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WHAT IMPACT WILL SATELLITE TECHNOLOGY HAVE ON POLICE RESPONSE TO NATURAL AND MANMADE EMERGENCIES BY 2004?

TECHNICAL REPORT

BY

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SACRAMENTO, CALIFORNIA

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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.

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Background and Issue Identification

In March 1967, President Lyndon Johnson spoke to a group of United States government officials and educators in Nashville, Tennessee about space photography. As he spoke about the country's ability to photograph its enemies' missile capabilities he said that the satellite photography program was worth ten times its cost because, " we know how many missiles the enemy has and, it turned out, our guesses were way off. We were doing things we didn't need to do. We were building things we didn't need to build. We were harboring fears we didn't need to harbor."[1]

As professionals in law enforcement look at satellite technology and capabilities available today they should be asking questions similar to those asked by President Johnson in 1967.

Is law enforcement perhaps doing things that they don't need to be doing? Could law enforcement be doing its job more efficiently and effectively by using satellite technology? Could this technology help to save lives and safeguard property?

The potential impact of satellite technology applications in the law enforcement field is an emerging issue that should be considered during this decade. The application of satellite technology could provide significant advantages if police managers choose to research, comprehend, and implement them.

History suggests that we have been able to point to many catastrophic events which have been predictable or foreseeable.[2] Government officials have had many opportunities to study these events in an attempt to find ways to improve their organizational response to emergencies or to determine how and why failures have occurred.

Law enforcement agencies in the recent past have not taken advantage of some of the technologies that could be of benefit to them. They either have been unable to afford these new technologies, do not understand the potential impact of these technologies, or have been denied, or received access on a limited basis.[3]

Significant natural and manmade emergencies have occurred that have provided examples of how satellite technologies could have been applied to the decision making and operational processes of the mission of emergency management. All that needs to be done is to look at almost any newspaper or magazine to find example of these events.

The management of personnel and resources during the rioting in Los Angeles in April of 1992 could have been aided by detection of temperature differences in the earth's surface facilitated by the Advanced Very High Resolution Radiometer (AVHRR) system aboard polar orbiting satellites operated by the National Oceanic and Atmospheric Administration.[4] AVHRR was able to detect and pinpoint locations of hundreds of fires during this event. This information could have proved essential to the efficient assignment of fire and police personnel and equipment.

The emergency service response to Hurricane Andrew in Florida in August of 1992,[5] is an example of how satellite communication technology could have facilitated assignment of personnel and equipment. The State of California is currently applying this technology through

its Office of Emergency Services, Law Enforcement Division. The Operational Area Satellite Information System, or OASIS for short, can facilitate statewide radio communications during disasters and mutual aid situations.[6]

The list of potential applications of satellite technology to law enforcement problems is potentially endless. Significant natural and manmade emergencies are occurring almost daily. Examples of these events include the bombing at the World Trade Center in New York in February of 1993[7], the worlds strongest earthquake in Landers, California in 1992[8], and a search for a lost hiker in the San Bernardino National Forest in 1991.[9]

California State disaster officials reported that 1993 was the worst year on record, in relationship to disasters until 1994. During 1994 the victims of the Northridge California earthquake alone received an $8.6 billion dollar earthquake relief package. During 1993 the State estimated that loss due to disasters totaled in excess of one billion dollars. In 1993 twenty-five of fifty-eight California counties filed declarations of emergency that ranged from winter storms to fires to civil disobedience. Disaster related deaths totaled twenty-six in 1993 and that year was also considered to be the fifth costliest year in terms of property damage since the California Office of Emergency Services was established in 1950. Nineteen ninety-three was also the fifth straight year that California was affected by some sort of disaster. The Malibu fires, the Northridge earthquake and the floods that followed started 1994 off at a significant pace in relationships to disasters.

The adaptation of satellite technologies to police response to natural and manmade emergencies range from communications to real time monitoring of natural disasters such as

fires, earthquakes, flooding and rioting. Additional applications also include position location, surveillance, topographic mapping, infrared sensing, color radar imaging and remote sensing.

In the movie "Patriot Games"[10], Central Intelligence Agency agents sat in Virginia and watched the live satellite feed of a raid on an Irish Republic Army terrorist camp in North Africa. The application of this kind of technology to law enforcement operations, like special weapons and tactics, is interesting. As in the example from "Patriot Games", possibilities exist to photograph situations in previous and real time. This capability would allow law enforcement to appraise a specific time or place in history. In this way it might be possible to find a reported lost hiker and actually watch where he or she went? If we could do that could we also see the bank robber leaving the bank or the murderer leaving the scene of the crime?

A system of geo-synchronous orbiting satellites used to pinpoint positions on earth, called Global Positioning Systems (GPS), are being used on almost anything that moves and some things that don't.[11] The value of GPS are becoming evident in projects across the United States. Satellite technology is gaining greater applications mainly in Geographic Information Systems (GIS) through applications like GPS. This technology can be directly applied to law enforcement operations like search and rescue and vehicle location and tracking.

In the future the hiking pass that a private citizen receives from the United States Forest Service will be replaced by a personal GPS wrist transceiver that will report their actual location at all times. The application of satellite technology in this manner could virtually take the search out of search and rescue.

What Impact will Satellite Technology Have on Police Response to Natural and Manmade Emergencies 2004?

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Abstract

This study examines how satellite technology will impact the future of a fictional law enforcement agency in a large geographical area of California. A futures study was conducted that forecast ten trends and events that had influence on the issue. The five highest trends are: level of global population's impact on cultural colonization, degree of privatization in police services, shift in defense spending from military to domestic, demands on public education and cooperation between federal, state and local law enforcement agencies. The five highest events are: efficient, accurate and timely deployment of responding emergency resources, hand held satellite communication devices used by law enforcement, satellite locators make rapid location of persons possible, United States Supreme Court rules eavesdropping permissible during disasters and emergencies and law enforcement included in classified technology loop. The development of a strategic plan determined the most effective strategy to be allowing satellite monitoring and tracking through legislation. A transition plan was developed and identified critical mass players and selected a project management team as the most effective method to bring about a future state. The study determined a broader application of satellite technology within the next 10 years is feasible and will greatly aid law enforcement disaster management. The report includes charts and graphs of trends and events, bibliography, information and appendices.

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The future of satellite technology in the management of natural and manmade emergencies in law enforcement is important. Satellite systems in private industry are presently monitoring and tracking many things that move and some that don't. The usefulness of satellite technologies in communication, tracking and sensing are opportunities available to law enforcement. California's law enforcement organizations have a primary duty to protect the lives and property of the citizens in the communities that they serve.[1] Major occurrences like riots, floods, fires and earthquakes represent a significant challenge to the accomplishment of law enforcement duties.

The availability of new technologies and the ways in which they are being adapted are signaling a start of a significant future for law enforcement. Many interesting and versatile technologies will be finding usefulness in law enforcement operations in the future. Geographic Information Systems; Global Positioning; infrared sensing; photographic mapping; communications; automated vehicle tracking; the Intelligent Vehicle Highway System and interactive training by way of satellite are just a few of the effective applications that can benefit law enforcement.

The use of satellite technology in the law enforcement community is already being applied by the California Commission on Peace Officer Standards and Training. POST has complemented its training curriculum by capitalizing on satellite technology through the Law Enforcement Television Network (LETN) broadcast on satellite, Galaxy 7. LETN already provides a wide variety of training across the entire state of California, not to mention

accessibility on a national basis. The versatility of this method of training can provide instant access to many kinds of learning opportunities.

The same instant access could be available during natural and manmade emergencies. Televised images by way of satellite could provide instant response for accuracy of resource deployment and damage assessment after emergencies.

Successful organizations of the future, including law enforcement, will be compelled to find people inside and outside of their organizations who understand the value and strengths of the application of these kinds of technologies in law enforcement. Not only must they find these people, they must be innovative in the way they provide law enforcement services in the future.

In March 1967 President Lyndon Johnson spoke to a group of government officials and educators in Nashville Tennessee about space photography. As he spoke about our ability to photograph our enemies' missile capabilities he said that our satellite photography program was worth ten times its cost. The satellite photography program demonstrated that previous military estimates were way off and that the photography program helped to provide a better assessment of existing conditions.[2]

Law enforcement must likewise assess its capabilities and be able to develop current and accurate needs' assessments during critical incidents. Only in this way can law enforcement managers adequately respond to the needs of their communities during disastrous times.

Law enforcement managers must establish critical incident management philosophy before involvement in disastrous situations. That management philosophy should include how

each organization will respond in time, with what resources it has available, and how it hopes to accomplish its tasks.

The result of a recent government information technology survey suggests that long range planning is not performed in most governmental agencies. Only 13.1% of those reached in the survey said that they had any long range plans at all.[3] How California law enforcement professionals prepare for the future is key to effective and efficient response to natural and manmade emergencies.

The dramatic evolution of technology and its application in law enforcement operations will radically alter the routine delivery of law enforcement services in California, especially during natural and manmade emergencies.

A Changing Environment

As a result of developing technology, California law enforcement professionals will have many opportunities to change the way traditional critical incidents are managed. It need not be just a reactionary response with little or no intelligence information directing the police response. The adaptation of satellite technology in police operations is growing throughout the nation and state. Satellite technologies are being adapted to many different kinds of police operations ranging from vehicle and narcotics tracking[4] to traffic accident investigation.

A study was conducted to answer the question, "What Impact Will Satellite Technology Have on Police Response to Natural and Manmade Emergencies by 2004?".[5]

Three related questions of the issue were also examined. They are: How can satellite technology be applied to law enforcement?; What management skills or knowledge will be

required to implement this technology?; and, What satellite applications show possibilities in law enforcement emergency operations?

To address the answers to these questions a future study was conducted. In that study using the nominal group technique forty-one trends that were a series of events by which change is measured over time and thirty-eight events that were discrete one time occurrences were identified.

The trends and events identified in the study were ranked by order of importance to the nominal group. The top ten ranked trends are: level of global populations impact on immigration and cultural colonization; degree of privatization in police services; shift in defense spending from military to domestic; demands on the public education system; level of cooperation between federal; state and local law enforcement agencies; level of unemployment; public perception of the need of satellite technology and the environmental impacts of industry. The top ten ranked events are: efficient, accurate and timely deployment of responding emergency resources; hand held satellite communication devices are used by law enforcement personnel; personal locators make rapid location of lost persons and inanimate objects possible; United States Supreme Court rules satellite eavesdropping admissible during disasters and declared emergencies; law enforcement is included in classified technology loop; inadequate numbers of satellite radio frequencies available to law enforcement; satellite users execute sharing agreements; voluntary used of personal locators; Federal Communications Commission is merged with the Justice Department and vehicle encoders are installed on all cars at the factory.

Using a Future Scenario

The scenario that follows provides a starting point to build a foundation and strategy to implement change. The scenario was developed using the trends and events identified by the nominal group. The scenario depicts a large fictional agency providing law enforcement service throughout a geographically large area.. The positions and persons in the scenario are also fictional. The thousands of square miles in Bear County are surrounded by metropolitan areas. The population has grown significantly during the past ten years and growth is expected to continue.

June 1, 1998 -- The Bear County Seat

"Sheriff Day approached the steps of the County Seat enroute to her appointment with the Board of Supervisors. Sheriff Day had gained quite a reputation for saving money and for the way she managed natural and manmade emergencies. It appeared that the Board was interested in seeing why she was so successful in managing operations in her department. Not only was she successful she was cost effective too. They probably wondered if some of the principles that she used would be applicable at the wider county governmental level.

The meeting started promptly at 2:00 p.m. After exchanging greetings the Chairman of the Board got right to the point. "Tell us Kathy, what is it that you do that makes your operation so efficient? We keep hearing about record recoveries of property and the location of lost people and that intrigues us."

Sheriff Day told the Chairman that for the past fifty years the United States government had been adapting satellite technology in many different ways. She told him that many years ago technology was exclusively military but that changed in the mid to late 1990's. She told the Chairman that the technology was originally used to spy on the enemy from space but there were many other applications today.

The Chairman asked the Sheriff to continue, wondering why we would even need such a system. "Isn't the public a little weary of government and big brother already?". The Sheriff's response was a resounding "yes."

Sheriff Day explained to the Chairman that his point was well taken but pointed out that the Board could play a vital role in the application of this technology. "You see Mr. Chairman, this technology, with certain guidelines,

could reduce lose and more importantly save lives. What we don't have as yet are laws and guidelines on the future use of this technology." The Sheriff told the Board that there were no requirements to use satellite locators anywhere in the county and the Sheriff explained that some people choose to use this technology and some did not.

The Sheriff told the Board that her department had saved thousands of dollars in their search and rescue operations when people voluntarily used satellite locators. She explained that a minimum of resources were deployed to conduct searches when this technology was being used.

The Sheriff also told the Board that their search and rescue operations were not always as simple as she explained. She said that sometimes additional resources were needed from outside the county. In those cases help was just a radio call away on California's Operational Area Satellite Information System (OASIS) that was operational, and in use, since 1992.

The Sheriff explained that the choice of whether or not to use a specially encoded satellite locator had a direct impact on how much an individual was billed for the rescue service provided.

The Board started to see that positive impacts of satellite technology application and thought that if the county vehicles and valuable property were equipped with such equipment it would be possible to limit thefts and recover property. The Sheriff reinforced the idea with the Board and remarked that accomplishing this task would involve innovative partnerships with organizations like insurance companies, vehicle manufacturers, and even legislators.

The Board was convinced that they would work towards developing guidelines and legislation that would require the use of satellite technology.

As Sheriff Day left the meeting she was convinced that she had gained valuable support from the Board for implementation of satellite technologies. The Sheriff wondered if the Board would propose some of the legislation that would facilitate implementation and if they would be willing to fund those new programs."

Developing a Strategic Plan

A strategic plan for change was developed for the fictional agency. The plan included two mission statements. These mission statements provide a framework to accomplish the department's goals. The "macro" statement emphasizes the overall mission of the Bear County Sheriff's Department. The "micro" statement emphasizes the Bear County Sheriff Departments' mission as it relates to the application of satellite technology in law enforcement operations.

The macro mission statement for the Bear County Sheriff's Department is:

The mission of the Bear County Sheriff's Department is to focus on the quality of service and interaction with the community it serves. To that end the Bear County Sheriff's Department will strive to:

* Recruit and retain the best trained personnel.

* Constantly monitor changing demographics to ensure that the service levels in the community are adequately maintained.

* Pursue innovative ideas and techniques to aid in the delivery of law enforcement service to the people it serves at the least possible cost.

The Bear County Sheriff's Department is committed to the principle of providing public service and protection through fair enforcement of all laws.

The micro mission statement of Bear County Sheriff's Department is:

The mission of the Bear County Sheriff's Department is to focus on the quality of service to the communities it serves by:

* Identifying opportunities to enhance service by the use of technology.

* Developing and coordinating partnerships and joint ventures with industry to improve efficiency and effectiveness of services.

* Developing and using technologies in ways that are unique and innovative to law enforcement.

Strategy for Change

A strategy that called for the application of satellite technology during natural and manmade emergencies was developed to form a plan to bring about a more desirable future. That strategy called for the county's board of supervisors allowing the use of satellite technologies, like monitoring and tracking devices, during emergency operations.

Before this strategy was selected an analysis of Bear County Sheriff's Department's external environment and its organizational capabilities was conducted. The key stakeholders were identified and their assumptions regarding the issue were listed. Stakeholders are normally individuals or groups, who if they disagreed, could radically impact implementation of the strategic plan.

The most important stakeholders were identified as the critical mass. That group included: the Sheriff; the Chairman of the Board of Supervisors of Bear County; a representative of the American Civil Liberties Union; the liaison officer to the Commission on Peace Officer Standards and Training (POST); the liaison officer to the California Office of Emergency Services (OES); the staff analyst for the Board of Supervisors of Bear County; and the Sheriff's special adjutant.

The strategy to bring about the change called for the Sheriff appointing a member of her staff to be a project manager. A project team was formed and was representative of a diagonal slice of the public and private sector. The project management team's job included the identification of what emergency situations were most applicable to the application of satellite technologies, how these technologies should be used and what future technologies might be used.

Key stakeholders in the public and private sectors were identified. Individuals in that group, considered the critical mass, were identified. The critical mass includes: the Sheriff; the chairman of the board of supervisors; a representative of the American Civil Liberties Union; a POST (Peace Officer Standards and Training) consultant; a representative of the

California Office of Emergency Services; a staff analysts for the county board of supervisors and the special adjutant to the sheriff.

After the critical mass was identified their readiness and capability to support the strategy was assessed and charted. The readiness of the critical mass was an important issue to the management team who had to be able to work with and gain support for the strategy. Equally important was the commitment level of the critical mass. The team would need to negotiate to achieve the commitment and support of the critical mass.

Management Structure

The management structure recommended for the strategy is a project management team, with the project manager appointed by the Sheriff. The team members represent a diagonal slice of representatives of various groups in the public and private sector.

The recommended manager for the project is the sheriff's special adjutant. As the adjutant to the Sheriff he functions from the executive manager's office and would receive power and authority from that office. The team members were selected from the list of stakeholders identified as the critical mass. This choice also frees the Sheriff to devote time to running her organization and to work for implementation behind the scenes.

The project manager will use a variety of methods and techniques to implement the changes that the team recommends. Those methods include:

* Designing the management team to include individual responsibilities.

* Development of a plan of action that will include the construction of a responsibility chart.

* Development of a plan of communications that would keep all stakeholders informed.

* Development of time tables for implementation of the selected strategy.

* Setting future expectations of management of critical incidents.

* Assessment of the availability of funding for the project.

The following chart represents how the Project Management Team would look.

Project Manager

1 POST Consultant	1 OES Consultant
1 Bear County Staff Analyst	1 POST Representative
1 ACLU Attorney	

The responsibility of each team member must be clearly defined. The teams' duties would include:

* Developing support for technology use.

* Development of guidelines for technology use during emergencies.

* Identification of applicable technologies for use.

* Identification of future technologies.

* Development and implementation of training strategies.

* Identification of sources of funding.

* Approving funding.

Conclusions

As technology continues to develop and change California law enforcement agencies likewise need to change. One area of change will be in how technology is applied to law enforcement operations.

