ABSTRACT

GOALS AND OBJECTIVES

This research is a collaborative effort between Development Services Group, Inc. (DSG), and the California Department of Corrections and Rehabilitation (CDCR) to conduct a process and outcome evaluation of CDCR's Global Positioning System (GPS) Monitoring Program for High-Risk Gang Offenders (HRGOs). Despite the increasing use of electronically based monitoring systems, little is known about their effectiveness in reducing recidivism and increasing offender compliance with supervision conditions. While gang researchers have spent decades examining gang programs, a review of the literature suggests that these programs have had little effect on the gang problem, and there is a dearth of quality evaluation research on gang suppression strategies. Virtually nothing is known about the use of electronically based monitoring systems for gang offenders. The study's purpose is to assess the impact, fidelity, and costs of the CDCR GPS program, including its effectiveness both as a strategy for reducing recidivism and as an investigative and prosecutorial tool.

RESEARCH DESIGN AND METHODOLOGY

The study proposes a nonequivalent group quasi-experimental design with multilevel modeling. The treatment group will include all HRGOs placed on the GPS monitoring technology in each of six specialized gang units in San Bernardino, Sacramento, Fresno, Riverside, the city of Los Angeles, and Los Angeles County from March 2006 (the program start date) through the study start date (est. October 2009). The comparison group will be constructed with data from CDCR tracking systems to create a pool of gang offender parolees from each of the six areas who have not been placed on the GPS monitoring technology. The study population is conservatively estimated to be 714 (357 treatment and 357 comparison parolees). A propensity score will be used to estimate the probability of assignment to the treatment group from several pretreatment characteristics selected a priori to present a broad spectrum of pretreatment risk factors. Five primary data sources will be used to measure variables, including 1) CDCR data management systems, 2) CDCR records, 3) GPS monitoring data, 4) CDCR staff interviews, and 5) CDCR cost information. This data will be collected through a variety of methods. The outcome measures will include recidivism, compliance, and effectiveness as an investigative and prosecutorial tool. It is hypothesized that the GPS technology will deter parolees from engaging in future criminal behavior because it increases the probability of detection, encourages parolees to be more compliant, serves law enforcement in investigating a reported crime, and supports prosecutors in building a case by providing stronger evidence. Survival analysis will be used to model all time-to-event data.

EXPECTED PRODUCTS

This research will produce a GPS program fidelity instrument, an interim report, a final report, several articles in both peer-reviewed academic and practitioner journals, and three versions of two linked datasets (CDCR Parolee Data and GPS Data).

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PROGRAM NARRATIVE

PART 1

Development Services Group, Inc. (DSG), is pleased to respond to the National Institute of Justice's (NIJ's) *Recovery Act: Law Enforcement Technology Research and Development* solicitation an evaluation of the California Department of Corrections and Rehabilitation's (CDCR's) Global Positioning System (GPS) Monitoring Program for high-risk gang offenders (HRGOs). DSG brings numerous strengths to this effort: a successful working relationship with CDCR that puts DSG in the unique position of being able to bypass many of the bureaucratic impediments that can hamper evaluation projects; an outstanding track record of research and evaluation with respect to justice issues and evidence-based programs; in-depth experience with, and knowledge of, State criminal justice system operations; a proposed research team with extensive expertise in criminal justice technology issues and an intimate knowledge of CDCR data systems, gang research, and evaluation methodology; years of experience working closely with agencies and program staff in implementing evaluation protocols; and recognized experience in facilitating the collaboration needed to sustain such evaluation efforts.

1. PURPOSE, GOALS, AND OBJECTIVES

Purpose

The purpose of this study is to conduct an outcome and process evaluation to assess the effectiveness of the CDCR GPS Monitoring Program for HRGOs over a 4-year period. The California Department of Justice estimates that there are more than 420,000 gang members statewide. The Department reports that many of these persons are responsible for crimes including murder, witness intimidation, money laundering, extortion, narcotic production and sales, prostitution, human trafficking, assassinations for hire, theft, and counterfeiting. Moreover, despite an overall decrease in crime in most California cities since the 1990s, rates of gang-related violent crime remain steady (CDCR, 2007).

The impetus for this project occurred in July 2005 when CDCR began a pilot program in San Diego to test the use of GPS technology to monitor high-risk sex offenders on parole. The success of this pilot project prompted CDCR to expand the program across the entire State.* In response to the severe gang problem (addressed above), CDCR's Division of Adult Parole Operations in March 2006 entered into a partnership with the city of San Bernardino to implement a similar pilot project to track the movements of known gang members. The San Bernardino pilot program established a 20-unit specialized gang parole caseload that uses GPS technology as a supervision tool on active gang member parolees who have a history of violence and weapons possession and who are identified as a public safety risk to the city of San Bernardino.

In May 2007, Gov. Arnold Schwarzenegger proposed an antigang initiative—known as the California Gang Reduction, Intervention, and Prevention (CalGRIP) program—to provide more than $48 million in State and Federal funding for local antigang efforts, including job training, education, and intervention programs. CalGRIP expanded the CDCR 20-unit pilot program in San Bernardino to an 80-unit program by adding 20 units each in Sacramento, Fresno, and Los Angeles.† CalGRIP also established a new parolee designation: the "high-risk gang offender." Parolees designated as HRGOs are subject to the following restrictions:

- A special parole condition that limits their ability to recruit children into gangs and limits their access to known gang areas. Parolees are evaluated for HRGO status prior to release.
- A requirement that HRGOs must register with local law enforcement upon release.
- Enrollment in a statewide, multijurisdictional parolee database used by law enforcement.

The CDCR HRGO Monitoring Program is composed of two distinct components: intensive supervision, and the GPS technology. The intensive supervision component involves recurrent contact with HRGOs by parole agents (PAs). The PA meets face-to-face with the parolee on the 1st working day after release and informs the parolee that GPS monitoring technology is being added as a special condition of parole and that participation in the program is mandatory (refusal will result in immediate revocation of parole and return to prison). The PA

*NIJ provided the funding for the evaluation of this program to DSG under Grant No. 2007–IJ–CX–0048. The proposed Principal Investigator of this study is also the Principal Investigator of the high-risk sex offender study.
†The program was further expanded in 2008. The capacity was doubled to 160 units through the addition of 60 units in Riverside and

explains how the GPS unit functions, the parolee's responsibilities for caring for the unit, the conditions of compliance, and the consequences for noncompliance. The PA is also required to

- Meet face to face at the parolee's residence within 6 working days of release.
- Meet face to face with each parolee twice a month (four of the six quarterly contacts must occur at the offender's residence).
- Establish at least two collateral contacts per month (one of which may be with a clinical or a treatment provider) and one per quarter with an individual who has significant knowledge of the parolee.

The GPS monitoring component currently employs the tracking system of two different vendors. Satellite Tracking of People (STOP) LLC is the vendor used in San Bernardino, Riverside, the city of Los Angeles, and Los Angeles County. Pro Tech is the vendor used in Sacramento and Fresno. The hardware and software of each system are virtually identical. Each vendor uses an active monitoring system whereby the GPS unit takes a data point every minute and transmits the location data every 10 minutes. A notice is instantly transmitted during a strap tamper or zone violation (i.e., an immediate event). Weighing six ounces, the GPS unit is a single-piece device about the size of a computer mouse that is worn flush around the left ankle, secured by a black plastic band. It combines cellular and GPS technology to automatically report the wearer's exact location. Its internal memory can be remotely programmed with multiple inclusion and exclusion zones.

