

# HERMAN GOLDSTEIN AWARDS

2011



**Lancashire  
Constabulary**  
police and communities together



ROBBERY PREVENTION  
INITIATIVE  
CASH & VALUABLES in  
TRANSIT

Presented by  
Lancashire Constabulary  
&  
Applied DNA Science

police and communities together

# **1. FOUR HUNDRED WORD SUMMARY**

## **Scanning**

£2 billion worth of cash is transported in the UK each day.

UK Crime figures showed that in 2008, £19.4 million was stolen which represented 76% of **Cash and Valuables in Transit (CViT)** attacks in Europe that year. CViT offences had increased each year since 2000.

In Lancashire in December 2008, a security guard was shot as he left his van; £20,000, impregnated with a unique DNA dye, was stolen. After the offence a suspect presented the stolen money at a petrol station. There was no process to link stolen money back to the original offence which provided the focus for this initiative. The objective was to develop a cost-effective forensic process aimed at designing out the problem.

## **Analysis**

Vast amounts of money were spent on examinations to link offenders to offences. This led to a partnership between Lancashire Police, Applied DNA Science (ADNAS), who pioneered the box-specific patented DNA, and Loomis.

**Offenders** - are motivated, professional and undeterred. The offences are well planned and executed. Conventional methods and traditional investigations were often unsuccessful therefore significant resources had to be deployed both overtly and covertly to prevent and detect offences.

**Location** - Offenders committed multiple offences across the North West region.

**Victims** - Research showed that in 2005, 836 couriers were attacked, 208 involved a firearm and 170 resulted in couriers being injured.

There were two significant issues surrounding the examination of recovered dye-stained stolen notes. Firstly, it was cost prohibitive at £3000 per item; secondly the examination process conducted in USA was incompatible with the UK criminal justice system.

No examinations had been carried out previously; consequently, evidence had not been tested in a UK Court.

### **Response**

- A strategic partnership between Lancashire Police and ADNAS established an innovative design solution to link dye-stained notes to offences.
- The opening of a laboratory in the UK at no cost to the police.
- Funding secured from the security industry to finance forensic examinations.
- Support and training provided for ADNAS staff compatible with “Guidance for Expert Witnesses”.

### **Assessment**

- CViT attacks in Lancashire fell to the lowest figure in 10 years.
- 20 successful convictions using this evidence representing a cost saving of £600,000.
- 100% examination success rate.
- 70% reduction in value of cash stolen (£2.7m).
- 55% drop in attacks on Loomis vans, decreasing from 1 in 70 deliveries to 1 in 150 per year.

## 2. DESCRIPTION

### SCANNING

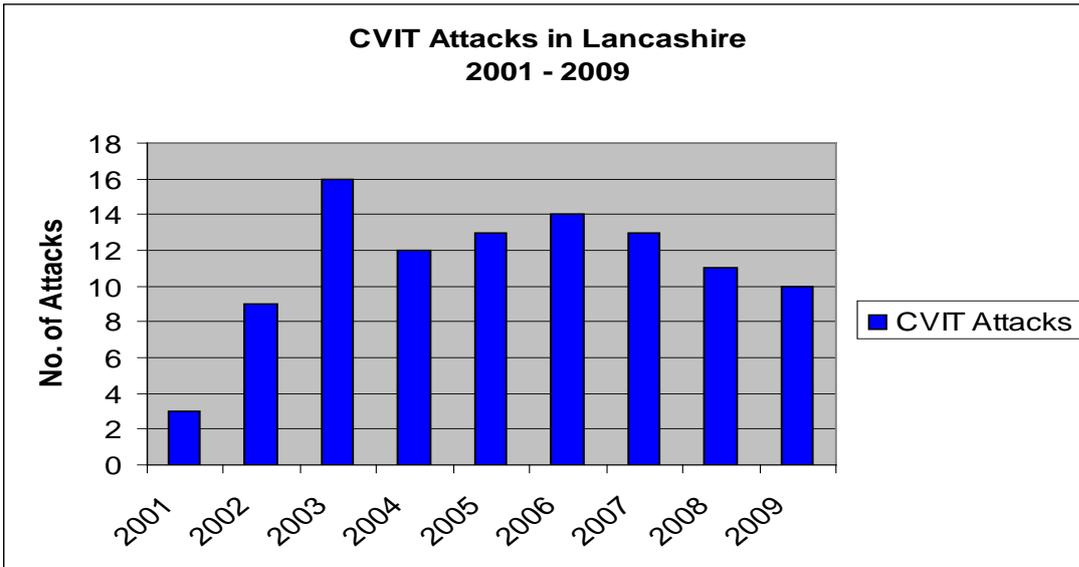
It is estimated that around £2 billion worth of cash and valuables are transported in the UK each day. That makes **cash & valuables in transit** (CViT) robberies an attractive proposition for organised criminals.

