University of Glasgow
School of Education

SCCJR
The Scottish Centre for Crime & Justice Research

Crime and Technology

INTRODUCTION

The use of technology in crime detection and policing is ever-changing as new technological advancements are made almost daily. From DNA technology to Artificial Intelligence (AI), most forms of technology have found their way into the criminal justice sphere in one way or another – whether this is in committing crime, detecting crime, or both.

This resource will cover a range of topics related to crime and technology, including:

- Electronic monitoring (tagging)
- Use of drones
- CCTV
- Facial recognition
- Police bodyworn cameras

Photo by Mathias Reding on Unsplash

What is electronic monitoring and how is it used?

Electronic monitoring (EM), also commonly known at 'tagging' due to the use of an ankle monitor or 'tag', was introduced in Scotland in 1998 and rolled out nationwide in 2002. EM is often used in Restriction of Liberty Orders (RLOs) Home Detention Curfews (HDCs – these were introduced in 2006), Community Payback Orders (CPOs) or Drug Treatment and Testing Orders (DTTOs). You can read more about these in the learning resource on **Community Sentences and Financial Penalties**.

In Scotland, a private company called G4S is responsible for providing and monitoring EM. A tag can be fitted to someone for their full sentence or, sometimes, to someone leaving prison and serving the rest of their sentence in the community. EM uses radio-frequency technology to monitor those wearing a tag and if they are complying with the conditions of their sentence e.g., they must be inside a certain address between the hours of 7pm and 7am. A primary monitoring unit will be placed within an address where the proximity to the tag can be established. If the tag is outwith this address within curfew hours, G4S will be alerted and this will be investigated. Non-compliance with EM could ultimately lead to imprisonment.

The potential uses of EM, especially with developing technologies, have been highlighted and its use was extended under the Management of Offenders (Scotland) Act 2019 so it

could be combined with other community justice measures. It was also recognised that those on EM need additional help to address their needs so it should be included as part of a support package.
The use of Global Positioning Systems (GPS) for EM was approved in January 2025 but only in certain cases. The Scottish Government stated:

> *'GPS will only be used within HDC where the HDC risk assessment concludes that GPS use will be appropriate and proportionate. The regulations come into force on 31 January 2025.'* **Scottish Government, 2025.**

One of the main features of GPS enabled EM is that 'exclusion zones' can be included as a condition, enabling people to be banned from certain areas at certain times and their location to be monitored. For example, shoplifters could be banned from entering a shopping centre or perpetrators of domestic violence banned from entering the street where a previous victim may live. The GPS can tell in real time if these conditions are broken and appropriate actions taken.
These additional technological advancements can increase flexibility of EM and offer tailored conditions to each person; however, they will also increase the level of surveillance and data collected on individuals subject to EM.

Use of drones

Drones are used in several different ways in crime detection but also in offending. In recent years drones are becoming increasingly affordable and are often used for legitimate means as a hobby, or professionally by photographers etc. If you are using a drone professionally, you are expected to complete an accredited course that will teach you about drone safety about the law governing drones. The Civil Aviation Authority (CAA) Air Navigation Order (2016) is the law which governs drone activity in the UK and ensures they are flown and monitored in a safe way. Drones are also used by the police for surveillance, monitoring of borders and capturing images of large-scale civil events such as protests.
As of 2023, there were almost 400 drones in use by police throughout the UK and in 2024/2025 over £4million was provided by the Home Office for the use of drones and to explore how their use could be expanded. These figures show how indispensable drones have become in modern policing in the UK. Whilst the use of drones is framed as protecting public safety, the increase in surveillance of the public who are generally law-abiding has been criticised – especially when it comes to using them to monitor and film legal peaceful protests and the security of the data collected by the drones. This type of surveillance is added to the other measures already in place such as CCTV, bodyworn cameras and facial recognition technology.

Discussion point: Do you think surveillance of the general public is justified in the interests of public safety, or is it an invasion of privacy?

However, they can be used for illegitimate purposes such as attempting to carry illegal substances, phones and other supplies into prisons. This is thought to account for almost a third of all illegal drone activities (Protect UK 2025). As the below image shows, the issue of drones attempting to access prisons is an almost daily occurrence in the UK with 1063 incidents in 2023 in England and Wales.

