

**TECHNOLOGICAL ADVANCES AND THEIR IMPACT  
ON POLICE VEHICLE PURSUITS  
BY THE YEAR 2002**

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## INTRODUCTION

Imagine a high-speed police pursuit routinely ending without accident, injury, or further incident. Studies suggest that approximately one third of all high-speed pursuits result in accidents.<sup>1</sup> This occurs when a pursuing law enforcement vehicle, or the fleeing vehicle, crashes into another vehicle, pedestrian, or fixed object, causing property damage and possible injury or death. As a result, a close examination of police pursuits has been on going by the public, the courts, special interest groups such as the American Civil Liberties Union (ACLU), the media and the law enforcement community.

This examination is driven, in part, by the media, a powerful and visible segment of today's society. In addition to the number of exposes focusing on the drama of death and destruction resulting from pursuits, the news media, using their eye in the sky, now brings these "real time" dramas into the homes of television viewers as they are occurring.

"Braking point: L.A. deaths spur police chase protest."<sup>2</sup>

"5 Hurt, Fetus Killed During Police Chase."<sup>3</sup>

"Six killed and thirteen injured in pursuits in less than two weeks."<sup>4</sup>

"5 more injured in crash during police pursuit."<sup>5</sup>

"Man Fleeing Police Killed when He Crashes Car."<sup>6</sup>

"Youth Killed When Errand Takes Him in Path of Police Chase."<sup>7</sup>

"3 More Killed in High-Speed Police Chases."<sup>8</sup>

These are examples of the headlines which appeared during a media blitz covering police chases in southern California newspapers during a 2-week period in mid November 1992 - real life tragedies being played out on the streets of Los Angeles, Orange, Ventura Counties, and in many other areas of the United States. While it has been suggested by some that this rash of police pursuits, within a 14-day period, was an abnormality, it has been the genesis for others to propose the curtailment of law enforcement's involvement in high-speed pursuits altogether.

The perils of the high-speed pursuit are not a new concern. The courts and legislature have continuously wrestled with the problem since enactment of the first exemption of emergency vehicles from the "rules of the road" in 1905. However, it was not until the decade of the 1960's that the police pursuit was perceived as a danger by the public.<sup>9</sup> According to Alpert and Fridell, a report released in 1968 states in part: 1) 1 out of 5 pursuits ends in death; 2) 5 out of 10 pursuits end in serious injuries. While some experts have questioned the report's scientific validity,<sup>10</sup> the study was responsible, in part, for generating increased discussion within the law enforcement community during the 1970's and 1980's resulting in sparked interest within the criminal justice system and generated additional pursuit studies.

The first complete study on pursuits was a 1970 report by Edmund Fennessy sponsored by the U.S. Department of Transportation.<sup>11</sup> The researchers concluded, based on limited quantitative data and their thorough review of other available information, that "Hot pursuit is a highly controversial topic, bound up in the broader issue of what constitutes effective law enforcement."<sup>12</sup> From the police viewpoint "...their freedom to pursue law violators is a vital measure of their deterrent capability not only in terms of their traffic supervision mission, but also in relation to their broader crime control responsibilities." The basic argument stated, "If police were forbidden to engage in hot pursuit or unduly restricted then chaos on the highways would be the result." However, there also existed an opposing point of view held by the public which believed that "...high speed pursuits result in an unacceptable number of casualties." This study suggested that "...the reduction of crashes, injuries and deaths are the main goals of any policy or practice."<sup>13</sup>

The second generation of research on police pursuits was initiated in the early 1980's by the California Highway Patrol.<sup>14</sup> An exploratory study, limited to a 6-month period, this study analyzed 683 pursuits and found, in part, that 198 pursuits (29 percent) resulted in accidents, 99 pursuits (11 percent) resulted in injuries, and 7 pursuits (1 percent) resulted in deaths. This study concluded that the "attempted apprehension of motorists...is

necessary for the preservation of order on the highways of California....Undoubtedly, innocent people may be injured or killed because an officer chooses to pursue a suspect, but this risk is necessary to avoid the even greater loss that would occur if law enforcement agencies were not allowed to aggressively pursue violators."<sup>15</sup>

Subsequent to the California Highway Patrol study, other researchers (during the 1980's) initiated additional pursuit studies. Among the most comprehensive studies are those of the Solicitor General's Office, Ontario, Canada (1985)<sup>16</sup> Alpert and Dunham (1989, 1990),<sup>17</sup> and the Minnesota Board of Police Officers Standards and Training (1989).<sup>18</sup> These studies resulted in findings similar to those which preceded them in that on the average 35 percent of police pursuits end in accidents, 17 percent result in injuries, and 1 percent end in fatalities.

