ADVANCED POLICE COMMUNICATIONS TECHNOLOGY:

THE FUTURE IMPACT ON PATROL SUPERVISION

TECHNICAL REPORT

BY
DARRELL MYRICK

COMMISSION ON PEACE OFFICER
STANDARDS AND TRAINING (POST)

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I. INTRODUCTION

The American police industry is on the brink of a communications technology explosion. There is a virtual logjam of telecommunications technology awaiting developmental or pre-market stages which will throw law enforcement into a technical era which would have been considered science fiction only a few years ago.

The last revolution in police communications, the introduction of the two-way radio was introduced in a relative vacuum. Like most innovations of the time, the two-way mobile police radio was a single event revolution in technology[1]. It was a one-function development, but one that had no further application beyond voice communication that transcended the capacity of the local coin-operated telephone. In essence, it was a "coin-operated" telephone that the street officer could carry in the patrol car.

Police management was able to take this revolutionary device, study it, and fit this one innovative piece into the police services puzzle. The impact of instant two-way communications was the most significant technological development since the concept of modern police work was formed by Sir Robert Peel. Police officers instantly had the capacity to be not only immediately responsive to community needs, but immediately accountable to supervisors.

The coming revolution in advanced police communications differs from the introduction of the two-way system in many ways. The speed with which the innovations will be introduced is perhaps the single most important difference. The two-way system was introduced, grudgingly accepted, then was depended-upon over a period of decades. Advances in the next decade will be as fast paced as a whirlwind.[2]

Police circles will no sooner grasp the basic understanding of the introduction of a revolutionary communications technology when another "star wars" era breakthrough opens additional doors of communication. While the technology itself is intriguing, the study of future applications and effects of this next communications revolution on the working relationships within police departments commands not only attention, but riveting fascination. This study will analyze how emerging communication technology may effect the daily working of police field supervision. The issue to be examined is:

What will be the impact of emerging law enforcement communication technology on patrol supervision in a medium sized department by the year 2004?

The following sub-issues were developed through one on one and group discussions with police officers, supervisors and managers. In addition to police personnel, discussions were held with police association board members, communications and computer specialists, and an attorney who has a police related practice.To demonstrate the analysis of the issue ques-

tion, a Futures Wheel was developed from the input from discussions and interviews, refer Illustration 1.

A focus group of three colleagues met with the author and used brainstorming to identify four sub-issues judged to be essential to investigating the issue. The focus group members were:

* Lee Rossman, Lieutenant, West Covina Police Department
* Jim Dillon, Commander, West Covina Police Department
* Walt Hauser, West Covina Police Association President

The sub-issues are:

* **How will communications technology enhance the effectiveness of field supervisors?**
* **How will police training keep pace with innovation and technological breakthroughs?**
* **How will police departments of the future finance technological advances?**
* **How will technology impact the privacy of the field officers?**

To better understand and answer the presented issues, a more detailed understanding of the emerging technologies is needed. To accomplish this, a literature scan was conducted. A partial list of sources of written information used to gather specific advances and possible breakthroughs in communications technology will be found in the bibliography.

After the accumulated information was analyzed, one word came to mind, synergism. Each technological breakthrough, in and of itself, would have a large impact on the effectiveness of supervision. As the technologies are combined they enhance sister communication or computer advances, increasing the uses and effectiveness of each many times over. The following is a look at what the future scan revealed as likely police communications systems available by the year 2004.

To get a feeling for the coming innovations in police communications systems, it is first necessary to investigate the base of communications, the delivery systems. Both broadband telecommunications and fiber optic cable systems offer revolutionary advances over the current analog delivery systems. Fiber optic cable refers to a physical cable made of glass that transmits large amounts of data by light pulses. Fiber optic cable is currently the optimum medium for broadband telecommunications[3]. The current level of fiber optic technology could carry the equivalent of 45 copies of the *Autobiography of Malcom X* per second; a current analog phone line could carry only several pages per second.[4] Nearly 8,000,000 strand-miles of fiber-optic cable have already been laid in this country[5], laying the infrastructure for the "Information Super Highway."

The ability to carry massive amounts of information to police field units will open the doors to delivering the developing advances of the 21st century to the front seat of a patrol car. Broadband police radios will bring not only digitalized booking photographs and fingerprints to Mobile Computer Terminal's (MCT), but digital video transmitters that will permit the viewing of on-scene activity from the police station or other field unit.[6] The value and uses

of additional information sources to the patrol officer is fairly obvious, and follow traditional benefits of the two-way communications. Digital video transmissions will provide an entirely new dimension to police communications. With the trend of advancements toward miniaturizing, it does not take much imagination to envision a miniature transmitter that could be worn on the person of the future police officer that would be able to transmit and record virtually everything the officer can see or hear.

Other advancing technologies will also find their place in the future of police communications systems once the delivery systems to the patrol officer attains compatibility with the "Information Super Highway". Virtual reality, interactive video, computer bulletin boards, intelligent work stations, and artificial intelligence are some of the common technological advances that are approaching convergence with police communications capabilities.[7]

Taken a step further, direct face-to-face communications could be used to provide a link between citizens and either patrol units or supervisors over a multimedia 9-1-1 system.[8] With a fiber-optic link at the police communications center, field officers will have access to the "Information Super Highway". A college library full of information and search capabilities will be at the fingertips of both officers in their patrol cars and supervisors at police headquarters.[9] Communications will be greatly simplified and enhanced, with strides being made in computer technology, such as those described below.

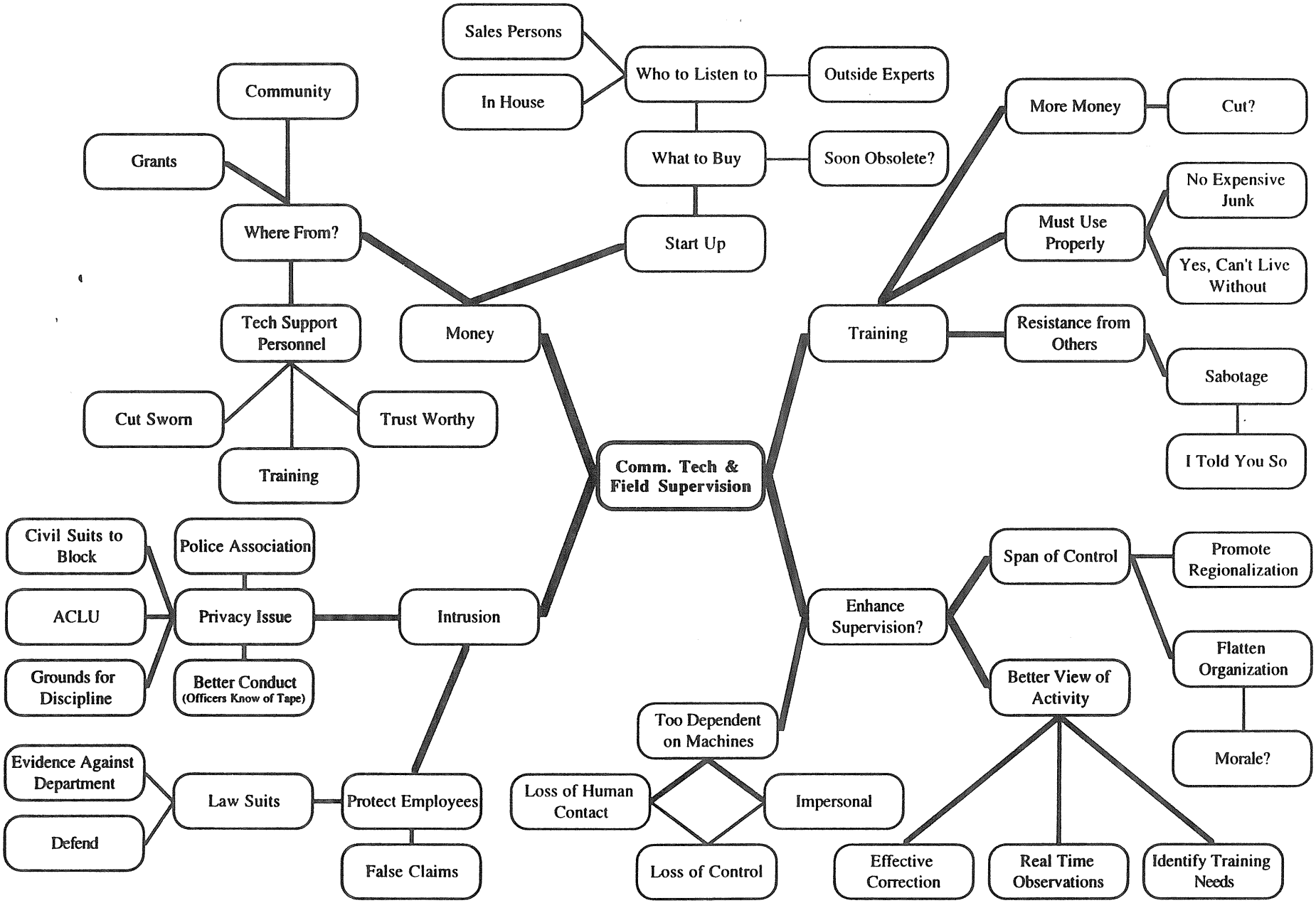
One of the emerging breakthroughs is voice recognition as a means of initiating programs, or composing written material.[10] Verbal prompts are more user-friendly and allow for contin-

ued attention to tasks other than computer accessing. Verbal recognition also opens the door to instant translation to or from English to any other major language of the world.[11] The United States military is currently testing a hand-held voice recognition technology (VRT) computer with a 500 word Spanish vocabulary that is used for in-field translation. It hears and speaks both English and Spanish.[12] Being able to instantly locate field police units for accountability purposes and to select the most appropriate unit for dispatching purposes will be an advantage available to the police supervisor of the future.

Global Positioning Systems (GPS) will be able to fix the position of field units in future police fleets to within five meters.[13] With the increased accuracy of GPS systems, coupled with the increased storage of future computers, an officer's activity and patrolling patterns can be stored and retrieved at a later time to assist in supervision or an investigation.

Through the investigation and scanning of literature, it became apparent that it would be easy for the issue to become unnecessarily cluttered with the scientific workings of the communication technology. This study will deal, instead, with the impact, uses and application of the emerging technology. In-depth futures based research was conducted to attempt to determine the effect those technologies have on the daily supervision of the police patrol function.
The findings and methodology of the futures research are provided in Section II.

The following illustration depicts an "Futures Wheel," sometimes also referred to as an "Impact Network,"that was constructed to help define the interrelationships and consequences of the issues discussed in this study with the assistance of the "Nominal Group Technique" participants discussed in the next section.



Future's Wheel

II. FUTURES FORECASTING

Through the investigation and scanning of literature, it became apparent that it would be easy for the issue to become unnecessarily cluttered with the scientific workings of the communications technology. A basic understanding of emerging technology, however, is necessary to best understand the possible future impact.

The delivery systems of the future, both broadband communications and fiber optic cable systems, will open the doors to the delivery of the "information age" advances in technology to the front seat of patrol cars. These advances will include video transmissions, delivery of information superhighway research capabilities to mobile computers, face-to-face communications with citizens through a multimedia 9-1-1 system, voice recognition and program initiation, and a global positioning system that will be able to fix the position of any field unit to within five meters.

The existence of the above advances by the year 2004 is not in question; they are either currently being developed or are in testing or classified use. The question is how the technologies will impact the daily workings of field officers, and their supervisors.

The interesting future of the issue and sub-issues must be explored to identify emerging trends and events. The trends and events that loom in the future of advanced communications technology are both nearly infinite and interrelated. To identify the significant trends and events, the author employed a systematic set of techniques and processes. These techniques and processes will be briefly mentioned so as to give the reader a road map to follow through the futures study process employed in this research project.

To assist the author in developing a broad forecast of the interesting future a panel was assembled. The panel participated in a nominal group technique (NGT) for the purpose of

brainstorming a wide variety of trends and events relative to the issue. The panel selected the ten most relevant trends and events and established the probabilities of occurrence for the events and forecast the trends. Each event was examined for its impact on other events to establish final probabilities of occurrence (X-Impact). The probabilities for the ten events were placed into a random generation program (Sigma) to generate a random occurrence of events that provide the basis for scenarios that demonstrate the interesting future of advanced communications technology.

The above steps are defined and explained in depth as this future study progresses.

Nominal Group Technique\Modified Delphi Process

A nominal group technique (NGT) followed by the use of a Modified Delphi was used as the research method. The purpose was to develop trends and events relevant to the issue in a manner designed to elicit information from a diverse group in an efficient and expedient manner. The first (NGT) was used to identify and rank-order the trends and events; the second (Delphi) was used in evaluating, forecasting and charting them.

The panel was comprised of ten selected participants. Participants were selected to cover five criteria developed by the author prior to the NGT process. The criteria were: representatives from all levels of patrol supervision (participants 1, 2, 5, and 7), representatives with expertise in computer/high technology systems (participants 3, 8, and 10), a representative from a police labor organization (participant 7), representatives from non-police organizations with similar interests (participants 4 and 6), and a representative with expertise in formal police training (participant 9).

1. Lee Rossman
   Police Lieutenant, West Covina Police Department
   Patrol supervisor, Command College student.

2. Bob Garcia
   Police Captain, Azusa Police Department
   Patrol supervisor.

3. Vern Morton
   Computer programmer, future technology enthusiast.

4. Bob Shannon
   Southern California Edison field supervisor, daily supervising in excess of twenty field employees, mainly through two-way radio.

5. Mark Tedesco
   Police Sergeant, West Covina Police Department
   Patrol supervisor, S.W.A.T. team leader.

6. Bill Clark
   Southern California Gas field supervisor, daily supervising in excess of fifteen field employees, mainly through two-way radio.

7. Mike Ferrari
   Police Detective, West Covina Police Department
   Police Association Executive Board member.

8. Bill Lym
   Computer programmer, expert in police computer systems, including mobile police computer systems.

9. Marco Plebani
   Police Corporal
   President San Gabriel Valley Training Officers Association, Hostage Negotiator.

10. Jim O'Brien
    Expert on Cal I.D. computerized fingerprint system, consultant on implementation of Fingerprint 2000 automated fingerprint system.

The panel represented every level of traditional patrol supervision as well as private sector field supervision. There was a significant level of technical expertise relating to, and interest in the issue. The application of this NGT process was to identify the elements and policy actions relevant to the research question. The six phases in this exercise were:

1) The panel silently generated individual ideas in writing.
2) Ideas were accepted from each panel member in sequential order until ideas were exhausted.
3) Items were discussed for clarification.
4) Preliminary vote taken to pare down to fifteen most important trends/events.
5) Discussion of preliminary vote-asking if these are the most important trends/events, and to determine if further clarification of trends/events is necessary.
6) Final vote for top ten trends and events.

Identification and Definition of Trends

The basic definition of a trend is a series of events over time. Following the six-step process of the NGT, twenty-seven trends were identified. For a complete list of trends refer to Appendix A. To focus in on the ten trends that have the most significant bearing on the issue the panel was asked to vote. The vote was a rank order of the individual's top ten, with the individual's number one in importance receiving ten points and their number ten receiving one point. A tally by the author produced the fifteen trends with the most points assigned by the panel. A second vote was taken to trim the list of fifteen to ten after each of the fifteen trends was clarified and additional discussion focused on importance to the issue and probability of occurrence. The following are the ten trends the NGT panel found to be the most significant to the issue and sub-issues of this study:

1) Impacts of advanced communications on interpersonal relationships, specifically between supervisors and field officers. The panel was interested in the level of face to face communications between a field supervisor and the field officer after an implementation of an advanced communications system. They showed strong opinions on the effects of increased or decreased personal contact on moral, effectiveness of communications and self-esteem.

2) Level of funds allocated to high technology communications systems. The panel was concerned with economic and political climate to determine if more or less would be allocated from closely guarded resources.

3) Use of video recordings or transmissions as a basis for decisions by field supervisors. Transmissions, especially live transmissions, from a field officers location to a supervisor

was the main focus of this trend. The question was basically would a supervisors inclination to direct an incident, while not physically at the scene be effected by the advanced communications systems.

4) Public perceptions and expectations of technology's impact on productivity of field officers. The panel was interested in the level of public expectation of its police officers once an advanced communications system was implemented.

5) Field supervisors dependence on high technology communications and computer systems as an evaluation tool. The question posed in this trend is basically to what degree would information received via communications impact a supervisor's perception of an officers' performance purposes. Examples given by panel members were level of supervisors reliance on computerized statistical data and the level of credence given by a supervisor to viewed video transmissions as opposed to judging an officers effectiveness by physically observing performance in person.

6) Level of field officers acceptance of technology's intrusions on privacy. An officer is relatively autonomous in his police vehicle. Could the intrusion of being constantly viewed or recorded create animosity towards the technology and supervision?

7) Percentage of full-time civilian employees within a police department. What number of civilians would be needed in a police department that invested in an advanced communications system? Would that level create any personnel problems that could conflict with effective supervision?

8) Costs associated with maintaining advanced communications equipment. The panel members were interested in the ongoing costs of updating and maintaining an advanced communications system. They were curious if the maintenance would be prohibitive and prevent implementation or continued use of some of the communications system components.

9) Level of technological skills required for promotion to field supervisor. What skills will be required to be an effective field supervisor on a police department with an advanced communications system? Panel members were curious to explore the possibility of creating two

levels of supervisors, those promoted prior and those promoted after the implementation of communications technologies.

10) Ability of field officers and supervisors to accept change. An advanced communications system will require a drastic change in working conditions. Will the conservative nature of police officers hinder the acceptance of new technology that will require new skills and at the same time infringe upon their privacy.

Delphi Process-Trends

The same panel members used during the NGT process were used during the Modified Delphi Process that was utilized to forecast the ten identified trends. During the Modified Delphi Process the panelists were allowed to express their opinion of the progression of each trend over time. The anonymous process allowed for controlled feedback and discussion through the facilitator. The process was repeated until a consensus or a reason for dissension had been fully explored. The mathematical process of establishing high, low and median measures of dispersion allowed each panelist to rethink and understand the trends better, and moved the group toward a more precise answer.

Trend Evaluation

Table I shows the top ten trends identified by the NGT panel. The trends are listed by priority one through ten, with one being selected as the most important by the panel. Based on personal experience and expertise the panel members were instructed to use the Delphi process to forecast each trend over time. The value assigned to the present (today) was 100. An estimate equal to today is 100, less than today would be less than 100 and greater than today would be more than 100. Each trend has been individually portrayed on a graph expressing three values. The graph visually expresses the high deviation, low deviation and the median. This process was used on all trend graphs. The significance of each trend in relation to the research issue is explained through the discussion accompanying each graph.

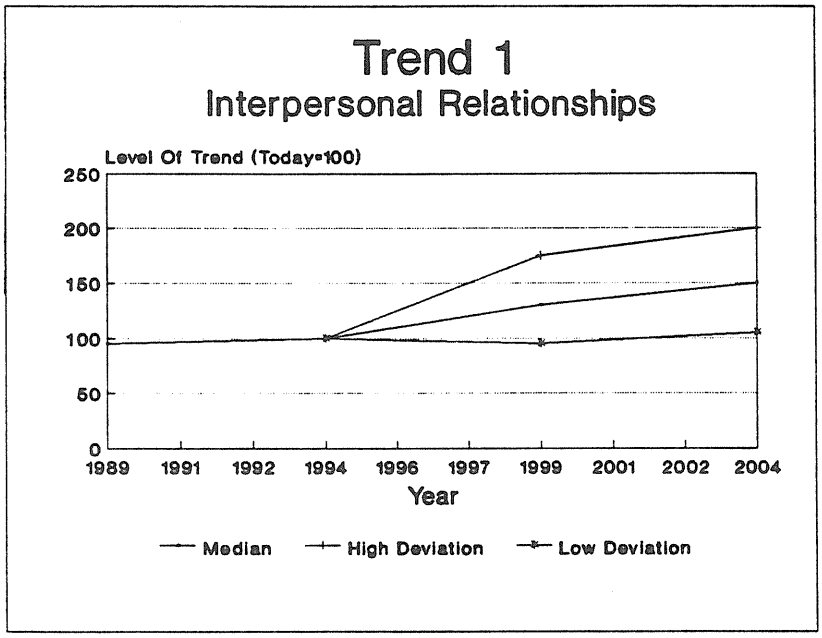
TABLE I TREND EVALUATION

TREND #	TREND STATEMENT (Abbreviated)	LEVEL OF THE TREND (TODAY = 100) FIVE YEARS AGO (1989)	TODAY	FIVE YEARS FROM NOW (1999)	TEN YEARS FROM NOW (2004)
1	Advanced communications impact on interpersonal relationships, between supervisors and field officers	H 105 M 95 L 90	100	H 175 M 130 L 95	H 200 M 150 L 105
2	Level of funds allocated to high technology communications systems	H M 115 L	100	H 125 M 120 L 100	H 200 M 145 L 125
3	Use of video recordings or transmissions as basis for decisions by field supervisors	H 100 M 100 L 95	100	H 150 M 125 L 100	H 175 M 150 L 120
4	Public perceptions and expectations of technology's impact on productivity of field officers.	H 100 M 85 L 80	100	H 160 M 120 L 100	H 200 M 160 L 120
5	Field supervisors dependance on high technology communications and computer systems as evaluation tool	H 100 M 85 L 75	100	H 150 M 140 L 110	H 160 M 125 L 80
6	Level of field officers acceptance of technology intrusions of privacy	H 100 M 95 L 95	100	H 150 M 105 L 90	H 155 M 150 L 110
7	Percentage of full-time civilian employees within police department	H M 93 L	100	H 125 M 120 L 105	H 180 M 140 L 70
8	Costs associated with maintaining advanced communications equipment	H M 93 L	100	H 140 M 120 L 80	H 190 M 150 L 80
9	Level of technological skills required to promote to field supervisor	H 110 M 95 L 85	100	H 160 M 120 L 100	H 175 M 115 L 100
10	Ability of field officers and supervisors to accept change.	H 100 M 90 L 75	100	H 125 M 106 L 100	H 160 M 125 L 117

H - High Deviation M - Median L - Low Deviation N = 10

ILLUSTRATION 2

Trend One: Impact of advanced communications on interpersonal relationships, specifically between supervisors and field officers.



