



Home Office

Forensic Science Strategy

A national approach to forensic science delivery in the
criminal justice system



Forensic Science Strategy

**A national approach to forensic science delivery in the
criminal justice system**

Presented to Parliament
by the Secretary of State for the Home Department
by Command of Her Majesty

March 2016

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Ministerial Foreword



Police reform is working and crime has fallen by more than a quarter since June 2010; that is nearly three million fewer crimes a year.

But there are new challenges. As the world becomes more digital, technology is creating new ways to commit old crimes, new crime types are emerging, and so the way evidence is created and captured is changing as are the public's expectations of their police and the criminal justice system.

Digital technology has transformed how we live our lives. The internet and new technology offer criminals new opportunities to commit crimes such as fraud and cyber crime. Criminals also use the internet to carry out their crimes, from arranging travel, buying items online to sharing illegal images. We need to ensure that those responsible for our protection continue to have the capabilities to investigate crime in this new technological age.

But technology also presents us with opportunities. There is, more than ever, a need for us to look to the skills and innovative practices that exist elsewhere in order to help us counter the threats we face. Just as DNA profiling was originally developed in the healthcare sector but has grown to dominate analysis of crime scenes and identification of offenders, research in other sectors could provide solutions that can be used to build forensic capability and respond to the current threat.

We have shown it is possible to cut crime, maintain public confidence and save money for the taxpayer at the same time. Over the course of this Parliament, we will continue this vital work; supporting forces to deliver a nationally coordinated approach to forensic science delivery. I am confident that this is the best way to ensure the continued stability of the forensic market, to provide increased legitimacy, whilst responding to the changing nature of crime.

This Strategy sets out my vision for the future of forensic science for police forces in England and Wales and criminal investigations; showing how we intend to reshape the current landscape towards a modern forensic science provision. I would like to express my gratitude to all those who have contributed to the development of this strategy and I look forward to working with you all as we turn this vision into a reality.

Rt Hon Mike Penning MP
Minister for Policing, Fire and Criminal Justice and Victims

National Policing Lead for Forensics Foreword



I welcome this Forensic Science Strategy which has been prepared following extensive consultation with the National Police Chiefs Council. The Strategy will provide a strong focus for further cooperation between the parties interested in further developing forensic science in England and Wales.

Forensic science makes a huge contribution to the detection and prevention of crime. This is often most evident in the very serious cases that cause the most public concern. Strong forensic processes, allied to good policing, are capable of creating a climate of deterrence for potential criminals and increasing public confidence in the criminal justice system.

This public confidence must be supported by sound governance arrangements and ever improving levels of quality assurance.

Forensic science is a dynamic discipline. The strategy sets a framework for future innovation to ensure that effectiveness is maintained. This will almost certainly involve further investment in digital forensics which continues to offer significant opportunities to combat crime.

The strategy also points to the need for increased efficiency; identifying new ways to deliver services at reduced cost.

This Forensic Science Strategy points towards a new national approach which will harness the efforts of police forces, national infrastructure, regulators and the private sector in making forensic science more effective in the future.

Chris Sims
Chief Constable

Executive Summary

Vision

1. Forensic science is the application of science to a criminal investigation and court proceedings. This includes crime scene investigation and the collection, identification, analysis and interpretation of potential evidence such as DNA, fingerprints, digital evidence, drug analysis and footwear marks.
2. The Government's vision for forensic science is for a clearer system of governance to ensure quality standards and proper ethical oversight, and a cost effective service that delivers to law enforcement and the criminal justice system (CJS) robust and relevant forensic evidence, and in so doing strengthens public and judicial trust in forensic science.

Context

3. Crime is falling, but it is also changing. Latest figures from the Crime Survey for England and Wales (CSEW) show that there were an estimated 6.5 million crimes in the year to June 2015. This is an 8% decrease compared with last year and the lowest estimate since the CSEW began in 1981. Police Recorded Crime shows a long-term shift away from 'traditional' volume crime, such as burglary and theft from a vehicle, and an increase in offences with a digital element, such as child sexual abuse and indecent imagery offences. The shift to digital not only enables new types of crime, but also means that traditional volume crimes can be committed in ways that leave a digital as well as a physical trail.
4. Demand for digital forensics has grown in parallel with the increased use of digital devices over the past 20 years. At the same time, there has been a decline in the demand for traditional forensic science such as DNA and fingerprints. Forensic science can make a significant contribution to improving policing outcomes and efficiency, but will only be able to meet this challenge through a whole system approach, from the crime scene to the court.

Landscape

5. There are currently a variety of forensic delivery models in existence ranging from forensic teams in forces, collaborative/regional structures and some operating models linked to wider partnership approaches. All models have a combination of services delivered by forces and external Forensic Service Providers (FSP).
6. In early 2016, the police service will consider options on how best to develop a digital approach which could encompass biometrics (e.g. fingerprint bureaux) or broader areas of forensics, including scene of crime officers, digital forensics and other in house forensic facilities. Scoping work setting out business case options is expected to be completed in Spring 2016. A national approach to forensic science delivery, proposed and delivered by police forces, would aim to ensure greater consistency of service quality; resilient, reliable capability and with economies of scale.

A National Approach to Forensic Science Delivery

By the end of this Parliament, policing will design and deliver a national approach to Forensic Science delivery, supported by the Home Office, which reinforces the legitimacy and capability of forensic science through:

- a) consistent quality management and standardisation across police forces, including a clearer statutory role for the Forensic Science Regulator;
- b) enhanced governance for the forensics system, including a wider role for the NDNAD Ethics Group;
- c) a review by police forces of the case for moving current fragmented provision into a Joint Forensic and Biometric Service to achieve economies of scale, increased capability and resilience;
- d) ongoing oversight of the health of the supply chain, including contingency plans developed by police forces to cope with disruption to the market;
- e) working closely with research councils and other public research organisations to identify new cost effective opportunities and influences for forensic science;
- f) working with the College of Policing to understand the capabilities required within the forensic science workforce; and
- g) nurturing a stronger partnership with industry and education to ensure that learning programmes are future proofed and aligned to the business requirements.

