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**A COORDINATED RESPONSE
TO MOTOR VEHICLE THEFTS:
Evaluation of Enforcement
and Crime Prevention Efforts**

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**ASSOCIATION OF
GOVERNMENTS**

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ABSTRACT

In response to dramatic increases in vehicle thefts, local, state, and federal agencies formed the San Diego Regional Auto Theft Task Force (RATT). The task force is a proactive approach to the investigation, apprehension, and prosecution of motor vehicle theft suspects, particularly those involved in major countywide vehicle theft operations. RATT is funded through a \$1 assessment on state vehicle registration, authorized by State Senate Bill 2139. Sixteen federal, state, and local law enforcement agencies participate in RATT.

The National Institute of Justice (NIJ) authorized funding to the San Diego Association of Governments (SANDAG) to evaluate the effectiveness of enhanced crime analysis information about motor vehicle thefts to target enforcement and crime prevention efforts. The evaluation involves collecting motor vehicle theft data to identify information needed by investigators and to analyze crime patterns associated with major vehicle theft rings. A crime analysis and mapping system (CAMS) is being developed and implemented in collaboration with the San Diego Police Department Crime Analysis section. In addition, the assessment entails providing crime analysis information to detectives and identifying target and control areas for enforcement and crime prevention. The evaluation includes a descriptive analysis of RATT operations before and after the implementation of CAMS, analysis of baseline and post-test data, and interviews with RATT detectives.

This paper presents an overview of motor vehicle theft in San Diego County. Also presented are results from interviews conducted with RATT staff, the process of the creation of CAMS, and identification and implementation of strategies in target and control areas chosen throughout the county of San Diego.

INTRODUCTION

Over the past decade, San Diego County experienced dramatic increases in motor vehicle thefts (107%), with decreases occurring in recent years. The area still has a relatively high rate of motor vehicle thefts, with 9 vehicles stolen for every 1,000 residents during the first six months of 1995, or one of every 72 registered vehicles. These crimes represent a significant loss to individuals and insurance companies. During the first six months of 1995, the value of vehicles stolen in San Diego exceeded \$75 million, representing 58% of the value of all stolen property. Only 8% of reported motor vehicle thefts were solved through arrest or identification of a suspect in the same time period (Pennell, et al., 1995).

This grant, funded by the National Institute of Justice (NIJ), examines the effectiveness of the use of enhanced crime analysis and mapping capabilities to target law enforcement and crime prevention efforts to reduce motor vehicle thefts and increase the apprehension and prosecution of offenders. The research represents a collaborative effort between agencies participating in the San Diego Regional Auto Theft Task Force (RATT), local business groups, such as the New Car Dealers Association, and the San Diego Association of Governments (SANDAG) Criminal Justice Research Division.

ORGANIZATION OF THE REGIONAL AUTO THEFT TASK FORCE

The San Diego Regional Auto Theft Task Force (RATT) was formed in response to the increasing trend in vehicle thefts. The task force is a proactive approach to the investigation, apprehension, and prosecution of motor vehicle theft suspects, particularly those involved in major countywide vehicle theft operations. The State of California has established a unique method for funding local programs to address the problem of vehicle theft. RATT is funded through a \$1 assessment on vehicle registrations, authorized under State Senate Bill 2139. The task force, in operation since July 1992, was the first formed under Senate Bill 2139. Approximately \$1.8 million are collected annually by the State Department of Motor Vehicles from San Diego County vehicle registrations, which pays for the salaries of one coordinator, 19 investigators, four supervisors, three deputy district attorneys, and five support staff. The funds are administered by the County District Attorney's office. In addition, five FBI agents and one agent from the National Insurance Crime Bureau are assigned to the task force, for a total of 29 investigators. FBI informant and undercover money is also available to the task force, as is \$300,000 from the Safe Streets Act, to be used for overtime and equipment.