In 1992 a study, conducted by the Illinois State University, Department of Criminal Justice Sciences, found that a negative outcome such as death, personal injury, and property damage was estimated as high as 41 percent of reported police pursuits.<sup>19</sup>

The public has responded to this public safety issue by creating a surge of social upheaval and demanding accountability by the police. In response,

the California State Legislature passed a mandatory statewide pursuit reporting statute which became effective January 1, 1992. This law requires all California law enforcement agencies to report every vehicle pursuit involvement to the California Highway Patrol. During 1992, the California Highway Patrol reported a total of 7,658 law enforcement pursuits which resulted in 5,924 arrests and 33 deaths, of which 23 were occupants of the pursued vehicle and 10 were innocent bystanders.<sup>20</sup>

Moreover, the courts have not been silent on this issue of police pursuits. In the past, the courts have emphasized the right and duty of police officers to apprehend law violators. But in the present climate, courts are tending to balance the need to apprehend law violators against the threat of injury and death that any given chase poses to the public. The latest appellate decisions suggest that the California courts will increasingly restrict law enforcement's availability to engage in pursuits. In Colvin,<sup>21</sup> the court observed:

"This court can also take a judicial notice of prominent and pervasive news coverage of at least ten pursuit-related deaths in Southern California in the recent weeks alone, as well as personal injuries and property damage to uninvolved parties (citations omitted), and the inescapable conclusions that high-speed chases are dangerous even under the best of circumstances."

As the result of these increased civil liabilities and tighter restrictions resulting from police pursuits, law enforcement officials have responded by creating stricter policy statements and controls.<sup>22</sup> However, history has shown that tighter controls, absent banning pursuits altogether, have not resulted in a successful conclusion to the police vehicle pursuit issue. Innocent civilians, law enforcement officers, and criminals are still being injured and killed while official investigations report the pursuits were within policy.

The purpose of this study is to provide law enforcement, and the public it serves, an alternative to the historical "unsuccessful" conclusion to police vehicle pursuits. While the studies previously cited have addressed statistical and attitudinal causation, as well as policy and training issues relative to police pursuits, there is an apparent lack of information available which focuses on alternative intervention application to police pursuits. It is the researcher's belief that emerging technology is a viable answer to making police pursuits less hazardous to innocent citizens, law enforcement officers, and criminals. Its application holds the promise to dramatically increase the effectiveness of police pursuits. While policy and training will continue to be examined by policy makers, it is the impact of technology that will enable law enforcement officers to safely terminate vehicle pursuits that might otherwise end in tragedy.

While no single technology has been developed with specific application to the external intervention of vehicle pursuits, there exists today several technologies which have potential future application. In recent years, science has introduced the public to technologies such as Lojack, Teletrac, and micro chip applications which have enhanced automotive safety. By the turn of the 21st Century, significant change and advancement will occur within the application of satellite, laser and radar technologies.<sup>23</sup>

Technologies which, with further development and application, could be used by law enforcement for the intervention of vehicle pursuits. These include vehicle locate and identification systems<sup>24</sup> as well as gradual fuel restriction systems and gradual hydraulic braking systems.<sup>25</sup>

Advances in micro chip technology have also progressed to the stage where, with further development, the use of a microcomputer processor in the automobile's engine computer control system would allow for law enforcement's external intervention. Using locate and identification technology, a targeted vehicle could be identified and a vehicle engine control inhibitor activated which would sequentially reduce power to the vehicle's engine, restrict fuel access, and activate the braking system thereby bringing the vehicle to a gradual and safe stop.<sup>26</sup>

Notwithstanding the identification and development of this technology, law enforcement will also have to create policy guidelines which promote and support the deployment, exploration, funding, and public acceptance of this technology. The potential application of this intervention technology to the problem of police pursuits is worthy of analysis and is the reason for this futures study.

Having identified the past and present environments, a concern was raised about the future environment of the police pursuit. It was out of this concern that a primary issue question: ***What Impact Will Technology Have On Police Pursuits by the Year 2002?*** and 3 sub-issue questions were formulated to address this study. The 3 sub-issue questions are:

- What affect will funding sources, public and private, have on law enforcement obtaining this technology?
- To what extent will public support affect the use and acceptance of this technology?
- To what extent will technology affect statewide civil litigation generated from parties involved in police pursuits.