Thorough analysis of the national crime figures showed that:

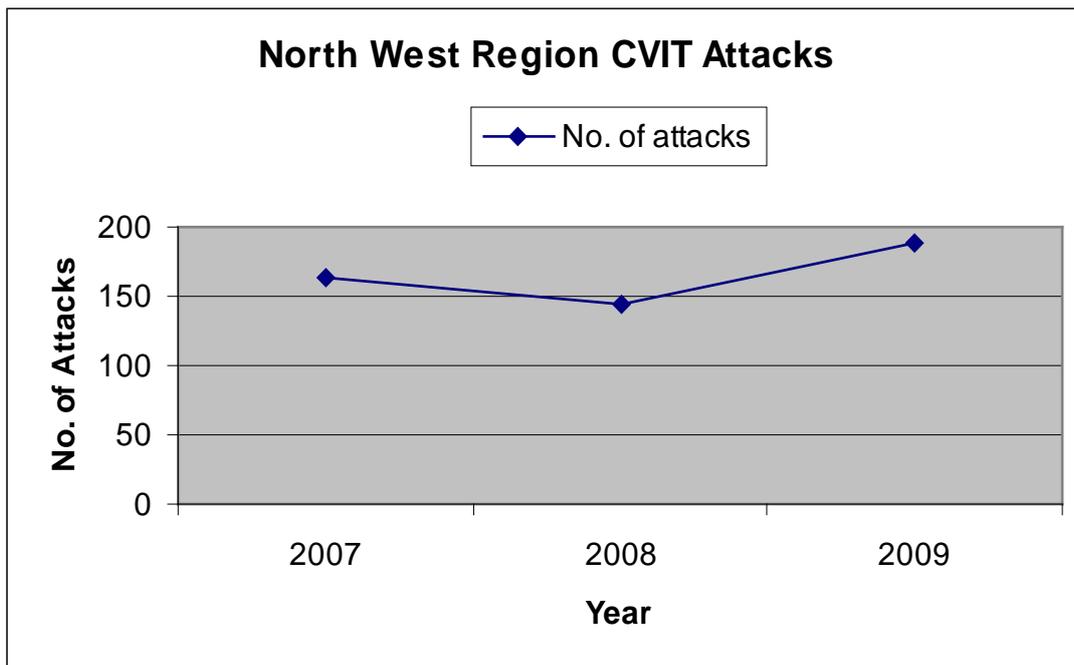
- In 2008 £19.4 million was stolen from (CViT) robberies in the UK.
- 76% of recorded CViT attacks in Europe that year were committed in the UK.

In December 2008, following a number of similar attacks in Lancashire, a Loomis security van was attacked and a security guard was shot. A dedicated team set about investigating the offence, and it was this case which caused officers to look at the wider issue and the problem which this project sought to address i.e. organised criminals committing robbery offences against cash and valuables in transit.

Initially data was gathered in respect of offences committed within Lancashire.



It was clear from the analysis that treating Lancashire offences in isolation would not give a true picture of the problem. Therefore in order to obtain a more complete picture, data was obtained on a regional level. This was appropriate because the data showed that it was often travelling criminals resident in neighbouring forces who were responsible for committing the offences.



By liaising with other investigators within Lancashire and other forces it became apparent that forces were spending vast amounts of money on forensic submissions in order to link offenders and offences together with limited success.

