

**The Bill Blackwood
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**Eye on Crime:
The Applicability of ANPR and Closed Circuit Television
within Texas Law Enforcement Agencies**

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ABSTRACT

The success of many law enforcement agencies has occurred due to advances in technology. While European law enforcement agencies have embraced technology to reduce crime and fear of crime, American law enforcement agencies have been slower to implement technology such as Automatic Number Plate Reader (ANPR) systems and closed circuit television (CCTV) systems. It is believed that ANPR and CCTV can have similar success in reducing crime within Texas communities. The purpose of this paper is to review the successes of such technology and determine the applicability to Texas law enforcement agencies. Through a literature review and survey of selected Texas law enforcement agencies it was determined that such technology could reduce crime. Attitudes towards reducing the fear of crime were mixed. The significance of this research is the possibility of using technology to enhance crime fighting capabilities during a time when staffing resources are limited.

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INTRODUCTION

Anyone who has spent any amount of time in law enforcement has no doubt seen the impact of technology on the profession as well as the impact technology has had on the reduction of crime and the apprehension of criminals. Examples of ground breaking technology include the Automated Fingerprint Identification System (AFIS), the use of laser technology as a speed measuring device, the use of infrared technology to apprehend criminals in low light conditions, and the introduction of laptop computers and video cameras in marked police vehicles. After the events of September 11, 2001, the need for additional technological advances is apparent in order to increase the possibility of apprehending terrorists and other criminals before they commit other acts against the law abiding members of society. There is no panacea, no single idea or piece of equipment that will eliminate crime. However, European law enforcement agencies have begun using a combination of old technology, closed circuit television, along with a relatively new technology in order to further their crime fighting efforts. This new technology is Automatic Number Plate Recognition (ANPR).

Automatic Plate Number Recognition (ANPR) systems work by capturing the digital image of a vehicle license plate as it passes a camera. The license plate is cross-checked against a number of local and national databases to identify vehicles that may be of interest to the law enforcement agency. Those vehicles are subsequently stopped and the drivers are identified and in many cases arrested for some criminal violation. In the United Kingdom (UK), ANPR has been used with some impressive results. In 2001, the West Midland (UK) Police Department deployed a team of 16 officers on 171 occasions using one ANPR unit. The results included 1,662 arrests, recovery of a substantial amount of stolen property, including 64 vehicles that had been reported as stolen. The team also recovered a large number of stolen vehicles. Between

April and December 2001, a team of six (6) officers in the Northampton (UK) Police Department was linked with a number of ANPR enabled closed circuit television (CCTV) cameras. This team reported almost 400 hundred arrests for a variety of offenses. Only 8% of the vehicles matched were stopped but, 80% of the people who were stopped had criminal records. Additionally, during this reporting period vehicle crime in Northampton decreased by 13% according to Vaughn Clarke of the Police Standards Unit, London Home Office (Clark,2002).

Closed circuit television has been used for many years in Europe as a means of maintaining surveillance over crime ridden areas. Use of CCTV in the United States has been limited for the most part to private businesses as a means of monitoring their premises. Variants of CCTV such as red light cameras and in-car video systems have also been utilized by some agencies as a means of deterring speeding, intersection related violations and other activity. Some governmental agencies such as the Texas Department of Transportation (TX DOT) use closed circuit television cameras to monitor traffic flow on freeways. These systems have limited usefulness. TX DOT cameras while monitoring the flow of traffic, are not sophisticated enough to focus in on the license plate of a moving vehicle nor is the cameras linked to any informational databases.

The same can be said of CCTV used by private companies to monitor their premises. Cameras used to monitor speed or intersection related violations normally take a photograph of the offending vehicle and in some cases the operator of the vehicle. A citation is later mailed to the violator or registered owner along with a photograph of the violation. ANPR can be linked to CCTV systems to allow coverage of roads in any size of city. ANPR can also be used in a mobile unit in order to target crime hotspots anywhere in the community. Small, mobile ANPR

units can also be placed in marked patrol units as an additional means of initiating a proactive response to crime reduction.

It is hypothesized that ANPR in combination with closed circuit television systems can be utilized to reduce crime and the fear of crime. Research will be conducted to determine the use and success of this technology with the United States of America and in particular the State of Texas. Additional research via literature review is expected to determine how effective ANPR and CCTV have been within the United Kingdom. The cost and benefits of this program must be addressed to determine if the project represents strong fiscal stewardship. A determination must also be made on the availability of the technology in the United States and the degree of difficulty in implementing the program.