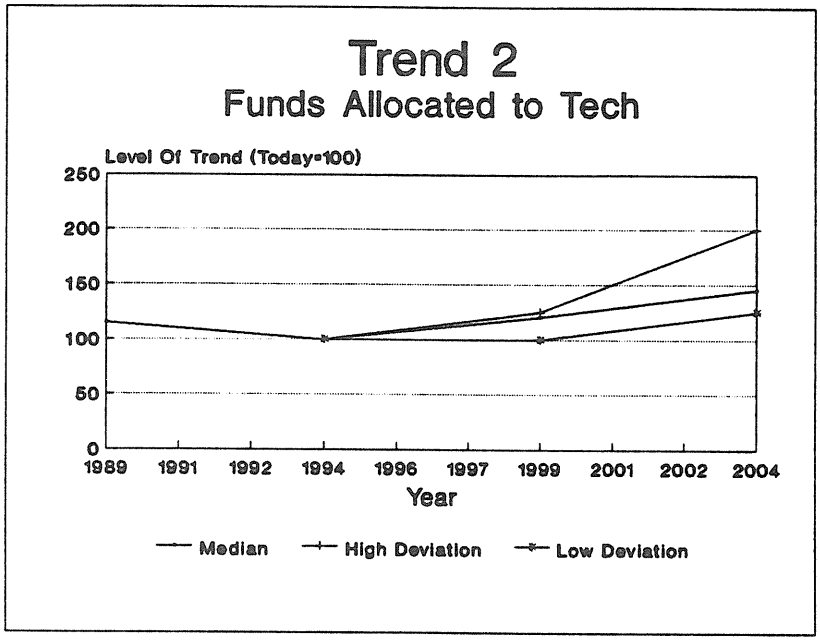
The graph for Trend One depicts interpersonal relationships and interaction between patrol supervisors and the field officers. This trend generated a spirited discussion about the effects of high technology on personal interaction. The majority of the panel felt the insertion of high technology into the communications process would reduce the face to face interaction now the norm. The majority were of the opinion that supervisors would lean heavily on technology as workloads increased and supervisory positions dwindled.

The panel chose to indicate a degrading of interpersonal relations by assigning a higher number. The higher the number given, therefore, the poorer the working relationship becomes.

The minority had a less negative view of the technological impact. The reasoning behind this opinion was that the "high-tech would necessitate high touch". The optimistic view felt the supervision team of the future would recognize and avert the degeneration of the vital working relationships.

ILLUSTRATION 3

Trend Two: Level of funds allocated to high technology communications systems.

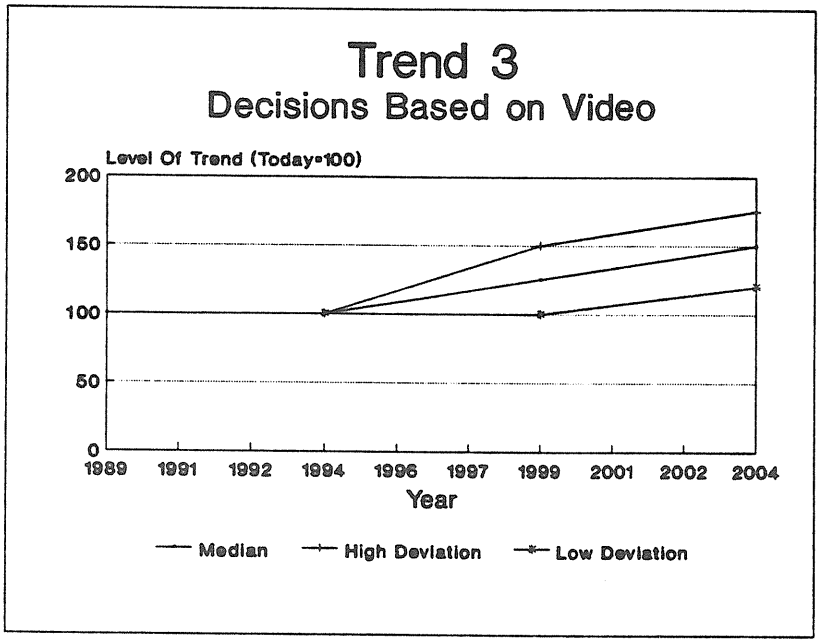


Trend Two shows the future level of funds the panel felt would be allocated specifically toward high technology communications equipment. The figure for the preceding five years was supplied to the panel by the author. The figures were derived from a survey conducted prior to the NGT process, refer to Appendix B. The declining figure, from 1989 to 1994, reflects the deep recession and its' effect on the budgets of the medium sized police departments within the state.

The panel, unanimously, felt the worst was over, and that expenditures for high technology would no longer decline. It is interesting that there is a fairly strong consensus at the five year mark, but a broad disagreement at ten years. Further discussion revealed that all felt the investment would be made to upgrade most communications systems within the ten-year time frame. The difference in opinion was the level of commitment to high technology, and surprising to the author, the cost of the high technology. Some of the more knowledgeable members of the panel felt the cost of technology would drop dramatically as new breakthroughs were made and as existing technologies were declassified by the military.

ILLUSTRATION 4

Trend Three: Use of video recordings or transmissions as a basis for decisions by field supervisors.



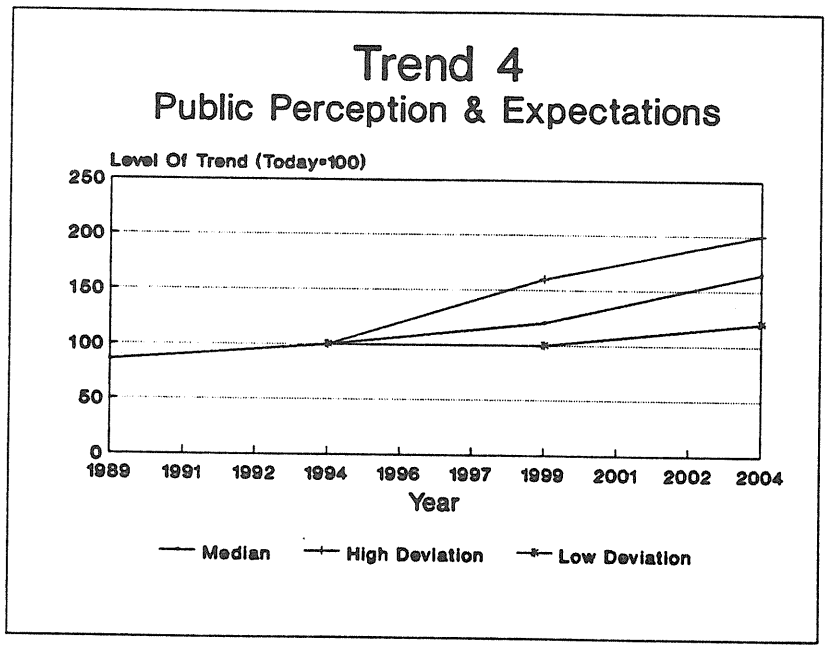
The panel felt that video recording, whether in-car recording or digital transmission, is to be a significant part of the future of police field services. They felt the trend was significant as a video is two dimensional and is indicative of, but not a truly complete recreation of any incident.

The higher the number on the graph indicates a higher level of dependence on video for decision making and internal affairs investigations by patrol supervisors. It was difficult to keep the panel on task on this trend. Some members of the panel, particularly the non-supervisors, were very critical of the possibilities. The Rodney King incident and trial were used as an example of the inaccuracies and limitations of video.

The panel was instructed to list the level of reliance on video by patrol supervision, and not on the ramifications of the technology. It was agreed that this trend was to deal with the level of use, while other trends and events would deal with possible implications.

ILLUSTRATION 5

Trend Four: Public perceptions and expectations of technology's impact on productivity of field officers.



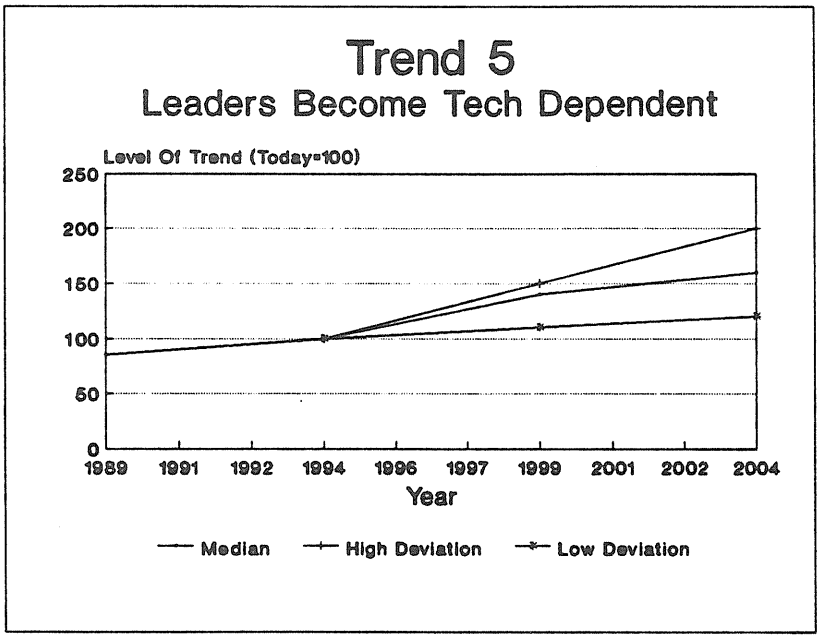
Trend Four deals with the level of service the public expects from the police department and how that expectation is affected by the infusion of high technology communications. The panel felt that the expectation, realistic or not, had already been raised due to technology currently in place. The general public, the panel felt, expected a return for the investment of tax dollars, and the return they expected was an increase in productivity and security.

There was a wide discrepancy in the panel on this trend. The majority felt, shown by significant trend increase in both high deviation and median, the public would be aware of the

investment in technology and would expect a large return from that investment. The minority were convinced that the apathetic public would barely notice the change. They argued that the few that were involved and interested in the inner workings of the police department would remain interested, given no change, and those who are disinterested today will remain disinterested.

ILLUSTRATION 6

Trend Five: Field supervisors dependence on high technology communications and computer systems as an evaluation tool.



Trend Five illustrates the fact that the panel, as a whole, felt the trend toward high technology is and will continue to impact the personal contact between supervisors and field officers. The panel felt supervisors now depend on computer generated statistical data to evaluate officers productivity. They felt less emphasis is placed on observed, one-on-one interaction with the public as a significant evaluating factor. The panel felt this trend will continue, while the majority felt the added communications technology will accelerate the trend. The panel cited dependence on video, either recorded or broadcast transmissions, as a means of

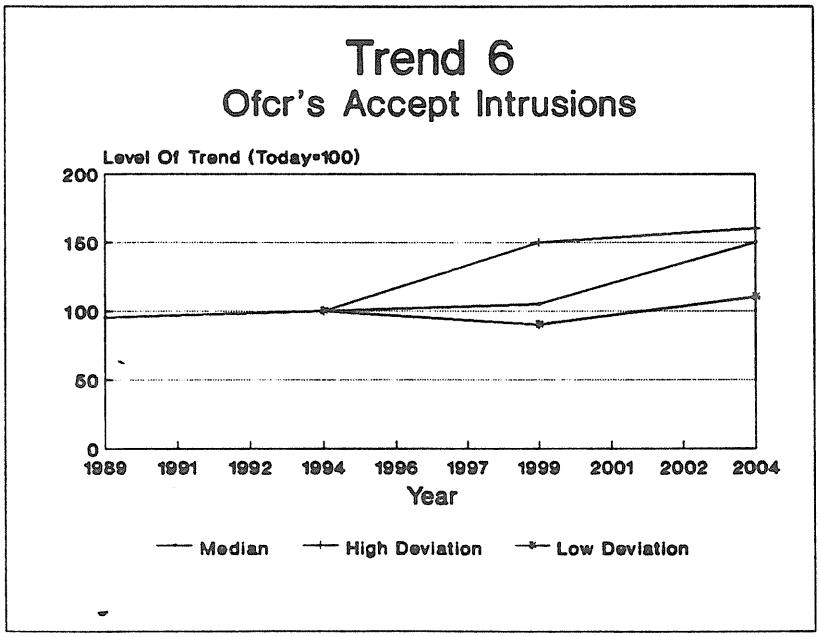
viewing officers conduct. The panel expressed their opinion that reliance on such technology as the sole basis for evaluating an officer's performance would gravely hamper the supervisors' effectiveness and control of field situations.

Some of the less pessimistic of the panel felt that, though there are going to be pitfalls, the technology could be properly managed and used to handle many of the day to day incidents. Freeing a supervisor from some of the time consuming routine would allow a conscientious supervisor more time to be involved in the fact-to-face interaction that the panel felt was vital.

To a member, the panel felt the negative effects that may be generated by advanced communications technology could be mitigated, with planning and concerted effort. The panel cited effective training of field supervisors, self motivation, and proper supervision of field supervisors by department managers as essential elements to successfully implementing an advanced communications system.

ILLUSTRATION 7

Trend Six: Level of field officers acceptance of technology's intrusions on privacy.



This trend proved to be a volatile subject, evidenced by the wide discrepancy. The panel members on the higher end of the range felt that with the continued advances in technology, officers would grow accustomed to and accept a more obtrusive environment. Those members felt that with proper training and handling of the information gathered by the technology, field officers would grow to accept the intrusions. The panel members on the higher end of the scale also cited the new, younger officers, coming into police work as having a significant impact on this trend. They felt officers entering the profession in the next ten years would be much more tolerant of technology and technology's intrusions.

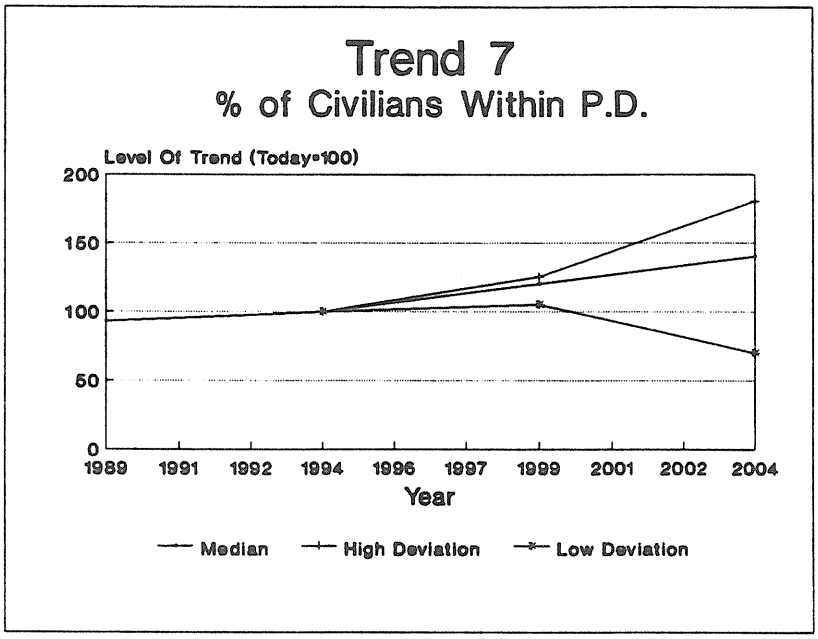
The panel members on the lower end of the scale shared a less optimistic outlook. They felt the field officers would begin to resist the invasion of privacy. They also felt that this resistance would grow with each new technology implemented.

It became clear, during the discussions that a difference of opinion, a non-reconcilable difference, existed between several members. It was interesting to the author that those with the most pessimistic view of this trend were officers with no supervisory experience or responsibilities, while those on the highest end of the graph were currently supervisors. The one issue they did unanimously agree upon was that the key to the acceptance of the intrusion was trust. Trust that the information obtained through advanced technology would be properly used and protected by police supervision and management. Those on the high end of the graph had that trust, and those toward the lower end of the scale had significantly less trust of future supervision.

ILLUSTRATION 9

Trend Seven: Percentage of full-time civilian employees within a police department.
Trend Seven depicts the level of civilianization of medium sized police departments. The trend line indicating an increase from 1989 to 1994 represents the results of a survey conducted prior to the NGT, refer to Appendix B. The members of the NGT were supplied with the information on the trend prior to the discussion on Trend Seven. The 1994 percent-

age of full time civilians employees, in relation to the total full time employees, was given the value of 100 for the purposes of charting.

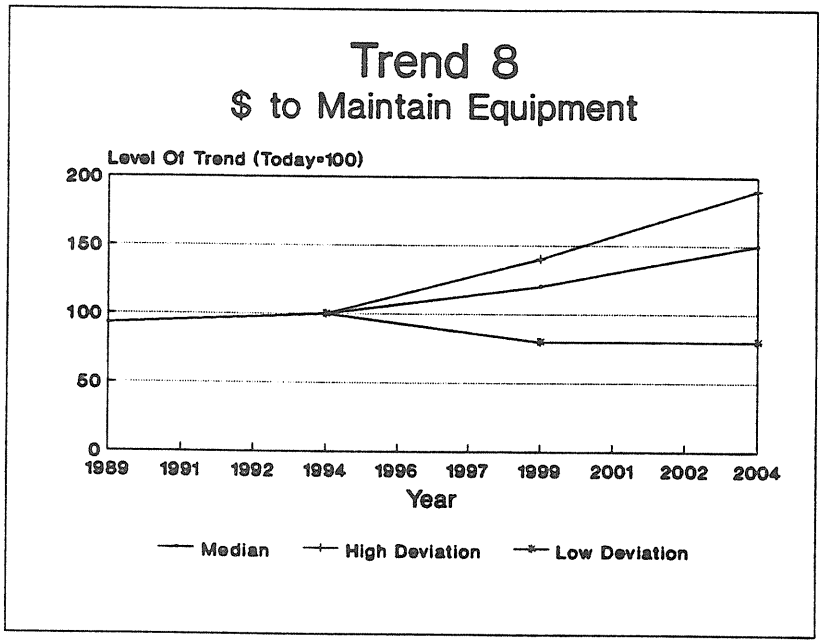


The Low Deviation indicates that the panel felt that, at the least, the rate of civilians employed by departments would continue to rise at roughly the same rate as it has been rising for the past five years. The Median and High Deviation both show an acceleration of hiring civilians by police departments.

The panel was quick to point out that they felt civilianization of police departments is only partially due to technology. They felt the increased dependence on civilians is a trend that encompasses nearly all aspects of police work.

ILLUSTRATION 8

Trend Eight: Costs associated with maintaining advanced communications equipment. Trend Eight indicates the amount of money budgeted to maintain advanced communications systems. The panel agreed that the cost of personnel dedicated to maintaining the systems and equipment would be included in their estimates.



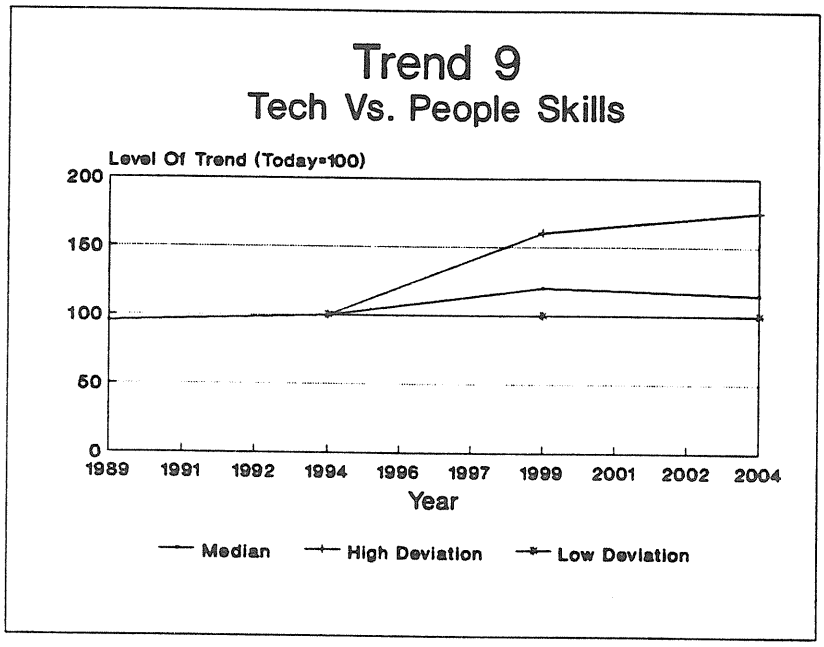
The figure for the five years preceding 1994 was established by the author from a survey of medium sized police departments, Appendix B. The data from the survey shows a slight, but significant increase in the cost of maintaining advanced communications equipment.

Once again the panel had a wide range of opinions on the continuation of the trend. Most, indicated by both the High Deviation and the Median, felt that costs and therefore allocations for maintaining advanced systems would continue to rise. The reason for the increased costs were a continued rise in both personnel and material costs.

The minority felt that costs would decrease. The reasons given for supporting a decrease in costs were of particular interest. The obvious reason for a decrease in maintenance costs is a lack of funds available to police departments. The maintenance budget would be an easy target, it was argued, if cuts were mandated. More positive reasons were: reduced costs through regionalization of communications and maintenance services, appropriate contracting of maintenance services, entrepreneurial applications of current resources, and reduced costs of technology through bidding and competition.

ILLUSTRATION 10

Trend Nine: Level of technological skills required to promote to field supervisor.



The data for Trend Nine indicates another strong difference of opinion among panel members. The discussion surrounding Trend Nine involved just the level of technical proficiency that may be required to apply for a supervision position, and to be an effective supervisor. The discussion included the possibility that leadership skills could take a back seat to technical skills when selecting a new supervisor.

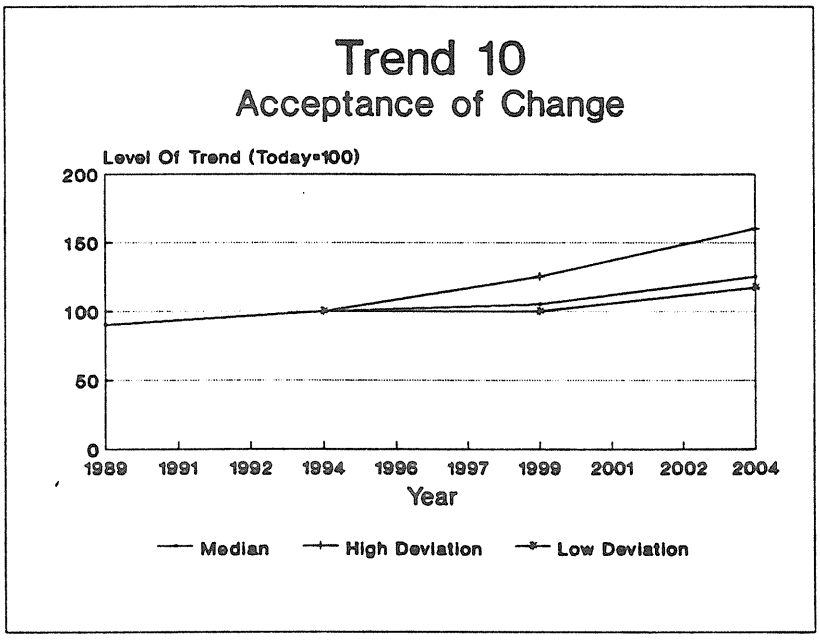
The split on this trend among the panelists was strongly along the lines of technical proficiency. The panelists with the stronger backgrounds in high technology especially computers, argued confidently that the more advanced the system the more user-friendly the system would be. They reasoned that the technical end of the systems could be handled by civilian programmers and technicians. The applications would be a matter of running user friendly programs, and the application would be what supervisors would be required to learn and know.

The majority that drove the High Deviation and the Median were not convinced by the above reasoning. They referred to the complexity of new mobile computer systems and what was referred to as "wizardry" as indicators of the future.

The author's opinion is strongly aligned with the minority opinion on this trend. It is noted, however, that the majority opinion appears typical of many sworn officers. The fear of technology seems to be not just that it is intrusive, but that the perceived complexity is threatening. This perception should be considered and addressed in the planning stage of any technological implementation.