Satellite technology will play an important role in many kinds of law enforcement tasks. Global Position Systems will not only report locations but will monitor elevations of objects like bridges, power and communication lines. Satellite technology will provide a valuable uninterrupted communication link covering vast areas. These communication links will be less susceptible to interruption from natural and manmade causes.

Learning to use and implement satellite technologies into emergency situations will be as important as managing an operational budget. These technologies can radically have an impact on other areas of operations and save countless amounts of time, money and lives.

To create a better future, law enforcement managers must recognize the impacts of satellite technology on many areas of law enforcement operations. The transfer of technology in disaster management operations is almost immeasurable. The transfer of technology, like monitoring, tracking and photography will certainly have an impact on critical incident management in the future.

Governmental agencies, like police and fire agencies, must establish procedures and guidelines to deal with the application, and implementation, of technologies that will help during natural and manmade disasters like riots, fires, earthquakes, floods and other types of emergencies.

Technology, and indeed the world around use, is changing rapidly. A land based program called Real Time Earthquake Monitoring (RTEM) was a proposal in 1991 that was to help generate post earthquake information that is so critical to rescue efforts.[6] Then a National Research Council panel reported that the California earthquake monitoring network could be relatively inexpensive to update. In two short rears, by 1993, the United States and France

were jointly conducting the first major space mission that could detect the change in sea levels on the southern hemisphere. During that time period a rise in the sea level of twelve inches was reported.[7] The early recognition of a rise in sea levels could be of significant value in anticipation of flooding and potential evacuation.

How police managers make use of resources will be directly impacted by how they use new technologies. Satellite technologies like monitoring from space can significantly impact timely, effective and efficient response to natural and manmade emergencies.

Recommendations

The breadth of benefits of satellite technology use in law enforcement emergency operations and disasters suggest the issue is suitable for further study.

One issue that needs to be looked into is the development of funding strategies. Because of the high cost of changing technologies police managers will be required to examine different methods of funding available for implementation. The competition for available dollars to increase emergency operation capabilities will be keen and an event that will require significant police management skill. Considerations must be given similar to those given by legislators during the summer of 1993 in association with the Disaster Protection Act. It was discussed that the successful implementation of technologies might come about by the formation of federal trust funds to defray costs to local agencies.[8] Other funding strategies should also be developed due to the high costs of changing technologies. The continuos update, and change, in technology will require significant funding to stay current.

Adaptability and flexibility are key in the approach to implementation. The skill with which management approaches funding will demonstrate who has been the best planner in the interests of their organizations and communities.

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Wood, Daniel B., "Crime fighting technology to take hugh leap" The San Diego Union-Tribune, June 14, 1993, p A-5.

This technology can also be applied to robotics.[12] Conducting searches of bombed out buildings or the disarming of bombs by robots from a safe location should be of significant interest to law enforcement.

There are significant current and future applications of satellite technologies that include communications, topographic mapping, infrared sensing, and color radar imaging. By mid-1994 the National Aeronautical Space Administration hopes to have the capability to see beneath the clouds, desert sands and ice.[13]

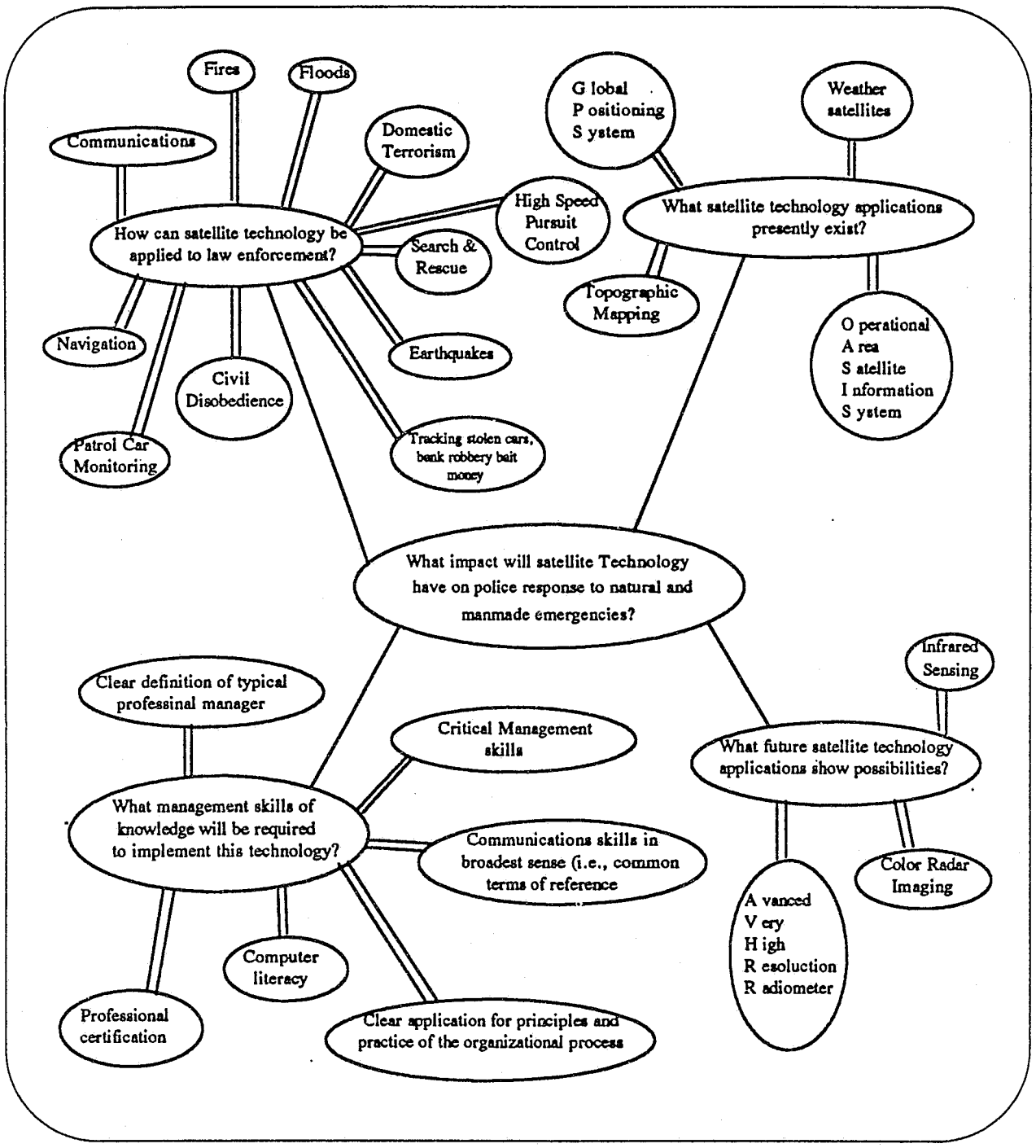
This research project strives to identify satellite technology uses that are applicable to law enforcement. The research strives to identify public and private sector professionals who would support the implementation of applicable technologies. The findings of this project would also be of interest to agencies, government and private alike, who have a responsibility for the preservation of life and property.

Development of the Issue

The process of scanning available literature began twenty-three (23) months ago, in July of 1992. Since that time the process has included scanning of books, newspaper and magazine articles, and personal interviews. Those items, or portions of them, were cataloged and placed into a futures file. The criteria chosen to categorize these articles was from the STEEP process. (Social, Technological, Economic, Environmental, and Political = STEEP).

The scanning process helped focus on the issue question. A search of the literature on satellite technologies helped to reinforce the initial assumption that the topic was worthy of further study and would be of value to police managers in the future. The scanning process also included a Futures Wheel.

FUTURES WHEEL



The center of the futures wheel represents the issue question in relationship to the various sub-issues.

Initially the issue of "What critical incident management skills or knowledge would be required of police managers by the year 2004?" was placed in the center of a Futures Wheel and it was presented, or discussed, with various professionals. These professionals included an executive in a Disaster Preparedness Division, an executive in a Human Resource Division, a disaster planner, a Deputy Director from the California State Office of Emergency Services, a professor of the University of Southern California, POST Command College students and graduates, a chief officer of a governmental communications division, and other experts.

The original topic was very broad and the process of using the Futures Wheel helped focus the issue of critical incident management towards a more specific question. The narrowed issue for research evolved to, "What Impact Will Satellite Technology Have on Police Response to Natural and Manmade Emergencies by 2004?" The revised question was placed in the center of a second Futures Wheel for further discussion.

From the second Futures Wheel process several sub-issues were identified. They included:

* What future satellite applications show possibility in emergency operations?
* How can satellite technology be applied to law enforcement?
* What management skills or knowledge will be required to implement satellite technology?

It is anticipated that the results of this study will help police managers adapt to new technologies and develop unique approaches to managing emergencies. This study will also assist law enforcement agencies in identifying new technologies and provide suggestions on how these new technologies can be applied to emergency management.

Section II

FUTURES FORECASTING AND ANALYSIS

The issue and sub-issues concerning satellite technology application are examined in this section, and a list of relevant trends and events are identified. Ten trends and ten events will be forecasted and analyzed. These twenty trends and events will serve as the basis for three futures scenarios.

The Issue

What impact will satellite technology have on police response to natural and manmade emergencies by 2004?

The Sub-Issues

A consensus group of six colleagues (Appendix B) assisted in identifying three sub-issues believed to be essential to studying the issue. The sub-issues are:

1. How can satellite technology be applied to law enforcement?
2. What management skills or knowledge will be required to implement this technology?
3. What satellite applications show possibilities to management of law enforcement response to emergency operations?

Futures Wheel

A futures wheel was generated intended to illustrate the relationship of the central issue question to the sub-issues (Page 5a). The futures wheel was developed with the assistance from a loosely formed consensus group. Each group member was contacted either by phone or in person for their input. The consensus group consisted of the Deputy Chief Michael O'Rourke of the San Bernardino County Sheriff's Department's Human Resources Division, Deputy Director Ken Jones of the California Office of Emergency Services Law Enforcement Division, Mr. Fred Mintz of the Jet Propulsion Laboratories in Pasadena California, Mr. Bill McGreevy of the City of San Bernardino Disaster Preparedness Division, Captain Lee Wagner of the Riverside California Police Department and Lieutenant Paul Stotesbury of the Escondido California Police Department. The center of the wheel represents the issue question in relationship to the various sub-issues. The entire wheel represents how satellite technology might be applied to law enforcement.

Trend and Event Identification (NGT)

A panel of ten professionals using the Nominal Group Technique (NGT) generated a list of forty-one trends and thirty-eight events, which are listed in Appendix F and G.

The Nominal Group Technique is a small group technique for achieving an acceptable consensus on the answer to a single, usually two part, question by a process that alternates private work and open discussion.[14]

The NGT participants were selected based on their expertise, diversity, political perspectives and important opinions. The expertise of the panel was varied so that a wide range of information could be gathered. The NGT professionals were Mr. Bill Bethel of the San

Bernardino County Sheriff Department Disaster Preparedness Division, Captain Mike Cardwell of the Apple Valley California Police Department, Lieutenant Norm Hurst of the San Bernardino County Sheriff's Department, Mr. Mike Izumi of TRW Space and Electronics Group, Mr. Jeff Lewis (military surveillance background) of the Morongo Basin Indian Police, Ms. Nancy Rengert field representative for California State Senator Bill Leonard, Mr. Paul Sheridan of the San Bernardino County Communications Division, Mr. Keith Thompson science teach for the Fontana California Unified High School District, Captain Lee Wagner of the Riverside California Police Department and Assistant Sheriff Gil Wait of the San Bernardino County Sheriff's Department.

Each participant was contacted personally and was invited to participate. If they agreed, they were sent a formal letter of invitation and an information packet providing background on the issue in preparation for the exercise.

On June 3, 1993, the group of ten professionals were brought together for the purpose of conducting the NGT.

Before the candidate lists of trends and events were developed, the group was familiarized with the issue and sub-issue questions being studied along with the STEEP (Social, Technological, Economic, Environmental, Political) process[15] for trend and event categorization. The group was asked to identify as many trends and events as they could that were related to the issue. The group was provided instruction on how to identify trends and events and were given examples (Appendix A). Trend and event gathering occurred separately. The gathering process used was the same for both the trends and events.

After working silently a round robin was conducted with the panel and each participant was asked to provide one trend or event from their list. Clarification of trends or events for the group was facilitated if needed. An assistant listed these trends and events on chart paper and those papers were posted throughout the room for reference. The NGT was also video taped.

At the conclusion of each round robin consolidation of trends and events took place and when the group had no further clarification questions a silent vote occurred to rank the ten most important trends and events. The ranked lists were scored silently using the trend and event evaluation forms (Appendix D and E) provided by the California Commission of Peace Officer Standards and Training (POST).

Trends Selected for Forecasting

The candidate trends identified were clarified and a silent voting process was used to select the following ten trends as most important to the study for forecasting.

T-1 Level of global population's impact on immigration and cultural colonization.

T-2 Degree of privatization in police services.

T-3 Shift in spending from military to domestic.

T-4 Demands on the public education system.

T-5 Level of cooperation between federal, state and local law enforcement agencies.

T-6 Level of unemployment.

T-7 Public perception of need of satellite technology.

T-8 Environmental impacts of industry.

T-9 Degree of civil unrest in the United States.

T-10 Degree of global unrest and regional conflict.

Events Selected for Forecasting

The candidate events identified were clarified and a silent voting process was used to select the following ten events as most important to this study for forecasting.

E-1 Efficient, accurate, and timely deployment of responding emergency resources.

E-2 Hand held satellite communication devices are used by law enforcement personnel.

E-3 Specially encoded satellite locators make rapid location of persons and objects possible.

E-4 United States Supreme Court rules satellite eavesdropping admissible during disasters and declared emergencies.

E-5 Law enforcement is included in classified satellite technology loop.

E-6 Insufficient numbers of satellite radio frequencies available for law enforcement operations.

E-7 Satellite users execute sharing agreements.

E-8 Voluntary use of personal encoders to locate people.

E-9 Federal Communications Commission is merged with the Justice Department.

E-10 Vehicle encoders are installed on all vehicles at the factory.

Trend and Event Forecasting

A trend evaluation form was used to obtain the groups estimate of the level of each trend five years ago and what each trend would be in five and ten years. Each trend received a present day level of 100.

The following illustration represents the trend level estimates with median forecasts for the ten selected trends.

Trend Evaluation Table

Trend	5 Years Ago	Today	5 Years From Now	10 Years From Now
T-1: Level of Global Population on immigration and Cultural Colonization	70	100	150	200
T-2: Degree of Privatization in Police Services	25	100	125	150
T-3: Shift in Spending from Military to Domestic	75	100	125	150
T-4: Demands on the Public Education System	80	100	120	150
T-5: Level of Cooperation Between Federal, State and Local Law Enforcement	80	100	120	150
T-6: Level of Unemployment	80	100	125	140
T-7: Public Perception of Need of Satellite Technology	80	100	140	150
T-8: Environmental Impacts of Industry	50	100	125	125
T-9: Degree of Civil Unrest in the United States	80	100	120	150
T-10: Degree of Global Unrest and Regional Conflict	80	100	120	140

Table reflects median scores
N=10

Illustration 1

The Nominal Group used an event evaluation form to forecast the probability of the ten selected events. The data was compiled and median forecasts were made for each event for:

* Years until probability of occurrence first exceeds zero.

* Probability of occurrence in five years.

* Probability of occurrence in ten years.

* Positive and negative levels of impact if the event occurs.

The following table represents the forecasts for the selected events.

Event Evaluation Table

Event	Probability 0-100%			Impact on the Issue if Event Occurs	
	Years Until Probability First Exceeds Zero	Five Years From Now	Ten Years From Now	Positive 0 - 10	Negative 0 - 10
E-1: Efficient Deployment of Resources	3	40	80	10	0
E-2: Satellite Communicators Used by Law Enforcement	2	50	80	10	0
E-3: Locators Aid in Finding Lost Persons	5	40	90	10	0
E-4: Satellite Eavesdropping Becomes Legal	5	50	70	5	5
E-5: Law Enforcement Included in Technology Loop	3	50	80	10	0
E-6: Lack of Satellite Frequencies	5	50	80	2	8
E-7: Sharing Agreement Executed	3	50	80	8	2
E-8: Voluntary Use of Personal Locators	5	30	70	6	4
E-9: FCC Merged with Justice Department	4	25	50	5	5
E-10: Vehicle Locators on all Vehicles	5	20	50	7	3

Table reflects median scores
N=10

Illustration 2

Trend Graphs and Analysis

The following charts provide a visual illustration of the panel's forecasts for the ten selected trends. The Nominal Groups estimation of the magnitude of the each of the trends are forecasted in three levels and are included on the charts that follow. Illustration 3 graphs the median forecast, maximum forecast and the minimum forecast.

T-1 Level of global population on immigration and cultural colonization.

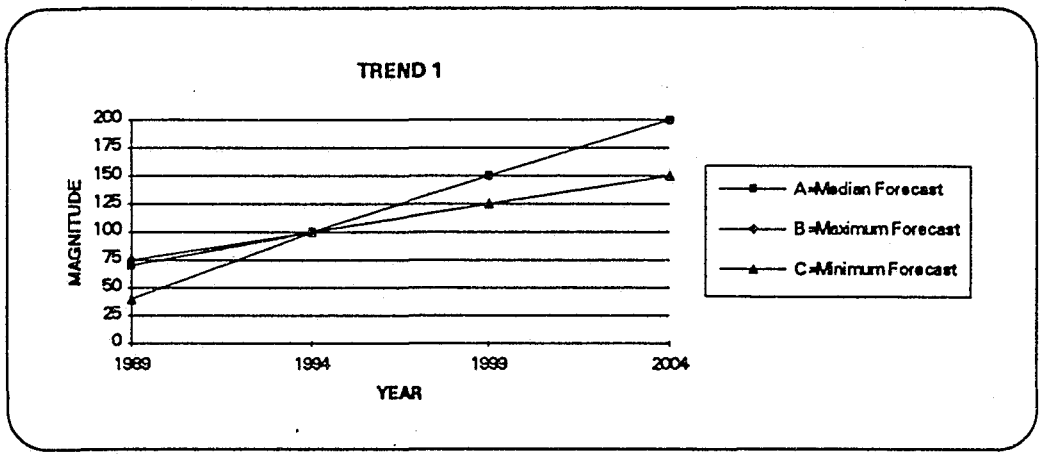


Illustration 3

Interpretation

The median forecast for Trend 1 represents the Nominal Group opinions about the levels of global population over the next five to ten years and what impact that might have on immigration into the United States. The Group believed that this trend would lead to the development of "cultural colonies," like China Town and Little Saigon in the United States, and that might lead to unique policing issues.