More than 1,000 drone incidents at jails in England and Wales last year

Exclusive: MoJ attempts to fight back against brazen deliveries that often include household items like ketchup alongside drugs

The number of drones sighted or reported around prisons in England and Wales more than doubled between 2022 and 2023. Photograph: Christopher Thomond/The Guardian

Source: https://www.theguardian.com/society/2024/oct/25/more-than-1000-drone-incidents-at-jails-in-england-and-wales-last-year

This is just as much an issue in Scotland with drones being intercepted on a regular basis. As well as being illegal, if the products make it into prison they feed and drive gangs and organised crime – inflating prices of products to such an extent that this can result in debt and violence. To tackle drone activity, HMP Perth, HMP Edinburgh and HMP Glenochil have had window grilles installed, and they are

The six-rotor drone captured by the prison service and some of its haul laid out on the table

The image shows the cargo of a drone intercepted by staff at Perth prison

hoping to roll this out across the prison estate. In the 6 months after installation, HMP Perth reported no drone breaches which suggests the measures have been a success.

CCTV

CCTV is arguably the most well-known use of technology and has become a normal and accepted part of everyday life. From its introduction in London as a temporary measure in the 1960's, to its rollout in the 80's and 90's due to advances in technology, CCTV has become a mainstream part of life in Britain and around the globe.
CCTV has different functions – it can be used as a crime deterrent in streets, commercial property and personal property; as crime detection e.g. catching thieves in shops; as evidence in criminal cases e.g. tracking movements and proof of criminal activity. Images captured on CCTV related to major crimes tend to stick in the public psyche and are remembered for years. The grainy image below shows 3-year-old Jamie Bulger being led away by 2 young boys who subsequently murdered him in 1993:

CCTV footage showed James Bulger being led away by two boys

Image source: James Bulger detective recalls mother's scream 25 years on -

The use of this image, and other CCTV images which helped identify the age of the young boys, was vital evidence in the case against them. This was a crime that gripped the nation and this image has become synonymous with the case. These days, CCTV has advanced, and clear images can be detected from miles away but in the early 90's this image was vital as CCTV had not yet been widely rolled out in Liverpool where the crime took place.
What started as an outdoor form of surveillance by police has slowly crept into private lives with more individuals setting up their own cameras. In fact, figures show that more CCTV cameras are privately owned than publicly owned, especially with the recent increase in video doorbells, dashcams and indoor cameras. CCTV is the original form of mass

surveillance using technology and is the basis from which many other forms have emerged, such as bodyworn cameras, ANPR and facial recognition (see below). A study by Nottingham Trent University in 2017 discovered that 65% of investigations found CCTV useful – a number which has no doubt increased over the years with the advent of video doorbells and personal cameras. Research shows that 20% of British people have a video doorbell. The increase in such technologies has increased the level of surveillance on innocent citizens whose privacy could be intruded upon without their knowledge. For example, in 2021 a case in Oxford found the use of a Ring doorbell broke Data Protection laws by capturing images of a neighbour's garden and driveway, as well as recording conversations, and issued a fine. Whilst the small print that comes with these smart devices encourage fair use and to respect the privacy of others, individuals are often not aware of Data Protection laws and could be left vulnerable to fines and prosecution without proper use of the devices. On the other hand, footage from video doorbells has been successfully used to detect, capture and successfully prosecute criminals.

Discussion point: Do you think constant surveillance by CCTV and video doorbells is a good price to pay for helping detect and prosecute crime? Or is this an infringement on privacy and human rights?

Facial Recognition

Closely linked to CCTV is the use of Facial Recognition technology by the police in the UK. According to the Home Office, there are 3 types of Facial Recognition:

1. Retrospective Facial Recognition (RFR) – this is where previously recorded CCTV images of an area or event where a crime took place is reviewed and people's faces compared using images in the Police National Database facial search facility. These images could be of those arrested, convicted or of missing persons.
2. Live Facial Recognition (LFR) – this is used in a targeted way in particular locations and the public should always be informed that LFR is in use. The cameras are able to scan faces in large crowds and match faces to known images of suspects or criminals on a particular 'watch list'. A police officer on the ground will take appropriate action if a match is identified. All images collected of those who are not matches are deleted immediately in line with Data Protection regulations.
3. Operator Initiated Facial Recognition (OIFR) – this is done through an app on a police issued mobile phone where an officer takes a photo of someone they believe is of interest to the police. They can then check on the spot if this person is a match for a wanted or missing person instead of arresting them/taking them to the station. This form of facial recognition technology is not used by all police forces in the UK at the moment.

