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Research in Brief

Michael J. Russell, Acting Director

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Improving the Investigation of Violent Crime: The Homicide Investigation and Tracking System

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In conducting investigations, detectives need methods and tools that will help them do their jobs as effectively and efficiently as possible. Ready access to information about the crimes being investigated is one of their needs. Armed with such information, detectives will be better able to develop good leads and in turn to solve the cases. The Homicide Investigation and Tracking System (HITS), a program that began in Washington State, is helping investigators work better by allowing them access via computer to a wide range of information about serious crimes and to resources that can help solve them.

HITS is a computerized murder and sexual assault investigation program that collects and analyzes information pertaining to specific serious criminal offenses. The

system relies on law enforcement agencies in Washington State to voluntarily submit information to HITS investigators on murders, attempted murders, missing persons cases in which foul play is suspected, unidentified persons believed to be murder victims, and predatory sex offenses.¹ The information is stored in the seven data files that compose the HITS system.

HITS provides three major services to law enforcement agencies. First, it supplies information related to a murder or predatory sexual assault case, including the following:

- Incidents with similar characteristics involving murder, attempted murder, suspected murder, or predatory sexual assault

and persons missing as a result of suspected foul play.

- Evidence, victimology, offender characteristics, offender's method of operation, associates, geographic location of the case, weapons, and vehicles.

- Identification of known murderers and sex offenders living in a particular community.

Second, HITS permits analysis of murder cases to identify:

- Factors that may help solve a particular murder case.

- Possible links between a single victim, offender, or case and other incidents of violence.

For years police investigators working in different jurisdictions on similar cases have worked independently of one another. They did not have access to the information available elsewhere that could speed and enhance investigations in their own jurisdiction. For example, although investigators knew that similar crimes were being committed in jurisdictions across the country, they sometimes had difficulty finding out what types of victims had been singled out, what methods of operation had been repeatedly used, or which suspects were under investigation.

Innovations such as Washington State's Homicide Investigation and Tracking System (HITS) have changed all that. HITS

compiles all that is known in its participating jurisdictions about serious crimes—rape, murder, and gang-related crime—into integrated data bases that are rapidly expanding beyond Washington State to include California, Oregon, and Canada. By filling out a simple form that takes less than 30 minutes, investigators save countless hours on the phone or on their feet searching for information that the HITS system locates for them. This *Research in Brief* highlights how HITS works and some of its benefits.

The National Institute of Justice (NIJ), the research arm of the Department of Justice, played a key role in developing this project. NIJ provided seed money that enabled a model system to be designed and implemented using

state-of-the-art computer technology. After the research phase was completed in 1986, the Washington State Legislature was so impressed by HITS' record of achievement that it has continued to fund both the project and its expansion.

Integrating police investigations with computer technology is one of the most exciting advancements in law enforcement today. The opportunity to coordinate field investigations among officers working in local, State, and Federal jurisdictions promises to increase public safety and make the criminal justice system more effective.

Michael J. Russell
Acting Director
National Institute of Justice

- Verification of statements provided by informants, offenders, or both, in which the information relating to an alleged murder is incomplete or questionable.

Third, HITS provides investigators with the following resources:

- Names of experts who can assist with a murder or sexual assault investigation.
- Advice and technical assistance on the various steps to be followed in a murder or sexual assault investigation.

Prior to HITS' use in Washington State, the only way to obtain this type of crime information was through time-consuming, labor-intensive personal visits, interviews, telephone calls, teletypes, and letters.

Most cases listed in HITS occurred from 1981 through 1986, and data on these cases were compiled under a 1987 National Institute of Justice (NIJ) grant. Subsequently, HITS has been funded through the Washington State attorney general's office, and some agencies have begun adding murder and rape incidents reported prior to 1981 to the system.

Setting up the system

As part of the NIJ project, researchers first wanted to determine the number of murders that occurred in Washington State from 1981 to 1986. Each of the following agencies were contacted for information:

- Police and sheriffs' departments covering 273 jurisdictions.
- Medical examiners' and coroners' offices in 39 counties.
- Prosecuting attorneys' offices in 39 counties.
- Washington State Department of Vital Statistics.
- Uniform Crime Report unit of the Washington Association of Sheriffs and Police Chiefs.