As a deterrent, during the commission of such offences, stolen cash is impregnated with a box specific dye rendering some of the notes unusable unless presented illegally. No process existed to definitively trace dye-stained notes back to the origin of the offence without incurring significant expense.

There were significant concerns regarding the number of such offences and the serious harm being caused both to the staff employed by these security companies and to community safety. The consequences of these crimes regularly put innocent members of the public in danger, particularly as they occur in public places and involve high levels of violence.

The scanning focused on acquiring both quantitative data i.e. that was held predominantly by police forces in the form of crime figures, and qualitative data obtained through interviews with industry leads in the following companies and held in the main by the security industry who invest heavily in security measures in this area of business.

**Data sources included:-**

- Lancashire Constabulary Intelligence
- Operation Vault – Lancashire’s response to CViT
- ADNAS
- Loomis Security Ltd
- British Security Industry Association

- Other police force areas.
- Crown Prosecution Service
- National Legislation / Best practise advice
- Banknotewatch.org
- CViT crime reduction Charter

The project had a primary objective and three secondary objectives:-

#### Primary Objective

- To develop a forensic crime prevention deterrent.

#### Secondary Objective

- To reduce Cash and Valuables in Transit (CViT) offences.
- To increase public safety and confidence by improving the quality of service offered in protecting the community.
- To increase detections.

## ANALYSIS

The method used to support the extent of the problem was a data analysis of CViT robberies in Lancashire and the Northwest region over a ten year period.

### **Offenders**

Through analysis of the data acquired, in particular with reference to intelligence held within Lancashire, it was shown that persons committing this type of crime were often repeat offenders, committed multiple offences and were linked to other forms of organised criminality including pre-cursor offences. They would inflict disproportionate levels of violence which was on the increase.

This was backed up by research conducted by the British Security Industry Association:-

*“The BSIA estimates that for every cash-in-transit robbery another 15 offences are committed, from car-jacking, through to illegal use of firearms and money laundering. Consequently, by cracking down on this type of crime a substantial number of other crimes will also be reduced.”*

The offenders were, in the main, motivated, professional, and undeterred and their offences are both well planned and executed. This meant there was often little evidence available and conventional methods of investigation were frequently unsuccessful in providing evidence to convict them. In addition vast amounts of resources were being deployed both overtly and covertly to prevent and detect the offences.

The Routine Activity Theory of Crime (Cohen & Felson 1979)<sup>1</sup> argues that the attention should be focussed on the situation in which the offending takes place rather than the offender. This is achieved when three elements of predatory offences come together in time and space. The three elements are a motivated offender, suitable target and the absence of a capable guardian. The likelihood of these three factors being found together and converging in time and space separates routine activity theory from straightforward situational crime prevention approaches. This has been useful in understanding trends of CViT across Lancashire and the North West region.

Rational Choice Theory (RCT) emphasises the rationality in human activity and is associated with the idea that individuals proceed on the basis of maximising the profits and minimising the losses (Clarke and Cornish 1986)<sup>2</sup>. This is especially so in CViT offences.

Not wishing to be too simplistic however, in the absence of a forensic deterrent the lucrative rewards whilst committing a CViT far outweigh the risks of being caught or punished and as Bartol argued all people have the potential to commit crime (Bartol, 1999)<sup>3</sup>.

This risk/reward theory and the convergence of motivated offenders, suitable target and lack of guardian are all ideally demonstrated in two offences being investigated by Lancashire Police. Offenders in these cases had an inside agent and were aware that guards are instructed to comply with offenders demands and hand over security boxes without resistance. In the first offence the guard did exactly that handing over £25,000 and he escaped unharmed. In the second offence the guard dropped the box containing £20,000, despite this the offenders shot him needlessly.

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<sup>1</sup> Cohen L E and Felson M (1979) Social Change and Crime Rate Trends: A Routine Activity Approach, American Sociological Review.

<sup>2</sup> Clarke R V G and Cornish D (1985) Modelling Offenders Decisions: A Framework for Research and Policy in Tonry M and Morris N Crime and Justice: A Review of Research, Chicago University of Chicago Press.