Each vendor's software employs a combination of data integration, geomapping, and GPS technology to monitor parolees. The GPS unit can track the precise location of parolees and link the data to the location and time of reported crime incidents, as well as electronically monitor individualized exclusion and inclusion zones for violations. Any intersection of a tracked parolee with a crime incident or a zone violation is known as a "hit" and is electronically sent to the appropriate police or corrections agency. Each vendor also tracks the information about parolee activities supplied by the GPS technology and transmits it to the supervising PA through the monitoring center. The PA typically receives the GPS information in two forms: daily notification (DN) and immediate notification (IN) alerts. For each parolee, a DN is emailed to the PA. The notification details all the activity recorded by the GPS unit, including charging activity, zone violations, strap tampers, and other

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20 units in Los Angeles County.

violations. The PA must review all recorded activity and note any actions that stem from the notification. The notification also includes a direct link to the Web-based STOP data system for review of "tracks" or movement patterns of any offender on any GPS caseload. The software plots the location and movement on an interactive Google map, allowing the PA to see the movements of a parolee and investigate any unusual or suspicious movement patterns. PAs are provided with laptops enabled with wireless Internet cards to allow access to VeriTracks from the field. A sample DN is included as Appendix H.

An IN alert is automatically generated by the monitoring center and transmitted to the supervising parole agent through a text message whenever the GPS unit records any of the following: low battery, strap tamper, 911 inclusion or exclusion zone violations, active exclusion zone violations, or a message gap exceeding 24 hours. On receipt of an IN alert, the supervising PA must analyze and respond to the information it provides. This investigation typically begins with transmission of a signal that forces the unit to beep or vibrate, indicating that the offender must either telephone or physically appear before the PA immediately. If these methods fail to resolve the problem and the event is regarded as a serious threat to public safety, the PA may contact local law enforcement to locate the offender.

PAs supervising an HRGO caseload (whether or not it includes GPS-monitored parolees) must be journeyman-level agents who have completed their apprenticeship. They also must complete two phases of GPS training. Phase 1 is 24 hours of training introducing the GPS technology and covering the application of GPS equipment and use of the GPS monitoring system. Phase 2 is 16 hours of training on the use and application of inclusion and exclusion zones.

Goals

Despite the increasing popularity of electronically based monitoring systems, little is known about their effectiveness in reducing the recidivism of gang members or their use as an investigative and prosecutorial tool. The overall purpose of this study is to conduct a quasi-experimental evaluation of the CDCR GPS monitoring program of HRGOs. The study goals are to assess the impact, fidelity, and costs of the GPS program. The next section discusses the goals and objectives in more detail.

Objectives

This project has set several highly specific objectives to measure the success of each goal. They are presented below, organized by goal.

1. *Assess the Program Adherence*

    - Identify the core components of the GPS program.
    - Quantify the degree to which core components of the GPS program are delivered as designed.
    - Quantify the degree to which the GPS program is delivered to the appropriate population.
    - Quantify the degree to which the program staff has the appropriate training.
    - Quantify the degree to which the prescribed protocols are followed.

2. *Assess the Program Exposure*

    - Verify the degree to which program participants receive the prescribed amount of program content (i.e., length of time on the GPS monitoring system).
    - Verify the degree to which parole agents make the prescribed number of supervision contacts.

3. *Assess the Quality of Program Delivery*

    - Substantiate the staff's attitude toward, and support for, the GPS program.
    - Verify the skill of program staff in using the techniques prescribed by the GPS program.

4. *Assess the Effectiveness of the GPS Technology in Reducing the Recidivism of HRGOs*

    - Compare the differences between GPS and comparison-group gang offenders in subsequent criminal behavior (including time to an arrest for any offense; time to an arrest for a violent offense, time to a subsequent conviction; and time to a subsequent return to prison), using between-group comparisons.

5. *Assess the Effectiveness of the GPS Technology in Procuring Compliance of HRGOs*

    - Compare the differences between GPS and comparison-group gang offenders in the number of parole violations, using between-group comparisons.

6. *Assess the Effectiveness of the GPS Technology as an Investigative Tool*

    - Compare the differences between GPS and comparison-group gang offenders who are arrested/charged for new offenses in terms of the speed of the investigation process (i.e., time from crime report to arrest and time from crime report to charging decision), using between-group comparisons.

7. *Assess the Effectiveness of the GPS Technology as a Prosecutorial Tool*

- Compare the differences between GPS and comparison-group gang offenders arrested for new offenses in terms of success of the prosecutorial process (i.e., conviction rate, plea bargaining, time from charge to resolution, and length of sentence), using between-group comparisons.

8. *Assess the Cost of the Program*

- Quantify the cost of monitoring HRGOs with the GPS technology.
- Quantify the cost of monitoring HRGOs without the GPS technology.

2. Review of the Relevant Literature

This evaluation study draws from two fields of research: a) research on gangs and b) research on the use of electronic monitoring. Brief reviews of both sets of literature follow.

Research on Gang Membership, Activity, and Programs

The peak age range for gang membership is roughly ages 14 to 15 (Huff, 1998). This finding is remarkably consistent across self-report studies, regardless of the risk level of the sample, the restrictiveness of the gang definition, and the study location (Klein and Maxson, 2006); the peak age range may be older in cities where gangs have existed longer (Curry and Decker, 1998). The typical range is ages 12 to 24. Although female gang membership may be increasing (Klein, 1995), virtually all studies agree that males join gangs at higher rates. In fact, the prevalence rates for males are 1½ to 2 times as high as those for females in most studies, a pattern that transcends different study approaches (Klein and Maxson, 2006). There is also a wide ethnic/race differential in gang membership; the prevalence rate for white youth is far lower than that of African Americans and Hispanics. This pattern is consistent regardless of the definition of *gang* and the nature of the sample approaches (Ibid.). According to a National Youth Gang Survey, between 2001 and 2004 the ethnicity of gang members was roughly 48 percent Hispanic, 36 percent African American, 9 percent white, and 7 percent Asian American. This ethnic composition (as reported by law enforcement) is virtually unchanged compared with the

1996–99 survey period (National Youth Gang Center, 2007). The disproportionate representation of minority groups in gangs is not a result of a predisposition toward gang membership; rather, minorities tend to be overrepresented in areas overwhelmed with gang activity (Bursik and Grasmick, 1993).

The most significant concern regarding gang membership is the nature of their criminal activity. The research demonstrates that while gang members commit a fair share of violent crime, gang members do not necessarily specialize in violence. Instead, gang members tend to be "generalist in nature, spanning the range of the cafeteria of delinquency choices" (Klein and Maxson, 2006; see also Thornberry et al., 2003). Gang members do, however, commit a disproportionate number of offenses compared with nongang members (Klein and Maxson, 2006; Thornberry et al., 2003; Miller, 2001). For instance, in a recent comparison of patterns of offending among gang and nongang youth in Dutch and U.S. youth samples, Esbensen and Weerman (2005) found that gang members are four to six times as likely as nongang youth to engage in minor and serious delinquency. Data from the Rochester Youth Development Study indicate that gang members are seven times as likely as nongang youth to commit delinquent offenses (Bjerregaard and Smith, 1993). This relationship is robust across a wide variety of definitions of *gang* and across different measurements of offending (Klein and Maxson, 2006); it also holds up when gang members are compared with other highly delinquent nongang youth (Thornberry, 1998; Huizinga, 1997).