Sixteen federal, state, and local law enforcement agencies participate in RATT. The task force is operated under a Memorandum of Understanding, with an Executive Committee consisting of police chiefs from four local agencies (Chula Vista, El Cajon, Oceanside, San Diego), the Sheriff, the Chief of the California Highway Patrol Border Division, the District Attorney, the FBI Special Agent in Charge, and a member of the County Board of Supervisors. The Investigative Operations Committee (IOC) consists of representatives of these same agencies responsible for the on-going management and operation of the task force. The task force represents an extension of the traditional task force approach, by

including not only a variety of federal, state, and local law enforcement agencies, but also the private sector.

RATT investigators employ a number of different enforcement strategies, including use of informants, surveillance, search warrants, arrest warrants, sting operations using covert warehouses as chop shops, and video-taped buy-busts. The deputy district attorneys assigned to RATT provide vertical prosecution for all arrests. Since RATT was implemented (July 1, 1992 through September 30, 1995), investigators have initiated 1,449 investigations and recovered 1,165 vehicles valued at \$11.6 million. In addition, 428 suspects have been apprehended, with 300 complaints filed with the court, and 234 convictions to date (Regional Auto Theft Task Force Quarterly Report, October 1, 1995). Recent investigations conducted by RATT suggest that many of the vehicle theft rings are involved in other serious offenses, including drug-related crimes and weapons offenses.

SIGNIFICANCE OF THE RESEARCH

The task force utilizes the resources of the member agencies, as well as businesses and other groups, to assist with investigations of major motor vehicle theft operations. Until very recently, regional information on motor vehicle thefts available to investigators has been limited. RATT investigators relied on information provided by individual agencies regarding vehicle theft activity in their jurisdictions. The Automated Regional Justice Information System (ARJIS) provides countywide information on vehicle thefts reported, but it does not provide sufficient statistical information to identify crime trends throughout the county. Also, ARJIS does not have the capability of mapping locations of crimes to highlight crime patterns. Investigators could not obtain *complete* information on the make and model of vehicles stolen throughout the county, the location of recovered vehicles, and the condition of the vehicle when it is recovered. Most of the needed information contained within local, County, and State computer systems was not available in a single geographic data base allowing regional analysis of trends in vehicles stolen and recovered through statistical reports and maps of incident location. This information is needed to assist investigators in targeting their efforts and educating the public in ways to prevent motor vehicle thefts. The law enforcement agencies involved in RATT recognize that enforcement efforts are only one component in a coordinated effort to reduce motor vehicle thefts in the county. The role that citizens and businesses can play in preventing motor vehicle thefts may have a greater impact on the number of these crimes than the law enforcement response.

Little research has been conducted on motor vehicle theft investigations, in particular the use of traditional undercover techniques and a problem-oriented approach to motor vehicle theft. Most of the research related to these crimes has focused on violence associated with carjackings (BJA, 1994; NIJ, 1994). For example, NIJ funded a project conducted by the University of Maryland to measure the incidence and police response to carjackings. As discussed previously, the major vehicle theft rings targeted by RATT pose a significant problem for law enforcement, citizens, and businesses. Of particular concern is the involvement of some offenders in drug- and weapons-related offenses. For these reasons, more effective responses to motor vehicle theft need to be developed and tested.

SANDAG is evaluating new technologies, such as geographic analysis and expert systems, for law enforcement to enhance crime analysis and identification of major offenders. The research also provides valuable information to law enforcement agencies throughout the country by identifying improved methods for responding to motor vehicle theft to reduce the number of incidents. The task force concept may prove to be an effective way to coordinate and use limited resources. Finally, the description of the RATT program and the enhanced crime analysis capabilities will be useful to law enforcement agencies.

RESEARCH GOALS AND OBJECTIVES

Goal: The primary goal of the research is to test the effectiveness of using enhanced crime analysis information for targeting investigations initiated by the Regional Auto Theft Task Force and focusing public education and prevention efforts to reduce motor vehicle thefts. This is being accomplished through the following research objectives.