Whilst the police maintain that the use of Facial Recognition adheres to all the relevant regulations, their use of this technology has been criticised. In 2020, South Wales Police

were taken to court over the unlawful use of LFR due to lack of guidance on where it could be used and found there was a need for greater transparency and safeguards around its use. Facial Recognition technology in general has been criticised due to its apparent lower level of accuracy when it comes to identifying women and people of colour, leaving room for misidentification, wrongful arrests and harassment. The Metropolitan Police in London have also bee heavily criticised for their over-use of LFR in areas with higher Black populations which has been said to;

'…reinforce(s) the troubling assumption that certain communities, such as those in Croydon, Lewisham and Haringey, are more likely to be criminals…The arrest figures are low, and it's really just subjecting us to surveillance without our knowledge, with Black Londoners being disproportionately targeted.' – Zoe Garbett, Green Party London Assembly member

The police, especially The Met, have been criticised for over-policing people of colour (see example of Stop and Search) in the past and critics are saying this has been exacerbated by the increase in technology and constant surveillance brought about by the introduction of Facial Recognition. There is also the issue of data protection and privacy laws with millions of faces being scanned yearly. With no current national law setting out rights or safeguards for Facial Recognition, campaign groups are calling for the UK government to address this urgently, so the general public are protected.
The use of Facial Recognition has also been praised for its effectiveness and efficiency with the Met Police announcing in July 2025 that they have made more than 1,000 arrests using LFR. Arguably, only a fraction of these arrests would have been made without the additional help of this technology.

Body Worn Video

Body Worn Video (BWV) is when a police officer records investigations or incidents using a small camera attached to their uniform. They record both visual and audio evidence. The camera is not always recording and must be switched on by the officer to record relevant interactions and evidence whilst on duty. The camera should be switched off when no longer required or, if making an arrest, when the suspect arrives at the police station where CCTV is present. The footage from BWV serves multiple purposes, including recording vital evidence and ensuring correct police procedures have been followed, as well as protecting the police from complaints.

Source: www.met.police.uk/bwv

Footage from BWV is uploaded after each shift and then deleted from the device. Footage is often used as evidence in court cases but, if it is not relevant or required for an investigation, it is deleted after 31 days.

Here is a link to a short video from Police Scotland that explains BWV and how it is used: https://youtu.be/JiCE-p3SKtw

As with most forms of technology used in justice, BWV is not without controversy. Since the introduction of BWV, there have been complaints of misuse for various reasons, these include switching off cameras when force is used, sharing of footage through What's App groups and relevant footage being lost or deleted.

Case Study

Brother and sister, Louisa and Yufial were prosecuted after allegedly abusing police officers at a Black Lives Matter protest in 2020. The siblings stated that they were innocent, and inappropriate force was used against them. However, due to the officers involved failing to turn on their cameras and hand over relevant footage, they were both prosecuted. After 2 years, footage was found showing Louisa being pushed and Yufial being hit by police officers. Both were eventually acquitted of any crime and the police were criticised for failing to disclose evidence. Unfortunately, during this 2 year battle, Yufial lost his job as a result, and both experienced a lot of stress.
No action was taken against any of the police officers involved.

Whilst the police say that BWV acts as an 'independent witness', the fact that its use is at the discretion of individual police officers and footage is processed and viewed by the police themselves, calls this independence into question. A recent report reviewing the Met Police found that there was a lack of transparency and accountability in the use of BWV and that they are often used as a way for officers to cover their own backs. This is despite their introduction intending to restore public trust in police officers after major incidents such as the unlawful killing of Mark Duggan.

The SCCJR has recently published a Policy Brief, written by Dr Jean-Pierre Roux, based on his research into body worn video – you can access the report here.

Automatic Number Plate Recognition and CCTV

Automatic Number Plate Recognition (ANPR) is used by police to find and identify vehicles for several reasons. Such as;

- Vehicle has no tax/insurance

- Vehicle is stolen
- Owner of the vehicle has a warrant
- Owner of the vehicle has been reported as missing
- The vehicle is known to be linked to a crime/organised crime/terrorism

As well as being fitted to police vehicles, ANPR cameras are in fixed locations around the UK – these locations are not advertised as they may be targeted or be actively avoided by those involved in criminal activities. The number of ANPR cameras is regulated and the police must complete a Data Privacy Impact Assessment if they wish to install a new camera as its location and use must be justified and not unfairly impact the privacy of those in the area. The cameras detect every number plate it sees and those that are flagged for specific reasons (see above) will come up on the ANPR system so the police can take appropriate action. If your vehicle is flagged by ANPR, the police can stop the vehicle to make investigations.

The scale of ANPR in the UK is vast with a reported 60 million reads recorded every single day in the UK. Not surprisingly, with these numbers, ANPR has proved an effective technology-based tool for the police when it comes to crime detection. All data collected by ANPR is stored at the National ANPR Data Centre in London and can be kept for two years. This has been criticised as the movements of all cars recorded, and not just those under suspicion, are kept and can be accessed for 2 years despite the innocence of their owners.

As with all forms of technology, ANPR is not without its flaws. In 2024, there were several drivers wrongfully fined for driving over the Dartford Crossing without paying the toll. This was either because their number plate was similar to one that had not paid, or the camera could not read the plate and issued an automatic fine. This caused unnecessary stress and hassle to several people and shows how ANPR is vulnerable to mistaken identity.

