

FOCUS ON ROBBERY

The Hidden Cameras Project Seattle, Washington

An Exemplary Project

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ABSTRACT

Although the incidence of robbery nationwide has remained relatively stable over the last five years, certain types of commercial establishments have been increasingly victimized. Robbery of chain stores, for example, increased by 20 percent during that period. Gas station robberies jumped 36 percent. At the same time, clearance rates are low — only 27 percent in 1977.

Commercial robbery is especially difficult for police to solve. Robbers usually strike quickly, rarely leaving any tangible evidence. Police departments in several cities have taken a novel approach to the crime: robbery-prone businesses are equipped with concealed cameras that are activated when a "trip" bill is removed from the cash register. A clear picture of the robbery-in-progress makes it possible to identify the suspect and gain admissible evidence for trial.

In Seattle, the concept was implemented according to a rigorous experimental design. Businesses with the hidden cameras were compared to a control group of sites without the cameras. Evaluation of the project demonstrates, with a high degree of confidence, that the hidden cameras effectively increased clearances, arrests and convictions for commercial robbery in Seattle.

The Seattle Hidden Cameras Project is relatively inexpensive and easy to operate. This manual explains how interested communities can develop similar projects to increase the apprehension and conviction of commercial robbers.

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CHAPTER 1: INTRODUCTION

Robbery is not an easy crime to solve. One reason is that it happens too fast. A robbery can be successfully completed in as little as 15 to 30 seconds. Even under the best response conditions, chances are the offender will be long gone before the police arrive. And in such a brief time span, victims and witnesses cannot observe the offender closely enough to identify suspects at a later date*

In Seattle and other cities, police departments have instituted a program that greatly enhances the probability of identifying commercial robbery suspects* Hidden cameras are triggered automatically when money is taken from the cash register, providing the police with clear photographs of the robbery-in-progress.

The photograph taken during a robbery of a chain grocery store revealed a man wearing a plaid jacket and carrying a sawed-off shotgun. Police identified the suspect from the photograph and arrested him. The jacket and weapon were found in his car. The offender is now serving a 20-year sentence for armed robbery.

Indeed, even wearing a ski mask does not guarantee complete anonymity and safety from the camera's telling effects.

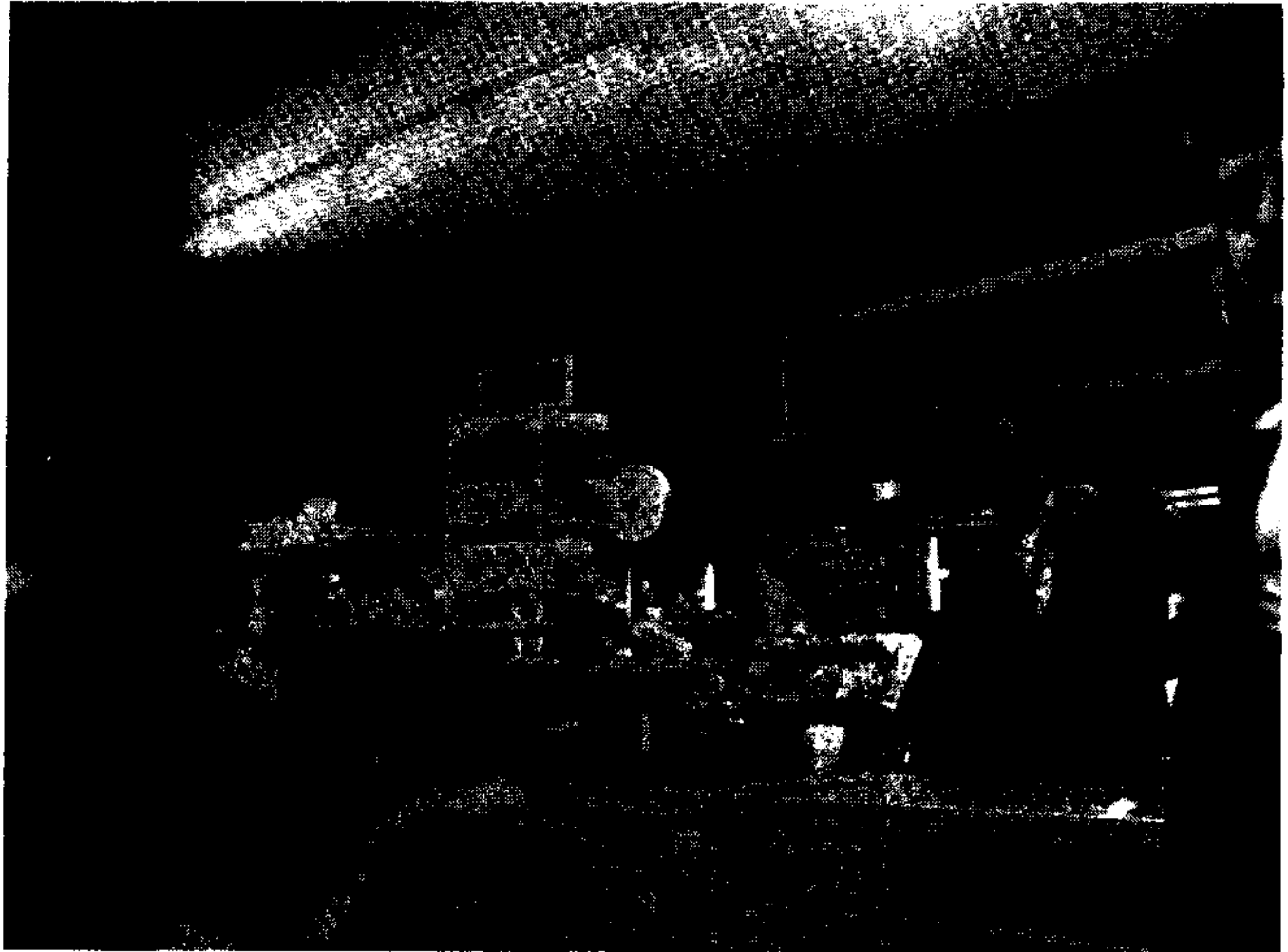
A suspect wearing a ski mask was photographed robbing a fast food chain store. Police made an arrest shortly after the robbery. The arrested person had a ski mask in his possession, which was compared to the mask in the photograph. The suspect gave 3 statement admitting the robbery.

Photographs taken by hidden cameras have effectively cleared crimes other than robbery, for example: if lights are left on when the store is closed, burglaries can be photographed. If money is taken from the register while the clerk is busy in another part of the store, the cameras will still be activated. A clerk observing a shoplifting or other suspicious activity can purposely activate the camera. And employee theft can be easily recognized if money is taken from the cash register without activating the camera. A hidden camera photograph has also been used in Seattle to clear a suspect mistakenly identified as the perpetrator of a crime.

Project costs are minimal, primarily for purchasing and installing the equipment. In Seattle the project is presently staffed by one officer. And because the existence of photographs has effectively shortened case processing time, there are potential associated cost savings to the courts, although as yet unquantified. In fact, many suspects plead guilty when confronted with the pictures, thereby eliminating the need for trial.

The Seattle Hidden Cameras Project is noteworthy for the rigor with which its achievements have been evaluated. Because a true experimental design was implemented, the results demonstrate, with a high degree of confidence, the impact of robbery-in-progress photographs on arrests, convictions, and the overall commercial robbery rate.

- 55% of robberies occurring in hidden camera sites were cleared by arrest, compared to only 25% in a control group of similar sites without hidden cameras.
- 48% of the offenders involved in robberies at hidden camera sites were convicted, compared to only 19% of the offenders at control sites.
- Monthly commercial robbery rates decreased 38% from an 11-month period before the project was instituted, to an 11-month period following project institution. For the same periods, non-commercial robberies increased 6.7%.



An actual photograph of a robbery-in-progress taken by the hidden camera. The suspect pictured was sentenced to 20 years for armed robbery.

- Hidden camera sites had an average case processing time from arrest to final disposition of approximately one month less than control sites*

Guide to the Manual

This manual focuses primarily on the Seattle Hidden Cameras Project and particularly on its evaluation design. Similar projects operating in other cities—e.g., Tucson and Kansas City—are described where their operations vary from or expand upon the Seattle project.

Chapter 2 describes the development of the Hidden Cameras Project in Seattle: why this particular strategy was selected, how it was initially implemented, and the actual operations of the project.

Chapter 3 is devoted to the experimental design developed in Seattle for evaluating the effectiveness of its Hidden Cameras Project. The results of that evaluation, including a cost analysis, are discussed.

Chapter 4 describes the experiences of other cities in which hidden cameras projects are operating.

Finally, Chapter 5 raises several issues relevant to those considering instituting a Hidden Cameras project.

Readers, particularly those interested in adapting the hidden camera concept to their local jurisdiction, are cautioned to carefully consider the symbolic and legal issues inherent in these types of activities. The United States Supreme Court has recognized the American public's right to a reasonable expectation of privacy in public places (Katz v. United States, 389 U.S. 347). Although this project serves legitimate law enforcement and deterrence objectives, those purposes, particularly when unaccompanied by sufficient safeguards for the right of privacy and adequate notice of surveillance, can be distorted and can lead to abuse. The danger of abuse is most acute where

the focus of surveillance shifts from private establishments to public places. This document should not be interpreted as endorsing the latter.

CHAPTER 2: PROJECT DEVELOPMENT AND OPERATIONS

Seattle is a medium-sized city, population 530,890-* The city's 1977 Criminal Justice Plan reports that the total crime index in Seattle had increased 115.4% from 1964 to 1975; in that same interval total robberies increased 328.3%. In 1976, Seattle experienced a 13.2% decrease in the total crime index (the nation had a 0.4% increase) while robberies increased 4-7% (the nation had a decrease of 9.6%) according to the FBI Uniform Crime Reports. Clearly, in Seattle, robbery is a lingering problem that demands increased attention. (To compare Seattle's crime and robbery rates with those of other cities using hidden cameras, see Table 6 in Chapter 4.)

2.1 Implementation

Based on the tremendous increase in reported robberies experienced in Seattle over the preceding decade and consistently low clearance rates, around 25 percent, Seattle's 1975 Criminal Justice Plan identified robbery as a "priority target crime." The Plan delineated several factors contributing to the low apprehension rates for robbery:

- Physical evidence is rarely available. Most non-commercial robberies occur in public places, and the scenes of commercial robberies are typically contaminated by high customer traffic.

* U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population: 1970, vol. 1, Characteristics of the Population, part 49, Washington (Washington, D.C.: U.S. Government Printing Office, 1973).

- Since the stolen property is usually cash, it is not identifiable should a suspect be apprehended.
- Victim and witness descriptions of offenders and vehicles are too general to make a positive identification. Also, the ability to identify suspects tends to deteriorate over time.
- Police cannot respond to a robbery call quickly enough to catch the robbery in progress.
- The police investigation process is too long to be effective.

Many of these problems point to the need for improved quality of evidence surrounding the crime.

To fill this need, the Hidden Cameras Project was initiated in 1974 by the Seattle Law and Justice Planning Office (LJPO) in conjunction with the Police Department as a "commercial robbery apprehension technique." Hidden surveillance cameras would be placed in potential robbery targets to photograph the robbery-in-progress. The resulting photographs would assist police in naming and arresting the offender, and would later become prima facie evidence for placing the accused at the scene and for establishing his or her identity*

The program which emerged was modeled after the Concentrated Bobbery Reduction Program which had been operating in Phoenix since 1970. Approximately 250 cameras had been permanently installed in convenience-type grocery stores, retail liquor stores, and smaller retail food and drug stores. The Phoenix project had reported clearance rates of between 70 and 80 percent, conviction rates of roughly 90 percent, and a 99 percent rate of guilty pleas in cases where photos were available.

