2-22-2011

Examining GPS monitoring alerts triggered by sex offenders: The divergence of legislative goals and practical application in community corrections

Gaylene Armstrong

Beth C. Freeman

Examining GPS monitoring alerts triggered by sex offenders: The divergence of legislative goals and practical application in community corrections

Gaylene S. Armstrong [a,b,*], Beth C. Freeman [b]

[a] *Correctional Management Institute of Texas, Sam Houston State University, Huntsville, Texas 77341–2296, United States*

[b] *College of Criminal Justice, Sam Houston State University, Huntsville, Texas 77341–2296, United States*

ABSTRACT

Purpose: Legislative mandates that require GPS monitoring of offenders add to the existing logistical complexities of community supervision. Challenges in implementing GPS policies and practices are heightened by the lack of sound empirical research. Studies examining the relationships between GPS monitoring of sex offenders in the community and the legislative goals of public safety, deterrence, and cost effectiveness are virtually nonexistent. To begin to address this gap in the literature, this study examines the impact of a statutorily-based GPS monitoring program for adult sex offenders convicted of dangerous crimes against children and placed under community supervision.

Method: Official offender generated alert data for DCAC Sex Offenders in Maricopa County, AZ are examined from the time of legislative mandate for a subsequent two year period.

Results: Analyses highlight the significant number of equipment related alerts triggered by a loss of satellite signal for offenders under GPS monitoring as a key concern as well as a significant increase in officer workload as a result.

Conclusions: A divergence between legislative goals and practical application of mandated GPS monitoring programs exists. GPS technology is far more limited than anticipated and should be viewed as a tool rather than depended upon as a control mechanism.

Introduction

Technological advances in electronic monitoring (EM) of offenders, including global positioning system (GPS) monitoring, have added a new element to the containment approach already utilized by community supervision departments for the most “dangerous” classes of offenders. State legislation authorizing either EM or GPS tracking of offenders has been passed in at least forty-four states (National Conference of State Legislatures [NCSL], 2008). Of these states, thirty- nine have statutes that are specific to sex offenders, while the remaining five states have authorized some form of EM or GPS tracking of offenders as part of parole, probation, alternative sanctions, and/or intensive supervision (NCSL, 2008). At least ten states require lifetime monitoring of certain sex offenders via EM or GPS (NCSL, 2008). As of April 2007, thirty-four states and the District of Columbia were using active and/or passive GPS monitoring for some classes of sex offenders, and at least two additional states were in the process of evaluating the use of GPS for sex offender monitoring (Interstate Commission for Adult Offender Supervision, [ICAOS], 2007).

Arizona Adult Probation Departments were recently faced with responding to the rapid enactment of legislation that required the GPS monitoring of some classes of sex offenders who were sentenced to a term of probation. The Arizona Revised Statute (A.R.S.) §13-902(G) enacted November 1, 2006, essentially states that if after conviction, a term of probation is imposed upon an offender for a dangerous crime against children (DCAC) as defined in section A.R.S. § 13.705 (formerly codified as A.R.S. §13.604.1) the court *shall* require GPS monitoring for the duration of the term of probation. Given that the Arizona legislature has previously instituted the option of lifetime probation for all sex offenders, the enactment of these two statutes effectively results in legislatively mandated lifetime GPS monitoring for DCAC sex offenders as a condition of probation.

This study presents the results from an examination of measurable outputs (i.e., monitoring alerts) from the GPS technology subsequent to the implementation of the mandated policy for the population of sex offenders convicted of a DCAC offense. These analyses focus specifically on data provided by Maricopa County, Arizona (which encompasses the Greater Phoenix Metropolitan area), spanning the period from

November 2006 through March 2009. Findings are contextualized within the goals of legislatively mandated GPS monitoring policies and the practical application of GPS technology to management and supervision of sex offenders in community-based corrections.

Electronic monitoring of offenders using global positioning systems

Traditional forms of electronic monitoring (EM) technology have included polygraphs, random calling identity and voice verification systems, remote breath alcohol analysis, sleep pattern analysis, and motion detection (International Association of Chiefs of Police [IACP], 2008). EM has been used in managing offenders who are under conditional release or community supervision, for offenders placed in jail or prison diversion programs, and for those offenders who are subjected to alternative sanctions, especially house arrest or home confinement (see Finn & Muirhead-Steves, 2002; Frost, 2002; Gable & Gable, 2007; Office of Program Policy Analysis and Government Accountability & Government, 2005; Padgett, Bales, & Blomberg, 2006; Renzema & Mayo-Wilson, 2005).

Global positioning system (GPS) technology is a contemporary form of electronic monitoring (EM) used by community supervision agencies to track offenders. Since the mid-1990s, human-tracking GPS devices have specifically been developed for use by law enforcement and corrections agencies. In the United States, GPS has emerged as the leading electronic monitoring technology for the supervision of sex offenders (IACP, 2008). The basic components of a GPS unit utilized for electronic tracking and supervision of offenders typically include a GPS receiver, a tamper-resistant bracelet worn on an offender's ankle or wrist (the portable tracking device [PTD] or portable tracking unit [PTU]), and a battery charging unit. In two-piece hardware configurations, GPS receivers store location data points in memory. In a one- piece configuration, the GPS receiver is typically integrated into the bracelet. Offenders are responsible for recharging their GPS units using a stationary charging device that is usually located at their residence. Vendor software permits the monitoring of an offender's whereabouts through the remote collection of location data from the receiver. The transmitted data

can be retrieved by authorized community supervision personnel via any computer or portable communications device that is connected to the Internet. Software includes electronic case management features that allow community supervision personnel to set alert parameters and monitor an offender's permissible schedule and his or her movements to, or from, pre-established restricted zones of inclusion (locations where an offender is required to be, such as at his or her residence, job site, school or treatment facility) and zones of exclusion (locations where an offender is prohibited from being at or near, such as schools, parks, or victim's vicinity) (Tewey 2005). Many vendor software packages provide mapping capabilities and graphical display features that depict the offender's location and/or movement over a specified period of time.