Introduction

Vision

7. The Government's vision for forensic science is for a clearer system of governance to ensure quality standards and proper ethical oversight, and a cost effective service that delivers to law enforcement and the CJS robust and relevant forensic evidence, and in so doing strengthens public and judicial trust in forensic science.

What is forensic science in the CJS?

8. This strategy focuses on the use of forensic science in the CJS. In that context, forensic science is the application of science to criminal investigation and court proceedings. Encompassing scene investigation and the collection, identification, analysis and interpretation of potential evidence such as DNA, fingerprints, digital evidence, drugs and footwear marks. We can detect and identify increasingly small amounts of physical and biological material and are increasingly able to gather and interrogate large sets of data.
9. Forensic evidence is invaluable to the investigation of crime. Forensic science allows investigators to work out what happened at a crime scene and piece together the story of events. For example, the location and pattern of blood found on a wall could assist the court in distinguishing between a murder and self defence.
10. The application of scientific advances have provided investigators with powerful new tools for identifying the perpetrators of crime; from fingerprint analysis in the early twentieth century, to DNA profiling in the 1980s and, more recently, digital forensics. The ability to match trace evidence with that found at crime scenes plays a vital part, not only in the identification, arrest and prosecution of criminals but in ensuring the innocent are eliminated from investigations.
11. The average British household now owns 7.4 digital enabled devices¹, meaning that it is not unusual to recover several devices as part of a single investigation. This proliferation of devices means that digital forensics is an increasingly common feature of investigations. Digital forensics involves the extraction, analysis and interpretation of information (such as photographs, videos or GPS data) from any digital equipment such as smartphones, tablets computers, satellite navigations systems, gaming consoles and smart TVs. The Forensic Science Regulator's Codes of Practice define digital forensics as *"the process by which information is extracted from data storage media, rendered into a useable form, processed and interpreted for the purpose of obtaining intelligence for use in investigations, or evidence for use in criminal proceedings"*².
12. The growth of digital not only enables new types of crime – from phishing emails to cyber attacks – but also enables volume crimes such as burglary and vehicle theft to be committed in new ways that leave a digital as well as a physical trail.
13. The rapid growth and development of digital technology creates unique challenges; from the sheer quantity of digital data, to new forms of encryption and the increasing use of cloud storage. Despite this, the principle of identifying, analysing and reporting on a digital trace is fundamentally similar to other forensic disciplines and should be treated as such.

¹ YouGov Plc. Total sample size was 2090 adults. The survey was conducted online between 16-17th March 2015. The figures have been weighted to be representative of all British adults (aged 18+).

²https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/470526/FSR_Newsletter_26__October_2015.pdf

14. A number of changes have been made to the forensic landscape in recent years. Through the creation of the Forensic Science Regulator we have introduced independent oversight of the quality of forensic science and the establishment of the College of Policing has created a strong lead for developing knowledge and skills across the police service, including in forensic science.
15. Forensic work has been contracted out to commercial suppliers since the late 1990s. Until its closure in 2012, the government-owned Forensic Science Service (FSS) provided services to the police and other agencies. The FSS was making unsustainable financial losses, and was at risk of entering administration, which would have jeopardised the provision of forensic services to the CJS. The Government therefore took the difficult decision to manage the wind-down of the FSS to avoid exposing the CJS to an unacceptable level of risk.
16. The majority of services are procured through the National Forensic Framework Next Generation (NFFNG), which is managed by the Home Office. This framework has fostered a competitive marketplace which has reduced the cost of services and driven improvements in case turnaround times, whilst ensuring services are delivered in accordance with robust quality standards.
17. NFFNG suppliers are accredited to international quality standards and the Codes of Practice set by the Forensic Science Regulator. All police forces are either accredited for fingerprints and DNA recovery, working towards accreditation, or share facilities with a force that already has accreditation. However, more needs to be done to ensure appropriate compliance with quality standards to maintain public confidence and reduce the potential for miscarriages of justice.
18. The Government has acted to protect the overall police budget but the police will need to continue to make savings. Forensic science can make a significant contribution to improving efficiency and cost effectiveness by considering the entire landscape; from the crime scene to the court.

This Strategy

19. The Home Office has responsibility for the policy and legal framework for forensic science in the crime and policing sector. It undertakes research in forensic science through the Centre for Applied Science and Technology (CAST) and operates a number of forensic and biometric databases on behalf of police forces such as the National DNA Database (NDNAD). The Forensic Policy Group (FPG) is chaired by the Home Office and includes representation from policing and other criminal justice partners.

Changes in crime

20. Police Recorded Crime³ shows that traditional volume crime (e.g. burglary and vehicle theft) has declined, while crime with a digital element (e.g. child sexual abuse and indecent imagery offences) has increased. This corresponds to a decline in the demand for traditional forensic science, such as DNA and fingerprints, and an increase in demand for digital forensics. Sexual offences recorded by the police have also risen, with increased reporting of historic cases. Historic cases often have minimal forensic requirements due to the lack of remaining physical evidence.

³ Police Recorded Crime is a collation of recorded crime data supplied by the 43 territorial police forces of England and Wales, plus the British Transport Police. Unlike the CSEW, recorded crime figures do not include crimes that have not been reported to the police or incidents that the police decide not to record.