Gang programs can generally be grouped into three broad categories: prevention, intervention, and suppression. In general, prevention strategies keep youth from joining gangs, while intervention strategies seek to reduce the criminal activities of gangs by pulling youth away from gangs. These strategies typically include community organization, early childhood programs, school-based interventions, and afterschool programs. Suppression programs use the full force of the law—generally through a combination of policing, prosecution, and incarceration—to deter the criminal activities of entire gangs, dissolve gangs, and remove individual gang members from gangs (Howell, 2000). Typical suppression programs include street sweeps, school-based law enforcement programs that use surveillance and buy–bust operations, civil procedures that use gang membership to define arrest for conspiracy, prosecution programs, and special gang probation and parole caseloads with high levels of surveillance and more stringent revocation rules for gang members (Klein, 2004).

The use of GPS technology to monitor HRGOs falls within the suppression category, given that the goal is to influence the behavior of gang members by dramatically increasing the certainty, severity, and swiftness of criminal justice sanctions (Braga and Kennedy, 2002). While suppression is universally considered to be the most fashionable response to gangs, it is also perceived to be the least effective (Decker, 2002). However, relatively few gang programs, regardless of strategy type, have been found to reduce the criminal behavior of gang members (Klein and Maxson, 2006; Howell, 1998; Spergel, 1995), and little serious evaluation research has concentrated specifically on gang suppression strategies (Klein, 1995). Moreover, one of the most successful gang programs noted in the literature is primarily a suppression strategy. The Tri-Agency Resource Gang Enforcement Team (TARGET) is a gang crime–intervention program in Orange County, Calif., intended to provide a strong criminal justice response to offenses committed by gang members. Similar to the GPS program, the goal of TARGET is to reduce gang crime by selectively incarcerating the most violent gang offenders. It accomplishes this goal by identifying repeat gang offenders based on their criminal record and monitoring them closely for new offenses. When a gang member is arrested, the offender is prosecuted by the district attorney assigned to the TARGET unit to obtain the lengthiest period of incarceration possible to deter future criminal offending. An evaluation of the program found that the placement of repeat gang offenders in custody appears to have had an effect on reducing gang crime (Kent et al., 2000). During the first year of the program (1992), gang crime decreased by 11 percent. The cumulative reduction in gang crime was 64 percent through 1993, 59 percent through 1994, and 47 percent through 1997.

Despite these encouraging findings, suppression programs are still perceived to be less effective than some other strategies designed to reduce the criminal behavior of gang members. Given this discrepancy and many other unanswered questions regarding the effectiveness of gang programs, there is still a critical need for high-quality evaluation research on gang programs (Decker, 2002). This research would help fill that need.

Research on the Use of Electronic Monitoring Technology

Electronic monitoring (EM) technology has become an increasingly common tool used by community supervision agencies in client monitoring. EM's increased popularity has coincided with the dramatic evolution of GPS technology in the last 10 years. First developed by the U.S. Department of Defense (DOD) in the late 1970s, GPS relies on a network of satellites transmitting signals to receivers to determine a receiver's location, speed, and direction. This new method of supervision uses telephonic communications and elements of Radio Frequency in conjunction with DOD's GPS monitoring system to identify a client's location on a map and design a schedule that goes beyond merely establishing a curfew (Brown, McCabe, and Welford, 2007). EM technology operates under three basic models of data collection and transmission: active, passive, and hybrid.

- *Active:* An active system uses cellular communications to transmit the collected GPS data points back to the vendor software for processing. This is done on a "near real-time" basis, such as every minute.
- *Passive:* A passive system collects the GPS data throughout the day. Once the client returns home, the unit is connected to the charger and the GPS receiver transmits the GPS data points for the day to the vendor's software for processing, using the landline phone connection.
- *Hybrid:* A hybrid system transmits data to the vendor on a less regular basis, but automatically switches to an active mode in the event of an alert. [Ibid.]

GPS technology has been used with a variety of offenders, including drunk drivers, spouse abusers, substance abusers, the mentally ill, and sex offenders. However, impact evaluations of GPS in the context of community supervision are rare, contradictory, and poorly designed and executed. Far more extensive but only slightly better in design are studies that evaluate the effectiveness of EM (Ibid.). A 2005 meta-analysis of 119 studies on the use of EM in moderate- to high-risk offenders concluded that "all studies [of EM] in moderate- to high-risk populations have serious limitations, and matched studies of EM in moderate- to high-risk populations are of very low quality" (Renzema and Mayo–Wilson, 2005). Only 3 of the 119 studies incorporated a control or comparison group, and all 3 of these studies produced inconclusive results. In the most compelling of the three studies, Finn and Muirhead–Steves (2002) compared EM with a historical control group of high-risk violent male offenders in Georgia. The researchers found that EM has a modest impact for its duration, but the effect ends after the monitoring system is removed. Within 3 years of release, 23.4 percent of the EM group (n=128) and 23.4 percent of the control group (n=158) were returned to prison.

More recently, Padgett, Bales, and Blomberg (2006) have made a slightly stronger case for EM. The researchers analyzed data from 75,661 serious offenders in Florida who had been placed on home confinement between 1998 and 2002, and found that "both radio frequency and GPS monitoring significantly reduce the likelihood of technical violations, reoffending, and absconding for this population of offenders." The chief criticism of this study was that the researchers neglected to conduct a process evaluation, making it difficult to interpret the results (Mair, 2006).

Finally, it is important to note that none of the existing studies, including Padgett's, has shown that EM does more than *postpone* recidivism. Parolees appear to be compliant while subject to monitoring, but, in the words of Peckenpaugh and Petersilia (2006), "when the bracelets come off, other studies have found that monitored offenders perform no better than offenders [who] were never subject to monitoring."

In short, the existing literature on EM leaves many uncertainties, such as the effectiveness of its use with high-risk gang offenders.[*] Moreover, advances and improvements in the technology, combined with an increased awareness of its capabilities, almost guarantee an escalation of its utilization for a wide variety of offender types. Unfortunately, as Gainey and colleagues (2000) point out, the research has not kept pace with the rapid implementation of this relatively new and promising supervision strategy. After more than 20 years, we are still uncertain of the technology's capacity to reduce recidivism, its long-term effects, or its potential costs versus benefits. A study such as the one proposed here is clearly needed.

3. Research Design and Methods

This research proposes a nonequivalent-group quasi-experimental design, using multilevel modeling with propensity score adjustments to assess the use of GPS technology for monitoring HRGOs. The multilevel modeling approach is employed because the sites are nested within the overarching organizational structure of the GPS program. Nested data can present a problem for standard statistical analysis because treatment subjects self-select into hierarchies (groups) in ways that are not entirely deterministic, so using statistical controls for variables that cause selection does not entirely eliminate selection problems. The propensity score procedure is employed to account for the differences between the treatment and comparison groups by modeling the selection process. It is widely accepted and considered the optimal method of establishing comparison groups (Quigely, 2003; Dehejia and Wahba, 1998; Rosenbaum and Rubin, 1985). The basic idea is to replace a collection of confounding covariates with one function of covariates and ultimately reduce selection bias. (See Appendix N for an assessment of validity).