Types of GPS units and communications capabilities

The manner in which GPS units collect and transmit location data to a monitoring center for processing, review, and analysis is dependent on the type of communication system that is used by one of three available systems: active, passive, or hybrid. Community supervision agencies are notified of offender noncompliance with established time and location parameters, equipment tampering incidents, and GPS hardware and communication failures via “alerts” from off-site vendor or third-party monitoring center representatives, or from an agency's internal monitoring center personnel (Brown et al., 2007). Procedures and methods of notification are contingent on the services offered by a vendor, the configuration of the GPS unit components, and the agency's program design, operational characteristics, and staffing resources.

Active GPS units incorporate wireless cellular communications network technology that permits “near real-time” continuous transmission of location and alert data to remote vendor management software in on-site or off-site monitoring centers. Generally, the data are immediately available for review by monitoring personnel who forward alert information to community supervision agents. Unlike the continuous monitoring capability of active systems, passive systems require that data be uploaded to the software management system at discrete times, usually at least once in a 24-hour period, thereby resulting in delayed notification of an offender's location and

noncompliance alerts. Passive GPS units require that the offender place the GPS receiver into the charging unit which is connected to a landline telephone through which data are transmitted. Hybrid systems transmit data to the vendor management software at pre-set multiple time intervals which are less frequent than continuous active systems, but more frequent than passive systems. When a monitoring parameter is violated, the hybrid system converts to an active mode and transmits immediate alerts to the software management system, which are then forwarded to community supervision personnel by the monitoring center's staff.

GPS equipment and technology: Advantages and disadvantages

The advantages and disadvantages of active, passive, or hybrid systems as compared to one-piece or two-piece GPS units have been documented by manufacturers, vendors, policing agencies, community supervision agencies, and independent program evaluators. All GPS units are subject to signal receiving and transmission failures due to a variety of technical limitations and interferences caused by physical and/or environmental conditions (Brown & McCabe, 2008; Brown et al. 2007; Tewey 2005). Although GPS units are designed to be tamper-proof, and alerts will be generated in the event of equipment tampering, offenders may attempt to defeat the GPS equipment by deliberately damaging the components, cutting ankle and wrist straps, or failing to recharge the batteries (Brown & McCabe, 2008; Brown et al. 2007; Tewey 2005). A common disadvantage of two-piece systems is the intentional separation of the receiver and the transmitter beyond the proximity necessary for proper functioning of the system.

In prior a study that conducted interviews with community supervision agencies, Brown, McCabe, and Wellford (2007) delineated several programming and operational challenges associated with GPS monitoring. Among those challenges were lack of guidelines for identification and selection of clients for GPS monitoring; proper use of GPS components by supervised clients; GPS hardware and software availability, durability, and reliability; scope of obligation and mitigation of agency liability for acts or failures to react to GPS alerts; and stakeholders misperceptions of the realistic

expectations, limitations, and capabilities of GPS monitoring. Effects on caseload and staffing are conditioned on many aspects of GPS monitoring programs, including the type of GPS unit (i.e., active, passive, or hybrid and one- or two-piece configurations) and the location of the monitoring center (i.e. on-site or off-site).

The limitations of current satellite and wireless technology are familiar to anyone who uses portable wireless communications or GPS navigation devices. In addition to limited battery life, the accuracy and reliability of satellite and GPS signal receipt and transmission as well as that of cellular communications can be compromised by environmental factors including terrain, inclement weather, and physical obstructions such as tall buildings, urban canyons, basements, and parking garages (Brown & McCabe, 2008; Brown, et al. 2007). Topographic features of mountainous areas, deep valleys, and natural canyons; or environmental conditions of dense vegetation or elevated moisture levels can interfere with the proper functioning of GPS units (Brown & McCabe, 2008; Brown et al., 2007; Tewey, 2005). These conditions make it difficult to obtain accurate and timely information about an offender's location and movement, and can result in false positive alerts that require a response by community supervision personnel.

The current evaluation of the mandated implementation of GPS technology for subclasses of offenders under community supervision in Arizona is a timely resource given the rapid enactment of GPS monitoring legislation across the country, despite the dearth of knowledge on the impact and utility of such technology for the community supervision workforce. Challenging budgetary climates, in combination with proactive solicitation of agencies by private technology vendors among other factors have led many jurisdictions to consider the potential cost savings (if any) that may result from GPS monitoring of offenders, in lieu of incarceration or application of other graduated sanctions for offenders. Unfortunately, the lack of available empirical knowledge in this arena to date fails to provide adequate guidance for jurisdictions especially with regard to expectations for staffing patterns, organizational needs, and potential offender outcomes. Here, we have developed initial insight into this supervision tool through an examination and contextualization of the available outputs from the GPS technology: alerts triggered by the offenders while under community supervision in one major urban jurisdiction. In implementing legislation and/or policy related to GPS monitoring of offenders, legislators and agency decision makers would anticipate that alerts would be directly related to offender behavior as it pertains to temporal and geographical restrictions of their movement.

Method

Arizona Adult Probation Departments were recently faced with responding to the rapid enactment of legislation that required the GPS monitoring of a subclass of sexual offenders who receive probation as part of their sentence. The Arizona Revised Statute (A.R.S.) § 13-902(G) enacted November 1, 2006, essentially indicated that if at conviction, a term of probation is imposed upon an offender for a dangerous crime against children (DCAC) as originally defined in A.R.S. § 13—604.01 (now codified as A.R.S. § 13–705), the court *shall* require GPS monitoring for the duration of the term of probation. Given that Arizona's legislature had previously instituted the sentencing option of lifetime probation for sex offenders, this statutory scheme effectively results in lifetime GPS monitoring for DCAC sex offenders as a condition of community supervision.