<sup>3</sup> Bartol C (1999) Criminal behaviour: A Psychosocial Approach, New Jersey: Prentice Hall

The offenders remain uber-motivated despite many of the suitable targets being invariably protected by CCTV and in heavily populated places. They are unperturbed despite being aware that the boxes, if tampered with, impregnate the money with dye and yet they still commit offences

The table below represents the total deliveries by Loomis and Group4Securities(G4S) on a weekly basis in Lancashire. CVIT deliveries are based at shops and ATM deliveries are based at banks, where the value of deliveries is considerably higher. The second attack in Lancashire was to place £96,000 into the ATM. Figures from Loomis detail that 1 in 70 deliveries could be the victim of an attack.



WEEKLY DELIVERIES in LANCASHIRE					
LOOMIS			G4S		
	CVIT	ATM		CVIT	ATM
Mon	85	11	Mon	320	20
Tues	47	5	Tues	299	42
Wed	50	7	Wed	310	16
Thurs	53	8	Thurs	236	32
Fri	64	6	Fri	327	43
Sat	26	0	Sat	65	11
Sun	1	0	Sun	43	0
Total	326	37	Total	1600	164

Ongoing initiatives such as Lancashire’s “Operation Vault” and the Regional “Operation Titan” had already introduced preventative measures such as “shadowing” of delivery vehicles with marked police vehicles and increasing the visibility of patrols in key locations at times of increased threat such as the pre-Christmas period. It was recognised that it would be very difficult for the police to sustain this activity and protect particular locations due to the

frequency of collections/deliveries, the number of potentially affected premises not to mention the cost involved of such deployments, in addition to the competing demand for resources.

It was identified through the Lancashire initiative and through analysis of intelligence held that these organised crime groups would often use associates and a variety of means to launder the proceeds of the offences including using dye stained cash in gaming machines, vending machines, betting shops and night clubs. This was identified as an opportunity, which could be exploited through the use of advanced forensic techniques.

## **Location**

Through analysis of crime statistics we identified that the offenders often committed offences across several force areas and operated on a national level. A successful preventative deterrent in one area would consequently be likely to reduce crime across a number of forces.

It was also identified that as the offences transcended police boundaries, without the benefits of a forensic link the opportunity of identifying recovered banks notes was significantly reduced.

Research and mapping of the available data highlighted that by their nature these offences often occurred in public places. Target premises were generally located in high streets and busy shopping areas presenting a significant risk to public safety. In particular banks, supermarkets and petrol stations were regular locations for the offences to take place.

## **Victims**

Analysis of crimes revealed that security officers working in this line of business were often repeat victims. In the Lancashire case the victim had been attacked on seven previous occasions. This repeat victimisation together with the level of violence typically used in this type of offence raised the concerns of the officers considerably.

According to data obtained from the British Security Industry Association attacks on couriers involved injuries resulting from shootings, stabbings, pistol whippings and severe beatings, not to mention the post-traumatic stress which was often suffered as a consequence. This had a lasting effect on the individuals involved, their work colleagues and their families. Historical research showed that in 2005, there were 836 attacks on couriers, and of those 208 involved a firearm and 170 resulted in couriers being injured.

There was also a significant collateral risk of harm to the community and public confidence in the police as a result of the issues mentioned above in relation to the location of the offences in public places.

### **Conclusions / Causes**

Analysis and comparison of the offences showed that, like the Lancashire offence, an associate of the suspects, was later found in possession of three stained banknotes subsequently identified to have been stolen during the Lancashire robbery. The crucial investigative opportunities often lay in tracing the source and subsequent movement of stained banknotes as a means of linking offenders to specific offences.

Data below from the Bank of England shows that during a 3 month period 2,056 stained notes were recovered, with a value of almost £30,000 and yet there was no method of linking those notes to offences committed. The bank also confirmed that use of serial

numbers to track notes is impossible as once a note leaves the bank for distribution this unique identification is not recorded by any security company.