Allowing immigration into the United States to go unchecked would have significant impacts on all governmental services. Cultural colonization would impact the views from one community to another. This could lead to one community preying on another or on itself. The preying could result in situations of civil unrest similar to riots. These kinds of occurrences could impact government services and directly impact law enforcement response to life threatening situations. Occurrences similar to the Los Angeles riots of the sixties and the more recent riots of 1992 are examples occurrences that could employ satellite technologies develop

plans for efficient deployment of responding resources in these kinds of situations. Because of many more different cultural beliefs, law enforcement could anticipate more diverse approaches to the delivery of services.

The nominal forecast for trend 1 suggests that law enforcement managers will need to closely monitor changing demographics in anticipation of increased immigration and the special policing issues that might result. Law enforcement managers will need to consider the development and implementation of strategies to deal with separate cultures and their problems. Policy considerations would also include types of approaches that might be used to deal with the unique policing problems of the colonies. Considerations would also include approaches to dealing with conflicts between the colonies.

T-2 Degree of privatization in police services.

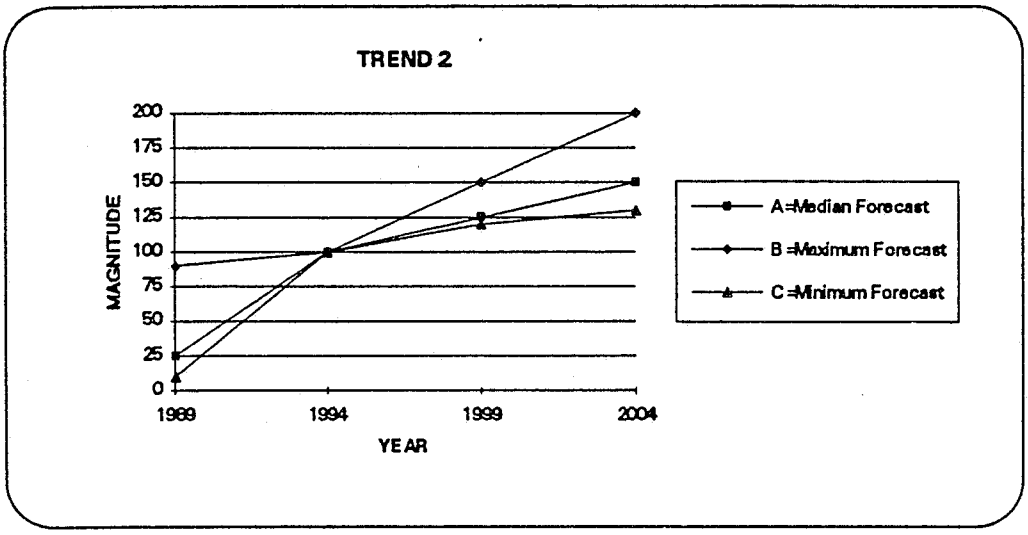


Illustration 4

Interpretation

The median forecast for Trend 2 represents the Nominal Group opinions about the privatization of police services.

The nominal forecast suggests that there will be a continued interest in how to provide law enforcement services more efficiently and effectively. An increase in accountability and independent audits of budgets point to the need for government, and law enforcement, to deliver services with equal or greater efficiency with fewer dollars. Delivering equal service with fewer dollars will be difficult if not impossible. The possibility of scarcer dollars signals a reduction in service by law enforcement. One approach to more service with fewer dollars would be the privatization of law enforcement services at a lesser cost to the taxpayer. Consolidation of, and contracting for, services and civilianization are areas that are currently receiving attention.

The Nominal Group suggested that technologies are making it easier to displace traditional law enforcement services. Examples of this include the security industry,

Geographic Information Systems, crime analysis and detention services. Global Positioning Systems are monitoring and tracking vehicles and narcotics and "in home arrest" has been discussed for some time as a way to eliminate overcrowding in the jail system. Monitoring of in home prisoners has been proposed using technology. Private industry is developing ways to privatize to traditional forms of law enforcement service.

Policy considerations would include planning for change and looking for the ways that general class employees might be able to utilize technologies to help facilitate the peace officers job in the field. Some operational tasks, like monitoring and communication could be performed through the use of technology by non peace officer status employees. There was some discussion that professionals in government and business might need to abandon provincial thinking and increase data and technology sharing in an attempt to solve problems.

T-3 Shift in defense spending from military to domestic.

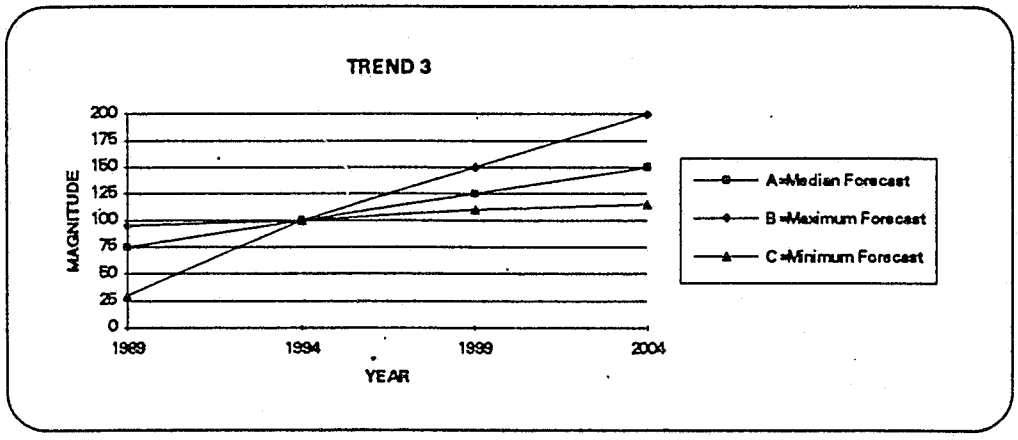


Illustration 5

Interpretation

The median forecast for Trend 3 represents the Nominal Group opinions about the shift in defense spending during the next five to ten years. The Group observed some current shifting of accessibility of information and technology and suggested that the future shift would open the door to many civilian contractors and applications of satellite technology to law enforcement. The Group observed significant interest by domestic companies to get involved in the application of military technology to domestic problems. The group perceived that some of these companies were making applications today and cited examples like tracking, monitoring, surveying and mapping.

Policy considerations would include partnerships between the military and local government and joint ventures with domestic companies to implement satellite technology to law enforcement. By planning for the future law enforcement would be in a better position to adapt to this change.

T-4 Demands on the public education system.

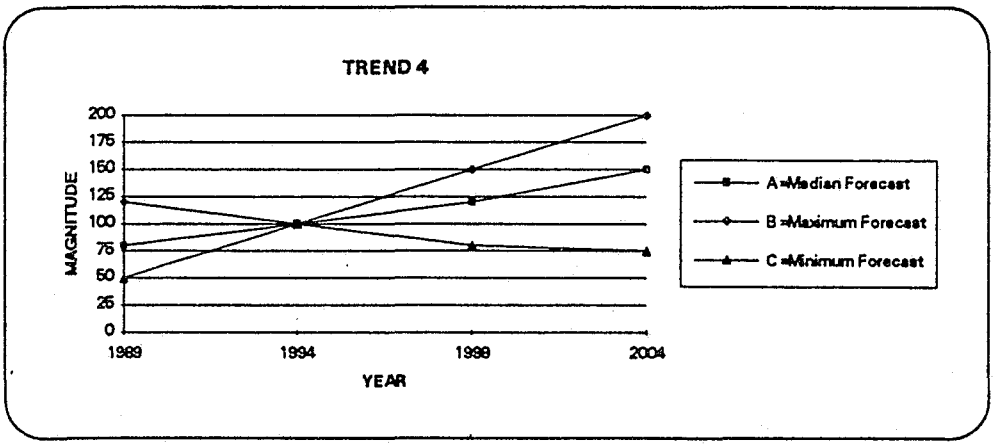


Illustration 6

Interpretation

The median forecast for Trend 4 represents the Nominal Group opinions about the demands on the public education system. There was varied opinion and belief of the successes of the public education in the future. Some group members saw improvement while others saw decay. The median forecast suggested a bright future. The Nominal Group believed that a more technologically defined curriculum would be developed to cope with a shift to more technically oriented jobs and tasks . If the future holds little or no increase in staffing levels, working smarter with fewer people points to the use of technology and better trained personnel.

Policy considerations for law enforcement would include development of partnerships with education to develop curriculum that would prepare present law enforcement representatives to cope with, and implement, technological changes. The more technologically literate the individual, the quicker implementation can occur.

T-5 Level of cooperation between federal, state and local law enforcement agencies.

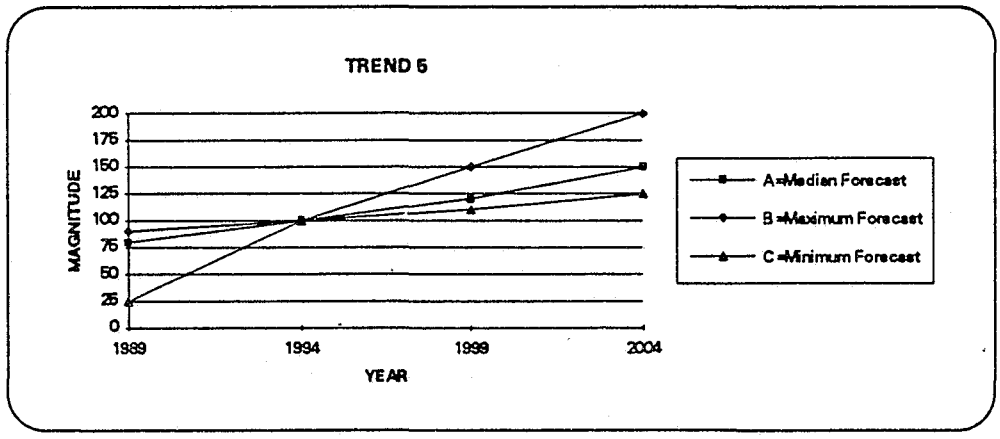


Illustration 7

Interpretation

The median forecast for Trend 5 represents the Nominal Group opinions about the levels of cooperation between governmental agencies. The median forecast suggested an increase in intra-organizational communication in the next five to ten years and sharing of information, knowledge and technology through agreements becoming more common.

The positive impacts of cooperation and networking between agencies would mean that the exchange of information might expedite or facilitate operations. Smaller agencies that might not have otherwise had accessibility to information could benefit tremendously by the networking contacts.

Law enforcement managers should consider policies that would facilitate the development of information sharing agreements. The possibility of less staffing would signal law enforcement agencies to develop alternative approaches to policing using the best real time technology systems available.

T-6 Level of unemployment.

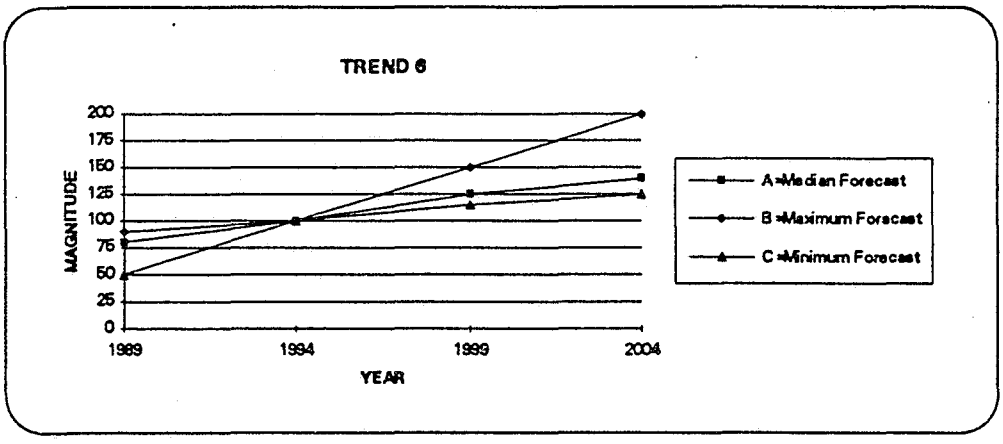


Illustration 8

Interpretation

The median forecast for Trend 6 represents the Nominal Group opinions of the impact of the level of unemployment on police services. The median forecast suggests a continued upward trend of unemployment. The panel suggested that the unemployment trend would include an increasing pool of employees in all sectors of business. The discussion included how this would impact the worker pool. Higher unemployment could mean that the worker pool might have significantly better qualified workers available to facilitate implementation of technologies. It could also mean that potential employees could be under-qualified for jobs that are technologically complicated. This would also impact training issues.

The discussion suggested that part of the unemployment problem could be caused by policies in the workplace that were in direct correlation to the use of satellite technology. Law enforcement professionals will need to contemplate policies with respect to how current job skills might be advanced due to changes in equipment and procedures.

Additional policy considerations include partnerships and joint ventures with education and private industry to maintain or improve proficiency in the workplace.

T-7 Public perception of need of satellite technology.

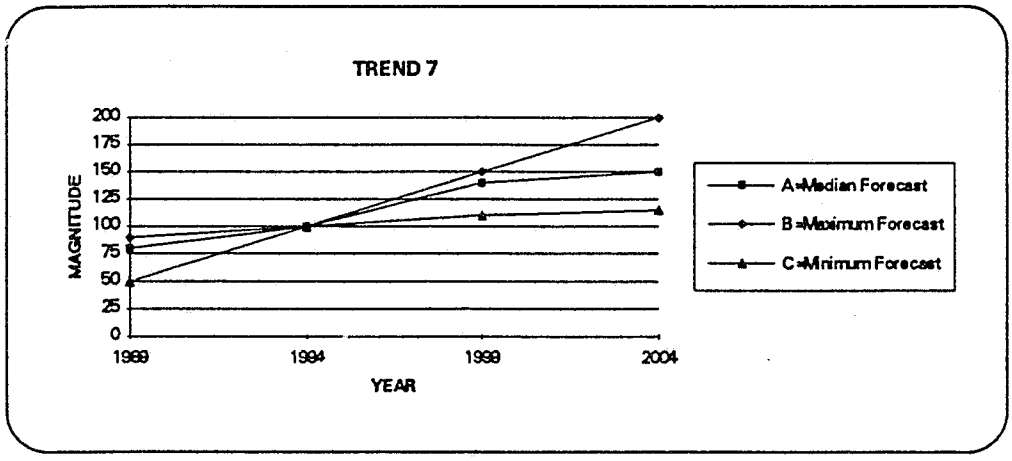


Illustration 9

Interpretation

The median forecast for Trend 7 represents the Nominal Group opinions about the public acceptance of the use of satellite technologies. The group suggested that the public would not arbitrarily accept satellite technology as a benefit to public safety and a significant demonstration of why satellite technology was needed and how its use would be safeguarded would need to occur.

The group discussion included the public perception that government was already intrusive enough and that unchecked applications of certain kinds of technology, such as satellite eavesdropping, would lead to ever greater apprehension by the public about the already too intrusive "big brother" atmosphere.

Policy considerations for law enforcement would include development of implementation strategies that would safeguard the uses of satellite technology. Demonstrations of benefits of this technology would also help to facilitate implementation.

T-8 Environmental impacts of industry.

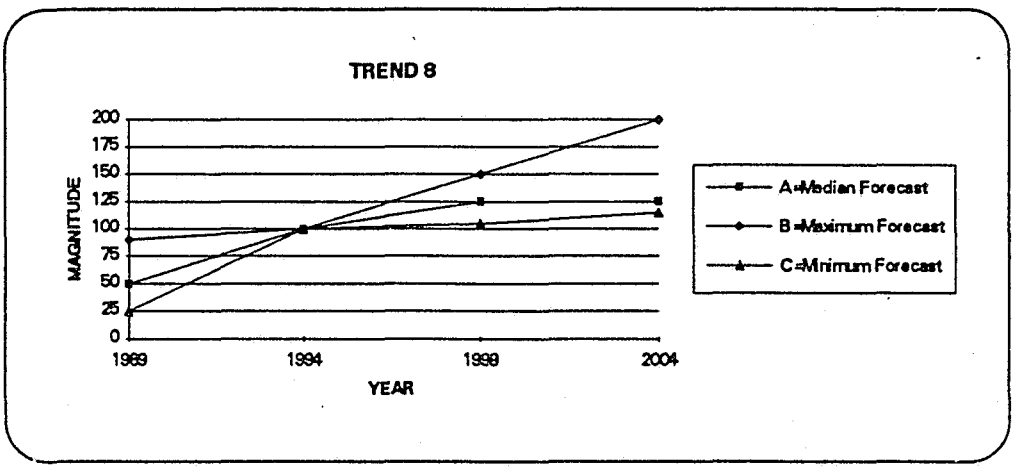


Illustration 10

Interpretation

The median forecast for Trend 8 represents the Nominal Group opinions of the environmental impacts on police services as caused by the use of satellite technology. The group suggested an increase in satellite technology use would have a positive impact on emergency operations. A positive impact cited was the reduced use of resources in search and rescue situations when using systems like global positioning. That system could almost eliminate rescue operations.

The application of satellite technologies could also have a negative impact on law enforcement organizations and could very well displace some employees. As in the example above the use of fewer resources could lead to elimination of traditional kinds of personnel, or job functions. Satellite technology could also have both a positive and negative affect and there could be a need for more, specially trained, employees to deal with special equipment. Group discussion about the types of technological applications included communications, tracking and

monitoring. With the help of satellite technology those tasks could be performed much quicker and with greater accuracy.

Policy considerations include alternatives to employee displacement and retraining programs. Retention of displaced employees through programs to upgrade skills must be considered should a need for more qualified employees present itself. Allowing technologies to displace employees would have an impact on the levels of unemployment as mentioned in Trend 6. Additional policy considerations would include how to deal with rapidly changing technology. How will the organization deal with finances and the purchase of new technology?