Sample

Treatment Group. The treatment group will include all HRGOs placed on GPS monitoring technology in each of the six specialized gang units in San Bernardino, Sacramento, Fresno, Riverside, the city of Los Angeles, and Los Angeles County from March 2006 (the program start date) through the study start date (est. October 2009). CDCR defines a parolee as an HRGO if he or she meets any one of a number of criteria (see Appendix I for the full list of criteria). Some of the criteria elements are 1) the parolee has been validated as a member of a prison gang; 2) the parolee has been identified as a member of a prison disruptive group; 3) the parolee has, as a special condition of parole, been ordered not to have contact, or associate, with any person known or reasonably known to be a gang member. CDCR estimates that the GPS monitoring system has been applied to 600 parolees meeting the HRGO criteria. Offenders typically serve 3 years on parole but may not serve that entire term with GPS monitoring, as CDCR maintains the discretion to apply or remove the monitoring technology to serve the best interests of the State. The final sample will likely be restricted to parolees who served at least 6 months on the GPS monitoring system, which is conservatively estimated to reduce the sample of HRGOs placed on the GPS monitoring system by 30 percent. Consequently, the

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*The researchers were unable to identify any studies that evaluated the effectiveness of GPS with gang offenders.

minimum sample of HRGOs placed on the GPS monitoring system is estimated to be roughly 420 parolees.* The study period for each participant will begin during the initial face-to-face meeting between the agent and the parolee (the 1st working day after release from prison) when the parolee is placed on the GPS monitoring system and will continue for 3 years (the maximum length of time parolees are monitored by the GPS technology [see Appendix G for project timeline]).

Comparison Group. A propensity score procedure will be employed to account for the differences between the treatment and comparison groups by modeling the selection process. Specifically, to construct a comparison group likely to have pretreatment characteristics similar to those of the treatment group, this study will draw on the Cal–Parole tracking system to create a pool of gang offender parolees who have not been placed on the GPS monitoring technology. According to the California Department of Justice, there are more than 420,000 gang members statewide. CDCR estimates that 25,000 parolees currently have special conditions of parole related to gang activity. Of these offenders, an estimated 25–30 percent (6,250 to 7,500) statewide can be considered HRGOs. All of these parolees—most of whom were *not* placed on the GPS monitoring system—are tracked in the Cal–Parole data management system, providing a large pool of offenders from which to pull at least 420 non-GPS HRGOs. The offenders eligible for inclusion in the comparison group are required to be a) released from prison after the initiation of the GPS program in San Bernardino (March 2006); b) placed on parole in San Bernardino, Sacramento, Fresno, the city of Los Angeles, Riverside, or Los Angeles County; and c) classified as HRGOs. Using the propensity score procedure (described below), this study will estimate the probability of assignment to the treatment group from several pretreatment characteristics selected a priori to present a broad spectrum of pretreatment risk factors. These include baseline values on all outcome measures as well as demographic characteristics (age, race, and gender), criminal history (e.g., lifetime arrests, days incarcerated, age at first arrest), offender registration types (e.g., narcotics offender, sex offender, violent offender), employment, and gang affiliation.

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*The sample may be larger by the study start date.

Attrition. Because the parolees are required to regularly meet face to face with the PA in addition to being monitored through GPS technology, we do not expect to lose many subjects through attrition. From a total sample of 840, we *conservatively* overestimate that no more than 15 percent of the population will be lost to attrition for various reasons (death, evasion, movement out of State), resulting in a final sample of 714 HRGO parolees. The reasons for attrition will be tracked during the study.

Power. Assuming a sample size of 714 parolees (357 per group), we should be able to detect an effect size of 0.21 or more with 80 percent power in a two-tailed test with alpha of .05 or less.[*] Though these conventions should be used with caution, Cohen (1992) provides the following guidelines regarding effect size in the social sciences: small (0.2), medium (0.5), and large (0.8). Notably, this is a conservative estimate and the actual size of the sample should be larger, thus increasing the ability of the study to detect smaller effects. In addition, if desired by NIJ, the comparison offenders could easily be oversampled to increase power.

Obtaining Informed Consent. Obtaining informed consent for this population is not required, because the data are the property of CDCR and no additional survey instrumentation will be administered to the offenders. DSG will, however, submit a formal protocol for review by NIJ's Human Subjects Coordinator and defend the research design and sampling procedures in a hearing before the DSG Institutional Review Board.

Data Sources

We will use five primary data sources to measure variables: 1) CDCR data management systems, 2) CDCR records, 3) GPS monitoring data, 4) CDCR staff interviews, and 5) CDCR cost information.

CDCR Data Management Systems. California operates many data management systems that house information relevant to HRGO parolees. These databases include, but are not limited to, the Automated Release Date Tracking System, COMPAS, Cal–Parole, the Parole Law Enforcement Automated Data System, the Revocation Scheduling Tracking System (RSTS), the Offender-Based Information System (OBIS),

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*This approach compares two groups to see if they differ at any point in time. It assumes that a) the number of participants is largely fixed because of logistical constraints, b) the level of power must be 80 percent or better, and c) only minimal a priori data exist for making detailed power estimates. (For more on the formulas used for these calculations, see Dennis, Lennox, and Foss, 1997.)

Distributed Data Processing Systems, and the California Law Enforcement Telecommunications System. The majority of data for this study will be derived from three databases: Cal–Parole, RSTS, and OBIS. The Cal–Parole tracking system stores a variety of information on offenders released from prison and placed on parole, including birth date, gender, race, residency information, the date the parolee was released from prison, the date the parolee is scheduled to be discharged from parole, any special conditions linked to parole, and the unit and agent to which the parolee is assigned. RSTS stores a vast array of data regarding parole revocations, including information on the date and type of parole violation, and the result of the parole revocation hearing. OBIS maintains a rich database of information concerning prior criminal history (date of arrest, arrest charges, disposition date, disposition charges, disposition, and length of sentence) of all adult offenders in California.

A central feature of the California system is that offenders are linked across all three of these systems through a unique identifier that permits users to identify the same individual in different contexts or data systems. Moreover, most of these systems collect data electronically and allow the data to be transferred electronically in a conventional format such as Microsoft Access that can then be opened with a statistical software package. This study takes advantage of the data collected by the State of California by gathering data post hoc on each offender for at least 1 year subsequent to the activation of the GPS technology.

CDCR Records. In some instances, data elements may not be available electronically through the databases described above. A few elements known to be excluded from an electronic format include offender marital status, number of children, and education level. Under these circumstances (where the need arises), the case record files of offenders involved in the study may be accessed and transcribed using a prespecified archival parole data collection form.

GPS Monitoring Data. The GPS monitoring data will be used for the process evaluation and for descriptive purposes. The GPS monitoring system into which HRGO parolees are enrolled is operated by two companies:

STOP and Pro Tech. Each company maintains comparable data in a similar format.[*] Through CDCR, each provider will make available the following: a profile of the offender; a record of each event (inclusion/exclusion violation, strap tamper, charge violation, message gap) that includes the event start and stop times and duration during a specified period; and the assignment history of the device. DSG has extensive firsthand knowledge regarding the use of these data, given the firm's experience with the NIJ-sponsored evaluation of electronic monitoring for high-risk sex offenders in California.

CDCR Staff Interviews. For the process evaluation, DSG will monitor the implementation of the GPS program through visits to the six sites, where DSG will interview all parole agents assigned to GPS HRGO units. The main emphasis of the site visits will be to assess fidelity to the model by comparing the GPS program implementation with the GPS program design to determine how well the core components of the GPS program were put into practice. The parole agents will be questioned about the core program components, including caseload size, enrollment and orientation, intensive supervision contacts, investigative use of GPS monitoring, synthesis of parole GPS and law enforcement data, and program staffing. The survey DSG is employing in the current CDCR study of GPS use with high-risk sex offenders will serve as a model for these interviews (see Appendix J).