## SUMMARY OF THE FUTURES STUDY

Trends and events which could significantly impact the primary issue and sub-issues were identified using a carefully selected Nominal Group Panel (NGT). The criteria for trend selection stated that each trend: must be clearly defined and stated with terms which are understood; must be worth forecasting; must be non-directional and that later forecasting would determine direction; and must be comprehensive and address the issue question. The criteria for event selections stated that each event: must be occurrences that a future historian could determine did or did not occur; must be comprehensive and relevant to the issue and sub-issues; must impact the issue if they occurred; and must be worth forecasting.

The panel identified 10 key trends and 10 key events which were then graphed to document the panel's median forecasts, as well as their upper and lower mean deviations from the median. This method was used to soften the possibility of a single individual or a small group of individuals from skewing the data. Each trend and event was then assessed on its respective evaluation table. Finally, a cross impact matrix was used to analyze how each of the forecasted events would impact the other trends and events.

## TRENDS (T)

### T-1: Concern of financial impact to communities resulting from civil

litigation. The panel was in agreement and consistent as to the level of impact to communities from civil litigation indicating a continuing increase of 50 percent by 1997. However, between 1997 and 2002 there was disagreement among panel members. The median and low ranges indicated a downturn by 65 and 45 percent, respectively, because of anticipated "caps" on damage awards. The high range represents some panel members' beliefs that this trend will continue to skyrocket primarily because of increased officer accountability.

T-2: Public's demand for personal security from pursuits. The median forecast reflects an 80 percent increase of concern in public safety and security over the next 10 years. The primary causation will be as a result of a projected increase in the number of pursuits, the media's "real time" coverage of these chases, and the projected increase in injuries and fatalities resulting from these pursuits.

T-3: Level of public's acceptance of technology giving law enforcement more control of pursuits. The median forecast shows a gradual yet continual increase of 50 percent in the level of public acceptance of pursuit technology

by the year 2002. The consensus of the panel was that 5 years ago the application of technology was not as high as it will be in 5 and 10 years. While there will be a segment of society who will question its use, there will be a greater acceptance of technological advances relating to impacting pursuits primarily driven from a heightened awareness of public safety issues.

T-4: Availability of technology which disables fleeing vehicle. It is noteworthy that the median forecast reflects a dramatic 80 percent increase in the availability of disabling technology during the next 10 years. Five years ago, disabling technology was for the most part a nonissue outside the law enforcement community. Within the next 5 years, the sophistication of this technology will be developed to the degree that it will be viable. However, the panel felt that the application of this technology by automakers will most likely be driven by the public's demand for security coupled with future legal-mandated restrictions involving pursuits.

T-5: Requirement for police officer pursuit training. Because of the sophistication and application of technology, pursuit training will be trend driven; and the level of mandated training will continue to increase during the next ten years. It is noteworthy that, while the median forecast reflected a 25 percent increase during the next five years, some panel

members felt this training would increase by as much as 90 percent by 1997 primarily because of legal mandates for officer accountability and liability.

T-6: Level of government funding of technology. The median forecast of the panel projected the level of funding will remain the same over the next 5 years and then decrease by 10 percent between 1997 and 2002. Not all panel members agreed. Four members forecasted a dramatic 75 percent increase during the next 5 years and then begin to decline between 1997 and 2002.

T-7: Number of police pursuits resulting from criminal activity. The panel's median forecast reflects a 25 percent increase in this trend through the year 1997 and then decreasing slightly by 15 percent between 1997 and 2002. However, not all panel members agree. Some believe that technology will reduce this trend to about or just below the 1992 level. Others project there will be a dramatic 60 percent increase between 1997 and 2002 because of more third world people, coupled with greater court restrictions on law enforcement's ability to deal with criminals effectively.

T-8: Availability of information systems to law enforcement. The median forecast indicates a dramatic 100 percent increase in the availability of information systems to law enforcement over the next 10 years. The group

opinion was consistent in agreement of a 50 percent increase between 1992 and 1997. However, some panel members felt there would be a spectacular increase of 210 percent between 1992 and 2002 driven by affordability and application.

T-9: Level of punitive damage awards against police officers. The panel's median forecast indicates a 50 percent increase in punitive damage awards against police officers over the next 10 years. Generally, there was a consensus that the increase will be because of a demand for more officer accountability as technology is available and perhaps not used. A segment of the panel, representing the high deviation from the median forecast, believes that there will be a significant increase of 100 percent between 1992 and 1997 and then a gradual decrease of 35 percent over the next 5 years. The declining trend segments are supported by those who project that litigation will be reduced as a result of increased training and the application of technology.