Data for this study were made available from Maricopa County, Arizona, which encompasses the Greater Metropolitan area of Phoenix. Specifically, data were derived from two separate sources: [1] official data provided by the Maricopa County Adult Probation Department (MCAPD), and [2] semi-structured interviews with community corrections stakeholders in the jurisdiction. First, data was extracted from the official records of the MCAPD GPS on-site monitoring center for the entire population of DCAC sex offenders in Maricopa County, Arizona who were sentenced to probation as part of their sentence[1] after November 1, 2006 and who were subject to mandatory GPS monitoring. At sentencing, a judge assigns either a passive or an active GPS unit to sex offenders who are placed under legislatively mandated community supervision in Maricopa County. The court's decision is typically based on an assessed risk level, prior criminal history and recommendations from the presentence investigation report. Specifically, the number and types of alerts received, as well as the date the alerts were generated, were collected from active and passive GPS devices to allow for a descriptive examination of the patterns and trends associated with GPS monitoring. Second, interviews were conducted with all persons involved in the development of policy and practices related to the MCAPD GPS monitoring program, as well as staff members involved in the program's implementation, which included current probation officers and their supervisors.

Based on the results that follow, we provide a brief overview of the operative processes of the GPS program. Alert data are then examined for temporal patterns and trends related to active and passive GPS units separately in aggregate form, and then are disaggregated by alert types. We examine these data to gain insight into the types of alerts that occur and the impact of GPS monitoring on offender accountability and deterrence, as well as on the accompanying workload of community supervision officers for purpose of assessing the impact of the GPS monitoring program on the human resource costs to the agency. Information gathered from the semi-structured interviews is incorporated into the discussion of results to contextualize these descriptive findings.

Results

Program description

Data from the GPS units of 154 DCAC sex offenders include all alerts that occurred between November 1, 2006 through March 31, 2009 for both active and passive devices. Offenders in this population have been monitored via GPS for periods ranging from one to thirty months, with an average of 10.8 months per offender. MCAPD utilized both active and passive GPS monitoring systems as well as developing an on-site “command center”. Recall that active GPS unit technology allows for near real-time alert transmission from an offender's unit to the supervising agency. Within seconds of the transmission of an alert from an offender's active GPS unit, information about the alert is received by a monitoring center located in a regional call center as well as forwarded to one of four probation officers (PO) assigned to this specialized caseload of sex offenders, and to the PO's supervisor by way of pagers that the officers carry at all times. In contrast, the transmission of alerts from passive GPS units is delayed until the client reports for an appointment at a predetermined time with an officer. All alert data are centrally stored by the off-site monitoring station, which is capable of generating a series of reports from the accompanying software.

Alerts triggered by GPS monitored offenders

The total numbers of alerts in each quarter of a calendar year are displayed in Fig. 1. Passive GPS units have been in use since the inception of the program in November 2006; however, active GPS units were not fully implemented for monitoring this population of sex offenders until July 2007. Therefore, the data for the fourth quarter of 2006 are limited to the number of alerts from passive GPS units for the months of November and December, and the data for Q2-07 reflect the number of alerts from active GPS units for the month of July.

The total number of alerts by type of GPS unit presented in Fig. 1 demonstrates a progressively heavier workload produced within the GPS monitoring program in Maricopa County. At the inception of the program in November 2006 through the month of December 2006, there were less than one hundred alerts generated by the passive

GPS units in use as probationers began GPS monitoring. By the first full quarter (Q1-07) for which data from passive GPS units were available, the total number of alerts from the passive units was almost double that of the alerts generated in the first two months of the program as the number of offenders under GPS supervision grew. By the time the active GPS units were introduced into the program in the second quarter of 2007, there had been a five-fold increase in the number of alerts from passive units since the initial implementation of the GPS monitoring program. The steep increases in the total number of alerts from the initial two months of Q4-06 through Q2-07 illustrate the rapid ramp-up of the GPS monitoring program in its early stages of operation. The rise in the number of alerts, from less than one hundred total alerts generated in the first two months of the program in 2006 to almost 2,200 alerts received during last full quarter for which data were available (Q1-09), indicates the extent of the program's expansion and its impact on the workload of MCAPD's onsite monitoring center staff, probation officers, and supervisory personnel.

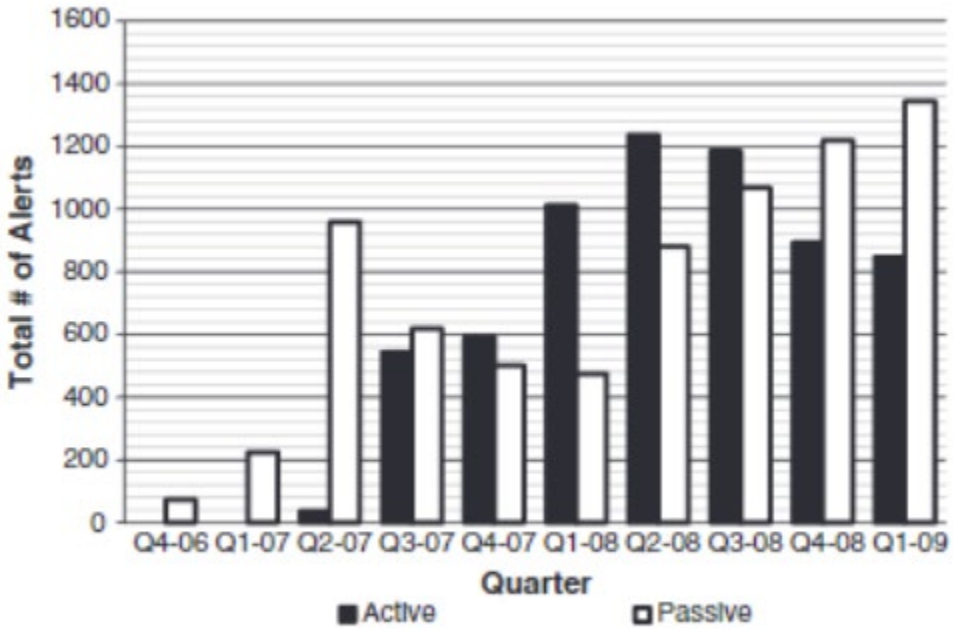

Fig. 1. Total number of alerts by type of GPS unit.

