserra of the program staff.

Comment and criticism on the content and format of the monographs is welcome and will assist the program staff in data updating before preparing the final draft of the handbook. Letters should be directed to Dr. Michael Wong, Director, Courthouse Reorganization and Renovation Program, Suite 922, 111 Centre Street, New York, New York 10013.

A COMPREHENSIVE information communication system for courts and related law-enforcement facilities can be defined as a thorough arrangement of essential information within a logical network of relationships, each contributing toward improving the administration of justice.

In any judicial facility complex, a comprehensive information communication system can be identified by its several subsystems.

1. An integrated network of information signs and other visual devices to direct persons having business with the court to arrive at their destinations.
2. Public information communication systems in the court complex that provide all essential information relating a case to the persons who require the information as expeditiously as possible.
3. Information input and retrieval systems that store all relevant historical as well as current case information for automatic and instantaneous retrieval when required.
4. Security communication systems that provide optimum security for court buildings at minimum expenditure.

No court complex to date possesses a comprehensive information communication system, although parts of such a system are being developed, notably in Philadelphia and in Chicago. This monograph will describe the major components of a comprehensive information communication system, and a method of implementing such a system in a court complex. The comprehensive information communication system (hereafter referred to as CICS) should provide a wide range of interrelated services, as follows.

INTEGRATED NETWORK OF DIRECTIONAL SIGNS AND GRAPHICS

An integrated directional sign system is necessary to direct the public, (including attorneys, witnesses, jurors, litigants and the general public, to the court facility of their destination. A series of simple, yet well designed signs and maps in major subway stations, on subway trains and buses, and on local streets is usually necessary. The sign system, however, should be only one component of an overall program for the courts. The design of summonses and warrants, as well as other court legal documents and forms, should be unified in design and, if necessary, standardized for easy identification. Summonses, subpoenas and notices of appearance requiring the physical presence of the summoned persons in court should include specific directions to the courtroom or clerk's office in a court building within a judicial complex. It would be very useful to include on these forms a simple map of the judicial complex and its geographical relationship to the major public transportation routes, major roads and available parking stations at or near the complex. This map should be designed for standard all-purpose use, easily recognized in many applications. An identical map in larger scale can be placed at strategic locations near the judicial complex to orient and direct the public to other destinations.

An analogy might be made between the directional sign and graphic system used to guide airline passenger motorists to airport terminals and that which should be used to guide the public to court buildings within a judicial complex. When a motorist is approaching an airport terminal, signs are posted for several miles to inform him of the distance to the terminal or other destinations within the airport. In large metropolitan airports, such as New York's John F. Kennedy International Airport, where various airlines operate their own widely-dispersed terminals, a system of number-coded and color-coded signs usually guides motorists to their destinations. Applying such a system to metropolitan court complexes, color-coded signs could be installed on roads several miles from the court complex. This same system should be carried through to streets near the facility or complex.

At major airports, a large number of private cars, taxis and airport buses have been known to overload the road system and the car-park facilities. Much as some cities are discouraging the use of cars in overcrowded city centers, the trend at airports is toward providing large car parking structures along the periphery of the facility and relying on inter-terminal buses (mini-buses, in some cases) or monorail to move the masses of passengers to their destination. It seems essential that a similar approach be evaluated for feasibility in relation to urban court complexes.

PUBLIC INFORMATION COMMUNICATION SYSTEMS

A public information communication system is required to provide case information; persons may need information such as case number, litigants' and attorneys' names, case status, hearing date, courtroom number, presiding judge, court decisions on the case to date, and so on. The analogy of the airport information communication system again can apply here. In an airport terminal building, a passenger is directed to the appropriate gate by a series of signs displaying flight number, destination, time of departure and gate number. Having arrived at the

waiting and check-in area outside the gate, a closed-circuit television display unit or other posting device informs the passenger of the most up-to-date flight information. An efficient information communication system announces on posting devices boarding times as well as flight information, and waiting passengers are directed through the gate directly to their plane.

The major difference between this system and one like it for the courts is that, in most instances, there are fewer flights than cases within an equivalent time period. Flight information for each airline can be accommodated and updated continuously within a relatively small posting space. Furthermore, passengers arrive at and depart from the airport at various times, whereas, under existing operations, most persons involved with the courts arrive at about the same time, typically for 9:30 a.m. and 2:00 p.m. court sessions.

Today, the only sources of information available to the public entering most courthouses on court business are an information desk manned by a court officer who can relate cases being heard on that day, and, at most, a bulletin board posted with calendar sheets. Most persons have to wander from space to space trying to determine where their cases are being heard.

To repair this inefficient communications technique, a series of signs in the lobby should direct the public to major parts of the building (for example, to the clerk's office and courtroom floors), as well as to an information center where clerks on hand can provide case information to those involved in cases. It is envisaged that automatic visual display units similar to those used in airport ticket counters for retrieving information on flight and seat availability will be used in the near future in the courts for retrieving case information in response to public inquiries. Such an information center would direct the public to its destination. Variants of the lobby sign system appearing on each floor and an information and security station near the elevator lobby on each public floor would provide a much-needed service for the public, many of whom might be involved in the judicial process for the first time who may be under mental strain.

The kind of information communication system used for each courtroom would depend on the method of court operation. In courts where individual calendaring is used, cases assigned to a judge remain with that judge, until they are disposed, and persons involved in those cases would go to the same courtroom for every action taken. In courts where a master calendaring system is used, ready cases are assigned by a calendar judge to a number of hearing and trial courtrooms.

For this operation, it is recommended that the calendar courtroom have a large public waiting area equipped with a reasonably large-size information display similar to those used at the main passenger waiting lounges in airport concourses -- but designed here as an integral part of the building environment so as to preserve the dignity that spaces in a court building should possess. This display would show cases ready to be heard in chronological sequence during the morning and afternoon court sessions (when the court calendar can be split into two sessions). As each case is disposed by the court, information relating to it is removed automatically by the computer from the display board so that there is a continuous updating of cases throughout the day. (A more detailed description of this system is contained in a later section of this monograph under the heading, "General Specifications of an Information Input, Retrieval and Display System.")

For an individual calendaring system, some type of smaller posting device, either a closed-circuit television display unit or a three-line modular flap unit, could be installed outside each courtroom to display information pertaining to the case being heard in that courtroom and that of the two or more ready cases to follow that session.

To obtain accurate information on average time per type of case (hearings and trials of both misdemeanor and felony cases), detailed time studies of all kinds of cases over an extended period of time, and possibly simulation studies made through computer programming, are necessary. Such information would be posted on display boards, cathode-ray tube (CRT) or visual display units. For example, if the kind of hearing being conducted in the courtroom averages 15 minutes and the

case following averages 30 minutes, and if the first case started at 10 a.m., then the second case would be scheduled for 10:15, and the third case at 10:45. These times, of course, can be updated and rescheduled continuously.

In the master calendar courtroom where adjournments are granted and dates for subsequent appearances are determined by the judge, the clerk of the court should have a visual display unit with two-way operator-computer communication through a typewriter-like keyboard (C.R.T. Terminal) which would supply, on demand, information on the first available date and approximate time and courtroom number for the court to hear the adjourned case. When the judge decides on the date, time and place for the case, a card printout is automatically produced by the machine as a reminder for the litigant and his attorney of their next appearance in court. Trial and hearing courtrooms would not need such units; the rare request for an adjourned data can be referred to the clerk in the master calendar courtroom who would seek the necessary information for the clerk in the trial and hearing courtrooms. An alternative approach would be for the judge in the trial or hearing courtroom to return the case to the master calendar judge for rescheduling. The system described above maximizes the use of available competent personnel and existing facilities.

INFORMATION INPUT, RETRIEVAL AND DISPLAY SYSTEMS

It is envisioned that automatic visual display units or CRT terminals could be installed in chambers and offices for instant information retrieval during case preparation and processing by judges, probation officers, district attorneys, legal-aid attorneys and other appropriate court personnel. Information relating to the status of a case, the time and place of next court appearance and prior judicial actions could be retrieved on demand. The cost of installing a terminal in each office or chamber in the near future would be prohibitive. A small number of units could be positioned centrally in strategic locations and shared by several persons or departments. As an alternative use, department

personnel requiring specific information could phone the operator at each unit location who would request the information from the main computer for distribution.

For legal research and planning, the researcher may require information on, say, the average time elapsed between arrest and sentencing of a specific type of felony case in a specific city; or he may desire information on major causes in delays on the work output of judges for estimating of the number of judges needed to reduce case backlog to an acceptable minimum, and so on. To research such information manually through case files or in a library could consume thousands of man hours -- and still not be complete. It is technologically possible to input legal research information into the computer memory bank for complete and accurate retrieval through computer terminals and printout equipment. The availability of such a system would enable problems to be accurately defined, alternative solutions to be clearly evaluated and historical information on legal interpretation to be comprehensively cross-referenced by computer. Although work is moving forward to compile index and cross-reference statutes, laws and case information and to make computer inputs of it, the initial cost of the system now is prohibitive for most facilities. However, it is envisioned that eventually the system will be within reach for many and its availability will substantially reduce the time attorneys and legal researchers spend in tedious and repetitious research.

Another area being experimentially developed is the use of video-tape for recording depositions and trial proceedings. One experimenter says that,"When used to record discovery despositions, video-recording or video-tape system offers the trial attorney an opportunity to review the demeanor and effectiveness of prospective witnesses, even though he may not have personally been present at the deposition."[1]

Video tape is especially useful for recording depositions from witnesses who are either too old, too ill or are professionals like

---

[1] William M. Madden, Interim Report on Experimental Videotaping of Court Proceedings, Chicago, Nov. 1968, p.1.

physicians with very little time to serve as witnesses in court when needed. If the video-tape system is approved and adopted by the courts, it can also be used for security surveillance, recording of physical evidence and for presenting edited trial proceedures to juries on request.