21. As the number of people using digital devices grows, so does the amount of information stored digitally. In 2000, only 36% of UK adults owned a mobile phone compared to 93% in 2015⁴. Smartphones have overtaken laptops as the most popular device for getting online.
22. The unprecedented amount of digital information being generated has led to an increase in demand for digital forensics, whether the crime itself is digital or not. The Metropolitan Police Service (MPS) reported approximately 36,000 digital forensics examinations in 2012/2013, 20% of which were deemed as 'complex' (e.g. those which require specialist research & development or high levels of interpretation).
23. Techniques for the extraction of data from digital devices are continually being developed in response to the constant evolution of technology. Manufacturer and consumer behaviour drives the rapid uptake of new devices and apps, each of which can present new challenges for investigators. For example, the yearly cycle of new smartphones requires new capabilities within police forces to interrogate devices for evidence. Manufacturers releasing new versions of operating systems or the sudden mass uptake of a new social media app can present similar challenges. The increase in the volume of potential digital forensic material, and the limited capacity within forces to process these, has resulted in significant backlogs in a number of forces.
24. There is currently a mixed landscape of forensic delivery models in existence; ranging from those based at an individual force level, to models based on well developed collaborative/regional structures, and some operating models linked to wider partnership approaches. Most of these operating models use a mixture of internal and external forensic science provision. The private sector plays an important role in providing a robust and reliable forensic science service to law enforcement and the CJS.
25. Police forces undertake forensic services themselves e.g. crime scene investigation, search and recovery, fingerprints, image processing and the control of submissions for analysis and interpretation to FSPs and through private sector services e.g. DNA profiling, toxicology and drug analysis.
26. Spending on forensics was broadly stable up to 2009/10 after which estimated police spending fell 18%⁵ to 2015/16. There has been much debate about the implications of this shift. However, there is no evidence to indicate that the reduction in spend means that forensic science is making a less valuable contribution to criminal justice investigations. For example, Figure 1 below shows that, despite falling crime, the proportion of domestic burglaries attended by crime scene investigators has remained at 85% or over from 2009/10 to 2014/15⁶, although as crime volumes have fallen the absolute number of burglaries attended has fallen. Vehicle theft offences have seen a small reduction in the proportion of scenes attended by a crime scene investigator (down from 34% in 2009/10 to 27% in 2014/15).⁷

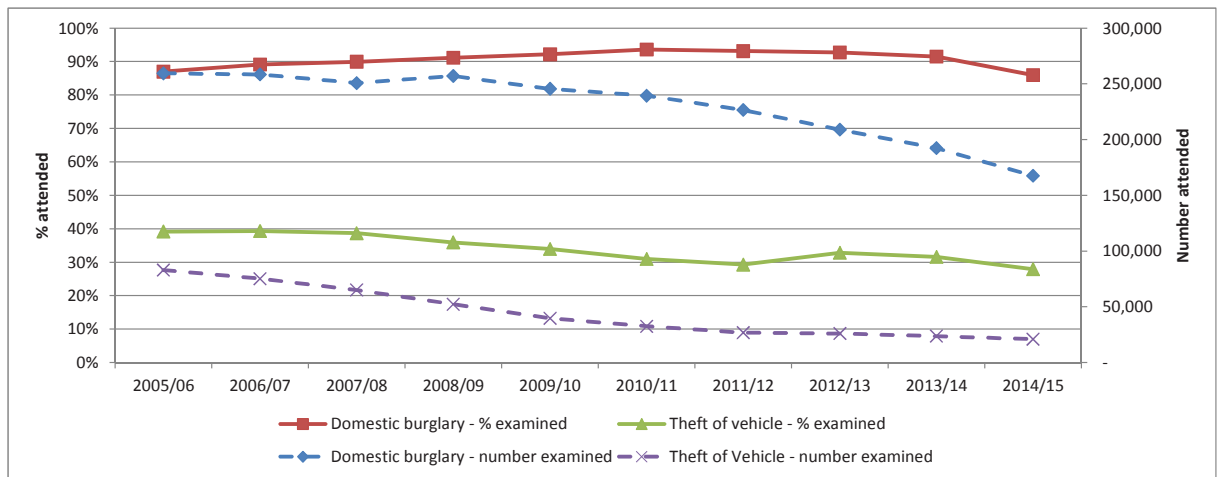
⁴ OFCOM, 'The Communications Market Report' (August 2015), http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/CMR_UK_2015.pdf

⁵ Chartered Institute of Public Finance and Accountancy (CIPFA).

⁶ Home Office, 'National DNA Database Strategy Board Annual Report 2014/15 (December 2015), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/484937/52921_NPCC_National_DNA_Database_web_pdf.pdf

⁷ Office for National Statistics, 'Crime Survey for England and Wales' (July 2015), <http://www.ons.gov.uk/ons/rel/crime-stats/crime-statistics/year-ending-march-2015/sty-crime-march-2015.html>

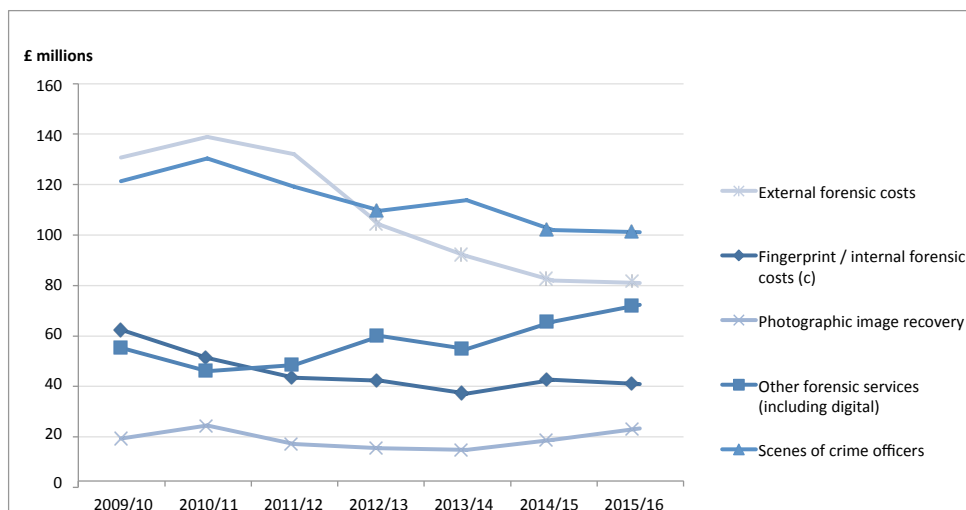
Figure 1 - Number and percentage of burglary and vehicle theft crime scenes attended by a crime scene investigator in England and Wales, 2005/06 - 2014/15



Source: Home Office

27. The reduction in spend can be attributed to a range of factors including that the number of acquisitive crimes, in which forensics have traditionally been used, is falling. The closure of the FSS resulted in greater competition and lower prices. Police forces have adopted a more targeted approach to forensics submissions, moving away from a blanket approach.
28. Consultation with police forces suggests that the majority of services are currently being delivered satisfactorily. Indeed, many are being delivered cheaper, faster, more reliably, to higher quality standards and with far greater scrutiny than they ever have been. For example, prices for DNA casework have fallen by as much as 40% and turnaround times are reduced by half⁸.