To date, every police and sheriff's department in Washington State has cooperated in developing the HITS system.

Initially, more than 1,300 murder files were located in police agencies across the State. Virtually every department had investigated one or more murders in the 1981-1986 period. After all known cases had been identified by name, case number,

and investigating jurisdiction, each police and sheriff's department was asked to voluntarily complete the HITS data collection instrument, a 54-page form containing 467 fields of information, for each murder file. In addition to salient characteristics about the murder event, victim(s), and offender(s), the HITS form also asked questions about the quality of the murder investigation and its solvability. Investigators spent an average of 2.3 hours completing each form.

After 1986, a shorter version of the HITS form, containing 250 fields of information, was developed. This form asks much of the same information as the original form, but omits questions related to the NIJ research project. The shorter form takes approximately 30 minutes to complete.

The short version of the HITS form has been evaluated by homicide investigators in all the larger police and sheriffs' departments in Washington State as well as by investigators in Arizona, California, Florida, Georgia, Iowa, New York, Oregon, and Texas. They concluded that it is the most comprehensive application of homicide information for investigative purposes ever developed.

Using the HITS program

The HITS program uses a relational-based data management system to manage the data files.² The most important feature of HITS for murder and rape investigations is its interactive search capability.³ By choosing among 250 fields of information, HITS analysts can ask for single- or multiple-field information in any order or combination.

For example, if a detective were investigating the rape and murder of a white female prostitute, he or she could use HITS to discover whether similar crimes had been committed in the previous 2 years. Using information provided by the detective, a HITS analyst could query the data base for any combination of data: victim's gender, race, or lifestyle; date and cause of death; location of the body; presence or absence of clothing; concealment of the body; or date of body discovery. In this way, the analyst could identify other cases with common elements and supply the detective with the names of victims murdered in similar ways, date of body discovery, investigating agencies, case numbers, and

HITS Staff

Located in Seattle in the State attorney general's criminal division, the HITS unit is staffed by the following:

- One manager.
- Five investigators/analysts.
- One violent crime analyst.
- Two computer programmers.
- One secretary.
- One data entry operator.

The manager coordinates all HITS activities, including training, data collection, and analyses for police investigators statewide. The unit is supervised by the chief investigator of the attorney general's criminal division, who also conceptualized the HITS project. The chief investigator also analyzes major cases and consults with local law enforcement agencies.

primary investigators' names and telephone numbers. This type of search would take only a few minutes to perform.

Data organization

The HITS program contains information from at least six sources and is stored in seven different data files: murder, sexual assault, preliminary information, Department of Corrections, gang-related crimes, Violent Criminal Apprehension Program (VICAP), and timeline. Because of the diversity of sources, three master data files were constructed to aggregate information about persons, addresses, and vehicles so that any one query could search all seven data bases at the same time. The fields available for analysis range from 20 to more than 250.

HITS murder file

The data base created with the NIJ grant is the HITS murder file, which contains information about victims, offenders, and methods of operation for more than 4,000 murder investigations (table 1). When a murder is committed, law enforcement officers complete the HITS murder form, which is then keyed into the murder file.

Table 1. Records in the HITS Murder and Sexual Assault Files (January 1981 through January 1993)

Type	Number of Records in Murder File	Number of Records in Sexual Assault File
Victims	4,086	2,692
Incidents	3,733	2,345
Offenders	4,312	2,563

Source: Homicide Investigation and Tracking System, 1993

The murder file also includes information on 49 cases from the Green River Task Force (table 2). A series of murders involving prostitutes in the Seattle/Tacoma area, the Green River murders began in July 1982 and ended in March 1984. To date the Green River murder count is 41 dead and 8 missing.

The following three cases demonstrate how HITS has helped Washington's law enforcement agencies in their murder investigations. For these and other cases discussed in this report, names, locations, and related facts have been withheld in cases where investigations are ongoing.