Cost Information. The cost information elements that will be used in the analysis are grouped into four broad categories: 1) personnel (all full- and part-time staff and consultants), 2) facilities (i.e., the physical space required for the program), 3) equipment and materials (furnishings, instructional equipment, etc.), and 4) other inputs (all other costs that do not fit the other categories).

Data Collection Procedures

Data from the sources described above will be collected through a variety of methods. The CDCR data management systems will be queried by CDCR staff to extract the relevant information, which will be

[*] CDCR will award another contract through a competitive process in the near future. While all vendors are contractually obligated to supply requested data to CDCR, subtle system differences may affect the nature of GPS alerts. However, our expertise in GPS products and technologies will allow us to mitigate the impact of any potential differences.

transferred on a password-protected CD in a Microsoft Access format by Federal Express Priority Overnight delivery at specific intervals. The CDCR records will be reviewed at the start of the study to determine the most pertinent information, and an archival parole data collection form will be developed to collect the information in a uniform format. At the completion of the follow-up data collection period, DSG research staff will review and code the case record files of each study participant. The GPS monitoring data will be queried by STOP/Pro Tech staff to extract the information described above, which will be transferred electronically through a secure static IP address at specific intervals. The CDCR staff interviews will be conducted at each site and at CDCR headquarters. The Principal Investigator (Dr. Gies) will design both the PA and management staff surveys that will be used to guide the interviews. A two-member team (Dr. Gies, and Amanda Bobnis or Allina Boutilier) will conduct staff interviews. CDCR will provide the CDCR cost information on a password-protected CD.

Site Visits. Eight site visits will be conducted. The first site visit will occur shortly after the commencement of the project at CDCR headquarters in Sacramento to initiate study activities with CDCR and interview the management staff. Five subsequent site visits will be conducted to interview the parole staff from each of the six sites (San Bernardino, Sacramento, Fresno, Riverside, and Los Angeles*). Two weeklong site visits will be conducted at the end of the follow-up data collection period to review case records of all parolees involved in the study. As a result, assuming three researchers participate on each site visit, we estimate a total of 24 site visits (3 persons x 8 trips) will be conducted throughout the duration of the project.

Data Management and Security

DSG operates under the NIJ policy that provides for the protection of the privacy and well-being of NIJ research study participants through the statutory protection of private information under the authority of 42 U.S.C. § 3789g and Part 28 CFR Part 22. In accordance with this policy, unduplicated identification (ID) numbers, in lieu of legal names, will be used to identify study participants. The key that connects ID numbers to subject names will be kept by CDCR (the repository of the automated database files). DSG research staff will *not* have access to the names of study participants. Nevertheless, all study staff will sign a *Confidentiality Agreement* to protect any information they encounter during interviews or other project-related work.

The hard copy of all subject-related data (e.g., court record data collection form, staff interview transcripts) will be stored in a locked file cabinet located in the office of the Principal Investigator. Electronic data (e.g., victim data files, study data sets) will be stored in a central evaluation data repository located on a partitioned drive permitting only project researchers who have signed DSG confidentiality forms to access the data. All servers use 128-bit encryption. These data will be kept 5 years after the study and then destroyed.

The computers are located in DSG offices, which require passcode access. In addition, all screen saver settings are mandated to activate within 5 minutes of inactivity and require a passcode to re-access the computer. Daytime access to DSG offices is limited to DSG employees. The suite entry doors are locked at all times and monitored by a receptionist during working hours. Visitors must sign in with the receptionist. The premises are secured after hours through the use of a motion-sensor security system. After-hours access to the building requires the use of a proximity key card to both enter the building and use the elevators.

Statistical Approach

The study will evaluate the impact of the GPS monitoring of HRGOs using a quasi-experimental design that features a propensity score to model the selection process. The central feature of the analysis will be to use survival analysis to model all time-to-event data. The following sections describe the dependent variables that will be employed in the analysis, the use of survival analysis, and the steps of the analysis plan.

Dependent Variables. This study will assess the use of GPS technology with HRGOs in terms of recidivism and compliance, and as an investigative and prosecutorial tool (see *Table 1*). It is hypothesized that the GPS monitoring technology may deter parolees from engaging in criminal behavior because it increases probability of detection by law enforcement, encourages parolees to be more compliant, serves law enforcement in investigating a reported crime (e.g., in locating a suspect on the GPS, in identifying witnesses)

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*The Los Angeles County and city of Los Angeles site visits will be conducted during a single trip.

TABLE 1. DEPENDENT MEASURES

VARIABLE	DESCRIPTION	SCALE	SOURCE
RECIDIVISM			
Arrest	Time (number of days) from release to arrest for any offense	Continuous	OBIS
Arrest for Violent Offense	Time (number of days) from release to arrest for violent offense	Continuous	OBIS
Return to Prison	Time (number of days) from release to a return to prison	Continuous	OBIS
COMPLIANCE			
Parole Violations	Time (number of days) from release to parole violation	Continuous	RSTS
INVESTIGATIVE TOOL			
Police Report	Time (number of days) from police report to arrest	Continuous	OBIS
Charges Filed	Time (number of days) from arrest to charges filed	Continuous	OBIS
PROSECUTORIAL TOOL			
Conviction	Conviction, no conviction	Dichotomous	OBIS
Plea Bargain	Plea accepted, no plea accepted	Dichotomous	OBIS
Resolution	Number of days from charges filed to case resolution	Interval	OBIS
Disposition	Type of disposition (suspended sentence, probation, jail, prison)	Ordinal	OBIS
Length of Sentence	Number of days sentenced to jail/prison	Interval	OBIS

and supports prosecutors in building a case by providing stronger evidence (e.g., documentation of the accused's whereabouts).

Survival Analysis. The principal analysis will concentrate on the timing until first event (i.e., recidivism and compliance measures), using a Cox proportional hazards model.* Allison (1995) argues that the Cox model is the most robust type of survival model. In addition, nonparametric procedures can be employed in sensitivity analyses to confirm (or question) the results (see Gainey, Payne, and O'Toole, 2000). For example, fully parametric models—such as the Weibull, Gompertz, log-normal, gamma, and exponential—can be estimated. Diagnostic criteria (AIC and BIC statistics), Schoenfeld residuals, and Martingale residuals, among others, can be used to tell which approach is giving the best fit. They also permit a test of the proportional hazards assumption to see whether it is valid. The use of a fully parametric model, if it provides a good fit, has some additional advantages. It enables one to integrate unmeasured heterogeneity (frailty) into the model. This allows a free parameter to be estimated, which is the percentage of the sample that never recidivates. Most of these other models assume that everyone eventually will commit a new offense—the only question is when.

Our design will treat each individual in the GPS program as an observation and model the duration of noncriminal behavior. The activation of the EM technology is the treatment, and the variables affecting the outcome (the duration of noncriminal behavior) will be measured at the individual (length of time on parole, the Z-vector of control variables) and community (site dummy variables) levels. The discrete event of placement onto the GPS monitoring technology (G) is the impact of interest.