Figure 2 - Trends in forensic spending categories: estimates £m in England and Wales 2009/10 - 2015/16



Source: CIPFA⁹

⁸ Commercial information recorded by the Home Office Forensic Marketplace Management Team.

⁹ (a) The figures for each forensic spending category are based on the Chartered Institute of Public Finance and Accountancy Police Objective Analysis spending estimates. Each category has been consistently reported on over the last seven years.
 (b) This graph does not include spending on investigative overheads (which are unavailable for 09/10). Inclusion of these overhead figures does not change the overall picture of spending greatly.
 (c) 'Fingerprint and DNA bureaux' between 09/10 and 11/12.

29. The majority of forensic services are purchased through the NFFNG and the previous framework. Under this arrangement, police forces order specific tests or procedures from an external FSP, rather than an overall managed service. Whilst this approach enables forces to exercise greater control over the investigation strategy, and their expenditure on forensic services, it can also create fragmentation of cases. Investigations will also often encompass services that police forces provide in-house such as pre-screening of exhibits or the provision of digital forensics analysis. This is leading forces to consider new approaches to their relationships with external suppliers in order to consider the end-to-end oversight of the supply chain.

Transformation

30. We know that forces are transforming the way they deliver their business, for example, by collaborating on the delivery of services. The Government has placed a statutory duty on Police and Crime Commissioners and Chief Constables to collaborate where it is in the interests of efficiency and effectiveness¹⁰. Some forces have already achieved far more effective processes, with significantly reduced resources, through process improvement, but there is much more to do to reduce the duplication of services across forces.
31. Police forces must find new ways to streamline their services and make efficiencies whilst maintaining the integrity and legitimacy of forensic services. Through collaboration and the use of digital tools to transform internal business processes, police forces can remove duplication and bring together functions on a national or regional basis. This has clearly been shown through successful forensic service collaborations, for example, in collaborative procurement through the NFFNG arrangements, through the National Ballistic Intelligence Service (NABIS) services and through sharing support services such as the East Midlands Special Operations Unit.

Case study 1 – East Midlands collaboration

Five police forces in the East Midlands region; Derbyshire, Leicestershire, Lincolnshire, Northamptonshire and Nottinghamshire, have shared policing expertise and resources, including forensic science, to improve their effectiveness and increase the capability to detect and prevent serious crime. The collaboration programme seeks to combine innovative yet practical approaches to policing to make the region a safer place to live, work and visit.

Collaboration on forensic science sits within the East Midlands Special Operations Unit (EMSOU), and is formalised by a document legally-binding on each of the police forces. EMSOU is not separate from the five forces, it is an amalgamation of the key resources that can be deployed as and when there is an investigative need. Through this approach, the East Midlands region has reduced forensic science costs by 44%; from £24 million in 2010 to just over £13 million in 2015.

¹⁰ Police Reform and Social Responsibility Act (2011).

A National Approach to Forensic Science Delivery

32. For police forces to respond quickly to new and emerging threats, and take advantage of the opportunities that arise, a new approach is required. Police forces have therefore collectively commissioned scoping work on how best to deliver a more consistent national approach.
33. Real-time forensics need to be at the heart of a new approach. This enables the ability to deliver forensic outputs as near to the point of need as possible; delivering faster results, informing real time investigations and resulting in swifter criminal justice outcomes.
34. Police forces are considering a new approach which could enable a single forensic deployment to cover all requirements; from traditional evidence recovery to digital triage and basic crime reporting. To deliver this, the crime scene investigator would need the skills and technical capabilities to allow forensic information to be collected and processed at scene and directed to the most appropriate database or end user; be it investigator, prosecutor or specialist.

Legitimacy of Forensic Science

35. This strategy will deliver an approach to forensic science that reinforces the legitimacy of forensic science through consistent quality management across police forces, including a clearer statutory role for the Forensic Science Regulator.
36. Forensic science in the UK is delivered to a high standard that is acknowledged globally. High profile cases have led to significant efforts being made to ensure legitimate, credible and validated forensic science support for the CJS. Confidence in forensic science in the UK has remained high and there have not been major or widespread challenges as a result of those experienced in other countries, for example, in the US, serious doubts have been raised about the reliability of hair analysis carried out by the FBI in the 1980s and 1990s.

Case study 2 – The Birmingham Six

Following the acquittal of the “Birmingham Six” in 1991, who were jailed for the Birmingham pub bombings of November 1974, substantial reforms and safeguards have been implemented to maintain public confidence in the integrity of the CJS in England and Wales. The case against the Birmingham Six collapsed when fresh evidence caused the Court of Appeal to cast doubt on a key piece of forensic evidence used at the original trial to secure the convictions.

Rigorous quality standards have been put in place to determine a common and consistent approach on how forensic science is applied. The standards are determined by the Forensic Science Regulator and published in the Codes of Practice and Conduct. All commercial and police providers are expected to conform to the standards.