Gaming Machine	Notes	Amount	ATM Machine	Notes	Amount	Ticket Machine	Notes	Amount	Public	Notes	Amount	Total Value	Total Notes
	1795	£25,655	2	3	£50	11	184	£2,900	51	74	£1,215	£29,820	2,056

Through scrutiny of the Lancashire offence in conjunction with Loomis it transpired that although all Loomis cash boxes had a note staining security feature provided by ADNAS which activated upon the box being stolen. There were issues in relation to the evidential use of seized stained banknotes. We discovered that these issues surrounded the lack of forensic examination of recovered, dye stained, stolen notes. The notes had to be sent for forensic examination in New York and this was problematic for two main reasons. Firstly, it was cost prohibitive, each submission cost £3000 per item and secondly the examination process conducted in New York and was incompatible with the UK criminal justice system.

Funding for examinations was a key issue and a major contributory factor as to why no forensic submissions had been undertaken. This meant that vital independent forensic evidence was being lost.

Why did we enter into partnership with ADNAS as opposed to other potential competitors? SigNature™DNA is genomic plant DNA and analysis with competitors, Smartwater, revealed that SigNature™DNA is extremely robust and stable under most aggressive conditions. It is the “Gold Standard” in forensic anti-counterfeit globally. In contrast, Smartwater is not DNA. It is made from mineral-based inert chemical compounds making it less robust and more susceptible to solvent washout. SigNature™DNA has been proven and tested in laboratories

and is persistent against heavy duty solvents used by criminals therefore this appeared to best available product on the market to progress the initiative.

## RESPONSE

The analysis led to a partnership between Lancashire Police and ADNAS. We established that they provide the Cash in Transit industry with a box-specific patented DNA based system. This places unique identifiable cash staining dye into each CViT box at the time of commissioning. Despite having equipped a number of security boxes with the SigNature™DNA, ADNAS had never carried out an examination for a UK police force and consequently had never provided a report/statement or given evidence in a UK Court. This was done in conjunction with the BSIA.

The success of this partnership was always going to be measured by the prevention and reduction in the number of CViT offences and the successful identification of ADNAS DNA on submitted items, linking them to reported CViT crimes. A further necessary objective was the successful presentation of that evidence at court leading to convictions.

What happened next:-

- Introduction of a strategic partnership steering group and working party that recommended a solution and design model to link dye stained notes to offences.
- Consultation between Lancashire Police and ADNAS led to the opening of a satellite laboratory in the UK which was funded by ADNAS to improve the submission process.
- Securing of funding from the security industry to finance initial forensic submissions free of charge.
- Provision of bespoke support and training for ADNAS staff compatible with “Guidance for Expert Witnesses” and demonstrating Criminal Procedures and Investigations Act compliance.

## **Education**

Having identified the issues surrounding court compatibility Lancashire Police set about compiling a training & advice package to assist ADNAS Staff. This was done in partnership with the CEO of ADNAS in order to ensure all staff had a full knowledge of the processes and legislative requirements for them to provide evidence suitable to be presented to a UK court and compatible with the criminal justice system. Scientists and technicians from ADNAS were provided with training and instructions taken from the ACPO guidance to expert witnesses on what should be included in examination reports, disclosure reports and evidential statements. This process was conducted with full consultation and approval of the Crown Prosecution Service.

*“Lancashire Police were tremendously supportive and innovative in finding a solution and helping us develop robust procedures for integrity of evidence and compatibility of forensic examinations and Expert Witness reports.” **Tony Woodward (ADNAS)***

## **Funding**

ADNAS agreed to set up a satellite laboratory within the UK to receive forensic submissions. The set-up cost was in the region of £300k and was met jointly by the Textile Centre of Excellence, Yorkshire Forward and the European Development Agency. Ongoing costs in terms of rental, telephone, travelling and technicians in the region of £125k per year are being met by ADNAS.

The integrity of the process and the initial cost of £3000 per submission were clearly preventing examinations from taking place. A review of the costings and an agreement with the security companies to fund the first 10 items submitted by UK police forces achieved a cost saving of £30,000 per case. The establishment of a UK laboratory ensured that exhibits were screened by ADNAS technicians before being couriered to New York, which ensured the integrity and security of exhibits until they reached the laboratory in the USA.