1. Develop an automated geographic-based information system which contains detailed data on motor vehicle thefts, salvaged cars, tow companies, salvage yards, and other related data to be used to analyze crime problems and target investigations and public education campaigns.
2. Determine the factors associated with successful investigations and prosecutions in vehicle theft cases investigated by RATT.
3. Develop a computer model to analyze the characteristics of reported vehicle thefts and crime patterns to assist in targeting task force efforts.
4. Assess the characteristics of areas where vehicles are stolen and recovered, including land use patterns, sociodemographic characteristics, and commercial development.
5. Evaluate the effectiveness of using enhanced crime analysis information and computer modeling techniques to target task force enforcement efforts in specific areas in terms of reported incidents, arrests, prosecutions, and vehicles recovered in these areas.
6. Test the effectiveness of public education and prevention programs to reduce motor vehicle thefts, based on information developed using crime analysis information for specific areas of the county.
7. Identify factors that impede or enhance the effectiveness of enforcement strategies.
8. Provide recommendations regarding effective strategies to reduce motor vehicle thefts through a coordinated approach to public education, prevention, and law enforcement to assist other jurisdictions in implementing programs to successfully address vehicle thefts.

This paper reports the current status on objectives one and three. Additionally, the following questions will be addressed in the proposed project.

- What are the characteristics of vehicle theft rings in San Diego, and how are the stolen vehicles and/or parts used/transported/distributed?
- What types of vehicles are targeted by vehicle theft rings and what is the modus operandi of suspects?
- What is the extent of violence involved in motor vehicle theft incidents in general, and in thefts associated with vehicle theft rings?
- What is the relationship between the locations of vehicle thefts and recoveries?
- To what extent are stolen vehicles exported to other countries (e.g., Mexico)?
- How do investigators identify motor vehicle thefts that warrant investigation by the task force?
- Are the characteristics of motor vehicle theft cases investigated through RATT different than other cases reported throughout the county?
- What investigative techniques are effective in apprehending and prosecuting suspects involved in major vehicle theft operations?
- What is the impact of enhanced crime analysis information and computer modeling on targeting decisions?
- What are the most effective ways to educate the public to reduce the risk of motor vehicle theft?

RESEARCH DESIGN

The research follows the steps associated with a problem-oriented approach to policing: identification of the problem, data analysis, identification and implementation of a response, and evaluation of the effectiveness of the law enforcement and crime prevention strategies employed. A pretest/posttest quasi-experimental design will be used to assess the impact of these strategies on case outcomes (arrests, prosecutions, and convictions) as well as reported crimes in areas targeted. The methods for collecting data and tasks for this project include:

- observation of task force activities;
- pretest and posttest interviews with task force members;

- collection of baseline data on motor vehicle thefts to identify the scope of the problem and crime patterns;
- design and implementation of a crime analysis and mapping system (CAMS);
- identification of law enforcement targets;
- development and implementation of enforcement and crime prevention strategies; and
- collection of pre- and posttest data for target and control areas.

The research is a collaboration between the San Diego Police Department, which will provide crime analysis capabilities, and San Diego Association of Governments staff who will develop the CAMS software and conduct the evaluation of the law enforcement and crime prevention efforts.

Identification of the Problem

The first phase of the research identified current operations, information needs, strategies employed, and results and outcomes of investigations conducted by RATT. These data were used in the development of the crime analysis and mapping system. The information was also used to identify successful strategies implemented by RATT investigators. SANDAG research staff observed the activities of task force investigators over a two-month period to determine the types of investigative strategies employed and types of information needed. SANDAG research assistants used a set format for recording observations. Of particular interest were current methods used for identifying investigation targets, data available to investigators, strategies employed for specific types of cases, and the means of evaluating the success of an operation. More structured interviews were also conducted with all task force members (21) to identify strategies employed, effective approaches, coordination among agencies, resources and information needed, factors that enhance or impede investigations in a regional approach to motor vehicle theft, and suggestions for public education efforts. At the time the interviews were being conducted several positions were either in transition, being filled for the first time, or were filled with officers in a training capacity. Therefore, only 21 RATT members could be interviewed.