Quality Management

37. Operating within a robust quality framework provides the CJS with an assurance of the legitimacy of the evidence being submitted. Complying with international standards, such as ISO17025¹¹, provides a framework that assesses competence, quality and effectiveness in meeting customer requirements. Accreditation to these standards by an independent body demonstrates that the processes within which evidence has been obtained and analysed have been independently assessed to ensure appropriate validation of the methods used and competency of the staff who conduct the analysis.
38. Consistent quality across an organisation enables more cost efficient operations. The absence or failure of quality management systems could lead to massive costs from investigating and correcting miscarriages of justice.
39. The Forensic Science Regulator was established in 2007 to advise Government and the CJS on quality standards in the provision of forensic science. The Regulator ensures that forensic science services across the CJS in England and Wales are provided within an appropriate regime of quality standards. Scotland and Northern Ireland have their own CJSs but follow the Forensic Science Regulator’s standards. The Forensic Science Regulator published her first Annual Report in December 2015.
40. The Forensic Science Regulator has published the Codes of Practice and Conduct which provide additional guidance, context and interpretation of the standards for the UK. Accreditation of forensic science is carried out by the UK Accreditation Service (UKAS). This process of independent assessment provides an accountable and transparent process that strengthens public trust.

¹¹ ISO17025 is the international standard used to confirm the competence of a laboratory. It specifies the general requirements for testing and allows laboratories to develop management systems for quality, administrative and technical operations.

41. Under existing commercial arrangements, all commercial FSPs that deliver services under the NFFNG are required to be accredited to ISO17025 standards for each of the services they provide. However, this requirement for accreditation does not apply to services purchased outside of the framework, such as digital forensics or services purchased by the defence.
42. Police forces which carry out in-house forensic provision have agreed a timetable with the Forensic Science Regulator within which they will obtain accreditation to the same standards as those required by external providers.
43. Digital forensics is a growing and dynamic area but it is still possible to apply the same standards as for other forensic science disciplines to achieve accreditation. The rapid pace of technological change and the introduction of new devices mean that new methods are required in order to extract information. However, the use of an overarching quality management system is still essential to ensure the validity of the methods and the competence of the staff.
44. **We will develop proposals to give the Forensic Science Regulator statutory powers, put the current remit and the associated Codes of Practice on a statutory basis and enable the Forensic Science Regulator to investigate non-compliance where necessary.**

Perceptions of forensic science and its value

45. Research into the contribution that forensic evidence makes to the investigation of crime is limited. Forensic evidence is only collected in a minority of cases, partly due to its availability at crime scenes¹². However, a high-quality US study suggests that its contribution is most marked in detecting offences which otherwise would remain unsolved and identifying more prolific offenders¹³. Other international studies have found that cases which involve the collection and examination of forensic evidence have a greater chance of success as they progress through the different stages of the CJS¹⁴. However, the extent to which these findings apply equally within England and Wales is not clear.
46. There is a need for in-depth analyses to enhance our understanding of the specific contribution of forensic science to the CJS in England and Wales; for example, in terms of deterrence, increased prosecutions and convictions, and maintaining legitimacy and impartiality. **We will commission further research to identify the contribution and value of forensic science to the CJS in England and Wales in light of changing crime types and digital technology.**

12 Burrows J., Hopkins M., Hubbard R., Robinson A., Speed M., and Tilley, N., (2005) *Understanding the attrition process in volume crime investigations*. London: Home Office.

13 Roman J., Reid S., Reid J., Chalfin A., Adams W., Knight C. (2009) *The DNA field experiment: cost-effectiveness analysis of the use of DNA in the investigation of high-volume crimes*. Washington, DC: The Urban Institute.

14 Peterson, J. L., Hickman, M. J., Strom, K. J. and Johnson, D. J. (2013), Effect of Forensic Evidence on Criminal Justice Case Processing. *Journal of Forensic Sciences*, 58: 578-590.