The review delivered a standard operating procedure, developed between the security companies, police and ADNAS that introduced new processes to overcome the issues of cost, integrity and compatibility of forensic examinations. The new arrangements specifically addressed the location of the laboratory (New York), submission methods, examination processes and compatibility with the UK Criminal Justice system.

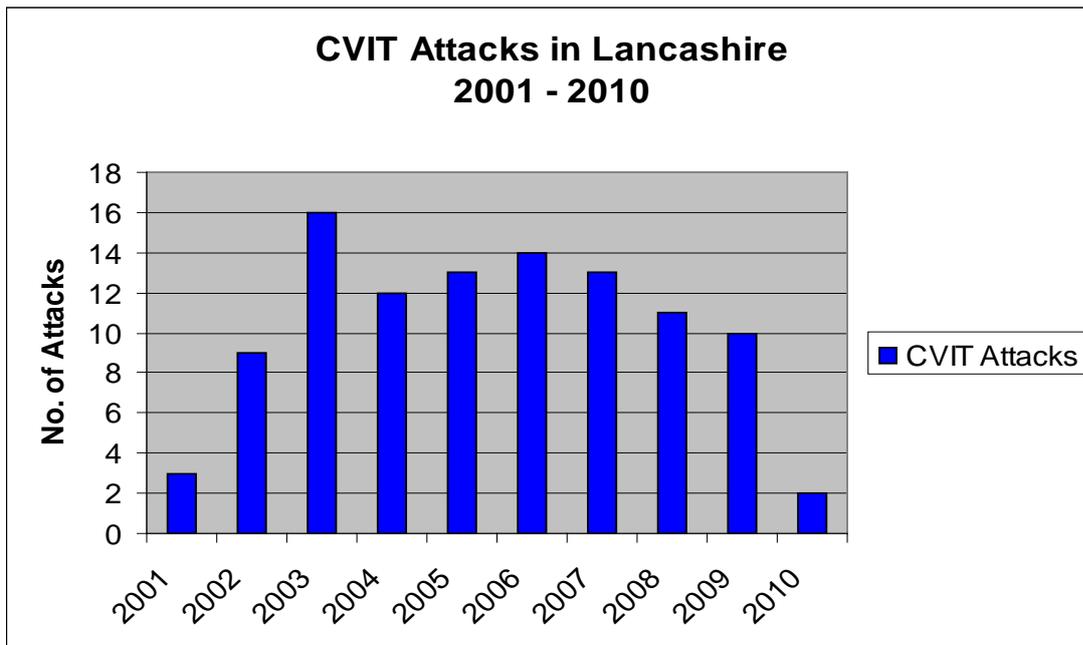
Successful delivery of evidence had been achieved by ensuring that ADNAS processes, disclosure and evidence complied with the "Guidance to Expert Witnesses". Failure to comply could lead to discontinued prosecutions, unsafe convictions, professional embarrassment, a threat to public confidence and a guilty person escaping conviction.

Consultation with all of the key stakeholders and analysis of any issues encountered continued throughout the process, which meant that problems were detected early and could be addressed as they arose.