Video-taping of court proceedings requires a multi-track video-tape recorder, a recorder monitor, three high-resolution, low-light-level cameras, a special-effects generator for using split screen techniques, a remote control pan head for one camera and, where not already available in the courtroom, a sound system consisting of four to six microphones and a quality pre-amplifier. [2]

Two of the three cameras would be installed in the courtroom, one capable of 180 degrees rotation to cover the entire judicial area, and the other fixed for concentrating of the judge and witness. Each would have a zoom lens for close-up views of court participants, and each would transmit images to a TV screen in a detained defendants' room. A monitor room would be located outside the courtroom, separated by a glass wall for viewing court proceedings. The third camera would be used to cover conferences between judges and attorneys during the trial and would be located either in the judge's chamber or in a conference room. Experimentally, the video-tape system has been shown to be a generally adequate substitute for a competent court reporter when one is not available. Alaska has relied on voice recorders to record all trial proceedings, but video-tape systems have to overcome many technical problems and objections before they could be widely adopted. [3] Regardless of the recording system, it should be possible to direct input the recording of court proceedings directly into the computer, and to retrieve the transcript in the form of a printout when required for the appellate process. A number of copies of the transcript can be produced in a very short time, when compared to the normal amount of time required for manual transcript typing.

---

2. op. cit., pp.2.
3. op. cit., pp.8-19.

SECURITY COMMUNICATION SYSTEMS

All security communication systems installed in court complexes should be monitored from a central security station and substations. The central security station should be located on the entrance floor or at a level central to the floors with public and court activities. In multi-story court buildings, there can be a security substation on each floor or group of floors, with the central station strategically located on a floor most convenient to the substations (a similiar system is used at the Civic Center Building in Chicago).

In the criminal trial courtroom where adequate security precautions are necessary, it is essential for a communication system to be linked to a central security station or substation. A button located on the side wall of the judge's bench and the clerk's or bailiff's station, when pushed by the knee (to avoid any upward or downward movements caused by the hand or foot), will sound an alarm and light up a button on a control panel in the security station, signifying location of the disturbance. By depressing the lighted button (if circuit completion does not open a communications channel), a security officer can listen to courtroom activity. Depending on his evaluation of the urgency of conditions, the officer would begin a plan of action. In situations of extreme emergency when instructions to persons in the courtroom is necessary (for example, evacuation directions during a bombing incident), the security officer can depress another button denoted for that courtroom and speak directly over a loudspeaker system mounted in the courtroom. By installing such emergency devices in courtrooms, hearing rooms, robing rooms, chambers and other spaces where security problems may arise, security level of the court building is increased proportionally. It is important to stress that proper space planning for security prior to the final design of the court facility is more effective as a security risk deterant than the indiscriminate selection and installation of costly security equipment. Such equipment should only be used to enhance security when space planning concepts alone prove to be inadequate.

Other security communication options between the courtroom and the security station include a simple alarm located in the security station activated by depressing a button at the judge's bench or at the clerk's station (no communications channel); a simple two-way intercom telephone between the judge, clerk or bailiff and the security-station; an interconnected alarm-telephone system which activates an alarm when the phone at the judge's bench or clerk's station is off the hook; and a transistorized radio alarm unit the size of a cigarette lighter which can be carried in a pocket and which, when depressed, would activate an alarm at a remote security station. If necessary, this unit also can provide two-way intercommunication with the security station. A similar size unit the alarm of which can be activated by abnormal physical movements is also available, but is much more costly.

Handling disruptive defendents and unruly spectators poses yet another security risk. While it is technologically possible to separate courtroom judicial and public areas by a shatterproof, one-way glass or plastic partition, it is not recommended because of questions raised as to restricting defendants' rights to a "public" trial. Similarly, the public shut behind a "wall" may be led to question whether the court is dispensing fair and equal justice. In short, a partition conveys that the court has lost the respect of the public to the extent that it is compelled to take extreme measures for its own safety.

Should the court resort to such a solution, a communication system linking the two spaces would be essential. The "sounds" of the trial proceeding will have to be piped from the judicial to the public areas through a microphone-amplifier-loudspeaker system. The loudspeakers should be placed in locations that would not produce echoes or fluttering effects in the public area.

If a room separate but adjoining the courtroom is needed for detaining a disruptive defendant during the trial, assuming its legal acceptability, the same sound system or a closed-circuit television or video-tape system (as described in the previous section) would be required for the defendant to see as well as hear the entire court proceedings. In several states, the law permits the court to remove

disruptive defendants and for his trial to continue without his presence on the basis that he gave up his rights to presence as a result of his actions. Other states have passed laws which require the piping of sound of the trial proceeding to the isolated defendant in an adjoining room.[4]

Court and law-enforcement facilities can be TV-monitored for security much in the same way as are modern multi-story apartment buildings. A surveillance system for such buildings usually consists of a TV camera located at each entrance with their projected images appearing on an equal number of receiver screens at a central main entrance attended by a doorman (security officer). In court buildings, such surveillance is very useful in detecting suspicious persons entering the building and in locating a prisoner during an escape attempt. This system can be expanded to using a camera strategically located on each courtroom floor, with the panel of TV screens centrally located in the security control room on each courtroom floor or on the entrance level. Any unusual disturbances in the public spaces on each floor thus can be detected visually and audibly, and measures can be taken immediately to restore order. (For more details on security measures for court buildings, see companion monographs, "A Systems Approach to Courthouse Security" and "Space Management and Courthouse Security.")

RECOMMENDED INTER-SPATIAL COMMUNICATION SYSTEMS REQUIREMENTS

Figure 1 shows the major types of communication systems recommended between major kinds of court spaces. The systems considered include audio communication (AC) which takes into account telephone and intercom; visual communication (VC) which involves button lights, video-tape and picture phones; visual surveillance (VS) which covers close-circuit television, video-tape and watchman's tour; security communication (SC) which encompasses signals, alarms, combined alarm-intercom

4. The State of California, for example.

SPACES	COURTROOMS	CHAMBERS	SECURITY STATIONS	JURY DELIBERATION ROOMS	JURY CONTROL SPACES	DEPARTMENTAL OFFICES	CLERK'S OFFICE	COMPUTER ROOM	TEMPORARY PRISONER HOLDING FACILITIES	DISRUPTIVE DEFENDANT HOLDING FACILITIES	LAW ENFORCEMENT FACILITIES	PUBLIC WAITING SPACES
COURTROOMS		AC VC[1]	AC SC		AC	AC	AC	IR	AC[2]	AC VC[3]	AC	AC VC
CHAMBERS	AC		AC SC		AC	AC	AC	IR[4]			AC	
SECURITY STATIONS	AC VS	AC		AC[5]	AC	AC	AC		AC[2] VS	AC[2] VS	AC SC	AC
JURY DELIBERATION ROOMS	SC											
JURY CONTROL SPACES	AC	AC	AC					IR				
DEPARTMENTAL OFFICES		AC	AC SC[6]				AC	IR			AC	AC[7] VC[7]
CLERK'S OFFICE	AC	AC	AC		AC	AC		IR			AC	
COMPUTER ROOM	IR	IR			IR	IR	IR				IR	
TEMPORARY PRISONER HOLDING FACILITIES	AC		AC								AC	
DISRUPTIVE DEFENDANT HOLDING FACILITIES	AC[8]		AC								AC	
LAW ENFORCEMENT FACILITIES		AC	AC			AC	AC	IR	AC	AC		
PUBLIC WAITING SPACES		AC	AC			AC	AC	IR[9]			AC	

LEGEND

AC Audio-communications including telephone and intercom systems
VC Visual communications including video-tape and picture phones when available and if approved
VS Visual surveillance including closed circuit television, video-tape and watchman's tour systems
SC Security communications including signal, alarm, combined alarm-intercom and alarm-intercom-video systems
IR Information input and retrieval systems

1 Record private conference between judge and attorneys
2 Guard's location in prisoner holding facilities
3 If facilities remote from courtroom
4 If economically feasible
5 Used only in emergency situations
6 Only in specific locations
7 Communications with clients, litigants, when applicable
8 Private communication between defendant and attorneys
9 From information clerk's location