Impressed by the apparent success of the Phoenix project and the relative ease of implementing such a project in Seattle, the LJPO applied to the Law Enforcement Assistance Administration for a grant to institute a hidden cameras project. Awarded for the period December 1975 through May 1977, the

grant provided a total of \$50,000 of which \$45,000 were LEAA funds and the remainder, state and local matching funds. first hidden cameras were installed and operational in June 1976. **The**

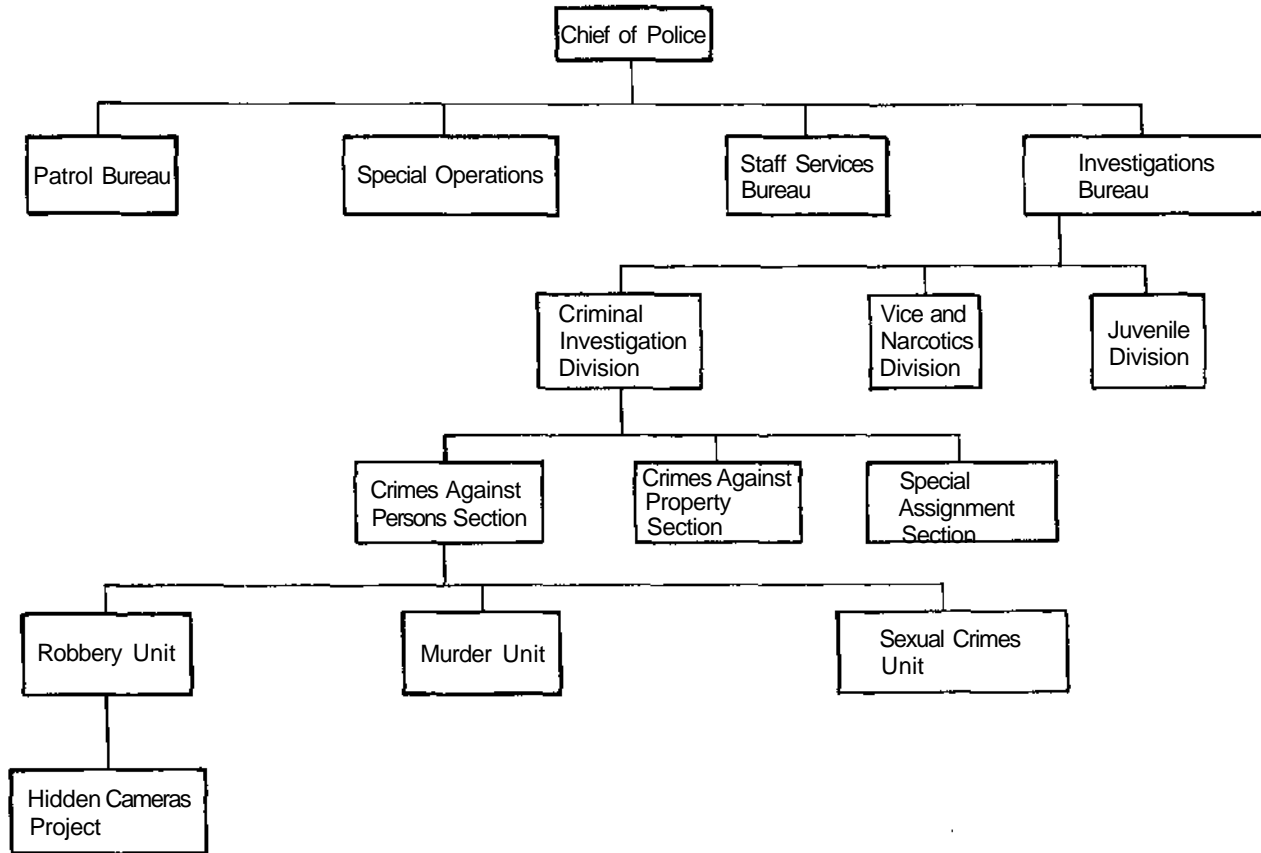
The unique aspect of the Seattle Hidden Cameras Project is the thorough and extensive evaluation design, which was Implemented prior to project operation. This characteristic allows conclusions to be drawn about the project which are not possible with many other projects that use virtually identical operational procedures and equipment.

2.2 Organization

As indicated by the partial organization chart of the Seattle Police Department on the following page, the Hidden Cameras Project is administratively located within the Robbery Unit of the Crimes Against Persons Section, Crime Investigation Division.

In addition to grant monitoring and data collection, the project director is responsible for purchasing, installing, and servicing all equipment; training employees in the operation of the camera-triggering device; and developing camera films. He routinely inspects each of the hidden camera units about twice a month to protect against mechanical problems. The project director also distributes project photos among Seattle police personnel and if necessary, the King County Sheriff's Department, the FBI, other police agencies, and occasionally the local media if police are unable to identify or apprehend the suspect.

Figure 1
Organization of Hidden Cameras Project*



*This chart is only a partial representation of the Seattle Police Department organization.

2.3 Site Selection

Although the actual procedure for selecting hidden camera sites in Seattle was dictated by the project's experimental design (see below, Chapter 3), the intent was to install cameras in those establishments with the highest potential for robbery.

Restricting the proposed strategy to commercial robberies was felt to be appropriate for several reasons:

- While commercial robberies accounted for only 22% of all robberies in 1975, an analysis of robbery data from 1972 to 1975 on such items as type of commercial establishment indicated that commercial robberies were concentrated in relatively few types of businesses: convenience grocery stores, restaurants, pharmacies, service stations and taverns* In addition, among these several types of businesses, there were some individual establishments which were subject to robbery significantly more frequently than others. Thus, potential robbery sites could be readily identified.
- Commercial robbers were believed to have much higher recidivism rates than other types of offenders. The 1972 robbery data showed a 46% robbery-to-robbery recidivism rate among sample persons arrested for robbery that year. Consequently, the arrest and conviction of commercial robbers could conceivably result in a perceptible and permanent decrease in robberies if these individuals were in fact responsible for multiple incidents.*

* There is some evidence to support this view- Tucson reported 20 commercial robberies in the first three months of 1975, for which nine suspects were identified and arrested with the assistance of robbery-in-progress photographs taken by hidden cameras. From the nine arrested suspects, the Police Department cleared one homicide, one kidnapping, and 18 robberies. Stephen Shack, Theodore H. Schell, and William G. Gay, Prescriptive Package: Improving Patrol Productivity, Volume II: Specialized Patrol (Washington, D.C.: Law Enforcement Assistance Administration, 1977), p. 102.

Victims of a number of convenience store robberies all identified the same suspect when shown a photograph taken during a robbery at one of the camera sites. An employee of one of the stores was able to identify the suspect by name and address. Although the suspect initially denied all involvement, when confronted with the photograph he admitted not only to the photographed robbery but to several other crimes as well.

- Public fear of commercial robberies was thought to be disproportionate to the actual number of incidents. Commercial robberies are highly publicized in the media and occur most frequently in small businesses which are patronized by large portions of the city's population.

The locations of commercial robberies were examined by business types for an 18-month period prior to project implementation. Taverns were immediately excluded because of their typically dim interior lighting which would not be suitable for filming purposes. Banks were also excluded since bank robbery is a Federal offense and banks generally operate their own camera systems. Ultimately, a pool of 200 possible sites was developed consisting primarily of convenience markets, drug stores, restaurants, and fast food outlets.

Camera units were initially installed in 75 locations; three months later they were redistributed as required by the experimental design (see Chapter 3). Many of the 75 cameras are still in the same locations since the reassignment, and an additional 25 units have since been purchased and installed in target locations.

2.4 Equipment Operations

Cameras are concealed in simulated stereo speaker boxes which are strategically placed to focus on the store's cash register area. A single bill known as a "trip" bill is inserted in a specially wired clip mounted to the rear of one slot in the cash drawer. The serial number of the trip bill has been

recorded. When the trip bill is withdrawn from the register, the clip activates a radio transmitter* and the camera begins to film. The camera cannot be activated again until it is reset and a new film cartridge is inserted. Because the camera does not film continuously, but only when the trip bill is removed from the cash register, any charges that such a project connotes a form of "Big Brother" surveillance have little support. Indeed, often the robber himself initiates the camera's filming action by reaching into the cash drawer.

When police officers arrived at the scene of a convenience store robbery, they found the clerk shot dead and money missing from the cash register There were no witnesses and no evidence. Photographs developed from the hidden camera showed a woman taking money from the register and the victim lying on the floor behind her. Another photograph revealed the arm of a second suspect. Police were able to identify the woman from the photograph. She was arrested in the company of another woman, and both admitted to the robbery and the homicide.*

False activations and other camera malfunctions must be detected, reported and corrected immediately, since otherwise they will render the camera inoperable. As precautions against accidental trips, one slot in the cash drawer is reserved solely for the trip bill--no other money is placed on top. The Seattle project director prefers to use \$2 bills or Canadian money as the trip bill because they tend to "stand out" from the rest of the cash. A signal light in the cash drawer goes out when there is a malfunction or when the camera has been tripped; clerks are instructed to notify the project director should this occur. The project director also inspects all camera units about twice a month as a check against unreported problems.

* in 15 of the camera sites--all drug stores--employees can activate cameras by a pocket radio transmitter. The pocket transmitters are often more appropriate for drug stores since drugs may be taken rather than money.



A Camera Officer replaces the used film cartridge and resets the camera whenever the camera has been activated.

A clerk in a small neighborhood grocery store that had been robbed gave police a description of the suspect's get-away car. One half-hour later the suspect was arrested. In the get-away car the police found a handgun and a \$2 bill, which was identified by serial number as the trip bill used in the store's cash register.

Although store employees are instructed by the project director in concealment and use of the trip bill, Seattle has experienced a large number of false activations--315 over a 10 month period. The high number of false activations is attributed primarily to the high employee turnover characteristic of the participating businesses. Even so, four sites in Seattle were dropped from the program due to unreasonably high rates of false activations*

The equipment used in Seattle is said to be very reliable and relatively easy to maintain and repair. Of the six cases in the 10-month experimental period in which photographs were not taken, only one was due to equipment failure. Three were due to previous false activations that had not been detected and reset, and two were due to "activation failure not the fault of equipment or victim" (e.g., in one case the offender was a store employee and did not remove the trip bill). Out of 26,625 total camera days (75 cameras over 10 months), only 26 days were lost for service or repair.

The photographs were originally taken in black and white. However, a recent subgrant was used to convert the photographic equipment to allow for color film processing, and to develop a library of suspect photographs that can be transported to victims and witnesses to assist in suspect identification.

More detail on the equipment used by various hidden cameras projects is provided in Chapter 5, Replication.

2.5 Police Procedure

Once a robber has left a site, employees are instructed to call the Police Department. The project director is on call twenty-four hours a day, seven days a week via a bell-boy paging system. The project director immediately retrieves the film at the robbery site and personally develops it to insure a high quality photograph. Within a few hours he is able to distribute the photographs to robbery unit personnel and patrol staff.

A suspect wearing a ski mask was photographed robbing a grocery store. Three hours later a suspect was arrested for robbing a restaurant on the other side of town. Photographs of the grocery store robbery had already been circulated among patrol officers. A comparison of the suspect's jacket and an abscess on his right hand with the photograph from the grocery store robbery was used in court to convict the suspect of both robberies.

Often, patrol officers or robbery unit detectives can readily identify the suspect from the photograph, which is then shown to victims and witnesses, who verify that the suspect pictured is the person who committed the crime. Police will then arrest the identified individual and confront him with the photograph* A typical suspect response is, "I know I'm in trouble." Most will admit to the crime.

On one occasion a robbery-in-progress photograph was used to clear an individual wrongly identified as the perpetrator of a robbery:

Two clerks in a fast-food establishment with a hidden camera identified their robbers as the same persons who had robbed them the previous month. At the time of the first robbery the store had no hidden camera and a suspect was selected from Police Department mug shots. Accordingly, police detectives arrested the same individual, who was free on personal recognizance after having been charged with the first robbery. Once the photographs were developed, it became clear

that the arrested suspect was not the person in the photograph. Detectives were able to identify and arrest the photographed individual, who later admitted to both robberies.