ILLUSTRATION 11

Trend Ten: Ability of field officers and supervisors to accept change.



Trend Ten forecasts the ability of field officers and supervisors to accept change. It was the consensus of the panel that the level of change, as it relates to police communications, is ac-

celerating. It was also the collective experience of the panel that change in working conditions by field officers and supervisors is critically viewed and frequently resisted, to varying degrees. Though the panel felt that the average officer is more open to change in 1994 than they were in 1989, the Median did not show a continuation of this trend. The Median did not show an increase in acceptance of change until 1999.

The panel leaned strongly toward what was termed "human nature". The panel felt the officers were conservative by nature, in the respect that they desired structure and order. Constant change was suggested as being a threat to the comfort zone of field officers and supervisors.

Identification and Definition of Events

As with the identification and evaluation of trends, the events were selected and rank-ordered using the NGT process. The basic definition of an event is a discrete, one-time occurrence. Events can be internal (over which one has some control) or external (over which one has no control). There were twenty-two events identified by the NGT panel. Refer to Appendix C for a full list of events developed by the NGT panel. To focus in on the ten events that would have the most significant bearing on the issue, if they were to occur, the panel was asked to vote. The vote was a rank order of the individual's top ten, with the individual's number one in importance receiving ten points and their number ten receiving one point. A tally by the author produced the fifteen events with the most points assigned by the panel. A second vote was taken to trim the list of fifteen to ten after each of the fifteen events was clarified and additional discussion focused on importance to the issue and probability of occurrence. The following are the ten events the NGT panel found most important to the issue and sub-issues of this study.

1) Legal decision affecting the use of communications technology is passed. The panel identified this event as a decision by a court prohibiting or requiring implementation of certain communications technology.

2) New revenue source for technology is developed. With this event the panel considered the possibility of new revenues (taxes) being collected or current revenue sources directed specifically at the purchase of advanced communications technology.

3) A liability issue arises from incident causing serious implications on a state or national level. The liability issue defined by the panel was a single event liability that has state or nation wide implications on the issue. The implications could be a force driving departments to, or away from the implementation of certain technologies.

4) Advanced communications system implemented, affecting on-scene decisions. The panel was interested in the possibility that field supervisors could control and direct from in front of a video monitor, and the possible effects constant direction could have on the ability of field officers to make independent and instant decisions in critical situations.

5) Technology impacts span of control. The question posed by the panel on this event is: What effect would advanced communications have on the number of officers one supervisor could effectively lead?

6) New funds become available for high technology training of field officers. New funds for in-service training of seasoned officers, as well as police recruits in the academy.

7) The main means of officer\supervisor contact is conducted through advanced communications systems. The panel was curious if the face to face contact between a supervisor and officer would diminish with the advent of advanced communications, and what affects a decrease in physical contact would have on proper supervision.

8) The communications system suffers a significant security breach with industry-wide implications. A security breach, as defined by the panel, would be accessing of protected police files by an unauthorized source, through an advanced communications system.

9) Officers seek legal means to stop the use of technology. This specifically deals with an officer or organized police association seeking legal grounds to prevent a police department from implementing portions of the technologies that will be available.

10)Technology flattens organizational structure. Organizational flattening refers to removing one or more layers of supervision and/or management due to an increase in productivity directly related to superior communications.

Event Evaluation

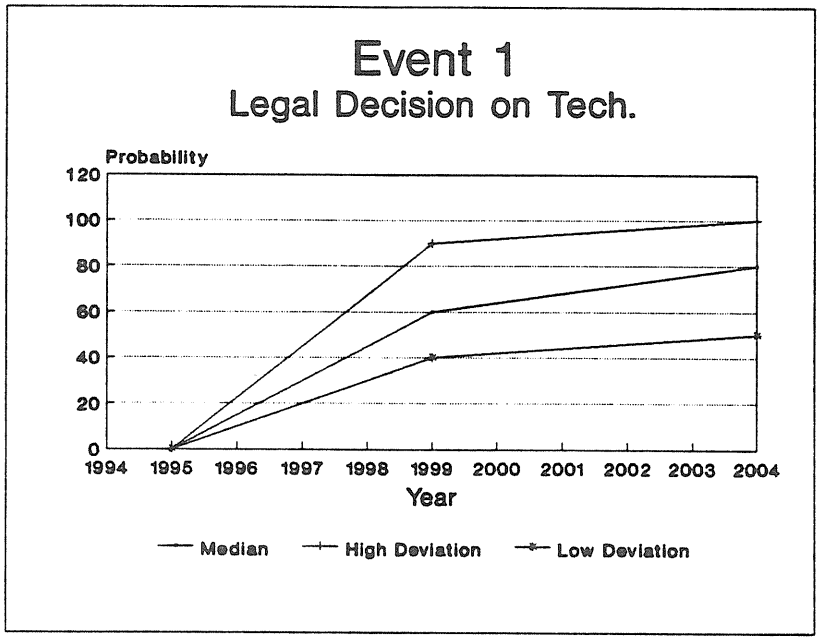
Table II shows the top ten events identified by the NGT panel. The events are listed by priority one through ten, with one being the most important. The panel, using the delphi process, was asked to forecast each event by probability of occurrence (0 to 100%) for five years and ten years from now. The panel also listed years until the probability first exceeds zero and the positive and negative impact of the event on the research issue. Each event has also been individually portrayed on a graph, expressing three values. The use of upper and lower deviation from the median value softens the possibility of a single individual, or small group on the NGT panel, from skewing the data. This process was used on all graphs even though there may have been a close consensus on the issue. The significance of each event in relation to the research issue is explained through the discussion below each graph.

TABLE II EVENT EVALUATION

EVENT #	EVENT STATEMENT	YRS UNTIL PROBABILITY FIRST EXCEEDS ZERO	PROBABILITY		IMPACT ON THE ISSUE AREA IF THE EVENT OCCURRED (average)	
			Five Years From Now (0 - 100)	Ten Years From Now (0 - 100)	Positive (0 - 10)	Negative (0 -10)
1	Legal decision affecting the use of communications technology passed.	H 4 M 1 L 1	H 90 M 60 L 40	H 100 M 80 L 50	7.6	6.5
2	New revenue source for technology developed.	H 5 M 2 L 1	H 80 M 50 L 10	H 100 M 70 L 20	7.6	5.3
3	Liability issue arises from incident, causing serious implications on a state or national level.	H 5 M 2 L 1	H 95 M 60 L 30	H 100 M 90 L 40	4.1	7.8
4	Advanced communications system implemented, affecting on-scene decisions.	H 4 M 2 L 1	H 75 M 50 L 5	H 100 M 70 L 35	5	8
5	Technology impacts span of control.	H 5 M 3 L 1	H 50 M 30 L 5	H 75 M 50 L 10	4.6	5.7
6	New funds become available for high technology training of field officers.	H 5 M 3 L 1	H 75 M 40 L 20	H 99 M 75 L 40	7.5	3.7
7	Main means of officer/supervisor contact is conducted through advanced communications systems.	H 5 M 3 L 1	H 50 M 30 L 10	H 90 M 65 L 50	3.7	6.9
8	Communications systems suffers significant security breach with industry-wide implications.	H 3 M 2 L 0	H 100 M 50 L 10	H 100 M 90 L 25	0	9.8
9	Officers seek legal means to stop the use of technology.	H 3 M 1 L 0	H 100 M 60 L 20	H 100 M 70 L 30	2.4	6.1
10	Technology flattens organizational structure.	H 5 M 1 L 1	H 50 M 20 L 5	H 75 M 50 L 20	6.3	6.7

ILLUSTRATION 12

Event One: Legal decision affecting the use of communications technology is passed.



Event One could have an immediate and possibly major impact on the implementation or restriction of advanced communications systems in police departments. Three basic possibilities for legal decisions were discussed.

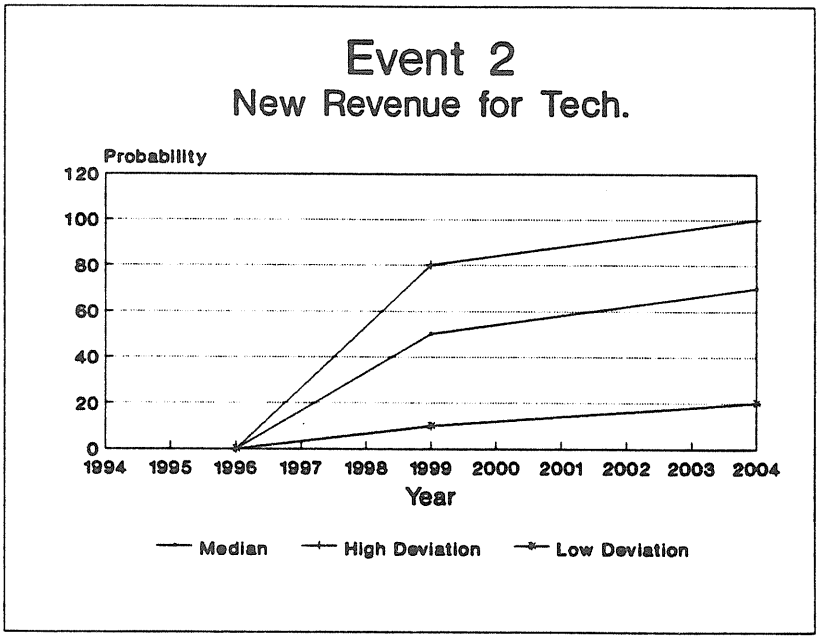
The first possible decision discussed by the NGT group was some type of court-mandated implementation. Specifically discussed was the possibility of liability being attached after a civil suit because a department did not have in place current technology that would have tended to prove or disprove the facts of a case. This possibility was discussed with some type of video recording device in mind. If a court found against a police department because the department failed to install a video system, when the technology was available and affordable, departments would definitely be more motivated to invest in a system.

The second possibility was an injunction forbidding the implementation of communications technology. The grounds specifically considered by the group were that the new communications systems would be an unacceptable intrusion on the privacy of the field officers.

Last, the NGT group discussed a possible court decision on the use and admissibility of evidence. The group considered possibilities that the courts could consider the video public records, open to view by anyone interested. Another possibility considered was that the rules of evidence would be changed significantly when video evidence was available, requiring that courts give an excessive amount of weight to recorded evidence. While none of the situations discussed would have prohibited the implementation, they could open the departments to excessive litigation, encouraging departments not to implement new systems.

ILLUSTRATION 13

Event Two: New revenue source for technology is developed.

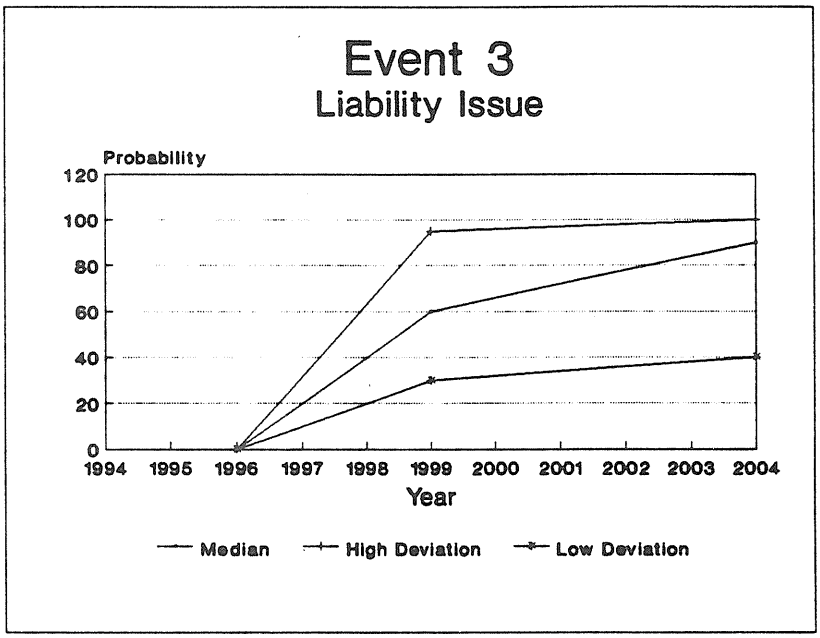


Event Two considered the possibility of new revenue collected or specifically earmarked for implementation of high technology communications systems in police departments. The discussion included the possibility that the Federal or State governments could establish communications as a priority and dedicate funds to the effort. A second possibility discussed was that funds could be set aside after a department realized savings from downsizing (reduction of personnel to reduce costs). The logic relating to this possibility hinged on the belief that communications systems could make the patrol functions more efficient, especially when

supervision was considered. Last, the group considered the possibility that the California economy could rebound. After years of cuts, a return to better economic times would find most departments lean and better able to apply the new funds toward productive ends.

ILLUSTRATION 14

Event Three: A liability issue arises from incident causing serious implications on a state or national level.



The panel discussed Event Three and Event One, and felt that these events were different, and that both were important to the issue. The panel saw Event Three as a single liability issue which had a monetary impact on a single department. They felt Event One would cover a legal decision that had direct impact or implications toward law enforcement either state or nation wide.

Event Three covers what most departments seem to fear most in these times of high litigation, getting sued. Three possibilities were discussed on this issue: where evidence from the communications systems were used against the department, where the department could have or should have been able to direct or control officers better, therefore avoiding the situation

under question, and where a department lost a law suit because the department was not equipped with available technology that may have prevented or provided evidence of the incident that caused the liability.

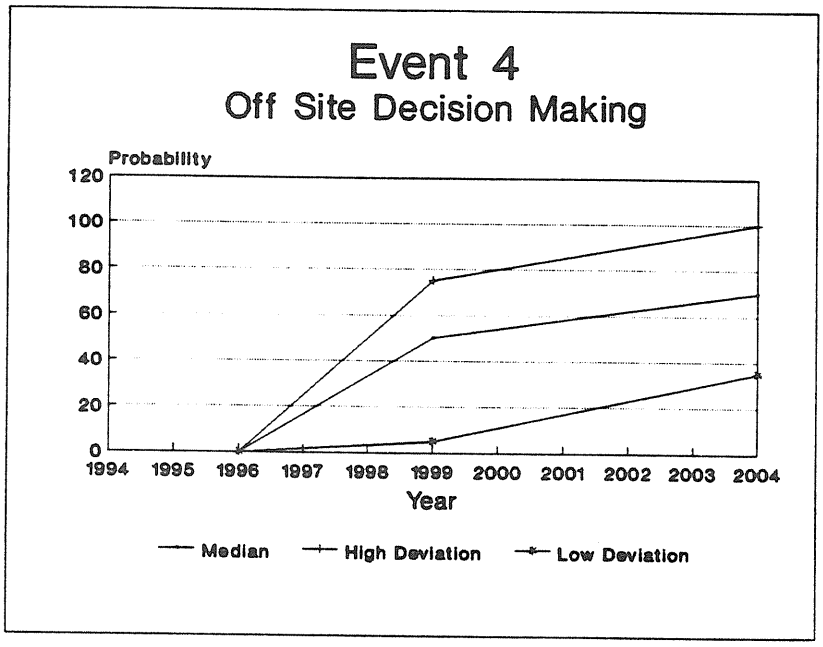
The panel felt that if any of the situations did occur and the department was found liable, the event would have a significant impact on the implementation or continued use of advanced communications. The first possibility is basic. The better the communications, specifically video communications, the better the evidence to either prove or disprove a case in point. The problem with video communications, the panel felt, is that it provides only a two dimensional view of an incident. It may be difficult, for instance, to properly access the threat a person presents to an officer using a video as the sole or significant piece of evidence. This possibility was felt to be a possible stumbling block to the implementation. Just the threat of increased liability is enough to shelve most proposals within city government.

The second possible liability discussed was the additional control supervisors may have or could be viewed as having. The panel felt if field supervisors were seen as having more control over field situations the courts could hold supervisors more accountable for not intervening in any situation in the field that resulted in liability. This assigning of a larger percentage of liability to supervisors was seen as also placing more liability directly to the department for failure to supervise or direct.

The last possibility discussed by the panel was not having technology that was available, especially if other departments of similar size did. The issue could be argued in court that if advanced communications were in place, as with other departments, the true facts would be more easily ascertainable. It would also be easy to suggest to a jury that perhaps the reason the department did not implement the more obtrusive communications was because the department knew of its failings and was attempting to cover up. If successful, this tactic would assign more liability to the department and reach into its deep pockets. The panel observed that this last issue tended to press departments toward implementation, while the first two were common reasons for the avoidance of change.

ILLUSTRATION 15

Event Four: Advanced communications system implemented, affecting on-scene decisions.



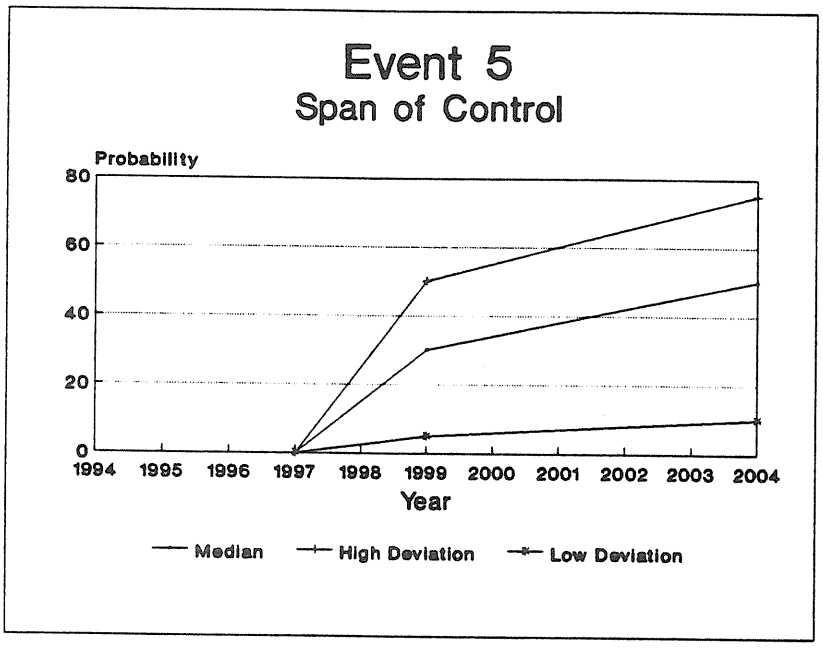
The panel was concerned with the decision-making process learned and undertaken by field officers. The more situations supervisors were able to view as they were happening, the panel felt, the more the supervisors would direct officers. The problem the panel saw with this possibility was that officers are trained to make decisions. Field officers make hundreds of decisions a day, mainly because they tend to be the ultimate authority at a given scene. If officers could rely on a ready and higher authority, the panel felt, the officers decision making abilities may not develop. The panel felt this could make the officers become or appear indecisive.

There was a wide range of opinion on the probability of what the panel termed "off-site decision making" becoming reality. All members felt that there is a strong probability that this type of shift in decision-making policy would occur, the difference of opinion was when. The members of the panel that felt the technology affording the shift would be in place early

opted for the higher figures. The panel members who felt the technology would probably not be in place quickly selected the lower probability.

ILLUSTRATION 16

Event Five: Technology impacts span of control.

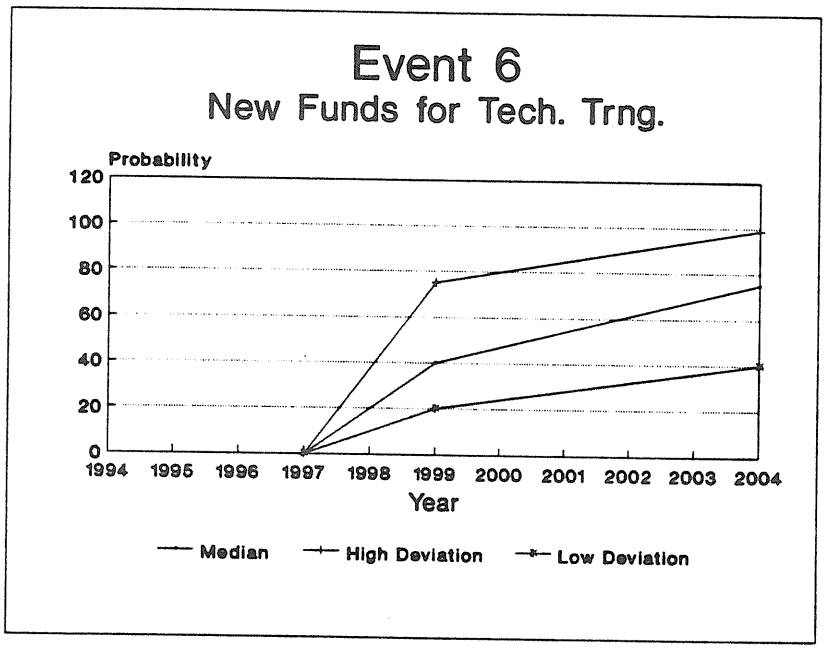


Event Five showed one of the largest ranges of opinion of any event discussed by the group. The span of control of field supervision, the number of officers a supervisor could effectively supervise, would probably be effected by the implementation of advanced communications systems. The panel basically agreed to that premise, but beyond that, discussion was diversified and opinions were inflexible. The low probability is indicative of members who felt the chances of a supervisor being able to effectively supervise a larger number of officers with advanced communications was remote. The reasoning behind this logic is that the supervisors would have to deal with all the personnel matters, regardless of the supervisor's ability to communicate more effectively. They argued that the majority of field situations that required a field supervisor to be present would not decrease enough to have a significant impact on span of control.

The higher probability was indicative of members who felt that advanced communications systems would allow supervisors to view the day to day performance of officers more effectively. This, they argued, would allow supervisors to better and more rapidly identify troubling tendencies of officers and allow for early correction, therefore preventing larger problems. The prevention of problems, and not convenience, was the main reason given by members supporting higher probability as the main benefit advanced communications afforded field supervisors.

ILLUSTRATION 17

Event Six: New Funds become available for high technology training of field officers.

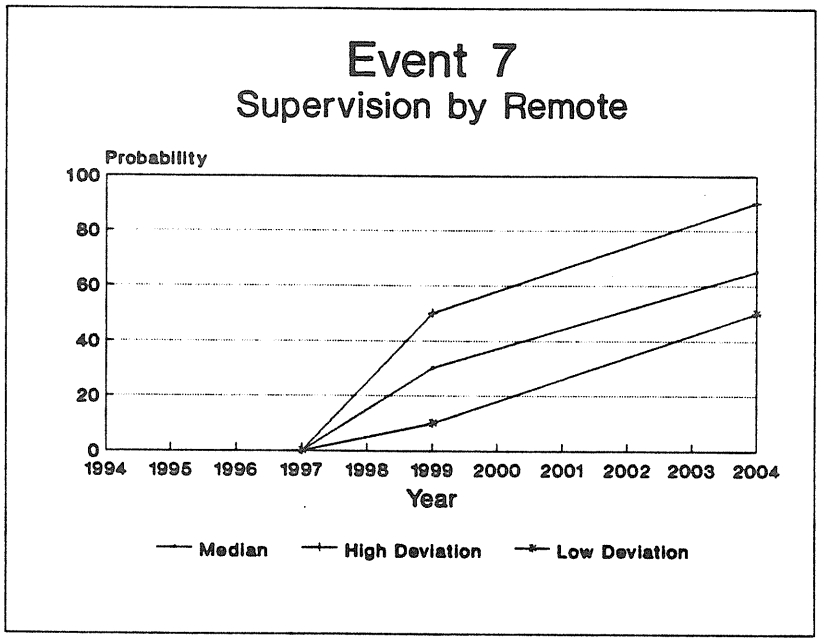


The panel was united in its belief that the best way to prevent problem trends and what the panel termed the "down side" of advanced communications systems was proper training. The panel felt that the need for proper training was so great that within the next ten years there is a good likelihood that an adequate source of training funds would be developed. There was some discussion that proper training could be properly handled through existing

methods, with existing budgets. The majority, however, felt that police academy training would have to be extended to accommodate additional training. This was seen as overtaxing current allotments for training and drive the need for additional funding.