T-10: Number of private industry searching for new technology markets. The median forecast shows an increase of 70 percent of this trend over the next 10 years. However, there was a significant deviation by some panel members who projected a dramatic 120 percent increase during the 5-year period between 1997 and 2002. There was consensus among the panel that

private industry will recognize and search out new markets. The group felt that this reaction would be because of a "need-driven" trend, coupled with the de-militarization of the defense industry and the privatization of traditional public policing responsibilities.

## EVENTS (E)

E-1: Locator devices required by law which allow police to control fleeing vehicles. The panel projected that this event will not occur for at least 5 years with the probability of occurrence increasing dramatically between 1997 and 2002. Causation for this event's occurrence will be driven by increased public pressure on lawmakers to pass enabling legislation.

E-2: City declares bankruptcy as a result of police vehicle pursuit liability.

While there was consensus that this event could occur today and will probably occur by 1997, there was a difference of opinion as to the degree of probability. The median forecast reflects a 10 percent probability within 5 years doubling to 20 percent by the year 2002. However, based on current large punitive- and general- damage awards being assessed, others felt this event had a 15 percent probability of occurrence within one year climbing to a 75 percent probability by 1997.

E-3: State legislature repeals municipality "pursuit immunity" statute. The median forecast shows this event will not occur until 1997 and then increasing in probability to 25 percent within the next 5 years. However, the legal experts and public administrators on the panel deviated from the median - forecasting this event as having a 20 percent probability of occurrence by 1996, doubling to 40 percent within one year, and then climbing gradually to 45 percent over the next 5 years. The panel's forecasts were based on what they project as a "whittling" away of this immunity statute based on an attempt to pass such legislation in 1991.

E-4: Law enacted requiring forfeiture of vehicle and license for causing pursuit The panel forecasts that this legislation will not occur until 1996 and that the probability would then increase sharply to a 55 percent occurrence within a one-year window. The consensus of opinion was that such an event occurring would be driven by the public's demand that responsibility and accountability extend to the criminal.

E-5: Supreme Court bans pursuits: Rules it is a use of deadly force. There is an interesting picture painted by the diverse forecasts in the probability and intensity of this event occurring. Panel members representing law enforcement and the legal system forecast a 40 percent probability that this event will occur by 1997 and then increasing to 50 percent by 2002. The

median forecast, however, suggests this event will not occur before 1994 and then gradually increasing to only 10 percent by 2002. The later opinion was based on the belief that other events with higher probability of occurrence would take place prior to a ban. It was also the panel's belief that a ban on pursuits would be viewed by the public as a loss of law enforcement credibility.

E-6: Media coverage of a catastrophic pursuit. A significant event relative to the issue, the median forecast reflected the probability of this event occurring was immediate and climbing dramatically to a 100 percent probability within 5 years.

E-7: Supreme Court rules technology is a violation of civil rights. The panel's median forecast indicates this event will not occur for 6 years with a 10 percent probability by 1999 and increasing to 50 percent by 2002. The panel felt that it will take at least 5 years for the Supreme Court to rule on such a case and that, as technological applications increase, so will these challenges.

E-8: Law requiring mandatory sentencing for causing pursuit. The median forecast reflects this event's probability of occurrence will not occur until 1995 and then increase dramatically to 60 percent within 2 years. During

the next 5 years, this event's probability will continue to increase by 15 percent, capping at 75 percent by the year 2002. As with Event 4, the public will demand criminal accountability.

E-9: Law restricting police officer conduct in pursuit. The median forecast shows this event will not occur prior to 1994 and then will increase dramatically to 50 percent by 1997 and then level off and remain constant during the next 5 years. The panel felt that given the increasing number of pursuits (T-7) coupled with the increased media coverage (E-4) that new policy will be created by law enforcement prior to new legislation being mandated.

E-10: Voluntary integration of vehicle identifier into new vehicles. The median forecast reflects that this event will not occur until 1997, as automobile manufacturers will be reluctant to install this technology pending legal challenges. The probability increases significantly over the next 5 years reaching 80 percent by 2002.

## CROSS-IMPACT ANALYSIS

Each of the described events were assessed in a cross-impact analysis to determine how each of the events would impact the other events and trends.

Analysis of these impacts allows for judgments as to the future impact that one event might have on another event or trend should it occur first.

Event #1 - Locator devices required by law which allow police to control fleeing vehicles (18 impacts). This Event had an impact on 8 events and 10 trends. Vehicle locating devices, as defined by the panel, is technology which will allow law enforcement the ability to locate, identify, and monitor a fleeing vehicle. This technology would have a dramatic impact on law enforcement's pursuit management capabilities. This technology would decrease the probability of Event #2 (city declares bankruptcy) and Trend #1 (concern of financial impacts to cities) as a result of decreased liability through control. Event #3 (repeal of pursuit immunity) as well as punitive damage awards against police officers (Trend #9) would also probably decrease.