Random railroad killings. A Spokane detective filed a HITS form for the murder of a male vagrant found stabbed to death in a railroad yard. When analysts checked the HITS system, a similar case involving a male vagrant in Cowlitz County was identified. The HITS investigation revealed that a person previously considered a possible witness in the Spokane case was listed as a suspect in the Cowlitz County case. When HITS information was communicated to other law enforcement agencies, investigators from Thurston County reported a third case involving a male vagrant to HITS. The witness is now listed

as a suspect in a Midwestern State for a similar murder.

Double murder. When a Federal undercover agent overheard someone bragging about killing two people in Washington State and being enroute to the Western United States to kill someone else, the agent requested information on double murders in Washington State. The agent was referred to a law enforcement agency in Washington that had cases similar to those mentioned by the potential suspect. The suspect is currently under investigation.

Victim location. A police informant from the Eastern United States told a police detective in Western Washington that an acquaintance had murdered two people in the same area—one victim from the detective's own jurisdiction and another from an unknown location. After spending 4 days contacting numerous police agencies trying unsuccessfully to locate the second victim and coordinate investigations, the detective called HITS and was given the information needed within seconds.

HITS sexual assault file

The HITS sexual assault data file contains information about victims, offenders, and methods of operation for more than 2,000

rape investigations (table 1). The HITS sexual assault file form asks investigators to provide data on serial rapists, stranger rapists, and predatory sex offenders.

Two cases show how HITS data have helped detectives solve sexual assault investigations.

Tracking known sexual offenders. After an extremely brutal rape and attempted murder, the investigating detective requested HITS information about offenders with a particular physical description and method of operation. HITS staff provided the detective with a list of known sexual offenders who had been released from prison during the past 5 years and the areas to which they had been released. The detective was also provided photographs of suspects, one of whom was immediately identified by the victim as her assailant.

Victim identification. A western Washington police agency was trying to identify a female victim who had been raped and murdered at an unknown location east of the Cascade Mountains about 5 years earlier. The HITS unit provided the name of the victim and the investigating officer to the inquiring agency.

HITS preliminary information file

The preliminary information file stores information about crime classification, chronology, victims, offenders, methods of operation, weapons, vehicles, geographic locations, and other pertinent information (table 3). The file also contains more than 4,600 sex-offender registrations. Information for the file is gathered from the following sources:

- Teletypes.
- Newspapers.
- Crime bulletins.
- Sex-offender registration files.
- Requests for information from investigators.

Violent crime information transmitted via teletype through the Washington State Patrol's access system is automatically entered into HITS' preliminary information file. No other State system stores this type of data for retrieval and use in investigations. In addition, every week a clipping service provides newspaper articles containing information about murders and rapes that have occurred in Washington

Table 2. Additional HITS Files and Records Used for Analysis (January 1989 through January 1993)

Files	Number of Records
Green River murders task force (in murder file)	57,538
Department of Corrections	189,960
Gang-related crimes	76,150

Source: Homicide Investigation and Tracking System, 1993

Table 3. Records in the HITS Preliminary Information File (January 1986 through January 1993)

Incident Classification	Number
Murder	2,150
Sex offense	7,785
Robbery	2,052
Arson	220
Total	12,207

Source: Homicide Investigation and Tracking System, 1993

State. This information is also entered into the file. The teletype and newspaper data are particularly valuable because they are usually the first information given to HITS about the occurrence of a violent crime.

Every inquiry from a police investigator, whether it receives a response or not, is stored in the preliminary information file. This allows investigators to keep their inquiries active in the event that information becomes available in the future. For example, if an investigator asks whether an adult male named Joe Smith has been found murdered, a negative answer might be given, but the inquiry is stored in the file. Later, if another investigator reports Joe Smith as a murder victim, the two items are matched and the appropriate authorities informed of their mutual interest in the case.

The preliminary information file stores data about murder and sexual assault cases only until completed HITS reports have been submitted by the investigating agency. The following case illustrates how this file has been used in the field.

Suspect analysis. During an investigation of a rape, the victim described the suspect's appearance and vehicle, which matched those of someone the investigating officer had stopped only minutes before being detailed to the rape case. The officer notified other agencies by teletype to be on the lookout for the suspect. When the teletyped information was entered into the HITS preliminary information file, another teletype was found describing a similar rape that had occurred in another jurisdiction several months earlier. Both the physical description and the method of operation matched, and the prior address of the suspect was located in the same city as

the agency that had issued the earlier teletype. HITS staff notified both police agencies that they both had cases involving a similar method of operation and known offender.