Even if this technology reduces crime, one must also consider the attitudes of the public. Americans are concerned that technology such as CCTV may have the intended result of reducing crime but at the same time, it may infringe on the right to privacy. In 2001, the City of Tampa, Florida began using a technology known as FaceIt, a video surveillance system based on face-recognition software. Informal interviews of citizens revealed divergent views among the community. Many of the citizens viewed the technology as an invasion of privacy reminiscent of George Orwell's 1984, which predicted a totalitarian state based on constant state-initiated surveillance of its subjects (Taslitz, 2002). Similar concerns exist in Great Britain where CCTV systems have been utilized for years according to an article in the Houston Chronicle newspaper (Honoré, 2004).

REVIEW OF LITERATURE

Despite the best efforts of law enforcement and government as a whole, crime and terrorism continue to plague the United States as well as other pro-Western nations that favor

democratic styles of government. As a way of deterring crime and social disorder, many law enforcement agencies in Europe, particularly the United Kingdom, have installed closed circuit television (CCTV) systems throughout communities as a means of reducing crime and the fear of crime. Automatic Plate Number Recognition (ANPR), while being a variant of CCTV is still relatively new technology and thus, little research has been done to determine how much of effect it has on reducing crime and reducing the fear of crime. Thus, the majority of this review will focus on the impact of CCTV.

The Uniform Crime Report (UCR) for 2002 stated that in the United States alone, there were an estimated 1.2 million reported motor vehicle thefts resulting in an estimated financial loss of \$8.4 billion dollars. The same report also reported an estimated 2.2 million burglaries resulting in a financial loss of \$3.3 billion dollars, as well as an estimated 7.1 million larceny-theft offenses resulting in financial losses estimated at \$4.9 billion dollars. Clearly, property crimes far outweigh crimes against persons in terms of frequency and financial loss.

These crime rates have a tendency to induce a fear of crime in communities. In Arlington, Texas for example, in the 2003 Citizen Satisfaction Survey (2003), residents indicated by a margin of 56% that they had a fear of crime outside of their own neighborhoods. A large number of property crimes do occur outside of one's own neighborhood. In fact, there were 1,669 vehicles stolen in Arlington, Texas during 2003 and almost 100 vehicles were stolen at or near the Parks Mall, a major retail center.

Unacceptable crime rates in public areas, especially retail establishments, can have a debilitating effect on the community when people no longer patronize such locations due to real or perceived crime problems. Communities, law enforcement agencies in particular, must develop strategies to impact such crimes. According to the Chicago Sun-Times, the City of

Chicago, Illinois has recently purchased fifty (50) closed circuit television cameras equipped with gunshot detection devices as a means of reducing crime at selected locations (Spielman, 2004).

The European law enforcement community has considerably more experience at using such technology as a crime fighting tool. For example, the UK government added large numbers of CCTV systems to selected town centers primarily as a means of preventing thefts, various public order crimes and the fear of crime. Police clearly viewed the purpose of these CCTV systems as a tool to reduce crime, improve crime detection and to provide better command and control over incidents (Roberts & Goulette, 1996). In the town of Airdrie, near Glasgow, Scotland, police installed CCTV systems in areas frequented by known offenders. It was an effort to monitor these offenders and let them know they were being monitored, in hopes of reducing crime in these areas. This experiment had mixed results. The town of Gillingham, England recorded a thirty five percent (35%) decrease in crime over a five year period after installation of CCTV in the town centre. These earlier experiments with CCTV have led to the increased capabilities brought about by Automatic Plate Number Recognition.

As mentioned, ANPR has shown significant results in reducing crime within the United Kingdom. Although ANPR can be used in patrol cars and larger scale mobile operations, it has been extremely effective when linked to existing CCTV systems. The Northampton Police officials recorded significant increases in arrests and suspects contacts by officers involved in that project over a twelve (12) month period. While attempting to deny criminals the use of the road, ANPR is considered to be one of the ultimate examples of intelligence led policing. In the town of Thames Valley, the TVPD deployed an ANPR system during the period of February 29,

2004 through March 21, 2004 with the following results (Thames Valley Police Department, 2004):

- 673 arrests (including 28 for burglary)
- 53 recovered stolen vehicles
- 3,186 offenses were detected
- 3,636 criminal intelligence reports submitted

The Home Office (UK) reported several benefits to using ANPR technology including (Police Reform, 2002):

- Officers working on ANPR teams arrest 10 times more offenders than the average non-ANPR directed officer.
- Arrests are mostly for significant numbers of robbery, vehicle crime, theft, burglary and drug offenses.
- Full national ANPR deployment of 365 teams would generate 219,000 additional arrests per year.
- 57% of people stop searched as a result of an ANPR alert were arrested, compared to 14% when stop-searched not as a result of ANPR.
- 75% of arrests from ANPR alerts (excluding warrants) resulted in a charge, compared to 45% of non ANPR cases.
- Only 12% of ANPR arrests resulted in a refused charge compared to 21% for non-ANPR arrests.
- Vehicle crime fell by 13% in ANPR areas, in contrast to rises elsewhere in the country.