ILLUSTRATION 18

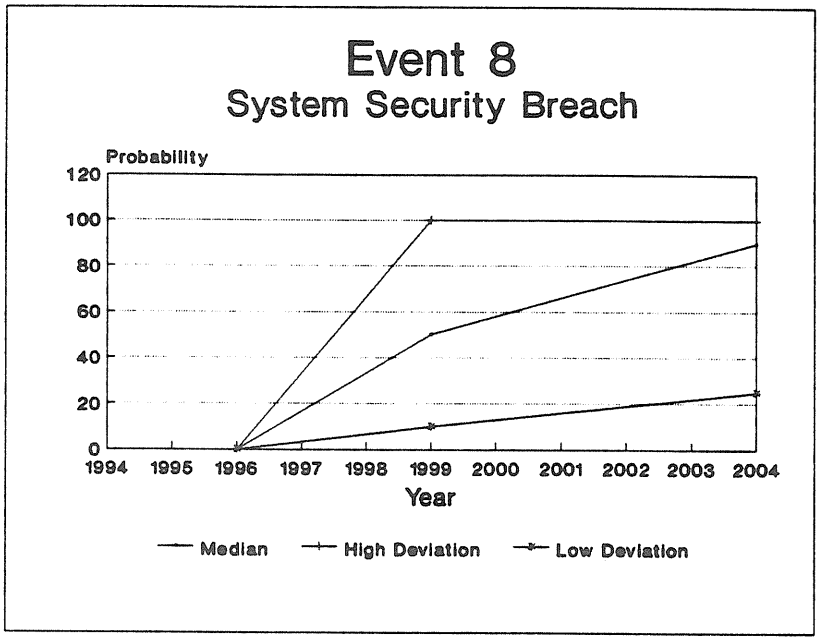
Event Seven: The main means of officer\supervisor contact is conducted through advanced communications systems.



Event Seven shows the probability of the majority of supervision being done by "remote". "Remote" was the term coined by the NGT panel to cover the supervision of officers, with little or no face to face contact. The panel considered this possibility to be very likely, and as with Event Four, the variation on probability was more a difference of opinion of when the communications systems would be implemented. The panel felt strongly that if Event Seven were to occur it would have a negative impact on the quality of field supervision. The panel explained that personal, face-to-face contact was absolutely necessary for proper supervision.

ILLUSTRATION 19

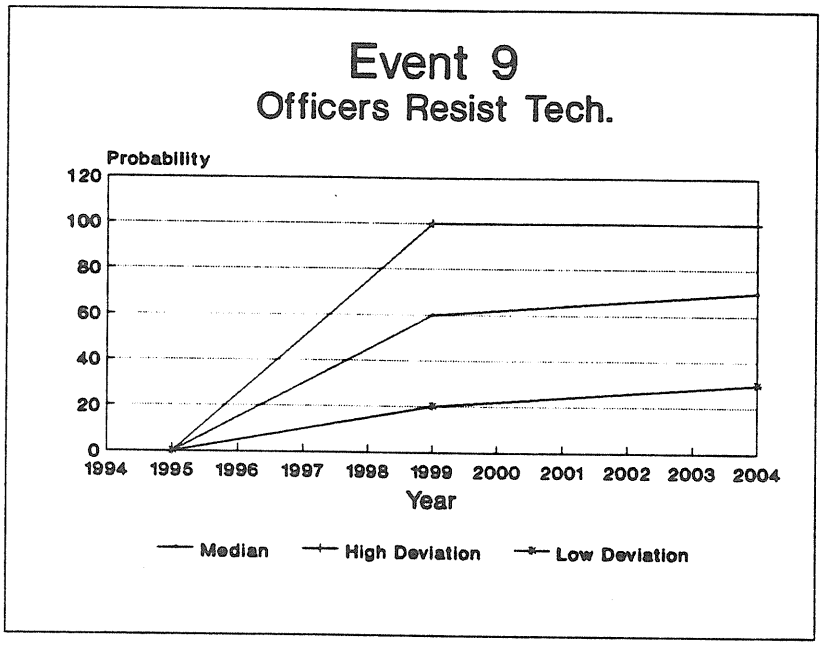
Event Eight: The communications system suffers a security breach with industry wide implications.



Event Eight had the highest consensus probability of any of the events chosen by the panel. A system security breach was defined by the panel as access to restricted department files or computer systems. With a lone exception all members felt the probability was very high. The reason given for the low opinion of probability was "just a matter of opinion". It was noted by the author that those with the greatest knowledge of computers and computer systems were the most certain of the virtual certainty of a security breach within the first year of implementation. The impact of this event occurring is almost totally negative. A highly publicized event could limit effectiveness of the communications systems by limiting field access to sensitive computer systems or files. It was noted by the group that the very information essential to an effective communications system is the information most likely to be sought after by individuals or groups illegally accessing police systems.

ILLUSTRATION 20

Event Nine: Officers seek legal means to stop the use of technology.

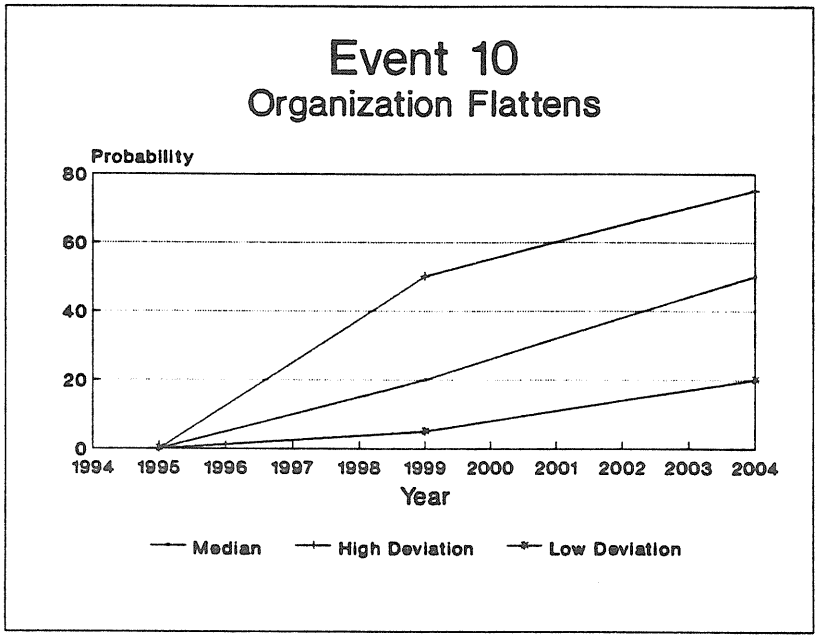


Event Nine stirred significant conversation and debate among the panel members. The probability of this event was discussed at length by the members and one central causal factor continued to surface, lack of trust of supervisors. It was agreed by all members that a lack of trust of supervisors by field officers would significantly increase the probability of Event Nine occurring. The lack of trust, the panel expressed, led to suspicions of everything from spying to undue scrutiny due to personality conflicts.

The panel was specific in the description of the type of resistance. Noting that some form of resistance could be found with any change, the panel defined the resistance in Event Nine as some form of legal resistance. The example given was a lawsuit filed by the police association of a department to prevent the implementation of a system, or to restrict its use by supervisors. The impact of Event Nine happening could have some very negative consequences. The panel felt that, though proper use must be assured through professional application, unbending legal guidelines could cripple the effectiveness of an outstanding system.

ILLUSTRATION 21

Event Ten: Technology flattens organizational structure.



The probability of this event is as much tied to continuing poor economic times as with advanced communications. The definition of this event given by the panel members was the elimination of a rank within a police department, i.e. eliminating the rank of lieutenant. The panel discussed two major reasons driving the probability of Event Ten: an effect of better communications, and to reduce costs.

The first factor driving the probability of Event Ten was directly attributed to enhanced communications capabilities. The panel felt that if communications effectiveness increased to the point where visual communications could be conducted from a patrol car it could be argued that a field sergeant could conduct the majority of duties assigned to a watch commander, traditionally a lieutenant.

The second reason for the probability given by the panel was simply money. Given the economic climate of the early 1990's, departments are exploring every money-saving avenue.

Some members felt the elimination of a rank for a financial reason could provide a need for more effective communications.

The flattening of an organization reduces the opportunities for promotion within the organization. The panel members were quick to point out that if officers equated the implementation of a communications system with the blocking of their personal promotional opportunities the communications system would face stiff resistance.

Cross Impact Evaluation

The author met with a consensus group of two police managers and a police computer systems programmer to review the forecasts made by the NGT panel. The purpose of the panel was to conduct a cross impact analysis. The basic definition of a cross impact analysis is a method that systematically integrates events with other events already forecast individually. The purpose is to graphically depict how each event, if it occurred, would impact the other events. The members of the consensus group were:

*Lee Rossman, Lieutenant, West Covina Police Department
*Jim Dillon, Lieutenant, West Covina Police Department Computer Systems Manager
*Vern Morton, West Covina Police Department Computer Programmer

The group estimated the impacts by using a X-Impact Evaluation Matrix. Table III indicates the group's estimations. The table displays the impact of each event on every other event. Notice that no event can impact itself. It can have a significant impact on the other events. An extreme version of this would be if one event happened it could conceivably prevent one or more of the others from ever occurring.

Table III

EVENT-TO-EVENT X-IMPACT MATRIX

IMPACTING EVENT	MAXIMUM IMPACT									
	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
E1 Legal decision re. technology		+3	+5	-	-	-11	-	+3	+5	-
E2 New revenue for technology	+5		+4	-	-	-	-	-5	-7	+4
E3 Incident causes liability	-	-		+3	+2	-9	-	+3	-	-
E4 Decisions made off site by supervisor	-	+7	-15		+2	-12	-	-	-7	-
E5 Span of control changes		+15	-	+8		+2	+10	-	-13	-
E6 New funding for training developed	+6	+5	-	-	-		-	+2	-9	-
E7 Officer/supervisor contact through video	+12	+5	+3	-	+2	-		-	-11	+7
E8 Communications security breach	-	+11	-	-	-	-7	-		-	-
E9 Officers resist technology through legal system	+2	+5	+2	+4	-	-43	+2	-		-
E10 Organizational structure flattens	-	+8	-6	+14	+21	-	+9	-	-8	

The final probabilities were developed by factoring the impacting events into the original probabilities developed by the NGT panel. The following are the original probabilities and the final probabilities determined by the cross impact analysis. The first number is the original probability.

Event One: 80/85
Event Two: 75/75
Event Three: 90/89
Event Four: 70/49
Event Five: 59/66
Event Six: 75/79
Event Seven: 65/78
Event Eight:90/93
Event Nine:70/49
Event Ten: 50/71

During the discussion with the consensus group it became apparent that the event with the potential for the most significant impact on other events was Event Six. Event Six (new funds for training) showed promise in mitigating or avoiding other events with negative implications for an organization. The one event it had the most impact on was Event Nine (officers resist technology). The group felt strongly that a well planned and funded training program could significantly curtail misinformed resistance to advanced communications technology.

Along the same lines the group felt Event Two (new revenue for technology) had an impact on the largest number of other events. The reasons for this are slightly more obvious. The group felt with available funds not only could the technology be afforded, but the likelihood that it would be implemented in a more orderly fashion was far greater. The group felt that a systematic implementation was important to help establish credibility in the communications system.

Event Nine (officers resist technology) became an interesting topic of conversation with the group. This event was seen as a possible threat to the decision, or a department's ability to implement some critical components of a communications system. The group felt the main means for legally opposing the technology concerned the issue of an officer's right to privacy, and the impact some technologies may have on that right.

Two other excellent examples of event-to-event impacts are Event Three (incident causes liability) to Event Four (decisions made off site by supervisor), and Event Five to Event Ten. On the first example the group felt a law suit could arise from over supervision. A supervisor monitoring a scene from another site, who attempted to direct could overlook important factors obvious to officers at the scene. This was seen by the group as having a negative impact on the possibility of this off scene decision making becoming an accepted practice.

The second of the examples, Event Five (span of control) to Event Ten (organizational structure flattens), had one of the largest impacts. The group reasoned that if advanced communi-

cations allowed supervisors to become more effective the possibility of eliminating a rank were enhanced significantly.

SIGMA

The final probabilities generated by the cross impact analysis were input into a random number generating computer program, Sigma, to generate thirty scenarios or alternative futures. Using the assigned probabilities Sigma randomly selected events occurring during the ten year window, and assigned a month and year of occurrence. Three scenarios were then selected from the thirty. The author selected the three based on their interesting futures and for their ability to fit the three scenario categories selected by the author: Most Likely; Optimum; and Worst Case. Each scenario has a distinct means of financing the coming wave of high technology communications systems, and each means of financing has impacts on the events generated within the scenarios.

Impacting events are identified and the beginning of each scenario, and throughout the scenarios by an (E), accompanied by the number of the event. Events that did not occur are listed at the end of each scenario.

Scenario I: Most Likely

EVENT	EVENT DESCRIPTION	DATE OF OCCURRENCE
E-2	New revenue source for technology is developed.	April 1994
E-3	A liability issue arises from incident causing serious implications on a state or national level.	October 1998
E-6	New funds become available for high technology training of field officers.	June 1999

E-8	**The communications system suffers a significant security breach with industry-wide implications.**	**January 2000**
E-10	**Technology flattens organizational structure.**	**June 2002**
E-4	**Advanced communications system implemented, affecting on-scene decisions.**	**January 2003**
E-9	**Officers seek legal means to stop the use of technology.**	**April 2003**

TECHNOLOGY REVIEW 1994-2004 by Leroy Ross, Middleton Police Department

The drive for advanced communications technology got a major push from an unexpected ally back in early 1994 (E-2). Looking back, without a well timed effort to salvage a political career by President Clinton, law enforcement in the U.S. would probably be continuing to operate with industrial age technology in the information age. It is apparent a medium sized department, like Middleton Police Department, would not have been able to afford the major expense of updating its communications systems, let alone implement one that is compatible with all the other departments in the State and U.S. In those days of recession most middle sized suburban departments were struggling just to maintain manpower. An aggressive investment in advanced equipment was, generally, out of the question.

A task force, commissioned by then President Bill Clinton, was convened in 1995. After the failure of his proposed health care reform he selected an obtainable goal for his next political foray, reinventing police services. The task force, nicknamed "Reinventing Cops" by the media, was put together with all the political savvy lacking in his health reform planning. Made up of respected experts, from within as well as outside law enforcement, and solid representation from all political ideals, the task force did a stellar job putting together tough, but agreeably necessary recommendations.

A major cornerstone to the proposal was a complete rethinking of the law enforcement communications system. The task force felt law enforcement should be ready to make the best use of the communication superhighway being implemented back in the mid 1990's. Know-

ing money was tight, as the union came out of the nation's largest recession since the 1930's, the task force completed a masterful job of political economics to insure that the communications technology could be afforded by every police agency. The plan to supply matching federal funds, with the revenue generated by police agencies, through a one time sale of tax free federal bonds, generated the necessary funds for cities and counties to move forward.

Congress passed the "Reinventing Cops" bill in the fall of 1994, giving President Clinton a rare political victory during his single term presidency. The bill gave the U.S. dominated communications industry a huge boost with the major influx of newfound law enforcement business. In retrospect President Clinton was given credit for both injecting life into a sluggish economy and throwing the U.S. in the forefront of developing advanced communications technology with his forward looking proposals, credit that was overlooked at the time.

To be eligible for the matching funds law enforcement agencies had to have four technologies in full implementation by June 1998, a period of four years.

*Digital video capability at communications centers, headquarters and within every patrol vehicle driven by sworn police officers. This would allow headquarters to receive both digital transmissions from "Superhighway 911" calls from citizens and digital video transmissions from mobil transmitters. System must also be able to retain all recordings for a minimum of six months.

*Digital transmission capability from all police vehicles driven by sworn officers during patrol operations, to record audio and visual transmissions for future evidentiary use. Airwave transmissions must be "real time viewable" (allowing supervisors to view and direct activity at time of occurrence).

*Mobile compatibility with fingerprint 2000 system, for instant and positive in-field identifications of subjects.

*Mobil data link, compatible with both state and federal agencies. Mainly aimed at Department of Motor Vehicles and warrant systems access. Compatibility also allows for universal upgrades and implementation of developing future technology.

With a government guaranteed cash flow, over ninety percent of the law enforcement agencies in the United States had fully implemented the four criteria by June 1998. The remaining agencies came on line within a year with a lenient amnesty program.

Nothing is without its drawbacks, and the communications advancements were, unfortunately, no exception. It seems no sooner had Middleton implemented its communications systems when an old nemesis, civil liability, reared its head.

Since the maintaining of video transmissions were required under the "Reinventing Cops" bill many starving attorneys had adopted the practice of requesting to view incidents involving their clients. Generally, the viewing ended any visions of a lucrative settlement the attorneys had. The exception occurred in October 1998 **(E-3)**. A seemingly routine arrest for driving under the influence was not recorded due to an error by the arresting officer. The arrestee, after learning that the video recording had not been transmitted or stored, claimed he developed some serious injuries and a fairly believable scenario as to how he received them at the hands of the arresting officer. With no witnesses and a credibility problem as to how the transmission had been "conveniently" misdirected, the City was forced to make an out of court settlement, in excess of two million dollars.

The expensive lesson did not go unheeded by the Department management. The glaring weakness in the implementation of the new communications system was the lack of funds to fully train the officers. The Chief was able to convince the City Council and Manager that proper training would have saved the City not only the money, but the bad publicity as well. The "ounce of prevention" negotiated by the Chief was an initial eighty thousand dollars to completely train the entire work force. This was placed in the 1999 budget **(E-6)**. A twenty thousand dollar yearly budget for future years, to be spent on updated in-service training

was also agreed upon. The money has been proven to be well spent. Though there are always minor problems, there has not been a reoccurrence of the disastrous incident in 1998.

The new video evidence proved to simplify the court process; most drunk drivers pled guilty and many other violators pled guilty when the videos were introduced into evidence. One aspect of the new technology the Department had not anticipated was young hackers with nothing but time on their hands. It seems that a group of young computer hackers had accessed the system and had been secretly monitoring the Police Department's traffic stops and arrests for more than a year when an incident brought the breach to light in January 2000 **(E-8)**. A prominent sports figure was arrested for a minor traffic incident, and made a minor scene in the process. The threats, dismissed by the officers as an every-day occurrence, were on the five o'clock news the same day the incident took place. The enterprising youngsters had obtained recording capability and were no longer satisfied with just viewing. They were able to sell the digital disk to the less than reputable National Enquirer Television News Hour. Though safeguards were built into the system after the breach, evidence of unauthorized monitoring has turned up consistently since 2000.

It wasn't until the 2002/03 budget took effect at the end of June 2002 **(E-10)** that the traditional make-up of the Department underwent a major change. With field supervisors now able to make face to face contact with anyone who has access to a video telephone, as well as being able to monitor the activity of field units through video transmissions, the mid-manager level of the Department was determined to be obsolete. The Department's seven lieutenants positions were dissolved with the stroke of a pen. The Department took advantage of two retirements, a captain and a lieutenant, while creating an additional captain's position (video services/internal affairs) to reduce the surplus of ex-lieutenants down to four. These former lieutenants were moved to the rank of sergeant, but maintained their current pay scale, foregoing cost of living raises until all sergeants reached parity. The Department immediately saved the cost of two management positions, and reduced three of the remaining surplus positions over the next two years through attrition.

The last major event in the ten year evolution of Middleton's communications system is a controversial new program that is bitterly resisted by the line officers and the Police Association (**E-4**). The new directive from the V.I.A. Captain (Video/Internal Affairs) instructed that all arrests and many situations formerly handled at the field officer's discretion had to be approved by an on-duty supervisor. The directive required that the supervisor, usually a sergeant, had to view the appropriate recorded video and personally approve every arrest and course of action requested by the field officer. Since the officers now wore a video transmitter, that resembles a pirate's eye patch, nearly all the information the officer was able to obtain could be called up and viewed by a supervisor in an instant.

The intent of the directive was obviously to ensure that false arrests and possible liability could be avoided. The Police Association, however, saw the directive as demeaning and counterproductive. The Police Association initiated a lawsuit in April 2003 (**E-9**) that is pending today. The basis of the suit is that if officers continually must wait before taking action the delay will not only place the officers at personal risk, but will slowly erode the officers decision-making ability, making them then dependant on a supervisor to make decisions for them.

The case is pending before the California Supreme Court, and is commanding national attention. Can the dependance on technology actually reduce the effectiveness of individual law enforcement officers? Does avoidance of liability merit the risks involved? Does the approval of a sergeant automatically remove liability? Does it even reduce it significantly? Only the future will tell, if we could just look into 2014, but future forecasting is such an inexact science.

Events not occurring: E-1, E-5 & E-7.

Scenario II: Optimum

EVENT	EVENT DESCRIPTION	DATE OF OCCURRENCE
E-10	Technology flattens organizational structure.	May 1995
E-2	New revenue source for technology is developed.	June 1997
E-6	New funds become available for high technology training of field officers.	April 1997
E-1	Legal decision affecting the use of communications technology is passed.	January 1997
E-8	The communications system suffers a significant security breach with industry-wide implications.	April 1999
E-4	Advanced communications system implemented, affecting on-scene decisions.	May 2000
E-5	Technology impacts span of control.	March 2001
E-3	A liability issue arises from incident causing serious implications on a state or national level.	July 2002

TECHNOLOGY REVIEW 1994-2004 by John Distelrath, West Covina Police Department

The recession of the early 1990's took an exceptionally heavy toll on the City of West Covina. West Covina is located in eastern Los Angeles County and depended heavily on retail industry, taxes from their land-fill and property taxes for the City's revenue base. When the economy of the area took a dramatic decline, coupled with the closing of the land-fill and declining property values, approximately 7% of the households in West Covina immediately lost their main source of income. The ensuing economic chain reaction was both predictable and devastating to the middle-income community. Entire shopping centers and car dealerships closed, severely impacting the sales tax revenue that once comprised 42% of the City's income.