T-9 Degree of civil unrest in the United States.

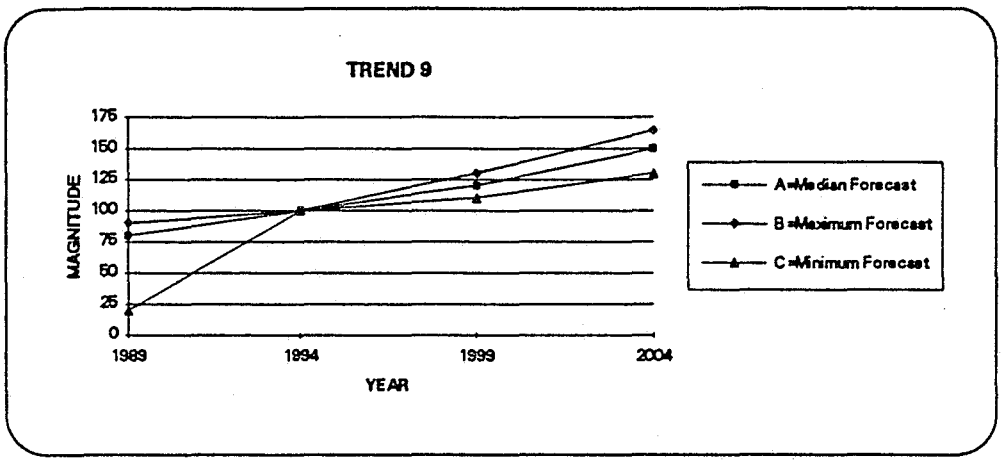


Illustration 11

Interpretation

The median forecast for Trend 9 represents the Nominal Group opinions about civil unrest. The group believed that civil unrest throughout the United States would increase slightly within the next five to ten years.

The group suggested that there were several indicators of this increase but most importantly was the impact of immigration on civil unrest. The Group felt that increased immigration into the United States would cause colonization of cultures and that conflicts would break out.

The cultural colonization and differences would play the biggest role in the degree of civil unrest that would occur in the future. Higher occurrences of civil unrest will present special problems to law enforcement up to and including riotous situations.

Policy considerations include monitoring crime trends in culturally centered communities to develop strategies to avert problems. And if that cannot be done to have an alternative plan to deploy resources efficiently based on accurate estimates of the problem.

T-10 Degree of global unrest and regional conflict.

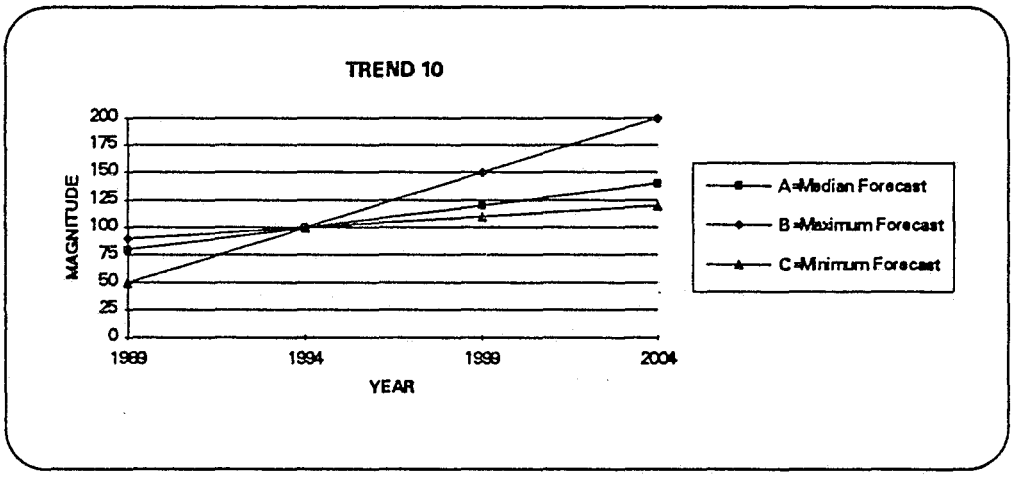


Illustration 12

Interpretation

The median forecast for Trend 10 represents the Nominal Group opinions about conflict. The Group suggested that global unrest and conflict would increase during the next five to ten years and domestic acts of terrorism would become more common in the United States.

The discussion suggested again that increased immigration and the mixture of cultures would create a favorable atmosphere for colonization. Acts of domestic terrorism like riots would become more and more common.

Policy considerations include the development of partnerships, and networking, with agencies with similar interests to develop plans to deal with the local conflict.

If the projections established by the group are accurate many organizations would be forced to rely on technology as a tool to gain the greatest benefit from its resources. These organizations would be forced to take innovative approaches to handling emergency situations as they are happening.

Event Graphs and Analysis

The following charts illustrate the panel's forecasted probability of occurrence for each of the selected events. The Nominal Group estimation of the probability of the event occurring is graphed at three levels; the median forecast, the maximum forecast and the minimum forecast.

E-1 Efficient, accurate and timely deployment of responding emergency resources.

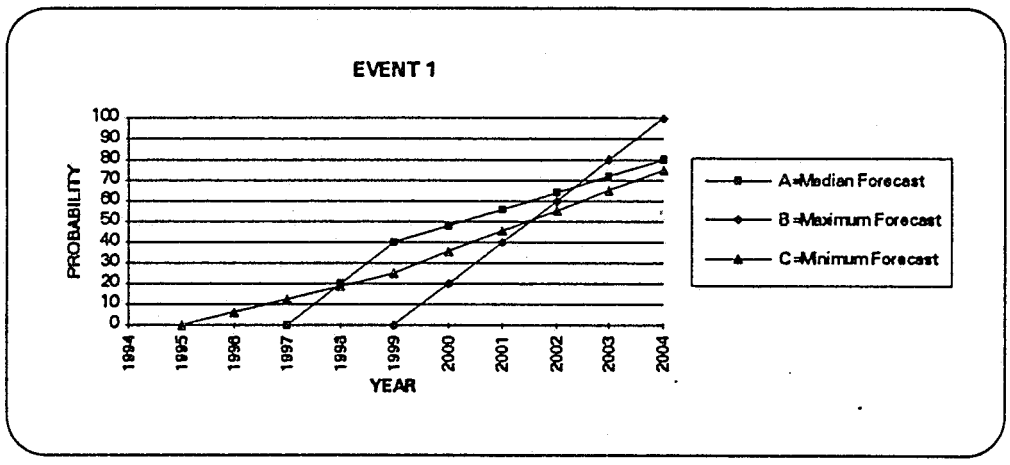


Illustration 13

Interpretation

The median forecast for Event 1 represents the Nominal Group opinions of the efficient use of resources during emergency situations. If efficiency is defined as the ability to apply only the required resources to the most urgent of disastrous situations then the group felt that law enforcement would take its first significant step by using satellite technologies like space photography and global positioning. The group saw the first indication of this event occurring in about 1997. By 1999 law enforcement professionals would perhaps efficiently use available

resources almost half the time. By 2004 it was suggested that because of emerging technologies and greater accountability that efficiency would be improved to approximately 80%.

This event would have a positive impact on law enforcement and society. Dollar savings would be considerable. Accurate deployment of resources would demonstrate the benefits and the need to apply these new technologies. Policy considerations for the future could include creating technological links to operational tasks that would make efficient applications possible.

Law enforcement is technically capable of applying satellite technology to critical incident management. The most significant impact of using satellite technology in critical incidents like an earthquake would be through imaging, sensing and positioning. Imaging, sensing and positioning could provide emergency first responders with information to determine areas of severe damage such as in freeway collapses. The benefit of examining building damage, fires, flooding and downed freeway bridges from above suggests that more accurate deployment may save lives, time and money and is a positive impact of the application of satellite technology in emergency operations. In this way emergency service providers would be capable of rapid deployment of available resources. In this manner response would be planned and deliberate avoiding duplication of effort between agencies.

E-2 Hand held satellite communication devices are used by law enforcement personnel.

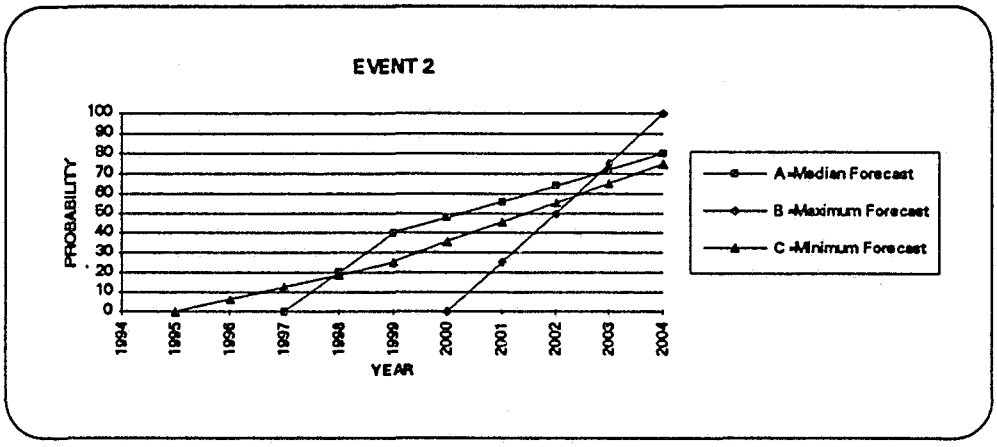


Illustration 14

Interpretation

The median forecast for Event 2 represents the Nominal Group opinions of the use of hand held communications devices by law enforcement officers. It was generally felt that this event would have positive impact on law enforcement. The use of hand held satellite communication devices would enhance law enforcement capabilities to communicate in areas where communications were otherwise impossible before. The Panel felt that there was an 80% probability that by 2004 the use of hand held satellite communications devices would be widespread.

This technology would prove invaluable during emergency situations like earthquakes if traditional communications systems failed. The ability to communicate from one end of the state to the other would enhance mutual aid requests. This technology would also make interagency operations more efficient.

Policy considerations would include radio frequency sharing agreements or dedicated statewide disaster channels for use by law enforcement agencies. Sharing agreements would benefit smaller agencies that were unable to afford the technology. Other considerations would include partnerships and joint ventures.

E-3 Specially encoded satellite locators make rapid location of lost persons and objects possible.

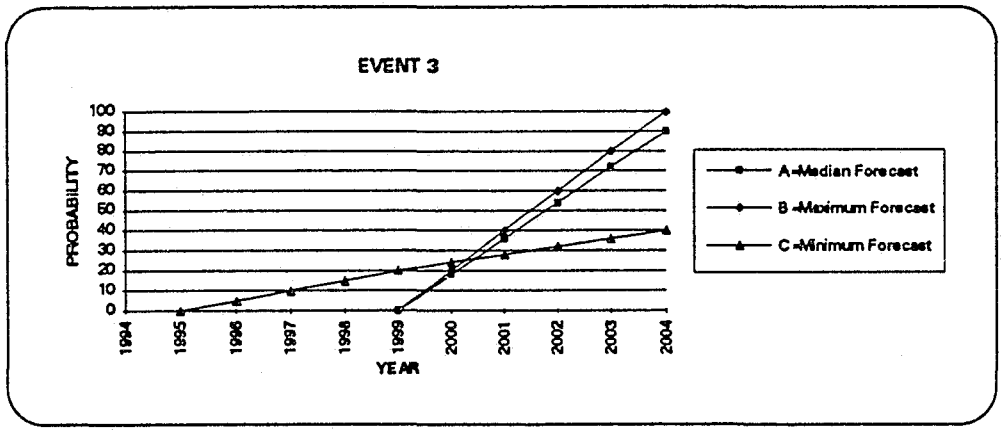


Illustration 15

Interpretation

The median forecast for Event 3 represents the Nominal Group opinions about the use of satellite locators. There have been applications of this technology during the 1990's law enforcement and the private. Satellite vehicle tracking systems are becoming more prevalent and marine applications to report ships in disaster can be found. Some law enforcement agencies are using satellite technology to track narcotics shipments. The Group expressed concern about the use of satellite technology to track human beings. It was suggested that law enforcement would not see any significant success in this area for about another five years. By 2004 there would be a ninety percent probability that this event would happen.

The group perception of this events occurrence was positive. This event would have a significant impact on costs associated with search and rescue operations. The use of satellite locators could prevent a hiker from getting lost or at least hasten the location of that individual.

Policy considerations include the development of legislation allowing for the use of satellite locators in wilderness areas. Public awareness programs would be developed to enlighten society on the benefits of satellite tracking technology. Cost saving alone could impact support for implementation and implementation strategies themselves. Life saving issues would demonstrate the importance of this technology. User fees would play a significant role in implementation and could defray costs associated with implementation and ongoing use. Failing to use a required locator device in wilderness areas would subject a lost hiker to pay for the cost of his or her rescue. An incentive to application of this technology would exist and there would be a positive financial impact on law enforcement by organizing rescues rather than searches.

E-4 United States Supreme Court rules satellite eavesdropping admissible during disasters and declared emergencies.

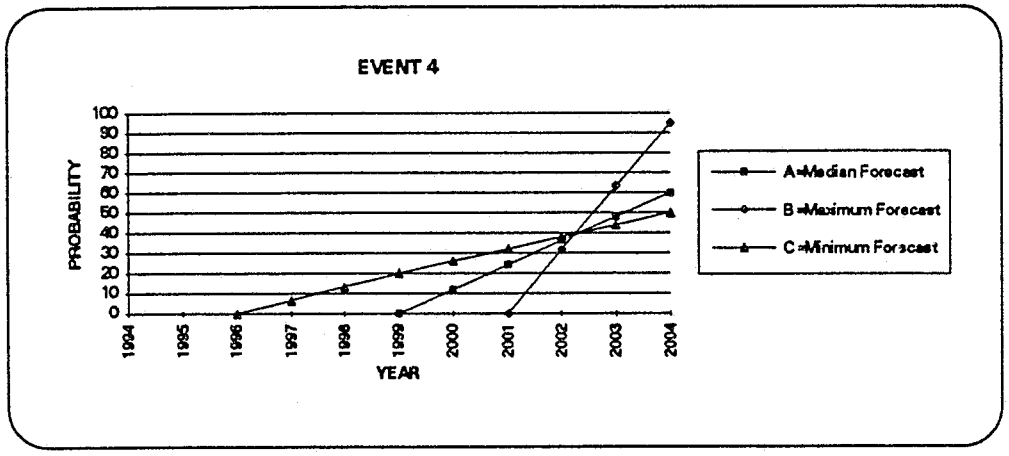


Illustration 16

Interpretation

The median forecast for Event 4 represents the Nominal Group opinions about the issue of eavesdropping. The Group suggested that this event could not occur until certain obstacles were overcome. The median probability of this event occurring by 2004 was only 60 %.

This Group suggested satellite eavesdropping would have a positive impact on law enforcement in several ways. Satellite monitoring of traffic, fires, floods, riots and other emergencies would facilitate deployment of resources and aid in eliminating hazards. Opposition would be expected from the American Civil Liberties Union. Their position on the event would most likely be one of too much intrusion already and the facilitation of more "big brother" by government.

Policy considerations included defining the parameters of emergencies and the applicability of the applications of satellite technology to law enforcement tasks during these

emergencies. Society would need to be convinced that the use of looking and listening technologies would provide a benefit that would outweigh constitutional objections.

E-5 Law enforcement is included in classified satellite technology loop.

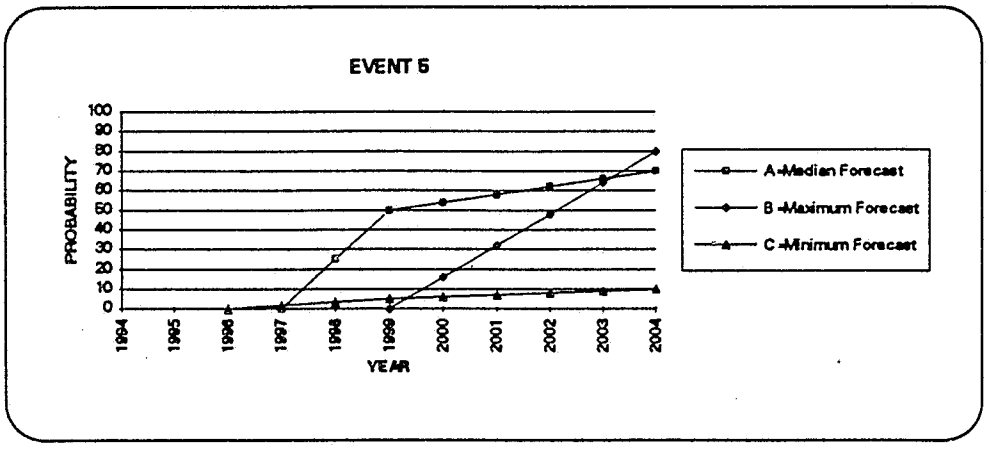


Illustration 17

Interpretation

The median forecast for Event 5 represents the Nominal Group opinions about law enforcement access to classified satellite technology. With current trends around the world and the apparent end of the Cold War it was suggested that heretofore classified technologies would be more accessible in the future. The consensus was that by 1999 there would be a 40% chance that law enforcement would be gaining access to these technologies without significant obstacles. There would be and even greater probability by 2004.

Negative consequences were identified. The costs of some satellite technologies would be significant. Smaller agencies will find it necessary to pool resources and develop sharing agreements and partnerships. Larger agencies with larger budgets would not necessarily be hindered by lack of funds.

Policy considerations include regionalization, communication links, partnerships and joint ventures. Being included in the technology loop suggests that law enforcement will be in a better position to adapt to change in a more timely manner.

E-6 Insufficient numbers of satellite radio frequencies available for law enforcement operations.