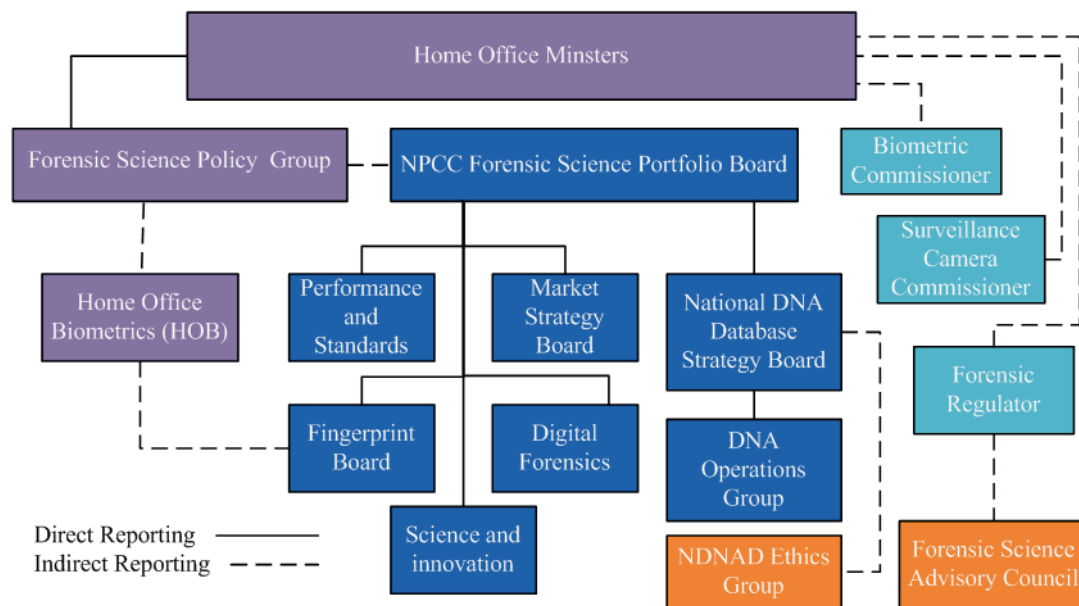
Forensic Supply Chain

47. Through this strategy, police forces will have a national approach to forensic science delivery that will provide a more strategic relationship with the forensic supply chain through:
 - a) ongoing oversight of the health of the supply chain, including contingency plans developed by police forces to cope with disruption to the market.
 - b) a review by police forces of the case for moving the current fragmented arrangements to a nationally organised system
48. The NFFNG was set up in 2012 for procurement of forensic laboratory services. The NFFNG includes laboratory services across 13 areas, with nine commercial suppliers presenting the forces with a range of suppliers to choose from whilst also maintaining healthy competition in the market. The NFFNG does not currently include suppliers of digital services.
49. The NFFNG is not a mandated national framework. With the exception of the North East region, all forces use or have used the framework. The majority of forensic services are purchased under the NFFNG as part of collaborative regional competitions with standardised specifications and regional aggregated volumes. However, the forensic landscape has changed considerably since the introduction of the first national procurement framework in 2008. A number of new suppliers have entered the forensic market, police forces are delivering more services in-house and new types of commercial partnerships have emerged in some police regions.
50. For digital forensics, there is a varied approach to the way services are procured and delivered. In some forces, digital forensics are delivered through forensic departments; in others, it is part of high tech crime units or intelligence bureaux. Most forces have invested in providing digital forensics in-house, but the growth in demand means they often use external suppliers when internal resource cannot meet demand or to clear a backlog. This leads to external digital services being procured in an ad hoc manner, which is unlikely to represent good value for money.
51. There is currently a mixed landscape of forensic delivery models in existence, ranging from those based at an individual force level, models based on well-developed collaborative/regional structures, to some operating models linked to wider partnership approaches. Rather than simply a different type of service contract, a partnership approach could include working with a specific FSP for the purposes of research and development or contracting for forensic services as part of a wider partnership contract for management of support functions. **Therefore, we will complete our work with police forces to deliver new forensic procurement arrangements and contingency plans to mitigate any disruption in forensic service.**
52. Currently, FSPs are responsible for their own archived materials, but there is no mechanism to ensure that this material is retained should a provider exit the market. The preservation of relevant material from providers is critical to the continuity and legitimacy of evidence. The Home Office sponsors the Forensic Archive Limited (FAL) which holds the historic case exhibits from the FSS, but there is currently no provision for FAL to take on materials from other providers. **We will carry out a review of FAL in 2016, which will include the wider requirements of, and options for, maintaining archived forensic materials.**

Lean and Transparent Governance

53. Through this strategy, we will have a national approach to forensic science delivery that provides lean and transparent governance mechanisms through enhanced governance for the forensics system, including a wider role for the NDNAD Ethics Group.
54. The current governance arrangements have grown organically over a number of years. For example, the past ten years has seen the introduction of independent oversight through the roles of the Forensic Science Regulator, Biometrics Commissioner, and Surveillance Camera Commissioner (SCC) and the creation of new governance arrangements for forensic science through the FPG.
55. The FPG is the overarching board where all stakeholders meet to identify and manage the progression of forensic service provision within England and Wales, and it will oversee the delivery of the strategy commitments. The NDNAD Strategy board is a statutory group which considers the strategic development of the NDNAD from an operational, policy and privacy context. The governance of other forensic disciplines is less developed. In order to bring clarity to the governance for fingerprints and the associated IDENT1 database, **we will extend the NDNAD Strategy Board to include the governance structure for fingerprints by the end of 2016.**

Figure 3 - Current Forensic Science Governance and Oversight



56. The NDNAD Ethics Group, an advisory non-departmental public body, was established to provide independent advice on ethical issues surrounding the operations of the NDNAD to Home Office ministers and the NDNAD Strategy Board. Both the NDNAD Ethics Group and the Information Commissioner are represented on the NDNAD Strategy Board. Ethical issues relating to forensic science and biometric information are often connected. **Therefore, the remit of the NDNAD Ethics Group will be expanded to include both forensic science and biometric information.**
57. **To achieve this, we will review the existing governance structure in order to ensure there is:**
- a clear, simple, overarching governance structure, capitalising on the national approach,**
 - stronger engagement on forensic science with the Ministry of Justice.**

Skills, Knowledge and Capability

58. Through this strategy, police forces will consider a national approach to forensic science delivery that enhances knowledge and skills through:
 - a) working with the College of Policing to understand the capabilities required within the forensic science workforce,
 - b) nurturing a stronger partnership with industry and education to ensure that learning programmes are future-proofed and aligned to the business requirements.
59. Forensic science includes a broad range of knowledge and skills. A single forensic investigation can involve multiple experts in multiple disciplines. As crime and technology evolves, a different mix of skills will be needed alongside the existing knowledge base to ensure that police forces and the CJS have the agility and flexibility to respond effectively.
60. Over the past 20 years, advances in technology have led to automation of processes, reductions in cost and time, and a change in the skills required by forensic scientists. This largely reflects trends in other industries. Science and technology continue to develop, creating new challenges with new digital devices and increasingly complex encryption, as well as new opportunities through advances in traditional science such as new DNA technologies, leading to the potential for forensic analysis in real time. Complex analysis that once took days or weeks could soon be completed within hours or minutes. Some laboratory tasks are now almost completely automated, meaning the skills required by the scientist have also changed, with a greater emphasis on interpreting the results.

Digital capabilities

61. Digital forensics are a key tool in the investigation of almost all crime types. Police need the capability to understand and tackle all levels of digital crime, including giving first responders the skills and equipment to preserve the 'digital crime scene'.
62. The National Police Lead for digital investigation and intelligence (DII), Chief Constable Stephen Kavanagh, has set out a framework for DII development nationally, regionally and locally, focusing on people, ways of working, digital sources, exploitation and partnerships. The programme will work with the College of Policing to ensure that, within police forces, there is coordination and oversight of training requirements in relation to digital investigation. It will also consider the digital forensics capability and capacity aligned to this strategy.
63. A national approach to digital forensics would ensure that services are designed, built once, and used many times across law enforcement agencies. There is already much good work underway to develop digital forensic capability across law enforcement. Police forces need to ensure that as any particular tools or techniques are developed there is sufficient governance and infrastructure in place to avoid unnecessary duplication. **Digital forensic capabilities will be shared between law enforcement agencies as quickly as possible where operational and legal considerations permit.**

Front line officers

64. Real-time forensics will move forensic science from a largely reactive and supportive role in investigations, into a role that proactively informs the investigation through the provision of quick and reliable information. As a result, the role of investigators will change, and new knowledge and skills will be required by officers to ensure that forensic evidence is properly identified, recovered and acted upon.
65. Police forces will take digital investigation closer to the crime scene, with earlier assessment and intervention of digital sources in order to reduce the burden of central

examination. Some child sexual exploitation cases have shown that this approach can identify early evidential items or data which encourage early guilty pleas, with one force reporting that up to 90% of offenders who are shown the early results of an investigation during interview then admit the offence.