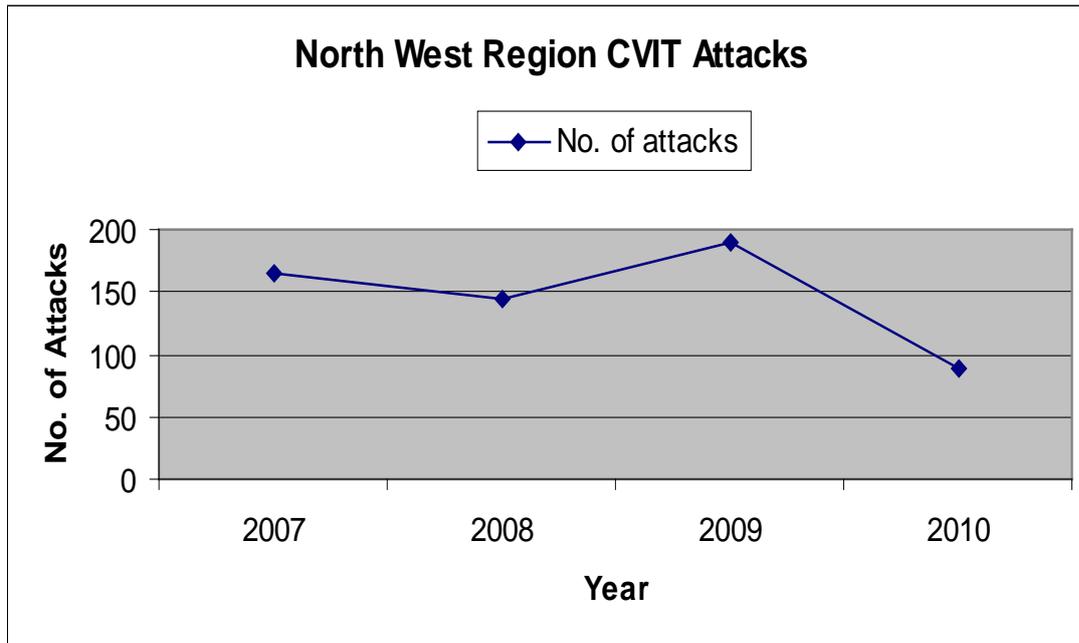
## ASSESSMENT

In order to properly assess the impact of the project it is necessary not only to consider the reduction in the number of offences post 2009 following the implementation of the projects response, but also the successful prosecutions and identifications directly resulting from the project. The project recognises that crime figures alone can be difficult to put into context as there may be a number of external factors affecting them. Despite this the reduction in CViT offences both locally and regionally cannot be underestimated with Lancashire last year enjoying the lowest number of offences in 10 years.

### Lancashire CViT offences 2001 - 2010



Regionally the picture is the same seeing a 50% reduction in the number of CViT offences during 2010.



Data was obtained from ADNAS to show how the project had developed nationally since the laboratory was opened. The Lancashire case had been groundbreaking and was the first time that ADNAS had provided this service to a UK law enforcement agency.

- In the Lancashire case the evidence was so overwhelming that 2 defendants pleaded guilty and 3 further defendants were convicted after a six-week trial. The aggregate sentence was over 60 years in prison with the person who shot the security guard receiving life imprisonment. 10 items were examined with a cost saving of £30,000
- This led to other CViT offences in Lancashire being detected.
- After marketing the new protocol within the CViT industry, ADNAS began to receive cases at the UK laboratory from UK police forces.
- The laboratory has now dealt with 51 submissions from 18 different police forces with a 100% success rate.
- In the United Kingdom, nearly 30% of cash in transit is now protected by this SigNature™DNA.
- Over 20 convictions have been attributed to the utilisation of this forensic technology by UK Police.

- In a London case 23 robberies were linked where £300,000k was stolen.
- Authentications have resulted in prison sentences exceeding 120 years.
- Attacks on Loomis security vans decreased from 1 in 70 deliveries to 1 in 150 deliveries (Loomis)
- Attacks decreased by 40% across the country

The assessment shows that whilst the response has only been in place for a relatively short period of time, it is now being utilised by forces across the UK. The service is providing evidence that can link crimes together whilst the incarceration of prolific and persistent offenders improves the chances of preventing as well as detecting crime.

The training provided to ADNAS in relation to the delivery of expert evidence led to fully compliant evidential statements being produced by the company. This evidence has been presented in a number of successful prosecutions and withstood the scrutiny of the court process. This is a highly successful outcome and removes one of the major barriers Police UK had in relation to the use of this evidence.

### **Service benefits**

- A sustainable and transferrable partnership solution that is available to all UK police forces and is CPIA compliant.
- Satellite laboratory now set up in the UK providing easier accessibility and quicker turnaround time whilst maintaining the integrity of the process and improving submission continuity.
- An independent consistent, cost effective and efficient process for submitting dye stained recovered stolen notes.