General Considerations. Consider each of the individuals (I) in the GPS program. There are data on their individual characteristics (Z_i), their length of time on parole, and their criminal activity. There is also local information (site dummy variables) and temporal information. The key outcome of interest is the duration of noncriminal behavior. There are several ways of modeling this duration, but the most widely accepted is to

*Another option is to use a discrete time-to-event history model to more easily account for the removal of the GPS technology at the completion of parole after 3 years. The main difference between the Cox proportional hazard model and the discrete time-to-event history model is that the latter more readily treats time as discrete units (e.g., months or years) rather than as continuous.

model the conditional probability given a state of noncrime behavior up to time *t* that the individual will not be arrested at time t+1. This probability will be conditional on the length of noncrime time, and the factors mentioned above. The treatment will be the placement on the GPS monitoring technology, which will occur at a different time (t_g) for each individual (or sufficient variation in t_g), because their release times (t_r) differ:

$$t_r \rightarrow t_g \rightarrow t \rightarrow c$$

In practice, however, the data are censored because the duration of some spells of noncriminal behavior is unobserved. Some individuals will recommit offenses or will be removed from the sample for other factors, while others will not commit offenses for the duration of the study. This study will observe spells from time t_r (the release date) through censoring time (c). Beyond (c) the study period ends and there is no further information on the outcome; thus, many of the observations will be censored. Duration in the state of noncriminal behavior is a random variable, denoted T. The survivor function* may be denoted

$$S(t) = \Pr[T>t] = 1–F(t)$$

where F(t) represents the distribution of T, and S(t) represents the probability that the duration exceeds the current period of observation (t). The hazard function, the instantaneous probability of leaving a state conditional on survival to time t, is denoted $\lambda(t) = f(t)/S(t)$

where f(t) represents the density of T (or dF(t)/dt). Finally, the cumulative hazard function is denoted

$$\Lambda(t) = –\ln S(t)$$

a basic result of integration and knowledge that S(0)=1.

During estimation, this study will employ a proportional hazards model where the conditional hazard rate $\lambda(t|Z,G)$ is factored into separate functions:

$$\lambda(t|Z) = \lambda_0(t,\alpha)\varphi(Z'\beta,G\gamma)$$

where $\lambda_0(.)$ is known as the baseline hazard (a function of time alone), $\varphi(.)$ is a function of X and the treatment alone, and α, β, and γ are parameters to estimate. The proportional hazard model is desirable because the parameters (β) can be estimated consistently without specification of $\lambda_0(.)$. In addition, if an exponential functional form for φ(.) is chosen, then a coefficient (β_j) can be interpreted as the impact of a change in Z_j (the j^{th} regressor) on the hazard:

$$\partial\lambda(t|Z,G,\beta,\gamma)/\partial Z_j = \lambda_0(t)\exp(Z'\beta+G\gamma)\beta_j$$

Thus, the model provides a way of understanding the marginal impact of a variable (such as the GPS technology) on the probability of survival.

To implement this approach, several modeling issues still must be addressed, including time-varying regressors, competing risks, and specification testing.

Time-Varying Regressor. This term describes the fact that a covariate may not be fixed; rather, it may change over time. If the time-varying regressors are endogenous, they may bias the outcomes. In this study, elements of Z and G vary over time. These variables, however, are external to the individual; as they are exogenous, there is no need to worry about feedback between the time on parole and the treatment. The case of exogenous time-varying regressors is spelled out well in the literature (see Cameron and Trivedi, 2005, 600–602). The (γ) coefficient on G will provide the information about the impact of the program. The coefficients on the dummy variables representing the sites will enable a comparison across sites.

Competing Risks. Often a participant may experience an event other than the one of interest that alters the probability of experiencing the event of interest. Such events are known as "competing risk" events. The competing risks for this study include a) violation of parole and b) death or other form of sample attrition. Treatment of competing risks is relatively straightforward. Assume there are latent variables (t_1, t_2) for each of these competing risk events (censoring can easily be handled) corresponding to the spell duration for each, given no other risk factors. Only one duration $\tau = \min(t_1, t_2)$ is observed. That is, only the shortest duration is observed; the others are not. Assuming the risks are independent (a reasonable assumption), writing a hazard function and an overall survival function is relatively straightforward—using a competing risk model with

*This presentation closely follows that of Cameron and Trivedi, 2005, *Microeconometrics: Methods and Applications*, chapters 17–19.

proportional hazards. This model is somewhat more complex than a hazard model with no competing risks, but the main complication is in interpreting the regression coefficients. In particular, the sign of β_r for the r^{th} risk is not the same as the partial of the probability of exit with respect to the Z. But methods for calculating the partial are available and will be used to interpret the impact of G on the risk of exit into competing risk event (a) or (b).

Specification Testing. A ubiquitous problem with survival models is disentangling numerous sources of potential model misspecification. These include a) issues of functional form of the survival function, b) appropriateness of inclusion or exclusion of covariates, and c) unobserved heterogeneity and other underlying model assumptions. Of these, those of type b are the easiest to deal with; several variants of Wald-type tests are available. Types a and c are related. This study will use graphical tools based on generalized residuals to handle each (see Cameron and Trivedi, 2005, 630–32).

Analysis Plan Steps. The study analyses will proceed in accordance with logic that moves from straightforward to more complex research questions.

Step 1. Compare Characteristics of GPS and Comparison Parolees. We will conduct a preliminary analysis to compare baseline characteristics (e.g., age, race, age at imprisonment, age at release, number of prior arrests) of the treatment and comparison groups using a cross-tabulation (for nominal data) and/or independent t-tests (for interval data). The independent t-test procedure compares means for two groups of cases.

Step 2. Perform Propensity Score Matching Procedure. The matching procedure will be performed using STATA/PSMATCH2. The basic steps are as follows:

2.1. Identify GPS group and a large sample of non-GPS offenders.
2.2. Run a logistic regression analysis predicting group membership from a range of covariates.
2.3. Compute the probability of being in the GPS group using the logistic regression function based on the covariates for all subjects. This is the propensity score: predicted probability (p) or log [p/(1–p)].
2.4. Form a new matched-pairs control group. For each subject in the GPS group, find the control with the closest propensity score. Alternately, one could use the caliper approach to find all subjects whose propensity scores are within a certain, very small, range.

2.5. Test that the samples are appropriately matched by stratifying both the GPS and control groups into equal-size intervals based on propensity score. The distribution of each covariate within strata should be very close for both groups.

Step 3. Assess Implementation of GPS Technology. We will conduct an analysis to assess the degree of fit between the original design and actual implementation. This analysis will be performed by calculating the percentage of program components operating as designed. GPS monitoring data will also be presented in a descriptive statistics format.

Step 4. Compare Outcomes of GPS and Comparison Parolees. We will perform bivariate (e.g., t-test, Pearson's chi-square test, Fisher's exact) and multivariate analyses (e.g., logistic, ordinal logistic, multinomial logistic regression* for non-time-to-event data [i.e., investigative and prosecutorial outcomes, controlling for treatment/comparison group status, baseline offense(s), criminal history, county, time at risk, and so forth]).

Step 5. Compare Time-to-Event Outcomes of GPS and Comparison Parolees. We will conduct survival analyses† of recidivism (i.e., any offense, violent offense, and return to prison) and compliance (i.e., technical violations), using a Cox proportional hazards model. This test of the GPS technology necessitates several levels of analyses. We will

5.1. Make overall comparisons of the survival rates (hazard function) for elapsed time before violation.
5.2. Compare the survival rates (hazard function) for time to violations for the GPS and comparison groups. GPS is a time-varying covariate that measures the interruption of standard parole.
5.3. Compare the survival rates (hazard function) for time to violations for the GPS and comparison groups, controlling for both time-stable (e.g., race, age at imprisonment, age at release, number of prior arrests, county) and time-varying covariates (e.g., age, time at risk on standard parole).