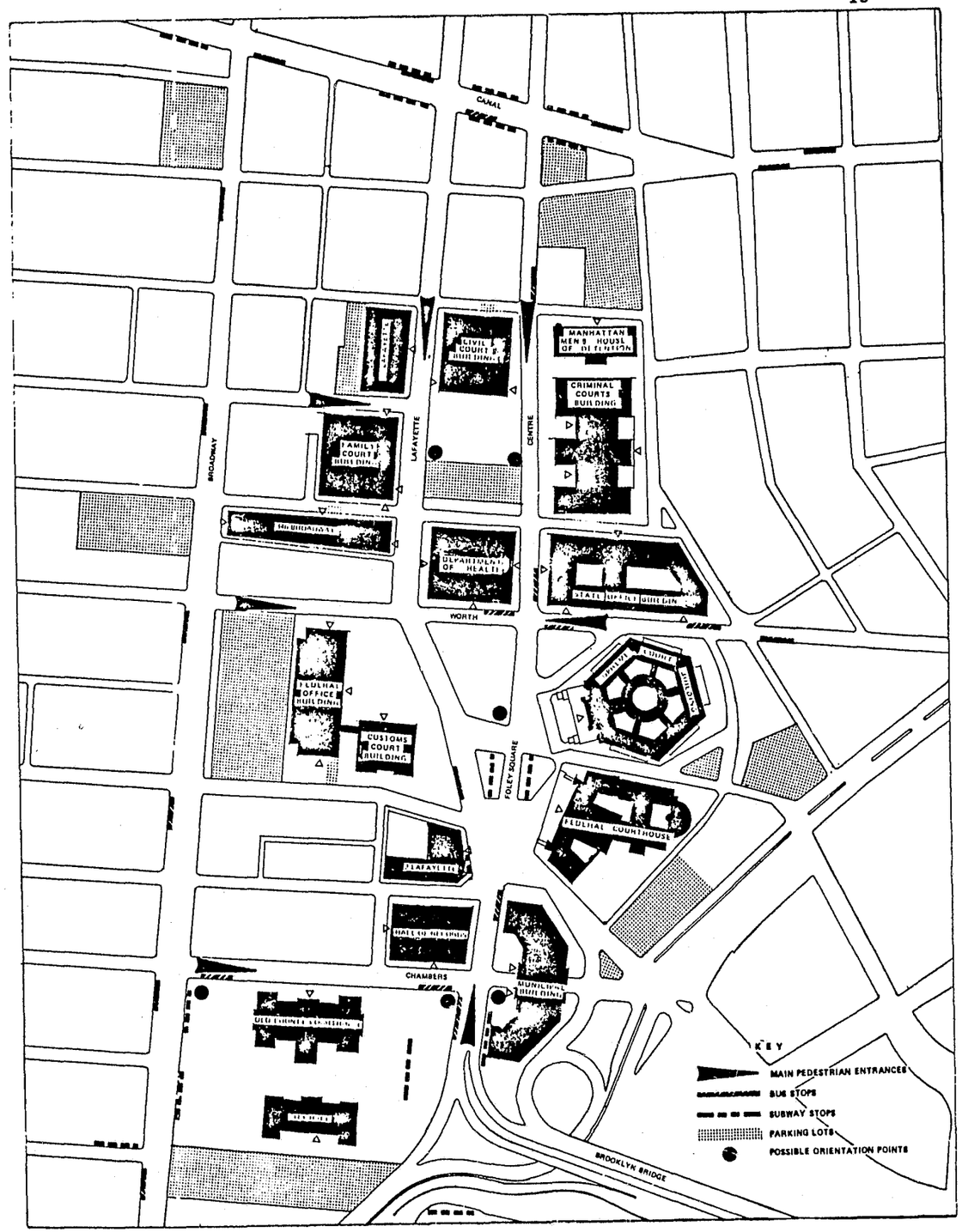
FIGURE 1
RECOMMENDED INTER-SPATIAL COMMUNICATION SYSTEMS REQUIREMENTS

and alarm intercom-video; and information input and retrieval systems (IR) which involve computer, interface and video display units. The types of communication systems required from one space to another can be quite different. For example, the communication systems from courtroom to security station are audio and security communications, whereas those from security station to courtroom are audio communication and visual surveillance. Some recommendations, especially the use of video tape for surveillance and recording of evidence, depositions and proceedings, depend on future court rulings or legislative changes.

INTEGRATED SIGN SYSTEM (ISS): COURT COMPLEX RELATED TO CITY

The airport is one place that is hard to miss in most U. S. urban areas. A motorist, whether leaving from the heart of the city or approaching from miles away, is ushered along direct routes by a system of easily recognized, highly legible signs terminating, not on the perimeter of the facility but, literally, at a departure gate.

Not so court complexes. Located in most large cities in thoroughly congested downtown areas, they might as well not exist at all for many among the vast number of persons who seldom have to use a court building--or find it. By car or public transportation, getting to a court on time can be a monumental guessing game. Signs as all-encompassing as those carefully provided for airport users seem not to have inspired similar systems in court and law-enforcement facility planning, although they should. More typically, the pattern is one of random placement throughout a building, and, possibly, in close vicinity to it, of a collection of rudimentary displays having little in the way of design to distinguish them from other directional information, and much about them that is confusing. It is tempting to speculate on how many court procedures are delayed because a principal participant is wandering aimlessly through a subway passage right under the court building or is still in his car searching in vain for a parking lot he was told is nearby.



MAP 1
TRANSPORTATION STOPS AND PEDESTRIAN ENTRANCES

90,000 by surface transportation (buses and ferryboats) and an overwhelming number, 337,500, by subway (including "PATH," a New York-New Jersey connection). While it is estimated that about one-fifth of this total number works in the Foley Square area,[6] ISS would communicate with many others along many routes.

Heavily traveled and direct routes to the area in which courts are located should be traced on a scale map of the city. This procedure will provide the first indication of strategic locations--"terminals" --along an ISS system at which court directions are called for and should be posted.

Major transportation routes to the Foley Square area by car, bus and subway on Map 1, along with major interchange points for the three transportation modes (bus, subway, bus-subway, car-subway and car-bus). Major car routes into Manhattan shown on the map are those from Brooklyn, Queens, the Bronx and New Jersey. The map also indicates major Manhattan highways leading to the courts complex.

SIGN DESIGN

The next stage in ISS development is the actual design of signs that will be prominently displayed along frequently used roads and at significant locations in or near mass transportation facilities.

The design settled on should complement and relate to--but not parrot--previous or current court information display systems and above all should provoke instant identity with the court complex and buildings within it.

Simple geometric shapes are perceived far more easily than complex multiple shapes.[7] Certain colors are better received, too, as described subsequently. But, in shaping ISS identity, it

---

6. Ibid.

7. Lake George Park Commission. "Welcome to Lake George." New York State Natural Beauty Commission, Ticonderoga, N. Y. 1968, p. 4. This profusely illustrated booklet offers a broad range of sign designs and guidelines.

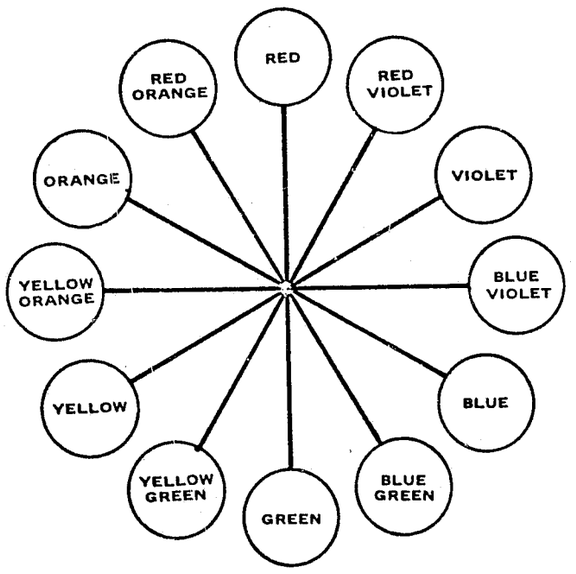
would be well to avoid those shapes and colors commonly associated with standard road signs.

The choice of lettering can significantly enhance or detract from the effectiveness of a sign. Letters should be crisp, simple and well-spaced.[8] Sign functions should dictate sign size, but the total lettered area should not exceed 25% of total sign area,[9] providing an optimum ratio with the background field of 1:3.[10]

Required field of vision is a major determinent of letter size. One study suggests the following relationships for viewing a sign from a moving vehicle:[11]

Traffic Speed	Letter Size	Readable From
50 mph	6 in.	97 yds. (15 car lengths)
25-30 mph	4 in.	65 yds. (10 car lengths)
10-20 mph	2 1/2 in.	38 yds. (6 car lengths)

Equally important for good visibility is the contrast between letter color and background field. Maximum contrast should be the guide; contrasting colors can be selected from the color wheel reproduced in black and white below:[12]



The ISS designer would do well to look to Madison Avenue for color preference among men and women that seem to be the most pleasing and best remembered. A study by a leading advertising agency[13] lists this order of preference for people: blue, red, green, violet and orange. Women in the study voted in large part for yellow instead of orange.[14]

Psychological studies have demonstrated that colors also can evoke subjective feelings.[15] Many studies show that among the primary colors, red excites, blue relaxes and that yellow stimulates ebulience. Light or pastel colors generally are considered "active," while "passive" colors are deeper or more somber.[16]

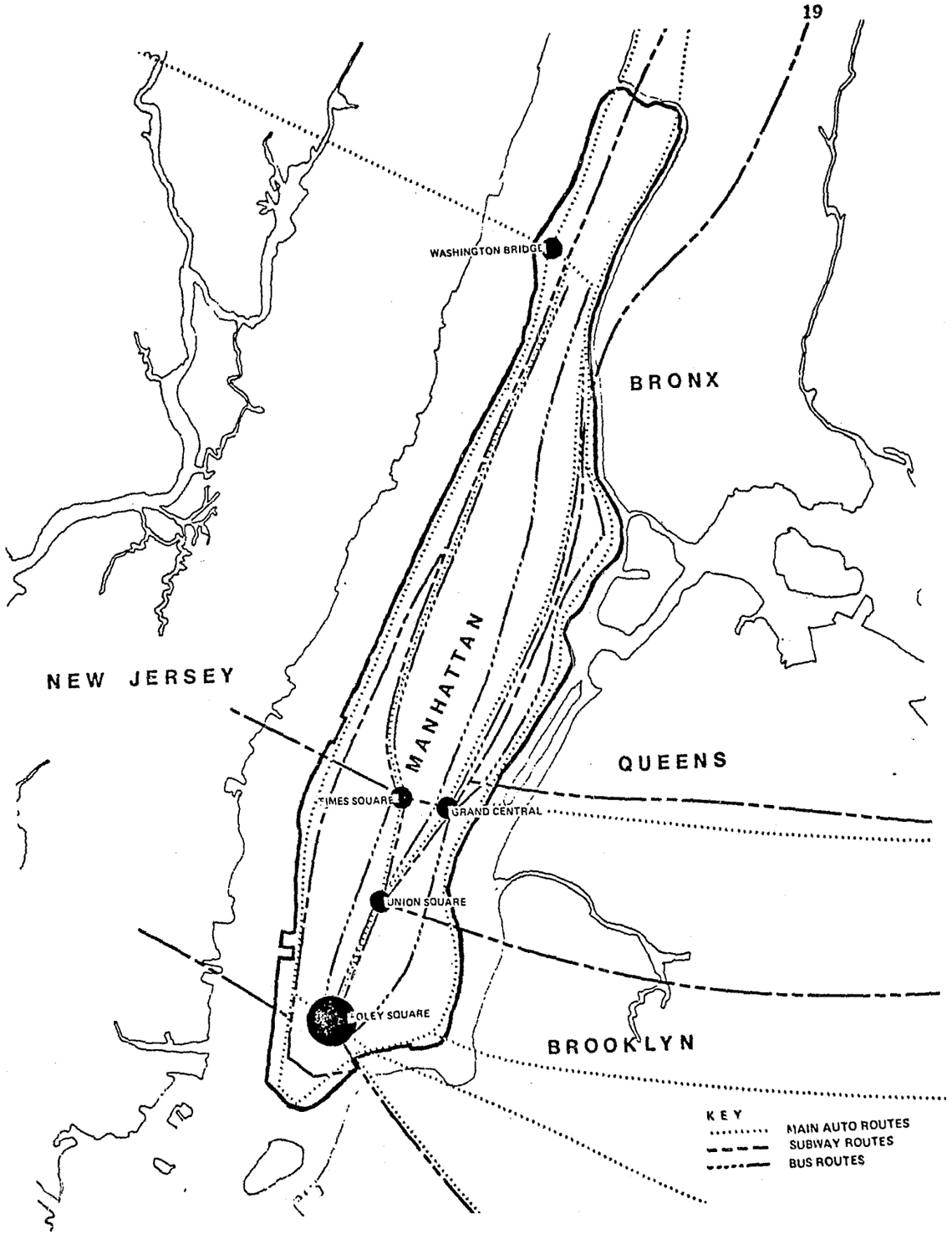
Whatever the final design of signs, they should be placed, at the very least, at major points of entry into the court area.*

