

HOW WILL DIGITAL IMPLANT
TECHNOLOGY APPLICATIONS IMPACT MEDIUM-SIZED
LAW ENFORCEMENT AGENCIES BY 2007?

A project presented to
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Peace Officer Standards and Training

By

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This Command College Project is a FUTURES study of a particular emerging issue in law enforcement. Its purpose is NOT to predict the future, but rather to project a number of possible scenarios for strategic planning consideration.

Defining the future differs from analyzing the past because the future has not yet happened. In this project, useful alternatives have been formulated systematically so that the planner can respond to a range of possible future environments.

Managing the future means influencing the future; creating it, constraining it, adapting to it. A futures study points the way.

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CHAPTER ONE
ISSUE IDENTIFICATION

Introduction

The introduction of implanted digital chip technology surfaced more than fifteen years ago as a means of positive pet identification. Pet identification chips, produced by Destron Fearing, use an implanted digital chip to store a specific identification number.¹ The identification number corresponds to information about the pet, such as the pet's name, and the owner's address. A scanner passed over the animal detects the presence of a digital chip, and if present, receives the stored information. Pet identification chips do not have tracking capabilities and are limited solely to animal identification. Until recently, only animals were implanted with digital chips. Refinements in technology and functionality of digital chips led to experimental implantation in humans in 1998.

The first human recipient of an implanted digital chip was Professor Kevin Warwick. Professor Warwick, the chairman of the Cybernetics Department at the University of Reading in England had a digital chip implanted in his forearm in August of 1998.² The implant contained a radio transponder, electromagnetic coil and digital chip circuitry sealed in an inert glass capsule. The capsule measured 23 millimeters long and 3 millimeters wide. Transmitting a radio signal to the transponder generates an electrical current in the coil that drives the circuitry. The implanted digital chip transmits a unique code to a computer that can open doors, turn on lights, heaters and in a digitized voice greet Professor Warwick when he enters his office. In July 2001, Applied Digital Solutions announced beta testing of implant technology in humans. The implants are capable of allowing users to emit a homing beacon, have vital bodily functions monitored and confirm identity when making e-commerce transactions. The digital transceiver named Digital Angel sends and receives electronic data capable of continuous tracking by Global

Positioning Satellite technology.³ Once implanted in the body, the movement of muscles electromechanically powers the implanted device. The device can be activated either by the wearer or electronically from a remote monitoring facility.

The Global Positioning Satellite (GPS) system created the ability to determine position, velocity and time using satellite signals to compute positions in three dimensions. Precise locations on earth can be reliably pinpointed with this data. The GPS system consists of twenty-four satellites orbiting the earth in 12-hour cycles. Each satellite repeats the same ground track and configuration over any point approximately every twenty-four hours, thereby maintaining constant satellite coverage. The orbital planes of the satellites are designed to allow between five and eight GPS satellites to be visible from any point on the earth at any given time. The GPS system requires four satellites to compute a location.⁴

The U.S. Department of Defense funds and controls the GPS system. The system was designed for and is operated by the U.S. military; however, thousands of civilian users worldwide use the GPS system. Airplanes, ships, vehicles and individuals use GPS for navigation and are the primary non-military users of GPS. The GPS receivers communicate directly with satellites to determine precise receiver positioning. The cost of a GPS receiver varies based on the capabilities of the receiver. Inexpensive hand-held receivers are available for under \$200.00 whereas other highly sophisticated GPS receivers can cost up to \$40,000.00.⁵ GPS technology created the potential for individuals, vehicles and parcels possessing or containing a GPS receiver to be tracked anywhere in the world.

The marriage of digital implant technology with GPS tracking capability will significantly impact the effectiveness of law enforcement agencies to monitor and track persons,

vehicles and articles. Digital implanted devices can become a means of positive personal identification.

Statement of the Issue

Monitoring and supervising parolees and probationers poses an enormous challenge to law enforcement agencies due to increasing caseloads and shrinking resources. Nationally, 3.8 million adult men and women were on probation at the end of 2000. That number signifies an increase of almost 70,000 probationers from the prior year.⁶ The number of probationers will increase in the future fueled by increasing incarceration costs, prison overcrowding and the increasing use of mandatory minimum prison sentences. On average, each probation officer supervises approximately 258 adult offenders nationally compared to the ideal caseload of thirty probationers per probation officer. Caseload management remains the number one problem facing probation and parole agencies according to a national survey of probation and parole departments. Approximately twenty percent of the offenders assigned to probation have no personal contact with a probation officer.⁷

California state law requires registered sex offenders to register with the police agency serving the jurisdiction of their residence. Convicted sex offenders must register upon moving to the jurisdiction, and then annually.⁸ No routine tracking or monitoring of registered sex offenders occurs other than the annual residence registration. Serious risk sexual predators re-offend at alarming rates. Approximately 88,000 registered sex offenders resided in California in December 2000, an increase of 10,000 registrants from 1998. Nearly 47,000 of the registered sex offenders are child molesters.⁹ The City of Roseville has 110 registered sex offenders living

in the community. Thirty of the sex registrants in Roseville are not living at their address of record and their whereabouts remains unknown.¹⁰

The FBI reported, in its annual Uniform Crime Reports (UCR), that 11.6 million Part 1 crimes were committed in 2000.¹¹ Murder, non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny-theft, motor vehicle theft and arson makeup UCR Part 1 crimes. The Crime Victimization Survey revealed an estimated 25.9 million crimes occurred in 2000.¹² The Crime Victimization Survey includes crimes not reported to law enforcement agencies. Police departments arrested an estimated 2.2 million persons for committing Part 1 crimes in 2000 compared to 2.3 million persons in 1999.¹³ Despite the slight decline in arrests, the number of parole and probationers could continue to rise due to increased conviction rates resulting from increased use of scientific methods for analyzing evidence.

The California Department of Corrections reported it housed an average of 158,759 prisoners daily in 2000 and supervised a daily average of 121,188 parolees. Fifty-four percent of the parolees were returned to prison for violations of parole conditions or for committing new offenses.¹⁴ Additionally, the California Youth Authority incarcerated 14,351 youth offenders and supervised 6,092 parolees.¹⁵ Nationally, 725,500 offenders were on parole in 2000.¹⁶ Of those, 43 percent were returned to jail or prison and 10 percent absconded.

The Center for Missing and Exploited Children reported 876,213 missing person cases in 2000 in the United States. Experts estimate 85-90 percent of all missing persons are children and youths. The number of children reported missing to the FBI National Crime Information Center was 2,100 per day in 2000.¹⁷

The California Attorney General reported 81,291 runaway children in 2000. Fifty-one children were kidnapped by a stranger and 1,938 children were victims of parental abductions.

Another 644 children were missing under suspicious circumstances indicating a stranger abduction.¹⁸ The inability of law enforcement agencies to quickly find runaway children subjects the runaways to potential harm. As an example, a seventeen-year-old female resident in Roseville ran away and was missing for 8 months. Tragically, she was discovered deceased due to complications from childbirth. The female and her adult boyfriend tried to deliver the baby at home to prevent her from being detained as a runaway. The unborn child also died. The boyfriend hid both bodies and fled the area.

Alzheimer's disease patients who wander away and become lost frequently require law enforcement resources to aid in the search. Nationally, 360,000 new cases of Alzheimer's disease are diagnosed each year. Fourteen million Americans will be afflicted with this disease by the year 2050, according to recent estimates.¹⁹ Roseville police officers are regularly summoned to look for missing Alzheimer's patients. Fortunately, most Alzheimer's patients are found unharmed; however, in one recent Roseville case the patient took the family car and disappeared. The abandoned car was found the following day near Folsom Lake. Sadly, the patient died from exposure.

Law enforcement agencies cannot adequately monitor the number of convicted individuals in society today without electronic monitoring and tracking devices. The increased number of probationers and parolees anticipated in the future will compound the ability of law enforcement agencies to monitor those individuals. Current electronic monitoring systems offer some relief to the overburdened criminal justice agencies, however those systems will not be sufficient in the future.