66. Some forces are beginning to form partnerships with universities to meet the new and increasing demands for specialist skills in forensics. **The College of Policing have committed to developing a strategy for the review and development of national police forensic learning from crime scene to court.**

Case Study 3 – Portsmouth University

The Forensic Innovation Centre is a joint initiative between Portsmouth University and Hampshire Constabulary in which police and academics work together to help detect and reduce crime. The collaboration is mutually beneficial. For Hampshire Constabulary, it provides a purpose built infrastructure with access to academic partnerships which brings new opportunities for innovation. For the University of Portsmouth, it provides their forensics studies students with real life experience in their field, significantly increasing their employability.

The initiative embeds the team in an academic environment, which helps facilitate a two way exchange of expertise. Staff are able to obtain masters degrees in their field from the university, with some serving as honorary lecturers, imparting their professional experiences to prospective crime scene investigators.

The University helps the forensics team to keep up-to-date with the ever-evolving technology the forensics team encounter. For example, students can take on research challenges which could include developing software designed to solve specific problems arising from digital forensics.

Knowledge and skills for the wider CJS

67. Forensic science is not just a matter for the police but also for the courts and wider CJS. Forensic evidence presented to courts must be not only reliable and scientifically rigorous but also accessible to juries. **We will work with partners including the Ministry of Justice, academia and the College of Policing to embed the recommendations of the Leveson Review. As well as introducing statutory powers for the Forensic Science Regulator, this will involve developing guidance to facilitate understanding of forensic science processes for the courts and for juries.**

Innovation and Continuous Improvement

68. By the end of this Parliament, we will have a national approach to forensic science delivery that nurtures a **culture of innovation and continuous improvement** through working closely with research councils and other public research organisations to identify new cost effective opportunities and influences for forensic science.
69. Throughout the history of policing, developments in forensic science have led to fundamental changes in the way crime is investigated. Innovations ranging from fingerprint analysis in the early twentieth century, to DNA profiling in the 1980s and, most recently, digital forensics, have identified entirely new evidence traces that provide investigators with powerful new tools for identifying the perpetrators of crime. In light of the way crime is rapidly evolving, the forensic science community must continue to invest in research and development of new capabilities for law enforcement.