Referring to MAP 2, signs would be placed at all bridges entering Manhattan, as well as at points of exit onto Canal Street from Franklin D. Roosevelt Drive (East Side Highway) and the Henry Hudson Parkway (West Side Highway). Signs also would be located at intersections along major streets leading to Foley Square, including Broadway.

---

8. Ibid.
9. Young & Rubicam, Inc. "Research Results Reports", 1970.
10. Parry Moon, The Scientific Basis For Illuminating Engineering, Dover Publications, Inc., New York, 1961.
11. Solari and Udine, "Schipol Letterings" (Form 026/67b).
12. R. L. Gregory, Eye and Brain, McGraw Hill Book Company, New York.
13. Young & Rubicam, op. cit.
14. Ibid.
15. Ibid.
16. Ibid.

* Vehicular traffic causes severe street congestion in downtown court areas and should be discouraged. It is strongly recommended that a pedestrian mall be created around court buildings, with adequate parking garages located on the periphery of the complex, perhaps with a small fleet of mini-buses used to ferry those having business in the complex to their destinations.



MAP 2
MAJOR TRANSPORTATION ROUTES

Signs at mass transportation facilities should be placed adjacent to route signs, at bus ramps, for instance, in major stations and at each transfer point. Directions to the courts should also be installed on subway cars and in buses to familiarize local residents with court locations, even for future use.

Staying with the New York example, signs could also be placed near stop designations inside each subway station (including the platform area) and along pedestrian transfer passages (at the major locations on MAP 1).

Directions and court designations also should be placed at bus departure points as well as along routes to the courts area.

Another suggestion that may merit implementation is to provide for a person served with a court or hearing summons a small, clearly drawn map indicating how to get to the courts area by car or mass transportation. If color is used to designate locations, it chould relate to signs used elsewhere in the system. Where precedent and legality permit, such a map might even be printed unobtrusively on the summons itself.

Road signs should be mounted at an appropriate height for reading from a moving vehicle. Height will be a function, in part, of vehicle speed and distance from the sign. Car manufacturers have investigated these variables in a number of studies. One reports the following findings:[17]

Speed Limit	Distance To Sign	Ground To Bottom of Sign Height
50 mph	97 yds.	10 ft.
30 mph	65 yds.	8 ft.
20 mph	38 yds.	6 ft.

Sign placement obviously must be coordinated with the agency that will erect the system on public road and transportation facilities, usually the public works department.

In some areas, private transportation companies should be encouraged to participate in an information communications improvement program. In collaborating with all such agencies it may prove

17. W. H. Ittelson, Visual Space Perception, Springer Publishing Co., New York, 1960

beneficial for the sake of overall community appearance to incorporate some existing directional information in the new ISS--without impairing the effectiveness of the new signs. It bears repeating that the modus operandi of ISS must minimize "clutter" on roads and other transportation facilities.

ISS: COURT BUILDING RELATED TO COURT COMPLEX

Persons arriving in a courts area either by car or mass transportation, should immediately be drawn into the most direct route to their destination.

Workers or some persons having business in the courts may be "pre-conditioned" to quickly identify sign shapes, symbols and colors and proceed immediately toward their destination. Others will need more specific assistance on the spot. The forementioned map provided with a summons will encourage pre-conditioning. To repeat, the key of an effective ISS is integration of all its elements in relation to the overall city sign system.

ISS operates in the vicinity of court buildings and within a complex through a series of "information banks" located at positions which prior research has shown are "strategic" and where persons can confirm directions. Central to the "bank" concept is a simplified area street map or aerial photograph that overcomes language barriers, for the most part, with distinguishing symbols, colors and shapes. Certain more complicated directions -- although none should be too obtuse -- may have to be given in a second language.

A variation on this pictorial system in use in some European cities -- Paris, for example -- may be used at some U.S. locations. Electric map boards are keyed to the location where they are erected. A person selects a location to which he wants to travel, then depresses a push-button designating that location. A chain of miniature lamps light up in sequence, showing the most direct route to that destination.

Map elements should include the court and court-related buildings, major streets leading up to them and traffic direction, and parking lots and garages (public and private). Major bus routes also should be shown along with area subways and trains. On another map -- or on the same one if it does not over-complicate the plan -- should be shown transportation stops and terminals for buses, trains and taxis.

APPROACH IN NEW YORK

Because of the complexity of the Foley Square area two maps were used in the study of the ISS. One, (MAP 3) depicts mass transportation routes and direction of traffic in the area. The other (MAP 1) indicates stops made by buses and subways and the location of parking lots areas within close walking distance of court buildings.

MAP 1 shows the most frequently used means of ingress and egress for the Foley Square area, based on earlier research. Subways being the most frequently used method mandates locating signs at each stop in the area.

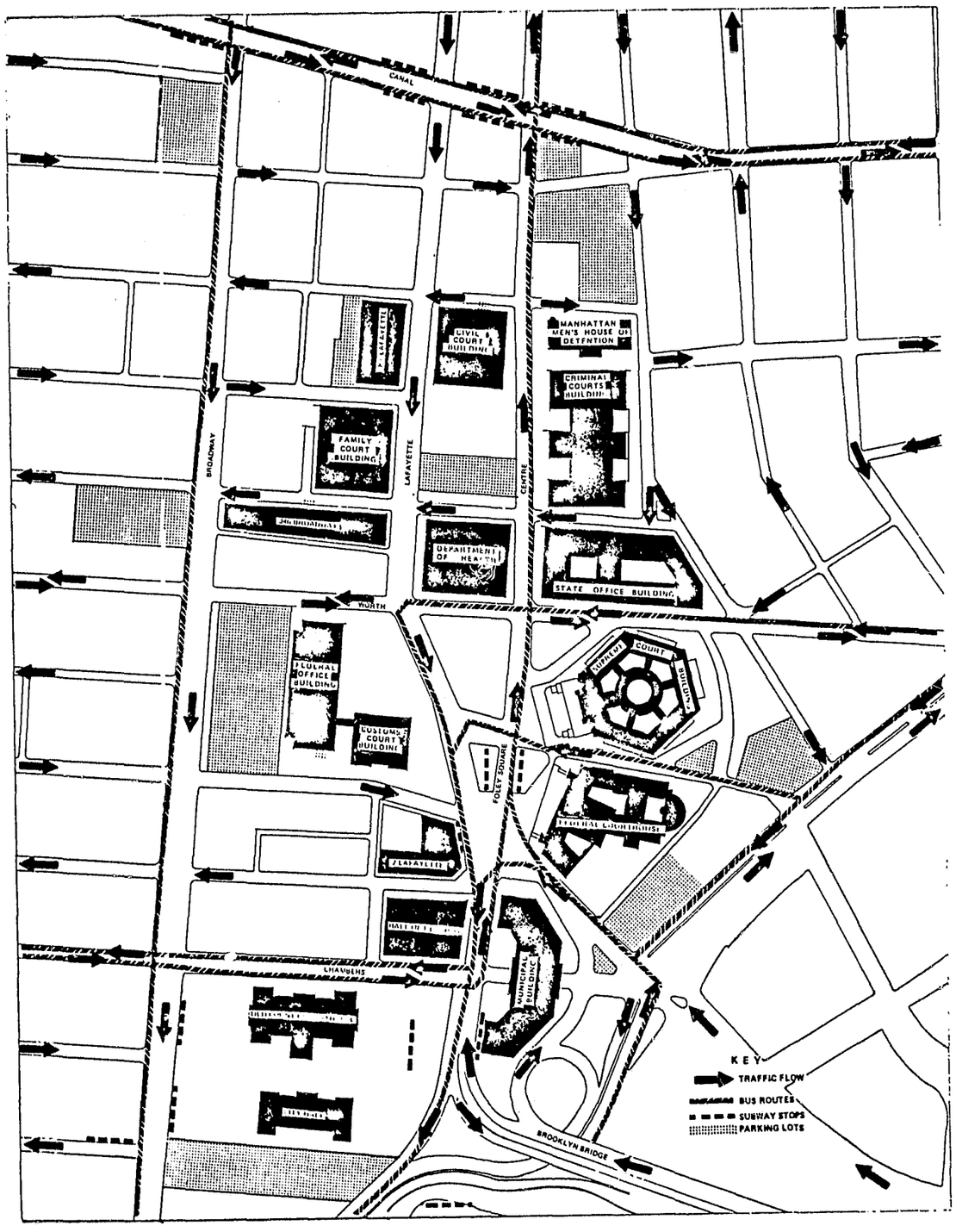
The format of pedestrian orientation signs can be similar to those designed to be seen by persons in a moving vehicle. Lettering obviously does not need to be so large -- 3/4 in., or less, for upper-and-lower-case information and, for titles, 1 1/2 in. indoors and 2 1/2 in. outdoors.[18]

Most orientation signs are usually read from within 6 ft. The bottom of the sign should not be less than 4 ft. above ground level to facilitate easy reading. In some instances, such as intersecting paths, a multi-sided sign could be used to convey the same information in more than one direction. Consideration may also be given to providing seating in a sign location area.