Law enforcement agencies have already partnered with private enterprise to use wireless technology to expand resource capability. Small transmitters secured to the ankles of

probationers are effectively used throughout the country as an alternative method to incarceration. Ankle transmitters are effective in confining the movement of supervised offenders on house arrest, yet these systems have limitations. The restrained person wears a tamper proof transmitter strapped to his/her ankle that sends a continuous signal to a receiver connected to the offender's home telephone. The offender's telephone sends an electronic alert to the supervising probation agency if the offender moves beyond the predetermined perimeter, generally 150 feet. This type of surveillance system effectively monitors offenders while they are at home; however, it does not provide any location information while the offender is outside the perimeter.²⁰

Alzheimer's patients who wander away are sometimes located with wireless technology. Care Trak, Inc. utilizes an electronic transmitter, worn as a wristwatch, to locate missing patients. The transmitter broadcasts a constant electronic signal up to one mile away. A mobile locator receiver tunes into the missing person's individual radio signal allowing a hand-held directional antenna to detect the direction of the signal. An alert signal sounds louder as the directional antenna moves closer to the transmitter. The short signal tracking distance limits the effectiveness of this system. Delays in discovering that a person is missing and the time required to start a search reduce the chances of locating the patient within the limited search range.²¹

The LoJack Corporation developed wireless tracking technology for locating stolen vehicles. Automobile owners purchase the LoJack transmitters and install the transmitter in their vehicle. The transmitter in the LoJack-equipped-vehicle is electronically activated whenever a police agency anywhere in the country enters the vehicle identification number into the National Crime Information Center Stolen Vehicle System. Law enforcement agencies working cooperatively with LoJack install trackers in their police vehicles and aircraft. Law enforcement

agencies do not pay for the tracking equipment. LoJack earns a profit by selling the transmitters to automobile owners. The trackers can locate the transmission signal from several miles away.²²

Electronic Tracking Systems, Inc. (ETS) contracts with law enforcement agencies and private business for property tracking. Miniature transmitters are secreted in property likely to be stolen. Moving the property activates a mercury switch in the transmitter causing the transmitter to broadcast an electronic signal. Police vehicles and aircraft equipped with tracking devices can receive the signal from up to a mile away. The tracking equipment registers direction and approximate distance to the transmitter. Multiple police vehicles equipped with the tracking devices can triangulate the location of the signal.²³

The Roseville Police Department contracts with both LoJack Corporation and Electronic Tracking Systems for wireless electronic tracking of articles and vehicles. Roseville police officers have recovered several stolen vehicles by using the LoJack tracking system. One notable case involved a stolen vehicle transported through Roseville on a train. The LoJack trackers picked up the electronic signal as the train passed through Roseville. Officers regularly recover stolen property equipped with Electronic Tracking Systems transmitters. A robbery suspect was shot and killed after officers tracked an ETS signal to the car he was driving. The officers attempted to stop the car; however, the driver sped away. The pursuit ended when the driver crashed into another vehicle. The driver shot at the pursuing police officers who returned fire and killed the suspect. The suspect was responsible for several Sacramento-area bank robberies.

Pro Tech Monitoring, a Florida based GPS surveillance company, contracts with several law enforcement agencies for satellite monitoring of convicted offenders. The use of the Pro

Tech Monitoring technology is new to law enforcement. The offender wears a transmitter secured to the offender's ankle. The transmitter sends a signal to a GPS locator, referred to as the box. The box weighs about four pounds and resembles a transistor radio. The offender must carry the box with him/her at all times and not be more than 100 feet from the box. The box reports the offender's location to the monitoring agency through the cellular telephone system. This technology greatly expands law enforcement's ability to track and monitor offenders; however, the system has several glitches. Florida authorities monitor approximately 600 offenders with Pro Tech Monitoring.²⁴

Trackable digital implants offer hope to overburdened law enforcement agencies. Digital implants would be difficult for the wearer to manipulate and offer a safe and secure means of tracking an individual's movement. GPS tracking eliminates the obstacles associated with the short tracking distances of conventional methods and equipment.

Public acceptance and judicial approval of implanted electronic tracking systems may pose the single greatest obstacle to the use of digital implant technology. Many opponents to electronic tracking cite civil liberty violations as of paramount concern. The security of tracking system data against unauthorized access and the illegal use of individual tracking information pose challenges to law enforcement as the use of these systems increase.

Defining the size and scope of the problem of monitoring and tracking persons represents the first step in identifying how to solve the issue. Understanding the expected future impacts on the use of implanted digital devices helps to further define the possible solutions and implications of such devices. Possible future impacts are described in the next chapter.

CHAPTER TWO

FUTURES STUDY

Forecasting the Future

A group of individuals was assembled at the Roseville Police Department to examine potential digital implant technology application impacts on a medium-sized law enforcement agency. The Nominal Group Technique (NGT) generated and prioritized ideas in a structured, yet free flowing, format. The Nominal Group technique involves each participant presenting ideas in a round-robin session similar to brainstorming. The NGT process required the group to focus on trends and events that might impact the application of implanted digital devices. The specific issue of the NGT panel's focus was: How Will Digital Implant Technology Applications Impact Medium-sized Law Enforcement Agencies by 2007?

The Nominal Group

The Nominal Group Technique brought together individuals with a wide range of experiences and knowledge to maximize different perspectives and viewpoints. The group identified trends and events they believed could impact the issue in the future. The panel was composed of eight individuals with expertise in the following areas: computer science engineering, clinical psychology, electronic tracking, medicine, and law enforcement. The names of the NGT panel members are listed in Appendix A.

Ten days before the scheduled NGT process, each participant received a packet containing materials describing the NGT process, a definition of trends and events and the issue statement. Additionally, the packet contained literature on the development of digital implant technology and its potential applications. The panelists were asked to bring a list of approximately ten trends and events to the session to expedite the idea collection process.

Trends

The NGT process involved participants verbally presenting their individual trends and events. The group identified 60 trends which are listed in Appendix B. Each trend presenter, before a group consensus vote to identify the most important trends, briefly clarified each trend. The group identified nine trends as having the greatest potential of impacting the issue.

Each member of the group ranked all nine trends with a numerical value in the periods of five years before today, five years in the future and ten years in the future. The numerical value was based on the panelists' perception of the status or importance of the trend at the specified periods. The individual data was collected and a group mean value determined for each trend as shown in Table 2.1.

The nine identified trends are listed in column 1 of the table. Column 3 represents the present day with an arbitrary value of 100 assigned. Columns 2, 4 and 5 display the median values as determined by the panel. The value in column 6 represents the group's median level of concern about the trend with 1 representing a low concern and 10 a high concern.

Trends	-5 Years	Today	+5 Years	+10 Years	Concern (1 to 10)
(1) Tracking/finding lost or kidnapped persons	60	100	175	300	8
(2) Privacy rights litigation	100	100	150	225	10
(3) Social/cultural obstacles to digital implants	50	100	150	200	8
(4) Number of high risk offenders tracked	50	100	200	350	8
(5) Digital personal identification card	30	100	175	300	7
(6) Number of medical complications as a result of implanted digital devices	80	100	200	300	9
(7) Number of breaches to national security incidents	50	100	200	350	10
(8) Microchip technology improvements	35	100	200	400	8
(9) Cost Effectiveness	75	100	150	150	5

Trend Analysis
Table 2.1

The nominal group panel identified the following trends as most likely to impact the use of digital implant technology by medium-sized police agencies.

1. Tracking / Finding Lost or Kidnapped Persons

The panel believed the failure of law enforcement to locate lost, missing or kidnapped persons before they suffered physical or emotional harm significantly impacted the acceptance of society to use implanted tracking technology. The panel thought the use of digital implant tracking technology would result in increased success in law enforcement's ability to locate lost

or kidnapped persons before they suffered harm within the next ten years. The successes would grow within the next five years with the greatest improvement during the next five to ten years according to the panelists. They viewed this trend as important to the issue with a concern rating of eight.

2. Civil Rights Litigation Cases Involving Privacy Rights

The panel thought court litigation of privacy rights regarding law enforcement's electronic tracking and monitoring of people would have a significant impact on the issue and stir considerable future legal debate. Considerable discussion by panel members occurred regarding the forced or voluntary implantation of digital tracking devices in persons. Some panelists believed any attempt to force implantation of digital devices into the general population would be overruled by the courts. However there was consensus that implantation on a voluntary basis or to those who are incapable of giving consent, such as infants and Alzheimer patients would have a much better chance of surviving privacy rights litigation. The panel believed the growth of this trend would increase in the next five years followed by a sharper increase in ten years.