- This partnership and initiative has challenged the traditional way the police do their business and changed the way we forensically submit dye stained notes stolen during the course of a CViT robbery.
- Reduction in harm / offences of violence.
- Increase in convictions of those responsible for CViT attacks.
- The opportunity to aggressively market this success will act as a significant preventative deterrent to others considering such offences. Both within the criminal fraternity and internal marketing within the security industry. Many offences involve an inside agent who provides information to the organised crime groups, as in the Lancashire offence, and this will deter employee corruption from these groups if the motivated offender understands that the risk outweighs the reward.
- All the agencies concerned in this partnership are committed to continuing this collaboration.

## **Lessons Learned**

The examination sequence for recovered notes was previously set in stone and had unwittingly been a blocker to the success of the forensic collection plan. Upon receipt of stained notes the response was to submit them for examination for fingerprints and conventional DNA prior to any additional examinations. This project has now shown that traditional treatments used to develop fingerprints on notes renders the ADNAS DNA undetectable. This was established very early in the partnership and the order of priority for examinations was changed as a result. Best practise advice has been made available to all police forces throughout the UK.

This critical learning has been shared with the CViT Industry and Police through CViT leads, presentations at National Conferences and bulletins circulated to regional representatives for onward wider circulation.

### **Measures of Success**

The success of this initiative has been widely recognised both within and beyond the police service.

The innovative way in which the officers went about resolving the problem and the contribution to detecting the shooting of the security guard in the Lancashire case led to a number of staff involved in the case receiving commendations.

In September 2010 the project was presented jointly by Lancashire Police and ADNAS at the “Excellence in Policing” Conference where it won a national award.

Through extensive marketing results like the Lancashire case continue to receive media attention. This media attention has helped to promote this technique as a successful preventative and investigative tool which has now been taken up by many forces across the UK.

## Media

Following the conviction of 5 offenders for the Lancashire robberies and shooting:-

*"I am really pleased that these people have been convicted. I never expected the Police to find the people responsible but I now feel safer knowing they are in prison for a long time"*

**Imran Aslam, the Loomis guard who was shot.**

*"We are pleased with the sentencing of these cash-in-transit crimes. We are especially gratified that since the deployment of SigNature®DNA in Loomis cash boxes, we have sent cash-in-transit criminals to jail for an accumulated total of more than 120 years."*

**Tony Benson, Risk Director, Loomis UK**

In the West Midlands, Colin Waddingham was found guilty of cash-in-transit robbery and sentenced to 11 years of imprisonment. He was found guilty based, in part, on the SigNature®DNA evidence presented during the trial.

*"This is a fantastic result. I would like to thank all involved for their contributions and pay tribute to the non-police witnesses who had the courage to give evidence. SigNature®DNA was critical in linking the recovered cash to the defendant."*

**DC Daniel Halford. West Midlands police.**

In London, the DNA evidence provided by ADNAS assisted the Flying Squad in convicting Alpesh Daudia of two separate CViT crimes. When officers searched him, a wad of dye-stained cash fell to the ground from his waist. Forensic tests of the dye-stained linked it to an earlier cash-in-transit robbery.

*"These convictions resulted from a combination of both good detective work and the use of advanced technology. The introduction of unique DNA markers such as SigNature®DNA technology, has been a significant development and proved critical in this case in securing crucial evidence with which to convict a prolific gang of robbers." D/Supt Bob Cummings, of the MPS Flying Squad.*

Three men committed a series of 23 robberies across Northeast London amassing more than £300,000. In total, the offenders will remain behind bars for over twenty-one years.

*"The arrest and conviction of these men has resulted in a reduction in cash-in-transit robberies in north east London..." January 26, 2010 Metropolitan Police news bulletin. DI Ralf Kirchel, Flying Squad.*

Further to this initiative, ADNAS has continued its innovative approach to providing support to law enforcement agencies by extending the range of its services. A good example of this is the work done between ADNAS, and Thames Valley Police and the Flying Squad, whereby kidnap and ransom monies are now marked with SigNature™DNA and used for "sting" type operations.

### **3. AGENCY and OFFICER INFORMATION**

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