Black circles on MAP 1 indicate proposed locations for orientation signs. The system is used to draw persons away from main traffic flow, either vehicular or pedestrian. Orientation signs must serve the dual purpose of attracting the attention of those seeking information, while at the same time allowing other patterns of movement to proceed unimpeded.

---

18. Solari and Udine op. cit.



MAP 3
FOLEY SQUARE TRANSPORTATION ROUTES

ISS: INTERIOR SPACES RELATED TO COURT BUILDING

ISS components in court building interiors aid in moving persons from the entrance to their destination expeditiously and with minimum confusion. Information should be conveyed in stages, as described below.

The place of maximum confusion in most court buildings is the entrance area, and persons unfamiliar with the building have a natural tendency to seek directions at this level. An orientation sign posted in this area within easy viewing range should attract attention through its shape, color and lettering.

Entrance-area signs should not contain all the information a person will need to get to his destination; rather the person should be directed quickly to a second orientation point, preferably on the same floor as his final destination. Less congestion at the second level will allow for more liesurely reading of the sign and decrease primary-level confusion.

The concept of the entrance-area sign system can be similar to that used at airports and train terminals. A sequence of information boards suspended from the ceiling permits easy reading without needing to stop. Electrically controlled display boards or closed-circuit monitors can serve a like function. But design of similar systems for court buildings and related law-enforcement facilities has to maintain the dignity of the court or related facility.

COMMUNICATE PRECISELY

Major functions of court operations and their locations should be communicated simply, as follows:

CLERKS FLOOR 3
or
COURTROOMS BLUE WING

---

* Blue being a color-code designation for courtrooms and ancillary facilities.

Orientation signs in the form of large display boards should be located in an information alcove off the main entrance area away from pedestrian flow in the lobby. In addition to relating major function information, the signs can direct persons to elevators, escalators, stairs or hallways.

When a particular symbol or color has been designed and used throughout ISS to represent a court or court complex it should be prominently used in the building it represents. Repeating a simple design element injects into the sign system a sense of order, orienting persons more easily than does a mix of colors and symbols.[19]

Lettering for entrance-area signs need not exceed 2 1/2 in. in height, a dimension that, on the average, can easily be read from a distance of 38 yds.[20] Signs at this level also should maintain the 1:3 lettering-to-background ratio described earlier, and should convey information with as few precisely used words as possible. The more information given to a person at one time, the more easily he will forget it.[21]

After a person arrives at a major area or floor of destination, additional information can direct him to a specific location, or secondary waiting space. On this level, sign lettering can be smaller--1 1/2 in. maximum, a dimension readable from a distance of 19 yds.[22] The secondary breakdown in functions on this level might appear:

CLERKS

CASHIER 418
RECORD 419

428 ..... CALENDAR
431 ..... JUVENILE

19. Erickson, Fundamentals of Teaching With Audio-Visual Technology, McMillan Co., New York, 1955.
20. Solari & Udine, op. cit.
21. Alpern, Lawrence & Wolsk, Sensory Processes, Brooks Cole Co., Belmont, California, 1967.
22. Solari & Udine, op. cit.

An arrow or other symbol can aid persons to locate rooms or spaces. Signs at secondary locations should be placed at eye-level, with the lowest line of lettering being at least 4 ft. above the floor and the highest line no more than 7 ft. above the floor.[23] Signs should be placed so that information they convey can be easily seen upon exiting an elevator.

Room entrances should be well identified so that a person knows he is at his final destination. A simple title giving room and occupant (when there is one) positioned at eye-level, above or to one side of the door frame, has proved to be the most appropriate. Placing this information on the door means it will be concealed when the door is open. When there are several entrances to a room, the number and title should be shown at the public entrance. The other entrances should merely be titled without the number. Lettering for such signs should be at least 3/4 in. high to be easily seen.

SIGNS IN OTHER PUBLIC SPACES

Information signs at public spaces inside rooms, such as a county clerk's office, are useful in assisting the public to complete and file forms. Titles of 1 in. lettering in this location can be read from 40 ft., if letters are bold and crisp. Information printed in 3/4-in.-high letters can be read from 25 ft.[24]

It may also be useful to post an enlarged completed sample form as a guide. Such signs can help lessen the work load of court personnel and increase court productivity. They should be conveniently placed at eye-level. Mixing of languages in one visual block of lettering should be avoided.[25]

EMERGENCY SIGNS

Signs such as these should be presented without words or letters when possible to minimize confusion and reading time. Symbols can

23. W. H. Ittelson, op. cit.
24. Solari & Udine, op. cit.
25. Erikson, op. cit.

be used to lead people quickly and safely out of buildings.[26] A sign depicting a fire symbol, for instance, could be used in conjunction with arrows to direct persons to emergency fire exits or shelters. Another concept is to apply to interior walls an emergency color stripe that persons can follow to an exit or shelter from any point in a building. Lettering, if needed, should be integrated with the stripe.[27]

Lettering, when used for "emergency" signs, should be at least 1 1/2 in. high in clear, bold type for easy reading from half the distance between such signs. Colors in such signs should stimulate appropriate action during an emergency. Because red had been used repeatedly for emergency exits, it is easiest to recognize for this purpose.

The integrated sign system is only one aspect of the comprehensive information communication system. In planning the CICS, the sign system should be integrated with the other subsystems, including the information input, retrievel and display and security communication systems. These sub-systems are described in further detail in the next section. For a more in-depth description of a security communication system, see companion monographs.*

THE ROLE OF EDP IN AN INFORMATION COMMUNICATION SYSTEM

Electronic data processing (EDP) systems are being used extensively in courts for many applications, the most significant being the creation of an adequate data base and the control of case processing. The applications of concern in this monograph are those related closely to an information communication system. For more detailed descriptions of general EDP applications for courts, the reader is referred to the numerous publications available from the courts and from major EDP firms, as will be discussed later.

---

26. Design Concern, "88 Pine Street Presentation", 1971.
27. Ibid.

* "A Systems Approach to Courthouse Security" and "Space Management and Courthouse Security".

Electronic data processing has been used extensively as a management and information communications tool to improve court administration and operation. Applications to date include notification, control, updating and processing of traffic cases, jury selection and administration and docketing and calendaring. Several large urban areas, including Los Angeles, Chicago and New York, have been using EDP to process parking and traffic tickets, resulting in a significant increase in collection of fines through faster checking and control, the computer system providing positive and automatic followup on delinquent traffic violations. In operation, the computer first prints a warning notice, then, when the first notice is ignored, prints the summonses or arrest warrants. With input of vehicular registration records, the computer automatically locates the violater's name and address. Beyond collecting traffic fines, EDP is used to print information on case judgments for governmental departments, traffic calendars and notices to appear, cumulative violation records, and to perform many other functions.

EDP has been used extensively to replace manual registration of jurors' names and addresses. Initially, jurors' names are selected at regular intervals, generally from voter, election or tax rolls. The computer prints notices and, in some cases, questionnaires for mailing to prospective jurors. Returned questionnaires are screened automatically and lists of qualified jurors are printed out. Jury duty notices are printed and mailed. EDP updates jury lists, records length of jury service and prints out checks to reimburse jurors. EDP can improve jury administration by rapid selection and screening of jurors and by replacing manual clerical operations with an automatic process.

Automation of docket files improves statistical analysis of court records and increases the court's administrative capability to manage the calendaring system. The cities of Philadelphia, Washington, D.C., Chicago, Pittsburgh, Los Angeles and San Diego, among others, have developed computerized calendaring systems that

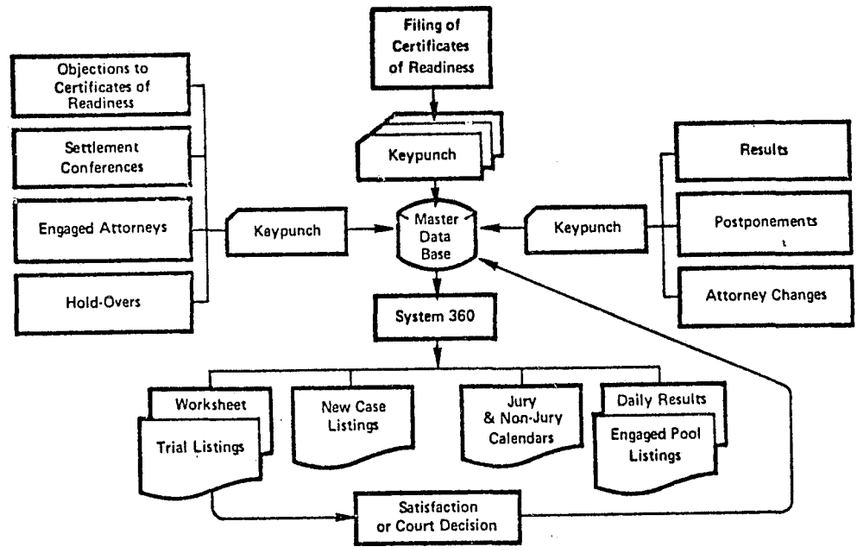
provide automatic updating of ready civil cases and, in some locations, ready criminal cases. Simulation work, though largely in developmental stages, enables the tentative scheduling of various types of cases in terms of amount of time per case. Computerized calendaring systems automatically provide conflict-free scheduling for attorneys (thus eliminating or at least reducing the possibility of their being assigned to two places at any one time), makes docket inventories, ranks cases by age, groups cases according to attorneys or law firms, each being assigned a code number, and schedules pre-trial or motions hearings, when necessary.