3. Social and Cultural Obstacles to Digital Implants

The panel recognized this trend as closely related to the previous trend, privacy rights litigation, as the success or failure of privacy rights litigation may be influenced by social and cultural concerns. Yet the panel believed there were substantial differences. They recognized the use of digital implanted devices as an extremely controversial issue that will raise considerable debate and media attention. The panel was strongly influenced in their analysis of

this trend by the terrorist attacks at the World Trade Center and Pentagon on September 11, 2001. They saw this trend significantly impacting the issue with the impact increasing in the future as evidenced by the value in the +5 and +10 columns. The panel believed the terrorist attack would result in a greater acceptance of the use of this technology in the future.

4. Number of High-Risk Offenders Tracked

The NGT panel realized this trend would have a strong impact on the issue. They discussed the failures of current tracking systems and the perceived high number of convicted sexual offenders who are free in society and not adequately monitored. This trend had universal support by the panelists who saw a tremendous increase in the number of offenders tracked in the next ten years. They felt the mandated electronic tracking of high-risk offenders was appropriate for the protection of citizens.

5. Digital Personal Identification Cards

The panel identified the trend of a digitally encoded personal identification card as important to this issue. The panelists forecast the use of personal identification cards may soften the transition to an implanted digital device. The members noted that advances in technology have increased the ability to store data electronically in the past five years. They anticipated continued refinement in the technology of smart cards in the next five years with a significant increase in five to ten years. Some panelists thought a national identification card would replace the individual state driver's license as a primary source of personal identification.

6. Number of Medical Complications as a Result of Implanted Digital Devices

The panel viewed this trend as significantly important if implanted devices were determined to cause adverse medical ailments. The panel believed the impact would be minimal, because no adverse conditions have arisen from implanted devices in animals to date. The panel was cautious about potential adverse health concerns caused by expanded capabilities of future implanted digital devices and thus identified the impact as significant. The technologies used to power future devices and transmit location data concerned some members relative to the effects on individual health.

7. Number of Breaches to National Security Incidents

The September 11, 2001 terrorist attack on the United States created a heightened level of concern for national security among the panelists. They commented that their concern for national security was minimal before the terrorist attack as reflected in their numerical value toward the trend five years ago and an increase in breaches to national security. The members saw an increasing concern on national security during the next five and ten years. Their concern of this trend was high and they believed any increase in national security or terrorist incidents would impact this trend.

8. Microchip Technology Improvements

The panel members believed that the anticipated refinements and innovations in microchip technology would have a profound impact on this issue. They discussed the rapid advances in automated wireless technology and the anticipated future advances. The nominal group believed this trend would advance at a rate higher than any of the other listed trends as depicted on the table. They thought future improvements in the size and capabilities of

implanted devices might make the viability of their use less objectionable to the populace. The board felt strongly that the use of tracking devices will increase in the future in a wearable or carried medium; however, they remained cautious of the acceptance of implanted devices.

9. Cost Effectiveness

The panel identified potential cost savings as a significant trend related to the use of implanted digital monitoring devices compared to traditional non-automated methods. They noted finding lost or missing persons with an implanted tracking device would generally require fewer resources to locate the person. The panel anticipated a reduction in the number of parole and probation officers if all parolees and probationers had implanted monitoring devices. The law enforcement panel members thought significant cost savings would result from electronic monitoring of convicted sex offenders compared to the cost of systems now in place. The board also viewed the inability of wearers to tamper with or remove the devices positively. The ability of law enforcement agencies to continue to use GPS tracking satellites without cost was of concern. Panel members believed the GPS satellites are owned by the military and restrictions on the use of the satellites by non-military users could prove cost prohibitive. However, the majority of the panel members did not think that would occur and felt the trend would be for continued cost effectiveness over the next 10 years.

Events

The same nominal group members participated in the event identification phase. The results are shown in Table 2.2. The group identified nine significant events as depicted in column 1. Column 2 in the event chart displays the group's median value identifying the number

of years from today the event could first occur. Columns 3 and 4 show the median group value expressed as a percentage of the likelihood of the event occurring within five and ten years respectively. The last column, number 5, represents the group’s median value of the impact of the event on the issue. The impact is expressed in a range from –10, an extremely negative impact, to +10, a high positive impact. The NGT panel selected nine events as the most significant events from 31 events identified during the NGT process. The 31 events are listed in Appendix C.

Events	Year > 0	+5 Years	+10 years	Impact -10 to +10
(1) Supreme Court rules digital implants constitutional	4	5%	70%	+10
(2) Supreme Court rules digital implants unconstitutional	5	10%	30%	-10
(3) New technology makes digital implant technology obsolete	6	0%	75%	+7
(4) Computer hackers compromise financial institutions	2	70%	90%	-6
(5) Riots erupt due to loss of privacy rights	10	0%	10%	0
(6) Stock market crash	5	5%	15%	-5
(7) Kidnap victim located unharmed by use of implanted digital tracking device	2	100%	100%	+8
(8) Economic Globalization	10	40%	50%	5
(9) Prisons become obsolete due to electronic incarceration	65	0%	0%	4

Event Analysis
Table 2.2

1. U.S. Supreme Court Rules Digital Implants Constitutional

This event, coupled with event 2, generated significant discussions among the group as it could significantly impact the issue. The median group impact value was +10 despite one

panelist rating the impact value at -5. The extreme variance seemed to result from one member's belief that governmental monitoring via GPS technology violates individual rights and is inappropriate. The group felt strongly, with a 70 percent projection of probability, that the Supreme Court would approve of digital implants within five to ten years. They saw the likelihood of such a ruling within 5 years as improbable with only a 5 percent chance of occurring.

2. U.S. Supreme Court Rules Digital Implants Unconstitutional

Events 1 and 2 are exact opposite court rulings. The members felt there was 30 percent probability of the Supreme Court ruling digital implant use unconstitutional within ten years. The ruling would have a severe negative impact on the issue. They recognized the voluntary use of implanted digital devices would probably not warrant court scrutiny. The panel believed the cases of forced or mandated use could potentially involve court litigation.

3. New Technology Makes Digital Implants Obsolete

The NGT members felt this event had a significantly high probability of occurring in ten years. They gave such an outcome an impact value of positive seven. The impact rating seems to conflict with the issue since the obsolescence of digital implants would generally be viewed as having a negative impact rather than a positive impact. The group rated the year this event could first occur at six years with a 75 percent probability of occurring in ten years.

4. Computer Hackers Compromise Financial Institutions

The nominal group felt strongly that computer hackers would create havoc with national electronic databases such as in the financial industry. They believed such occurrences might shake citizen confidence in wireless technology and would have an adverse impact on this issue. The nominal group's belief that such an event would occur within five years with a 70 percent probability generated significant concern.

5. Riots Erupt Due to Loss of Privacy Rights

The group believed this event had a low potential of occurring and, if it did occur, it would not happen for ten years. Further, they saw such an event as not impacting the issue. The panelists did not think civil unrest would result in dramatic changes to privacy rights because sweeping changes have not historically resulted from domestic civil unrest. The panelists felt this event had a small probability of occurring.

6. Stock Market Crash

This event was deemed significant by the group and had a 5 percent chance of occurring in five years. The panelists believed that while the potential of this event was low, the impact would be significant. They viewed the elimination of governmental funding for tracking systems as likely if the stock market collapsed. Medium-sized police agencies rely heavily on governmental grants for technology purchases and the panel thought this event would signal an end to governmental grants. A stock market collapse could limit the resources available for scientific research of digital implant technology.

7. Kidnapped Victim Located Unharmed by Use of Digital Tracking Device

The panel felt certain digital tracking devices would result in the successful finding of kidnapped persons within five years. They believed the tracking device might be a wearable style rather than an implant. The panel discussed the success in vehicle tracking systems such as LoJack. The successful recovery of a kidnap victim would bolster confidence in the technology, give rise to greater public acceptance of the practice, and be positive for the issue according to the panel. The panel believed the prevention of a serious crime through the electronic monitoring of a known predatory offender would be positive.