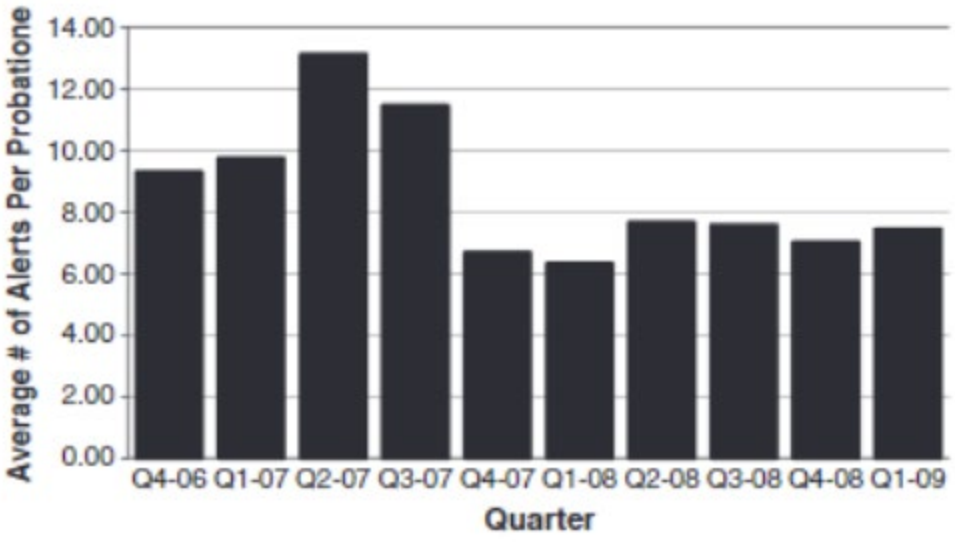

Fig. 2. Mean number of alerts over time by passive GPS units.

Figs. 2 and 3 depict the conversion of the raw total numbers of alerts into average rates of alerts per probationer per quarter of the calendar year. This conversion controls for the number of supervised DCAC offenders on GPS-monitoring status in each quarter. These two figures illustrate the average number of alerts per probationer by type of GPS unit, thereby permitting an examination of the workload produced by an individual offender in terms of the specific type of GPS unit that has been assigned.

The average number of alerts per probationer assigned to passive GPS units (Fig. 2) ranges from approximately 6.32 alerts per quarter in Q1-08 to 13.12 alerts per quarter in Q2-07. The average number of alerts per probationer assigned to active GPS units (Fig. 3) ranges from about 5 alerts per quarter in Q3-08 to more than 11 alerts per quarter in Q3-07. The workload generated by alerts from passive GPS units has declined since the first twelve months of program initiation and has remained between rates of 6 and 7 alerts per probationer per quarter from Q4-07 through Q1-09. For those assigned to active GPS units, the average number of alerts per probationer fluctuates on a quarterly basis, but has declined in the last nine months of the period for which data were collected for the current study.

A seasonal pattern in the rates of alerts generated from passive units appears to be emerging in that the highest rate of alerts in the calendar years 2007 and 2008 occur in the second and third quarters which include the spring and summer months, whereas the lowest rates of alerts in a calendar year occur in the first and fourth quarters which include the fall and late winter months. These trends are evident when comparing the mean alerts rates per quarter for passive GPS units in Fig. 2 to those of active units in Fig. 3; however, given the limited period that GPS has been in use a longer follow up would be needed to confirm a discernable seasonal trend.

It is also appears evident that additional training and continued experience in the use of GPS devices for offenders and probation officers alike appeared to decrease the number of alerts. This trend is demonstrated by the higher rates of alerts during early stages of implementation of each type of unit followed by a reduction in the rates after the twelve month period that each type of unit was initially placed into service. While the learning curve for MCAPD personnel appears to peak at twelve months, such a peak would not be sustainable for offenders due to the influx of new probationers into the

GPS monitoring program who will need to be trained to properly use and maintain the devices. Moreover, despite the differences in the trends and patterns between the mean alert rates of passive and active GPS units when controlling for the number of probationers, the actual raw total number of alerts (see Fig. 1) clearly illustrates the overall impact of program implementation on MCAPD's workload—a 2000 percent increase in the total number of alerts over a period of 29 months. Next, we turn to an examination of the types of alerts generated to determine whether any discernable patterns are evident. Recall, that earlier we suggested that legislators and agency decision makers would tend to believe that alerts will be primarily related to offender behavior, specifically a lack of adherence to temporal and geographical restrictions placed upon them by supervising officers.

Alerts and violations by type

Thirteen types of alert codes are generated by the GPS units. In order to facilitate presentation of these data, alert codes are grouped into five general categories: area violation, time violation, equipment tampering, battery failure, and other technical failures. Alerts for area violation (i.e., failure to adhere to geographic restrictions) and time violation (i.e., failure to adhere to temporal restrictions) are clear indicators of violations of community supervision conditions. The nature of these violations has important implications for the legislative goal of enhancing public safety through the reduction of the potential for victimization. Using the GPS vendor software, probation officers set predetermined parameters for geographical areas to restrict a probationer's movement within the community. When a probationer enters, or is too near a prohibited area (an exclusion zone), or when he or she exits a prescribed area (an inclusion zone), the GPS unit transmits an alert. Exclusion zones for DCAC sex offenders typically include areas near primary and secondary schools, preschool and childcare facilities, and the residences of victims and their families. Exclusion zone area violations occur when a probationer enters into an “off limit” zone. Typical inclusion zones are comprised of campuses, workplaces, treatment facilities, and courts or corrections facilities where the probationer is expected to be located and is required to remain between specified

hours. An inclusion zone area violation results when an offender physically moves outside of the designated zone. In essence, the use of exclusion and inclusion zones allows for a high level of offender accountability because both passive and active GPS units track his or her movement not only when he or she enters a prohibited area, but also confirms that the probationer is located in an authorized or required location.