People have a need to feel safe in their communities. The technological advantages of CCTV, ANPR and other technology have the potential to demonstrate an impact on crime rates.

The impact on reducing the fear of crime is not as demonstrable. For example, in 1994 the City of Glasgow, Scotland installed 32 CCTV cameras in the city center. The goals of this program included reduction of crime and reduction of fear of crime. One year after the installation of the cameras, it was discovered that recorded crime in Glasgow had *increased* by 9%. From January 1994 through January 1996, three different surveys were conducted of Glasgow residents within the town center area. The conclusion of the surveys uncovered no evidence that the installation of CCTV cameras had positively affected fear of crime (Ditton, 2000). However, in the County of Warwickshire, UK, surveys conducted over a two year period from 2000 to 2002 showed a slightly reduced rate of fear of crime among survey residents (Warwickshire, 2004).

Government agencies and researchers in the UK still seem to be unable to positively conclude the effects of open-air surveillance such as CCTV or ANPR. Arguments abound over whether such systems reduce crime, have no effect, or merely displace crime to other areas. In fact, a study of offenders in Airdrie, Scotland revealed that many criminals did not fear being under the watch of surveillance systems and that they often avoided the areas (displacement) where they knew the cameras were located (Short & Ditton, 1998).

While initially slow to embrace this new technology, in recent years public area CCTV has also begun to become more popular in the United States. Street cameras can now be found in cities such as Boston, New York, Chicago and Los Angeles. In many instances, these cameras have been installed without public discussion or consent and are subject to little in the way of formal or informal regulation. To some extent, the lack of regulation stems from a reluctance on the part of the courts to decide the issue of whether or not individuals have an expectation of privacy in public places. Despite declaring in **Katz v. United States 389 US 347 (1967)** (Taslitz, 2002) that the fourth amendment protects people, not places, the Supreme Court has

been resistant to the idea that privacy rights extend to streets and other public areas. The Court has also refused to consider whether or not public area video surveillance should be regarded as a form of police search (Goold, 2002).

METHODOLOGY

The purpose of this study is to determine the effectiveness of Automatic Number Plate Reader (ANPR) and Closed Circuit Television (CCTV). It is believed that these technologies will reduce crime as well as the fear of crime. The effectiveness of this technology has been determined through review of current literature as well as a survey instrument. The survey instrument was provided to twenty four (24) participants of Class 57, LEMIT Module II. The survey group consisted of police managers representing various sized agencies from communities throughout the State of Texas. The survey had a return rate of 88%. The information obtained will be analyzed along with statistics generated through a review of the literature to determine if these technologies will be likely be successful when applied to American law enforcement efforts.

FINDINGS

In a survey of Class 57, LEMIT Module II participants, a two page survey was distributed to the 24 members. The first page of the survey was a brief introduction to ANPR and the results that had been achieved in Europe. The survey instrument contained questions regarding the participant agency's use of open-air surveillance systems such as red light cameras, CCTV or ANPR. The survey instrument also questioned the participants on whether or not they believed that CCTV/ANPR could (1). reduce crime and/or (2). Reduce the fear of crime. Respondents were employed by agencies with as few as four (4) commissioned officers and as many as 1300 commissioned officers (Table 1).

Table 1- Survey of Texas Law Enforcement Agencies

Question	Yes	No	Don't Know
Use of Red Light Cameras	1	20	-----
Use of CCTV Surveillance	3	18	-----
Use of ANPR	0	21	-----
Can ANPR technology reduce crime	17	0	4
Can ANPR reduce fear of crime	14	1	6
Would your agency purchase ANPR	10	2	9

The results of the survey show that few of the participating agencies use any form of electronic surveillance as a means of addressing crime related issues. The survey also indicates that 81% of the participants believe that electronic surveillance such as ANPR can reduce crime in their community, while 19% were unsure if ANPR can reduce crime in their community. With regard to reducing fear of crime, 66% stated they believed ANPR technology can reduce fear of crime in their community, 5% stated they did not believe ANPR can reduce fear of crime in their community and 29% stated they were unsure if ANPR can reduce fear of crime in their community. Results on whether responding agencies would purchase ANPR technology were mixed. Only 47% of the respondents indicated their agency would be interested in purchasing ANPR technology while 10% indicated their agency would not purchase ANPR technology and 43% indicated they were unsure whether or not their agency would support such a purchase. Respondents indicating their agency would not purchase ANPR technology were limited to ISD law enforcement agencies, while those were unsure on such a person tended to express the idea that such purchases would depend on who was the chief executive of the agency at the time.

In 2001, the International Association of Chiefs of Police (IACP) conducted a survey of 700 agencies with over 100 sworn officers in three types of video technology (Table2).