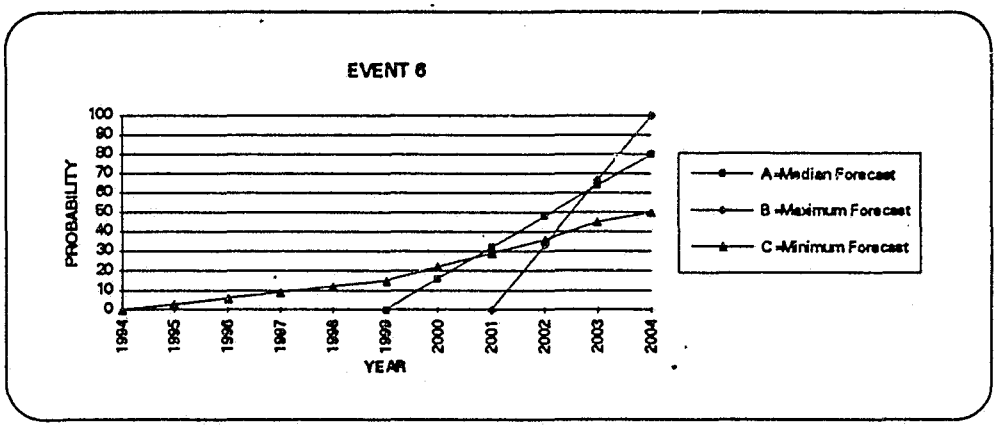


Illustration 18

Interpretation

The median forecast for Event 6 represents the Nominal Group opinions about the availability of radio frequencies available to law enforcement. The group suggested that competition from many sources would make it difficult to obtain an adequate number of frequencies necessary for basic operational tasks like communications.

This event is viewed as mostly negative to law enforcement but there were some positive impacts related to the issue. These positive impacts would be the forced drafting of sharing agreements between agencies. Smaller agencies would consider pooling their resources so that they might be in a position to compete with larger agencies throughout the state for frequency allocation.

Policy considerations include seeking opportunities to develop technology applications with partners in other law enforcement agencies and even in private industry.

E-7 Satellite users execute sharing agreements.

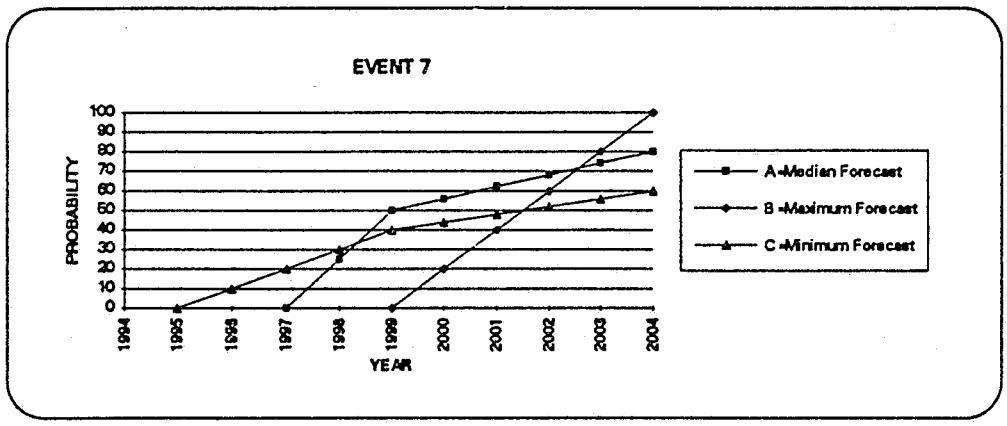


Illustration 19

Interpretation

The median forecast for Event 7 represents the Nominal Group opinions about sharing agreements. It is suggested that the necessity of pooling resources will drive the formulation of sharing agreements and that by 2004 many agencies will have formed these kinds of partnerships. For information to be most useful it must be shared.

The development of agreements is mostly positive in that it forces conformity by users while at the same time enhancing networking by more agencies. Forming partnerships will also make technology more affordable.

This event has a link to Event 6 (insufficient numbers of satellite radio frequencies) and the execution of sharing agreements would result in the acquisition of more frequencies being available to conduct law enforcement operations.

The lack of conventional radio frequencies in the Very High Frequency (VHF) and Ultra High Frequency (UHF) ranges are currently very important issues. Communications professionals are searching for additional frequencies to facilitate existing workloads. Sharing current radio frequencies is not uncommon. The California Law Enforcement Mutual Aid Radio System or CLEMARS is one example of this practice.

E-8 Voluntary use of personal encoders to locate people.

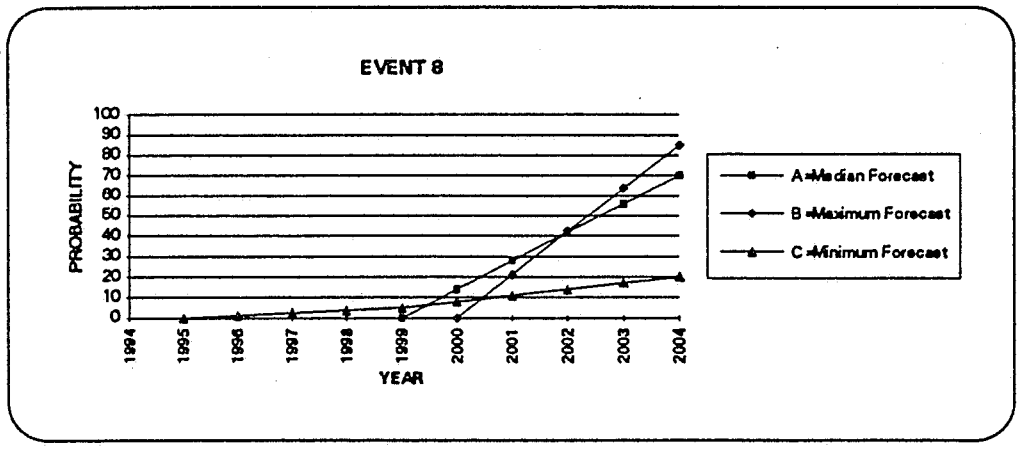


Illustration 20

Interpretation

The median forecast for Event 8 suggests that the group felt that this event would not occur until 1999. By the year 2004 the probability of this event occurring could increase to seventy percent.

The group looked at the event as having a significant positive impact on rescue operations "if" the citizens and governmental organizations like law enforcement took advantage of the technology.

There were several situations discussed but most prevalent was the application of this technology to lost hikers in wilderness areas.

The voluntary use of this technology was viewed as a negative unless other influences were to draw awareness to the positive impacts of voluntary use. Those influences could include the publicizing of the efficiency of the use of this technology in hiking and a penalty such a paying a rescue service fee if the technology was not used, yet available.

Policy considerations could include demonstrations of efficiency of application that save dollars and provide an example of efficient application of emergency response resources. These examples would lead to the drafting of legislation that mandated and set guidelines on the use of satellite technology in varied situations. Positive examples of cost saving and the protection of life would also be strong arguments in favor of implementation.

E-9 Federal Communication Commission is merged with the Justice Department.

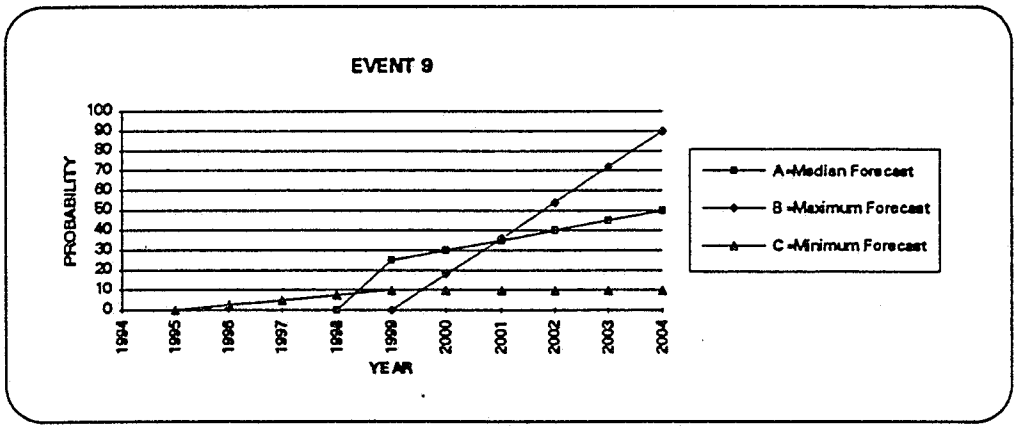


Illustration 21

Interpretation

The median forecast for Event 9 suggests that the group felt that this event would have no problem occurring prior to 1998. By the year 1999 the group felt that the probability of this event occurring would rise to twenty-five percent and would further increase to fifty percent by 2004.

The group interpretation of the merger of the Federal Communication Commission was that this would be the formation of the "Information Police" with local agencies having greater access to information previously unobtainable. The public fear of "big brother" and government getting bigger was part of the panel discussion about the negatives of this event and the information highway of the future.

Policy consideration could include the creation of laws to marry federal and local law enforcement agencies. The occurrence of this event could also have a large impact on how federal, state and local agencies network.

E-10 Vehicle encoders installed on all vehicles at the factory.

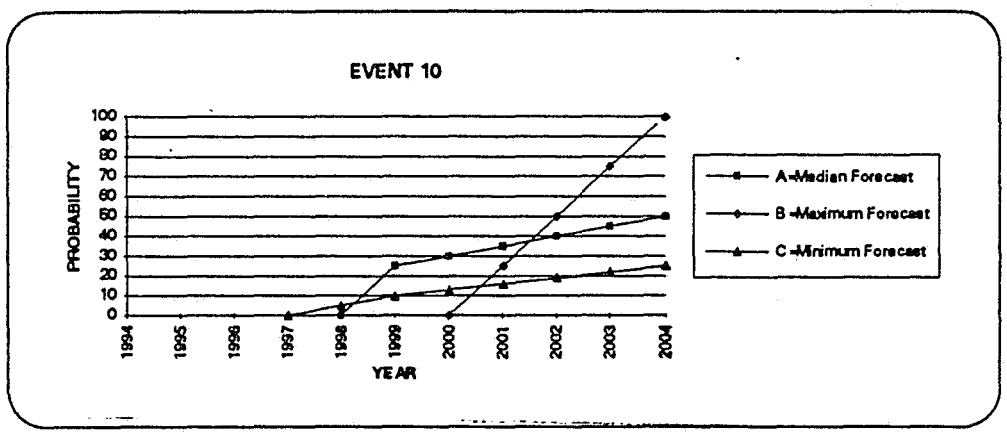


Illustration 22

Interpretation

The median forecast for Event 10 suggest that the group felt that this event would have no problem of occurring until 1999 and the probability of it occurring by the year 2004 would increase to fifty percent.

The panels perception of the event occurring was positive. The probability of recovering more stolen vehicles and eradication of some carjackings was possible although there was some discussion about an increase in hostage situations caused by rapid location of hijacked vehicles with the owners still in them.

Policy considerations could include developing strategies with insurance companies to develop, and implement, this technology. The application of this technology could reduce costs due to theft losses.

One of the most positive impacts included teaming satellite technology with relational databases to provide an early disaster warning information system to people inside their vehicles.

Cross Impact Evaluation

A five member focus group consisting of law enforcement professionals met to discuss the effects of the events on the other events and or trends. (Appendix B). Two of the members of this group were on the original NGT panel. The group consisted of Captain David Bellomy of the San Bernardino County Sheriff's Department, Mr. Bill Bethel of the San Bernardino County Sheriff's Department, Lieutenant Norm Hurst of the San Bernardino County Sheriff's Department, Lieutenant Paul Stotesbury of the Escondido California Police Department and Lieutenant Robert Utegg also of the San Bernardino County Sheriff's Department.

The group estimated the impacts by using a Cross Impact Evaluation Matrix. The chart in illustration 23 shows the group's estimations. In this illustration the impacting event along with the initial probability for that event is listed in the two left columns. The events were impacted against each other using a computer program for cross impact analysis.[16]

In the illustration a random number ranging from one to one hundred was used to determine the level of impact an event would have on itself and are seen in the chart as five, ten, fifteen and so on. Final probabilities can be found in the right column. Events could not be impacted against themselves and those areas are depicted by an "X".

The illustration also contains reactor hits in the far right column and actor hits in the lower row. These numbers were arrived at by figuring the greatest number of occurrences in which one event would have an impact on another event. The focus group suggested that each of the events selected would have some level of impact on event 2 and therefore the number of reactor hits equaled nine. This figure tends to support the rise in the percentage of final probability from fifty to ninety percent.

The five highest probabilities of occurrence for the events forecast were law enforcement being included in the technology loop (E-5), efficient deployment of resources (E-1), law enforcement using hand held communication devices (E-2), the execution of sharing agreements (E-7) and the use of satellite eavesdropping during emergencies (E-4).

CROSS IMPACT EVALUATION MATRIX

EVENT TO EVENT

Impacting Events

Impacted Event	Probability Five Years From Now	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9	E-10	Probability Ten Years From Now	Reactor Hits
E-1	40%	X	—	—	5	25	25	30	20	15	20	95%	7
E-2	50%	10	X	30	5	15	20	5	5	10	5	94%	9
E-3	40%	—	—	X	5	—	20	—	—	—	30	61%	3
E-4	50%	—	—	5	X	—	10	—	—	—	30	65%	3
E-5	50%	25	—	25	5	X	15	15	5	15	15	96%	8
E-6	50%	—	—	10	10	—	X	—	—	—	10	63%	3
E-7	50%	15	—	5	10	10	30	X	5	15	5	90%	8
E-8	30%	—	—	30	5	—	5	—	X	5	10	52%	5
E-9	25%	—	—	5	10	—	10	—	5	X	10	38%	5
E-10	20%	—	—	20	15	—	10	—	—	—	X	43%	3
Actor Hits	---	3	0	8	9	3	9	3	5	5	9	—	—

E-1 Efficient, accurate, and timely deployment of responding emergency resources.
E-2 Hand held satellite communication devices are used by law enforcement personnel.
E-3 Specially encoded satellite locators make rapid location of persons and objects possible.
E-4 United States Supreme Court rules satellite eavesdropping admissible during disaster and declared emergencies.
E-5 Law enforcement is included in classified satellite technology loop.
E-6 Insufficient numbers of satellite radio frequencies available for law enforcement operations.
E-7 Satellite users execute sharing agreements.
E-8 Voluntary use of personal locators to locate people.
E-9 Federal Communication Commission id merged with the Justice Department.
E10 Vehicle encoders installed on all vehicles at the factory.

Illustration 23

Future Scenarios

Three future scenarios are provided based on the trend and event forecasts. The scenarios are intended to give the reader a view of the future should certain events occur. They

are typically written looking back over the forecasted events as if they had, or had not, actually occurred.

The future scenarios are presented in the narrative style as though the reader was listening to the speaker as he expressed opinions on an issue that was of importance to him. The development of the scenarios was made possible by the panel forecasts of the trends and events established by the nominal group. The results of the cross impact analysis of events were also carried forward into a computer based scenario generation program called "SIGMA"[17]

SIGMA was used to develop families of like occurrences of events (Appendix C) that were identified by the Nominal Group in June of 1993.

The the ten most important events as identified by the nominal group were used for the scenario generator. In addition to the name of the events the percent of probability of occurrence and the positive and negative impact scores that ranged from one to ten were also entered. The process included entry of a random seed number which was the author's home telephone number. This process provided the author with like families of events that occurred. SIGMA also identified the events that did not occur.

The author ran sixty series of tests of the events in SIGMA changing the seed number each time by an increment of one. The reoccurring families of events formed the basis for the scenarios.

The scenarios are centered around the Bear County Sheriff's Department, a fictional agency that is situated in a large geographical area of the State of California. Bear County is located on the fringes of metropolitan Los Angeles.

Scenario 1 - Exploratory (Nominal Mode)

In this surprise-free scenario, none of the events forecast in the futures study occur.

The day had finally come when Ken's retirement was close at hand. July 25, 2004. Ken had devoted thirty five years to the Bear County Sheriff's Department.

Ken was scheduled for an exit interview with the Sheriff and was looking forward to it. He had had many opportunities to talk to the Sheriff before and was asked many times to comment on some procedural matters and for the most part his comments and suggestions were given serious consideration.

Ken had worked hard during his career having had many varied assignments throughout the department and he had attained the rank of Commander. Not an exceptionally easy thing to do since the economic hard time of the early 1990's when budget reduction and layoffs were common.

Ken thought about how times seemed much simpler during the 1990's before civilianization really took root in law enforcement (T-2). But civilianization helped stretch those shrinking dollars so that police officers were free to enforce the law (T-6). He also thought about how different the employees of today were compared to those ten years ago (T-4).

The last ten years of Ken's career really helped him form a picture in his mind of how the future of law enforcement might look by the year 2010. He was watching as technology was playing a bigger and bigger role in society.

With all of his acquired knowledge and opinions Ken was happy, yet sad, that he was going to retire. Too many people (T-1), cooperation between agencies was about the same as it always had been (poor) (T-5) and citizens were still unhappy with the politicians due to their

inability to deal with local problems (T-9). The shift of emphasis from military to domestic (T-3) was also having its affect on industry (T-8) and our ability to deal with global problems on the local front (T-10).

Ken was excited knowing that there were many young, intelligent and well informed people in the organization. He thought that these people were ready, willing and able to lead the organization into the future and they were able to implement technology into law enforcement.

Ken arrived at the Sheriff's office and was invited in by the Sheriff. Sheriff Day had not been in law enforcement quite as long as Ken but she seemed really well informed, enthusiastic and she had a reputation of being a risk taker; not afraid of trying something new or different. She had prepared herself well. College degrees, community involvement, committee work at the state level, and P.O.S.T. Command College (a little too much busy work in Ken's eyes). Ken did feel that she was open minded and willing to listen to new ideas.

Sheriff Day greeted Ken at the door to her office. "Ken, glad you could make it. Please come in and set down. I have really been looking forward to seeing you today." She continued, "Ken you have been with the Department for thirty five years and have seen many changes. I really wish that I had your experience and knowledge. You have always been helpful to the organization and I would value your opinions one more time."

Ken had somehow felt that the exit interview was a formality but after listening to the Sheriff he was sure that she was interested in his opinion. He responded to her request with enthusiasm that he hadn't felt in some time. Ken told Sheriff Day that he had in fact seen many

changes during his career, but the most significant change in his mind was how technology was going to affect law enforcement.