Sixty-two percent (62%) of those interviewed were RATT investigators, 19% were law enforcement sergeants, and 19% were Federal Bureau of Investigation (FBI) agents. Representatives from six local law enforcement agencies, the FBI, the California Highway Patrol, the District Attorney's office, the Sheriff's department, and the National Insurance Crime Bureau were interviewed. Sixty-seven percent (67%) of those interviewed said that the number one goal of RATT is to decrease auto theft. When asked how RATT investigations differ from a single detective working on an investigation of a motor vehicle theft, respondents said that RATT is more proactive, has no jurisdictional boundaries, has more resources, and has smaller caseloads. The respondents were asked to rank the items that make a multi-agency task force approach to enforcement and crime prevention efforts in

response to motor vehicle thefts more effective than traditional law enforcement. Twenty-nine percent (29% or six) stated that the ability to work together as a team is the most effective element of a task force; 29% ranked the opportunity to be more effective in arrest, prosecution, and convictions as the second most effective element; and 38% said that being more proactive would be their third highest reason for why a multi-agency task force is more effective.

During the same time period, researchers began compiling data on a randomly selected sample of 1,000 motor vehicle thefts reported in San Diego county during FY 1993-94 and assessing the characteristics and outcomes of cases. The sample was selected from a computer data file provided through the ARJIS system. Data were also collected on all RATT investigations during the same time period. This portion of the study provides information on motor vehicle theft cases in general, and documents the activities and results of RATT investigations during a one-year period, including number of investigations initiated, types of information available to investigators, enforcement strategies employed, arrests, prosecutions, case dispositions, vehicle recoveries, and public education and crime prevention efforts. A profile of the suspects/targets in vehicle theft cases will be developed, including sociodemographic characteristics of suspects, types of businesses targeted, and characteristics and location of the vehicle theft crimes.

The final analysis will include the use of bivariate and multivariate statistical techniques. Logit analysis will be used to evaluate the factors associated with successful outcomes of cases, to determine strategies that result in arrest, prosecution, and conviction. Logit analysis is well suited for dichotomous outcome variables and categorical independent variables that will be available from the baseline data. Characteristics of the cases/suspects and the strategies employed, such as surveillance, search warrants, and undercover buys, will be used as independent variables in the logit model to determine their effect on the odds ratio of arrest, prosecution, and conviction. A typology of motor vehicle thefts will be constructed based on similar characteristics of cases.

Database Development

SANDAG staff, with the assistance of San Diego Police Department (SDPD) crime analysts, have been designing a database and mapping system for use by investigators and researchers which contains complete regional data on motor vehicle thefts reported, tow companies, salvage yards, and salvaged vehicles. CAMS represents an extension of the concept of geographic analysis of crime data, through the integration of a variety of databases available to local law enforcement and SANDAG. The data elements for the operational component of CAMS are presented in Table 1. To the extent possible, data are being compiled from existing databases. This baseline information has been useful in identifying crime patterns associated with major vehicle theft operations and variables to be included in the Crime Analysis and Mapping System (CAMS) database. The information compiled was then used to identify potential targets for investigation by RATT, using the CAMS database and cluster analysis. The CAMS system is located on-site at the RATT office and is currently being tested by RATT staff. It should be fully operational in December 1995.

Existing technology in local agencies has been used for the geographic-based system to ensure compatibility of data and development of a system that is consistent with future automation plans within the county. In particular, a crime mapping system developed jointly by SANDAG and SDPD, and currently used for crime and drug-market analysis, is being expanded to include more extensive data on motor vehicle thefts and related information. The current system uses ESRI ARCINFO software on a UNIX workstation. The system will be transferred from the UNIX workstation to a personal computer, and will use the PC-based software recently developed by ESRI (ArcView 2). Use of personal computers will ensure that a portable system is developed that could be used by other law enforcement jurisdictions. ArcView 2 is an easy-to-use desktop mapping and geographic information system that can access existing data from multiple external source files (e.g., database managers, spreadsheets, ASCII files) and across networks from different systems.