Department of Corrections file

The more than 189,000 records stored in the Department of Corrections data file (table 2) offer immediate access to the identification of current and former inmates who have been convicted of murder or sexual assault. Updated bimonthly, the file can be used to check the physical description of a convicted felon against the description of an unknown suspect in investigations involving sexual assault. The following case illustrates how the file has been used.

Suspect and method of operation. When HITS received a teletype summarizing a second-degree rape incident, physical description of the suspect, and method of operation, HITS staff identified a convicted rapist with a comparable physical description and method of operation who had been released from prison in the previous 3 months. The subject was living only a few blocks from the location of the rape. HITS released all of the information to the investigating detective.

Gang-related crime file

A separate data file for gang-related crimes and driveby shootings contains more than 76,000 records from the Los Angeles County sheriff's department and police agencies within Washington State (table 2). The data from Los Angeles were received after investigators discovered that numerous gang members had migrated from California and had committed crimes

in Washington. The file is routinely used to search for aliases or nicknames and physical descriptions of potential offenders.

VICAP file

Prior to implementation of the HITS system, the State attorney general's office helped local police agencies participate in VICAP, a national serial murder tracking program run by the Federal Bureau of Investigation (FBI). Approximately 350 of the State's murder cases, entered into the VICAP system before HITS was created, have subsequently been merged into the HITS murder file. Now, when data from a HITS form are entered into the HITS system, the computer automatically reformats the information and creates a report to be submitted to VICAP.

Timeline file

Another data file used for analysis is a timeline file that records chronological activities of known murderers. The file contains information about times and places of offenders' movements. As of January 1993, the file had information on 9,083 locations for 73 known murderers.

Data for the file are gleaned from employment records, arrest records, banking records, traffic tickets, and any other record collected during a murder investigation that reveals the location of a possible offender. These times and places can be cross-checked against the dates and locations of murders. The file is another way to determine if a known murderer could have been the perpetrator in other murders. The following two cases illustrate how detectives have made use of the timeline file.

Travel pattern analysis. When an alleged serial killer from Minnesota was arrested in Texas, his travel pattern was examined, and investigators determined that he had spent a considerable amount of time in Washington State. Minnesota authorities contacted the HITS unit, and an analysis was conducted by HITS staff. A murder case involving a woman who had been beaten, strangled, and raped was located in the files. Further investigation revealed that the suspect had been released from a jail in Western Washington the day before the murder and had hitchhiked along the same thoroughfare where the body was discovered. The case is under continuing investigation.

Methods of operation. A Kansas detective contacted the HITS unit when he discovered that an identified multiple murderer from Kansas was known to have visited Washington State. The detective described in detail what the killer did to his victims and how he disposed of their bodies. When a similar case was found in the files, HITS analysts contacted the police agency that had reported the case. Currently the suspect is under investigation.

Cost of HITS

Since 1986, after initial NIJ support, ongoing operational costs have been borne by the Washington State Legislature, which in 1990 awarded \$1.2 million for the 11-member HITS staff in the attorney general's office to operate the program for 2 years.

The only cost to local agencies has been the 30 minutes it takes an investigator to fill out the HITS form. This is negligible compared to the time an investigator would spend trying to obtain information that HITS can supply in a matter of minutes.

Time is also saved by the automatic integration of HITS with VICAP. Investigators are not required to complete two questionnaires because the HITS computer automatically generates VICAP data from the HITS form. HITS staff also routinely verify leads, telephone contacts, and other information that VICAP requires concerning a murder.

Signs of success

As of January 1993, HITS staff had received more than 800 requests for investigative assistance in violent crime cases. Most of these requests had been received since 1988, when the Washington State attorney general announced that the HITS system contained investigative information on more than 1,600 murder cases. The rate of response to requests has been extremely high; assistance has been provided in more than 850 murder and rape investigations (table 4).