If no officers of the Seattle Police Department are able to identify the robber, the project director will circulate the photographs to other local police departments, the FBI and the King County Sheriff's Department. If after a substantial period of time an identification is not made, a photograph may be distributed to newspapers for publication*

It should be noted that in some cities, hidden cameras are utilized as mechanisms for deterrence in addition to apprehension. Signs are posted warning that cameras are operating, and robbery-in-progress photos are regularly published in local media to maintain a high level of awareness. No rigorous evaluation has yet been conducted to determine whether hidden cameras do have a deterrent effect. But, as discussed in greater detail in Chapter 5, Replication, hidden camera project directors in Seattle, Tucson, and Kansas City concur in their belief that increased apprehension rates will have a greater effect on commercial robbery rates than will deterring criminals from robbing marked establishments.

2.6 Record Keeping

Careful records must be kept of all installation, service and robbery calls for each operating camera unit in order to establish the chain of custody so that the photographs will be admissible as evidence in court. The Seattle project director keeps a logbook in which he records all his activities related to servicing the cameras: installation date, inspection dates, film changes (about every 1-1/2 months if the camera has not been tripped to insure the film is fresh), accidental and legitimate trips.

Because the Seattle project director does not use standardized forms for record keeping, the forms used by the Kansas City

Police Department (several adapted from Tucson) are attached as Appendix A. Two activity logs are maintained. One is a "camera trip log" on which the Camera Officer records, chronologically, the name and address of each store where a camera has been tripped, whether the trip was reported to the Camera Officer, who handled the service need, the date of the report or discovery and the date of repair. The second log is a "store activity log" which records the dates and nature of all service calls to each participating store. In addition, whenever a camera is accidentally tripped and reported by the site, a brief report is filed with the Camera Officer noting the date, time and nature of the call.

2.7 Project Costs

The Seattle Hidden Cameras Project was initiated with a \$50,000 LEAA grant awarded for the period December 1975 through May 1977. In starting up the project, the bulk of the grant funds were allocated toward the purchase of equipment: 75 surveillance camera units, transmitters and receivers, tools, vehicle rental, etc. Other expenditures went for supplies: film cartridges, developing materials, telephone, etc*. The grant covered only one salary, that of an installation and service technician. The project director, a police officer selected from among officers and detectives in the Seattle Police Department, was paid out of the regular Department payroll. The budget breakdown was as follows:

Personnel compensation	\$11,414
Equipment	28,700
Supplies and operating expenses	<u>9,886</u>
TOTAL	\$50,000

In June 1977 the project received continuation funding in the amount of \$37,124 (\$33,413 Federal, \$1,856 each state and local matching funds) to extend project operations through November 1978. The City's 1979 budget includes general fund support to continue the Hidden Cameras Project as a permanent program. Total annual cost for the project, including the project director's salary and project supplies, is \$28,000.

CHAPTER 3. EVALUATION AND RESULTS

Before instituting the Hidden Cameras Project, the Seattle Law and Justice Planning Office stated the five goals it hoped to achieve:

1. To increase significantly robbery clearances by arrest for those businesses in which hidden cameras are installed as compared to other comparable businesses.
2. To increase significantly the proportion of convictions for commercial robberies in which photographs are taken as compared with those commercial robberies not involving hidden cameras*
3. To reduce significantly the incidence of commercial robbery in the City of Seattle, as compared to other comparable jurisdictions.
4. To accomplish project objectives without significantly increasing the risk of injury to victims, bystanders, police and offenders.
5. To reduce significantly the cost of processing robbery cases from initial police response through investigation and prosecution and final court disposition for those cases involving hidden camera photographs as compared with other commercial robbery cases*

The evaluation designed and conducted by LJPO to assess the project's success in achieving these goals is an outstanding feature of Seattle's Hidden Cameras Project. The study was released in January 1978 and evaluated the project's performance for the period from December 1975 through April 1977.

The evaluation design involved random assignment of experimental and control sites from a pool of comparable commercial establishments. Experimental sites were equipped with hidden cameras; control sites were not. Arrest and conviction data were collected comparably for both groups. Because the evaluation was rigorously controlled, the findings discussed below may, in most instances, be accepted with a high degree of confidence as true effects of the hidden cameras.

3.1 Experimental Design

One of the most crucial aspects of a true experimental design is random assignment of subjects (in this instance, potential commercial robbery sites) to experimental and control groups. Random selection requires that every subject have the same chance of being assigned to either group, thereby eliminating sources of bias in selection and refuting any argument that observed differences are related to the subjects themselves, i.e., the particular stores in each group, and not to the experimental treatment, i.e., the presence or absence of hidden cameras.

Seattle was able to randomly select its experimental and control groups by carefully constructing a pool of eligible commercial robbery sites. Before project operation began in June 1976, the project director and Seattle Law and Justice Planning Office research evaluation personnel collected data on all commercial robberies occurring during the preceding 13 months*. The robberies were classified by type of business and then summed to determine the number of robberies committed against each type of business. Bureau of Census data on the number of such businesses in Seattle were then used to estimate the type of business with the highest risk rate*. Within these identified groups, those specific businesses with past robberies were chosen as the most likely to be robbed again in the future.

Based upon these data and other information, 150 commercial sites were identified as being the most likely places to be robbed in Seattle. As noted above in Chapter 2, certain types of businesses (e.g., taverns and banks) were excluded due to



Photographs are immediately distributed among officers in the Robbery Unit, who often recognize the suspect from previous incidents.

poor lighting or because they already were serviced by a security system. Convenience grocery stores were most common in the remaining pool but fast food restaurants, pharmacies, and a few other types of commercial establishments were also included (e.g., a service station, bakery, auto supply shop, motel, etc.). A random numbers table was used to select the 75 experimental sites from the pool of 150 potential sites. In a number of cases inadequate lighting conditions or other physical features of selected sites made installation of the hidden camera impossible. In these instances, a new store was identified as a probable robbery site, added to the control group, and a replacement experimental site was randomly selected from the control group.

Approximately three months following initial camera installation, half of the cameras were randomly selected to be moved from their sites and then randomly assigned to control sites. At this point, the old experimental sites were designated as control locations, while the old control locations became experimental locations. The Law and Justice Planning Office originally intended to repeat this re-randomization process every two months* Such re-randomization would necessitate moving approximately half of the cameras every two months* since the other half would retain their status as experimental or control sites due to the 50/50 chance of being re-categorized into a different group. However, the procedure was not repeated, primarily due to time pressures placed upon the evaluator and the project director for the performance of other tasks.

Data on subsequent robberies, case clearance and disposition, court processing, offender characteristics and costs were collected comparably for both experimental and control sites using a data collection form designed by the Seattle Law and Justice Planning Office (see Appendix B). Sources of information for the evaluation included Seattle Police Department Monthly Crime Capsules and Robbery Unit data, Seattle Police Statistical Report 1976, the 1977 Police Department Budget, King County Superior and District Courts docket files, and offenders¹ "rap" sheets. All data were collected by the project director and verified by staff of the LJPO. Data were collected for the 10-month experimental period from June 1976 through April 1977.

The results of Seattle's experiment and techniques for measuring the achievement of each of the project's five goals are described below.

3.2 Findings of the Seattle Experiment⁴

At the 150 sites (75 experimental, 75 control), 100 offenses were reported from mid-June 1976 to April 27, 1977. Ninety-four of these offenses were for robbery, and six were for other crimes, of which five were photographed (till tap, shoplifting, forged prescriptions). All non-robbery cases were eliminated from the study. At the experimental sites, 38 robberies were reported, while 56 robberies occurred at the control sites.**

Goal 1.- *To increase significantly robbery clearances by arrest for those businesses in which hidden cameras are installed as compared to other comparable businesses.*

Robbery clearances may be "exceptional" or they may occur through the arrest of the suspect. Exceptional clearances involve instances in which the identity of the offender is known, but the offender is unavailable for arrest (dead, in prison, etc.) or where the victim refuses to prosecute.

* As reported in Lawrence G. Gunn, Kenneth E. Matthews, Jr., and Antoinette Hood, Office of Policy Planning, Law and Justice Planning Office, Evaluation Report: City of Seattle Hidden Cameras Project, January 1978.

** The higher robbery rate in control sites is partially an artifact of when a site was designated as "experimental". Until a camera was actually in place, robberies that occurred were not considered to be experimental robberies. Initial placement and subsequent movement of cameras took approximately three months of the total 10.5 months. Thus, the larger number of robberies observed in the control group may be due to the longer time at risk coupled with a possible reduction in false robbery reports by clerks at experimental sites. The possible change in clerk behavior is difficult to measure independently.

Data required to assess this goal include both exceptional clearances and arrest data on all offenses occurring at experimental and control sites during the evaluation period. The Law and Justice Planning Office performed the following analyses on these data: overall clearance rates (combining arrest and exceptional clearances); overall clearance rates adjusted to eliminate control group clearances caused by experimental group photographs; arrest clearance rates; rates of arrests of offenders; and reasons for arrests and clearances.

Overall Clearance Rate: Table 1 provides a summary of robbery case clearances for both experimental and control group sites. The table shows that 68 percent of experimental group cases were cleared either by arrest or exception, compared to 55 percent of control group cases. This difference is not statistically significant. However, part of the high clearance rate in the control group was due to the clearing of 18 cases (5 by arrest; 13 by exception) through pictures taken at experimental sites; that is, pictures taken of robbers in experimental sites were identified by victims and witnesses in control site robberies.

Table 1. Robbery Case Clearance Rate by Site

	Experimental	Control	Total
Total robberies	38	56	94
Not cleared	12 (32%)	25 (45%)	37 (39%)
Cleared	26 (68%)	31 (55%)	57 (61%)
By arrest	21 (55%)	14* (25%)	35 (37%)
Exceptional	5 (13%)	17** (30%)	22 (23%)
Arrested for robbery at other experimental site	4	13	17
Arrested for robbery at site other than experimental/control	1	4	5

* Includes five cases in which suspects were identified and subsequently arrested through photographs taken at experimental sites. Exclusion of these cases results in nine, or 16 percent arrest rate.

** Includes 13 cases in which suspects were identified through experimental site pictures. Exclusion of these cases results in four, or 7 percent exceptional clearance rate.

If control-site robbery clearances resulting from experimental-site pictures are deleted and clearance data reanalyzed, there is a statistically significant difference ($\chi^2=8.89$, $df=1$, $p<.01$). (See Table 2.) While the experimental group retains its 68 percent clearance, only 34 percent of control cases were cleared without the aid of experimental site photographs.

Table 2. Revised* Robbery Clearance by Site

Clearance Status	Group	
	Experimental	Control
Cleared	26 (68%)	13* (34%)
Not cleared	12	25
Total	38	38*

*18 cases which were cleared because of experimental site photographs deleted.

Clearance by Arrest: When only cases cleared by arrest are examined, the difference between experimental and control group cases becomes more distinct. While 55 percent of experimental cases were cleared by the arrest of at least one suspect, only 25 percent of control site cases were cleared in the same fashion. This difference was highly significant ($\chi^2 = 8.87$, $df = 1$, $p < .01$). (See Table 3.)

Table 3. Robbery Cases Cleared by Arrest by Group

Case Cleared By	Group	
	Experimental	Control
Arrest	21 (55%)	14* (25%)
Other than arrest	17	42
Total	38	56*

*Includes five cases in which suspects were identified from pictures taken at experimental sites.

Robbery Suspects; While a total of 94 robberies occurred, the number of offenders involved was 126. Within the two study groups, 56 percent of experimental site robbers were arrested as compared to 22 percent of control site robbers (see Table 4). This difference is highly significant ($\chi^2 = 15.52$, $df = 1$, $p < .001$).