Living on surplus saved from better economic times, the City endured until July 1994 with only minor personnel and moderate equipment cutbacks. The City fathers gambled that the City could outlast the lean economic times, spending precious reserves, and avoiding the difficult decisions that needed to be made. Harsh reality was felt by the City and its' municipal employees when the fiscal budget of 1994-95 came, with the City reserves at zero. The dreaded edict was issued and Chief Distelrath was given a non-negotiable 13% budget cut. No direction was given, other than to minimize the impact on patrol functions where possible.

Chief Distelrath had seen the handwriting on the wall, and had wisely chosen not to fill several positions that had become vacant in the past eight months. He currently held five vacancies in his 110 officer sworn complement, and was short three positions in his non-sworn ranks. It was painfully obvious to the Chief that there was only one way to reach that deep into the police department budget, and that was to make serious cuts in personnel. The Chief consolidated some functions and streamlined others. Taking advantage of the vacant positions he found that he could achieve nearly half his goal without the loss of a single employee. He knew then the hard decision was now his, and that every employee group was poised to jump on any encroachment into their membership.

The Chief came to the only conclusion he felt was feasible, given the grim conditions. Remove an entire rank. He commanded a department with three captains, eight lieutenants, and ten sergeants. Not a bad supervisor to officer ratio in better economic times, but a luxury that was beyond the means of the Department at that time. The Chief froze a captain's position opening up in 1995 (**E-10**) due to a pending retirement, then broke the bad news. The lieutenant's position was to be abolished. Seven lieutenants were reduced to the rank of sergeant, pushing the seven junior sergeants down to the officer rank. This required the temporary layoff of seven officers.

After the initial shock wore off, the Department adjusted to the change and got back to the business of police work. The community, particularly the business community, did not stand

still however. The underlying causes of the area's recession, aerospace and defence industries took on an entrepreneurial air, and developed marketable products. Focusing on the private consumer instead of government contracts, the first major breakthrough was a long-lasting, compact usable battery system. The new system allowed for a viable alternative to the internal combustion engine for local commuters. This development and others in the same vain, in addition to a return to a steady flow of government contracts, brought the area's tax base back to and exceeding the level of the late 1980's, in time for the 1997/98 fiscal budget **(E-2)**.

With the tax base restored Chief Distelrath had another tough decision to make. The Chief resisted the temptation to just turn back the clock and restore the lieutenant's rank. Drawing from his favorite author's book "Managing in Turbulent Times", he chose to go forward and not backwards. He was aware of the advanced communications technology that had been around for several years. He was also aware that the systems had been in place in several other departments for years, and that the price had dropped dramatically. Feeling that the opportunity to modernize might never present itself again, during his career, the chief opted to spend the lion's share of the windfall allocated to him by the City Council on bringing the Department into the twenty-first century.

The first leg on the transition was to update the Department's personnel on the available technology, with a strong emphasis on how it would assist the line officer in their day to day activities. From that department wide in-service training, in April of 1997 **(E-6)**, an interested group, from all ranks, was selected to research and implement the project. The committee's focus was not just the selection of equipment. They were charged with the smooth implementation of the new system, as well as the selection of the most suitable equipment and technologies.

The committee was well into its second department wide eight hour training when the United States Supreme Court issued their decision on People vs. Farrell. In retrospect, it should have been expected. With the proliferation of mobile recorders and mobile digital transmit-

ters recording every move by officers in the field it seemed only a matter of time before a decision on the use would be handed down. The liberal court, bolstered by four ultra left wing appointees, ruled the recording of a traffic stop an infringement on a person's fourth amendment rights (E-1). The Court imposed a "Miranda" style warning that must be given to every person contacted, if the contact was being recorded.

The setback was only temporary, as officers and departments had long since learned to deal with inane decisions. Undaunted, the Department initiated the first of five phases for the full implementation of the committee's program in October 1997. The first phase consisted of little more than mobile computers, with full computing and mobile data terminal capabilities. The first phase brought the Department up to speed with most of the progressive departments, but the acquisition of the data channel was the key to the following stages. Within the next five years the Department would have instant in-field fingerprint identification, digital image transmission to and from patrol cars, global positioning to assist in dispatching, and the final phase, full video transmission with full record storage capabilities.

The system had worked as expected and was accepted with more than a little rumbling by the older officers. Those who were most vocal against the technology were labeled "dinosaurs" by the younger officers. The large majority having strongly supported the innovations placed a good deal of peer pressure on the lagers to conform and keep up. The implementation was lauded as a model by the vendors, without a major hitch, until April 1999.

A scandal, started with information that could only come from police department personnel or records, broke. Confidential information, regarding the Mayor's somewhat imaginative sexual appetites hit the newspapers on April 1, 1999 (E-8). The contact with the Mayor that had caused the Department to be aware of the unusual, but not illegal, tendencies was transmitted via mobile data terminal to the Chief as a one-to-one communication from a field sergeant. With only two within the department aware of the incident it was very curious when the incident was described, almost verbatim, in the newspaper on the following day.

The obvious fervor and embarrassment turned to anger at the department, for what was considered a breach of faith.

With a limited pool of suspects, one being himself, the Chief decided to check further into what he thought earlier to be "just rumors". The Chief had heard of the possibility of someone gaining access into the Department's records, through the data frequency channel, but he had dismissed it as very improbable. An audit revealed what he feared most. Unauthorized access had been made, and hundreds of inquiries had been run through every imaginable governmental system. The ensuing investigation quickly revealed that a private investigator had been selling information, obtained through the Department's systems, for nearly two years. She admitted that she had been hired to turn up as much negative information on the current City Council as she could. Her client, a developer who had been unsuccessful in a bid to build a strip mall, was eager to embarrass one or all of the members of the council.

Additional security was added to the Department's communications systems. Security had admittedly been underfunded, a lesson Chief Distelrath vowed would not need to be given twice. The chief was determined to maintain both the officer's and the public's trust in the system and he came to realize that security of information is a cornerstone to that trust. Chief Distelrath reached the limits of his endurance and retired to a more relaxing environment after he assured himself that the security of the communications system was assured.

In May of 2000 the brainchild of Chief Distelrath was fully implemented. With all the tools available to them, the field sergeants began monitoring officers on a regular basis through the video transmissions. With the ability to monitor from their patrol cars, as well as from the station, the sergeants found it possible to direct officers through most any incident, without actually being there (E-4). The officers resented the intrusion, but tolerated the step by step supervision as they felt the liability for their actions would now fall on the shoulders of the sergeant. West Covina P.D. management recognized that constant direction was causing discord within the department and felt it could erode the ability of the field officers to think independently. The committee that oversaw much of the implementation of the system was

reactivated to insure that this component was being used to the best advantage of the department and the community it served. Common sense guidelines were easily agreed upon and a balance between the need for officers to act independently and the responsibility of field supervisors to lead was met and followed.

An opportunity presented itself for the new chief of West Covina in March 2001. A neighboring city, Covina, fell into serious financial difficulty, and was in the process of requesting a preliminary contract bid from the Los Angeles County Sheriff. Chief Yamamoto felt she could bid competitively with the County Sheriff. She felt the high technology nature of the West Covina Police Department would give them the edge needed to secure the contract. With the advanced communications system she had inherited from the previous chief she felt her current supervision could easily handle the additional officers. With an enlarged span of control **(E5)** for her field supervisors she would need only to add additional officers and detectives, giving her the edge in bidding for the contract.

Chief Yamamoto won the battle for Covina, but not without paying a price. She did enlarge her Department by nearly thirty percent, but the City Council held her to her word. She was not allowed to increase the supervision or management personnel. Supervision was spread thin, and managing the additional personnel seemed an impossible task to those entrusted with the responsibility. Through effective training, diligence and a strong dose of accountability the sergeants became very adept at manipulating all the resources available to them. The reality of the situation was, they could more effectively supervise the additional personnel with the new technology than they could supervise the smaller number with the "old systems".

Early one warm July morning in 2002 **(E-3)**, a young officer ran into something he was unprepared for. Confronted by an obnoxious, but unarmed intoxicated driver, the inexperienced officer attempted to take command of the situation. The driver, sensing the lack of command presence commonly associated with newer officers, tried to intimidate the officer into releasing him. A heated argument resulted in the officer drawing his handgun in an

attempt to gain control of the situation. A scuffle resulted in the violator being wounded, causing a permanent disability.

The lawsuits are just now making it to court, nearly two years later. At the core of the issue is the low supervisor to officer ratio. The plaintiff is alleging that the young officer would have been better able to handle the situation, without deadly force, if he was more closely supervised. The reality is that the officer had ample supervision, more than officers from other departments with a lower ratio and outdated communications. Reality, however, has little standing in legal matters, and the outcome is pending a much discussed trial.

Events not occurring: E-7 & E-9.

Scenario III: Worst Case

EVENT	EVENT DESCRIPTION	DATE OF OCCURRENCE
E-10	Technology flattens organizational structure.	December 1995
E-2	New revenue source for technology is developed.	June 1996
E-6	New funds become available for high technology training of field officers.	September 1996
E-9	Officers seek legal means to stop the use of technology.	December 1997
E-8	The communications system suffers a significant security breach with industry-wide implications.	March 1998
E-4	Advanced communications system implemented, affecting on-scene decisions.	February 2002

TECHNOLOGY REVIEW 1994-2004 by Joeph Wu, East Valley Police Dist.

It's hard to imagine today how a department of less than two hundred was able to exist. Looking back about ten years, to 1994, would be the time one could probably say that regio-

nalization really started changing the face of law enforcement in the United States. Back then the "downward adjustment" in the quality of life in the United States was still being called a recession. It took the "downward adjustment" to force city governments to give up their antiquated notion of having "their own" police department.

It happened here in 1995, with the implementation of the East Valley Police District. The district was one of the first to form a separate political entity and elect a governing board. The East Valley Police District encompasses four cities: Coyote Hills, San Marcos, Russleton and Liberty City. Each of the cities had previously had their own police department. In addition to the incorporated cities, the district also picked up approximately 30,000 residents from unincorporated county area, who were previously served by the County Sheriff.

Each of the police departments that now make up the East Valley Police District had in excess of sixty sworn officers; Coyote Hills had nearly twice that number. The Police District consolidated all services, and facilities, but the biggest impact was on patrol and patrol services. Each of the departments had the traditional lieutenant watch commander and sergeant field supervisor. The incorporation survey found that with some adjustment of duties one watch commander would be capable of handling the supervision of field services, and that three sergeants could easily cover the field supervision **(E-10)**. The actual number of patrol officers remained the same, but did pick up an additional 30,000 residents from the county area. The configuration reduced the number of lieutenants by eleven, and sergeants by ten, from patrol alone.

The consolidation was able to save Liberty City, the smallest of the four, $700,000 per year. The largest of the cities, Coyote Hills, trimmed $1,300,000 from its general fund. The first budget adopted by the Police District had nearly $2,000,000 set aside for equipment upgrades, recognizing that the incorporation brought together four police departments with four completely different communications systems and records systems. A large percentage of the $2,000,000 was set aside to update and make those four systems compatible **(E-2)**.

The first step towards the department goal of a modern communications system was taken in September 1996, with the hiring of a communications consulting firm. Having no particular expertise within the Department to draw from, the management team depended heavily on the guidance and recommendations of consultants/sales associates.

The consulting firm, D.C.& H. Communications, was in business to make money, and found they could enhance their profits by selling last year's unsold technology at today's prices. With no experience to draw from, the management team was wowed by the slick Madison Avenue presentation and implementation plan. The management team, and ultimately the Police District Board of Supervisors bought into the five phase implementation plan.

The first phase of the plan brought the first major problem. D.C.& H. underestimated the number of microwave stations needed to support the data channel that was necessary for the digital system being planned. The $500,000 overrun delayed the implementation of the in-car computers that comprised the second phase of the implementation. The following phases would implement a global positioning system, digital video transmission, instant in-field fingerprint identification, and a link with the superhighway 911 system. As it turned, out the five year plan that was to cost a total of 7.5 million dollars over five years is costing twice that, while remaining uncompleted eight years later.

It was not hard to predict that the ineptness with which the plan was implemented would have an adverse effect on the acceptance of the technology by the patrol personnel. Officers who saw that they were forgoing cost of living raises at the same time the District was pouring millions into a technological black hole were becoming dissatisfied with their superiors. This dissatisfaction was manifested in technology bashing that a majority of the officers practiced daily.

Seeing that the communications systems were doomed without a buy-in from those who would use them, the management team attempted to correct the problem. Realizing that not involving line personnel from the beginning was a serous error, in hind sight, they took a

better late than never approach. A training budget was established and an implementation committee was established in September of 1996 (E-6). Unfortunately the committee and training were seen by the rank and file for what it was, a pacification attempt. The committee had no authority to make changes, and recommendations were accepted and promptly dismissed. The training program was little more than an attempted justification for the program and its numerous setbacks and missed implementation deadlines.

The problems grew over the next couple of years. The original implementation plan for the West Valley Police District caused the demotion of more than a dozen supervisors. Attrition in the management ranks was slow, and when a position did become open a demoted supervisor was returned to their previous rank. This condition had caused a stagnation effect within the officer's ranks, the backlog of demoted supervisors negating the need for a promotional test for fully three years.

The dissatisfaction over lack of promotional opportunities, coupled with the strong and promotion minded police association directors, caused the police association to formally call for an increase in supervision. The association used the stretched span of control, caused by the original incorporation of the four police departments into one, as the basis for their call for a drastic increase of field supervision. The association board saw the new communications technology as a severe hinderance to achieving additional sergeant's positions. They foresaw a counter argument by management, citing the enhanced abilities of supervision due to technology, as a real threat to their ultimate goal.

The Association's board of directors, of course, did not divulge their true intentions for attaching the continued implementation of the new communications system. They, instead, cited officer safety issues, invasion of privacy issues, medical issues and moral issues as their motivation for challenging the continued implementation. They enlisted the assistance of the American Civil Liberties Union (E-9), to assert the officer's right to privacy. The A.C.L.U. had their own ulterior motives for taking on the fight. They pulled in the Occupational Safety and Health Administration to investigate the possibility of adverse radiation from the mo

bile computer and computer monitor. They approached the local media and planted the "Big Brother" scenario with some of their most skeptical journalists. In short the police association pulled no punches in attempting to undermine the implementation of existing technology, because it interfered with the agenda the association had adopted.

The constant pressure caused the East Valley Police District Board of Supervisors to balk, and suspend the implementation of both the global positioning system and the digital video transmission phases of the implementation plan. Though the supervisors halted the implementation, they found it unnecessary (translated too expensive) to bolster the field supervisor ranks.

It was ironic that in March 1998 (E-8), just one month after the Police Association was successful in blocking additional implementation, a breach in the security of the system was found. The communications firm, D.C.& H., had a mobile computer stolen. The monitor was complete and capable of monitoring the status of all of patrol units. Hoping to avoid embarrassment the companies' president, Mr. Dewey, chose not to notify the police department of the loss. He bet, wrongly, that the thief would be unable to use the complicated system. In reality the thief found little challenge in the archaic security measures incorporated within the system.

The thief, a computer buff with organized crime connections, was monitoring every police transmission and assigned call for three months before D.C.& H. discovered the unit missing. He found willing buyers of information of police surveillance, and had developed an alert system that sounded whenever an address of one of his "clients" was either mentioned in a car to car transmission, or when field units were dispatched to the address. This allowed him to place a warning call, giving all the details available to the officers. Business was so lucrative that he was able to purchase a computer with the ability to store all transmissions made by every mobile computer and the dispatched calls. The computer would be

able to search the stored data and pull up any transmission where a client's name, address or vehicle license was used.

Fortunately, for the Police District, the thief had friends who valued their own freedom over the loyalty they felt for friends. When arrested for possession of methamphetamine for sale one of the thief's friends gave him up in a deal with detectives that kept the dealer out of prison.

A search warrant revealed that nearly 200 narcotics cases had been compromised in the previous two years. Worse than losing cases, however, was the exposure of confidential informants used by the narcotics detectives. In the past two years, three tested and reliable informants had suddenly disappeared. All three of the missing informants had been mentioned in the thief's notes within a week prior to their disappearance.

Cost overruns continued to plague and delay the reestablished phases, well past the new millennium. Phase three, global positioning, was put into effect four years behind schedule. Phase four, digital video transmission to and from field units, followed five months later in February of 2002.

With the implementation of all but the final phase the Department's management team felt it necessary to update field decision making policies (E-4). With the new technology now at their disposal, managers felt it was time to take the decision making responsibility from the field officers in several areas. They felt their ability to view and recall video to review incidents, at a monitor away from the incident, gave them an added advantage over officers at a scene.

The Police Association, holding true to form, filed a grievance over the new policies. The grievance was denied and legal steps were begun to resolve the issue. While the lawyers

were filing the appropriate briefs and obtaining depositions an incident occurred that resolved the issue, at least temporarily.

To this day it is unknown if the incident was set up by the association, or if it was just a coincidence. It seems the association president who was working patrol for a sergeant that strongly supported the new methods of approving the actions of field officers. The association president, Officer Hauser, was working a string of child molestations near elementary schools. A pattern had been developed through the plotting programs in place in the department computer. Officer Hauser spotted the suspect vehicle near an elementary school as children were leaving for home. Waiting until his sergeant was busy reviewing an arrest video, as the rumor goes, Officer Hauser attempted a stop, knowing the suspect would flee at high speed. Officer Hauser requested authorization to pursue the vehicle, as per the new policy. His sergeant, unable to react quickly enough, was unable to give the required authorization before the suspect was out of Officer Hauser's sight.

Acting on an anonymous tip, the local news media obtained a copy of the transmission. Besides endangering the public, the incident opened the Department to deserved civil liability and seriously impacted the Department's credibility with the community.

Is the advanced communications worth the animosity and turmoil it caused? Hard to say at this point. The five year 7.5 million, five phase plan has cost 15.5 million. The final phase is on hold, eight years after the plan was adopted. The technology in place remains under used, due to poor planning and training, and inept management. For the expense and effort to pay off, the Department will have to be able to learn from history, a tall order for a bureaucratic organization.

Events not occurring: E-1, E-3, E-5, & E-7.

POLICY CONSIDERATIONS

This section covers conclusions and recommendations of the author as well as observations and recommendations of the NGT panel.

NGT panel recommendations:

As part of the NGT process the panel developed a list of observations and recommendations for the avoidance or lessening of negative trends and events. The following list was generated, and is in random order.

1) The panel felt strongly that all levels of an organization needed to be consulted and involved in the planning and implementation of a system that would effect the organization so thoroughly.

2) Build in safeguards for misuse. Though misuse may be inevitable, the panel felt that proper training coupled with a strong likelihood that misuse would be detected and punished would limit the amount and impact of misuse.

3) Training, training, training (a direct quote). The use of training, preferably prior to implementation would lessen misunderstandings and "avoid vapor lock by "non-techies" (another direct quote).

4) Constantly re-evaluate process and function of technology. Answer the question "Is it doing what the department needs of technology?".

5) Seek input from outside sources or others who have similar systems. The panel felt too much money is wasted "reinventing the wheel".

6) Re-evaluate policies each time new technology is implemented to prevent contradictory and/of outdated directives.

7) Establish the goals of the new technology. The panel felt that it is vital for officers and supervisors to know what the technology is intended to do, what benefits can be derived to make the day to day operation of a police department more efficient.

Author's observations:

The most enlightening facet of this futures research, to the author, was the interaction of the NGT panel. Some of the most thought provoking statements came from those outside the law enforcement field. Being from law enforcement, at times, was a burden to NGT members as their thinking was shackled with past procedures and paradigms. At times, especially during discussions involving high technology, some members got stuck trying to apply old rules to rapidly evolving future technology and that technology's effect on law enforcement.

Another key to productive and spirited discussion among panel members was a representation of virtually every rank and related assignment within a police department. The difference of perspectives on issues opened doors to unique and imaginative applications and discussions.

In reviewing the panel's recommendations, in conjunction with the author's observations of the cross impact analysis, several common themes seem to constantly assert themselves.

The first of these themes, and the most obvious to the author, is the training. Proper training, coupled with well established expectations of technology, helps assure productive use of the systems. It was also seen by the NGT panel as a means of reducing the fear of technology and change. The event-to-event cross impact analysis was perhaps the demonstration of the possibilities of proper training. When the members of the consensus group discussed the effects of Event Six (new funds for training) they found that training, assuming the training was effective, has a lessening impact on the undesirable events or aspects of events.

The value of planning was also a common topic with both the NGT panel and the cross impact consensus group. Effective planning, especially planning involving all impacted levels of the organization, was seen as a means of developing informal leadership and support for planned change. Planning was suggested by the NGT members as a means of bringing the field officers "on board", and allowing those involved officers to sell the systems to their peers. This system of peer education was seen as far more effective than having a

supervisor expounding the merits of the new communications technology. The NGT panel members were very firm in their belief that field officers will be suspicious of a supervisor's motives for being enthusiastic about a system that may invade the once predominately autonomous working environment of the patrol officer.

Before investing in, or implementing a new communications system, definite goals for that system should be firm. It is the strong belief of the author that if little is expected from a system, that is exactly what will be produced. The goals need to be established, preferably with input from all affected levels of the department, then a system found or developed to meet those goals. Finding a system, then attempting to discover its useful attributes is a recipe for failure, frustration and resistance.

Lastly the ingredient that insures the systems purchased or developed will reach their useful life expectancy, flexibility. A system that can not change, that will not accept new technologies, or can not communicate with systems of other departments or forms of communication will become a department's albatross. The future is fluid. The most beneficial systems, to law enforcement, may not even be imaginable today. A system put in place must be capable of change, not only to accept new technological breakthroughs, but to be able to meet the individual needs of the department and its community.

III. STRATEGIC PLAN

In the proceeding section on futures research, there were several central themes that ran through both the NGT and the Cross Impact Analysis. The first of these themes is proper training. When coupled with well established expectations of technology, proper training helps assure productive use of the systems. Training has the ability to reduce the fear of technology and change. Secondly, effective planning, involving all segments of the department, will have a tremendous impact on the effectiveness of the systems, and enhance the effectiveness of field officers and supervision. The third area is flexibility. A system that cannot change, that will not accept new technologies, or cannot communicate with systems of other departments or forms of communication will become a department's albatross. In addition to the above themes, the NGT panel had strong recommendations for implementing an advanced communications system: Seek input from as many outside sources as possible; re-evaluate current policies to ensure they support the system; build in safeguards for misuse/abuse; establish goals for the system; and consistently re-evaluate the system to insure that the system is doing what it was designed for. This will insure that the system is working for the department; not vise-versa.

The optimum scenario from Section II was selected as a basis for strategic planning and policy considerations. The strategic plan will focus on the positive aspects and benefits attainable with advanced communications technology while planning to avoid or minimize the possible negative impacts explored in scenarios I and III.

STRATEGIC PLAN

Mission Statement

The development of a mission statement is an important step in the strategic planning process. The mission statement is specific to the issue and gives desirable direction and depart-

mental values. The following mission statement was developed by the author, with input from Lieutenant Rossman and Commander Dillon, both of West Covina Police Department, specifically for the implementation of an advanced communication system at West Covina Police Department.