For criminal cases, the computerized calendaring system prepares a daily criminal docket index, schedules a daily calendar of criminal cases, provides case status, reports case delay patterns and judges' sentencing patterns. An automated calendaring system should be integrated with a comprehensive information communication system to provide up-to-date case information for display or posting devices (for the public) and visual display units (for the court personnel). Civil and criminal case information systems operating in the Common Pleas Court in Philadelphia are shown in Figs. 2 and 3.

SPECIFICATIONS: INFORMATION INPUT, RETRIEVAL AND DISPLAY SYSTEM

The Information Input, Retrieval and Display System (IIRDS) specified here proposes to alleviate delay time in case processing in courts having congested case flow. Designed to provide completely integrated information display, the system capability is sufficient to post and retrieve information including defendant names, courtroom numbers, type of crime, scheduled time and courtroom assignments. The heart of the system is an independent mini-computer linked to a primary computer. Ancillary equipment consists of a control unit, input devices, interfaces, a programmer, display boards, video monitors and display units.

CIVIL SYSTEM GENERAL DATA FLOW



Following is a list of the main types of information contained in the disk-stored civil data base:

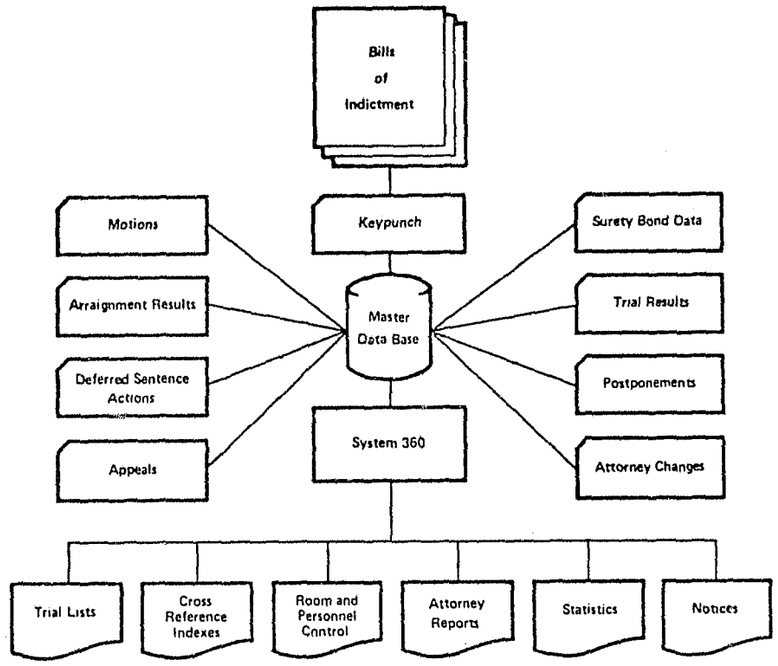
1. Present status of case
2. Type trial requested
3. Court term and number
4. Date Certificate of Readiness was filed
5. Type of case
6. Preference code
7. Insurance company
8. Case title (indication for minor in case)
9. Attorneys involved in case (maximum of 25)
10. Listing information
    a. First and last date and number of times in published pool
    b. Highest position reached and total days in published pool
11. Engaged pool information
    a. First and last date and number of times in engaged pool
    b. Total days and consecutive current days in engaged pool
12. Disposition information
    a. Date and type of disposition
    b. Amount of settlement or award
13. Continuance information
    a. Date to which continued
    b. Times continued
14. Trial information
    a. Date, judge and room assigned
    b. Type and length of trial
    c. Current status
15. Settlement information
    a. Date reported settled
    b. Dates of first and last settlement conference
    c. Result of last settlement conference
16. Miscellaneous
    a. Relative position on list
    b. Latest date in current pool
    c. Plaintiff demand and defendant offer
    d. Amount at issue

FIGURE 2

CIVIL CASE INFORMATION SYSTEM
COMMON PLEAS COURT, PHILADELPHIA

From Data Processing in the Courts of Philadelphia, IBM Application Brief

CRIMINAL SYSTEM GENERAL DATA FLOW



Automated master docket records are maintained in the disk files. These consist of the following basic types of information:

Defendant identification data
- Name
- Address
- Aliases
- Sex
- Race
- Religion
- Date of birth
- Police arrest number
- Police photo number
- Charges
- Cross reference to other indictments and charges

Arraignment information
- Number of times arrested
- Date of first arraignment
- Latest date arraigned
- Arraignment disposition

Trial listing information
- Number of times listed for trial
- Date first listed for trial
- Latest date listed for trial
- Trial disposition

Pre-trial motion activity

Post-trial motion activity

Trial details
- Type of trial
- Days of trial
- Judge
- Date of sentencing
- Institution to which sentenced
- Amount of fine
- Amount of restitution
- Costs

Next court action
- Date
- Room
- Type of action
- Type of case

Miscellaneous case information
- District Attorney case numbers
- Medical doctor codes
- Bail and surety amounts and details
- Defense attorney names
- Assistant District Attorney names

FIGURE 3

CRIMINAL CASE INFORMATION SYSTEM
COMMON PLEAS COURT, PHILADELPHIA

From Data Processing in the Courts of Philadelphia, IBM Application Brief

SYSTEM INTENT

Specifications define system onjectives with regard to performance, functions, capabilities, operations and interfaces with other systems and units. Bidders should be restricted in their choice of equipment to national brands in accordance with a list of court approved manufacturers. If the bidder wishes to offer equipment of a manufacturer not on the list, the substitute equipment should be approved in writing by the court administrator or his delegate (perhaps, the consultant).

GENERAL DESCRIPTION

IIRDS should be designed and installed to provide a complete information communication display facility for participants in court proceedings, including courtroom assignments, case names, types of criminal charges, and approximate time of the scheduled cases. The system should provide automatic programming of displays, accepting manual as well as automatic programmed entry to accomplish changes in/or additions to the displayed information. Furthermore, the system should be capable of entering into an existing data base through interfacing and other equipment required for such entry and recall. The computer location should be considered remote.

SYSTEM CRITERIA

IIRDS should be the most advanced and flexible information communication display system available from the bidder, and should permit construction to be expanded in stages up to the maximum capability of the system.

A. INITIAL PHASE

Initial major equipment required is given on the "Equipment Schedule" at the end of this section. The schedule represents only major functional equipment and does not constitute a complete list of materials, panels, relays, switches and so on.

The contractor should be responsible for providing and installing all additional equipment and materials required to make the complete system operational. The actual physical configuration of system components and additional or substitute equipment required for the system should be defined and listed in the bidder's technical proposal.

B. EQUIPMENT LOCATIONS AND CONFIGURATIONS

Locations of major equipment items should be indicated on shop drawings and should be submitted for the project consultant's approval. Specific configurations and mounting arrangements should be approved by the court administrator and his consultant before each item is shipped to the site.

C. EXPANDABILITY

IIRDS should be designed to permit modification or additions of equipment with minimum interruption to the active system. Guidelines relative to minimum expandability are set forth in subsequent sections; however, unforeseen requirements may require expansion beyond minimum specifications. The bidder should indicate areas in which expandability is limited.

D. SYSTEM REQUIREMENTS

IIRDS should consist of a central programming major subsystem, video display subsystem and a display board subsystem. The quantity and locations of substation equipment and the performance capability of the central processing unit should be furnished and installed in accordance with specification drawings and equipment schedules. The IIRDS system should be capable of integrated operation of the display board and video-display subsystems and be controlled by the central programmer. The system should be capable of integrating the operations of the display boards and the video sets for automatic simultaneous display. All subsystems should have built-in adequate input devices to

permit future additions of compatible equipment to increase the basic IIRDS facility to its maximum capability, as later specified.

PERFORMANCE CRITERIA

A. OPERATION MODES

Basic mode of operation should be automatic, whereby display boards and video displays are controlled in accordance with a pre-prepared program. The program should provide automatic roll-up and insertion of new court data at pre-determined times, and should have minimum storage capacity adequate for required court display information during a two-week period.

The system should have capability for temporary modification or correction of the automatic program by means of the central key board or by remote inputs. Location of remote inputs should be indicated by room number and department on an equipment location diagram. Typical program modifications should include roll-down of displayed data to insert new case information, changes in appearance times and back-up courtrooms and insertion of other temporary changes relative to cases displayed.

B. PERMANENT PROGRAM

The permanent program input may be generated selectively either from the main computer data base or from the digital computer of the central processing unit, and stored in the disc storage unit (capacity up to 32K). The program should contain all court schedule information relative to the daily case calendar.

Data should appear chronologically and should indicate case designations, part numbers or romms to which the case is assigned, docket numbers, case status and other pertinent data.

It is desirable that the maximum case period covered by the program, as constrained by the storage capacity, be of a duration to minimize the number of required pre-prepared programs. The

program period, therefore, should be referenced to scheduled cases with the longest time duration. The estimated minimum program period would be about one month, although longer periods may prove desirable, as constrained by considerations of economy and operational simplicity.