Table 4. Robbery Offenders by Group

Offenders	Group		Total
	Experimental	Control	
Arrested	27 (56%)	17 (22%)	44
Not arrested	21*	61**	82
Total	48	78	126

*Includes six identified suspects

•Includes 30 identified suspects

Reason for Arrest, Case Clearance: To determine the specific factor responsible for arrest and clearance data, the basis for each arrest was identified (see Table 5).

Table 5. Basis of Arrest by Group

Cause of Arrest and Clearance	Experimental		Control	
	Suspects Arrested	Cases Cleared	Suspects Arrested	Cases Cleared
Photograph	21 (78%)	15 (71%)	7 (41%)	5 (36%)
Arrest at or near scene	4 (15%)	4 (19%)	5 (29%)	4 (29%)
Victim/witness identification	1 (4%)	1 (5%)	2 (12%)	2 (14%)
All other	1 (< 4%)	1 (5%)	3 (18%)	3 (21%)
Total	27	21	17	14

Photographs were responsible for 78 percent of the arrests made and for 71 percent of the cases cleared by arrest at experimental sites. Photographs were also responsible for 41 percent of the arrests made and 36 percent of the cases cleared by arrest at control sites.

In conclusion, robberies were significantly more likely to be cleared by arrest (55 percent versus 25 percent) in businesses equipped with hidden cameras, photographs were responsible for 71 percent of the experimental site robberies cleared by arrest.

Goal 2.- *To increase significantly the proportion of convictions for commercial robberies in which photographs are taken as compared with those commercial robberies not involving hidden cameras.*

Information required to assess goal 2 includes data on court actions (pleas, trials, etc.) for cases arising out of experimental and control group offenses. To determine if there was an increased conviction rate from the use of hidden cameras in Seattle, a comparison was made between the number of arrests resulting in convictions for robberies committed within hidden camera sites and within control sites.

There were 27 arrests for robberies at hidden camera sites and 17 arrests at control sites. All arrests resulted in a determination of guilt except for six cases, of which four had outstanding warrants, and two involved juveniles for whom court data were not available. The occurrence of a 100 percent conviction rate in both the experimental and control groups makes it impossible to differentiate between the groups or generalize to more typical cases.

However, of the 48 suspects involved in the experimental site robberies (see Table 4), the 23 convicted (48 percent) represent a significantly higher overall conviction rate than the 15 convicted of 78 suspects involved (19 percent) in the control group robberies ($\chi^2 = 11.61$, $df = 1$, $p < .001$).

To examine the possibility that the quality of convictions may have differed among experimental and control sites, prosecutor actions were studied in terms of severity of recommended sentences and plea bargaining. It was assumed that the existence of robbery photographs would lead to more serious sentence recommendations and fewer instances of plea bargaining in order to obtain convictions.

These assumptions were not supported by the data. In all instances of guilty pleas (74 percent of all convictions in experimental cases; 80 percent in control cases—a nonsignificant difference), the prosecutor agreed to recommend less than the maximum possible sentence for all charges.

To assess the project's effect on the use of plea bargaining, the King County Prosecutor's Office reviewed both experimental and control group cases against its filing and disposition standards to determine if plea bargaining had occurred and whether it was a result of proof problems. Again, no significant differences were found among the two groups. The evaluators note that the small size of the sample may be at least in part responsible for the lack of significant findings in the area of prosecutor activities.

Goal 3; To reduce significantly the incidence of commercial robbery in the City of Seattle, as compared to other comparable jurisdictions.

The evaluators conducted two different analyses of the project's Impact upon commercial robbery rates. The first analysis involved the use of regression techniques to predict the likely robbery rate in Seattle in the experimental period based upon robbery rates of the preceding four years. A similar regression analysis was run on data for all U.S. cities combined with populations exceeding 250,000. The regression analysis resulted in roughly comparable significant declines in robbery both in Seattle and the comparison group sample.

A number of significant problems exist in this form of analysis, however, as noted by the LJPO. These include the facts that (1) the robbery data for both the U.S. cities and Seattle include approximately 75 percent non-commercial robberies which should not have been affected by the project; (2) the project arrests occurred late in the 10-month project period and thus any reduction in robberies due to either deterrence or incapacitation is likely to be slight, and (3) data from the U.S. cities (FBI Uniform Crime Reports) and Seattle data are not strictly comparable for the project period because FBI data were not yet available for 1977 and had to be estimated.

Due to the above shortcomings/ a second analysis was conducted in which non-commercial robbery data for Seattle were used as a comparison against commercial robbery data. This analysis was based upon the assumption that while changes in the occurrence of commercial and non-commercial robberies are influenced by the same general factors (unemployment, social unrest, etc.), the offender populations for the two types of robberies are relatively distinct. Given this assumption, one would expect that a reduction in the number of commercial robbers would result in detectable reduction of commercial robberies while not influencing the number of non-commercial robberies*

Using a pre-project period from August 1975 through June 1976, and August 1976 through June 1977 as the post-project period, a 38 percent reduction in monthly commercial robbery rates was observed, dropping from an average of 65.8 per month in the pre-period to 40.6 per month in the post-period. Non-commercial robberies, on the other hand, increased by 6,7 percent. An analysis of covariance using same named months as covariates found that the difference in changes between the commercial and non-commercial robbery groups was highly significant ($F = 38.78$, $df = 1$, $p < .001$).

An additional test of the effects of hidden cameras on commercial robbery rates involved correlating the cumulative number of persons arrested and convicted within camera sites by month with commercial robbery rates during corresponding months. The evaluators found a statistically significant negative correlation ($r = -.63$, $df = 9$, $p < .05$), indicating that as the cumulative number of arrests increased, the monthly rate of.

commercial robbery decreased. Although such a correlation is never definitive, it does provide suggestive evidence of a causal relationship between the project and commercial robbery rates.

Goal 4: *To accomplish project objectives without significantly increasing the risk of injury to victims, bystanders, police and offenders.*

This goal can be simply measured by assessing the number and severity of injuries experienced in experimental and control group crimes. Of the ninety-three cases examined by the LJPO evaluators, no officers or offenders were injured. Three victims were injured at control sites and one at an experimental site* The difference between the groups is not significant and none of the victims required medical attention.

Goal 5: *To reduce significantly the cost of processing robbery cases from initial police response through investigation and prosecution and final court disposition for those cases involving hidden camera photographs as compared with other commercial robbery cases.*

Two separate analyses were performed to assess the project's success in this effort. The first examined the time spent in processing a case from arrest through conviction for experimental cases compared to control cases. This analysis found that hidden camera cases were processed in significantly less time—approximately one month less—than were robbery cases from control sites*

It was believed that by shortening this time span, police investigatory costs would be reduced as well as jail costs incurred by detaining suspects between their arrest and final court disposition. Estimates of such cost savings were not attempted, however, because the evaluators felt that reliable data were unavailable.

The second analysis performed by the LJPO examined the cost to the Seattle Police Department to achieve a conviction for experimental cases compared to controls using the total 1977 budget for the Robbery Unit and 1976 Seattle crime statistics. The evaluators then added to the police cost an estimate of victim loss, based on the average dollar loss from all reported armed robberies. The analysis found that the cost of obtaining a conviction was substantially lower for experimental cases than for control cases (\$811.74 and \$1,835.02, respectively), indicating that police investigatory resources are more efficiently utilized where hidden camera photographs are available.

The cost of the Hidden Cameras Project itself was computed at \$1,228.41 per experimental site conviction (total project costs/number of project convictions) and added to the police cost for a total of \$2,040.15 per hidden camera conviction. This figure is 11 percent higher than the cost of a control case conviction (\$1,835.02). However, if the five control site convictions obtained through hidden camera photographs are removed from the analysis, conviction costs for experimental cases are 22 percent lower than for control cases (\$2,040.15 and \$2,607.89, respectively).

Based on these computations (presented in full in Appendix C) and on the significantly higher conviction rate of experimental site suspects, the evaluator concludes that the Hidden Cameras Project is cost effective and appears to be able to achieve convictions at a lower cost than control cases. This cost savings is attributed primarily to the higher clearance rate and consequent greater efficiency of system processing in experimental cases.

Additional factors that could be considered in a complete cost assessment of a hidden cameras project include: (1) differences in police patrol costs for initial contacts, apprehension, etc., (2) differences in prosecutor costs for case preparation due to the availability of superior evidence in photographed cases, (3) estimates of the differential costs of detaining experimental and control suspects in the local jail,* and (4) estimates of

* It is perhaps more appropriate to view detention costs as transferred from the city to the state since convicted offenders will be incarcerated at the state level at an earlier date.

differential costs to the court for case processing (hearing time, number and types of hearings, etc.).

Offender Characteristics

In addition to assessing the degree of achievement of the project's stated goals, the evaluators in Seattle gathered data on the characteristics of offenders to assess whether only "naive, amateurish and generally inexperienced offenders" would be inept enough to have their picture taken during a robbery. Comparisons were only made for convicted offenders* Seattle Police Department "rap", or local arrest history, sheets were used to examine whether convicted robbers differed on (a) whether they had ever been arrested before, (b) average number of arrests, and (c) severity of offenses for which they had been arrested. In addition, comparisons of offenders' age, race and sex were performed.

No significant differences were observed in offender age, race, or sex. Offenders tended to be in their mid-twenties, white, and all were males. Differences in prior arrest records were roughly comparable as were measures of severity of past crimes for which they were arrested. The evaluators conclude that persons arrested and convicted as a result of being photographed by the project are not less serious offenders than control group offenders, and are no less sophisticated in their criminal behavior* Some evidence suggests that their local arrest histories may be even more severe although the differences are not statistically significant.

3.3 Summary of Project Results

The Seattle Hidden Cameras Project successfully achieved each of its stated goals.

Goal 1: The clearance rate in experimental site robberies (68 percent) was significantly higher than that of control site robberies (34 percent). An additional 21 percent of control

site robberies (for a total of 55 percent) were cleared by arrests or identifications brought about through photographs taken at experimental site robberies*

In addition, arrest data show clear and statistically significant differences. While 55 percent of all experimental cases were cleared by arrest, only 25 percent of control cases were cleared by arrest. Of the 48 offenders in experimental cases, 56 percent were arrested, while of the 78 control site offenders, only 22 percent were arrested*

Goal 2: Significantly more of the robbers in the experimental group (48 percent) were eventually identified, arrested and convicted than were robbers in the control group (19 percent).

Goal 3: A comparison of commercial robbery data with local non-commercial robbery rates revealed a statistically significant 38.8 percent decline in commercial robbery following project onset, while non-commercial robberies increased by 6.7 percent. The decline in commercial robbery was found to be significantly correlated with the number of robbers arrested and convicted during the project period*

Goal 4: Project objectives were achieved without significantly increasing risk to victims, police or offenders.

Goal 5: Due to higher clearance rates and more efficient use of police investigatory resources, convictions for hidden camera cases were achieved at a lower cost than were convictions for control cases.

It was also found that persons arrested and convicted as a result of project photographs are not less "serious" offenders in terms of past criminal history than those arrested through other means. There are indications that the project may, in fact, identify more serious offenders as indicated by local arrest history.

CHAPTER 4: HIDDEN CAMERA PROJECTS IN OTHER CITIES

Police departments in a number of cities are operating hidden camera projects, most quite similar to Seattle's* This Chapter discusses the experiences of six cities, highlighting elements that vary from the Seattle program.

Table 6 on the following page compares several features of Seattle's Hidden Cameras Project and the programs in the six cities surveyed. All were initiated with LEAA funding; many have since been absorbed into the police department's budget. Annual operating costs typically are limited to salaries, photographic supplies, and repairs as necessary.

Projects are organizationally located in various divisions of the police department. The project director in Seattle suggests that the robbery squad is the best location because officers in such units are familiar with local robbers and patterns of robberies within the city.