It is the author's belief that the West Covina Police Department will maintain a posture of being proactive and on the leading edge of communications technology. The members of this department strive to embrace the advances in communications technology. They are innovative in applying those technologies for the improvement of the efficiency of patrol services and towards improving the quality of life within the City of West Covina.

Environmental Analysis

An inspection of the situation is introduced examining the external and internal environment concerning the issue and sub-issue questions utilizing the STEEP (Social, Technical, Economic, Environmental, and Political) organization method and WOTS-UP (Weaknesses, Opportunities, Threats, Strengths, and Underlying Planning) analysis. The examination of these environmental factors is an attempt to identify the strengths and weaknesses within the department of its surrounding environment that may aid or stand in the way of the fulfillment of the department mission.

A consensus group of five colleagues collaborated with the author to produce the environmental situational analysis and identify the stakeholders and the stakeholder assumptions. The group members were:

*Jim Dillon, Commander, West Covina Police Department, police computer systems expert.

*Lee Rossman, Lieutenant, West Covina Police Department, Command College graduate.

*Vern Morton, Computer Programmer, West Covina Police Department, computer and future technology expert.

*Mark Dettor, Sergeant, West Covina Police Department, patrol supervisor.

*Walt Hauser, Officer, West Covina Police Department, Police Association President.

External Environment

Social-Threats

The current economic climate makes the purchase of any non-critical equipment exceedingly difficult. Economic hard times for government agencies places additional scrutiny on any purchase especially if the purchase is of high technology that can be labeled as toys or gadgetry by detractors. Difficult economics also lend themselves to the belief that advanced technology is viable only if that technology replaces personnel, thus reducing budget strain.

Aside from the economic considerations and political entanglements there is a fear from the public and politicians of any increased ability of law enforcement to gather and store information/intelligence. The public is becoming increasingly concerned with local government maintaining files of a non-criminal nature, and are therefore suspicious of the information gathering technology.

Continued failings of the educational system can hinder advancements in advanced communications systems in two ways. First, the systems in place and used in the day to day workings of the patrol officer may beyond the capabilities of many who have received public education, thus reducing the viable pool of potential peace officers. Secondly, a public ignorant to the workings and uses of high communications technology will tend to withhold support of the purchase of the systems.

Social-opportunities

The City of West Covina enjoys a traditionally strong community support for the police department and law and order issues. The relationship with the community could be further enhanced with interactive high technology communications systems, especially the face to face communications afforded by the information superhighway.

Increased accountability of patrol officers and more timely resolution of citizen's complaints, due to availability of objective recorded evidence (in patrol car video recording capability for example) could help build additional confidence in the police department. The presence of

video recorded evidence could assist in the image of professionalism the community has for the department by allowing more effective prosecution of criminal matters and appropriate settlements in civil cases.

Technology-Threats

Advancements in communications technology will permit a drastic increase in the amount of information being transmitted from field officers to either other field officers or a communications center. The information transmitted and the information systems available to field officers and supervisors will be of great interest to police buffs, casual snoopers or those seeking information for personal gain. Communications technology used by police departments of the future will not be classified, therefore anyone with the finances and knowledge may be capable of intercepting transmissions or accessing confidential files or systems.

Technology-Opportunities

The present communication (and emerging) technology will present opportunity for the agency supervisors to have increased visual supervision of their personnel, provide quicker linkage between the police station, field units and the communications center. This presence coupled with the ability to record the transmissions will allow agencies to present additional solid evidence in criminal proceedings as well as convincing evidence to help resolve personnel complaints of misconduct by officers.

Economic-Threats

The obvious threat is the projected high initial implementation costs for advanced communications systems. Less obvious would be the personnel costs associated with programming and maintaining high technology equipment. An agency with the capability to record the in field activities of officers may incur additional exposure to litigation if the recordings show inappropriate actions by field officers.

Economic-Opportunities

An agency with and advanced communication system may enjoy an increased span of control by field supervisors. The increase could allow for a greater number of patrol officers without increasing supervision costs. An increase in span of control could also lead to flattening (elimination of a supervisory or management rank) of an organization, therefore reducing costs.

Advanced technology will allow the option of eliminating many written documents. A report dictated into a voice actuated word processor will eliminate not only much of the time necessary for the officer to prepare the report, it will also eliminate the need for a secretary to enter the information on the report into a partially automated records system.

Civilianization has allowed many departments to cut personnel costs, without impacting service to their communities. Civilianization could be expanded by a department that had access to the communications superhighway. Face to face video phone contact could allow a non-sworn employee to assist the caller, eliminating the need for a police officer to physically respond to the caller's location.

Environmental-Threats

The environmental threats would be threats to the officers in their environment, namely the patrol unit. There would be a possibility that the increase in electronic equipment, especially the close proximity of high resolution computer screens could expose patrol officers to additional radiation. The use of the emerging technology could also contribute to threats to the officer, especially if the use requires repetitive tasks with a system that is not ergonomicly engineered. The added strain could cause an increased in carpel tunnel syndrome, neck or back strain and eye problems/strain.

Environmental-Opportunities

Advanced communications systems could cause a reduction in emissions and traffic congestion through disposition of calls for service over information superhighway and telecommuting.

Political-Threats

One threat to an effective advanced communications system would be political involvement in the implementation of information superhighway. There is significant political posturing over who should provide the delivery of the information superhighway (phone company, cable television, broadcast television) which could delay the investment in the fiber-optic infrastructure. A delay or substandard investment in the information superhighway could dilute the effectiveness of any system put into effect by a police agency.

There may also be significant political pressure placed on any attempted implementation of an advanced communications system. For various reasons many groups or individuals would find it in their best interests, not necessarily the best interests of the community, to prevent or influence any proposed system. Many groups or organizations may feel threatened by the increased ability of police departments to access and store data, and would be interested in preventing abuses and legitimate uses of technology and the information superhighway. Political pressure to limit the use and therefore effectiveness of the emerging communications could also be brought by employee associations who may fear losing police officer or non-sworn positions to technology. Another direction political pressure will likely come from will be the expenditure of scarce revenue. Many politicians and community have the short sighted notion that all advanced technology amounts to little more than toys for civil servants. This belief could bring significant pressure to delay or forgo any expenditure for advanced communications systems.

The lack of industry standards or government regulations could make competing systems incompatible, preventing neighboring departments from communicating with each other or with a state or federal system.

Political-Opportunities

The emergence of advanced communications systems will give local police many opportunities to improve the public's perception of their particular department as well as the perception of law enforcement as a whole. An informed public could view an investment in advanced communications as providing them with a more proactive and productive police force. The ability to quickly handle complaints and accusations through the use of verifiable unbiased evidence, i.e. audio and video transmission recordings, could defuse a possibly volatile situation that otherwise may fester in the community because allegations of misconduct were not acted upon for lack of sustaining or refuting evidence.

Organizational Analysis

The West Covina Police Department is a medium sized police department within a large metropolitan area. The department provides full police services to an incorporated city of 100,000 residents in a middle and upper middle class bedroom/retail community of approximately 18 square miles. The department has a total of 155 full-time employees, 111 of those are sworn officers. The following analysis is intended to show the department's strengths and weaknesses as they relate to the issue being researched.

Strengths

The West Covina Police Department is technologically advanced. The department currently has mobile high capacity (386) computers in every patrol car, with word processing and full access to State and West Covina records systems. A data channel, a separate radio frequency to transmit information to patrol units, is in place and is Federal Communications Commission approved. The computerized records system developed by the West Covina Police Department is user friendly and has been sold to other agencies worldwide.

Money for the purchase of equipment has been supplied by a highly productive major narcotics unit. Through asset forfeiture, the department has received over $16 million dollars in the past eight years. Over $5 million remains at the disposal of the department. The funds

are restricted to combating narcotics abuse and abuse related problems, though, the purchase of advanced communications systems is an accepted allocation of these funds.

The personnel are generally open to advances in technology and change. Both management and line personnel have been supportive of innovation. Being seen as innovative and leaders in the advancement of technology is a source of pride within the department.

The department currently has the technical proficiency needed to implement most of the foreseeable advances in communications technology. The West Covina Police Department has two full-time computer programmers on staff, as well as two sworn officers, both at the rank of commander, who are recognized as experts in the field of police computer systems.

The West Covina Police Department enjoys relatively strong political support for the purchase and implementation of advanced technology. The City Council and City Manager have been supportive, especially when the purchases are made from the Drug Enforcement Rebate funds (asset forfeiture) or when the technology can be demonstrated to enhance the effectiveness of the existing personnel. This reduces the pressure for added personnel.

The West Covina Police Department has a tradition of maintaining a high priority on training and the development of personnel.

The West Covina Police Department is beginning to profit from assisting other departments with their computer and communications systems. The department has formed a cooperative group, and, for a fee will provide technical support to police departments from as far away as Utah and Greenland with the management of their systems.

The West Covina Police Department has a new chief who places a significant emphasis on practical technology, effective training and strategic planning.

Weaknesses

The City of West Covina and its police department have become dependent upon Drug Enforcement Rebate funds, shifting nearly all allocations for equipment into the separate Drug Enforcement Rebate budget. The future of asset forfeiture is in doubt. The legislature is coming under pressure to limit the ability of law enforcement agencies to seize property and convert those assets to departments for combating drug abuse. Additionally, seizures have been reduced dramatically for West Covina, but West Covina is not alone in the reduction. Drug cartels have changed their operations to make it more difficult to detect and seize their profits.

To compound the problems associated with the reduction of forfeited assets, the City is relying more and more on the Drug Enforcement Rebate funds to help balance the general fund budget. Over the past five years several full time positions and most equipment purchased have been shifted from the general fund budget to the Drug Enforcement Rebate budget. The police department now spends in excess of $2 million per year from the Drug Enforcement Rebate budget. At the current rate of income and expenditures the department will deplete the Drug Enforcement Rebate funds in less than four years.

Training, a traditionally strong area at the West Covina Police Department, is beginning to be questioned. Cuts in the general fund budget are becoming deeper and training funds are more vulnerable as well. The impacts of financial constraints are threatening to move the department from an innovative mode to one of survival.

The in-house expertise could serve as an anchor if those who have been the driving force lose their initiative. Those who have pushed and have taken the risks to develop the advanced systems now in place are viewed with great esteem by their superiors and peers. If those members of the department lost initiative or were faced with technology that made their years of hard work obsolete, they may block or slow that development.

Financial difficulties are not limited to the police department. Those problems face every department in the City and has had a negative impact in cooperation between city departments. Survival has caused a reduction in the spirit of cooperation between those departments, especially where expenditures are involved. This is of particular concern since the communications department in West Covina is separate from the police department, unlike many police departments.

Stakeholder Identification and Analysis

The following list of "stakeholders" consists of a collection of people, or groups of people, who have been determined by a panel of colleagues to have a strong interest in how communications technology will affect patrol supervision. Stakeholders can create opposition, be supportive, or have conflicting/mixed interests in the issue. Evaluation, identification, and mapping of their positions is important for the successful implementation of a strategic plan. The colleagues who assisted with the list of stakeholders are:

*Commander Jim Dillon, West Covina Police Department

*Lieutenant Lee Rossman, West Covina Police Department

*Computer Programmer Vern Morton, West Covina Police Department

This section will identify the stakeholders and the assumptions they have about the issue. The assumption is a brief description of the feelings or beliefs the stakeholder has about the issue of advanced communications systems effects of patrol supervision.

The following groups or entities are stakeholders. The position and the assumptions they may have about the issue are listed.

1. POLICE OFFICERS
   - A. Will be suspicious of infringement on privacy.
   - B. Could resort to sabotage if they feel it is necessary to resist technology.
   - C. Will support technology that will reduce their exposure to liability and prevent frivolous complaints regarding their activity.
   - D. Concerned with loss of current, or possible future positions.

2. POLICE CHIEF
   A. Primary interest is providing quality service at lowest possible cost.
   B. Supportive of innovation.
   C. Believes the department is currently on the leading edge of technology.
   D. Has strong concerns about liability issues, labor issues, and community perception.
3. CITY MANAGER
   A. Views past expenses on technology as excessive.
   B. Extremely concerned with costs, especially those that come from general fund budget.
   C. Thinks the police department has too much political power.
   D. Would support expenditure of funds if the return on the investment could be demonstrated, especially if personnel costs could be reduced.
4. WEST COVINA CITY COUNCIL
   A. Aware of political support the police department has within community.
   B. Easily influenced by lobbying efforts of small groups.
   C. Would balk at replacing police officer positions with technology, due to negative connotation associated with reducing police officers numbers.
   D. Very concerned with general fund expenditures. Much less concerned with asset forfeiture expenditures.
5. WEST COVINA POLICE ASSOCIATION
   A. Strong concerns about job security.
   B. Will be suspicious of management's intention for implementation of technology that will make field officers more accountable for their actions.
   C. Will threaten or initiate lawsuit if technology is seen as threatening to members or association's clout.
6. AMERICAN CIVIL LIBERTIES UNION
   A. Advanced communications systems have many aspects that are invasive and open to abuse by police officers and government.
   B. Have ulterior motives that may be threatened by advanced communications.
   C. Will monitor closely misuse of computer networking systems for violations of civil rights.

7. COMMAND DATA SYSTEMS (Owns the rights to software systems now in use by the West Covina Police Department)
   A. Will be seeking to be a part of any system upgrade initiated by the department.
   B. Profit will be their main driving force.
   C. Strong on technical knowledge, but weak on practical application to police work.
8. MISCELLANEOUS EMPLOYEES ASSOCIATION (Bargaining unit that represents civilian officer members of the police department)
   A. Increasingly resistant to loss of employee/membership base.
   B. Will support technology that reduces workload.
   C. Will require "meet and confer" negotiations for implementation of technology that affects conditions of employment.
9. CITIZENS OF WEST COVINA
   A. Strong "no new tax" sentiment.
   B. Generally misinformed about capability of police equipment/technology.
   C. Interested in having responsive police department that is open and accessible.
10. WEST COVINA POLICE DEPARTMENT COMPUTER SYSTEM MANAGER
   A. One of the leading police officer experts on police communications/computer systems in the nation.
   B. Innovative and energetic.
   C. Strongly defends abilities and quality of current communications/computer system.
11. *FEDERAL COMMUNICATIONS COMMISSION
   A. Has limited number of radio frequencies available for use as data channels (data channels are necessary for transmission of digital data for advanced communications systems).
   B. Can be swayed by strong political pressure.
   C. Slow to change or react to technological advancements.
12. OTHER LOCAL POLICE DEPARTMENTS
   A. Interested in observing advances without taking financial risks.
   B. Will compete for available data channels.
   C. May be interested in cooperative effort to support similar systems.

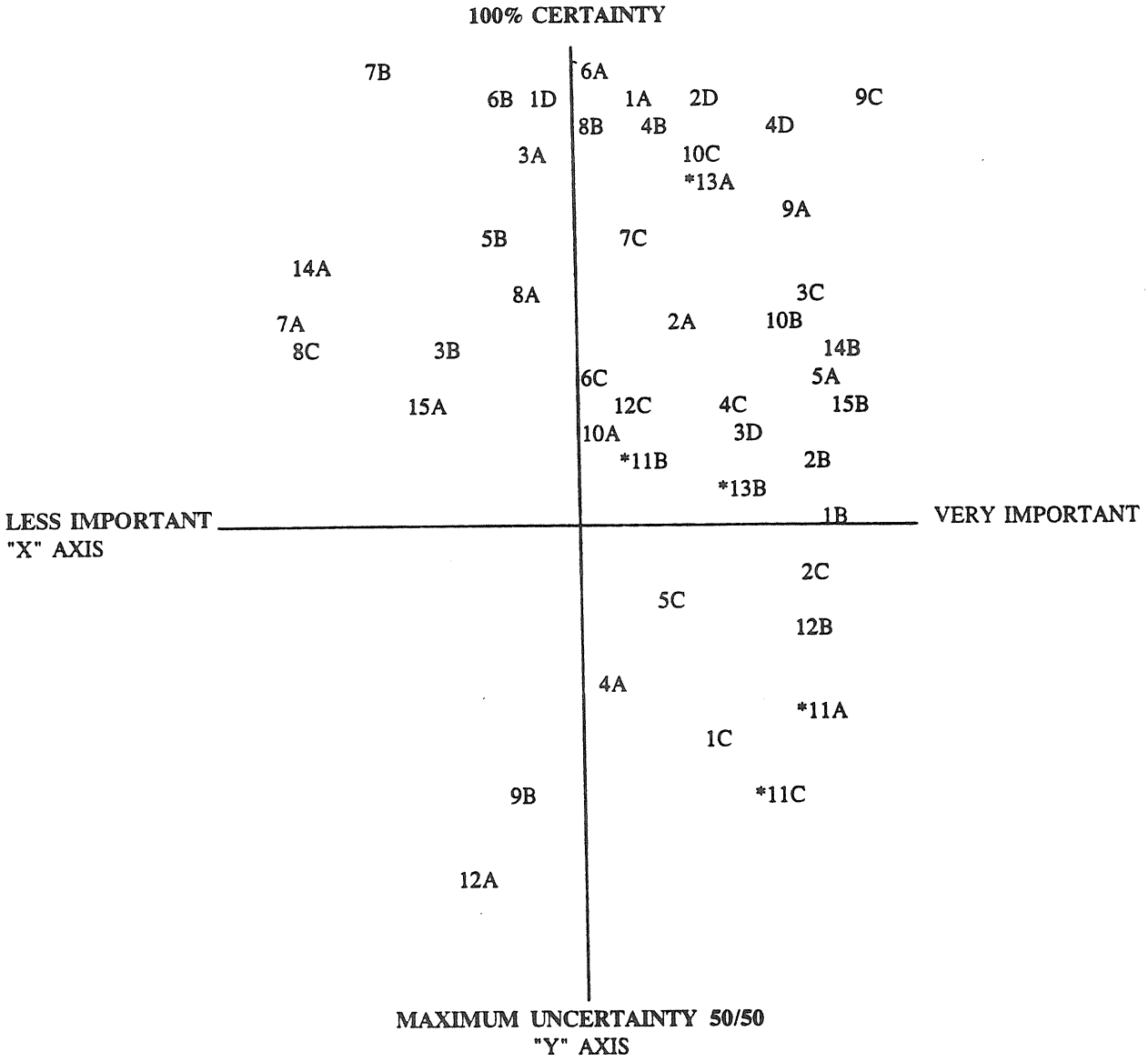
13. *Occupational Safety and Hazards Act (O.S.H.A.)
    A. Concerned only with safety of employees as it relates to their working environment.
    B. Unyielding and difficult to influence with logic or reasoning.
14. COURT SYSTEMS, CRIMINAL AND CIVIL
    A. Will have concerns with and will dictate best evidence rule as it relates to advanced communications related evidence.
    B. Will allow severe financial penalties toward officers and political entities (City) that allow misuse of information systems.
    C. Will dictate the circumstances required to obtain access to stored video or audio transmissions by attorneys or private citizens/groups.
15. POST (Peace Officer's Standards and Training)
    A. Will evaluate training necessary for new and experienced officers to function in advanced communications environment.
    B. May serve as coordinating agency to assist in standardizing formats to make State and local systems compatible therefore capable of communicating with each other.

*SNAILDARTERS: Those unanticipated stakeholders who can radically impact the strategy.

Mapping of stakeholders and their assumptions appears on the following chart. The purpose of plotting each position is to assist in understanding: 1) How important the issue is to each stakeholder, and 2) How certain or uncertain their assumptions are regarding the issue of advanced communication technology's affect on police patrol supervision. The stakeholders are listed below the assumption map for ease of identification.

The assumption map serves as a quick visual reference to ascertain which assumptions held by stakeholders are most vital to the issue. At the top of the map are the assumptions with the greatest certainty of occurring, while the right edge holds the assumptions that are most important to the issue. The most critical assumptions, therefore, are those plotted in the upper right quadrant, as they are not only important, but relatively certain.

TABLE IV - ASSUMPTION MAPPING



LEGEND OF STAKEHOLDERS

"X" AXIS Importance of the stakeholder's assumption to the agencies's management of the issue.
"Y" AXIS Certainty/uncertainty of the stakeholder's assumption.
*Indicates snaildarters

1. Police Officers
2. Police Chief
3. City Manager
4. West Covina City Council
5. West Covina Police Association
6. American Civil Liberties Union
7. Command Data Systems
8. Miscellaneous Employees Association
9. Citizens of West Covina
10. West Covina Computer Systems Manager
11. Federal Communications Commission
12. Other Local Police Departments
13. O.S.H.A.
14. Courts Systems, Criminal and Civil
15. Police Officer's Standards and Training (P.O.S.T.)

Developing Alternative Strategies

The author met with a group of six colleagues in February, 1994 to generate a list of strategies that could be used to achieve the goals listed in the mission statement listed earlier in the strategic plan. The panel was comprised of West Covina police officers representing every rank within the department from officer to commander. The panel members were:

1) Commander Jim Dillon
2) Lieutenant Lee Rossman
3) Sergeant Mark Dettor
4) Sergeant Mark Tedesco
5) Officer Walt Hauser
6) Vern Morton, Computer Analyst

The panel utilized the Modified Policy Delphi process to generate a list of credible strategies. The list of strategies was weighted against a set of criteria developed prior to the Modified Policy Delphi process. Using those criteria the panel rated the list in order of desirability. The author chose the two highest rated strategies and the strategy with the most diversity of support.

Strategies developed:

1) Hire an outside consultant to assist in implementation.
2) Hire an outside company to complete implementation, under a contractual agreement.
3) Create a new position within the police department to implement the program.
4) Do nothing, we have a good system now.
5) Continue using system in place from past communications/computer systems implementations.
6) Develop a committee from within the department to oversee and implement program.
7) Wait for other departments to develop systems and purchase the completed and tested system.
8) Buy a ready made system from a commercial vender.

The criteria used to weigh the panel's list of strategies was:

1) Potential for employee acceptance and support.
2) Assurance that implemented communications technology will be appropriate for the depart ment's goals.
3) Feasibility.
4) Assurance of proper balance between employee's privacy and the needs of supervision.
5) Long term desirability.
6) Cost effectiveness.

The following three strategies were selected by the panel and are presented in rank order.

Strategy 1

Develop an implementation and oversight committee to recommend implementation strategies and policies regarding advanced communications technology. The panel should consist of at least one member of every sworn rank within the police department and a representative from affected non-sworn classifications.

Advantages

Two areas the N.G.T. panel from the futures portion of this study were most concerned with were: 1) The field officer's acceptance of the technology and 2) Insuring appropriate training for new advanced communications systems. Those areas are best covered by strategy number one. A panel empowered with the specific duty of implementing a program, has access to specific information and reasoning for the program. Input can be received from all levels within the police department and ownership or buy-in for the program is likely to occur. Since all levels are represented, as information regarding the program is given, the information comes from peers, and not a management group. Information from peers is generally viewed with much less skepticism.

An oversight committee has a varied pool of talent. Drawing from different perspectives, with varied concerns and needs, can better anticipate possible problem areas and develop specific training strategies to avoid or lessen the impact of expected difficulties.