During the early 1990's Ken had purchased a satellite system for television viewing at his home. He had gotten the idea after watching the Law Enforcement Television Network (LETN) at the Department. He thought that monthly in-service interactive video training was a pretty good idea.

Along with his home system came a lot of satellite reading material and as Ken read he thought about LETN and wondered what other satellite applications might work in law enforcement.

"Sheriff Day, if I could pass on any one idea to you I would suggest that you look into how satellite technology will affect law enforcement response to emergency situations in the future. There have been some pretty significant developments in this technology."

Ken made many significant points about how satellite technology could be applied. He said that he understood that someone in San Bernardino County had thought about that issue back in 1992 after an intensive search for a lost hiker in a wilderness area.

Ken also mentioned that he understood that there were several Command College papers on the issue and that many of them made reference to satellite tracking devices (E-1, E-3, E-8). Ken had even read about how hijacked semi-trucks were being tracked by satellites (E-10).

Ken told Sheriff Day that he had several discussions about this technology with her Adjutant and Public Affairs Officer Mr. Longhetti and he had shown some interest and knowledge about satellites. Ken suggested that Mr. Longhetti would be a good choice to start

researching the future of satellite technology application for the Bear County Sheriff's Department.

Ken continued on for some time while the Sheriff listened forming some ideas of her own. She wondered if there would be complications (E-9), problems (E-6), or restrictions (E-4). She wondered what applications would be necessary and appropriate today (E-2, E-5, E-7).

As Ken finished Sheriff Day thanked him again for all of his years of valuable service and told him that she was intrigued by his thoughts. "Maybe we can be one of the first agencies in the state to try applying this technology."

Scenario 2 - Normative Mode

In this feared, but possible scenario, five forecasted events occur. The events that occur are: United States Supreme Court rules satellite eavesdropping admissible during disasters and declared emergencies (E-4); Law enforcement is included in classified satellite technology loop (E-5); Insufficient numbers of satellite frequencies available for law enforcement operations (E-6); Satellite users execute sharing agreements (E-7); Federal Communication Commission is merged with the Justice Department (E-9).

Monday, June 1, 2001, 8:30 a.m., Sheriff Day's office.

Sheriff Days says, "Mr. Longhetti could you come to my office please?" As Longhetti comes through the door he says, "Yes Sheriff, what can I do for you?"

"I would like to discuss how we are doing with the satellite technology application issue. I really believe that this is significant technology for law enforcement but can't seem to get anywhere with the Information Police (E-9). I am not certain that we are really as prepared to

move ahead as we should be. Those federal boys sure do keep their information close to their vests (T-5)."

There had been several opportunities to use the technology that had been available to law enforcement yet Sheriff Day and the Bear County Sheriff's Department had failed to recognize early on the significance and how to get started on the implementation issues.

Having researched the application of satellite technology in law enforcement Sheriff Day found out that she should have taken steps years ago to guarantee her right to use the systems that were available.

The population explosion of different ethnic cultures (T-1) was having an impact on Bear County and Sheriff Day's operations. She knew that it was legal to gain information by eavesdropping (E-4), but she was having difficulty gaining the intelligence information needed for tactical operations.

Had Sheriff Day known sooner about satellite technology, she could have applied for direct access to the satellites via radio but because of her lack of information she was now excluded because the larger agencies in the neighboring jurisdictions and states had acquired all of the available frequencies and there were none left (E-6). Her only alternative now was to try to negotiate an agreement with the owning agencies to use one of their frequencies (E-7). Any agreement that she negotiated now would surely require a considerable user fee paid directly to the owning agency.

As Sheriff Day and Mr. Longhetti discussed the issue she gave him additional direction that she felt might have some impact on the future of the Department. She asked Mr. Longhetti to speak with some private and domestic companies involved in satellite technology. She knew

that since the Cold War in the 1990's that there had been a shift in federal spending (T-3) and with more and more privatization of police service (T-2) that there might be some additional opportunities for participation in the technology loop (E-5).

Sheriff Day began the task of building the contacts and relationships that would be necessary to use satellite technology and participate with other agencies in the future. She only wished that she had been more attentive to technological issues earlier.

Scenario 3 - Hypothetical Mode

In this "what if" scenario, five forecasted events occur ten years. The events that occur are: Efficient, accurate and timely deployment of responding emergency resources (E-1); Hand held satellite communication devices are used by law enforcement personnel (E-2); Specially encoded satellite locators make rapid location of persons and objects possible (E-3); Voluntary use of personal locators to locate people (E-8); Vehicle encoders are installed on all vehicles at the factory (E-10).

Sheriff Day approached the steps of the County Seat enroute to her appointment with Board of Supervisors. Sheriff Day had gained quite a reputation for saving money and for the way she managed emergency operations. It appeared that the Board was interested in seeing why she was so successful in managing operations in her department. They probably wondered if some of the principles that she used would be applicable at the county level.

The meeting started promptly at 2:00 p.m. After exchanging greetings the Chairman of the Board got right to the point. "Tell us Kathy, what is it that you do that makes your operation so efficient? We keep hearing about record recoveries of property and the location of lost people and that intrigues us."

Sheriff Day told the Chairman that for the past fifty years the United States government had been adapting satellite technology in many different ways. She told him that many years ago the technology was exclusively military but that changed in the mid to late 1990's. She told him that the technology was originally used to spy on the enemy from space but there were many other types of applications today.

The Chairman asked the Sheriff to continue explaining why we would even need such a system (T-7). "Isn't the public a little weary of government and big brother already?" The Sheriff's response was a resounding "yes".

Sheriff Day explained to the Chairman that his point was well taken but that the Board could play a vital role in the application of this technology. "You see Mr. Chairman, this technology, with certain guidelines, could reduce losses and more importantly save lives. What we don't have as yet are laws and guidelines on the future use of this technology." The Sheriff told the Board that there were no requirements to use satellite locators (E-8) anywhere in the county. The Sheriff explained that some people choose to use them and some did not.

The Sheriff told the Board that her department had saved thousands of dollars in their search and rescue operations when people voluntarily used satellite locators. She explained that a minimum of resources were deployed to conduct searches when this technology was being used (E-1).

The Sheriff also told the Board that their search and rescue operations were not always as simple as she explained. She said that sometimes additional resources were needed from outside the county. In these cases help was just a radio call away on California's Operational Area Satellite Information System (OASIS) that was available, and in use, since 1992 (E-2).

The Sheriff explained that the choice of whether or not to use a specially encoded satellite locator had a direct impact on how much an individual was billed for the rescue service provided (E-3).

The Board could see the positive impacts of satellite technology application and thought that if the county vehicles and valuable property were equipped with such equipment it would be possible to limit thefts and recover property. The Sheriff confirmed the idea with the Board and remarked that accomplishing this task would involve partnerships with insurance companies, vehicle manufacturers, and legislators (E-10).

The Board was convinced that they would work towards developing guidelines and legislation that would require the use of satellite technology.

As Sheriff Day left the meeting she was convinced that she had gained valuable support from the Board for implementation of future technologies. The Sheriff wondered if the Board would propose some form of legislation that would facilitate implementation and be willing to fund those new programs.

Section III

Strategic Plan

Situational Background

The focus of this section is to develop a strategy to implement a change for the Bear County Sheriff's Department (BCSD), a fictional agency in a large geographic area of the State of California. The strategic plan will manage and bring about a desired future based on hypothetical scenario #3 from the futures study, which represents a future state for BCSD that is the most desired. The forecasts of trends and events suggested that the application of satellite technology to law enforcement operations would have a positive impact on emergency operations in the future. The forecasts, and research, pointed to wider application's of satellite technologies like global positioning and communications by emergency service providers helping to improve law enforcement emergency operations, save money, time and lives.

BCSD is a large diverse agency providing law enforcement services throughout the County of Bear. Sheriff Kathy Day, a five year veteran of the department, has been the sheriff since defeating a long time well respected incumbent sheriff. BCSD is a large diverse law enforcement agency that geographically covers thousands of square miles of area bordered by metropolitan areas. The county's population has grown significantly during the past ten years and growth is expected to continue. Half of the 2000 member workforce are peace officers.

Sheriff Day is concerned that funding will surely impact her ability to deliver police services to Bear County. She believes that command level managers will need to use knowledge and skill to deliver services that will include implementation of technology. Sheriff Day

believes that department demographics will change in the future and will look more like the demographics of the population of the county.

The additional responsibility as Director of Public Safety leads Sheriff Day to believe that the application of satellite technology to natural and manmade emergencies will impact law enforcement in positive ways. The use of computers and data vision in patrol cars, telecommunications, navigational technologies, moving map displays, real time monitoring of disasters and more would significantly improve efficiency.

The components of the strategic plan include: a mission statement, situational analysis, organizational capability analysis, stakeholder identification and analysis, policy alternatives, and a selected strategy.

STRATEGIC PLAN

Mission Statements

Two mission statements are provided. The "macro" statement emphasizes the overall mission of the Bear County Sheriff's Department. The "micro" statement emphasizes BCSD's mission as it relates to the application of satellite technology to law enforcement operations.

Macro Statement

The mission of the Bear County Sheriff's Department is to focus on the quality of service and interaction with the community it serves. To that end the Bear County Sheriff's Department will strive to:

* Recruit and retain the best possible personnel

* Constantly monitor changing demographics to ensure that the service levels in the community are adequately maintained

* Pursue innovative ideas and techniques to aid in the delivery of law enforcement service to the people it serves at the least possible cost

The Bear County Sheriff's Department is committed to the principles of providing public service and protection through fair enforcement of all laws.

Micro Statement

The mission of the Bear County Sheriff's Department is to focus on the quality of service to the communities it serves by:

* Identifying opportunities to enhance service by the use of technology

* Developing and coordinating partnerships and joint ventures with industry to improve efficiency and effectiveness of services

* Developing and using technologies in ways that are unique to law enforcement

SITUATIONAL ANALYSIS

An analysis of the environment and the organization was done by using the STEEP (Social, Technological, Economic, Environmental, and Political) and WOTS Up (Weakness, Opportunities, Threats, and Strengths) models. A consensus of group of six law enforcement professionals assisting with the situational analysis and the identification of stakeholders and stakeholder assumptions included Captain's Bernard DeYoung and David Bellomy of the San

Bernardino County Sheriff's Department, Captain Frank Scaldone of the Fontana California Police Department and Sergeant Charles May and Lieutenant Rodney Hoops also of the San Bernardino County Sheriff's Department.

Environmental Analysis

The environment relating to the use of satellite technology has been changing for some time. The end of the cold war and a trend towards the declassification of satellite technology has opened the door to the application of satellite technology in many ways and to many users.

There are significant ways in which satellite technology can be used to save money, time and lives while at the same time improving the quality of our everyday lives. The application of satellite technology to our everyday routines include enhanced map making, color radar imaging, navigational and exact location abilities and real time monitoring of situations such as traffic congestion, fires, floods and earthquakes.

The budget crises have forced governmental agencies such as law enforcement to find new and innovative ways to provide services to the communities they serve. The application of satellite technology to critical incidents has significant potential impacts for law enforcement.

Social

Threats - The perceptions held by many people in the community suggest that there may be some obstacles to the use of satellite technology for purposes that have been traditionally referred to as spying. The "big brother" issue would present problems to implementation from the legal community.

Opportunities - Community leaders and politicians could likely be supportive of more efficient and less costly delivery of services. A demonstration of cost effectiveness of the use of

satellite technology could help convince the community that satellite technology is beneficial to our daily routines.

Technological

Threats - The continual rapid change of technologies are identified as a threat to the issue. Funding would also hinder the department's abilities to purchase state of the art equipment. Costs of changing technologies and obsolescence of technologies are threats to implementation.

Opportunities - More and more significant and efficient ways of applying satellite technology exist. They are a cost effective use of resources and are opportunities related to the issue. The application of satellite technology is expanding rapidly. One example is how Geographic Information Systems (GIS) joined with Global Positioning Systems demonstrate a more rapid, and efficient, way of identifying specific locations and are rich opportunities.

Environmental

Threats - Unemployment is identified as a hazard to the work environment. The displacement of workers due to technology application would impact the organization. This will be viewed as a threat to implementation.

Opportunities - Positive examples of cost savings and the preservation of life are opportunities to demonstrate the value for implementation of satellite technology.

Opportunities would exist to retrain, and retain, displaced employees so that they would be able to re-enter the workforce with the skills necessary to perform in a technological environment. Opportunities exist to bring the technological skills of current employees to levels required for implementation.

Economic

Threats - A continuing decline in revenues available to all forms of government service will affect the workforce as well as the resources available for law enforcement operations. The declining economy of the county would impact levels of employment. The number of employees in the workforce would decline.

Opportunities - Opportunities will exist to form partnerships and agreements at the local, state, and federal levels. These partnerships and agreements would preclude duplication of services and efforts thereby saving dollars that could be applied to other programs.

Political

Threats - Threats identified include the perception of a "big brother" state as government and law enforcement is intrusive enough as it is. Politicians would oppose implementation due to pressure from constituents and special interest groups. Voters might threaten to vote against politicians who they saw as not representing their best interests. Special interest groups such as the American Civil Liberties Union could be expected to apply pressure to politicians to not support implementation. Politicians would refuse to introduce or support favorable legislation that would govern the use of satellite technologies.

Opportunities - Political leaders would be responsive to the concerns of their constituents and special interest groups and view implementation of satellite technologies as a positive approach to saving dollars. Politicians could introduce favorable laws that govern use of satellite technology.

Organization Analysis

The Bear County Sheriff's Department is a relatively traditional department with a refreshed approach to law enforcement service. Because of its regionalized operations BCSD has much diversity in its workforce.

BCSD has many well qualified and experienced employees who are intrigued by the possibilities brought about by the implementation of newer technologies to law enforcement.

Because of regionalization the Bear County Sheriff's Department serves a large ethnically diverse geographical area. Budget concerns threaten existing services across the county. BCSD has several different divisions across a somewhat large geographical area and management consistency and organizational communication can sometimes cause problems.

There is also some resistance to change from some of the more tenured employees who are comfortable with things the way they were before the last sheriff left office.

Overall the analysis of the organization suggests that the skills of the personnel in the organization, and its flexibility, would help to overcome obstacles caused by budgetary constraints and lack of equipment available to perform the law enforcement task.

The Bear County Sheriff's Department has many strengths and some weaknesses in its approach to the application of technology.

These strengths and weakness' include:

Strengths	Weaknesses
Flexibility	Ability to Purchase Technology
Community Support	Availability of State of the Art Equipment
Legislative Support	Money
Police Officer Skills	Police Officer Training

Supervisor Skills	Supervisor Training
Image	Resistance to change

Stakeholder Identification and Analysis

A consensus group of seven law enforcement professionals identified the following individuals and or entities as stakeholders regarding the implementation of satellite technology. The groups make-up was Lieutenants' Norm Hurst, Robert Utegg and Larry Swope of the San Bernardino County Sheriff's Department, Captains' David Bellomy and Bernard DeYoung also of the San Bernardino County Sheriff's Department, Captain Frank Scaldone of the Fontana California Police Department and Captain Mike Cardwell of the Apple Valley California Police Department. At least two stakeholder assumptions have been identified for each stakeholder.

Stakeholder	Assumptions Re: The Issue
1. Bear County Sheriff's Department	(a) Would be a valuable resource to identifying acceptable situations in which satellite technology could be applied
	(b) Would be a valuable resource to identify the kinds of satellite technology that is most applicable to emergency operations
	(c) Would share or sell information
2. Bear County Board of Supervisors	(a) Would mandate or legislate the use of satellite technology
	(b) Would fund satellite technology programs for law enforcement
3. Private Industries	(a) Would sell satellite information and services
	(b) Would capitalize on opportunities to sell services to law enforcement

4. American Civil Liberties

(a) Would object to use of satellite technology for Union surveillance

(b) Would argue against citing a "big brother" type atmosphere

(c) Would suggest that government is already too intrusive

5. California Commission on Peace Officer Standards and Training

(a) Would Play a role in identifying technology experts

(b) Would assist in the development strategies

6. The Public Education System

(a) Would help to develop partnerships with law enforcement and industry to develop curriculum

(b) Would have a positive impact on the skills and abilities of future employees

7. United States Military

(a) Would object to sharing of satellite technology

(b) Would play a major role in identifying some technologies that would be most applicable to law enforcement emergency operations

8. Vehicle Manufacturers

(a) Would support use of location devices

(b) Would help to develop some technology partnerships with insurance companies for future applications