8. Economic Globalization

The nominal group identified a trend toward globalization of currency as a trend that may impact the issue. The standardization of currency, such as the Euro dollar, was believed to potentially impact the world economy. The panel thought the potential for such a movement was strong within the next ten years and had a low impact concern.

9. Prisons Become Obsolete Due to Electronic Incarceration

The panel recognized a trend toward alternative sentencing methods for convicted persons. This specific trend involved the elimination of prisons due to electronic incarceration by yet undeveloped technology. The panel did not view this potential as significant with the likelihood of it not occurring for sixty-five years.

Cross Impact Analysis

Two members from the Nominal Group Technique process assisted with analyzing the trend and event data and the preparation of a cross impact analysis. The impact of events on

trends was scored using a numeric rating of -5 to +5. A rating of zero indicated no impact. A rating of -5 indicated the strongest negative impact and a rating of +5 indicated the strongest positive impact. The cross impact analysis illustrated the potential impact of specific events on trends. Data from the cross impact analysis resulted in strategies to deal with potential outcomes. The cross impact values generated by the members were converted to median scores. The median scores are illustrated in Table 2.3.

	Trend 1 Finding lost person	Trend 2 Privacy rights laws	Trend 3 Social/ Cultural obstacle	Trend 4 High risk offender	Trend 5 Digital ID card	Trend 6 Medical issues	Trend 7 Nation Security issues	Trend 8 Micro chip tech.	Trend 9 Cost
Event 1 Constitutional	0	-2	3	5	5	3	4	3	1
Event 2 Unconstitutional	-5	0	-5	-5	-3	3	-5	-3	1
Event 3 Implant obsolete	4	-1	3	4	4	5	4	5	2
Event 4 Hackers	-2	-3	-3	-4	-2	0	-5	-4	-3
Event 5 Privacy rights	0	-3	-5	-1	-2	0	-3	-1	-2
Event 6 Stock Market	-2	0	-1	0	0	-1	-1	-2	-3
Event 7 Kidnapping	2	2	4	4	4	0	2	3	3
Event 8 Economic	2	0	1	0	0	0	1	1	2
Event 9 Prisons obsolete	4	-2	4	5	4	0	1	4	4

Cross Impact Analysis
Table 2.3

The cross-impact analysis indicated that a Constitutional Supreme Court ruling, event 1, could have a positive impact on all trends except privacy rights laws, trend 2. The occurrence of event 1, a Constitutional Supreme Court ruling, significantly affects the number of high-risk offenders tracked and digital personal identification cards, trends 4 and 5. A constitutional

ruling permitting implanted digital chips would greatly increase the ability of police agencies to track and monitor high-risk offenders. Such a ruling would also potentially ease restraints on mandated digital identification cards.

Event 2, Unconstitutional Supreme Court ruling, negatively impacts all trends except privacy rights litigation, medical issues arising from digital implants and cost effectiveness, trends 2, 6 and 9. An unconstitutional ruling would obviously prohibit the use of implanted digital tracking devices and significantly impact finding lost persons and tracking high risk offenders, trends 1 and 5. It also impacts national security issues, trend 7, adversely because no electronic tracking of suspected terrorists would occur if digital implant devices were determined to be unconstitutional.

Event 3, new technology, would positively impact several trends because new technology would enhance the capabilities of tracking and monitoring individuals. Event 3, the obsolescence of digital implants due to new technology, would positively impact the finding of lost persons, the number of high risk offenders tracked, digital identification cards and the number of breaches to national security, trends 1, 4, 5 and 7. Any new technology would presumably be more effective in tracking and monitoring those persons. Event 3, new technology makes digital implants obsolete, could impact trend 6 by eliminating health concerns or perhaps creating new medical problems due to the advanced technology.

Event 4, computer hackers compromise financial institutions, might create negative impacts on the number of high risk offenders tracked, breaches to national security and microchip technology improvements, trends 4, 7 and 8. Computer hackers compromising a wireless communication network may erode confidence in other wireless communication networks, impacting their effectiveness and use.

Riots caused by a perceived loss of privacy rights may negatively impact the trend concerning social/cultural obstacles by swaying public opinion against the use of this technology. Implanted digital technology and its application to track humans will create considerable controversy and debate.

Event 9, the obsolescence of prisons due to electronic incarceration, has the potential to positively impact several trends. The advancement of electronic monitoring to a level where it could replace prisons represents a significant improvement in the technology. The technology improvements necessary to accomplish Event 9 positively impact the finding of lost persons, the number of high-risk offenders tracked and the number of breaches to national security, trends 1, 4 and 7. The sophistication of electronic monitoring and tracking technology capable of controlling inmates in a prison without walls would be equally effective in monitoring high-risk offenders in society.

Scenarios

Scenarios are imagined situations, projected into the future, to provide a glimpse of the possibilities that might occur because of the impact of events on trends. They are based on historical data, NGT process results and cross impact data analysis. The following describe possible pessimistic, optimistic and normative scenarios.

Pessimistic Scenario

Larry Lucky finished sipping his morning coffee and verbally commanded his television to turn on. Larry knew voice activated appliances were the new wave but he sure missed holding the remote control. The television flickered to life displaying the date and time on the screen,

Thursday March 10, 2007, 5:30am. Larry no longer received his daily newspaper. Paper news was discontinued years before. He accessed the news website on this television and scrolled the electronically presented articles. Larry had little time for reading the news before departing for the office. His work as an ACLU attorney was endless and tiring. The lead story detailed the kidnapping of an executive's daughter the night before. The kidnapper demanded a high ransom for her safe return. The police, using the GPS digital chip implanted in her hand, pinpointed her location and rescued the daughter several hours later. The parents were joyous at the quick return of their daughter; however, Larry's anger began to rise.

Larry had recently argued a case before the U.S. Supreme Court against the implanting of digital chips in humans. Like many citizens, he felt strongly the practice was wrong and an invasion of privacy. Small children could not legally give consent for such invasive tracking systems and parents should not be allowed to give the consent, Larry believed. The recent demonstrations at the state capitol regarding the passage of new laws requiring implanted digital tracking devices in all parolees was evidence to Larry that the citizens objected to the practice. Larry knew his fight for individual freedom from government intrusion was a just cause.

Larry scrolled through the remaining news articles on the television, finished his coffee and left for the office. Larry failed to see an approaching car as he backed out of his driveway. Fortunately, the other driver was able to veer around Larry and avoid a collision. Traffic Officer Gotcha saw the near collision and stopped Larry for the traffic violation. Officer Gotcha asked Larry for his national ID card. Individual state driver's licenses were no longer issued. A single computer check revealed everything Officer Gotcha needed about Larry. Inconspicuously, Officer Gotcha passed his digital chip scanner over Larry's hand to determine if Larry had an implanted digital identification chip imbedded there but received a negative reading.

Larry was angry while he sat in his car waiting for the officer to finish the citation. Larry knew he committed the violation but was angry with the officer for issuing a citation. When Officer Gotcha returned, Larry yelled out saying he would have the last word when the Supreme Court ruled against the police for using implanted tracking devices. Officer Gotcha told Larry to have a pleasant day as Larry drove away.

Optimistic Scenario

Ima Crook lay on his jail bunk contriving ways to beat his latest arrest. He was mystified how quickly his arrest occurred following his release on parole. He will always remember that day, Friday May 22, 2007, because May 22 was his thirty-fifth birthday. He knew the implanted digital chip was in his arm. Ima Crook agreed to the implanted device to secure an early prison release. He did not think it actually worked. Now he was back in jail.

Lying on the bunk, Ima Crook thought about what went wrong. He was ordered by the judge not to leave the state but the pull of the Nevada casinos was just too much. He thought no one would notice him if he traveled at night since his parole agent was off duty. He would be gone only a few hours. He knew the Supreme Court recently ruled the use of implanted tracking devices was legal, so his attorney would have to find another angle to help him beat this charge.

Parole Agent Eye Spy leaned back in his easy chair and smiled as he closed the thick folder with Ima Crook's name written on it. Eye Spy recalled the days when he actually had to track down parolees in the field. Those days were over. All he had to do now was monitor the movements of his assigned parolees on his desktop computer screen. Tracking them was so easy. Eye Spy missed the excitement of working the streets; however, with this new system he

could monitor 100 parolees at a time. The financial savings to the state and taxpayers was significant, he knew.