A particularly desirable strength of an oversight committee is the expertise that will be developed by those on the committee. A quality committee will draw from experts in all related fields, assign research assignments and investigate other departments or companies that have systems with similar abilities of potential problems. The research and investigation, as well as the strategic planning associated with the committee will develop the employees, as far as technical knowledge and planning skills. An active committee will also give the employees broader view of the department, beyond the member's particular assignments.

Disadvantages

Committees are time consuming and expensive. They can tax a department's personnel resources and remove valuable members of the department from their assigned duties. Poorly run committees may attach a negative connotation to an issue, to the point of permanently hindering the implementation or purpose for the committee.

Appointing committees can be risky. When empowered a committee usually has a significant amount of freedom to explore innovative approaches to the given task. The possibility exists that the committee will return with a plan that, for whatever reason, is not feasible or impractical to implement. If this occurs, and the plan devised is not implemented, future committees within the department could start with a feeling that the committee is only to validate a plan of action already selected by the department. Additionally, a significant amount of time and scarce resources placed into a committee with such a broad assignment. To have the committee reach a conclusion that cannot be implemented or is not accepted is wasteful and can serve as a negative influence on morale.

Stakeholder Assumptions

Police officers, and the employee bargaining associations would be supportive of this strategy. Meaningful input from their members would be sought and areas of concern could be addressed, before the implementation.

Police Chief/Computer Systems Manager would be outwardly supportive, but reservations would be held about losing some control of the communications to a committee.

City Manager/City Council would be concerned with costs. Committees are less concerned with staying within a budget that one manager can be held accountable for.

American Civil Liberties Union, Federal Communications Commissions, O.S.H.A., and the Courts Systems are more concerned with how the communications systems will be used and what information will be retained and available.

Command Data Systems will feel more comfortable dealing with the current communications system manager, but will make themselves available to give self serving advice and information on technical matters in their specific field.

Citizens of West Covina will be uninformed on the manner with which the systems were selected and implemented. They will be concerned with efficiency and costs only if the costs affect the number of sworn officers or raise taxes.

Strategy 2

Allow current experts from within the West Covina Police Department to continue overseeing and planning the implementation of future advances in communications technology.

To be able to adequately address Strategy 2 the author feels background information is necessary to help clarify the issue.

The West Covina Police Department is fortunate to have two sworn members of the department, both at the rank of commander, who are recognized as experts in police computer and communications systems. In addition to the commanders, the department employs two full time computer programmers who have been instrumental with the systems now in place. The communications systems currently in operation at West Covina were developed by, or at the direction of current personnel. To date there has been no formal input, on the planning side, from patrol officers or supervisors.

Advantages

An implementation by a select group of knowledgeable people is much quicker than the other two strategies. Little is needed in the way of education on current technology, and future breakthroughs can be investigated as they become available. Since fewer personnel are involved, and less time is needed, costs will be lower.

The current strategy has been overwhelmingly successful. Although there is no formal vehicle in place for input from all levels a significant effort is made to seek input and fill the needs of those who will use the systems the most.

The system is accepted, by city and police department managers as well as the City Council. The department personnel view the current strategy as effective and open for constructive criticism.

Disadvantages

The current strategy is successful because of the personnel involved, not because of the merits of the strategy. Personnel are not permanent and may be gone on short notice, due to injury, retirement or moving to another employer. The current strategy has not allowed for losing one of the members of the department who were instrumental in developing the system.

The current personnel were uniquely qualified to implement the system now in place. Their personal talents may not be as well suited to upcoming technologies, and may therefore be resistent to some innovations. If emerging technologies make current systems obsolete there will be a temptation to ignore that technology to preserve the product of years of work.

Innovative spirit and drive, a cornerstone to the success of the current communications system, can be lost for a variety of reasons. With so few actively involved in current strategy, the initiative by key personnel could stop or dramatically slow the advancement of West Covina's computer/communications systems.

An infusion of new personnel and ideas is needed with technical projects to develop expertise and maintain a high level of commitment. The current strategy has no system for training and involving new personnel. The fact that the personnel involved are either commanders or civilian computer experts, could open additional criticism as to motives behind the implementation (to assist patrol or to keep track of their actions).

Stakeholder Assumptions

Police officers, and the employee bargaining associations would be comfortable with maintaining the status quo, since it has been successful to date. They will however become more concerned as intrusions and threats to jobs become greater.

Police Chief, and Computer Systems Manager will be most supportive with this strategy as they retain greatest control over the direction of the communications systems and budget considerations.

American Civil Liberties Union, O.S.H.A. and the courts system may become more involved with this strategy, as any resistance by an employee group could fall under their jurisdiction or be brought to their attention.

The Federal Communications Commission will be concerned only with the use of radio frequencies.

Command Data Systems will be strongly supportive of this strategy. They are comfortable with the personnel they deal with, although the relationship has been adversarial at times.

Citizens of West Covina will remain uninformed and relatively unconcerned with the implementation strategy.

Strategy 3 (Most diversity of support)

Allow other police departments to develop and implement advanced communications systems and policies regarding those systems, then select most desirable system for implementation.

Advantages

Implementing a system that has been developed and tested by another department would be less expensive than the other two strategies, and would be less of a draw on personnel resources.

The department would be able to view the system while it is in use, instead of studying a concept. The ability to see how patrol officers and their supervisors work with and react to advanced communications technology would give the department a large advantage in avoiding possible pitfalls. Training could tailored specifically to any weaknesses observed. If the host department had experienced animosity from patrol officers because of a perception of a technologically induced invasion of privacy, steps could be taken to eliminate or lesson the possibility at West Covina.

Purchasing a system that had been developed by another department would allow West Covina to install many components at one time, instead of in phases that would be incorporated under the other two strategies. With several components being implemented at once training the affected officers would be simplified.

Disadvantages

Waiting for another department to research and develop a system could be a long process. Technology is constantly evolving, and new aspects of technology and advances are continuous. It would be difficult to select and pay for a system from one department, when another department is developing a more advanced and effective system that is a year or two from implementation. Waiting for a system to be developed and tested would also require that West Covina take a back seat instead of a leadership role in the development of communications systems, which would be a change in traditional roles. The possibility also exist that the selected system, having been developed and tested over a period of years, would be obsolete only years after the purchase.

Buying another department's system does not develop the expertise within the West Covina Police Department. West Covina would, most likely, be dependent on others to maintain and support the system. Costs are difficult to control under these conditions.

A system that is purchased and installed does not have the same internal support as a system that has been developed by the department's personnel. If the purchased system fails there is no accountability for the failure. If the department's own system fails many who planned the system will also fail. Those who stand to lose if the system fails will have additional motivation to take whatever means possible to insure that the system is successful.

Training could be confusing and overwhelming if a large number of communications system components were put into place in a short period of time. Additionally a sudden surge of high technology systems could overwhelm the users, causing poor performance due to a lack of understanding of the possibilities the system provides.

Stakeholder Assumptions

The Police officers, and the employee bargaining associations would have mixed views on this strategy. A good deal of departmental pride is derived from being an innovative leader in the field, and the current systems are very advantageous to field officers. Additional sys-

tems, however, could be very intrusive aside from their benefits and assistance to the officer. Some may feel that this strategy would serve as means of delaying those intrusions.

The Police Chief, and the Computer Systems Manager would be openly opposed to this strategy. Remaining status quo, while waiting for another department to develop a system that meets the needs of West Covina, in an era of rapid change and technological advancements is not the path preferred. These innovative personnel view planning and proper use of advanced technology as a means of effectively running a police department in current turbulent times.

City Manager and City Council are more concerned with immediate costs and the appearance of innovation. This strategy would probably be least expensive to implement and would give the appearance that the department was keeping up on the advancements in technology by monitoring the progress of others.

American Civil Liberties Union, Federal Communications Commission, O.S.H.A. and the Court Systems are more concerned with the uses of the communications systems than implementation strategy.

Command Data Systems would feel threatened by this strategy. They would stand to lose money and the input on possible uses and assistance in implementation of their computer and communications systems.

Citizens of West Covina will remain poorly informed and would accept a logically presented strategy if individuals did show interest.

Preferred Strategy

After careful consideration and discussion the panel preferred Strategy 1. Elements of the other strategies, however, have merit and can not be dismissed totally.

A common belief held by both NGT groups (for the futures research and development of strategic plan) that the most critical points to implementing a successful and useful communications system were: 1)involve all affected levels early for input and to gather support from those peer groups, 2)training is key to not only proper and full utilization of applied systems, but can quiet most fears of technology and avoid problems, 3)establish goals for new technologies, to determine what the communications system is designed to do (the benefits expected) and write policies to be compatible with those goals, and 4)initiate a system of continual evaluation, to ensure the system is doing what is needed, and to insure that the department is not working for the benefit of the system.

The strategy that is best suited to address the concerns of the NGT panel is Strategy 1. The strategy involves a variety of personnel, with differing frames of reference and responsibilities.

Having a wider variety of personnel the system can more easily be viewed from all aspects of intended and unintended uses, allowing for the development of proper training strategies. Goals and a system of re-evaluation can be developed with a reasonable expectation of acceptance and support from those who will use and be affected by the systems.

Strategy 1 is flexible and can incorporate the desirable aspects of the other strategies. The pioneers of West Covina's communications could bring experience and technical knowledge to the group, and would be logical choices for leadership roles within the committee. A committee also allows for some pressure to be taken off lead individuals and the workload would be shared more equally. Freedom from some duties and having a larger pool of personnel to draw from; it would be easier to examine the advances other departments are investigating or are implementing. Discovering other technologies of strategies being developed by others in the same field could eliminate the time necessary to re-discover these methods and help to avoid costly and time consuming mistakes.

Implementation Plan

After the decision that advanced communications technology is beneficial to the operation of a police department in the twenty-first century the most crucial decision a police chief could make while following the strategy above is the following: Who will be assigned to the implementation committee. Members will need to be energetic and have a long term commitment to the police department and a futuristic view of police work. After those two attributes are satisfied the appointees should be diverse in rank, assignment and view of the department. The last of the criteria, in the view of the department, is intended to insure that those selected are not all seen as being strong supporters of the department or status quo. It would be beneficial to have members who have been seen by the rest of the department as a bit rebellious. If the more rebellious of the group became overwhelmingly supportive of the recommended implementation, the group is more likely to be seen as a true committee, as opposed to an elaborate rubber stamp system to validate an implementation plan engineered by management.

Once the committee is established, a ten year strategic plan would need to be developed. The first year of that strategic plan should be devoted to formalizing the plan, education and research. The education should be directed not only at the members of the committee, but to the department as a whole. As the members of the committee come to grips with the available and soon to be available technology and their applications, the members should be encouraged to share that knowledge with their peers, on an informal basis. This would start the educational process and hopefully start to reduce the resistance that is usually experienced during times of rapid change.

The training needs should also be established at the end of the first year. As the department as a whole becomes educated to the possibilities of the information age, feedback should be sought through both formal and informal channels. The fears and concerns uncovered through the feedback should be addressed through the training strategy. The validity of the fears is not an issue since this is an instance where perception of a problem, especially by the rank and file, constitutes a problem. The committee will have to be careful not to leave the Police Chief out of any educational process. The Chief has the ultimate responsibility with the department, and needs to make the most informed decision possible.

One of the areas that must be addressed by the leaders of the committee is pride. The committee will be responsible with bringing the most effective communication system to West Covina. Where it comes from, or who is credited with developing the system is of little concern. If the committee, drawing on past successes and breakthroughs by West Covina, becomes so self-enamored that learning from other departments or organizations is no longer an option, the committee is almost surely destined to settling on something that is less than the best system for West Covina.

The actual implementation of components of the system should be worked out in a best case scenario. The step by step plan should be worked out so that each successive component is supported by or enhances the previous component. The strategy for implementing the components will have to be developed with flexibility in mind. Unforseen technological difficulties and financial problems are almost certain to delay some aspect of the implementation. The plan will also have to be able to incorporate any new technological breakthroughs that become available in the implementation window.

Finally, each step, or implementation, will have to be monitored by a selected sub-committee. No manner of planning can foresee all. The questions: Is the newly activated system performing as expected?; How can the effectiveness of the component be enhanced?; Was the training for this section appropriate or is more needed?; Are any problems being caused to other components of the communication system by the newly activated technology?; Is there potential for abuse that was not foreseen?; What did the committee learn from the last implementation that will help in installing future parts of the system; and Is the component valuable to those using it, or is it creating more work or problems than it is eliminating, and if so would a change in policy make it more effective?

Summary

The coming advances in communication technology promises to be a boon to the effectiveness of the police patrol officer and their supervisors. Avenues in the prevention and the detection of crime will be discovered, and a means of interacting with the community a police department serves, can be opened. Unfortunately, potential of technology will not solve or prevent a single crime. The implementation of advanced communications systems will determine whether the emerging technology will be an invaluable tool, or a system that will require twice as much work as it hopes to save.

IV. TRANSITION MANAGEMENT

Transition management facilitates change from where we are today to where we want to be in an orderly and logical process. The success of this change process hinges on the ability of key people and organizations to manage this transition state. The transition management plan necessitates identifying these key players, developing their support and commitment or possibly overcoming their resistance, designing appropriate management structures and finally selecting methodologies to assist in program implementation.

The objective of this transition management plan is to facilitate the implementation of advanced police communications systems into the West Covina Police Department so that the full benefit of their capabilities may be utilized while avoiding possible pitfalls through preplanning and training.

The transition management plan selected to facilitate the most desirable results is a blend of several strategies. The following is an overview of those strategies, tailored to the West Covina Police Department, to allow an overall understanding of the transition management plan. The strategies and methods will be discussed in more detail later in the paper.

The first step of the transition management plan is to identify the "critical mass". Those are individuals who because of their position, knowledge or authority, are critical to the proper implementation of the communications systems. The critical mass is studied to assess the commitment, capabilities, and readiness of the critical mass to assist in developing strategies designed to overcome possible obstacles.

The management structure is critical to the implementation plan. All viewpoints and levels of experience and responsibility will need to have input to insure the best opportunity to foresee possible problem areas. The recommended management structure for this transition management plan is a diagonal-slice strategy, targeting natural leaders at each level of the organization.

Once the management structure is in place the members need to be educated on the capabilities and possible drawbacks of an advanced communications system, as discovered in the futures research. The management team needs to discuss and explore the applications of technology as they apply to West Covina, so that all members of the team have a shared vision on the project. A well-educated and prepared core of involved professionals can be an effective way to provide rumor stopping information and insight.

To help keep assignments coordinated and to fix accountability for all the tasks to be undertaken by the management team a "responsibility chart" will be prepared. The chart is an excellent means of giving an instant visual breakdown of assigned tasks and those who are accountable for the completion of those tasks.

As a means of evaluation and feedback a system to recognize established milestones will be put into place. Once an established milestone is reached a core group will convene to assess the completion under the following criteria: Was the implementation successful?; Did the implementation have the desired effect?; Did the implementation create any problems, expected or unexpected?; Did the implementation create any possible opportunities or barriers for future implementations?; Was anything learned from this implementation that can be applied to current strategies to make those strategies more effective?.

Critical Mass Analysis

The critical mass are those individuals or groups whose support is essential to the success of the strategic plan. They are the "key" stakeholders or minimum number of key players who, if they support the change will make the change successful; and who if they are against the change will cause or let it fail. The critical mass was established using the group of stakeholders in the previous section on Strategic Planning as a starting point. The author met with a group of three colleagues to identify those stakeholders who are critical to the implementation. The group used a Modified Policy Delphi process to identify the critical mass. The colleagues who assisted were:

* Lt. Lee Rossman, West Covina Police Computer Systems Manager
* Vern Morten, police computer systems expert

* Walt Hauser, past West Covina Police Association President and local political activist

Commitment Planning

The commitment of the members of the critical mass may be defined as one of the following: "block change", "let it happen", "help it happen", and "make it happen." The following table shows where each of the critical mass was seen by the group in the Modified Policy Delphi process. It also indicated where the group felt each should be to provide the minimum level of commitment required to ensure a successful transition to the planned change. The commitment of each of the critical mass is be analyzed in more detail following the table.

Table V

Commitment Planning

TYPE OF COMMITMENT TOWARD CHANGE

Actors in Critical Mass	Block	Let Happen	Help Happen	Make Happen
Mayor Pro Tem	X----------> O			
City Manager		X----------> O		
Police Chief			O <---------- X	
Computer Manager				XO
Patrol Commander		X----------> O		
Sergeant Jolly		X----------> O		
Police Association	X----------> O			

LEGEND
X=Where actor is now
O=Where they need to be for implementation

Mayor Pro Tem

Mayor Pro Tem is considered the current "mover and shaker" on the West Covina City Council by most of those involved in West Covina politics. He received the most votes of any candidate in the last election, and was successful in removing an incumbent who had openly opposed him on the council. The other candidate that was elected rode his coat tails to an easy victory. Mayor Pro Tem is the spokesman for the majority of a split council and has had the majority vote for any initiative he has proposed.

Mayor Pro Tem was not supported by the West Covina Police Association and, in fact, by both West Covina's Police and Fire Associations campaigned against him. Though there were hard feelings, Mayor Pro Tem has shown no vindictiveness toward either of the associations.

Mayor Pro Tem is viewed as being against the project initially. The tack he has taken with proposed change is to initially come out against any innovation that is expensive. He can be persuaded with logical reasoning, especially if a long-term cost savings can be shown. Mayor Pro Tem would also be very interested in a system that made the police supervisors more effective and could therefore hold personnel costs down, while making patrol officers more accountable.

Mayor Pro Tem would be very cautious of endorsing anything that was strongly opposed by the West Covina Police Association. Though he did not need their political support, the Association has considerable political clout in the predominantly middle class community. He will not have the single issue he championed this past election (closure of a local landfill) in four years when his term is up, and will need allies. A key issue to moving the Mayor Pro Tem to at least the "let it happen" category, therefore, would be to obtain strong support from the West Covina Police Association. The Mayor Pro Tem would also like to be able to campaign on the fact that he "pioneered" and supported innovations to help the police department work more efficiently.

West Covina City Manager

The City Manager is extremely concerned with the costs of any equipment, especially if the costs are earmarked for the general budget. The City Manager is progressive by nature and would support innovation if financing came from alternative source, or if the expenditure could be shown to have an impact on future costs, especially personnel costs.

The City Manager has been with the City of West Covina during the recent fiscal shortfalls. He views the cuts that have occurred in the police department budget as corrective and reducing waste. If financial times become brighter he would be more likely to be innovative with the additional funds, looking for ways to use the excess to work more efficiently as opposed to what he would view as going backwards (replacing systems and programs that were deemed unnecessary and cut).

Litigation and the civil liability associated with police work is a serious concern of the City Manager. If he could be convinced that the advanced communications systems could help better defend frivolous complaints, and better defend the City by showing increased accountability of individual officers, he would be more inclined to view the systems as favorable. He is an independent thinker, however, and will ask tough questions about the possibility that the systems may open the city to additional exposure to litigation. All possibilities will have to be explored in depth and credible answers will have to be prepared for all possibilities in this area.

The City Manager has the ability to place a reasonable amount of pressure on the City Council through logical persuasion. He will want to walk the tightrope between his respect for the authority of the council (primarily their authority to terminate his employment), his tendency toward innovation and his desire to keep employee groups reasonably happy. The City Manager is nervous with the amount of political pressure the West Covina Police Association can bring if the association has the full backing of its membership. If the Police Association was strongly against the implementation of advanced communications systems, necessary support from the City Manager would be difficult to obtain. If the Police Associa-

tion was strongly in favor, opposition to the innovation would be less likely from the City Manager.

To obtain the needed support from the City Manager, at least to the "help it happen", a combination of strategies must be used. The City Manager must be comfortable with financing, the plan must be logically presented in detail, including any downside, and he must be assured of support from the Police Association.

West Covina Chief of Police

The West Covina Chief of Police is approximately ten years away from retirement. It is generally considered that he thinks in the long term when viewing change and proposals. He is well educated, very well read, a Command College graduate and supports innovative thinking.

It is the Chief's belief that the sergeant rank is the most critical layer of the department. He feels that if sergeants are properly trained and motivated they will be effective leaders, thus preventing the majority of problems that plague modern day law enforcement. If he felt a new communications system would make field sergeants more efficient and effective, while making field officers more accountable, he would strongly support and fight for funding and implementation.

The Chief has had to deal with a reduction in police department funding over the past two years, resulting in the elimination of several positions and programs. He has at his disposal a large sum (in the neighborhood of eight million dollars) in a drug enforcement rebate account. Since the monies in the account are restricted as to use, the Chief has a nearly autonomous control over the use of the funds. The Chief has authorized the purchase of mobile 386 computers for all patrol cars, and the support personnel necessary to write and install the necessary software, using money from the drug enforcement rebate budget.

The Chief is less wary of the Association than the City Manager, or the Mayor Pro Tem, but is concerned with a maintaining a harmonious working environment. He will listen to all, but will do what he thinks is right for the department and the community. Honesty, therefore will be the best tactic with the Chief. A full demonstration of an advanced communications system would probably sell the system to the Chief.

West Covina Police Computer Systems Manager

The computer systems manager is a sworn officer, with the rank of Commander. In theory the computers are a collateral duty, but the reality is that the computer systems dominate the manager's time and their management is his main function.

The computer manager has been actively involved in the computer systems at West Covina for ten years. He had significant influence in the development of the records and computer-aided dispatch programs that have been sold commercially throughout the United States. He is up to date on most communications technology, their capabilities, and applications to police work.

The computer manager is generally very open to input and comments on the current system. The systems are constantly being modified and updated to meet the department's needs. It is unknown how he would react to a system not of his design that replaced, therefore making obsolete, one of his systems. For these reasons, and to harness his talent and experience, it would be critical that he be introduced into the planning of the project as soon as possible. If he were a major part of the planning, patrol officers and supervisors would give instant credibility to at least the quality and intent of the given systems being proposed.

Obtaining the computer manager's support for a system hinges on how soon he is introduced, and the quality level the city is willing to work toward. He would not be interested in having his name associated with a second rate system. His past successes with technology, coupled with excellent reputation as a manager makes the computer manager the logical choice to be selected as the project manager. As the project manager he will be in on the

ground floor of the program, and his ownership of the end result will guarantee the best possible quality.

Patrol Division Commander

The Patrol Division Commander will be the most affected by the communications system change, and will ultimately have a very significant say in the utilization and implementation of the technologies.

The current Patrol Division Commander recently was promoted to the rank of Commander after spending five years as the working manager of an undercover narcotics unit. He is widely considered as one of the brighter members of the department, task oriented, and has an uncanny ability to correctly judge a person's abilities, weaknesses and motivations. He has a strong personal interest in advanced technology, and builds and upgrades personal computers as a hobby. He has, lately, been fighting a strong effort from the city management to reduce patrol personnel, and is therefore very conscious of expenditures from the general fund budget.

The Patrol Division Commander has long been a proponent of accountability and documentation of all personnel infractions. He feels that unless personnel are held accountable, with proper documentation when problem areas are uncovered, they tend to do much less than they are capable of. These tendencies, coupled with his interest in advanced technology will be key when proposing the system to him. The system's ability to record and view officer involved incidents, as they occur, will be of special interest to him. The other systems will be presented on an efficiency basis, that will appeal to his realization of a dwindling or, at best, stable level of patrol personnel.