An additional aspect of offender accountability is provided by an active GPS unit— a virtual curfew monitor. Through the combined use of inclusion zones and time monitoring, supervising officers can ensure that an offender is located at his or her residence by their designated curfew. Should the offender not be within the perimeter of their home by the designated time, the probation officer is alerted and the monitoring or "command center" can determine the offender's real-time location. This same approach could be utilized for ensuring attendance at treatment, work or school.

Alerts generated for an area violation, that is, entering an exclusion zone or leaving an inclusion zone, or for a time violation are likely indicators of controlled decisions made by offenders to deliberately violate a condition of supervision. An additional category of alerts that is relatively unambiguous is Equipment Tampering. The GPS equipment includes the bracelet, the MTD unit that is transported by the offender, and the base unit that is located in the probationer's residence. Each of these components is equipped to send an alert signal if a probationer attempts to tamper with the device(s) (i.e., Base Unit Tamper, MTD Tamper, and Bracelet Strap in Table 1). Additionally, an alert is generated when the offender removes the bracelet (Bracelet Gone).

In contrast to the categories of Area Violations, Time Violations, and Equipment Tampering violations, in which alerts types can be attributed to probationer's willful intent, the alert types in the categories of Battery Failure and Other Technical Failures may or may not be intentional violations. These types of alerts do not necessarily indicate a probationer's deliberate intent to incur a violation. Each of piece of equipment that comprises the GPS unit is dependent on a power source. Specifically, the bracelet has a battery that must be replaced, the MTD must be recharged using the base unit, and the base unit must receive power from a battery or an electrical outlet. It is incumbent upon the offender to maintain these components. For example, the probationer must dock the MTD in the base unit to download data from passive GPS units, or to recharge an active

or passive GPS unit every day for a minimum of six hours. This means that when an offender forgets to dock the unit, or fails to dock it long enough, he or she risks producing an alert if the battery's power is depleted the next day. Additionally, the offender must maintain their residential electrical supply by remaining current on their bills.

The data exhibited in Fig. 4 confirm the perceptions of probation officers who supervised these offenders. When officers who had offenders on GPS monitoring in their caseload were interviewed, they believed that the most frequent technical failure is a loss of satellite signal, categorized here as “Other Technical Failure”. Signal loss occurs when the offender is out of a satellite's range, or is in an area such as a concrete building that may disrupt the satellite signal. Some of the officers offered anecdotal evidence of situations where an offender was in classroom at school, at a work site, or in an office building when a signal became weak or was entirely lost. The probationer was then contacted through their MTD and instructed to leave the building and move to an area where the satellite signal could resume. While it is obviously necessary to reestablish contact with these offenders via satellite as quickly as possible in order to maintain offender accountability and to ensure the safety of the community, this source of technical failure was viewed as excessively time-consuming for the command center, the officers and the offender. Additionally, this type of technical failure is disruptive for an offender who is engaged in prosocial behaviors and activities in an attempt to successfully reintegrate into the community.

Table 1
Alert Type by Category

Alert Category	Alert Type	Total Number of Alerts	Relative Frequency (%)
Area Violation	Inclusion Zone	125	4.78
	Exclusion Zone	269	2.22
Time Violation	Curfew	119	2.12
Equipment Tampering	Bracelet Gone	1,242	22.08
	Bracelet Strap	242	4.30
	MTD Tamper	7	.12
	Base Unit Tamper	0	0
Battery Failure	Base Unit Battery	44	.78
	MTD Battery	15	.27
	Bracelet Battery	13	.23
Other Technical Failure	Motion No GPS (loss of signal)	2,089	37.14
	Phone Line Disconnect	347	11.57
	Power Disconnected	462	8.21
	Unable to Connect – Caller ID Violation	651	6.17
Total		**5,625**	**100%**

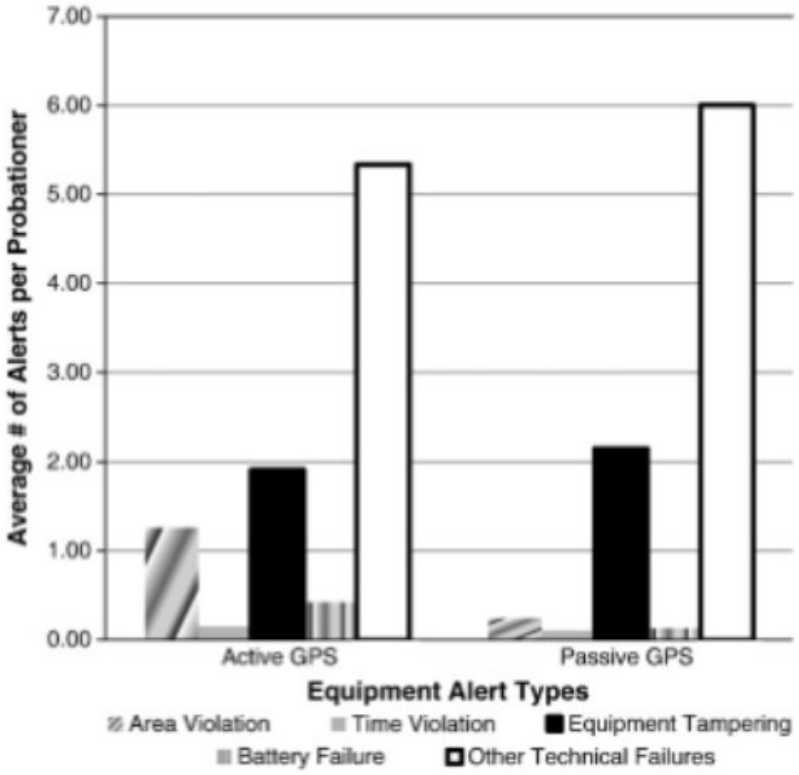

Fig. 4. Mean number of alerts by alert type for active and passive GPS units.