Table 1
CRIME ANALYSIS AND MAPPING SYSTEM (CAMS)
Incidents Involving Stolen Vehicles*
Data Elements

Data Available from ARJIS Crime Analysis Statistical System (CASS)

- Agency
- Incident number
- Type of vehicle stolen (auto, truck/bus, other)
- Vehicle make
- Vehicle model
- License plate
- Color
- City
- Name of victim(s)/suspect(s)
- Location of incident (address, xy coordinates)
- Beat
- Date of occurrence
- Time of occurrence
- Case status (cleared by arrest or exception, open)
- \$ value when stolen
- Recovery status (recovered/not recovered)
- \$ value when recovered
- Recovery agency

Data Available from Other Sources for Data Entry

- Vehicle Identification Number (VIN) - CLETS**
- Status/condition of vehicle at recovery - CLETS**
- Location of recovery - reporting agency
- Salvage yard locations - phone directory
- Tow companies - phone directory
- Other related businesses - phone directory
- Type of cargo stolen - crime report

SANDAG Data to be Incorporated in System

- Geographic file
- Population
- Travel time
- Land-use file

Software to Interface with CAMS System

- Database manager

* Includes automobiles, trucks, buses, tractor/trailers, etc.

** California Law Enforcement Telecommunications System - State Department of Justice

CAMS is connected to the City of San Diego Wide Area Network (WAN), with access to the IBM RS6000 system, which contains the Regional Urban Information System geographical database developed by the City and County of San Diego, and the ARJIS system used by local law enforcement agencies. ARJIS contains officer-generated reports on crime incidents, arrests, citations, field interviews, stolen property, and traffic accidents. The ARJIS Crime Analysis Statistical System (CASS) is a tool for preparing standard and ad hoc reports to support crime analysis efforts for individual agencies. CASS is the source of the data downloaded to CAMS. After CAMS has been implemented, posttest interviews will be conducted with RATT detectives to assess the value of the data being provided through CAMS and the need for system enhancements. To the extent possible, enhancements will be implemented to CAMS prior to the end of the test period to allow an assessment of their effectiveness.

The CAMS system uses Dbase as the database manager which allows analysis of data in tabular format in addition to mapping of incidents on the micro-computer. Also, the project crime analyst has access to the ARJIS system and its CASS system, which can be programmed to provide more complex analyses of crime patterns, using SAS software. SANDAG analysts have been developing SAS programs to analyze crime patterns and develop an expert system to identify potential vehicle theft rings for investigators, based on trends and patterns identified in the analysis of the baseline data. For example, the cluster analysis of baseline data showed a high concentration of motor vehicle thefts in certain areas of the San Diego region (Figure 1). These clusters were presented to the Advisory Committee for the project. Discussions with the Advisory Committee resulted in the need to analyze the data for stripped vehicles in order to highlight areas with potential chop shop activity (Figure 2). Strategies to address these problems are now under development. Due to limitations in the database, the number of vehicles stolen and recovered could not be analyzed separately by make and model. Methods to reduce the large proportion of unknown vehicle makes and models are currently under investigation. In this manner, CAMS is supporting RATT operations and assisting in targeting enforcement and crime prevention efforts. As the evaluation progresses, the geographic analysis of information will expand beyond identification of clusters of events and relative density, to displacement of crimes as a result of law enforcement operations. In addition, the CAMS system will allow analyses of the relationship of motor vehicle thefts to other types of data, such as land use patterns and locations of tow companies and salvage yards.