All of the projects focus upon commercial establishments with a high customer turnover such as convenience markets, liquor stores, and gas stations. Specific sites are selected on the basis of crime activity data. The number of cameras range from 50 in Fresno to more than 300 in Phoenix. The projects are generally managed by one full-time officer with assistance from civilian personnel or other officers as needed.

In Tucson and Fresno, several merchants have purchased their own hidden camera units but cooperate fully with the procedures set forth by the police departments. In contrast, videotape systems owned and operated by a number of stores in Oklahoma

Table 6. Basic Elements of Seven Hidden Camera Projects

	DEMO- GRAPHICS*	NUMBER OF CAMERAS	NUMBER OF STAFF	FUNDING SOURCE	ANNUAL BUDGET	LOCATION IN POLICE DEPT.	SPECIAL FEATURES
SEATTLE	pop.-530,831 crime-40,009 robbery-2,163	100	1	Local; previously LEAA	\$28,000	Robbery Unit	Evaluation based on true experiment
PHOENIX	pop.-581,562 crime-71,957 robbery-1,485	320	1 plus civilian technicians	Local; previously LEAA	Absorbed in larger robbery program	Criminal Investigations Bureau	First in country
TUCSON	pop.-313,500 crime-31,439 robbery—554	85	1 plus civilian technicians	Local; previously LEAA	\$22,000	Crime Preven- tion Unit	15 units owned by local merchants
KANSAS CITY	pop.-507,087 crime-43,381 robbery-2,410	50 (100 to be added)	1 (2 to be added)	LEAA (part of 1 CAP pro- gram); salaries fund- ed locally	\$1,866 for 50 cameras (does not include salaries, transportation or communication costs)	East Patrol Division (Support Unit)	Evaluation underway
OKLAHOMA CITY	pop.-366,481 crime-32,956 robbery—770	110	2 full-time 1 part-time	LEAA	\$38,000	Photographic Services	Some stores operate video tape systems in addition to cameras
SAN JOSE	pop.-445,779 crime-41,510 robbery-967	170 (20 pur- chased with local funds)	3 (1 assigned to secret witness program)	Local; previously LEAA	Most recent LEAA grant was \$135,000 includes secret witness program	Robbery Project	Operates in con- junction with secret witness program
FRESNO	pop.-i 65,972 crime-21,526 robbery-7 23	50	1	Local; previously LEAA	Less than \$10,000	Crime Prevention Unit	Some mer- chants have purchased camera units

*Population figures from 1970 U.S. Census; crime rates from FBI *Uniform Crime Reports*, 1976.

City and San Jose have proven to be less effective in identifying robbery suspects due to poor picture quality.

All of the cities report increased robbery clearance and arrest rates as a result of the hidden cameras. Where available, the results reported by other cities are noted; however, such findings were not derived from evaluations as rigorously controlled as Seattle's experiment and thus should only be used for broad comparisons.

4.1 Phoenix, Arizona

As noted above, Seattle's Hidden Cameras Project was modeled after a similar project in Phoenix, Arizona, the first such program in the country. As one phase of a Concentrated Robbery Reduction Program (CRR), initiated in 1970, 204 cameras were installed in 191 convenience markets and liquor stores. The project was launched with \$150,000 in LBAA discretionary funds and \$100,000 from the City of Phoenix.

In addition to the hidden cameras. Phoenix¹ original program included a squad of eight specially trained officers to operate the cameras and perform other functions intended to increase apprehensions, such as developing informants, operating stake-outs, and intensive patrol. This unit was composed of one sergeant, five patrol officers, and two photo lab technicians. It was organizationally located under the Criminal Investigations Bureau, as was the regular Robbery Detail with which the special unit cooperated in investigating robbery incidents. A total of 50 officers completed a 40-hour advanced training program which focused on stake-out techniques, surveillance, intensive patrol, and fast follow-in on reported armed robberies.

In the event of a robbery, all available team members would proceed to the scene, retrieve and develop the exposed film, and canvass the area for witnesses. If questioning of witnesses or informants yielded any leads about suspects, stake-out and surveillance techniques were employed to obtain an

arrest. (The use of informants was considered a vital aspect of the program and special funds were available for that purpose.) All arrest and identification activities were coordinated with officers of the regular Robbery Detail.

Team members were assigned exclusively to CRR activities and worked in six to ten hour shifts between 6:00 p.m. and 2:00 a.m. Actual deployment of team members was based on tips from informants or officers in the Robbery Detail, and on computer-based probabilities of robbery trends. These probabilities were derived from data on armed commercial robberies for the period July 1966 through June 1970. In an attempt to predict the likelihood of robbery incidents by day, time and location, reported robberies were plotted on City grid maps on a monthly basis. Forecasts were based both on long-range historical trends and on shorter, three-month trends. According to the project's final report, short-term trends were found to be more reliable.

In addition to cameras, special equipment purchased under the grant included six late-model compact cars and an infrared night vision device used for stake-out and surveillance.

The Phoenix project's final report indicates that after the first year of operations, robberies in convenience markets and liquor stores had decreased from 20-25 per month to 6-8 per month. Based on 33 pictures taken during robberies, 17 arrests were made and 27 robberies were cleared. The report further states that the existence of photographs has "drastically"¹ reduced police time expended in identifying robbery suspects.

4.2 Tucson, Arizona

A Robbery Camera Program has been operating in Tucson since 1974. A total of 85 cameras are located in convenience stores, motels, and gas stations; 70 are owned by the Police Department and 15 are owned by a large convenience store corporation. Company management has agreed to observe the operational and maintenance procedures developed by the Police Department.

Although there is only one Camera Officer assigned to the program, a corps of civilian Identification Technicians are available to answer camera-related calls after office hours. When responding to a camera site, the Identification Technicians are instructed to reset the camera (i.e., make it operable) and report any further problems or service required to the Camera Officer.

A large number of accidental trips had been hampering the effectiveness of the cameras. In an attempt to remedy the situation, the Camera Officer in Tucson moved the bait bill from the \$5 slot in the register to the far left slot (one that is seldom used); that slot is marked with a sticker as a reminder to the clerk. All but one bait bill were removed from the transmitter clip. In the event of a robbery, clerks are instructed to pull the bait bill first so that the camera will be activated as soon as possible. In addition to a neon light on the side of the speaker box that signals when the camera has been tripped, a tester light inside the cash drawer goes out if there is a breakage in the wire. Thus, the clerk is warned of both trips and malfunctions.

To further minimize the likelihood of false activation, the Camera Officer works closely with store owners and managers to insure that all employees are properly trained. The Camera Officer believes this practice to be of utmost importance in securing the full cooperation of participating merchants. Company security officers are requested to periodically check the camera units to insure/ that they have not been tripped. Furthermore, the fact that businesses pay for their film may serve as an extra incentive to store owners to see that cameras are not unnecessarily triggered.

As a result of these precautions, the number of accidental trips has decreased from 615 in 1976 to 201 for the period January-November 1978. The Camera Officer in Tucson reports that no cameras have failed to take a picture of a robbery suspect during the last three years of project operation.

Special precautions are taken to establish a chain of custody that will stand up in court. A picture of the date, time and

officer servicing the camera is taken on the first frame of each new roll of film, and again on the last frame after the camera has been legitimately triggered by a robbery incident. This procedure confirms that the camera mechanism is in good working order, since pictures were taken both prior to and subsequent to the robbery incident. It also helps to place the robbery at the particular location within a certain time frame, i.e., between the two sets of Camera Officer service photographs. Both the condition of the camera and the presence of the officer can be corroborated against the Camera Officer's "store activity log".

The Tucson project reports an arrest rate of 80-90 percent and a 100 percent conviction rate over the last four years of operation* Comparing robbery statistics for the first eight months of 1976 with the corresponding period in 1974, Tucson reports a 69 percent decrease in convenience store robberies and a 77 percent decrease in liquor store robberies.

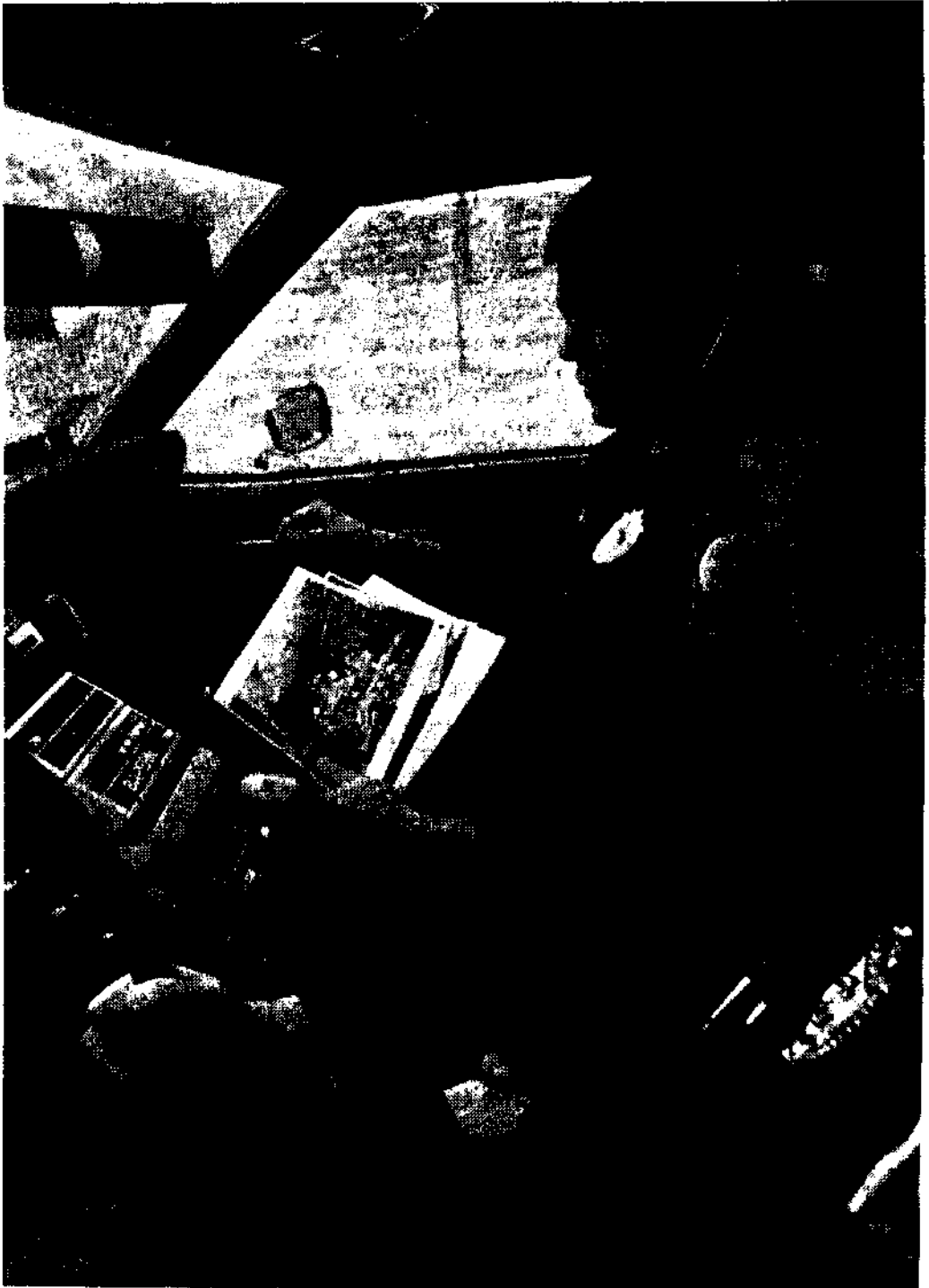
The City of Tucson funds the Robbery Camera Program at about \$22,000 annually. This figure covers the Camera Officer's salary, equipment, and vehicle maintenance and repair.