An examination of the cause of alerts

In addition to the increased workload generated from the sheer number of alerts produced by the passive and active GPS units, data can be examined in terms of the five alert categories delineated in Table 1. Column 3 in Table 1 demonstrates the total (raw number) of alerts associated with each category of alert. As indicated by the data, an overwhelming majority of alerts were related to “Other Technical Failures” as opposed to non-compliance with geographical area restrictions or temporal restrictions placed on the offender.

Further, Fig. 4 indicates, when controlling for the number of GPS-monitored probationers, the mean number of alerts by category for active versus passive GPS units are strikingly similar. Although the number of alerts differ between the active and passive units, the majority of alert types for either GPS unit are in the category of “Other Technical Failures”. The data for each type of alert within this alert category show that these failures are primarily due to the loss of signal between the GPS units, satellites, and communications networks. As garnered from interviews with community supervision stakeholders, a likely explanation is that offenders frequently move in and out of locations that diminish the reliability of GPS functions or completely defeat the system's network, especially within the “dead zones” created by buildings, terrain, and/or weather conditions.

Data also indicate that the second highest proportion of alerts for either the passive or the active GPS units was generated in the category of “Equipment Tampering”. Generally, an equipment tampering alert is attributed to the deliberate acts of offenders when they attempt to deactivate, destroy, or remove components of the GPS unit. The fact that “Battery Failure” as a separate category of alerts does not produce a high mean number of alerts per probationer suggests that limited battery life and removal or attempted removal of batteries by offenders has a minimal effect on probation officers' workload.

When the mean number of alerts in the categories of “Area Violation” and “Time Violation” in Fig. 4 are examined, it is clear that alerts for violations of preset area parameters exceed those for preset time or curfew violations; however, both categories are significantly lower than Other Technical Failures or Equipment Tampering. An examination of the workload produced by each type of alert category illustrates that much of the officer's time in this jurisdiction was consumed by responding to alerts that stem from a lack of the GPS unit's capacity to continuously and consistently monitor the offenders. Trends over time illustrated in Fig. 5 demonstrated the consistently high workload produced by this condition of supervision, which per legislation in Arizona are not expected to decline. Moreover, results demonstrated when a “true” violation does occur, it is more likely than not to be the results of equipment tampering when an offender cuts the bracelet thereby preventing further monitoring of his or her location.

Discussion

The primary purpose of this study was to determine the impact of a legislative mandate that requires GPS monitoring of certain classes of sex offenders who are sentenced to a term of probation with specific attention to officer workload. Legislative and agency goals are aligned in the enhancement of public safety achieved through increased surveillance and control of offenders in community-settings. While it is expected that GPS technology provides the capability for near real- time tracking of an offender's location and movement in the community and that alerts would primarily indicate non-compliance with geographical and temporal restrictions, findings

demonstrated that responses to non-violation alerts consumed an inordinate amount of an agency's resources—resources that could be better directed to other case management activities. As a result, a secondary impact is the possibility for complacency to occur at the officer level as they become desensitized by an overload of non-violation alerts. In turn, complacency could result in a failure to act leaving the officer and agency both liable for an offender's actions.

When a statutory scheme also includes a sentencing option of lifetime probation for such offenders combined with mandated GPS monitoring, the implications both short- and long-term, for community corrections practices become apparent. Traditional policies, procedures, and practices in community supervision agencies are radically altered to accommodate and enforce these novel yet increasingly burgeoning statutes. Legislative bodies seldom rely on empirically-based evidence to guide the construction and passage of bills related to the crimes of sex offenders. Button et al.'s (2009) explanation is instructive: “...[T]he push for the electronic monitoring of sex offenders may largely be an emotionally laden reaction as opposed to a more rational response grounded in methodological research” (p. 4). The observations of Sample and Kadleck (2008) echo this stance: “...[S]ex offender policies appear to be based on personal opinion, public perception, and media coverage of sex offenders and specific crimes, particularly those against children” (pp.60-61).