FIGURE 1

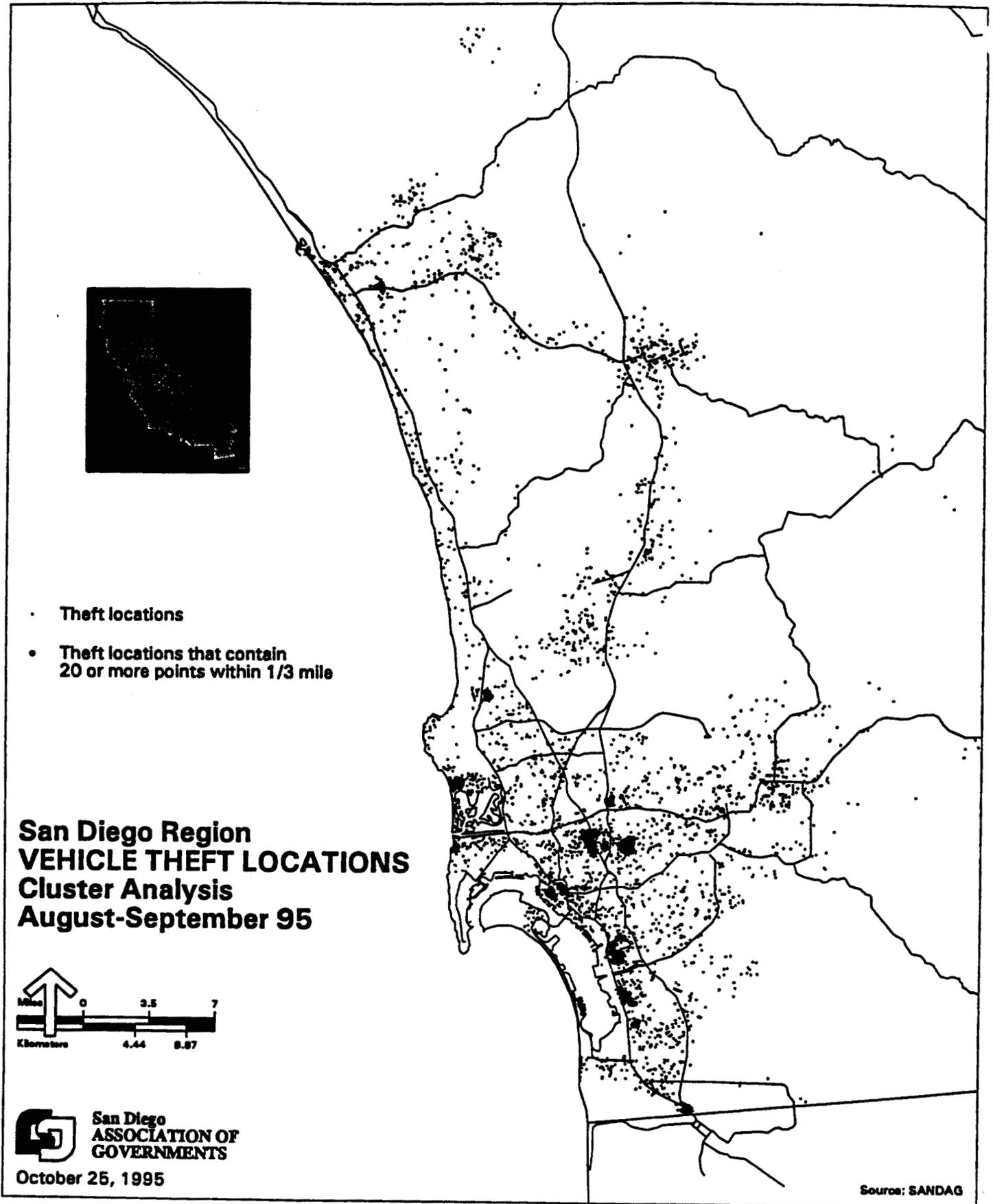