Table 2- IACP Technology Survey

Agency Type	Number of Agencies	In- Car Videos	Fixed-Site Surveillance	Mobile Surveillance
State	49	73%	41%	35%
Local	651	46%	48%	47%
Totals	700	48%	47%	47%

It is clear from the IACP survey that numerous agencies across the country are using CCTV technology and that it does have an impact on crime. The IACP survey found that:

- 63 % said it was useful for investigative assistance.
- 54 % said it was useful for evidence gathering.
- 20 % said it was useful for crime reduction.

The IACP survey did not survey agencies on whether or they believed CCTV technology would reduce the fear of crime in their communities. However, respondents did voice concerns over public fears of privacy violations, etc. (IACP, 2001).

The question of whether or not ANPR/CCTV technology is effective in reducing the fear of crime within communities can possibly be answered through a review of various surveys conducted in the United Kingdom. In a survey of Glasgow town center residents, thirty-two (32%) percent of the respondents indicated that they felt safer while sixty-eight (68%) percent of the respondents in the same survey stated they felt safer with extra police officers. In a survey by Honess and Charman (1992), it was discovered that sixty-two (62%) percent of the sample

thought CCTV was effective at preventing crime, seventy-four (74%) percent at detecting crime, yet only fifty-three (53%) percent stated that it would make people feel safer (Ditton, p.703, 2000).

DISCUSSION/CONCLUSIONS

The purpose of this study was to determine the applicability of ANPR/CCTV systems to law enforcement agencies within the State of Texas. It was hypothesized that ANPR in combination with closed circuit television systems could be utilized to reduce crime and the fear of crime. The findings of the study conclude that such technology can have a positive impact on crime although, what may appear to be reductions of crime may actually be displacement. The majority of Texas law enforcement agencies surveyed for this concluded by a margin of 81% that ANPR/CCTV technology could reduce crime in the communities they serve. The success of ANPR in the United Kingdom, though it has been in use for a short period, also leads one to see the potential for crime reduction in this technology. One should also look at the limited use of such technology in the United States such as the City of Los Angeles where CCTV has been used to as a tool in reducing crime rates in MacArthur Park. According to USA Today, an agency in Florida has begun using ANPR technology in an effort to address public concerns over an increase in violent crime (USA Today, 2004). In July of 1997, the City of New York installed multiple CCTV cameras within a Harlem housing project and a crime decrease of 44% was reported (Drucker & Gumpert, 2001).

It is apparent that no real determination has been made as to the ability of such technology to reduce the fear of crime in communities. The reviewed literature provided mixed results. The survey of Texas law enforcement also revealed that either 1/3 of the respondents were unsure of the effectiveness in reducing fear of crime or they believed that such technology

would not reduce the fear of crime. The IACP survey reported an even higher percentage of agencies who did not believe that CCTV technology could reduce fear of crime in communities.

The limitations of this study must be taken into consideration. First, the sample was limited to the members of LEMIT Module II, Class 57. The size of the sample was 24 people and the response rate was not 100% of the class. Second, the size of the agencies sampled must be considered. The sample consisted of agencies as small as 4 officers and as large 1300. The population of the communities served by these agencies ranged in size from approximately ten thousand to several hundred thousand. Third, there is a lack of significant research on ANPR technology although it can be considered advanced form of CCTV technology. It has been in use for such a short period of time and initial results are promising, but more review should be done.

Despite the limitations of the study, the potential use of this technology in the post 911 era is tremendous. As law enforcement agencies strive to prevent crime and terrorism in their communities, they must utilize all tools at their disposal. ANPR/CCTV technology has the ability to detect and apprehend criminals and other violators before they have a chance to commit further crimes and/or violations. ANPR can increase the number of arrest while reducing overall crime levels. The ANPR system can target specific areas or specific high crime areas. The technology can increase conviction rates and reduce the amount of time an officer spends in court through an increase in guilty pleas (Police Reform, 2002). A final impediment to deployment of such technology is the cost. A proposal from Appian Technology for the delivery of an ANPR system to the Arlington, Texas Police Department was estimated to cost approximately \$60,000. During a time when budgets are stretched thin and federal grant money has been reduced, many agencies are likely to shy away from such costs and stick with more

traditional methods of policing such as adding more officers to focus on larger areas rather than the limited areas capability of an ANPR/CCTV system. Agencies that can afford the technology, are likely to find it have similar results in crime reduction as seen in various agencies within the United Kingdom. Reducing the fear of crime by deployment of such technology may be a more difficult challenge and if the desired effect is achieved, the public must be made to realize that ANPR is merely one more weapon in the arsenal rather than the magic bullet. Law enforcement agencies must also be sensitive to privacy concerns expressed by the public. Reducing crime and fear of crime is always likely to require continued partnerships between law enforcement agencies and the communities they serve.

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