C. PROGRAM MODIFICATIONS

Provisions should be made in the programmer (see 5A for description) to permit both temporary and permanent modification of the program. Permanent modification should include changes of unpredictable duration such as date changes due to new adjournments granted by the courts. No one except the defendant's attorney appears to know that a request for adjournment is going to be made. It is desirable that the initial preparation and permanent modifications of the permanent program be accomplished by means of the central control unit.

Temporary changes should be carried out by a temporary data storage medium which would accept scheduled data from the permanent program, as well as data relative to changes, additions or deletions from the central keyboard or remote input displays.

D. PROGRAM ADDRESSING

It is desirable that the programmer be addressed for changes by case name and docket number, with court part being designated by a code identification. Addressing by display line number is not feasible because of requirements for remote up-dating and the entry of changes prior to actual display of the particular case information.

E. AUTOMATIC ROLL-UP

The programmer should provide automated roll-up of the case pending, and ready information on the display boards and video

displays. Provisions should be made for entry into the programmer of data relative to the actual arrival of participants of each case. The appropriate signs, "READY," with part location and room number or, "PART NUMBER," would be displayed. Following a pre-determined time interval relative to the case status data, the court action or the disposition of each case would be indicated. The programmer would then initiate the automated roll-up by removing the case from the display.

Following removal of the disposed case data, remaining case load information would be rolled up on a line-by-line basis so that current information is not interrupted. Upon completion of the roll-up, new scheduled data would be inserted on the bottom lime. When case information is divided into two equal information boards or solumns, data would roll-up on the information column and transfer to the bottom line of the other column. New schedule data then would be inserted on the bottom line of the first information column.

Automatic roll-up of the displayed information would be initiated by manual command. Following roll-up, the next line of schedule information would be read automatically into the channels memory from the permanent program. Manual entry of changes or schedule updating should be provided without affecting the remainder of the display.

EQUIPMENT SPECIFICATIONS

A. PROGRAMMER

The programmer or mini-computer should be a digital control unit capable of providing central control, data acquisition and distribution functions for the IIRDS facility. The control should be on a real-time performance basis, and include permanent and temporary data storage media consisting of a 400 word memory bank, disc storage capacity of 65,000 characters and ample logic circuits to accomplish control, arithmetic

and input-output functions. The memories should be protected from primary power loss by tie lines to an emergency power source.

Programmer inputs would come from the central control unit, and from remote keyboards, computers and other devices employed for program updating. The programmer should provide outputs to the display boards, character generators, video display units, and central control unit. Outputs to all displays would be control and data signals, as required by the type of display equipment. Outputs to the character generator should be American Standard Code Information Interchange (ASCII) serial-coded data and central signals at the rate required by the character generator. Outputs to the control unit would consist of feedback data and control signals, as required for operation and display monitoring and supervision.

Modular construction should be deployed wherever possible, using integrated circuitry and solid-state devices, exclusively. Provision should be made for expandability as to number of outputs, inputs and program volume. Minimum expandability capabilities in these areas should be 200%.

B. DISPLAY BOARDS

The automatic program will control the information displayed on the display boards. Display of information would be initiated by the entry of case data into the programmer, provided that space is available on the board at the time; otherwise the information would be displayed automatically by the roll-up method described previously upon removal of the case from the particular board. All boards should be single-faced unless otherwise noted on an equipment schedule.

The display boards would be capable of programming, with graphic displays operating in the modes described above. Several basic types would be supplied as standard equipment.

The boards may be flap-type, dot-matrix or other electro-mechanical types. Incandescent lamp matrices should not be used. Sketches depicting representative permanent legend and information line configurations are indicated on Figure 4.

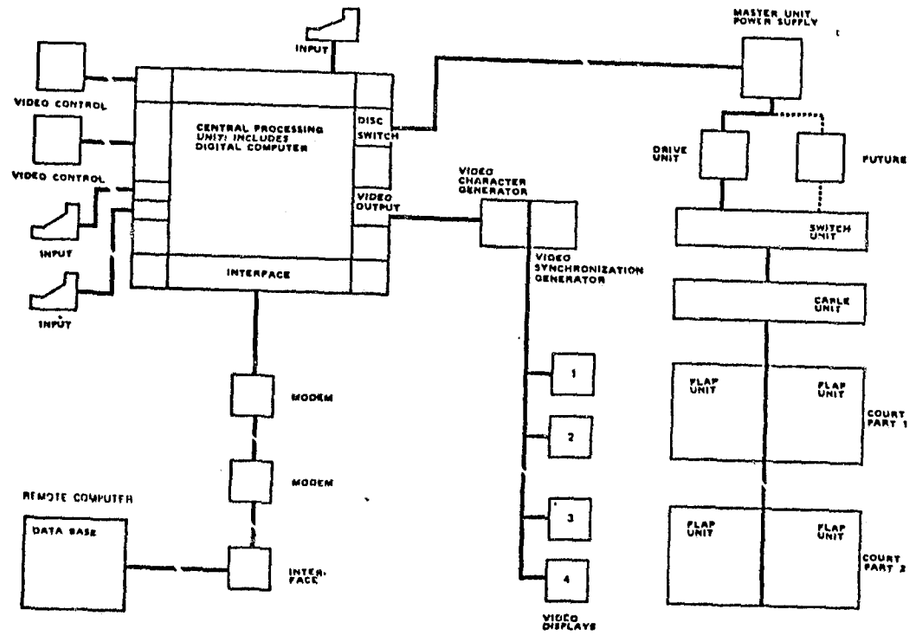


FIGURE 4
INFORMATION INPUT, RETRIEVAL AND DISPLAY SYSTEM

Modular construction should be utilized to the maximum practical extent. Information display may consist of all alpha-numeric modular or, as in the case of flap-type displays, of alpha-numeric, numeric and word modular. Access for maintenance and module replacement should be from the front of the board.

Lightweight, corrosion-resistant materials should be employed to the maximum practicable extent in the frame and display modules. Corrosion-protective metal finishes, hermetic sealing, and conformal coating should be used to protect against dust, grease, humidity, and damp-atmosphere environment characteristic of the location of the equipment.

Size and wight of each display board will have to be the minimum consistent with the information, character, size, number of characters and number of lines specified for the particular board. The bidder would indicate overall dimensions, weight and mounting requirements for each type of board. Location drawings for known dimension constraints must be referenced in preparing the technical proposal to accompany the bid.

The alphanumeric display module should be a combination single character unit providing a minimum of 39 characters and one blank position. The characters would include the alphabet, numerals 0 through 9 and two blank positions. Word modular would be a 40-position module of a length adequate to display specific information, with at least one blank position.

Permanent legends including board identification and column heading must be provided on each display board. Character sizes should be consistent with the legend functions and with considerations of maximum legibility and overall aesthetics, as approved by the court administrator and his consultant. Board identification legend should employ the largest practicable characters.

Futura Condensed characters are appropppriate for column headings. Board identification characters should be similar to Futura Demi-Bold Graphic type style of characters, 1 1/4 inches high, and would be presented to and approved by the court administrator and his consultant in writing before fabrication.

Each display board for a court building should have a capacity of 20 lines for case listing, with a permanent legend as follows:

DOCKET NUMBER	DEFENDANT'S NAME	COURTROOM NUMBER	STATUS OR CRIME
6 spaces	18 spaces	4 spaces	10 spaces

The makeup of each information line should include appropriate spaces and punctuation:

DOCKET NUMBER	ALPHANUMERIC FLAP TYPE	6 CHARACTERS 6 ALPHANUMERIC MODULES
DEFENDANT'S NAME	ALPHANUMERIC FLAP TYPE	18 CHARACTERS 18 ALPHANUMERIC MODULES
COURTROOM NUMBER	ALPHANUMERIC FLAP TYPE	4 CHARACTERS 1 NUMERIC MODULE
STATUS OR CRIME	ALPHANUMERIC FLAP TYPE	10 CHARACTERS 1 WORD MODULE

Display boards should be furnished and installed in waiting rooms and other spaces indicated on the "Equipment Schedule".

C. ELECTRONIC CHARACTER GENERATORS

The electronic character generator will perform the digital-to-video conversion functions for the video subsystems. The display unit initially should provide three data channels. The character generators should accept ASCII serial-coded data and control input at the levels and rates characteristic of the various input devices. The character generators should accept inputs from the central control unit and from specified remote devices.

Each channel must have adequate storage capability for the digital input data. Memories must be protected from primary power loss. Logic circuits should be built-in to convert stored data to video signals, to provide video synchronization generation, multiplexing and control functions. Video spectral limits should be adequate to insure sharp definition and more contrast of displayed characters. The units will provide for automatic roll-up insertion of new data and changes, as previously specified.

Each channel should provide a composite video output at Electronic Institute Association (EIA) standard timing suitable for driving standard video displays and monitors. Display formats shall be designed as specified earlier.

Construction should be modular. All circuits should be integrated, employing solid-state devices. Each character generator should have a built-in feature for easy expansion of a minimum of six additional channels. Means also should be provided for the addition of output amplifiers capable of driving an additional load of displays and coaxial equivalent to 100% of the loss specified herein.

D. CENTRAL CONTROL UNIT

The central control unit should provide for manual control of the system. The unit would include keyboard, print-out devices, controls, circuits and devices, as may be required for operation of those systems.

The control unit should accept manual inputs by means of the keyboard and operational controls, and additionally should accept electrical inputs from the programmer for the feedback of data and control signals. The keyboard should have full alphanumeric, punctuation and special symbolic characters in standard typewriter format. Data feedback from the programmer would be ASCII serial-coded data at the optimum rate required by the printer.

Data entered by means of the keyboard and data fed back from the programmer would be printed out. Display revisions entered by the control operator would be displayed upon the command of the operator following a check of the printed information. Changes entered from remote sources to the programmer also would be printed out and not displyed until the operator commands. A control should be provided to override this function and to permit direct display of remotely-generated changes.