A 1990 survey of 495 police chiefs, sheriffs, and homicide investigators indicated that 90 percent of respondents had heard of HITS and that 86 percent of respondents

Table 4. Types of Requests for Assistance (January 1989 through January 1993)

Types of Requests	Number of Requests	Information Provided
Name searches	169	87
Investigation analysis to develop leads	51	48
Inquiries concerning details of individual case	67	52
Checks of offenders' methods of operation and other characteristics against cases in data base	159	98
Inquiries about best way to pursue particular leads	24	20
Responses to HITS confidential bulletins	142	81
Requests for statistical information*	13	13
Requests for names of experts or other resources to help with investigations	95	73
Requests for HITS bulletins	67	60
Requests for verification of informant information	20	11
Subtotal	807	543
Connections made as a result of independent HITS analysis of incoming cases		388
Total connections or "HITS"		881

*Includes specific interests such as numbers of child victims or prostitutes in the data base.

Source: Homicide Investigation and Tracking System, 1993

who had used the system found it ranged from "somewhat useful" to "extremely useful" in their investigations.

National recognition. HITS is known as a computerized information system that is used in the field as an effective investigative tool. Recently HITS won two national awards for outstanding achievement—one from the Council of State Governments and another from the National Association of State Information Resource Executives.

Expansion beyond Washington

Offenders recognize no State boundaries. With that in mind, in October 1991 Kenneth Eikenberry, then Washington State attorney general, and Reginald Madsen, superintendent of the Oregon State Police, signed an agreement to allow Oregon access to the HITS system. Oregon State investigators can now electronically transfer information about violent crimes committed in their jurisdictions into the HITS

computer. As of January 1993, data from more than 700 murders committed in Oregon in the past 6 years have been entered into the HITS program. As a result, police and sheriffs' investigators have violent crime information from two States readily accessible for use in their own investigations. In addition, law enforcement officers from California, Idaho, Kansas, and Canada have submitted information about selected violent crimes to HITS for analysis.

Benefits of HITS

Small law enforcement agencies that do not encounter murder cases frequently or that have investigators inexperienced in specialized murder investigation techniques have found the HITS program to be especially beneficial. HITS analysts can offer guidance, based upon years of experience, on how to organize a murder investigation and provide access to information not available in any one department's files. Other benefits include the following.



HITS' prioritization of solvability factors helps investigators identify avenues of proper and logical followup.

Through HITS, analysts have discovered that different types of murder cases reflect critical solvability factors—such as the likelihood that a friend, lover, or spouse committed the crime—unique to each category of murder. Such information is particularly useful to a detective in a small jurisdiction where there are few murder cases to be investigated.

HITS' methods improve the criminal justice training curriculum for law enforcement investigators. For example, the Washington State Criminal Justice Training Commission has redesigned its basic homicide investigators training curriculum to reflect changes initiated because of HITS.

HITS complements Federal research and programs against violent crime. In addition to the automatic link between HITS and VICAP, the data collected on homicides in Washington State are useful for the FBI's Uniform Crime Reporting Program. But because the information collected by HITS is more comprehensive and richer in detail, it is even more valuable in answering questions from

legislators, elected officials, and government staff about the characteristics of victims, offenders, and murder incidents.

The information HITS provides enables other government agencies to better understand the complex process of murder investigation and its accompanying costs. Using data from HITS files, law enforcement agencies can help educate other government bodies about the needs that must be addressed in agency budgets.

HITS is a model that other States can replicate and adapt to their own needs. The creation of computer programs and methods for data collection and routine analyses could assist other jurisdictions in coordinating and sharing violent crime investigation information.

Notes

1. Predatory sex offenses are those in which the victim is a stranger to the assailant.
2. This system allows information in any file to be associated with related information in any other file.
3. A system with this capability allows the user to "talk" to the computer and receive an immediate response.

Robert D. Keppel, Ph.D., is chief investigator, Criminal Division, Office of the Washington Attorney General. Joseph G. Weis, Ph.D., is professor of sociology and director of the Center for Law and Justice at the University of Washington. The initial HITS project was supported by NIJ grant 87-IJ-CX-0026. A two-volume final report (NCJ 138618) is available. Call the National Criminal Justice Reference Service at 800-851-3420. For further information about the HITS program, contact Dr. Keppel at 800-345-2793 or 206-464-6430.

Findings and conclusions of the research reported here are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

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