9. Insurance Companies

(a) Would develop prototype vehicle recovery systems

(b) Would reduce insurance rates

10. *= The Courts

(a) Would legalize forms of satellite technology use

(b) Would mandate forms of satellite technology use

(c) Would block forms of satellite technology use

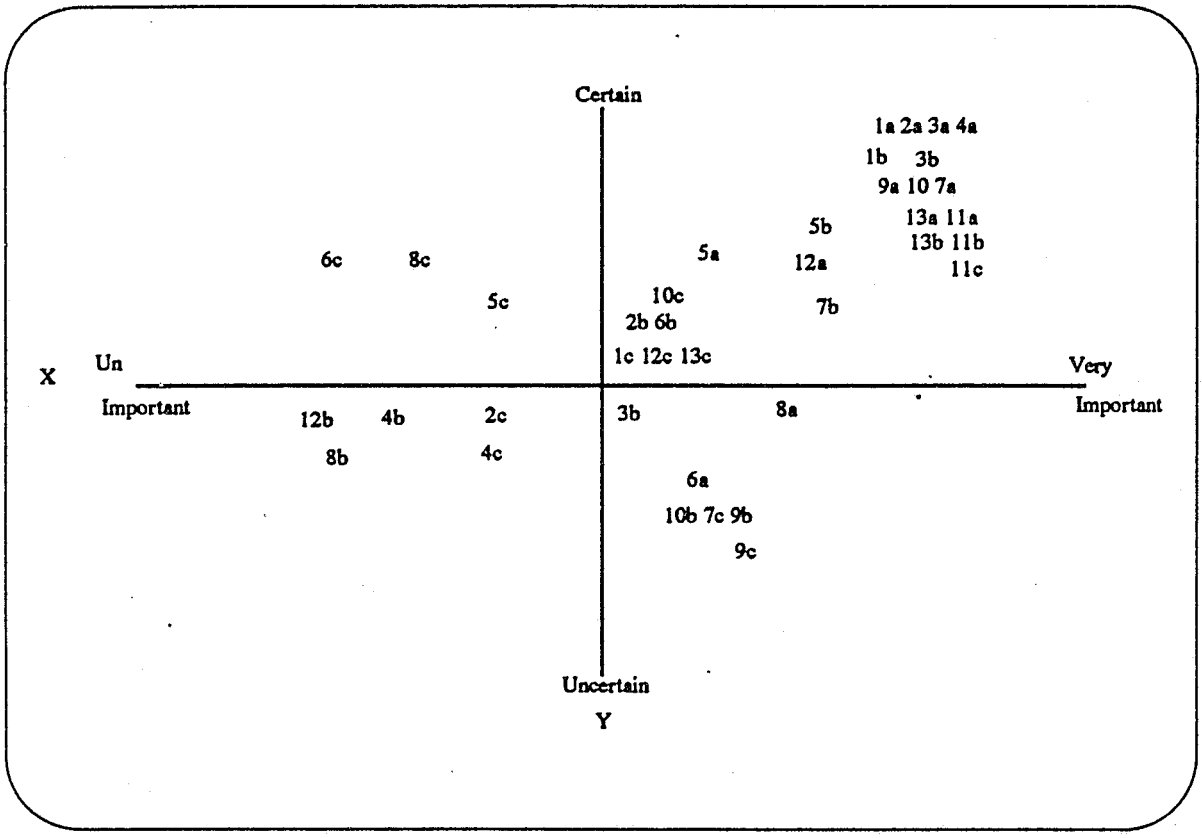
11. Public Safety Providers	(a) Would save money and time by using satellite technology
	(b) Would save lives with satellite technology
12. *= The Community	(a) Would object to some implementation strategies as too intrusive
	(b) Would support some implementation strategies as cost effective
13. *= Government (generally)	(a) Would mandate funding
	(b) Would mandate the use of satellite technology
	(c) Would disagree about how satellite technology should be used
	(d) Would help to develop sharing agreements

***= SNAILDARTER: Stakeholders who can unexpectedly and radically impact the implementation strategy.**

A stakeholder assumption map is provided and represents the key assumptions about each stakeholder's concerns in relationship to the application of satellite technology to law enforcement operations and emergency management. The map depicts estimates of both the importance and certainty of each assumption. The top of the Y axis of the map depicts the certainty of the stakeholder assumption while the bottom lists the uncertainty. The X axis depicts the importance of the stakeholder assumption on the map. The left side of the X axis suggests unimportance while the right side suggests that an assumption is very important. As an example stakeholder 4, the American Civil Liberties Union, would most probably object

strongly to the use of space photography for surveillance purposes. As this was listed as their first assumption it is mapped as 4a. The map suggests that the issue is almost certain to happen and that it will be very important to the issue. Each quadrant on the map can provide valuable information for the development of a strategy to deal with the issue.

STAKEHOLDER ASSUMPTION MAP



Legend of Stakeholders

1a. Bear County Sheriff's Department, can identify situations applicable to satellite technology use
1b. Bear County Sheriff's Department, can identify most applicable kinds of satellite technology to used in emergency operations
1c. Bear County Sheriff's Department, would sell or share information
2a. Bear County Board of Supervisors, would mandate or legislate use of satellite technology
2b. Bear County Board of Supervisors, would fund satellite programs for law enforcement
3a. Private Industries, would sell satellite information and services
3b. Private Industries, would capitalize on opportunities to sell services to law enforcement
4a. American Civil Liberties Union, would object to use of satellite technology for surveillance
4b. American Civil Liberties Union, would argue against citing a "big brother" type atmosphere
4c. American Civil Liberties Union, would suggest that government is already too intrusive
5a. California Commission on Peace Officer Standards and Training, would play role in identifying technology experts
5b. California Commission on Peace Officer Standards and Training, would assist in development strategies
6a. The Public Education System, would help develop partnerships with law enforcement and industry to develop curriculum
6b. would have a positive impact on the skills and abilities of future employees
7.a United States Military, would object to sharing of satellite technology
7b. would play major role in identifying some technologies that would be most applicable to law enforcement emergency operations
8a. Vehicle Manufacturers, would support use of location devices
8b. Vehicle Manufacturers, would help to develop some technology partnerships with insurance companies for future applications
9a. Insurance Companies, would develop prototype vehicle recovery systems
9b. Insurance Companies, would reduce insurance rates
10a. The Courts, would legalize forms of satellite technology use
10b. The Courts, would mandate forms of satellite technology use
10c. The Courts, would block forms of satellite technology use
11a. Emergency Service Providers, would save money and time by using satellite technology
11b. Emergency Service Providers, would save lives using satellite technology
12a. The Community, would object to some implementation strategies as too intrusive
12b. The Community, would support implementation strategies as cost effective
13a. Government (generally), wound mandate funding
13b. Government (generally), would mandate use of satellite technology
13c. Government (generally), would disagree about how satellite technology should be used
13d. Government (generally), would help to develop sharing agreements

Illustration 24

Alternative Strategies

A consensus group of law enforcement professionals brought together for stakeholder identification and analysis (page 58) also assisted in the development of a list of strategies that could be used to fulfill the Bear County Sheriff's Department's mission. The Bear County Sheriff's Department was described to the group as a diverse agency providing a wide range of law enforcement services to an equally diverse state. The sheriff was also identified as the Director of Public Safety.

The group was comprised of law enforcement professionals with management, educational and technical backgrounds, The group included two command level managers, two intermediate supervisors, one supervisor and a disaster planner from a large sheriff's department and one police manager from a small department. The group also helped identify advantages and disadvantages of each alternative strategy.

The group used the modified delphi process to general a list of possible strategies for implementation. A voting process was used to narrow the list of alternatives. The group was asked to rate each of the strategies identified in eight different areas that included short term desirability, feasibility, cost, long term desirability, stakeholder support and meeting the mission statement of the Bear County Sheriff's Department. The group analyzed each alternative and identified the pros and cons for each.

From the ranking process three alternative strategies were selected for analysis. The strategies analyzed included the strategy that was ranked the highest (Strategy 1), the strategy that ranked the lowest (Strategy 2) and the strategy that received the least consensus (Strategy 3). The ranking was based on a scale of 1 (highest) to 4 (lowest).

The following alternatives were selected for analysis:

Strategy 1

The County Board of Supervisors would mandate that emergency service providers apply satellite technology including, the development of policies and procedures that would be used during emergency situations.

Advantages

* Would expose different groups to others that have a common interest in satellite technology.

* Would provide greatest networking opportunities.

* Would reduce development costs.

* Would provide for a greater amount of input (expertise) from group participants.

* Would save lives.

* Would save money.

* Would facilitate the sharing of information.

* Would facilitate the declassification of certain kinds of information.

* Would lead to group technology purchases that would make the use of satellite technology more affordable to all users.

Disadvantages

* Would place limitations on how satellite technology might be used in various types of situations.

* Would give the general public the perception of more invasion of privacy (i.e., distrust).

* Would fail due to the lack of available technologies (i.e., classified technologies).

Strategy 2

Law enforcement charges users fees to individuals or groups for emergency response services. (ie., searches and rescues).

Advantages

* Would significantly defray operational costs when providing emergency response services.

* Would encourage voluntary use of satellite technology devices.

* Would lead to privatization of some emergency response services like search and rescue operations.

Disadvantages

* The collection of user fees would be difficult.

* Would lead to privatization of some emergency response operations.

* Determination of fee schedules could be difficult in multi-disciplinary operations.

* The determination of who is required to pay.

Strategy 3

The Bear County Sheriff's Department would develop and coordinate partnerships with private industry and other law enforcement agencies to purchase, use and develop joint training in satellite technologies.

Advantages

* Course (learning fees) would be subsidized and could be less than university or college fees.

* Would identify best situational application suited to satellite technology.

* The partnerships could develop guidelines for efficient use of satellite technology.

* Learning could be tailored to specific individual needs.

* Would lead to sharing agreements and satellite technology links.

Disadvantages

* There would be a dependency on private industry.

* There would not be sufficient law enforcement subject matter experts available.

* There would be a need to train law enforcement subject matter experts.

* Budget problems would pose limitations on how satellite technology is used.

Selected Strategy

The strategy selected by the Modified Policy Delphi Group was the county board of supervisors direction that the county's emergency service providers would use satellite technology such as photography, tracking and communications during disasters and declared emergencies. The strategy was also to identify what emergency situations were most applicable to the application of satellite technology, how those technologies should be used and what future applications of satellite technologies might be used in law enforcement emergency operations. The strategy also included the development of policies and procedures used during emergency operations.

It would be the task of a project development team to work closely with representatives from various governmental agencies as well as the legislature to develop guidelines that would meet the goals and objectives of the program.

The goals of the project development team are:

* To identify the stakeholders relative to the implementation of new policy, procedure and law.

* To identify the issues that are important to the policies, procedures and laws that would be developed.

* To conduct meetings to gather information based on guidelines establishes by the stakeholders.

* To develop policy, procedure and law that is adaptable to the emergency service environment.

This strategy was selected because:

* It would have the greatest impact on emergency operations in the emergency service environment.

* It would develop greater networking opportunities, partnerships and satellite technology links.

* It could be the most cost effective approach to application of satellite technology to emergency operations in law enforcement.

* It would provide stakeholders the opportunity to participate in the initial processes.

IMPLEMENTATION PLAN

Sheriff Day and the Chairman of the Board of Supervisors feel that the implementation of various satellite technology applications in government, and specifically to law enforcement operations, could require five to ten years to occur. Sheriff Day would serve as project consultant and all reports would be made to her. The project development team would also obtain necessary direction from Sheriff Day.

While there are some significant opportunities for progress the process will be slow. There are also some significant threats and snaildarters that could destroy the progress that had been made to this point in time. Implementation of the selected strategy requires a gradual approach and is to be accomplished in phases. These phases are:

Phase One - Planning

After the chairman of the Board of Supervisors directed Sheriff Day begin working on the implementation of satellite technology she identified individuals that she saw as significant

stakeholders of satellite technology applications. She appointed a project development team. She and the Chairman estimate that phase one may take one to two years to complete. The project development team would meet with representative from other law enforcement agencies, industry, emergency service providers and law makers whom they have identified as stakeholders. During the first phase the project development team would spend time with those they have identified as stakeholders to implementation of satellite technology gathering information that would help them in drawing conclusions regarding implementation strategies. The project development teams primary goals would be to:

* Select a spokesperson for the project management team.
* Identify those who would be impacted by the use of satellite technology.
* Explore opportunities to apply satellite technology.
* Construct a budget that reflects implementation costs.
* Develop and commit to a planning schedule.
* To report bimonthly any obstacles to implementation
* To report bimonthly any recommendations that would have a significant positive or negative impact on implementation
* To report immediately any current applications of satellite technology found in government services

Phase Two - Implementation

The second phase of the project development teams task includes meeting with stakeholders individually to establish a list of concerns (assumptions) that they might have regarding the application of satellite technology. This phase could require up to two years to complete and would require the services of legal council and or legislators. This process would requires continual review as most probably any draft policies, procedures and laws would

require many re-writes. The major objectives of the project development team during this phase would include:

* Draft proposed legislation that meets the criteria set by the project development team.

* Discuss draft legislation with legislators who will support the draft legislation.

* Determine implementation costs.

* Identify training needs.

* To report bimonthly any new obstacles to implementation.

* To report bimonthly any recommendations that would have a significant positive or negative impact on implementation.

* To report immediately any current applications of satellite technology found in government.

* See that final draft legislation is proposed and is supported by law makers.

Phase Three - Evaluation

Having monitored an assisted the proposed legislation to fruition the project management team's last phase in the implementation process should take no longer than two years to complete. During that time the project development team should have identified all stakeholders and researched the majority of satellite applications to government operations but specifically to law enforcement's application to natural and manmade emergencies. The final task for the project development team will include:

* Developing partnerships with other satellite technology users to share technology and ideas.

* Develop ways to creatively acquire and fund satellite technology hardware. Determine if grant monies could be obtained for implementation.

* Conduct needs assessment and develop training curriculum.

* Develop partnerships with education providers for the training of personnel to use satellite technology. The California Commission on Peace Officer Standards and Training would be a significant resource.

* Identify a process whereby the application of satellite technology would be monitored over an extended period of time, similar to that used in a grant process.

SUMMARY

This section has covered the strategic planning portion of the selected strategies regarding the implementation of satellite technology in law enforcement. The process has helped to identify several possible strategies for bringing about change.

The purpose of the strategic planning process has been to identify the mission of the Bear County Sheriff's Department and to analyze the internal and external environment.

The strategic planning process also provided alternative strategies and an opportunity to make an otherwise uncertain future more manageable for law enforcement leaders by identifying threats and opportunities.

Section IV

TRANSITION MANAGEMENT

A Transition Management Plan for the implementation of satellite technology in police response to natural and manmade emergencies is required due to the strong feelings, both pro and con, that can be anticipated. The adaptation of satellite technologies in law enforcement and the ability to monitor disastrous and criminal situations in real time will be controversial.

In order to accomplish the change the Department will need to prepare for it. The Department will need to focus on its culture, personnel strengths and weakness', emphasize training in advanced technologies, review its current philosophies of police intervention, and determine how it will react to changing technology.

Transition Management Situation and Strategy

The affected agency in the transition plan is the Bear County Sheriff's Department. It is a totally fictional department. Bear County Sheriff's Department is a large diverse law enforcement agency that geographically covers thousands of square miles of area bordered by metropolitan areas. The counties population has grown significantly during the past ten years and growth is expected to continue. BCSD's 2000 member workforce is diverse. Half of the 2000 employees are peace officers.

Sheriff Kathy Day is concerned that limited funding will continue to plague law enforcement services and she believes that technology applications will aid in meeting operational goals in critical incidents as well as providing the most efficient delivery of service for available funding.

The futures study conducted during the project identified ten relevant trends and events that would impact the issue by the year 2004.

A hypothetical scenarios was developed based on trends and events that impact the issue. The selected strategy to manage the change includes the legislation of satellite technology use in law enforcement operations during emergency management situations. The strategy also requires development of policies, procedures and guidelines for satellite technology use during natural and manmade emergencies. The plan is expected to be implemented by July 1, 2000.

The Critical Mass

The Critical Mass for the project was identified through consultation with three colleagues in a large sheriff's department and a city councilman. These professionals included Mr. James Singley, Councilman for the City of Highland California, Lieutenants' Rodney Hoops, Norm Hurst and Captain David Bellomey of the San Bernardino County Sheriff's Department. The following individuals or entities were identified during the strategic planning process of the project as major stakeholders:

1. Bear County Sheriff's Department
2. Bear County Board of Supervisors
3. Private Industry
4. American Civil Liberties Union
5. Peace Officer Standards and Training
6. Public Education System
7. United States Military
8. Vehicle Manufacturers
9. Insurance Companies
10. * Court System
11. Public Safety Providers
12. * The Community at large
13. * The County of Bear

From the list of thirteen major "stakeholders" or "snaildarters" (* above) above the following key players were identified as part of the "Critical Mass". These "key players" were so identified because of their positions within their organizations and because of their ability to aid the Bear County Sheriff's Department in meeting its objective of implementing satellite technology for law enforcement operations during emergency management situations. The key personnel in the "Critical Mass" (that group of individuals who, if they support the change will make it happen, or who can make it fail if they do not support it) are identified as follows:

1. Sheriff Kathy Day

Kathy Day was elected as Sheriff Bear County Sheriff's Department when its long time well respected sheriff left office five years ago. She is the 11th sheriff the county has known and the only new sheriff in the last twenty five years. Sheriff Day is well educated, informed and well liked.

Kathy Day's election as sheriff was based on her abilities, knowledge and vision of the future. She has since provided a clear direction for Bear County Sheriff's Department that includes the exploration of technologies and their application in emergency management. As the chief executive of Bear County Sheriff's Department Sheriff Day influences policy and implementation.

2. Supervisor Charles May (Chairman of the Board)

While Supervisor May has many years of political experience he is still considered a junior politician. Supervisor May would use his influence as the chairman of the board to inspire other supervisors to support the implementation of satellite technology in law enforcement operations.

Supervisor Mays position on this issue is identical to Sheriff Day's. He is supportive and committed to implementation. The supervisor is in a perfect position to guide legislation. He would dramatically impact funding issues. As the chairman of the board Charles May can guide the remaining board members in discussion sensitive. He would also be sensitive to programs that would increase public safety particularly if it was cost effective.

3. Mr. Mike Miller

Mr. Mike Miller has been in private legal practice for thirty years. During his many years in the legal profession he has held many positions in the field and most recently he has become the President of the County Bar Association. He is also an associate member of the American Civil Liberties Union.

Mr. Miller is very sensitive about right to privacy issues and has been an outspoken critic of the governments attempts at eavesdropping. Mr. Miller would view the capabilities of satellite eavesdropping as negative and as the leader of the county trial lawyers could sway others to either support or oppose implementation. It would be expected that Mr. Miller would block implementation.

4. Mr. Brian Alvarez

Mr. Alvarez is the Bear County liaison to the State of California's office on Peace Officer Standards and Training (POST). His office and provides training and consulting services to law enforcement agencies throughout the State of California.

As a consultant for POST Mr. Alvarez would assist the Bear County Sheriff's Department by identifying technology experts. He would also help develop application and training strategies. He would also assist the department in gaining and facilitating funding.

5. Mr. Pat Scarletta

Mr. Scarletta is a consultant for the California State Office of Emergency Services. He provides emergency management consulting services to law enforcement agencies throughout the state and serves as a valuable resource in changing technologies.

As a consultant to the states Office of Emergency Services Mr. Scarletta is in a position to recommend technologies for application and he would be valuable in gaining support from other entities. He is also be a valuable resource as he is considered a subject matter expert and is a member of an agency that others look to for guidance in emergency management situations.

6. Ms. Constance Dowd

Ms. Dowd works directly for the elected officials of the Bear County Board of Supervisors. As an analyst she reviews all proposals and programs that require an increase in expenditures by county departments. Her concurrence and recommendations to the board are critical to obtaining budget allocations.