4.3 Kansas City, Missouri

In Kansas City, a Concealed Cameras Project was instituted in 1976 as one component of the larger Integrated Criminal Apprehension Program (ICAP), an LEAA initiative. Twenty-five cameras were installed in fast food restaurants, convenience stores and motels in one of five patrol divisions of the city. As in Seattle, target sites were selected based on a high incidence of armed robbery. Procedurally, the Kansas City project was modeled after Tucson's hidden cameras program.

An evaluation of Kansas City's Concealed Cameras Project was recently conducted as part of an evaluation of the ICAP program.*

* Kansas City Police Department, "Evaluation of Directed Patrol-June 1976 through December 1977, Chapter 10: Concealed Cameras Project," draft.



Photos are also given to patrol officers to assist in apprehending the suspect.

Using eleven months' data pre- and post-implementation, evaluators found a 70 percent reduction in armed robberies at target sites. A time series analysis using five years pre- and eleven months post-data also found a reduction in robberies, but was unable to definitively link that reduction to the presence of cameras. Another test was performed in which robbery rates for similar types of business establishments were compared among the city's three major patrol divisions, only one of which housed the hidden cameras project. All three divisions experienced decreases in commercial robberies over the time period under study; the experimental division did not show a greater decline than the others. The evaluator concludes that the presence of cameras appears to have a specific impact only on those establishments with installed units and not on the community generally* Because the project was not intended as a deterrence mechanism (i.e., there are no signs or warnings of the camera's presence), it is unclear why there should be such a large decrease in robberies at target sites. It is likely that a certain proportion can be attributed to a decrease in employee theft; another possibility is that the criminal community has become aware of the project and avoids robbing participating businesses.

The evaluator indicates that such a displacement effect cannot be ruled out, that is, robbers may be robbing other businesses in other parts of town; they may be more likely to wear masks; they may switch to other criminal activities. A few instances in which robbers purposely avoided the cameras or instructed the clerk not to pull the trip bill suggest that the project has indeed become known to some element of the criminal community/ who could be directing their activity elsewhere.

Another possible explaining factor that cannot be ruled out is the regression artifact, a statistical phenomenon that occurs when the experimental subjects (in this case, the target sites) were selected for treatment due to extreme scores (i.e., a high incidence of robbery). The artifact presumes that because scores started out at an extreme, even no treatment at all would result in a trend toward a more moderate score*.

In an attempt to circumvent this problem, a second set of 25 cameras was installed in businesses experiencing less severe robbery rates. Unfortunately, the frequency of robberies was too low to allow for demonstrable decreases as a result of the cameras. This second set of cameras was subsequently placed in target sites in another division of the city. Using 12 months pre- and post-implementation data, evaluators found a 45 percent reduction in armed robberies for the target sites. Project evaluation will continue throughout the duration of ICAP funding. A cost-effectiveness study is presently underway.

The initial cost for 50 camera units was \$16,855, which includes equipment and supplies for installation and developing the film. This amount was covered by the Kansas City Police Department's ICAP grant. Based on 22 months of operation, the annual operating cost is estimated at \$37.32 per camera, or \$1866 for 50 units. This figure does not include salaries or the costs of transportation and communication devices used by officers assigned to the camera project; these costs are borne by the Police Department in its regular budget. In an attempt to reduce operating costs, new procedures are being instituted whereby participating businesses will pay for film wasted as a result of accidental trips.

An additional \$42,295 has been allocated from the ICAP funds to purchase 100 cameras and related equipment and supplies. When these cameras are installed, staffing will increase from one officer to three; these salaries will also be absorbed by the Police Department.

4.4 Oklahoma City, Oklahoma

Like Seattle, Oklahoma City modeled its program after Phoenix' Hidden Cameras Project. Initiated in October 1976, Oklahoma City's project now maintains 110 cameras, 85 of which are installed in convenience stores, pharmacies and liquor stores. Most of the remaining 25 are kept on hand for "saturating" target locations with hidden cameras in order to capture an offender who is repeatedly victimizing a single type of business, for example, liquor stores. A few camera units may also be in repair at any given time.

These 110 cameras are monitored and serviced by one full-time police officer, one full-time civilian technician, and a part-time police photographer who shares the 24-hour on-call duty with the full-time officer. Now in its second year of operation, the project's annual cost is \$38,000, half of which is provided by LEAA and half by state and local match. The project director indicates that the federal funding has been expended solely for equipment; staff salaries are funded locally. The civilian technician position is funded through CETA (Comprehensive Employment and Training Act).

Several stores in Oklahoma City are utilizing videotape systems in addition to the hidden cameras* These systems are designed to serve as a deterrent to shoplifting and employee theft (monitor screens are in plain view). Although there have been occasions when robbers have deliberately avoided the videotape cameras, the hidden camera units were able to film the incidents. According to the Camera Officer, videotapes of robberies in progress are seldom useful in identifying suspects due to poor picture quality. The videotape systems are privately owned and operated entirely independently of the Police Department. Some merchants have indicated an interest in purchasing the camera units used by the police and the project director has encouraged them to do so. To date, however, he is not aware of any privately owned hidden camera units.

Oklahoma City reports a 60-65 percent clearance rate in protected locations, compared to an overall robbery clearance rate of 36-40 percent.

4.5 San Jose, California

The hidden cameras project in San Jose was originally one of five components of a larger Robbery Prevention Project launched in 1975. The other four components were: (1) improved robbery investigative techniques and robbery analysis, (2) improved patrol procedures and techniques, (3) a confidential and investigative fund for purchasing information from informers, and (4) a secret witness program. All but the hidden cameras and the secret witness program were discontinued after the first year.

The hidden cameras are operated and maintained in San Jose as they are in Seattle. The San Jose project varies markedly, however, in that it works in conjunction with the secret witness program. In that program, photographs of robbery suspects whom the police cannot identify are routinely submitted to the San Jose Mercury News for publication in a weekly column*. Informants, who remain anonymous, are offered reward^ for information leading to the arrest of suspected robbers. These rewards range from \$300 to \$2000; a board composed of representatives from the San Jose Police Department, the newspaper, and the Northern California Grocers Association determines the exact amount. Reward monies are provided by the Grocers Association and contributions from local merchants.

A total of 170 cameras are installed in a range of target locations, primarily convenience stores and liquor stores. The budget for the Robbery Prevention Project in its three years of federal funding was \$278,283, \$217,405 and \$135,000. One-time start-up costs for 150 cameras and related supplies are estimated at \$60,000 and a certain proportion of the first year's costs were allocated to the three project components which have since been eliminated. The City of San Jose has since purchased an additional 20 cameras.

San Jose operates its 170 camera project with a staff of three police officers; one assigned to operation and maintenance of the cameras, one assigned primarily to the investigative duties, and one who acts as liaison with the secret witness program, supplying case descriptions and photographs where available for the weekly news column. Since LEAA funding expired in August 1978, the Police Department has continued the hidden cameras project by absorbing the staff officers¹ salaries. The Northern California Grocers Association and local merchants continue to post the rewards for the secret witness program.

An evaluation report on the San Jose hidden cameras project is presently being prepared by a private contractor.

4.6 Fresno, California

Fresno is a much smaller city than the other sites surveyed; its camera program is correspondingly small. Fifty cameras are located in convenience markets and liquor stores and are maintained and serviced by one full-time officer. Although the project was initiated with LEAA funds it is now funded locally with an annual cost of less than \$10,000.

Several store owners in Fresno have purchased camera units from the same distributor who supplies the Police Department. Arrangements have been made whereby the police maintain these cameras as they would their own project cameras- The Camera Officer observes that merchants who have purchased their own units are more meticulous about training their employees in the proper use of the system.

The Fresno County Sheriff's Department has recently acquired seven hidden camera units. The Camera Officer from the City Police Department is assisting the sheriff in site selection, installation, and start-up procedures.

CHAPTER 5: REPLICATION

The arguments in favor of implementing a hidden cameras project are impressive:

- Much of the initial planning is done routinely in many police departments in the collection of crime statistics. All that would be required is to analyze the data for commercial robbery and identify those establishments most vulnerable and most appropriate for camera installations*
- The equipment is readily available in most cities and can be installed without the assistance of highly specialized technicians*
- After the initial expense for purchasing and installing the equipment, operating costs are limited to staff salary and general supplies.
- As demonstrated by the Seattle experiment/ the impact on commercial robbery can be highly significant.

Indeed, many cities have already instituted hidden camera projects. One distributor of camera surveillance units reports that he supplies cameras to 67 cities in 15 states and Canada. The discussion which follows focuses on issues that should be considered prior to instituting a hidden cameras project.

5.1 Determining the Size of the Project

The number of cameras required to adequately and efficiently obtain a high degree of success in apprehending robbers depends on a number of factors. Certainly the nature of the crime problem in a particular city is of prime importance, i.e., the overall commercial robbery rate and whether such robberies are geographically limited or widely dispersed. Where robberies are concentrated within a certain area, or among a certain "type" of business, or even among individual establishments, one might expect that a few cameras strategically placed would have a telling effect on the overall commercial robbery rate.

Another primary factor in determining the size of a hidden cameras project is simply the number of appropriate business establishments. Most of the cities presently operating hidden cameras projects locate the units in convenience stores, fast food establishments, pharmacies, and liquor stores. Although taverns, gas stations and other businesses typically suffer a high robbery rate, environmental conditions may render the camera useless. A related issue is whether the program intends to include sites that require more than one camera, e.g., stores with more than one register or pharmacies, where robbers are as likely to steal drugs as cash.

Whether cameras are temporarily or permanently installed is another factor to consider. Conceivably, fewer temporary units could suffice since they can be relocated as crime trends shift, obviating the need to buy additional cameras. In any event, as the project directors in both Tucson and Kansas City have indicated, budgetary constraints are often the final determinant in purchasing cameras.

Associated with the number of cameras operating in a given city will be the number of staff required to manage the program. Fresno, California has one person assigned full-time to its 50-camera program. Kansas City, which presently has one full-time officer directing the 50-unit project, will be adding two full-time staff when 100 more cameras are installed. In Tucson, civilian Identification Technicians insure that the 85 cameras are always operational, but all problems and service calls are

still handled personally by the Camera Officer. In Seattle, one officer is solely responsible for maintaining 100 units. It appears that a working rule of thumb for staffing a hidden camera project is one officer per 100 camera units.

5.2 Camera Equipment

Several types of camera units are being used for surveillance purposes. They vary both in their capabilities and their price. Seattle is presently using two brands of camera units* The 75 units purchased under the original LEAA grant had the advantage of being less expensive (about \$450 per unit including camera, transmitter, receiver, and simulated speaker box), but the project director had to build motors for the cameras since they were not equipped with an automatic advance. The 25 new units are fully automatic and cost about \$750 each. The former model takes about 20 pictures in a 20-second period; the latter takes 36 shots over 25 seconds. Color film is used in about 85 percent of the sites; the other sites are closed during evening hours and lighting conditions are such that color film is not appropriate.

All other cities surveyed use a unit manufactured and marketed by a former police officer from the Phoenix Police Department who helped design that city's hidden cameras project. These units may be triggered either by a hardwire connection or a radio transmitter. The former provides a relatively permanent installation and is less expensive (about \$420) than the latter model (\$495) which allows for temporary installations as proposed in the Seattle project. Temporary units **may** be preferred for two reasons: 1) they may be reassigned if crime trends shift and the participating businesses are no longer the most vulnerable to robbery; and 2) they may be reassigned if the criminal community becomes aware that certain businesses have camera units. In Tucson hardwire connections are used but one radio unit is kept on hand for quick installation when police are "tipped off" to an imminent robbery. Both Kansas City and Oklahoma City are converting their cameras from hardwire to radio transmitters to facilitate installation and to eliminate accidental trips caused by moving the cash register. The project



The suspect in the photograph had been arrested a number of times for similar robberies, but had never been convicted. With this photograph as evidence, prosecutors were able to obtain a conviction.

director in Oklahoma City indicates that the increased cost of the radio transmitters is offset by savings to police in installation and maintenance time*

The system used in these cities takes 12-14 pictures in 28 seconds* In Tucson only black and white film is used; processing time is shorter and the film is more adaptable to varying light conditions. The Camera Officer does not believe that color significantly enhances the witnesses' ability to identify suspects from photographs. In contrast, the camera project in San Jose recently switched to color film to facilitate the identification of clothing worn by suspects.