Step 6. Conduct Cost-Effectiveness Analysis. We propose the use of cost-effectiveness analysis (CEA) to measure the cost and consequences of the GPS program. The measure of efficiency used in CEA is the cost–effectiveness ratio, which is the ratio of program costs to a delinquency-related outcome such as a reduction in recidivism. In its most common form, CEA is expressed as the cost (in dollars) of obtaining the

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*Multinomial logistic regression could be used to assess recidivism as a dependent measure with several classes (misdemeanor arrest, felony arrest, return to prison).

†The STATA .xt mixed command can address multilevel methods in survival analysis by using complementary log–log regression to fit the proportional hazards model.

result divided by the number of cases in which the desired outcome was obtained. Cost–effectiveness ratios can assess the relative efficiency of two programs with the same goal. The lower the cost–effectiveness ratio, the more efficient the program.

4. Implications for Criminal Justice Policy and Practice

The proposed study has many clear and significant implications for both policymakers and criminal justice practitioners. As mentioned earlier, gangs and the crimes that gang members perpetrate are serious concerns. Gang members commit a disproportionate number of offenses compared with nongang members. This relationship is robust across a wide variety of definitions of *gang* and across different measurements of offending, and it holds up when gang members are compared with other highly delinquent nongang youth. Unfortunately, the literature to date reveals few programs that have been demonstrated to be effective in preventing or reducing serious and violent gang crime. A program that could intervene with, and suppress, the criminal activity of gang members could have a tremendous effect on the crime rates of many U.S. cities.

In addition, GPS technology is increasingly being used by community supervision agencies for client monitoring. It is employed in various supervision phases (pretrial, postconviction,* probation, and parole) and with various offender types, including drunk drivers, spouse abusers, substance abusers, and sex offenders (Brown, McCabe, and Welford, 2007). However, there is relatively little evidence to suggest that GPS technology makes a significant impact on recidivism. The research to date on its effectiveness as a community supervision tool is rare, contradictory, and poorly designed and executed (Ibid.). This study would fill a gap in the research and provide practitioners with answers to mounting questions regarding the effectiveness of GPS technology. Without such research, policymakers and practitioners have few alternatives but to go on implementing expensive "high tech" programs that may work—or may not work.

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*Postconviction in this case refers to using GPS following conviction but before sentencing.

Finally, this study could contribute significantly to the development of national standards for the use of GPS technology as a supervision tool. Currently, there are no such national standards. In their absence, jurisdictions have had to develop their own criteria for their programs based on experience, logic, statutes, and policies (Ibid.). A more systematic approach would be to incorporate the knowledge resulting from an evaluation of a properly implemented and operated GPS supervision program.

5. Management Plan and Organization

Project Staff

Our proposed project organization, staffing pattern, and management plans and controls are designed to ensure successful project implementation and the most efficient use of resources. A summary of DSG's management approach appears in Appendix K. Job descriptions for all project staff, including tasks and responsibilities, appear in Appendix L. Our proposed Principal Investigator (PI) has many years of experience designing and managing Federal research and evaluation projects. Moreover, he is currently working with the California Department of Corrections and Rehabilitation on a related project and has intimate knowledge of the existing data systems. Our proposed key staff have extensive experience in corrections and gang research. They will be supplemented with strategic advisers who are subject-matter experts. A brief description of our proposed key personnel's qualifications is provided below.

Key Staff. Full résumés for key personnel and consultants can be found in Appendix D.

Stephen V. Gies, Ph.D., Principal Investigator, is a research manager with significant experience in data gathering, data analysis, and database development. Currently, he is the PI for the NIJ–funded evaluation of the CDCR program for monitoring high-risk sex offenders using GPS technology. He also directs a 5-year project funded by the Administration for Children and Families (ACF) to evaluate the Boys Town Healthy Choices program. Dr. Gies is a key member of the DSG research team on the NIJ–funded evaluations of the Girls and Boys Town girls' shelter program and the San Francisco SAGE project, a commercial sexual exploitation intervention program. Randy Gainey, Associate Professor in the Department of Sociology and

Criminal Justice, Old Dominion University in Norfolk, Va., will be Co-Principal Investigator. Dr. Gainey is Co-PI for the NIJ–funded evaluation of CDCR's program for monitoring high-risk sex offenders using GPS technology. He has published 11 articles and presented research on various aspects of EM including legal and philosophical issues, the experiences of offenders on EM, public attitudes toward EM and media attention given to the sanction, and factors affecting recidivism following house arrest with EM. He is experienced in various research methodologies (including field experiments and longitudinal designs) and statistical techniques for program evaluation. Dan Stone, CDCR Data Liaison, is Associate Director, Division of Adult Parole Operations, CDCR, and provides administrative oversight to headquarters parole operations. He will offer no-cost leadership in GPS implementation in the participating counties. His sole responsibilities will be to serve as a liaison between CDCR and other State agencies to facilitate the release of data from CDCR and to assist in overcoming any bureaucratic impediments to obtaining data. He has been with CDCR for more than 20 years.

Strategic Advisers. We have augmented our staff with three consultants who will serve as strategic advisers as needed throughout the study to provide guidance on EM, gang offender management, and methodological issues. They may be consulted individually or convened as a group by phone. They are Jeffrey Alwang, Ph.D., Virginia Tech (statistical subject-matter expert [SME]); Scott Decker, Ph.D., Arizona State University; and Fernando Soriano, Ph.D., California State University, San Marcos (gang SMEs).

Other Staff. Alan M. Bekelman, DSG President, will be Officer in Charge. He serves in this capacity on all three of DSG's current NIJ grants and on three OJJDP projects. DSG support staff will include Research Analyst Allina Boutilier and Research Assistant Amanda Bobnis, who will work under the PI's supervision to assist in general data entry, tracking of case file data, database maintenance, and field interviews with parole staff. Editorial Director Michael Hopps will assist with production of all reports and deliverables.

Organizational Capability

DSG has more than 25 years' experience in criminal and juvenile justice research and evaluation. We have conducted more than 75 studies for NIJ, OJJDP, and the U.S. Department of Health and Human Services

(DHHS)—including ACF, Office of Minority Health (OMH), and the Substance Abuse and Mental Health Services Administration—as well as for many States and local governments. DSG has extensive evaluation expertise in community corrections, EM, and gangs and won the DHHS Secretary's Award for Excellence in Evaluation for a large OMH project. We have performed three major gang research studies and are currently evaluating an EM project for CDCR. Some of our recent evaluation projects are highlighted below.