Eye Spy expected Ima Crook to violate his parole, however he was surprised how quickly it occurred. Eye Spy placed Ima Crook's folder in the closed case basket and picked up another folder while turning to look at his monitoring screen.

Normative Scenario

Detective Mike Wiley studied the new missing person case folders stacked on his desk. He glanced at his calendar noting it was April 3, 2007. He despised Monday mornings and the stack of new missing person cases that greeted him every Monday. He would add the cases to the stack of open cases already on his desk. Giving a big sigh and taking a gulp of his coffee, he began to read the cases. He knew he had more cases to work than he had time. The telephone would start ringing soon with family members wanting to know what Detective Wiley was going to do to find their loved one.

The number of investigators assigned to the missing person bureau was cut from four investigators to one due to budget constraints. The economic recession and department cut backs left only Detective Wiley and a volunteer in the unit. Detective Wiley learned two of the missing persons were Alzheimer's disease victims as he read the reports. He had worked similar cases in the past and knew they were difficult because the person might go anywhere.

Detective Wiley recalled reading an article in the Police Weekly magazine where some cities had obtained GPS tracking transmitters for Alzheimer's patients in order to locate them if they wandered away. The transmitters looked like a wristwatch and could not be removed by the person wearing it. Detective Wiley knew he could probably quickly close at least two cases if

the tracking system was available in his city. Detective Wiley wondered if GPS tracking transmitters could be put on parolees to monitor their movements. That certainly would cut down on the overburdened parole system, he thought. Detective Wiley knew the ACLU would fight against a program to electronically monitor parolees. The telephone rang breaking Detective Wiley's thought. He answered the phone, "Missing Person Bureau, how can I help you."

The GPS satellite system created the potential for precise tracking of remote transmitters anywhere in the world. This capability created opportunities for many businesses interested in tracking the products it sends or receives. For law enforcement, the GPS system provides an economical means of tracking or monitoring those persons for which law enforcement has oversight responsibility. How implanted digital devices are used to accomplish the monitoring depends on several factors, most notably the acceptance of the technology by citizens and court scrutiny. It is important for law enforcement agencies to develop specific strategies for using this emerging technology.

The use of this emerging technology will require law enforcement agencies to analyze their internal and external environment to ensure they are suited for adopting the technology. Using a strategic planning process will help individual law enforcement agencies determine their organizational strengths and weaknesses and the external factors that may influence the change before the proposed change is made. Implementing the use of implanted digital devices will require significant changes in law enforcement operations. A strategic planning process will uncover the obstacles and potential roadblocks to successful implementation.

CHAPTER THREE

STRATEGIC PLAN

Introduction

Strategic planning involves a systematic method of enabling an organization to anticipate environmental settings confronting the organization in the future. For effective strategic planning, the guiding members of an organization must clearly understand the organization's purpose. They must envision the desired future of the organization, develop the necessary goals, objectives and action plans to achieve that future.²⁵ Law enforcement managers must anticipate their rapidly changing environment. This strategic plan defines strategies essential to developing, implementing and managing how digital implant technology applications will impact medium-sized law enforcement agencies by 2007. The strategic plan contains recommendations to assist medium-sized law enforcement agency managers plan for using wireless tracking devices and digital implants. A vision was created in the strategic plan to describe the future. The vision allows members of the organization to look forward from the present state to a desired future state.

The Roseville Police Department has established a reputation throughout the law enforcement community as an innovative department. The department members are committed to improving the quality of life for residents by using proven law enforcement methods coupled with innovative foresight in order to solve problems. The Roseville Police Department's vision and mission statement are used as a model as the police department meets the definition of a medium-sized police agency.

Vision

A vision statement allows all members of an organization to visualize the future destination of the organization. It helps establish organizational culture and focus employees toward a desired future state. The Roseville Police Department's vision statement describes the desired goals of the department.

A Healthy, Safe and Secure Community.

The Roseville Police Department shall continue to work collaboratively with the citizens of our community so they may enjoy the highest quality life. We are an organization that cares for youth, senior citizens and families striving to make them feel safe and secure. We use technology in service delivery but always with a human touch. We shall continue to provide the highest quality service and are committed to excellence. We are a professional organization with a sense of direction, intensely focused on our future.²⁶

The Roseville Police Department's mission statement captures the ideas expressed in the vision and identifies the template for objective and goal accomplishment.

Mission Statement

The Roseville Police Department exists to serve our community. Our primary responsibility is the safety of the public and the protection of their property.

Honor, Courage, Excellence and Teamwork are the core values that guide our organization.

Core Values

Honor

Honor is the value of personal and professional accountability displayed through integrity, honesty and ethical behavior. We recognize the privilege of serving and strive to treat everyone with dignity and respect.

Courage

Courage is the value that gives moral and mental strength to do what is right with confidence and resolve in the face of temptation or adversity. We will perform our duties with intolerance for illegal or unethical conduct.

Excellence

Excellence is the value of striving to be the best. We are committed to providing the highest quality service. We encourage personal and professional growth through innovation, education and training.

Teamwork

Teamwork is the value that fosters cooperation through a positive work culture and partnership with the community. We encourage and share ideas and goals while respecting individuality.²⁷

The Vision, Mission and Core Values of the Roseville Police Department defines the department's guiding principals and identifies how the organization strives to meet identified goals and objectives.

Organizational Analysis

Organizational analysis identifies key issues to facilitate a strategic approach. Matching internal organizational strengths and weaknesses with environmental opportunities and threats (SWOT) is a systematic method of classifying the internal and external organizational environment. Strategic plan development requires the organization's managers have a clear understanding of the organizations internal and external environment. The SWOT analysis was conducted using the Roseville Police Department, a medium-sized police agency. The analysis examined how digital implant technology applications will impact medium-sized law enforcement agencies by 2007.

A SWOT analysis of the Roseville Police Department by department managers revealed the following internal and external factors:

Internal Strengths

- Innovation and increased use of technology.
- Availability of advanced training opportunities.
- Works cooperatively with the Roseville Coalition of Neighborhood Associations (RCONA).
- Cooperative partnerships with public agencies.
- Positive working relationships within the law enforcement community.
- Dedicated employees who subscribe to the Department's mission and vision statement.

Internal Weaknesses

- Inability to fill police officer vacancies.
- Loss of experienced employees to other agencies / retirement.
- Reluctance of some employees to accept new technology.
- Resistance to change.
- Assurance of consistent funding.
- Limited training dealing with Alzheimer's disease and dementia patients.
- Change in department leadership may reduce the emphasis on technology.
- Apathy of employees to become involved in organizational opportunities outside their current job responsibilities.
- Supervisory employees not prepared to assume management positions.
- Individual priorities take precedence over organizational needs.

External Opportunities

- Recognition as a technologically advanced organization.
- Increased community support.
- Expand existing partnerships with private enterprise.
- Enhanced investigative capabilities by utilizing technological advancement from outside sources.
- Increased community sense of security and safety.
- Expand existing regional law enforcement cooperative efforts.

External Threats

- Court rulings restricting policing practices.

- Public protests from privacy rights advocates.
- Misuse of technology.
- Security of confidential automated information.
- Lawsuits relating to privacy rights.
- Obsolescence of existing systems due to changing technology.
- Loss of state and federal government grant funding.
- Electronic communication systems incompatible with surrounding law enforcement agencies.

Stakeholder Identification

Stakeholders are those individuals or groups who may be impacted by the organization, its resources, output or may impact the organization.²⁸ Understanding the relationship between the organization and stakeholders is critical to the strategic planning process.

Management staff at the Roseville Police Department reviewed and discussed how digital implant technology applications will impact medium-sized law enforcement agencies by 2007 before compiling a list of probable stakeholders. The potential stakeholder and role of the stakeholder was identified. An effort was made to consider all possible stakeholders including those stakeholders who may not be immediately obvious. An important task involves identifying obscure stakeholders, sometimes called snaildarters, who unexpectedly assert themselves at inopportune times.

American Civil Liberties Union

- Files lawsuits for individual and class actions.