ANPR technology is not only used by police. It is used in several different settings – including car parks, petrol stations and ferry ports. The aim of these cameras is to catch and record those who are, for example, not paying for parking. So, even though they are not being surveilled by the police, the cameras are able to detect and log activity that may ultimately lead to court or police action that would have gone undetected in the past. The expansion of ANPR is another example of mass surveillance that often goes under the radar but is recording millions of pieces of data about law-abiding citizens daily.

Further Reading:

- Ashby, A.P.J. (2017), 'The Value of CCTV Surveillance Cameras as an Investigative Tool: An Empirical Analysis', *European Journal of Criminal Policy Research*, available at: https://irep.ntu.ac.uk/id/eprint/30588/1/PubSub8405_Ashby.pdf
- BBC News (2018), 'James Bulger detective recalls mother's scream 25 years on', available at: https://www.bbc.co.uk/news/uk-wales-mid-wales-42993094
- Centre for Crime and Justice Studies (2013), 'What's Wrong with ANPR?', available at: https://www.crimeandjustice.org.uk/whats-wrong-anpr
- Cresto-Dina, L. (2025) 'Permanent facial recognition cameras – Balancing Civil Liberties and Public Safety in the Use of Live Facial Recognition Technology', available at: https://www.saunders.co.uk/news/permanent-facial-recognition/#:~:text=In%202020%2C%20the%20Equality%20and,government%20to%20suspend%20its%20use.
- Halliday, J. (2024), 'More than 1,000 drone incidents at jails in England and Wales last year', The Guardian, available at: https://www.theguardian.com/society/2024/oct/25/more-than-1000-drone-incidents-at-jails-in-england-and-wales-last-year
- Iriss (2017), 'Electronic monitoring in the criminal justice system', available at: https://iriss.org.uk/resource/electronic-monitoring-criminal-justice-system/
- McIvor, G., & Graham, H. (2016), 'Electronic Monitoring in Scotland', available at: https://www.sccjr.ac.uk/wp-content/uploads/2016/06/Electronic-Monitoring-in-Scotland-Report.pdf
- MET Police (2026), 'How and when BWV cameras are used', available at: https://www.met.police.uk/advice/advice-and-information/bwv/body-worn-video-bwv/how-and-when-bwv-cameras-are-used/
- NPCC (2024), 'Use of drones in policing', available at: https://www.npcc.police.uk/our-work/work-of-npcc-committees/operations-coordination-committee/police-use-of-drones/
- Open Access Government (2015), 'Assessing the impact of CCTV', available at: https://www.openaccessgovernment.org/assessing-impact-cctv/17761/
- Police.UK (2026), 'Automatic Number Plate Recognition (ANPR), available at: https://www.police.uk/advice/advice-and-information/rs/road-safety/automatic-number-plate-recognition-anpr/
- Rose, C. (2024), 'Drivers get Dart fines despite not using crossing', BBC News, available at: https://www.bbc.co.uk/news/articles/c6288ey03y1o
- Scottish Government (2025), 'Criminal justice – electronic monitoring by GPS: information note', available at: https://www.gov.scot/publications/criminal-justice-electronic-monitoring-by-gps-information-note/
- Scottish Government (2026), 'Reducing reoffending: available at: https://www.gov.scot/policies/reducing-reoffending/electronic-monitoring/
- Scottish Police Authority (2024), 'Remotely Piloted Aircraft Systems "Drones" – Public

Briefing', available at: https://www.spa.police.uk/publication-library/remotely-piloted-aircraft-systems-drones-public-briefing/the-use-of-drones-in-policing-england-and-wales/

- Stalker, F. (2025), 'Prisons 'winning battle' against drug-to-order drones', BBC News, available at: https://www.bbc.co.uk/news/articles/cvgq9yewge0o#:~:text=Drones%20have%20become%20a%20preferred,cargo%20increasing%20in%20recent%20months.
- They work for you (2025), 'Police: Unmanned Air Vehicles', available at: https://www.theyworkforyou.com/wrans/?id=2025-05-14.52238.h
- UK Government (2017), 'Drones: how to fly them safely and legally', available at: https://www.gov.uk/government/news/drones-are-you-flying-yours-safely-and-legally
- UK Government (2019), 'National ANPR Standards', available at: https://www.gov.uk/government/publications/national-anpr-standards
- Vaughan, H. (2025), 'MET Police release footage as more than 1,000 arrests made using live facial recognition technology', Sky News, available at: https://news.sky.com/story/met-police-release-footage-as-more-than-1-000-arrests-made-using-live-facial-recognition-technology-13391999
- Wakefield, J. (2021), 'Neighbour wins privacy row over smart doorbell and cameras', BBC News, available at: https://www.bbc.co.uk/news/technology-58911296