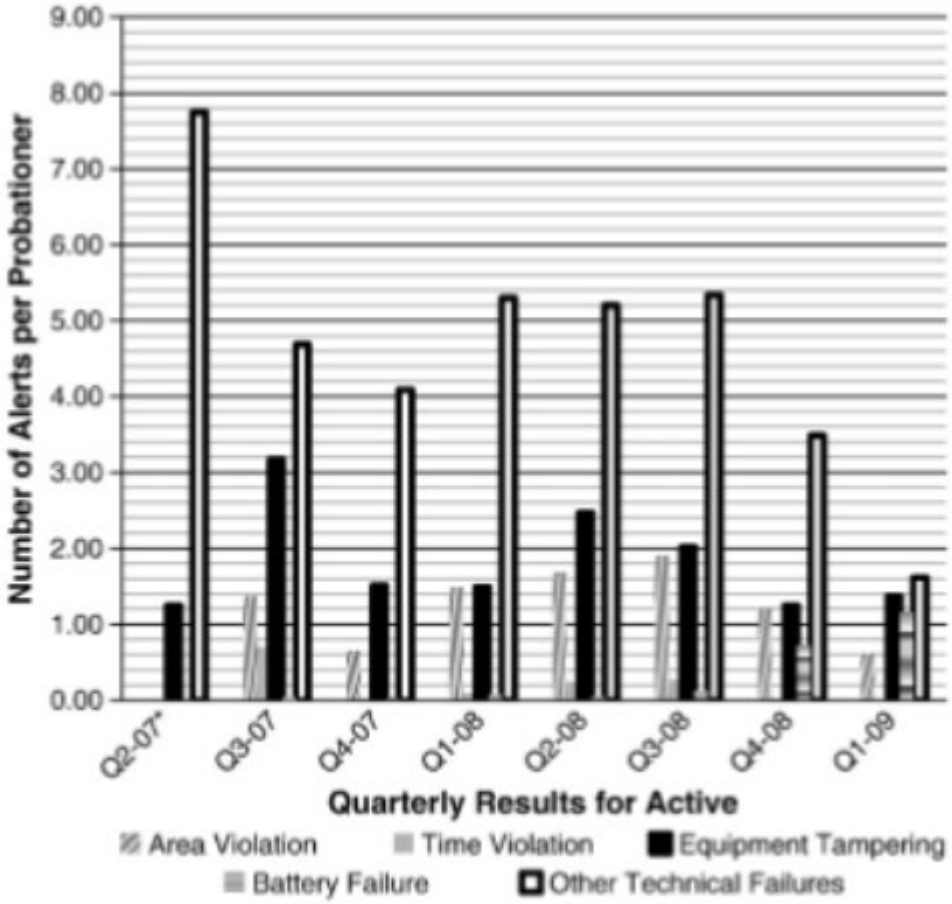

Fig. 5. Mean number of alerts by type of alert over time for active GPS monitoring systems.

The statutory scheme created by the Arizona legislature has forced the state's community corrections agencies to rapidly redefine their community supervision practices in order to accommodate the mandated GPS monitoring of probationers who have been convicted of a dangerous crime against children. The extant study was conducted for the purpose of ascertaining the impact of this legislation on MCAPD's structure and its operational and strategic processes. Our findings suggest that although legislative goals and the goals of community corrections practices are similar in terms of attempting to increase offender accountability through GPS monitoring, a significant divergence is apparent when legislation mandates are examined through the practical application and impact of GPS monitoring laws for the logistical aspects sex offender containment by community corrections personnel.

The results of our study demonstrate that a significant portion of a probation officer's time, and consequently the jurisdiction's GPS monitoring program staffing resources, are spent responding to alerts produced by the limitations of underdeveloped technology. This is contrary to the legislative intent underlying GPS monitoring statutes and the assumption that the majority of a probation officer's time will be spent on responding to violations of criminal behaviors, or precursory behaviors associated with an offending cycle. Additionally, legislative intent anticipates that offenders will be deterred from reoffending. To some extent, this expectation is supported by the relatively low rates of area and time violations. However, and potentially more important, the occurrence of equipment tampering demonstrates the premeditated nature of a small subset of offenders to escape monitoring or to abscond from supervision. Thus, the immediate notification that occurs via the receipt of an equipment tampering alert when an offender has absconded is arguably the most robust feature of GPS monitoring. The caveat to this feature is the relatively low probability of expeditious re-arrest given the limited “evidence” of an offender's subsequent whereabouts associated with investigating and tracking an absconder.

It follows then that a limited strategy for improving the cost effectiveness of a GPS program is to decrease unnecessary or unintentional alerts, thereby reducing the levels of staffing and financial resources that are allocated for response to these “false” alerts and, in turn, increasing the resources dedicated to case management activities. The policy and practical implications that follow recognize the current bounds of GPS technology. Nevertheless, much of the improved cost efficiency of any GPS monitoring program is directly related to the critical need of addressing the intrinsic limitations of GPS equipment and software capabilities.

Policy implications

Cost effectiveness of a GPS monitoring program should be considered with respect to both actual dollars spent on the technology and/or vendor contracts, as well as in light of the workload required to implement and maintain a GPS monitoring program. As suggested by Button, DeMichele, and Payne (2009), placing sex offenders on GPS monitoring for life means that the population of sex offenders under community supervision will continue to expand, thus increasing the workload of community supervision personnel. Moreover, attrition is only achieved by the death of an offender, if there are no statutory provisions for early release from probation.

It follows that decreasing officer workload related to unintentional alerts should be a key consideration in selecting monitoring equipment, as well crafting organization policies and practices related to GPS monitoring programs, especially protocol in responding to alerts. Community corrections supervisors estimated that approximately 70 percent of alerts are “false alarms” and are usually related to technology issues. Data presented in Table 1 confirm that a significant proportion of alerts were comprised of situations that were potentially unintentional or minimally related to equipment limitations rather than to obtrusive offender behavior. A number of steps could be taken to lessen the likelihood of unintentional alerts and reduce the workload associated with these alerts. For example, in order to decrease the amount of time consumed by the supervising officers' response to “false alerts,” a system could be developed that would evaluate the alerts when they are relayed to the jurisdiction. As the alarms are sent to the supervising probation officers, they are simultaneously sent to a command center that is staffed 24 hours a day/7 days a week by trained professionals. Depending upon the type of violation, command center staff could determine whether an immediate response is necessary (e.g., bracelet gone alert), or whether a monitoring period is necessary with appropriate follow- up action, and convey that information to the probation officers and their supervisors without an alert going to the individual officer.

Secondly, education of the offender is crucial. In examining the trends in MCAPD, a learning period was evidenced as the overall rates of actual violations decreased a few months after the implementation of each type of GPS unit. This reduction

was attributed to the increased education of offenders that was achieved through an orientation and training process, which occurred with the onset of GPS monitoring. During this information session, the offender and a designated orientation officer review a set a written rules and policies associated with GPS monitoring as a condition of that offender's probation. At the conclusion of the orientation, the document is signed by the probation officer and countersigned by the probationer to verify that the rules were explained and that the probationer understands the rules.