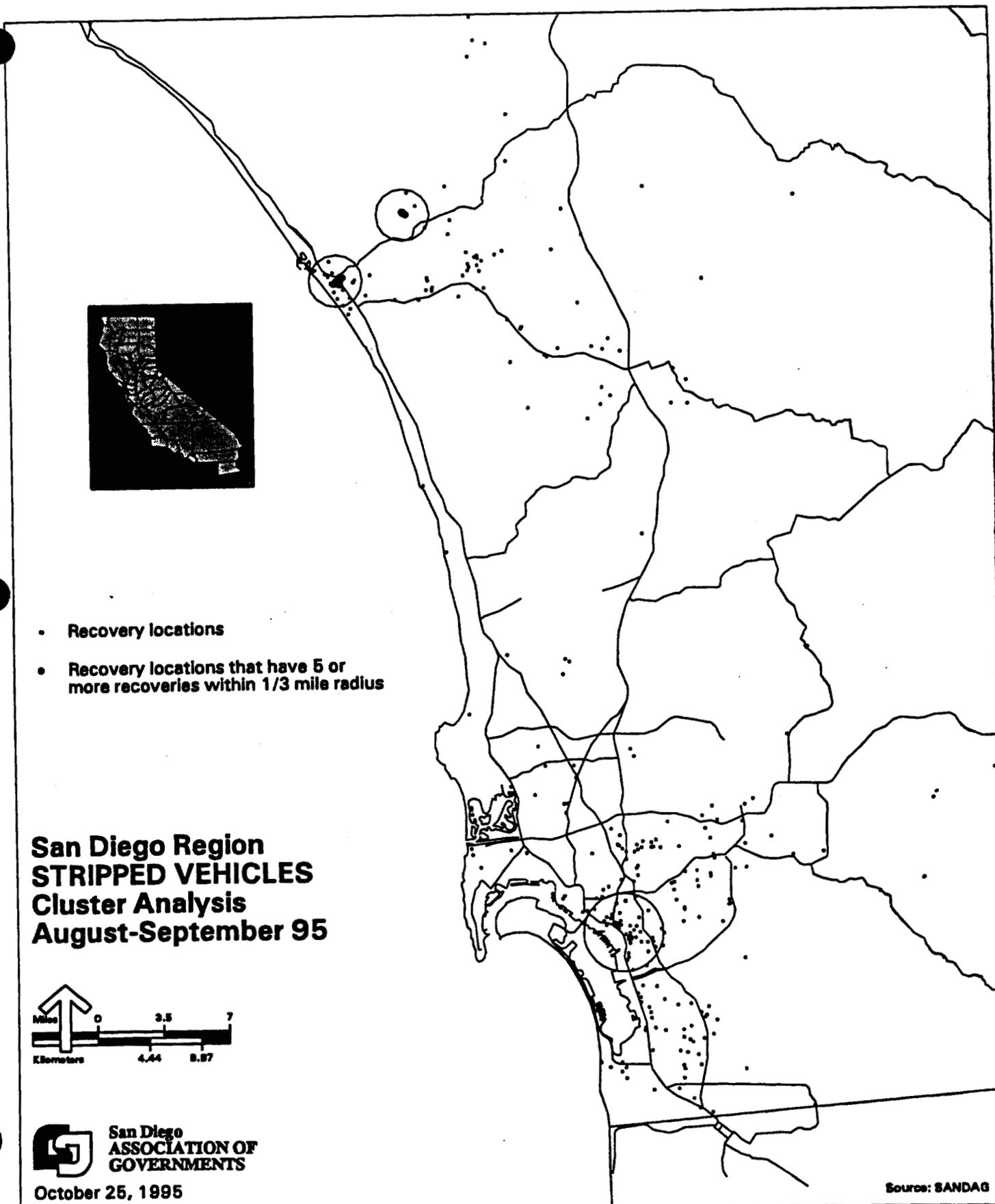