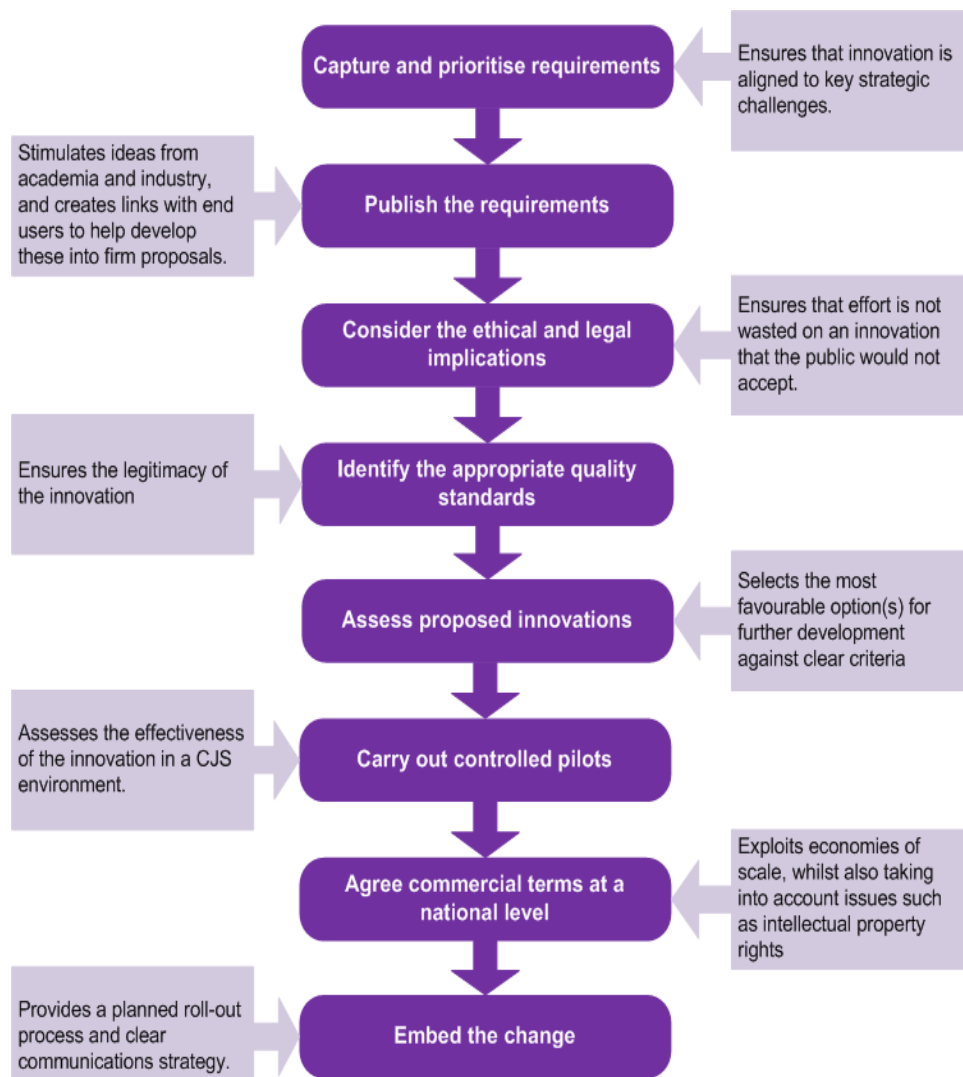
The research landscape

70. Research and development in forensic science is carried out by private FSPs, academic institutions, police forces and the Home Office. The breadth of forensic science disciplines creates a complex landscape in which collaboration between organisations is vital.
71. Currently the forensic market does not sufficiently incentivise investment in research and development as relatively short-term commercial contracts and the lack of clarity over requirements combine to create uncertain prospects for turning ideas into commercially viable products or services.
72. However, there are a number of innovative partnerships emerging. For example, the partnership between the MPS and King's College London (KCL) has enabled the MPS to leverage greater benefits from smaller investments. This has resulted in both published research and operational benefits such as improved methods of evidence recovery and analysis.
73. The Knowledge Transfer Network established a Forensic Science Special Interest Group (FSSIG) in 2012 to help facilitate research and development activity in forensic science. The FSSIG has developed a Forensic Innovation Database that identifies and publishes research challenges, and establishes contacts between the research community and end users. The Knowledge Fund has been set up to establish evidenced-based research to support transformation. However, there is no national mechanism for setting research priorities for the CJS.

How might a national approach support innovation?

74. This diagram illustrates how any national approach might ensure that innovation addresses the most important requirements of the CJS; that new techniques are fit for purpose, proportionate and affordable, and that police forces adopt innovations consistently across the service.

Figure 4 – Embedding innovation in the national approach



75. There are areas of research that could be of benefit to the CJS, but which have very limited prospects of generating a return on investment for the private sector. A national approach to forensic service delivery could generate significant savings for police forces, which could be recycled into priority areas of research.

76. The rapid growth and constant evolution of digital technology means digital forensics presents a unique challenge for research and development. Traditional research and development structures are typically geared towards the investigation of longer-term challenges, while research and development in digital forensics is a constant requirement to respond to everyday casework investigations.

77. Casework research is currently largely carried out in-house by police forces as and when an individual force encounters a particular challenge. However, a national approach could better coordinate requirements and share learning across forces.

78. In addition, many of the solutions to digital forensic challenges require engagement with the manufacturers of digital devices. Taking a singular approach would develop a more strategic relationship with manufacturers and approach them with a single unified voice.

Future opportunities

79. The forensic landscape has already driven innovations towards faster, cheaper and better quality services over the past five years, but, in the main, these services remain laboratory-based. The greatest opportunities in the delivery of forensic analysis in the next five years will come from a move away from the laboratory and towards the scene of the crime to enable 'real time' analysis. Such tools and techniques enable the rapid analysis of potential evidence at the scene, without compromising on quality, and with the speed of forensic investigations being significantly improved.
80. Digitisation of the end-to-end process will be vital to ensure that investigative leads generated in real-time, can also be acted on in real time. Wider technological trends will also offer new forensic opportunities to law enforcement. It is predicted that by 2020, over 20 billion devices worldwide will be connected to the Internet of Things¹⁵. This will create new types of digital traces that could be identified in forensic investigations.
81. The medical and food sectors have made significant advances in genetics, and phenotypic profiling has the potential to provide valuable intelligence such as physical characteristics of an individual. This would, however, require significant ethical scrutiny and a statutory framework to gain public acceptance.
82. Innovations such as these have the potential to transform forensic science in policing. However, these innovations could be disruptive to traditional forensic structures and markets. A national policing approach to forensic services would facilitate a coherent and effective response.

¹⁵ The Internet of Things is a network of networks of uniquely identifiable endpoints (or "things") that communicate without human interaction using IP connectivity, whether locally or globally.

Next Steps

Implementation

83. The implementation of this strategy will be overseen by the FPG which is chaired by the Home Office and includes representation from policing (including the national policing lead for forensics), the Ministry of Justice, the Forensic Science Regulator, and other CJS partners.

A national approach

84. In early 2016, the police service will consider options on how best to develop a digital approach which could encompass biometrics (e.g. fingerprint bureaux) or broader areas of forensics, including scene of crime officers, digital forensics and other in house forensic facilities. Scoping work setting out business case options is expected to be completed in Spring 2016. A national approach to forensic science delivery, proposed and delivered by police forces, would aim to ensure greater consistency of service quality; resilient, reliable capability and with economies of scale.

List of Acronyms

CAST	Centre for Applied Science and Technology
CJS	Criminal Justice System
CIPFA	Chartered Institute of Public Finance and Accountancy
CSEW	Crime Survey for England and Wales
DII	Digital Intelligence and Investigation
DNA	Deoxyribonucleic Acid
FAL	Forensic Archive Limited
FSSIG	Forensic Science Special Interest Group
FPG	Forensic Policy Group
FSP	Forensic Service Provider
FSS	Forensic Science Service
FSR	Forensic Science Regulator
KCL	King's College London
MPS	Metropolitan Police Service
NABIS	National Ballistics Intelligence Service
NDNAD	National DNA Database
NFFNG	The National Forensic Framework Next Generation
SCC	Surveillance Camera Commissioner
UKAS	United Kingdom Accreditation Service

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- Chartered Society of Forensic Sciences
- College of Policing
- Courts and Tribunals Judiciary
- Crown Prosecution Service
- Cheshire Police
- Devon & Cornwall Police
- National DNA Database Ethics Group
- East Midlands Special Operations Unit
- Forensic Science Regulator
- Government Office for Science
- Information Commissioner's Office
- Knowledge Transfer Network
- Leicestershire Police
- Metropolitan Police Service
- Ministry of Justice
- National Crime Agency
- National Police Chiefs' Council
- Scottish Police Authority
- Staffordshire Police
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