The rules set forth the offender's basic responsibilities for the operation and maintenance of the GPS equipment. The offender is instructed to keep the docking station plugged into an electrical outlet at all times, recharge the MTD (the tracking device), ensure that the MTD free from obstruction (e.g., not placing the GPS unit in a purse, car trunk, etc.), and to respond to all alarms and messages including low battery warnings and any instructions that appear on the MTD screen. The probation officer also reviews the probationer's legal responsibilities with respect to the GPS equipment which include the payment of fees to offset the cost of the device if ordered by the court, and replacement costs in the event that equipment is lost or damaged. Other legal aspects reviewed in the orientation session include the conditions probationers shall not tamper with the device nor remove or bypass any equipment, and shall keep the MTD with them when they leave their residence. Probationers are also required to consent to periodic equipment inspections as requested. Although most jurisdictions have some type of orientation, extensive “training” of the offender should not be overlooked as part of probation intake. While some MCAPD officers were concerned that too much information might lead the offender to try to “beat the system,” “under training” a probationer or foregoing training altogether will result in an unnecessarily high workload.

Finally, alerts due to equipment failure are particularly problematic in light of the need to mitigate liability. Brown and McCabe (2008) state that “The availability of client location data implies an obligation to act upon that data and a failure to act may result in liability” (p. 6– 1). They suggest that mitigation of liability should be a key aspect of an agency's policy, procedure, and operational strategy. The importance of mitigation cannot be understated in light of the possibility that community supervision personnel could become desensitized to alerts that are in their experience, historically non-violation.

Placing a lower priority these alerts by failing to engage in a timely response and follow-up, or to simply ignore them altogether, implicitly and explicitly implies that an agency has shed its responsibilities and neglected its obligations to enforce statutes, protect victims and the public at-large, and effectively manage offenders.

The current juxtaposition of legislation intent and practice regarding the use of GPS continues to underscore the importance of bridging the gap between research and practice by the development of a confluence through sound, empirically driven policies. Despite the promise in deterring sex offenders from significant levels of geographic or temporal violations, results demonstrated that GPS units demand a high level of human resources and due to their technical shortcomings, GPS can only be viewed as one of many supervision “tools” rather than supervision itself. Importantly, results demonstrated a clear difference between legislative perceptions of the level of technological advancement of GPS equipment and its actual readiness for broad based roll out in community corrections settings at this time. Moreover, it appears from these results that GPS technology is currently too underdeveloped to recommend continued swift enactment of legislation mandating implementation and utilization of GPS in a cost-effective manner.

Note

1. In this jurisdiction, split sentences are a relatively common sanction wherein a jail term is coupled with a subsequent term of probation.

References

Ariz. Rev. Stat. § 13–604.01 (2006).

Ariz. Rev. Stat. § 13–705 (2009). Ariz. Rev. Stat. § 13-902(G) (2009).

Brown, T., & McCabe, S. (2008). GPS use in community supervision: A practitioner's primer. *Perspectives: Journal of the American Probation and Parole Association*, *32*(1), 25−32.

Brown, T., McCabe, S. A., & Wellford, C. (2007). *Global positioning system (GPS)*

technology for community supervision: Lessons learned (Noblis Technical Rep. No. NTR-2007-012). Falls Church, VA: Noblis. Retrieved March 23, 2009 from http://www.ncjrs.gov/pdffiles1/nij/grants/219376.pdf

Button, D. M., DeMichele, M., & Payne, B. K. (2009). Using electronic monitoring to supervise sex offenders: Legislative patterns and implications for community corrections officers. *Criminal Justice Policy Review*, *20*(4), 414−436.

Finn, M. A., & Muirhead-Steves, S. (2002). The effectiveness of electronic monitoring with violent male parolees. *Justice Quarterly*, *19*(2), 293−312.

Frost, G. (2002, Winter). Florida's innovative use of GPS for community corrections. *The Journal of Offender Monitoring*, *15*, 6−10.

Gable, R. S., & Gable, K. R. (2002, September). The practical limitations and positive potential of electronic monitoring. *Corrections Compendium*, *32*(5), 6-8,40-42. Retrieved November 12, 2008 from Criminal Justice Periodicals database. (Document ID: 1385446361).

International Association of Chiefs of Police (2008). Tracking sex offenders with electronic monitoring technology: Implications and practical uses for law enforcement. Alexandria, VA: Author Retrieved March 23, 2009 from http://www.theiacp.org/profassist/reentry/GPS.pdf

Interstate Commission for Adult Sex Offender Supervision (2007). GPS Update Survey, April 2007. Retrieved February 25, 2009 from http://www.interstatecompact.org/LinkClick.aspx?fileticket=lU6GvRmuPwM%3D&tabid=105&mid=431

Maricopa County Adult Probation Annual Report (2008). *Developing Strategic Moves Towards Evidence-based Practices.* Phoenix, AZ: Author.

National Conference of State Legislatures (2008). *Statutes related to Jessica's Law.* Retrieved February 25, 2009 from http://www.leg.state.vt.us/WorkGroups/sex-offenders/NCSLs_Jessicas_Law_Summary.pdf

Office of Program Policy Analysis and Government Accountability (2005, April). Electronic monitoring should be better targeted to the most dangerous offenders. (Report No. 05—19). Tallahassee, FL: OPPAGA Report Production. Retrieved November 13, 2008 from

http://www.oppaga.state.fl.us/reports/pdf/0519rpt.pdf

Padgett, K. G., Bales, W. D., & Blomberg, T. G. (2006). Under surveillance: An empirical test of the effectiveness and consequences of electronic monitoring. *Criminology and Public Policy*, *5*(1), 61−92.

Renzema, M., & Mayo-Wilson, E. (2005). Can electronic monitoring reduce crime for moderate to high-risk offenders? *Journal of Experimental Criminology*, *1*, 215−327.

Sample, L. L., & Kadleck, C. (2008). Sex offender laws: Legislators' accounts of the need for policy. *Criminal Justice Policy Review*, *19*, 40−62.

Tewey, J. F. (2005, December 31). *Task force to study criminal offender monitoring by global positioning systems: Final report to the Governor and the General Assembly.* Baltimore, MD: Department of Public Safety and Correctional Services. Retrieved March 23, 2009 from http://www.dpscs.state.md.us/publicinfo/publications/pdfs/GPS_Task_Force_Final_Report.pdf