- Represents special interest groups.

United States Supreme Court

- Determines constitutionality of laws.
- Determines compliance with constitutional mandates.
- Review lower court rulings.

United States Department of Defense

- Funds and controls the Global Positioning Satellite system.

Private Companies involved in the research and marketing of implanted digital devices

- Digital implant research and design, holds U.S. patents on design.
- Contracts with U.S. Department of Defense for access to GPS system.
- Contracts with law enforcement for Digital Implant tracking.
- Financial profit motivation.

Parole and Probation Departments

- Responsible for monitoring and supervising parolees and probationers.
- Grant early release from prison, conduct Parole Board Hearings.
- Recommend incarceration or probation for convicted offenders.
- Liaison between the courts and law enforcement agencies.
- Establish parole and probation release criteria.

Federal Communications Commission

- Establishes rules and regulations governing electronic communications.
- Issues licenses and permits for wireless communication.

Law Enforcement Executive

- Establish policy and procedures relative to the use of implanted tracking devices.
- Develop Mission statement.
- Responsible for budget.
- Assure the organization is adequately staffed and equipped to accomplish its mission.
- Assure compliance with City Council and City Manager mandates.
- Approve new technology acquisitions.
- Scan external environment for signals of change.
- Lobby state legislature for favorable laws.

Police Officers

- Work cooperatively with parole and probation agents.
- Recognize the benefits of new technology.
- Subscribe to the organizations Mission and vision statements.
- Foster change.

United States and State Legislature

- Pass laws.
- Establish law enforcement mandates.

- Approve law enforcement block grants.

Search and Rescue Units

- Responsible for locating lost or stranded persons.
- Assist local governmental agencies.

Religious Organizations

- Establish social culture.
- Influence public opinion.

Racial Interest Groups

- Advocate change.
- Lobby legislature.

Development of Implementation Strategies

An implementation plan must be designed to address priority setting, decision-making and resource allocation. It should express the need, expected outcome, planning horizon and time frame of the plan. The key stakeholders and appropriate organizational staff from all levels must be involved in the process to ensure success. The impact on all stakeholders must be analyzed. The following strategies are based on an optimistic scenario to assist a medium-sized law enforcement agency decide how to use implanted digital devices in the future.

Strategy 1

The use of implanted digital devices will stir considerable controversy and pale to the controversy experienced with the introduction of microchip implants in pets years ago. Law enforcement agencies should focus the introduction of this technology on a voluntary basis and initially avoid any mandated programs. This strategy will accomplish several objectives. First, it will introduce the technology to willing recipients thus avoiding potential court challenges. Targeting a specific group for voluntary implantation may be an important strategy. An effective marketing plan could involve educating outdoor enthusiasts, for example, on their increased safety by the reduced time, effort and cost to find lost hikers or snowmobilers. Publicity of successful implant tracking cases will build confidence in the system and demonstrate the benefits of GPS monitoring. Broadcasting tragic incidents where the use of implanted digital tracking devices could have prevented the tragic result will aid in generating support.

Law enforcement agencies will need to work cooperatively with private vendors marketing the technology. Law enforcement managers and private vendors can cooperatively design implant devices that meet the unique needs of law enforcement. The devices will have to be affordable for the individual and the law enforcement agency.

Strategy 2

Law enforcement agencies will need to lobby the state legislature to enact laws mandating the implantation of GPS tracking devices in all sex registrants classified as serious and high-risk offenders in addition to all parolees convicted of violent crimes. By working collaboratively with organizations such as the Polly Klass Foundation, The National Center for Missing and Exploited Children and other law enforcement agencies, the law enforcement

executive can hopefully gain lobbying support for electronic tracking laws. Law enforcement agencies must attempt to gain support from the California Department of Corrections Parole Unit and local Probation Departments to give testimony to the legislature on the ineffectiveness of the current parole and probation systems.

Law enforcement managers can create a sense of urgency by publicizing the number of sex registrants and parolees whose whereabouts are unknown. Detailing the recidivism rates for sex offenders and parolees will help demonstrate the need and urgency for GPS tracking. Cite circumstances where this technology could have prevented tragic results.

Strategy 3

Law enforcement managers must work cooperatively with digital implant research and design units to identify characteristics best suited for law enforcement's needs. Frequently law enforcement agencies settle for generalized systems and adopt them as well as possible to a law enforcement application. Ensure adequate security measures are in place to guarantee confidentiality of the operating systems. Development of a user controlled implanted device for persons who voluntarily receive an implant may reduce the hesitation of some persons to accept the technology.

The strategic plan focuses the vision of the Roseville Police Department on the desired future state pertaining to the possible applications of digital implants. By identifying all potential stakeholders, the police department can work to develop possible implementation strategies. Once those strategies are solidified, efforts to transition the police department into designing an action plan can begin.

A transition management plan will identify specific steps required to implement the change. The plan will establish a timeline for completion and identify who is responsible for individual task accomplishment. The use of a structured transition management plan will increase the likelihood for successful implementation.

CHAPTER FOUR

TRANSITION MANAGEMENT

Change is a transition from a present state or current condition to a desired state; it is the moving from the present to the future.²⁹

Commitment Planning

Organizational success requires change yet change creates anxiety and the potential of failure. The prospect for success requires an understanding of change management. Identifying a necessity or urgency for the change and communicating the urgency to key organizational members generates support for change. The goal at this stage involves fostering a team atmosphere for leading the organization in change and developing a vision of the change. Change efforts will fail without the support of the critical mass.³⁰ Generating short-term wins builds momentum for the change process and demonstrates visible signs of success. Building on small successes strengthens the resolve and undermines the cynic and self-serving resisters. Anchoring change in the culture requires continuous reinforcement from the critical mass. The critical masses are those individuals or groups whose active commitment influences others to follow the change process. Without the support of the critical mass, change momentum can be lost to regression.

Organizational managers must identify and target the critical mass. These individuals and groups within the organization are the change agents because they see the value in the change and support the desired outcome. Change agents must identify the stakeholders within the critical mass because of the influence they possess over others. The following list identifies

groups and individuals whose support will assist in determining how implanted digital devices will be used by medium-sized law enforcement agencies:

- Chief of Police
- Police Managers
- Police Officers
- Digital chip industry
- Elected government officials (federal, state and local)
- Department of Corrections (parole)
- Probation Departments
- Federal and State judges

Implanting digital devices in humans will generate considerable resistance despite support from the critical mass. Many groups and individuals will claim implanted digital devices violate their civil rights and individual privacy rights. Their opposition may influence public opinion. The courts will ultimately decide privacy rights issues. The courts will determine the extent implanted digital devices can be used by an unwilling population. Public opinion on the use of implanted devices may affect any judicial opinion rendered by the courts. Lobbying legislators and special interest groups may result in legislative mandates for implanted GPS tracking devices in parolees, probationers and registered sex offenders.

Voluntary usage of implanted devices will probably not involve court scrutiny; however, influencing individuals to accept this technology may progress slowly. Perhaps the greatest inroads will occur by using implanted devices for medical evaluation purposes such as monitoring the physical condition of an individual who has a diagnosed medical problem. The digital chip can detect a change in the medical condition and immediately transmit the

information to the treating physician.³¹ As people become accustomed to human implanted digital devices, the resistance to greater capabilities of the devices might be minimized. Another key consideration will be the ability of the implanted person to control some or all of the functionality of the implanted device. The use of a wearable digital device might be an acceptable alternative to voluntary users who will not permit the intrusion of an implanted digital chip.

Implementation

The use of digital implant technology by law enforcement remains dependent on digital implant technology refinement. Limited applications of implant technology are present today; however, the technology has not advanced to the state where wide-spread use is practical. Law enforcement executives must plan for the eventuality of using implant technology. The rapid rate of technological advancement, coupled with the current beta testing of implant technology, provides clear notice this technology is nearing reality. A five-year implementation plan describes the necessary steps for the Roseville Police Department and other law enforcement agencies to prepare for the technology.