The application of locating technology would increase the probability of a vehicle forfeiture law (Event #4) and also the restriction of pursuit conduct (Event #9). Since technology would be available to control pursuits, it is expected that penalties for misconduct would increase for the criminal as well as stricter guidelines for law enforcement. Trends #2 and #3 (public's demand for personal security and the level of the public's acceptance of

technology) would also be positively impacted. The probability of private industry's search for new markets (Trend #10) would also increase.

Event #5 - Supreme Court bans pursuits - rules it is a use of deadly force (18 impacts). If this Event were to occur, it would have an impact on 8 events and 10 trends. The impact of the Supreme Court banning pursuits would increase the probability of a city declaring bankruptcy (Event #2) and Trend #1 (concern of financial impact to cities). Additionally, this Event would positively impact Event #9 (restricting officer conduct) and the availability of vehicle disabling technology (Trend #4). With the banning of pursuits comes increased liability for an agency's failing to comply and the basis for increased litigation. This Event would decrease the probability of pursuits resulting from criminal activity (Trend #7) as it would reduce the frequency of pursuits.

Event #6 - Media coverage of a catastrophic pursuit (19 impacts). This Event, were it to occur, would impact 9 events and 10 trends. This Event would increase the probability of the public's demand for personal security from pursuits (Trend #2), Event #9 (restriction of officer pursuit training), as well as Trend #5 (police officer pursuit training). Correspondingly, this Event would increase the probability of a city declaring bankruptcy (Event #2) as a result of "front page" liability. Should Event #5 (Supreme Court

bans pursuits) also occur, the impact on Event #2 would increase dramatically.

Event #7 - Supreme Court rules technology is a violation of civil rights (18 impacts). Were this Event to occur, it would have an impact on 8 events and 10 trends. Event #7 would decrease the probability of Event #1 (locate technology) and Trend #10 (industry searching for new markets) occurring. Event #10 (integration of vehicle identifier) as well as the availability of vehicle disabling technology (Trend #4) would also be negatively impacted. Correspondingly, the occurrence of Event #7 would drive up the concern of financial impact to communities (Trend #1) and the public's demand for personal security (Trend #2).

## FINDINGS

"...Police agencies throughout the world are entering an era in which high technology is not only desirable, but necessary in order to combat crime effectively."<sup>27</sup>

Significant change and advancement are waiting on the horizon within the application of satellite, laser and radar technologies. Technologies which, with further development and application, could be used by law enforcement for the intervention of vehicle pursuits. Technologies which will allow law

enforcement to systematically and safely locate, control and stop a fleeing vehicle. These include vehicle locate and identification systems,<sup>28</sup> as well as gradual fuel restriction systems and gradual hydraulic braking systems.<sup>29</sup>

Advances in micro chip technology have also progressed to the stage where, with further development, the use of a micro computer processor in the automobile's engine computer control system would allow for law enforcement's external intervention. Using locate and identification technology, a targeted vehicle could be identified and a vehicle engine control inhibitor activated which would sequentially reduce power to the vehicle's engine, restrict fuel access, and activate the braking system thereby bringing the vehicle to a safe and gradual stop.<sup>30</sup>

The availability and effective application of pursuit intervention technology are dependent upon funding. If funding sources, public and private, are not identified and managed effectively, pursuit intervention technology will not be developed. To this end, partnerships between government and private industry at the local, state, and federal level are a necessity. While possible opposition from the automobile manufacturers and civil rights organizations cannot be ignored, this resistance can be overcome through careful planning and a combined, orchestrated effort of strategic management by the public and private sector.

The NGT panel determined that pursuit intervention technology is dependent on public support. The panel identified the media as playing a key role in determining the public's acceptance of this technology. The public's acceptance of these technologies will be favorable but only if law enforcement's management and control of this technology is consistent with public opinion and perceived by society as beneficial. If in the alternative the public views pursuit intervention technology as threatening to their welfare, law enforcement's ability to effectively apply these crime-fighting tools will be negatively impacted.

Law enforcement officers may experience future increased, punitive damage awards because of a demand for officer accountability as pursuit technology becomes available and not used. However, the question of civil litigation of those involved in pursuits affected by technology was not adequately answered during this study and should be considered for inclusion in future studies.

With a focused vision on the future, a clear memory of the past, and applying the concepts of futures forecasting, *the responsible law enforcement leader of the 21st Century will be prepared to greet the future with confidence, not surprise, by understanding, not ignorance.* He or she will be prepared to have a positive influence on the future of police pursuits.

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