FIGURE 2



Identification and Implementation of Strategies

SANDAG and SDPD Crime Analysis staff will assist RATT in developing law enforcement, education, and prevention programs targeted at motor vehicle thefts through a coordinated effort by law enforcement, local businesses and associations, and the media. Crime analysis data has been utilized to identify areas, specific types of crimes or stolen vehicles, and groups to target. A crime analyst is on-site at the RATT office to provide information and assistance to investigators. A number of analysis techniques, technologies, and databases are being employed, including:

- analyzing characteristics of vehicles stolen (e.g., make, model, year)
- mapping of the location of stolen and recovered vehicles
- examining the distance (miles) between location of theft and recovery
- evaluating land use patterns in areas where vehicles are stolen
- using an expert system developed to assess crime patterns and identify factors associated with major auto theft rings.

Researchers, crime analysts, and representatives from RATT are identifying comparable target and control areas for implementation of specific strategies, using a random assignment methodology. Implementation is scheduled for November, 1995. The responses in targeted areas will vary, with target areas receiving enforcement, crime prevention, or a combined response. Strategies are being developed to address the specific targets, and include a wide range of undercover enforcement and crime prevention techniques.

As mentioned previously, structured interviews were conducted with all task force members (21) to document current operations, identify strategies employed, identify the most effective approaches to combating auto theft, describe coordination among agencies, isolate resources and information needed, determine factors that enhance or impede investigations in a regional approach to motor vehicle theft, and provide suggestions for public education efforts. Data collected from these interviews have been useful in the identification of strategies to be implemented in the target areas. As shown in Table 2, RATT utilizes a variety of techniques in combating auto theft. The most frequently used strategies include the data analysis (100%), surveillance (86%), business investigations (77%), and the use of informants (77%).

The approaches to reduce auto theft identified by RATT members are increasing punishment for the offenders (91%) and educating the citizenry (86%) (Table 3). Specific methods for effective implementation of public education efforts include increasing media coverage (86%) and holding community meetings (82%) (Table 4). These methods are under consideration for implementation in the target areas.

Table 2
ACTIVITIES CONDUCTED AT LEAST ONCE A MONTH
RATT Staff Interview, 1995

Searching various data bases	100%
Surveillance	86%
Business investigations	77%
Utilizing informants	77%
Responding to out-of-county requests	55%
Use of body wires	55%
Serving search warrants	45%
Fourth waiver searches	41%
Conducting controlled buys	36%
Serving arrest warrants	36%
Informing and educating residents	32%
Wiretaps	5%
Searching financial records	5%
TOTAL INTERVIEWED	21

Table 3
BEST APPROACH FOR AUTO THEFT REDUCTION
RATT Staff Interview, 1995

Stiffer penalties for offenders	91%
Citizen awareness/education	86%
Stolen vehicle recovery tracking	77%
More availability of computer data	68%
More visible patrol	45%
High recovery rate publicized	41%
TOTAL INTERVIEWED	21

Table 4
EFFECTIVE WAYS TO EDUCATE THE PUBLIC
ON AUTO THEFT REDUCTION
RATT Staff Interviews, 1995

Auto theft statistics in the newspaper or by the media	86%
Neighborhood/community meetings of high theft areas	82%
Crime prevention seminars	68%
Crime prevention handouts/brochures given out with auto registration	68%
TOTAL INTERVIEWED	21

The implementation of responses in target and control areas and testing will occur over a three-month period. Feedback will be provided to officers regarding the effects of strategies employed.

Evaluation

At the end of the three-month implementation period, data for the experimental or target areas and the control areas will be aggregated and compared using difference of proportion and difference of mean tests. The measures include: clearance rates of reported vehicle thefts; proportion of stolen vehicles recovered; proportion of arrests resulting in prosecution and conviction; change in number of motor vehicle thefts reported, and rate of motor vehicle thefts reported per 1,000 residents in the target and control areas. The effectiveness of the task force enforcement and crime prevention efforts in targeted areas will also be measured by a pre- and post-test comparison of apprehensions of suspects, prosecutions, convictions, and number and rate of motor vehicle thefts in the target and control areas. Using crime mapping technology, the effects of the response on other areas will be evaluated as well to determine if crimes are actually being reduced, or displaced to other areas. Data will be analyzed using the CAMS system and SANDAG's in-house computer systems, using SPSS/PC and SAS software.

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