5.3 Ongoing Monitoring Activities

In addition to the special data collection requirements of an intensive evaluation effort, certain ongoing monitoring activities should be undertaken to insure the continuing smooth operation of the project.

The camera activity logs discussed above in Chapter 2, Section 2.6 Record Keeping, are not only valuable for documenting the chain of custody for evidentiary purposes, but also can alert project staff to chronic mistreatment or malfunction of the camera equipment. An inordinate number of false activations occurring at a particular location may warrant removal of that site from the program. (Seattle dropped four sites from its program for this reason.) Similarly, an excessive number of repair calls from any one location may indicate (1) a true malfunction of the equipment, perhaps necessitating immediate replacement, or (2) employee mistreatment of the equipment, possibly warranting removal of the site from the program.

Another valuable monitoring activity is recording whether such activations or malfunctions were reported by employees at the site, discovered during routine inspection, or discovered as a result of the camera's failure to photograph a robbery incident. Repeated failure of a site to report camera problems may indicate a lack of cooperation with the project.

To further insure that the hidden camera project is operating to its maximum potential, commercial robbery patterns in the city should be assessed regularly, whenever the Police Department compiles its crime statistics. These crime patterns may vary over time either in the geographic areas most vulnerable or in the types of business most vulnerable. Careful monitoring allows project staff to relocate cameras where they are most needed, as in Seattle, where a rash of robberies against pharmacies in a certain area of the city prompted the project director to reassign several cameras to drug stores in the affected area.

5.4 Police vs. Merchant Ownership

In both Seattle and Tucson, local security firms have raised the issue of unfair competition with private security systems businesses, since the Police Department is providing to merchants/ free of charge, a service that would otherwise be purchased or rented, other criticisms have pointed to the cost of the program to local government, and to a possible charge of discrimination since not all commercial establishments are provided with hidden camera equipment.

In response to these charges, the Seattle Law and Justice Planning Office points out that the intent of the project is to apprehend robbers through covert surveillance, whereas the intent of most privately owned security devices is either target-hardening or deterrence through notices, warning signs, and alarms. (This issue of apprehension vs. deterrence is discussed in greater depth in the following section.) Thus, with apprehension as the major objective, the LJPO argues that supplying cameras through the Police Department is more appropriate. Police can distribute the units as crime trends dictate* They can insure that equipment is adequately maintained through routine inspections. And they can better control the processing and safekeeping of robbery photographs to establish a chain of evidence that will be admissible in court. The LJPO also points out that the temporary nature of the camera installations at particular sites may encourage merchants to purchase similar devices from private industry. The LJPO addresses the charge of discrimination by pointing to the

criteria used in selecting hidden camera sites: high incidence of robbery- Private industry, on the other hand, supplies only those merchants able to afford the units—a selection bias against the less wealthy companies that may, in fact, be those most vulnerable to commercial robbery.

Finally, the LJPO explains that the cost of the project to the city is, in large part, a one-time expense for equipment and installation; operating expenses are relatively small and would probably be absorbed within the city general fund or within the Police Department budget should the project prove successful and worthy of continuation.

5.5 Apprehension vs. Deterrence

Seattle project staff do not feel that hidden camera projects deter crime substantially; in most cases a simple mask would effectively render the cameras useless. Instead, they assume that incapacitating criminals apprehended by the project is the most effective strategy to decrease crime. They also believe that with detailed news coverage, criminals would then avoid stores where they suspected cameras were present or attempt to destroy or otherwise avoid the camera units. It would be very costly to replace the speaker unit boxes with other types of covert disguises should the criminals in Seattle begin to recognize these speakers as camera housings. The Kansas City evaluator notes that in some robbery incidents the perpetrators did purposely avoid the camera units and the trip bills.

On the other hand, the project director in Seattle recognizes that the decrease in the number of commercial robberies since the camera units were installed (in June 1976) could reflect some deterrent effect of the hidden cameras on employee theft and false reporting of robberies in equipped businesses. Since all employees are trained in the use of the trip bill to trigger the camera, they would be prime suspects in instances where cash is taken from the register without activating the camera unit*

In a robbery of a small donut shop in Seattle all money was taken from the cash register except the trip bill. After being questioned by the police, the employee who reported the crime admitted to the false reporting of a robbery, and was later charged with that offense in Municipal Court.

Conclusion

With a clear focus on robbery, hidden cameras are helping police to identify and convict commercial robbers with a high degree of certainty. The benefits are obvious; implementation is straightforward. In sum, a hidden cameras project is an apprehension technique that might appropriately be considered by any community suffering from high or rising commercial robbery rates.

APPENDIX A

**Daily Monitoring Forms Used by Camera
Officer, Kansas City Police Department**

STORE ACTIVITY LOG

STORE NAME _____ ADDRESS _____

CAMERA # _____ BOX#- _____ MANAGER'S NAME _____ PHONE# _____

#	DATES	TYPE OF WORK OR SERVICE
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	
	Date Reported	Work by:
	Date Repaired	

This form is used for each individual location. When a camera is installed in a camera location, the officer will log in the installation date on the form. Each time an accidental trip is reported and after the officer has responded to the location and reset the camera, the officer will log in the date reported, date repaired, the type of work and service done to the camera and who did the work.

KANSAS CITY, MISSOURI POLICE DEPARTMENT
CONCEALED CAMERA CHECK SHEET

FROM: _____ DATE: _____ TIME: _____

TO: Crime Coordinator, Officer _____

SUBJECT: Camera Trip

The camera at the _____ has been tripped this date.

_____ The system was checked and is working properly.

_____ The system was checked and there is a malfunction in the system. See remarks.

_____ The serial numbers on the bills were checked and are correct.

_____ The serial numbers on the bills were checked and were not correct. See remarks.

There were _____ exposures on the camera.

_____ roll(s) of film was/were expended.

Date and Time Reset _____

REMARKS:

Form 5211 P.D. (1-77)

Camera Technician

When a camera has been accidentally tripped, store personnel call the appropriate police number as instructed. The person answering the call (clerk, officer, etc.) records the pertinent information on this form and places it in the office of the camera project officer. At his earliest convenience, he will then respond to that location to reset the camera.

ACCIDENTAL CAMERA TRIP
IN CASE OF ACCIDENTAL TRIP, NOTIFY CRIME COORDINATOR
AT 842-6525, EXT. 466
EXPLAIN, HAVE HIM CONTACT BELOW LISTED OFFICER(S)

1. Sergeant _____
2. Officer _____
3. Officer _____

Form 5187 P.D. (Rev. 1-77)

This is placed in the store upon installation of the camera.
This form is to let the owners or clerks know whom to notify
when the Concealed Camera has been tripped.

CONCEALED CAMERA BAIT BILL

POLICE DEPT.: THE FOLLOWING INFORMATION PERTAINS TO THE BAIT MONEY THAT IS MARKED AND IN THE TRIP CLIP IN THE REGISTER.

STORE NAME: _____

ADDRESS: _____

DATE MONEY WAS
PUT IN THE REG. _____

MONEY MARKED & PUT IN BY: _____

INITIALS ON MARKED BILLS: _____

DENOMINATION OF BILL: _____

**The initials are on the seal just to the right of the picture in the center of the bill.

SERIAL # SERIES

FIVE; _____

ONE: _____

ONE: _____

Remarks:

This form is placed in the camera files. This slip is used to record serial numbers and the series of bait money used when installed in the trip mechanism of the Concealed Camera. Serial numbers are recorded to be used as evidence in court.

CONCEALED CAMERA

CRIME TRIP - NO PHOTOGRAPH

Whenever a robbery occurs at a business with a concealed camera, please complete the following information*

Date of Robbery _____ Date of this report _____

CRN _____ Location _____

Why no photographs obtained?

Please give details of item checked on back.

1. Camera tripped and unreported prior to robbery
 - A. Suspect Deliberate
 - B. Apparently Accidental
2. Suspect not in camera view
 - A. Robbery not a cash register (manager office)
 - B. Suspect deliberately stood out of camera view
3. Camera disabled (other than by tripping)
 - A. Prior to robbery
 - B. During robbery. Please explain how it was disabled
4. Bait money not pulled; who removed the money?
 - A. Victim
 - B. Suspect
5. Film damaged
 - A. Improper processing
 - B. Other
6. Other reason for no photographs.

Please make additional comments on back.

Signed

Approved

Date

This form is used by our Research Unit (for evaluation purposes) and the camera officer on the monthly summary-

APPENDIX B

Data Collection Forms - Seattle

HIDDEN CAMERA PROJECT
DATA COLLECTION SHEET

SPD CASE # _____

COURT: _____

OFFENSE: _____

DOCKET NO.: _____

OFFENDERS: (RACE/SEX/AGE/WEAPON/M-NUMBER)

ARREST RESULT OF: _____

SITE SELECTION STATUS: EXPER: _____ CONTROL: _____ OTHER: _____

OFFENSE PHOTOGRAPHED: YES: _____ NO: _____

IF EXPERIMENTAL AND NOT PHOTOGRAPHED, WHY? _____

IF PICTURES POOR QUALITY, WHY? _____

DOLLAR VALUE LOSS: _____

VICTIM INJURY: YES: _____ NO: _____

ANY INDICATION THAT INJURY RELATED TO CAMERA? _____

NUMBER OF DAYS BETWEEN REPORT AND DETECTIVE RESPONSE: _____

NUMBER OF DAYS CASE WAS UNDER INVESTIGATION UNTIL INITIAL
DISPOSITION: _____

NUMBER OF ITEMS OR ENTRIES MADE IN FOLLOW-UP REPORT: _____

FINAL DISPOSITION: INACTIVE: _____ CLEARED BY ARREST: _____

EXCEPTIONAL: _____ STILL ACTIVE; _____

DID DETECTIVE INVESTIGATION INCLUDE: {"+" MEANS YES, GOT FURTHER LEAD; "-" MEANS YES, BUT NO FURTHER LEADS)

INTERVIEW P/R: _____ DEV. PHYS. EVID.: _____

INTERVIEW WIT: _____ WEAPONS: _____

INTERVIEW VIC: _____ CLOTHING: _____

DMV CHECK: _____ FINGERPRINTS: _____

LINEUP: _____ REQ. MEDIA ASS.: _____

IDMO: _____ DRIVERS LIC.: PICTURE: _____

M.O. CHECK: _____ ALL OTHER: _____

USE MUG SHOTS: _____

INFORMANT TIP: _____

WAS THIS CASE CLEARED BY ARREST ON OTHER CASE: _____

IF YES, WHAT CASE? _____

WAS THIS A CASE IN WHICH WITNESS INCORRECTLY I.D. SUSPECT WHICH WAS SUBSEQUENTLY CLEARED BY HAVING ROBBERY PHOTOS? _____

	SUSPECT(S)		
	#1	#2	#3
DATE ARRESTED	_____	_____	_____
NO. CASES CLEARED	_____	_____	_____
CHARGE WITH	_____	_____	_____
DATE CHARGED	_____	_____	_____
PLEA BARGAINED	_____	_____	_____
COURT FINDING	_____	_____	_____
DATE OF FNDITFG	_____	_____	_____
SENTENCE	_____	_____	_____

APPENDIX C

Cost Analysis of the Seattle Hidden Camera Project*

- * As reported in Lawrence G. Gunn, Kenneth E. Mathews, Jr., and Antoinette Hood, Office of Policy Planning, Law and Justice Planning Office, *Evaluation Report: City of Seattle Hidden Cameras Project*, January, 1978.