7. Mr. Thomas Longhetti

Mr. Longhetti has been special adjutant to the Sheriff since she began leading the Bear County Sheriff's Department. He handles all special projects for the Sheriff and he has worked with other project management teams in the past. Mr. Longhetti is also inquisitive about technology.

Mr. Longhetti works closely with the sheriff on a daily basis and is highly trusted by the Sheriff. Mr. Longhetti would act as a center for direction, support, and resources.

The accompanying illustration demonstrates how each of the key players readiness and capabiiity to support the selected strategy might be represented. The chart lists the individuals

who are critical to the change effort. Their readiness and capability with respect to the change are ranked as either high, medium, or low.

Critical Mass Readiness/Capability Chart

	Readiness			Capability		
Key Player	High	Medium	Low	High	Medium	Low
Sheriff Day	X				X	
Supervisor May	X			X		
Mr. Miller			X		X	
Mr. Alvarez			X			X
Mr. Scarletta		X		X		
Ms. Dowd			X	X		
Mr. Longhetti	X			X		

X= Present Position

Illustration 25

With assistance from colleagues in the law enforcement field an evaluation was conducted to determine each players current and desired commitment. Sheriff Day is very interested in the implementation of technologies in law enforcement and she is able to make the project happen. The success of this project will require that the Sheriff's commitment remain constant throughout the entire process. Sheriff Day has the capability to see that things happen throughout the project. She is in a position to allocate resources to the project and she can garner support and commitment from other stakeholders. She will best accomplish her goals by showing support while at the same time influencing stakeholders behind the scenes. The Sheriff's level of commitment is high and her position is to make change happen. Her position on this issue will remain unchanged during the implementation process.

Likewise Supervisor May has equal interest in the project. Successful implementation would have a positive impact on how he is viewed in the political arena by showing that he is sensitive to programs that would increase public safety and save money. He too has available

significant resources to help in the implementation process. The Supervisor's position is to make change happen and again like the Sheriff his position on the issue will remain unchanged during the implementation process.

Mr. Miller is not yet ready to accept this change. He has significant concerns about government intrusion on private individuals and does not feel that this type of technology would be used only for the purposes of disaster management. He could be of significant value in the implementation process as he is capable of influencing the legal community. Mr. Millers' present position would be to block change. Because of his position in the legal community and his opinions regarding the issue the best position change that could be hoped for with Mr. Miller would be that he not block change and let it happen.

Because the application of satellite technology in emergency management is a tactics issue POST (Peace Officer Standards and Training) considers itself more as consultant to the identification of resources. POST will have significant value in their ability to identify subject matter experts and they have significant experience in training. Mr. Alvarez' commitment and expertise will make the implementation a smoother process. The position by POST of letting change happen needs to be changed to helping change happen.

Mr. Scarlettas' commitment and support to the issue is quite valuable. He has significant knowledge about disaster management and he has relationships with stakeholders across three separate states. Mr. Scarletta will be in a position to provide valuable input in the implementation process and he is in a position to gain support from other stakeholders. Mr. Scarletta will let change happen. His position on the issue needs to be changed to help happen because of his capabilities, knowledge and experience.

Ms. Dowds' capabilities in the legislative arena are acute. She is capable of delivering necessary support and votes from supervisors who in turn would agree to funding proposals. She will provide valuable input to the process assisting the key players in the decisions they make. She can either help or hinder the process. Ms. Dowds' position on the issue would be to let change happen if the politicians saw fit. She will be extremely valuable by changing her position to helping change happen. She would be in a position to convince politicians that the issue is valid and deserving of support and funding. Demonstrating to Ms. Dowd that implementation would have a positive impact would help to gain her support. A demonstration of how taxpayers would benefit from implementation and how politicians images would be enhanced by showing that they were all sensitive to special programs that saved money would also help.

Mr. Longhetti will play a vital role in the implementation process as the project manager. He has been given clear direction from the Sheriff and his capabilities in this type of process have been clearly demonstrated in the past. Mr. Longhetti has demonstrated his commitment to the issue and to the Sheriff. He is ready to begin the process at hand. Mr. Longhettis' previous position to this point has been to support the Sheriff helping make change happen. As the Project Team Manager Mr. Longhettis' position needs to be changed to make change happen. This would be accomplished by providing him the support, power, and resources needed to accomplish the task.

The accompanying illustration demonstrates each key player's position on the issue. The illustration shows the key players present position (X) and their future, or desired, position (O). As an example if Mr. Miller (the ACLU representative) were to actively work against the

application of satellite technologies in law enforcement operations during critical incidents would cause implementation to fail. If, on the other hand, Mr. Miller's level of commitment to the implementation project was raised to let change happen the effects on implementation would be positive. Getting Mr. Miller to commit to not blocking change will prove critical.

Critical Mass

Type of Commitment

Key Player	Block Change	Let Happen	Help Happen	Make Happen
Sheriff Day				XO
Supervisor May				XO
Mr. Miller	X	O		
Mr. Alvarez		X	O	
Mr. Scarletta		X	O	
Ms. Dowd		X	O	
Mr. Longhetti			X	O

X = Present position
O = Future (desired) position

Illustration 26

Management Structure

The management structure recommended for this project is a project management team, with the project manager appointed by Sheriff Day. The team members represent a diagonal slice of representatives of various groups of the public and private sector. There will be a need for continuing input from different levels of the community during the change implementation process.

The recommended manager for the project is Mr. Thomas Longhetti. As the adjutant to Sheriff Day he functions from the executive managers office and would receive power and authority from that office. This choice also frees the Sheriff to devote time to running her organization.

Technologies/Techniques to Support Implementation/Change

The Project Management Team will use a variety of methods and techniques to implement the changes that they recommend. These methods and techniques include:

* Designing the management team to include individual responsibilities.
* Development of a plan of action that will include the construction of a responsibility chart.
* Development of a plan of communications that would keep all stakeholders informed.
* Development of time tables for implementation of the selected strategy.
* Setting future expectations of management of critical incidents.
* Assessment of the availability of available funding for the project.

The accompanying responsibility chart illustrates how the Project Management Team might set its responsibilities. The decisions required of the team are listed in the right column. The "actors" are listed across the top of the chart and the body of the chart contains the information describing each actors responsibility in the process.

Responsibility Chart

Actors

Decisions	Project Manger	Supervisor May	Legislative Analyst	Sheriff Day	ACLU Rep	Post Rep	OES Rep
Develop Guidelines	R	A	_	S	I	S	S
Progress Reports	R	I	I	A	I	I	I
Identify Technologies	S	I	_	I	I	I	I
Identify Training needs	I	_	I	I	I	R	S
Implement Training	R	_	S	A	_	S	S
Develop Implementation Time Table	R	_	_	A	_	S	S
Approve Funding	R	S	A	S	_	S	S

R = Responsibility (not necessarily authority)
A = Approval (right to veto)
S = Support (put resources toward)
I = Inform (to be consulted)
_ = Irrelevant to this item

Illustration 27

Responsibility charting identifies those who are responsible for what and illustrates the interaction between the people who make up the critical mass. The charts value is to increase the groups understanding and agreement about rules and responsibilities. The chart normally referred to as a "RASI" chart identifies Responsibility, Approval, Support an to be Informed.

Section Summary

The transition management plan for the project has been discussed here. Included was the transition management situation, an analysis of the critical mass, a readiness and capability assessment, and an analysis of the commitment required for the successful completion of the project. This process has offered a framework to facilitate change.

The process used here suggests that there may be many different applications of satellite technology in government, not just law enforcement. This process also suggests that there may be some value in further research to determine what kinds of applications of satellite technology might exist in the future. While the significant application of satellite technology today is in the area of telecommunications and imagery, significant applications of technology such as global positioning are being applied today, and not just in aviation and geology.

The future of satellite technology in the management of natural and manmade emergencies is significant. Global positioning is now being used to predict how things might look within a day, and preferably hours after a disaster, like an earthquake, has occurred.

The future holds technologies that will aid with disaster information dissemination. Car radios can already "name that tune" and provide other information on request. How long will it take before early warning of impending disasters or emergencies will be broadcast, or printed out, via satellite direct to you in your car? We are now beginning to explore intelligent highway systems and talk of reinventing transportation while fighter aircraft technology and heads up (HUD) displays are being adapted to police cars.

The many applications of satellite technology suggest that the only obstacle to application, and implementation, is our imagination and of course money. The latter issue is a good argument for the development of partnerships and joint ventures between government and industry that would defray the costs of implementation. Both partners would conceivably benefit from such a partnership.

The positive implications of implementing strategies identified in this process suggest that there would be an enhancement of public service, a reduction of operational costs and improved emergency response capabilities.

Law enforcement managers in the future will be more capable of managing natural and manmade emergencies if they seek ways of implementing change through satellite technology.

Summary

This issue is:

What impact will satellite technology have on police response to natural and manmade emergencies by 2004?

A review of the literature and interviews imply that there are several issues for consideration. These issues are: (1) the ability to adequately fund technology; (2) the acceptance of the use of this technology; (3) development of acceptable policies, procedures and standards for implementation of sensitive applications; and (4) the enactment of legislation mandating use of satellite technologies in critical incidents.

The following conclusion may be reached regarding the sub-issues. The sub-issues are:

How can satellite technology be applied to law enforcement?

The data implied that there were several categories of application. Those categories include: (1) the enhancement of personal and property location by use of global positioning (GPS) systems. GPS will also facilitate improvement in geographic information systems (GIS); (2) enhancing communication through programs like the Operational Area Satellite Information Systems (OASIS); (3) more specific identification of areas through topographic mapping; (4)

real time monitoring of events such as fires with Advanced Very High Resolution Radiometry (AVHRR) and infrared sensing; (5) surveillance; and (6) color radar imaging.

What management skills or knowledge will be required to implement this technology?

Undeniably this is the critical sub-issue of the question. Law enforcement must recognize the potential, and impact, of satellite technology now. Three strategies are proposed to meet the objectives of applying satellite technologies to emergency situations. Those strategies are: (1) mandating satellite technology use in emergency situations. This strategy would facilitate networking, information sharing and reduce developmental costs. Using management skills such as negotiating and planning will be important; (2) to charge for emergency services to defray implementation costs and to facilitate implementation; and (3) to develop partnerships to co-sponsor implementation.

What satellite applications show possibilities in management of law enforcement response to emergency management?

The most promising applications of satellite technology are in the areas of position location and communications. Other variations, such as in the surveillance field, are emerging but not yet accepted in society.

Conclusion

To create a better future, law enforcement must recognize the impacts of technology on many areas of law enforcement operations. The transfer of technology in organizational operations is almost limitless. The transfer of technology will certainly impact critical incident management.

Governmental agencies, like police and fire agencies, must establish procedures to deal with the application, and implementation, of technologies that will help during riots, fires, earthquakes, floods and other types of emergencies.

A land based program called Real Time Earthquake Monitoring (RTEM) was a proposal in 1991 that was to help generate post earthquake information that is so critical to rescue efforts.[18] At that time a National Research Council panel reported that the California earthquake monitoring network could be relatively inexpensive to update.

By 1993 the United States and France were jointly conducting the first major space mission that could detect the change in sea levels on the southern hemisphere. During that time period a rise in the sea level of twelve inches was reported.[19] The early recognition of a rise in sea level could be of significant value in anticipation of flooding and potential evacuation an is an example of how rapidly the world around us is changing.

How police managers make use of resources will be directly impacted by how they use new technologies. Satellite technologies like monitoring of the earth's surface from space can significantly impact timely, effective and efficient response to natural and manmade emergencies.

Due to the substantial scope and suggested benefits of the application of satellite technology for law enforcement the issue is worthy of future study.

One issue was not researched in depth. That issue was the development of funding strategies. Because of the high cost of changing technologies police managers will be required to examine what methods of funding will be available for implementation. The competition for available dollars to increase emergency operation capabilities will be keen and an event that will

require significant police management skill. It will be these skills that will demonstrate who has been the best planner in the interests of their organizations.

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APPENDIX SECTION

APPENDIX A

Example Trends and Events

Trend: "A series of events by which change is measured over time"

Examples

* A shift in defense spending from military to domestic
* Broader application of satellite technology in tracking and monitoring
* Government satellite communications systems adapting to peacetime use

Event: "A discrete one-time occurrence"

Examples

* All police pursuits end
* United States Supreme Court rules that the use of satellite monitoring is unconstitutional
* All satellite technology is declassified

APPENDIX B

Trends identified by NGT Panel in June 1993:

Trends (*= selected for forecasting)

*** 1. Shift in defense spending from military to domestic.**

2. Broader application of satellite technology in tracking and monitoring.

3. Government satellite communications systems adaptability to peacetime use.

4. Level of funds available to local law enforcement.

5. Better educated managers.

6. Elimination of telephone lines.

7. Law enforcement plagued with satellite crime occurring.

*** 8. Public perception of need of satellite technology.**

9. Data gathered via satellite being sold or available.

***10. Level of cooperation between federal, state and local law enforcement.**

***11. Degree of privatization in police services.**

12. Same or greater efficient as same or less cost.

13. Terrorist acts occurring within the United States.

14. Greater sophistication of technology.

15. Prototype vehicle recovery systems.

16. Private proliferation of high technology crime devices.

17. Technical curriculum are developing in local colleges.

18. Shared costs in satellite development both from private and government sources.

19. High technology partnerships with public education and law enforcement.
20. User friendly technology.

21. Volcanic activity effects on weather.

22. Societies inability to pay for entitlement programs.

23. Aggressive movement towards big brother snooping.

***24. Degree of global unrest and regional conflict.**

25. Visual patrol technology reducing need for law enforcement.

26. More sophistication of modeling theories.

27. High technology personal protection.

***28. Degree of civil unrest in the United States.**

29. Reduction in workforce training in conventional systems.

30. Hidden public costs decreasing.

31. Accountability for law enforcement actions.

***32. Demands on the public education system.**

***33. Environmental impacts of industry.**

***34. Level of unemployment.**

35. Public perception of too much government control.

36. Public frustration of law enforcement's inability to control crime.

37. Home electronic monitoring.

38. Explosion of information.

39. Life extending technology.

40. High technology war on drugs.

***41. Level of global population explosion on immigration and cultural colonies.**

APPENDIX C

Events identified by the NGT Panel in June 1993:

Events (*= selected for forecasting)

1. All police pursuits end because of high technology satellite monitoring.

*** 2. United States Supreme Court rules that the use of satellite monitoring is unconstitutional and an invasion of privacy.**

3. All satellite technology has been declassified.

4. Space age radar resistant materials are used to build passenger vehicles.

5. Artificial daylight during darkness.

*** 6. Law enforcement is included is classified satellite technology loop.**

7. There is a conflict in the application of satellite technology.

8. Elimination of traffic congestion.

9. Traffic accident are located faster.

10. Satellite signals are safeguarded and encrypted.

***11. Satellite users execute sharing agreements.**

12. Mandates on funding.

13. Mandates on satellite use.

14. Voluntary use of individual encoders.

***15. Vehicle encoders are installed on all vehicles at the factory.**

***16. Insufficient numbers of satellite radio frequencies available for law enforcement operations.**

***17. Federal Communications Commission is merged with the Justice Department.**

18. Automatic location and moving map displays.

19. Level of international terrorism in the United States.

20. Greater accountability.

21. Firefighting resources more efficiently allocated.

22. Satellite frequencies are intentionally or unintentionally jammed.

23. Space reaches capacity.

24. United States Military gains ownership of all United States satellites.

25. Weather satellites accurately predict disasters.

***26. Hand held satellite communication devices are used by law enforcement personnel.**

27. Technology benefits do not outweigh the cost.

28. Civilian satellite signals are monitored by government.

29. Domestic companies gain access to all satellites.

30. Privatization of police services.

31. Federal government predominately liberal; police services restricted.

32. China deploys an offensive satellite based nuclear defense system.

33. Accurate and immediate local weather.

34. Satellite communications used for subliminal messages.

***35. United States Supreme Court rules satellite eavesdropping admissible during disasters and declared emergencies.**

***36. Specially encoded satellite locators make rapid location of persons and objects possible.**

***37. Efficient, accurate and timely deployment of responding emergency resources.**

38. California splits into three politically separate states.

APPENDIX D

TREND EVALUATION

Level of the Trend
(today = 100)

Trend Statement	Five Years Ago	Today	Five Years from Now	Ten Years from Now
T1 Level of global population on immigration and cultural colonization	70	100	150	200
T2 Degree of privatization in police services	25	100	125	150
T3 Shift in defense spending from military to domestic	75	100	125	150
T4 Demands on the public education system	80	100	120	150
T5 Level of cooperation between federal, state and local law enforcement agencies	80	100	120	150
T6 Level of unemployment	80	100	125	140
T7 Public perception of need of satellite technology	80	100	140	150
T8 Environmental impacts of industry	50	100	125	125
T9 Degree of civil unrest in the United States	80	100	120	150
T10 Degree of global unrest and regional conflict	80	100	120	140

Table includes median forecast scores
N=10

APPENDIX E

EVENT EVALUATION

EVENT STATEMENT	Probability: Years until probability first exceeds zero	Probability: Five years from now (0-100)	Probability: Ten years from now (0-100)	Impact on the Issue area if the event occurred: Positive (0-10)	Impact on the Issue area if the event occurred: Negative (0-10)
E1 Efficient, accurate and timely deployment of responding emergency resources	3	40	80	10	0
E2 Hand held satellite communication devices are used by law enforcement personnel	2	50	80	10	0
E3 Specially encoded satellite locators make rapid location of lost persons and objects possible	5	40	90	10	0
E4 United States Supreme Court rules satellite eavesdropping admissible during disasters and declared emergencies	5	50	70	5	5
E5 Law enforcement is included in classified satellite technology loop	3	50	80	10	0
E6 Insufficient numbers of satellite radio frequencies available for law enforcement operations	5	50	80	2	8
E7 Satellite users execute sharing agreements	3	50	80	2	8
E8 Voluntary use of personal encoders to locate people	5	30	70	6	4
E9 Federal Communications Commission is merged with the Justice Department	4	25	50	5	5
E10 Vehicle encoders installed on all vehicles at the factory	5	20	50	7	3

Table includes median forecast scores
N=10