The control unit will print-out periodically, under control of the programmer or upon demand by the operator, complete information showing on display boards. Provision also should be made for call-up of information and for changes thereto prior to actual display, as constrained by the programmer memory capacity. A check of information being displayed on the individual boards also should be available to the operator. Control of all boards would be from the central control unit, either directly or through the programmer.

Preparation or modification of permanent programs would be accomplished by the central control unit. Input outlets for devices such as tape punches and tape readers would be built into the control unit which would have visual outputs from printers and would provide ASCII serial-coded data and control signals to the programmer.

Construction of the central control unit would be modular to provide maximum flexibility in operation and ease of maintenance. Mechanical configuration, location, types, quantity of controls and indicators and the labeling of all controls and displays shall be of quality construction and materials consistent with the performance and reliability modes.

E. VIDEO CONTROL UNITS

Each video control unit would include a keyboard, video monitor, punched-tape readers and inch controls and indicators as will be required for control of three channels of the video display subsystem.

Each control unit section would accept manual inputs by means of keyboard and operational controls.

The keyboard should provide full alphanumeric punctuation and special symbolic characters in standard typewriter format. Tabulator controls also should be provided.

Each video control unit should provide semi-automatic and manual controls of the video subsystem, as specified earlier. Control would be provided for selection of channels, lines, columns and spaces, and for insertion and removal of displayed information. A

cursor would flash selected lines, words or characters. Video monitor characteristics will be as specified earlier.

Each control unit would provide visual outputs by the video monitor. Electrical outputs would also be provided to the selector channel in the character generator. These outputs would be ASCII serial-coded data at levels and rates characteristic of the keyboard and tape readers.

Video control units should be so designed and constructed as to provide maximum flexibility in operations and ease of maintenance. Each control unit should be designed and constructed to accommodate three additional channels. Integrated circuits employing solid-state devices should be utilized throughout, with the exception of cathode-ray tubes and a high-voltage rectifier.

F. VIDEO DISPLAYS

Video displays should be standard, monochromatic cathode-ray tube displays. The display size should be 23-inch nominal diagonal measurement. Characters should be displayed white against a black background. Displays must accept composite video signals at EIA standard timing and at the levels supplied by the electronic character generator.

Input sensitivity must be adequate to insure normal operation under all worst-case conditions and combinations thereof, including minimum output levels from the character generator and maximum attenuation introduced by the video distribution subsystems and loading thereof.

Voltage is required in the high- and low-voltage supplies. Regulation should be sufficient to insure no objectionable display variations due to fluctuations of AC power line voltages.

Controls and adjustments requiring frequent operations or adjustments should be accessible from the front of the display. Controls should be recessed and provided with flush-hinged covers with locks.

Display should be designed to provide maximum legibility in areas of high ambient lighting. Etched, laminated safety shields should be bonded to the picture tube in order to minimize reflection and glare when subjected to ambient levels of 100 foot-candles. All locations of displays should be approved in writing by the court administrator and his consultant. There should be a minimum of 16 lines provided in each video unit. Character heights and the number of characters per line should be optimum, commensurate with with maximum legibility.

Column headings and line make-up for the video displays should provide formats simultaneously with the board displays. Optimal feature of using abbreviations may be employed to display complete board information on the video display. The bidder should indicate in his technical proposal the method that is to be employed to accomplish such abbreviations.

Solid state construction should be employed exclusively, except in the cathode-ray tube and the high-voltage rectifier. In addition, lightweight, corrosion-resistant materials should be utilized to the maximum possible in cabinets, chassis, panels and covers. Corrosion-protective finishes for metal, hermetic sealing and conformal coating should be employed throughout video unit fabrication and formulation.

G. VIDEO MONITORS

Video monitors should be standard, monochromatic cathode-ray tube monitors, with display sizes of 18-inch nominal diagonal measurement, providing optimum legibility for their particular application. Input and operational characteristics and construction requirements should be as specified for video displays specifications. The monitors should be installed as to operate in parallel with their respective video displays and board displays.

The information channels displayed by each monitor should be

identical to those of the respective video displays, except for the cursor used for operational control of the channels.

H. VIDEO DISTRIBUTION

A video distribution subsystem would be supplied with each video display system for transmission of the video signals generated by the character generator to the various video displays and monitors. The distribution subsystem should use coaxial cable and connectors, fittings and other devices, as may be required to complete the installations. Attenuation, phase and flatness characteristics over the frequency range of interest should be such as not to introduce objectionable distortion of the video signals.

Coaxial connectors would be provided in the immediate vicinity of the displays. Connections to the displays would be made by jumper cables. Connectors would be mounted in standard wall receptacle boxes, as required by the local electrical code, and should be fully recessed. In all wet areas, or when outlets are located in floors, waterproof boxes with screw-on covers should be used.

The design of the subsystem sould be integrated with the video subsystem as to make the entire system compatible and interfaced. Electromagnetic interferences must be filtered out. The bidder, in his initial proposal and bid, would indicate the methodology of providing the integrated system free of interference.

I. INTERCABLING

The bidder shall additionally depict on drawings and schedules submitted with his bid, the intercabling as to wiring requirements from existing power supply sources (adequate to meet his power needs) to each piece of equipment requiring electric power.

TABLE 1
EQUIPMENT AND AREA SCHEDULE

Quantity	Equipment	Location	Equipment Unit Area (sq.ft.)	Minimum Circulation Area (sq.ft.)
One	Central Control Unit	Equipment Room	15	40
One	Programmer or Mini-Computer	Equipment Room	20	50
Two	Display Boards each 60" x 60"	Public Waiting Space Court Part 1	10*	50
Two	Display Boards each 60" x 60"	Public Waiting Space Court Part 11	10*	50
One	Video Character Generator	Equipment Room	5	20
One	TV Synchronizing Generator	Equipment Room	5	20
One	Master Power Supply Unit	Equipment Room	10	25
One	Switching Unit	Equipment Room	5	20
One	Cabling Unit	Equipment Room	5	20
Four	Video Display Units	Four Remote Locations	4	20
Two	Video Control Units with Keyboards	One - Control Room One - Chief Clerk	4	20
One	Modem	Equipment Room	5	20
One	Modem	Computer Room	5	20
One	Interface Unit	Computer Room	10	25
Three	Operators Input Units	One - Equipment Room Two - Control Room	4	20

* Display boards are wall-mounted, each measuring approximately 5 ft. x 5 ft.

COST CONSIDERATIONS

Cost considerations for the Comprehensive Information Communication System (CICS) can be divided into two distinct applications: 1) the integrated sign system (ISS) and 2) information input, retrieval and display (IIRDS) and the security communication systems (SCS). While cost considerations are quire different for each system, project phasing for cost estimating can be quite similar. Major phases include research and planning, design and documentation, testing and implementation, and evaluation and improvement. In planning CICS it is essential from an economic standpoint to develop optimum solutions at each level of system development, especially when more than one system is involved. Relationships between various systems must be assessed carefully to find a balance between available alternatives. The size of a court facility and its caseload may determine to a large extent whether a manual or an automatic information communication system should be adopted. For example, a small court building with one or two courtrooms located in a rural county would not need more than an information center, whereas a large metropolitan court complex, such as that in New York or Los Angeles, would need a sophisticated information communication system as a possibly more effective and economical solution to their vast volume of information communication problems. At any point of system development, alternative solutions involving both equipment or personnel may be available. In such cases, the most suitable solution at the lowest cost would normally be selected, however, at all stages of system development, the choice should accord with major decisions in the selection of a comprehensive and integrated system.

Lack of adequate funds being a major obstacle for some implementation processes, it is important to structure implementation in phases according to available budget. For instance, budget in the first year may be adequate only for research, planning and preliminary design phases; budgets in the second and third year could be used for

detailed design and implementation. In another case, the sign system could be implemented as the first phase, followed by the installation of the information input, retrieval and display, and security communication systems as subsequent phases when budget permits. For any information communication system, the planning phase is the most critical and special effort should be made to ensure that overall planning concepts take into account all contributory factors in a comprehensive plan. It is far less costly to make and remedy the mistakes in this early phase than to rectify the system after it has been installed.

Depending on the scope of a geographical area covered by the CICS, the sign system usually is less costly than the IIRDS and the SCS. There are fewer components and most are merely directional signs or maps and do not require sophisticated electrical wiring. In some instances, location of special significance can be identified by lights or a series of lights on a map. Typical locations might be outside a major subway station or bus terminal. But, depending on the scope of work, the cost of IIRDS can be prohibitive unless it is located in major court complexes. The components of the system as described in this monograph are complex, and many require special transistorized parts and electrical wiring systems. Consequently, system material costs could increase significantly if adequate power is not available and new power lines have to be installed, or if CRT terminals and other components are located in remote locations, necessitating excessive conduit runs. During installation of equipment in an existing facility, material costs can be expected to increase as demolition and repair work increases. Lack of staging and storage area, resulting in the delivery of materials in small quantities, can also increase material costs.

High labor costs occur in situations where strong labor unions exist, where disruptions to court operations can be minimized only by off-hours overtime work (nights and weekends), where slow contract payments force the contractor to increase his cost estimates, and

where the scope of demolition and repair work in a renovation project is overly extensive.*

Cost savings can be accomplished by maximizing the use of available existing equipment. For example, if the courts have a main computer memory bank from which information can be retrieved directly, storage capacity of the mini-computer can be reduced, thus lowering the cost of the unit. The cost of IIRDS also can be reduced by decreasing the number of display components. It would also be less costly to reduce the number of large display boards and to rely primarily on video display units and posted print-outs.

---

* For a more detailed description of cost estimates and cost planning, see companion monograph, "Program Administration and Cost Planning."

U.S. G.P.O. 1972/482-373/30/478

END