Project data, King County Superior and District Courts docket files, Seattle Police Statistical Report 1976 and the 1977 Police Department budget were used as data sources in the following analyses. Two separate analyses were performed. The first examined the time spent in processing a case from arrest through conviction, and the second examined the cost to the Seattle Police Department budget to achieve a conviction.

Case Processing Time: Arrest-to-conviction processing time was chosen for analysis because it was assumed that it should reflect the cost to the City in terms of both police response and investigatory efforts, and the cost of holding a suspect between the time of arrest and final disposition. As processing time decreases, there should be a corresponding decrease in police costs and in the cost of keeping suspects in jail. However, no estimates of potential cost savings were attempted because reliable data were judged to be unavailable, processing time was determined for those cases in which the court outcome was known. Time was counted as the number of named months (e.g., January, February, March, etc.) from arrest to court disposition*

Twenty-three arrests at hidden camera sites had an average case processing time of 1.65 months, while the average processing time for the 15 arrests at control sites was 2.60 months (see Table 1 below). The difference in the amount of time elapsed in processing a case was significantly different between the two groups ($t=2.45$, $df= 36$, $p=.02$).

Table 1. Processing Time Distribution in Months from Arrest to Conviction, by Groups

Number of Months between Arrest and Conviction	Number of Individuals by Group	
	Experimental	Control
0*	2	0
1	7	2
2	12	8
3	1	2
4	1	2
5	0	0
6	0	0
7	0	1

*Same month

This indicates that the presence of pictures of the crime being committed reduced the mean average processing time of cases resulting in conviction by 37 percent, or almost an entire month,

Cost of Investigation for an Arrest, Charge and Conviction:

To examine actual processing cost, a comparison of experimental and control cases on the cost of making an arrest, obtaining a charge and achieving a conviction was performed.

There are many different ways to estimate personnel costs for an activity within the criminal justice system. Typically, costs are estimated on the basis of how much time (and associated cost per unit of time) is spent performing the activity. However, this approach is accurate only if the total personnel time is productively spent (a situation that is rarely achieved in any work setting).

The approach used for this evaluation was to consider the robbery detectives as a resource whose sole purpose was the investigation of robbery cases. Using this approach, time engaged in any activity other than a "successful investigation" (defined as one resulting in a charge and conviction) is non-productive. This was felt to be appropriate because, if detectives did not perform this function, there would be no reasonable justification for their existence. Therefore, the cost/efficiency of the use of this resource will increase as either the number of successful investigations increases with the same resources, or the number of successful investigations remains the same with decreased resources.

Seattle's total 1976 robbery data are used as an example of the project cost-benefit analysis (see Table 2 below). The cost of the Robbery Unit within the Criminal Investigations Division (CID) was \$361,744.¹ During 1976, 2,163² robberies were

¹ 1977 Annual Budget, City of Seattle, p. 534; cost based on (number of robbery unit/number of CID) detectives x CID total budget, or (12/95) x (\$2,863,813).

² Seattle Police Department Crime Capsule: January through December, 1976, Seattle Police Department, dated January 11, 1977.

reported to the Seattle Police Department. Given the assumption that all cases were investigated and that the Robbery Unit exists only to investigate robberies, the department spent \$167.24 on the investigation of each case (Robbery Unit budget/number of robbery reports, or 361,744/2,163). The mean average cost to each victim is conservatively estimated at \$250.32, or the average value taken from all reported robberies.³ This includes person robberies, which may be assumed to involve lower dollar loss than commercial robberies.

Table 2. Cost of Robbery Arrests, Charges and Convictions to Seattle Police Department Investigative Units and Victims; 1976

	Costs			
	Number of Reports Required to Produce One Item	Police Department Cost per Item*	Victim Loss**	Total SPD and Victim Cost per Item
Robbery report	1.00	\$ 167.24	\$ 250.32	\$ 417.56
Adult arrest	7.05	1,178.32	1,764.76	2,943.08
Adult charge	11.27	1,884.08	2,821.11	4,705.19
Adult conviction	14.42	2,411.63	3,609.61	6,021.24

* Figured by dividing total Robbery Unit cost by total items

** Average loss of *all* robberies times the number of reports required to produce one item

Using the same sort of (total resource cost/number of activities) analyses, but using robbery arrests, instead of robbery reports as the activity, during 1976, 307⁴ adult⁵ arrests occurred at a cost of \$1,178.32 (Robbery Unit budget/number of

³ Ibid.

⁴ Seattle Police Statistical Report: 1976, "Adult Suspicion Bookings," Seattle Police Department, p. 49.

⁵ Only adult robbery arrests, charges and convictions are dealt with because of the small number of juveniles involved and the fact that juvenile cases are handled by a different division of the Seattle Police Department.

adult arrests, or 361,744/307). On the average, 7.05 reports, involving victim loss of \$1,764.76 (average loss times number of reports), occurred for each arrest.

In 1976, 192 adults were charged⁶ at a cost of \$1,884.08 per charge (total Robbery Unit budget/number of charges). For each charge of robbery entered by the prosecutor's office, there were 11.27 reports, with total victim loss of \$2,821.11 reported. In 1976, 78 percent of known court dispositions for robbery involved a finding or plea of guilt on the initial or lesser charges. The cost of the estimated 150 convictions (78 percent of 192) was \$2,411.63 each to the department and \$3,609.61 to victims. When both investigation costs and victim loss are added for each item, the cost for each robbery reported to police was \$418; an adult arrest cost \$2,943, an adult charge cost \$4,705 and a conviction cost \$6,021*. It should be noted that the investigative costs are not additive. Each cost estimate for the activities (report, arrest, charge and conviction) includes within itself the cost for the other activities (e.g., the \$167.24 report cost includes the cost of any subsequent arrest, charge and conviction cost to the Criminal Investigations Division).

Using the same procedure but restricting the analysis to experimental and control site robberies and using report, arrest, charge and conviction figures for these sites, the analysis was repeated.

Using 1976 police department cost for a robbery report (from Table 2,⁸ \$167.24) and a different estimate of victim loss (\$324.72⁹) as a starting point, relative police and victim costs

⁶ Seattle Police Department, loc. cit.

⁷ Seattle Police Statistical Report: 1976, "Persons Charged 1976," p. 45. Only 160 case dispositions were available to the SPD statistical section. Of those known dispositions, 113 were guilty as charged, 12 guilty of lesser charges and 35 were acquitted or otherwise dismissed.

⁹ Seattle Police Department, op.cit. Estimated victim loss was derived from armed robberies only (1,126 with a loss of \$365,639) because it was felt to be more comparable with the commercial robberies under study.

were computed for control and experimental sites (see Table 3). Within the two groups of robberies which occurred in experimental and control sites, both the amount of victim loss and police cost generated by the number of cases investigated to produce an arrest, charge or conviction in experimental site robberies were substantially lower (\$870.78, \$870-78 and \$1,023.28, respectively—control total cost minus experimental total cost).

Table 3. Costs of Arrests, Charges and Convictions to Police and Victims, by Group

Item	Group							
	Experimental				Control			
	Reports Needed per Item (a)	Police Cost* (b)	Victim Loss** (c)	Total Cost (d)	Reports Needed per Item (a)	Police Cost (b)	Victim Loss** (c)	Total Cost (d)
Arrest	1.52	254.20	493.58	747.78	3.29	550.22	1,068.34	1,618.56
Charge	1.52	254.20	493.58	747.78	3.29	550.22	1,068.34	1,618.56
Conviction	1.65	275.95	535.79	811.74	3.73	623.81	1,211.22	1,835.02

* Based on 1976 figures for robbery reports (\$167.24) times column (a)

** Based on average armed robbery loss in Seattle during 1976 (\$324.72) times column (a)

These figures indicate that much more productive use of investigation resources occurs when pictures of the robbery occurrence are available. However, the cost of obtaining those pictures must be included prior to making any final conclusions regarding cost effectiveness of the project.

Cost of Photographs: To determine the cost of obtaining the photographs in the experimental site robberies, project personnel costs, supplies and operating expenses, and initial equipment and eventual replacement costs were computed and then prorated for the time period for which data were available. All figures were computed conservatively so that all estimating errors should result in over-stating the cost of obtaining pictures of robberies-in-progress.

The procedure resulted in a maximum estimated cost of \$1,228*41 per robbery- This was obtained by taking the annual project cost, \$56,015.39 (see Table 4 for cost deviation) and multiplying this cost by 10/12, or the number of months the project was operational at the time of data collection. For this period of time, project prorated cost was \$46,679.40. This cost was, in turn, divided by the number of robberies occurring within experimental sites (38), resulting in a cost of having a hidden camera on-site to photograph a robbery-in-progress of \$1,228.41.

If one assumes that the most appropriate project objective is the conviction of offenders, the cost/benefit analysis of achieving convictions is \$2,040.15 (cost of obtaining robbery photographs, plus the cost of investigation to achieve a conviction—from Table 3, Experimental Group, column [d]). Within a comparable group of stores {differing only on the basis of random assignment to either control—no camera or experimental—hidden camera status}, the cost of achieving a conviction was \$1,835.02 (from Table 3, Control Group, column [d]).

The cost difference for achieving a conviction was, at most, 11 percent higher in the hidden camera sites than in control sites. It should be remembered, however, that 23 of 48 (48 percent) robbery offenders within the 38 experimental site robberies were convicted while only 15 of 78 (19 percent) of robbery offenders within the control site robberies were convicted. In addition, an excluded factor in the cost analysis is that experimental site defendants required an average of a month less incarceration prior to conviction.

A further factor not taken into account in the above analysis is that five convicted offenders (involved in three cases) in the control group were initially identified through pictures taken at hidden camera sites. If these control cases were deleted from Table 3 and the police cost recomputed for 53 cases (total control robberies [56] minus three cases in which five suspects were identified by project photographs) in which 10 convictions were obtained (15 total control convictions minus five in which suspects were identified through experimental-site photographs), the rate of the number of reported

cases to achieve a conviction becomes 5.30 rather than 3.73. Using the same police investigation and victim loss figures as before (\$167.24 and \$324.72), the cost to achieve a conviction is \$2,607.89. This cost figure would indicate that project conviction cost (\$2,040.15) was 22 percent lower than comparable control conviction costs.

Table 4. Cost Estimates for Obtaining Photographs of Robberies

Item		Annual Cost
Personnel		
Detective*	\$29,782.87	
Technician**	<u>11,414.00</u>	
Total Personnel cost, 12 months	\$41,196.87	\$41,196.87(74%)
Supplies and Operating Expenses**		
(18 months)	\$ 9,886.00	\$ 6,590.67 (12%)
Equipment		
Initial purchase**	\$28,700.00	
Replacement cost (estimated ten-year life; 7 percent compounded annual inflation)	<u>56,457.24</u>	
Subtotal ten-year cost	\$85,157.24	
Salvage value of initial equipment: 10 percent	<u>2,870.00</u>	
Total ten-year Equipment cost	\$82,287.24	<u>\$ 8,228.72(14%)</u>
		<u>\$56,015.39</u>

* Estimated by dividing total 1977 CILj budget by total number of detectives (\$2,829,373/95 detectives). Project director's salary was paid by the Seattle Police Department.

** Taken from grant application.

EXEMPLARY PROJECTS REVIEW BOARD

Members of the Exemplary Projects Review Board in August 1978, when the Seattle Hidden Cameras Project was selected were the following:

State Officials

John Parton, Executive Director
Office of Criminal Justice Programs
Columbia, South Carolina

Paul Quinn, Director
Division of Criminal Justice
Department of Local Affairs
Denver, Colorado

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Mary Ann Beck, Director
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