Year One

Law enforcement executives should create partnerships with other public agencies that will benefit from the enhanced capabilities of digital implant technology. In a cooperative effort, the executives must determine how the use of this technology will best suit the needs of law enforcement organizations as a tool to reduce crime rates, solve crimes and reduce resource requirements. Identifying a coalition of public agencies ambitious to use the technology will

help law enforcement leaders demonstrate a need for a law enforcement application. Law enforcement leaders need to meet with representatives from the companies involved in microchip research and marketing to relay the requirements for law enforcement's application of the technology. Law enforcement executives should monitor the current use of implanted devices and externally worn monitoring devices.

Responsibility: A state or national organization such as California Police Chief's Association or the International Association of Chiefs of Police are best suited for such a coordinated need assessment in conjunction with parole and probation departments.

Tasks:

- Identify law enforcement stakeholders and establish communication with the key individuals.
- Education of potential applications of this emerging technology to stakeholders.
- Develop a needs assessment questionnaire.
- Monitor development in digital implant technology.
- Establish local agency responsibilities

Year Two

The selected law enforcement executives should initiate dialog with the research and design units of digital implant research companies. They can address law enforcement's needs and requirements for successful use of implant technology as determined in the needs assessment. In cooperation with the digital implant manufacturers, identify a marketing strategy for digital implants.

Responsibility: Individual law enforcement agency representatives.

Tasks:

- Identify implanted digital technology companies.
- Open dialog with the research and design units.
- Communicate progress with stakeholders.
- Identify potential companies to market implanted digital implants, such as LoJack or Electronic Tracking Systems.
- Identify potential law enforcement costs for use of the systems.

Years Three and Four

Law enforcement executives build regional and local support for the technology. They should focus on the potential application of voluntary participation by individuals with the greatest need such as the mentally impaired, infants, outdoor recreationalists and those at risk of kidnapping. If implanted digital chips capable of GPS tracking are not yet readily available, law enforcement executives should continue to pursue the use of wearable tracking devices.

Responsibility: Individual Enforcement Executives who desire this technology

Tasks:

- Coordinate meetings with local associations deemed to represent those with the greatest need, such as Alzheimer patient support groups or outdoor recreation companies for the technology.
- Identify the operational needs and financial impact for implementing GPS based digital implant tracking.
- Determine availability of digital implant devices.

- Use portable GPS based tracking devices and secure contract agreements with a marketing company.
- In concert with the contract company, develop a marketing strategy.
- Encourage citizens to voluntarily use tracking devices.

Year Five

Law enforcement leaders must monitor the availability of implanted digital devices. The NGT panel believed GPS tracked implanted digital chips might not become available for five to ten years.

Responsibility: Individual Enforcement Executives

Task:

- Determine availability of implanted devices.
- Maintain contact with implant marketing companies.
- Establish timeline for implementation and identify target group.
- Finalize contracts with the marketing company for implementation.

Responsibility

Role responsibility must be clearly defined and understood by all participants for an effective strategic plan to succeed. Responsibility charting involves a method of visually representing the steps required to move a change forward and identify the roles individuals or groups play in the process. Responsibility charting reduces confusion, wasted energy and adverse emotional reactions between individuals and groups affected by the change.

The responsibility plan described on the following pages assumes a national or state implementation plan. However, if a national or state plan falters, local law enforcement agencies could still implement implanted digital chip programs. These local programs would be based on voluntary use of the technology by persons not compelled to use the technology based on criminal sanctions. For example, persons who elect to be implanted for their own personal safety could still occur. The local police agency, in partnership with a private firm marketing the technology, could monitor and locate the wearer if necessary using the GPS technology. The implantation of digital implants on registered sex offenders would still be possible if the convicting magistrate ordered the use at the time of sentencing. However, without legislation at the state or national level mandating the use of digital implants, the effectiveness would be greatly reduced but would still be possible on a local level.

Decisions or Actions	Actors										
	1	2	3	4	5	6	7	8	9	10	11
Assess need for digital implants	R	S	S	S	S	-	I	-	-	-	I
Identify Funding Sources	R	S	S	S	S	I	-	-	-	-	I
Approve Funding	I	I	I	I	I	I	-	-	I	R	-
Product research and design	S	S	I	S	S	-	R	I	-	-	-
Enact Legislation	S	S	S	S	S	-	I	-	S	R	S
Lobby Legislative Support	S	S	S	S	S	-	-	-	-	-	R

Responsibility Chart
Table 4.1

Actors

- | | |
|---|---|
| 1). National Law Enforcement Organization | 7). Digital Implant Industry |
| 2). Police Executive | 8). Federal Communications Comm. |
| 3). Police Managers | 9). City Council |
| 4). CDC Parole | 10). Federal and State Legislature |
| 5). Probation Departments | 11). Special Interest Groups
(runaway/missing persons) |
| 6). Federal Law Enforcement Grants | |

R = Responsibility (not necessarily authority)

A = Approval

S = Support (put forth resources)

}R.A.S.I.

I = Inform (consult before action)

- = Irrelevant to this item

Analysis of the Responsibility Chart

Assess need for Digital Implants

A national or state law enforcement organization was identified as the organization responsible of determining a needs assessment. Local law enforcement organizations, parole and probation departments were identified as support providers. The digital implant industry and special interest groups are informed of the law enforcement needs assessment results.

Identify Funding Sources

National or state law enforcement organizations are the responsible entities for determining federal and state funding sources. Law enforcement executives perform supportive roles in addition to determining local funding sources. Federal law enforcement grants and special interest groups would be informed. All other actors were determined as irrelevant to this item.

Approve Funding

Federal and state legislatures are responsible for federal and state funding appropriation and approval. Local government city councils are responsible for approval of budget expenditures at the local level. Law enforcement agencies receive information pertaining to federal and state appropriations for law enforcement grants.

Product Research and Design

The digital implant industry was identified as responsible for implant product research and design. Law enforcement executives, parole and probation departments serve in supportive roles and assist with design functionality. Police managers and the FCC are advised of implant product research and design.

Enact Legislation

The federal and state legislature were identified as responsible for enacting digital implant tracking legislation. Law enforcement executives and managers, parole and probation departments, local governing bodies and special interest groups were identified as key supporters. The digital implant industry would be informed of legislative mandates.

Lobby legislative support

Special interest groups are best suited for lobbying support for mandated digital implant legislation. The law enforcement community provides supportive roles and endorses legislation for mandated GPS tracking of parolees, probationers and convicted sex offenders.

The action plan establishes implementation timetables and role responsibility. The plan provides a framework for evaluating the progress and provides an opportunity for making modifications and changes as required. Determining how digital implant technology will impact law enforcement agencies requires a constant examination of the factors potentially affecting the use of implanted digital devices. Because this is an emerging technology, unforeseen circumstances may develop impacting how law enforcement agencies use this technology in the future.

The implementation of digital implant technology will move law enforcement into a new frontier. The potential to monitor the movement of individuals and articles anywhere in the world, for a law enforcement purpose, has never been capable before. Implanted persons will never be lost or capable of hiding to avoid detection. This technology will eliminate the backlog of outstanding arrest warrants, virtually eliminate the ability for persons to runaway without being quickly located and identify persons who were at the location of a crime during the time the crime occurred.

CHAPTER FIVE

CONCLUSION

Project Summary

The use of digital implant chips holds great hope for many people yet strikes paranoia in others. The anticipated reaction to implanted digital devices could mirror the reaction to the first artificial heart implantation in a human. What seemed unnatural and immoral at the time receives little attention or criticism today. Will the implantation of digital chips, capable of GPS tracking and medical monitoring, follow the same path as the artificial heart, from resistance to acceptance?

Prototypes of digital implant devices are currently available; however, more research and design modifications are necessary. The Global Positioning Satellite System functions as intended. Human and societal acceptance remains a missing link. Externally worn GPS tracking devices are generally accepted and used to a limited extent today. Cellular telephones and some automobiles have GPS tracking capabilities. Automatic vehicle locator (AVL) systems are increasing in popularity in the public and private sector. Some law enforcement agencies in Florida use GPS trackers to monitor some offenders. The resistance to the insertion of a foreign electronic monitoring device into the body will pose the greatest challenge. Medical use of implanted devices for monitoring the health of a person and immediately reporting serious health changes to the medical provider may bridge initial reluctance to the voluntary use of implanted devices.