- For NIJ, DSG is evaluating the impact of CDCR's GPS program for monitoring high-risk sex offenders (HRSOs). This study involves 852 HRSO parolees and uses a nonequivalent-group quasi-experimental design with propensity score matching estimators to account for the differences between the treatment and comparison groups.
- For NIJ, DSG is evaluating the impact of Father Flanagan's Girls and Boys Town Short-Term Shelter program on the recidivism of female juvenile offenders in three sites: Newark, N.J.; Philadelphia, Pa.; and Atlanta, Ga. The study uses a quasi-experimental design with a matched comparison group (total sample size is 442) and employs Hierarchal Linear Modeling to assess participants' performance.
- Also for NIJ, DSG is evaluating the impact of the SAGE Project's LIFESKILLS and GRACE commercial sexual exploitation prevention and intervention programs. The outcome measures include decreased levels of commercial sexual exploitation, delinquency, substance abuse, victimization, and PTSD symptoms; and improvements in commitment to school and attitude toward employment.
- For the District of Columbia's Office of the Deputy Mayor for Education and the District's Interagency Collaboration and Services Integration Commission (ICSIC), DSG is evaluating five evidence-based programs implemented in D.C. public schools. DSG also is performing a process evaluation using online surveys, focus groups, and interviews to assess the ICSIC infrastructure, its processes, its implementation of evidence-based programs, and its sustainability.

- For ACF, DSG is conducting a 5-year evaluation of the Boys Town Louisiana, Inc., Healthy Choices program to assess six groups of outcomes: Sexual Abstinence, Expectations for Future Behavior, Risks of STDs and Pregnancy, Consequences of Sexual Activity, Understanding the Risk of Unprotected Sex, and Perceived Effectiveness of Condoms and Birth Control Pills.
- For NIJ, DSG conducted a process and outcome evaluation of three adolescent female gang prevention programs. The study examined the processes by which females become involved in gangs, the activities in which females engage as gang members, and the processes by which females leave gangs. The methodology used an ex-post-facto, quasi-experimental design with 360 females. Results are presented in NIJ's *Responding to Gangs: Evaluation and Research* (Reed and Decker, 2002).
- For the Northern Virginia Regional Commission's Gang Task Force, DSG completed the Northern Virginia Gang Assessment Study. The 6-month study surveyed current and former gang members to examine the characteristics of gang members, as well as the level of gang activity and extent of gang membership in Northern Virginia.
- For the State of Maryland, DSG conducted a gap analysis study to develop a *Facilities Master Plan* for the Maryland Department of Juvenile Services (DJS). The final report includes a comprehensive assessment of current State and community-based programs and services.

Research–Practitioner Partnership

The DSG–CDCR collaboration is a classic example of an effective research–practitioner partnership. DSG worked closely with the Department[*] in developing this proposal, and both organizations are committed to the project's success (see letter of support in Appendix F). CDCR has pledged to provide DSG with access to its facilities and parolee data, and to assist DSG in obtaining the necessary resources from other partner organizations. In return, DSG is expected to provide CDCR with a high-quality evaluation of the GPS program,

[*]DSG holds monthly conference calls with CDCR. We have found that this regular communication builds a mutually beneficial collaborative relationship and permits us to quickly address any problems or issues.

which may result in a *better* program and *increased* funding. CDCR will receive acknowledgment in all publications, which will increase the program's visibility. DSG is also expected to adhere to all CDCR rules, regulations, policies, and procedures and ensure the confidentiality of all study participants.

6. Dissemination Strategy

DSG is highly experienced at disseminating research results to practitioners in the field. Key staff have produced final reports, book chapters, journal articles, papers, *NIJ Reports,* and an *OJJDP Best Practice Series.* DSG personnel have presented study findings at NIJ's Research Conference and at annual meetings of the American Society of Criminology, the Academy of Criminal Justice Sciences, and the American Evaluation Association. DSG will produce articles for peer-reviewed academic journals such as *Criminology* or *Crime and Delinquency* as well as practitioner publications such as the *Journal of Offender Monitoring*, which concentrates exclusively on monitoring technology and its use in enhancing public safety, and *Perspective*, the quarterly journal published by the *American Probation and Parole Association* for probation, parole, and community corrections professionals. We will also prepare all *NIJ Reports* and *Research Briefs.*

PART 2

1. Project Objectives Linked to Recovery Act

The stated goals of the Recovery Act are, in short, to "preserve and create jobs" and "promote economic recovery." One way NIJ intends to support these goals is to fund technology-based projects that "increase the economic efficiency and effectiveness of law enforcement activities." In our view, this is a sound economic policy that will stimulate the economy because technological change often drives economic growth, productivity, job creation, and improvement in living standards.

The economic implications of this technology-based project are both long and short term. The long-term implications are in sync with the broad goals of the Recovery Act and NIJ in the sense that a test of the GPS system can demonstrate the effectiveness of this relatively new technology as a valuable tool for parole agents in California (see Part 1's *Purpose* subsection for more on the value of GPS technology). In turn, disseminating its effectiveness may prompt other States and local law enforcement units to use the technology and modernize the way gang offenders are managed and supervised across the Nation. This revolutionary change in traditional parole monitoring practice would generate extensive restructuring of the system and create jobs among the parole personnel labor force and among the GPS technology service providers to fill the service and equipment needs of the local parole departments. This project will also address the short-term goals of rapid job creation and preservation specified in the Recovery Act by directly providing funds to employ five research staff members and four consultants for a total of 1,515 hours. It will promote economic recovery by expending at least $8,159 in the travel and hospitality industries through activities conducted during six site visits to various sites in California. In addition, this project will expend $1,348 on various supplies and other materials.

2. Organization Capabilities and Competencies

DSG's organizational capabilities are described in the *Management Plan and Organization* section of Part 1. A summary of DSG's management approach appears in Appendix K. As a long-time Government contractor, DSG has well-established accounting procedures for tracking all drawdowns and grant expenditures by project. DSG's accounting system and procedures track and report costs by funding stream. All activities undertaken by DSG staff are internally tracked in our Sympaq accounting system by Government-specified internal accounting cost center numbers, funding stream, and activity code. DSG reports on the expenditures by funding stream monthly. Quarterly Financial Status Reports (SF 269A) containing actual expenditures and unliquidated obligations as incurred for the reporting period and cumulative for the award are filed online.

3. Expeditious Activities

As discussed above, numerous activities can be completed expeditiously. First, the position of each of the five staff persons will be filled immediately upon award notice and preserved during the length of the grant. This employment assurance should increase both output and income, which will result in more consumption spending and ultimately increase the inducement to invest, thus helping to improve the economy. A second timely activity would be to conduct two site visits in the 1st year of the study. Each site visit will contribute to the economic recovery by infusing the travel and hospitality industry with much needed revenue. Attention to this economic sector is particularly important because, as the Obama Plan suggested, the leisure and hospitality industry employs “large numbers of low- and middle-income workers whose incomes have stagnated in recent decades and who have suffered greatly in the current recession” (Romer and Berstein, 2009, 8).

4. Timeline

This study is a 4-year project. (Please see Appendix G for project timeline.)

5. Performance Measures

The performance of this project in meeting the objectives of the Recovery Act will be assessed using the following measures organized by objective. (Please see Appendix O for full description.)

Preserve and Create Jobs

- Number of jobs retained owing to Recovery Act funding
- Number of jobs created owing to Recovery Act funding

Promote Economic Recovery

- Amount of Recovery Act funding spent on air travel
- Amount of Recovery Act funding spent on lodging
- Amount of Recovery Act funding spent on meals and incidentals
- Amount of Recovery Act funding spent on other direct costs

Develop and Demonstrate Relevant Tools or Technologies for Law Enforcement Application

- Number of changes to substantive scope [Research Relevance]
- Research quality score [Research Quality]
- Number of milestones achieved and deadlines met [Time management]
- Percent of actual expended funds compared to budgeted funds by category [Budget management]
- Number of NIJ reports and documents published [Dissemination]