The Senior Sergeant

The Senior Sergeant occupies a unique niche within the West Covina Police Department. His lack of interest in testing for lieutenant has nothing to do with his ability or desire to improve the department. He is universally considered the most influential sergeant on the

department and his opinion is highly regarded by not only the department's top management, but by the patrol officers as well. The Sergeant truly leads by example.

As a member of the West Covina Police Association, an association that covers officers, corporals and sergeants, he has a direct and strong voice in discussions during association meetings. As a peer to all field sergeants, who may be more effected by the innovations than any other group, he is recognized as the informal leader and serious weight will be given to his opinion.

Since he has the ability to have the most significant impact on all levels within the department the Sergeant is a critical component. He will not be impressed with a high tech sales presentation and will want to know the specifics; how will the systems benefit the patrol officers and sergeants, what are the possible drawbacks, and what measures will be in place to prevent abuses of the systems to protect both officers and the community. If the Sergeant is convinced that the system will be effective and that the possible negative aspects can be controlled or avoided he will support the system.

West Covina Police Officers Association

The West Covina Police Officers Association covers all sworn officers from the rank of sergeant and below. A large majority of its membership are in the patrol division, and will be looking for protection and compensation for changes in working conditions. The "Association", as it is referred to, has an executive board of nine members who give an informed direction to its membership, but that direction is not a mandate and a vote is necessary on decisions of any importance. The Association has an excellent working relationship with the management of the police department, but their primary function is to protect its membership. To this end the Association will not hesitate to bring legal action to protect any perceived infringement on the right of its members. The Association has an attorney on retainer and has more then two hundred thousand dollars in its treasury, to back a serious or lengthy law suit.

The members of the association have seen the effects of the current economic times in small or non-existent pay raises, and the loss of two sworn positions through attrition. A large expenditure to purchase advanced communications equipment would be seen, initially, as a poor allocation of resources. A large expenditure that was viewed as reducing their privacy and opening them to undue scrutiny by supervision and management would surely produce a full and vehement opposition.

The members of the Association will have to be assured the systems are in their best interests and to their benefit. The best way to accomplish this is to have their peers do the convincing. Members of the Association, trusted by their peers, will need to be on the management committee at the beginning. The member's selection is critical, in that they must be independent thinkers and not ones who would go along with management's wishes for personal gain. Placing "yes men" on the committee would be transparent and would almost surely taint all information coming from those committee members. The selected members must have shown the ability to stand up for their beliefs, even when the possibility existed that their stance could hurt their careers. They must be dedicated to the Association, the Police Department, and to the community of West Covina.

Once the committee members are selected they must be thoroughly educated on all aspects of the communications systems, even the downside potential. Only after all areas have been explored, and strategies developed to eliminate or lessen the negative effects and possible abuses, can members of the Association be counted on for critical but fair assessment of the proposed systems.

The members of the committee can keep peers informed on an informal basis as the committee progresses, but formal in-service briefings will be necessary to assure all potential problems are explored and discussed. Those who are briefing the Association members, and the remainder of the department's employees will need to keep an open mind. They will need to address those concerns that have been foreseen and give the detailed steps that are designed to prevent or lessen the negative impact. They will also need to be aware of the possibility

that other problems, unforseen by the committee will be brought forth. All problems brought forth by departmental employees should be viewed as a problem. It is important for the management team to recognize that a perceived problem is a problem, even if the problem lies in the perception or misunderstanding of the systems and their capabilities.

Readiness/Capability Charting

Table 2 has been developed to give a visual overview of the Critical Mass and their readiness and capabilities with respect to change. The left column lists the individuals or groups critical to the change effort. The right hand columns rate each (high, medium, or low) according to their readiness and capability with respect to the proposed changes in advanced communications systems.

Table VI

Readiness/Capability Chart

	READINESS			**CAPABILITY**		
Critical Mass Actors	High	Med.	Low	High	Med.	Low
Mayor Pro Tem			X		X	
City Manager		X			X	
Chief of Police	X			X		
Computer Manager	X			X		
Patrol Division Commander		X			X	
Senior Sergeant			X		X	
West Covina Police Association			X	X		

Management Structure

Most large and complex organizations, police departments included, are resistant to significant change. An effective management structure, coupled with capable and future thinking members of that management team can accomplish what was once thought to be impossible. The leadership of that management structure must identify and obtain credible input from all stakeholders, and develop strategies to educate and influence the critical mass to a more favorable position on the implementation of the given proposal.

To this end, a project manager must be selected by the Chief of Police. The project manager will derive power from the Chief of Police and will report to the Chief directly on matters involving the implementation of advanced communications technology. The project manager will be a commander, and can work directly for the Chief with a minimum of disruption.

The project manager will select the management team. The management team will represent all levels within the department, including all non-sworn positions. The project manager will solicit input on possible management team members. The members of the team must be respected members of the department, including a member of the executive board of the Police Association. The team will also have a technologies expert from an outside source, as well as one of the computer programmers currently working for the West Covina Police Department. The members must be capable of thinking independently of the group, and they need to look upon an assignment to the team as an opportunity to improve the police service in West Covina, not as a tool for career enhancement. The members of the police department identified as being part of the critical mass will be given first consideration.

A management team that represents a diagonal slice of the police department will best be able to realistically forecast the effect of proposed communications technologies. Members who are patrol officers will view this from their perspective and how it will benefit and effect them. Members in supervisory roles will view from their perspective and how it will enhance or harm the supervision of the patrol force, etc. Having a cross section of the de-

partment with different perspectives, the committee will be most likely to identify possible problems that may arise from the implementation. Additionally, the team will represent all levels within the department, positively impacting the informal peer communications and information delivery systems found in any large organization.

Implementation Technologies

The transition management plan must have direction and be methodically organized. While this transition management plan spans many years there still must be specific and tangible technologies and methodologies used throughout to reach final program implementation. These technologies will address the anxiety and confusion oftentimes created by change. Many within the law enforcement training community might resist any major change if change is arbitrarily forced upon them. The transition management plan technologies must emphasize thorough communications flow, consistency of plan implementation, sensitivity to the change process and realistic time frames for implementation. The following implementation technologies are selected for this transition management plan:

Responsibility Charting

Responsibility charting (figure 1) is used to clarify role relationships, reduce the ambiguity of assignment, and to eliminate duplication of effort. Listed horizontally across the top of the chart are the actors. The actors include key members of the management team as well as the critical mass. Vertically and on the left of the chart are the activities involved.

The members of the management team meet and come to a consensus on fixing the responsibility (R) of the tasks to be undertaken. The team then determines who must approve (A) the action or decision, the person designated for approval has the right to veto. The third designation is that of support. The person designated (S) is consulted for input and/or support, but has no veto power. The last designation is informed (I). To be designated as (I) indicates an individual or group will be informed of the decision made.

The following chart illustrates how the management team may establish its responsibilities.

Table VII

Responsibility Chart (RASI)

Decision-Action	Mayor Pro Tem	City Manager	Police Chief	Com-puter Manager	Patrol Cmdr.	Sgt. Jolly	Police Associa-tion
Selection of Project Manager	I	S	R	S	S	S	S
Selection of Management Team	I	S	A	R	S	S	S
Establish Budget	S	A	R	S	S	I	I
Develop Training Strategies	I	I	A	R	S	S	S
Selection of Communications Tech.	I	S	A	S	R	S	I
Develop Time Line for Implementation	I	I	A	S	R	S	I
Establish Formal System Evaluation	I	I	A	R	S	I	I

Legend
R=Responsibility (Not Necessarily Authority)
A=Approval (Right to Veto)
S=Support (Put Resources Toward)
I=Inform (To be Consulted)
- =Not Applicable

Developing a Shared Vision

Developing a shared vision of the capabilities of advanced communications technology amongst management team members is an important step. Agreement on where the department's communications systems should be in 2005 is an important first step. Once the management team has the vision, the vision can be communicated, formally and informally, throughout the rest of the department done properly, an air of anticipation can facilitate the implementation plan.

To achieve the shared vision, the management team must have access to experts in the field and participate in specialized training. Members can bring back the specific information obtained from training and research, discuss possibilities and determine the goals necessary for reaching the desired end. A shared vision is a critical first step, as it is much easier to determine the best route if the desired destination is known.

Ongoing Involvement

Early and ongoing involvement of impacted stakeholders in the transition phase is critical to program success. This involvement allows the transition management team the opportunity for pertinent input, creates less resistance during program implementation, and provides for quicker feedback from affected stakeholders. Early involvement with the opportunity for valid input, also provides a sense of ownership and motivation for success for the implementation.

Management By Wandering Around

A predictable human reaction to the stresses of change and uncertainty is peer communication and "worst case scenario" spinning. It is important that the project manager and key members of the transition management team be accessible at all levels in the organization. An open acceptance of information, including criticism and fears, by members of the team uncover valuable information that may have been overlooked. Additionally, a logical explanation of technologies or a clarification of facts can often avert what may have turned into a major obstacle.

Milestone Recognition

The transition management team should identify certain special events (acceptance of mission statement, completion of established research, establishing budget, etc.) and announcing the achievement to members of the police department and stakeholders of the completion. Milestone recognition serves several functions. It keeps stakeholders and interested parties informed, gives a sense of achievement to the management team, and keeps the transition plan

and goals of the plan conspicuously present in the minds of those who the communications system will affect.

Ongoing Assessment - Evaluation and Feedback

A formal ongoing system of evaluation and feedback, especially during program implementation should be developed. Completion of the initial studies and proposals does not mean the task is complete. An ongoing assessment serves as a checks and balance system to determine what areas of the plan are working, and which areas may need to be expanded or deleted. Without an ongoing assessment of the plan it will soon be antiquated. Outstanding systems may be going unused due to an oversight, or poor initial training. Misuse of technologies, by officers, supervisors or an outside faction, may be occurring, and cause a mistrust that could threaten the system's existence.

The task of evaluation and feedback should not be the responsibility of one person, especially the project manager. One person may be too close to the project to be objective. If that person is of a command rank they may be alienated from the rank and file, the converse may also be true. A committee could be the optimum vehicle for evaluation and feedback. If that committee contained at least one representative from management, supervision and the line level every perspective could be examined and input could be obtained on a peer level.

Without an effective and constant assessment of the implementation plan problems and/or abuses may go undetected or overlooked until the condition is unmanageable and the system is permanently impaired.

Transition Plan Outline

A transition plan outline is helpful in organizing efforts for the necessary changes. The outline form provides a visual "quick reference" and brings a complex plan into focus. Deadlines and target dates should be adhered to as closely as possible, but must also be realistic and attainable. Below is an outline of the major events for the implementation of the ad-

vanced communication technology. The implementation is designed to enhance the positive attributes of the communications systems, while controlling or eliminating the foreseen drawbacks of high technology.

I. Plan and Organize

A. Decision to implement advanced communications systems

Completion : Immediate

1. Selection of project manager
2. Selection of committee members
3. Set short term goals for education of committee

B. Building commitment & understanding

Completion : One month

1. Identify stakeholders and critical mass
2. Evaluate stakeholder and critical mass for strengths and weaknesses relative to the implementation
3. Develop strategy to overcome obstacles discovered

C. Educate committee members re. advanced communications

Completion : Two months

1. Expert scan
2. Investigate systems in place in private and government agencies
3. Scan of vendors to determine availability of advanced technologies
4. Conduct meeting to share gathered information

D. Establish budget

Completion : Four months

1. Yearly budget allotted for implementation
2. Source of funds (general or asset forfeiture budget)
3. Establish any limitations on the use of funds (for equipment only, etc.)

E. Develop shared vision

Completion : Six months

1. Establish vision for three, five and ten years
2. Communicate vision informally through peer network
3. Formally present vision at in-service training

F. Investigate barriers to implementation

Completion : Seven months

1. Hard barriers - Data line availability, availability of technology to non-military, etc
2. Soft barriers - resistance by employees, suspicion by media, etc., developed through use of Modified Delphi process
3. Develop strategies to overcome barriers discovered

G. Establish timeline for implementation

Completion : Nine months

1. Prioritized available technology based on departmental need
2. Build in flexibility to accommodate unforeseen advances in technology

H. Follow up departmental in-service training

Completion : Nine months

1. Re-communicate shared vision
2. Update personnel on new information developed by management team
3. Encourage airing of concerns, foreseen problems
4. Evaluate any new information derived from in-service

I. Establish sub-committees, for process evaluation

Completion : Nine months

1. Sub-committee responsible for milestone recognition and evaluation

2. Sub-committee responsible for evaluation of implemented systems
3. Sub-committee responsible for keeping stakeholders and critical mass informed of pertinent information

II. Implementation

Completion : Implementation of first system - one year

: Repeat for subsequent systems, as they become viable

A. Conduct Modified Delphi process prior to implementation of any new communi cations system taking interaction with current systems into consideration. Modified Delphi to include:

1. Committee members
2. Outside experts
3. Department employees not on committee staff

B. Announce planned implementation

1. Formal written memo
2. Peer channels
3. Through Management by Wandering Around

C. Conduct additional training, if necessary

1. Written training bulletin
2. Formal training
3. Emphasis on how the system benefits and allows employee to be more effective

D. Make members of the management team accessible to employees, "Management by Wandering Around"

1. Collect feedback on how proposal is perceived

E. Evaluate Feedback

1. Are changes needed?
2. Is additional training suggested?
3. Is implementation of this element still viable?

F. Bring system on-line

G. Prepare members of the management team to be available for feedback, and open to critique of system

H. Management team prepares written report to Chief of Police on implementation successes and failures

I. Any recommendations for smoother transition, learned from this implementation, formalized and maintained by the project manager to be reviewed prior to pending implementations

The impact, and ultimately the viability, of an advanced communications system rests heavily on the implementation of the chosen systems. A conservative environment accepts change grudgingly and with varying amounts of suspicion. This Transition Management Plan is designed to implement an advanced communications system into a conservative environment while enhancing the positive features and capabilities, and eliminating or controlling the negative aspects associated with change.

V. Conclusions

The foregoing report details several possible futures that the advent of advanced communications technology may thrust upon law enforcement. The efficiency with which a police department communicates may be the key factor to the success the department enjoys with virtually every undertaking. Successful communications must be taken in the broad sense when viewing the future. Police departments will find that effective communications with the public they serve will begin to take on the importance that communications to and from dispatch, patrol officers and the patrol supervisors have enjoyed.

This study has attempted to evaluate images of the future in order to determine what policies and strategies would create a desired future state. To that end the conclusion will come full circle and answer the questions identified in the introduction.

How will communications technology enhance the effectiveness of field supervisors?

It became blatantly obvious during the NGT exercise that communications technology is a tool. Good communications comes from gifted energetic supervisors. Good communications will be enhanced by the implementation of advanced communications and it will allow for a wider range and number of personal contacts and direction. If the communications skills of a supervisor are poor, or if motivation and motives are suspect no system will mask the deficiencies, and can in fact magnify the flaw.

To properly address the question it must be viewed in the spirit with which it was presented, namely with the assumption that the communications skills of field supervisors using advanced systems will be at least adequate.

Advanced communications will give supervisors an added insight to the abilities of field officers. Having the ability to view virtually all incidents the officer becomes involved with, either as the event occurs or at a later time, will assist in better evaluating performance and an officers' suitability for special assignments or promotion. The presence of recorded transmissions, either voice and/or video, will aid in the timely and appropriate disposition of personnel complaints. The appropriate and fair handling of personnel complaints does not only assist in identifying weaknesses, it relieves innocent officers from many frivolous accusations and perhaps reinforcing the officer's faith in the "system".

Advanced communications will also make face to face contact, via digital transmission, possible with every officer and many citizens at virtually any time. This will allow a supervisor to keep in touch with officers and situations with greater effectiveness, permitting the opportunity for more sound decision making and interpersonal communications.

How will police training keep pace with innovation and technological break throughs?

It is very important to realize that communications technology will not develop in a vacuum. Technology will be making quantum leaps in most of the fields related to police work. The main ally in training personnel in the uses of communications technology will be the technology itself. Linking a patrol car with the "Information Superhighway" will allow the officer access to interactive learning programs, instant assistance from user friendly help programs, or another officer that is perhaps more literate with the particular system.

Police department training must now include planning. Research and forecasting of needs of the organization will be necessary to make every dollar spent on training effective. Additionally, training will have to be designed to deal with the effects and side effects of the technology, not just the uses.

How will police departments of the future finance technological advances?

Several possibilities for funding were explored in the future scenarios. One suggests that a department, coming out of lean times, uses the increase in funds to make the officers more effective, as opposed to hiring additional officers. Another explores the possibilities of investing in a communications system as a byproduct of several departments combining in a regional effort. The last is somewhat wishful thinking that a bond issuance could bring the entire American police industry into the 21st century. All three are possibilities and interesting study, but the most likely means of acquiring additional funds would be to show that the investment would be cost effective, in the purest business sense. A system that could be shown to reduce or prevent additional personnel costs, or prevent a demonstrable trend in civil liability would get serious consideration.

Another possibility is that there will be no choice; advanced communications will be necessary and cost effective. The futures forecasting pointed to a strong concern over the civil liability associated with all aspects of police work. A scenario presented in the discussion of the NGT panel involves a future where a police department is viewed as attempting to hide wrongdoing or a pattern of abuse by <u>not</u> implementing advanced communications systems. The assertion that a department is more culpable because the lack of technology is a strong motivator for finding the funding.

How will technology impact the privacy of the field officers?

This sub-issue demanded the most attention of the four sub-issues. The intrusion was the main focus of several members of the NGT panel, and the steps to address or minimize concerns took a major portion of the Strategic Plan and Transition Management.

The intrusion, on what once was a fairly autonomous working environment, will be felt and in all but the most optimistic of instances be resisted to some extent. Participation in planning and implementation must be from all affected levels within the police department. The

early and meaningful involvement can solicit a "buy in" to the system from key personnel, who can then inform others on a peer level. Involvement in the planning phase by all levels can give a users view insight that can help avoiding problems that management could easily overlook.

A key factor in officers acceptance of an intrusive technology would be trust. The level of trust earned by supervision in the past will have a great bearing on the lengths field officers will go on the word of the department's hierarchy.

According to data obtained in the NGT, to most easily gain acceptance of additional intrusions officers must see the benefit as outweighing anticipated intrusion. Proposals and presentations must include this element and presentations must be geared to the benefit of the system to the officer. In no way is the author proposing a "soft soaping" of the issues related to implementation, intrusions and limitations must be addressed, but the beneficial element should be well thought out.

Advances in technology will be a necessary and inevitable part of the future of police work. Communications system are a tools, tools that can be used properly and effectively enhancing good communications, or abused causing legal, financial and personnel problems for the offending administration.

Recommendations for Future Studies

1) Advanced communications techonolgy's impact on best evidence rule.
2) Impact of interactive multimedia training via mobil computer terminal on police training paradigms.
3) Impact of advanced communications technology on the future of police internal investigations.
4) Minimum level of technological skills needed by the future police recruit.
5) Technology's impact on traditional police management/supervision structure.

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APPENDIX A

Trend Statements developed by NGT panel. The first ten trends were selected by the panel as most important.

T-1)Advanced communications' impact on interpersonal relationships, between supervisors and field officers.
T-2)Level of funds allocated to high technology communications systems.
T-3)Use of video recordings or transmissions as basis for decisions by field supervisors.
T-4)Public perceptions and expectations of technology's impact on productivity.
T-5)Field supervisors dependance on high technology communications and computer systems as evaluation tool.
T-6)Level of field officers acceptance of technological intrusions of privacy.
T-7)Percentage of full-time civilian employees within the police department.
T-8)Costs associated with maintaining advanced communications equipment.
T-9)Level of technological skills required to promote to field supervisor.
T-10)Ability of field officers and supervisors to accept change.
T-11)Entry level requirements for new police officers.
T-12)Non-comparable computer systems, between neighboring police departments.
T-13)Level of storage of records and information.
T-14)Ability to access stored records and information.
T-15)Technical requirements for entry level police officers.
T-16)Level of technological differences between neighboring police departments.
T-17)Number of field officers in relation to ten years ago.
T-18)Officers become reliant on technology, smart computer systems, and lose decision making abilities.
T-19)Availability of physical resources, radio band limitations.
T-20)Private security verses police departments, level of technological ability.
T-21)Level of technological expertise, new verses older police officers.
T-22)Ability of popular automobiles to accommodate high tech. equipment.
T-23)Public willingness to spend tax money on "toys".
T-24)Level of public personal contact.
T-25)Technology's impact on community based policing.
T-26)Level of mistrust of supervisors by field officers.
T-27)Sabotage of equipment, as form of resistance to change.

APPENDIX B

To assist in the evaluations of trends 2,7, & 8 the author contacted ten medium sized police departments to conduct a survey.
The departments contacted were: Milpitas, Burbank, Glendale, Covina, Baldwin Park, West Covina, El Monte, Torrance, Costa Mesa, and Oceanside.
Requested from each was:
1) The amount of money the department had budgeted for communications and computer equipment, for the years 1989 and 1994.
2) The number of full time civilian and sworn personnel within the department for the years 1989 and 1994.
3) The amount of money the department had budgeted for communications and computer equipment maintenance for the years 1989 and 1994.

An average of was taken of the responses and the results are as follows:
1)As reflected in the graph for Trend Two, the average of the departments have budgeted 15% less in 1994 than they did in 1989.
2)As reflected in the graph for Trend Seven, the average of the departments have 3% more full time civilian employees in 1994 than they did in 1989.
3)As reflected in the graph for Trend Eight, the average of the departments have budgeted 7% more for communications and computer repair in 1994 than they did in 1989.

APPENDIX C

Event Statements developed by NGT panel. First ten events were selected by panel as most important.

E-1)Legislation passed affecting the use of communications technology.
E-2)New revenue sources for technology developed.
E-3)Liability issue arises from incident that has major implications to law enforcement on a regional, state of national level.
E-4)Decisions and direction of field officer are made away from scene, with use of advanced communications systems.
E-5)Span of control changes increases for field supervisors.
E-6)New funds become available for high technology training of field officers.
E-7)Main means of officer supervisor contact is conducted through advanced communications systems.
E-8)Communications systems suffers security breach a major security breach.
E-9)Officers resist use of technology, through legal means.
E-10)Organizational structure flattens as a result of communications technology or incident.
E-11)Field officers become incapable of training new officers, technology gap.
E-12)Supervisors become overloaded with technology.
E-13)Vehicle safety guidelines established.
E-14)Effective security system developed to prevent security breach.
E-15)Private security becomes more technologically advanced than police departments.
E-16)Private security contracted to implement technology.
E-17)Technological services and training for officers contracted out to private interests.
E-18)Tech. skills pass people skills as most desirable abilities of new police officer.
E-19)Technology does not develop as expected.
E-20)Technology remains too expensive for police departments to purchase.
E-21)Public resists intrusion on privacy by high technology.
E-22)Court decision limiting use of high tech. as invasion of privacy on public.