Human implanted digital devices will almost certainly first be introduced to users on a voluntary basis. The people volunteering for implanted digital devices can be separated into two groups. The first group includes people who decide to be implanted for their own personal

safety. The reasons could range from medical monitoring to a fear of becoming a crime victim. The second group of volunteers will consist of incarcerated persons who volunteer to receive the implanted device as a means to secure an early release from jail. The group will contain convicted persons who volunteer for the implanted device to avoid incarceration. The potential for court challenges to the voluntary use of implanted devices remains low.

Law enforcement agencies will contract with digital implant providers on a fee basis. The people voluntarily using tracking devices will be responsible for the initial purchase or lease of the equipment and monthly service charges. On-Star, Care Trak, LoJack and Electronic Tracking Services charge the voluntary user for the equipment and service they provide. Cellular telephone and pager providers operate on a similar basis. The marketing of implanted digital devices probably will be handled in a similar manner. The user will purchase the device and subscribe with a private vendor for monitoring service. Persons volunteering for implanted devices as a means to avoid incarceration will pay a monthly fee to the law enforcement agency and will not contract directly with a service provider.

Cost factors may limit availability and use for this technology. The NGT panel forecast an economic recession. Local governmental agencies frequently operate on limited budgets and are often dependant on federal and state grant programs for financial assistance. Any limitation on funding sources may impact the ability of law enforcement agencies to adopt and use this technology. The cost for legislative mandated tracking of convicted offenders and sex registrants could be charged to those implanted with the devices. Persons required to use implanted tracking devices, but lacking the necessary funds, may necessitate governmental assistance.

Judicial approval of mandated implant tracking remains a significant potential obstacle to the implementation of mandated GPS tracking systems. Legislative mandated use will most likely involve those persons convicted of serious sexual offenses regardless of parole or probation status. Legal challenges claiming violation of privacy and civil rights are highly probable. The mandatory use of implanted devices for all persons is highly improbable. The increased ability of government tracking and monitoring of citizens with implanted GPS technology systems creates privacy issues far beyond those addressed in current case law decisions. While the NGT panel believed the mandatory use of implanted digital devices would survive judicial scrutiny, some restrictions might be imposed. Increased acts of terrorism in the United States may result in a shift in public opinion toward stronger governmental controls and relaxing of privacy concerns.

Medium-sized police agencies will be impacted by the use of implanted digital devices in a number of ways. The greatest impact presupposes future digital implants are capable of GPS tracking. Law enforcement agencies, such as the Roseville Police Department, could monitor the movements of persons wearing the implanted chip. This ability would be most advantageous if parolees and probationers were required to have a digital implant as a condition of their parole or probation. The Roseville Police department frequently must locate parolees and probationers who have absconded and this technology would make that task simple. The marriage of GPS tracking information with GIS mapping would pose a tremendous benefit to police agencies. The ability to plot crime scene locations with GIS mapping then overlay GPS historical tracking information would readily identify those individuals who were present at the location of a crime. Because of the high number of parolees and probationers who re-offend, this technology will greatly increase the effectiveness of the Roseville Police Department. Although highly

improbable, if all persons were required to have an implanted digital device, the issue of false or mistaken identities would be eliminated. Implanted digital chips would provide positive identification in the same way the technology is used today in animals. The potential to monitor the location of the person would virtually eliminate all missing and runaway persons as they would be quickly located. Persons in distress could be quickly rescued. The thousands of persons wanted by law enforcement agencies on outstanding arrest warrants could quickly be apprehended. Externally worn GPS transmitters would provide the same benefits as implanted digital devices, but the external transmitters may be more susceptible to manipulation by the wearer.

This technology presents significant possibilities for criminal justice agencies. The challenge to law enforcement leaders will be to work together cooperatively to design tracking and monitoring systems compatible to all law enforcement agencies. Unlike the electronic tracking systems available today, where electronic trackers used by one agency cannot receive and track the signal from the equipment used by a neighboring agency, future systems must be designed on a regional, state and national level.

Appendix A
Nominal Group Technique Panel Members

- Veronica Blake: Society for the Prevention of Cruelty to Animals Director
- Howard Clossen: LoJack Corporation Northern California Director
- George Alves: Hewlett-Packard Company Planner
- Marty Hackett: Care Trak
- Gene Genie: Placer County Deputy District Attorney
- Bev Gable: City of Roseville Family Services Coordinator
- Del Caldwell: State of California Parole Agent
- Dave Braafladt: City of Roseville Police Lieutenant

Appendix B

List of Potential Trends Identified by the NGT Panel

1. Electronic wireless property tracking
2. Number of National security breaches
3. Global terrorist incidents
4. Financial incentives in implanted digital technology
5. Number of high-risk offenders tracked
6. Tracking and finding lost or kidnapped persons
7. Number of infant and child kidnappings
8. Divorce rates – child custody tracking
9. Animal thefts
10. Number of documented medical issues related to implanted devices
11. Wireless communication technology improvements
12. Incidents jeopardizing personal safety by criminal offenders
13. Number of individuals considered to be terrorist sympathizers
14. Number of persons legally immigrating to the United States
15. Number of non-violent prisoners released early due to prison overcrowding
16. Monitoring of persons on student visas
17. Need for artificial intelligence systems
18. Civil rights litigation cases involving privacy rights
19. Unemployment rates
20. Economic cost constraints of monitoring convicted persons subject to government control
21. Birth rates
22. Number of personnel required to monitor convicted persons
23. Religious issues related to implanted devices
24. Number of identity theft cases, the need for positive personal identification
25. GIS and GPS tracking to determine relationships, if any, of crime scenes with tracked persons
26. Development of smart guns
27. Media support for implant technology
28. Occupational Safety applications
29. Uniform personal identification system
30. Programmable smart chip
31. Wireless electronic media
32. Technology research and cost factors versus anticipated profits
33. National unemployment rates
34. Number of qualified workers
35. National crime rate
36. Number of workers displaced by automation of work
37. Number of smart buildings
38. Frequency of digital implant tracking data theft

39. Alternatives to motor vehicle travel
40. Impact of political agendas
41. Number of regulatory laws limiting wireless transmissions
42. Growth of technology
43. Number of mass casualty incidents and victim identification
44. Number of fraudulent passports
45. Enhancement to personal intelligence
46. Implementation time frame of implant technology
47. Social acceptance of implant technology
48. Digital Personal Identification Card
49. Programmed ethics
50. Number of DUI accidents
51. Number of drug addicts, impulse control device
52. Number of persons in the United States with expired visas
53. DNA identification contained on digital chip
54. Number of health problem identified by implanted devices
55. Cloning
56. Number of persons requiring immunizations
57. Social and cultural obstacles to digital implant technology
58. Percentage of arrests resulting in conviction
59. Number of Alzheimer disease patients
60. Microchip technology improvements

Appendix C

List of Potential Events Identified by the NGT panel

1. Stock market crash
2. Kidnap victim located unharmed by use of implanted digital tracking device
3. Economic Globalization
4. Implants determined to cause adverse health condition
5. Solar flare causes implant malfunction
6. Digital implants used to control violent behavior
7. Domestic terrorists destroy digital implant research facility
8. Space alien invasion
9. Legislature passes law mandating digital implants for everyone over 18 years of age
10. Supreme Court rules digital implants unconstitutional
11. Computer hackers compromise financial institutions
12. New technology makes digital implants obsolete
13. U.S. Military reveals digital implants secretly used in soldiers since the Viet Nam War
14. GPS digital tracking facility seized by rioters
15. U.S. President agrees to have digital implant injected in him
16. Digital implants used to monitor homeless population
17. Prisons become obsolete due to electronic incarceration
18. U.S. mainland invaded by foreign army
19. Cellular telephones alter digital implant electronic transmissions
20. Vatican endorses digital implant technology
21. Disease epidemic thwarted by implants
22. Supreme court rules digital implants constitutional
23. HP awarded government contract for implant production
24. Illegal drug laws abolished
25. Man robbed of digital implant
26. Murder case solved by digital implant tracking / GIS analysis of known offender
27. U.S. federal Government awards grants for digital implant research
28. Riots erupt due to loss of privacy rights
29. Legislature mandates digital implants for all parolees
30. Less lethal electronic stun implant perfected
31. State law mandates digital implants for all infants for positive identification

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