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Abstract | This study examines how police use CCTV footage in criminal investigations. Structured interviews were conducted with 146 sworn members of the NSW Police Force who had recently requested footage from the NSW rail system's network of CCTV cameras.

Footage is highly valued by investigators. Nine in 10 investigators reported using the footage when it was available, and two-thirds were able to use it for the reason they had requested it. One in three investigators encountered issues related to image quality or coverage; however, two-thirds of investigators were provided with footage of a suspect and one-third with footage of the incident under investigation.

Consistent with prior research, the use and usefulness varied between offence types, with the most positive results observed for assault offences.

How do police use CCTV footage in criminal investigations?

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Closed-circuit television (CCTV) cameras are widely used in public spaces across Australia to achieve a range of crime and safety goals (Carr 2016; Hulme, Morgan & Brown 2015). However, research has tended to focus on examining the extent to which CCTV cameras prevent crime (Alexandrie 2017; Piza 2018; Welsh & Farrington 2009), while fewer studies have examined police use of CCTV in their response to crime. This is despite arguments for the investigative value of CCTV commonly being used to justify policies and codes of practice facilitating the establishment and expansion of CCTV networks in Australia (eg Australia New Zealand Policing Advisory Agency 2014; Council of Australian Governments 2012; NSW Attorney-General's Department 2000; Victorian Ombudsman 2012). Importantly, the investigative value of CCTV footage has implications for the ability of cameras to prevent crime by influencing the extent to which they are seen to increase the risks of apprehension and sanction. Research on the investigative value of CCTV footage is also critical to demonstrating its utility and cost-effectiveness in helping police secure positive criminal justice outcomes for cases, particularly given the frequency with which police request

footage as part of their investigations (Ashby 2017; Hulme, Morgan & Brown 2015; La Vigne et al. 2011; Levesley & Martin 2005; Morgan & Coughlan 2018), the significant investment of resources in CCTV networks and information sharing mechanisms between police and network administrators (Armitage 2002; Carr 2016; Hulme, Morgan & Brown 2015; Instrom Security Consultants 2014; Gill & Spriggs 2005; Wilson & Sutton 2003), and developments in footage quality and storage that have increased the potential value of CCTV cameras as a source of evidence (Taylor & Gill 2014).

Recent research has examined the role of CCTV in investigations into crime on public transport networks, both in Australia and overseas, reflecting the extensive camera coverage (and therefore financial investment) and concentration of criminal incidents that accompany the high volume of users. In the United Kingdom, studies have found pickpocketing (Sharp 2016) and metal theft cases on the railway network (Robb, Coupe & Ariel 2015) were significantly more likely to be solved when they occurred in locations monitored by CCTV cameras. Ashby (2017) found that cases in which the CCTV footage provided to police was assessed as being useful were 25 percent more likely to be solved than cases where the footage was assessed as not being useful. Most recently, research into the use of rail network CCTV footage in New South Wales revealed that police frequently requested footage (Morgan & Coughlan 2018)—an average 14 requests per day for criminal matters—and that requesting footage was associated with an increased likelihood of a matter being solved (cleared by way of legal action; Morgan & Dowling 2019). When footage was available and provided to police, matters were even more likely to be solved.

That the provision of *useful* footage appears to contribute to better investigation outcomes reflects the importance of well designed systems, but also that certain barriers can be encountered in using CCTV. Less favourable findings have emerged from research examining the benefits of CCTV in street and residential areas with less coverage (Coupe 2016; Kindgren & Marklund 2014; King, Mulligan & Raphael 2008; Olphin 2015; Paine 2012; Prenzler & Wilson 2018). Additionally, coverage and footage quality also vary markedly depending on the number of cameras monitoring an area and the different angles from which they monitor it; how cameras are mounted and whether they are static; their adaptability to times and environments of reduced lighting; the number of frames per second they record; whether there are major physical obstructions in the area of coverage; and whether systems use analog or digital recording technology (Gill & Spriggs 2005; Hulme, Morgan & Brown 2015; Instrom Security Consultants 2014; Keval & Sasse 2008; Levesley & Martin 2005; Taylor & Gill 2014). Any of these factors can contribute to poor quality CCTV footage that is of little value to police (Ashby 2017; Levesley & Martin 2005).

The usefulness of CCTV footage can also vary based on the characteristics of the offence being investigated. Ashby (2017) notes that police who received CCTV footage in relation to highly visible offences (ie violence, weapons offences and public disorder) were more likely to find it useful than police investigating more covert offences (burglary, theft and criminal damage). However, when footage of these more covert offences was useful, it had a larger positive impact on the probability of these cases being solved. Footage was also assessed as more useful in the investigation of offences that occurred at stations, where CCTV coverage is typically better, and across shorter spans of time.

Recent studies into the use of CCTV footage on the NSW rail network have measured the demand for footage (Morgan & Coughlan 2018) and the impact of footage on clearance outcomes (Morgan & Dowling 2019). They offer little insight, however, into how the footage is used by police, or the circumstances in which it is useful. This paper addresses this gap, presenting the results from surveys of police investigators who have used rail network CCTV footage.

Aim and method

The Australian Institute of Criminology (AIC) was commissioned by Sydney Trains to undertake research into the use of CCTV footage in NSW Police Force (NSWPF) investigations of criminal matters on Sydney's rail network. The current study addresses the following questions:

- Why do police investigators request CCTV footage during criminal investigations?
- How do police investigators use CCTV footage during criminal investigations?
- What factors influence the usefulness of CCTV footage as an investigative tool?

Sydney Trains administers a large proportion of the NSW rail network infrastructure, including its approximately 11,000 CCTV cameras. These cameras primarily cover train stations, including platforms, entry gates and ticket machines, although they occasionally cover areas adjacent to stations such as car parks and bus interchanges.

The camera network is actively monitored from a security control room, which enables the deployment of NSWPF and Sydney Trains security personnel when incidents are detected. While monitoring CCTV cameras is one of the primary roles of staff in the security control room, they also spend a significant amount of time retrieving footage requested by internal and external parties.

NSWPF operate an online portal (iAsk) through which police investigators can request CCTV footage from Sydney Trains. For the purposes of this study, a new question was added to the online portal, asking investigators whether they consented to being contacted by a researcher about their request for the purposes of a research project examining the usefulness of CCTV footage. Sydney Trains provided data on footage requests made by consenting officers between 28 February and 30 June 2018, including the names and contact details of investigators.

Police investigators were contacted and asked to take part in a 10-minute telephone survey about their footage request, asking specifically about the request process, why they requested the footage, how they used the footage, and why they found it useful or not. Survey questions and response options were developed in consultation with Sydney Trains on the basis of the research questions, and were informed by prior research examining the use of CCTV in criminal investigations. Where an investigator had consented to being contacted in relation to more than one request, their earliest request within the study period was selected. Investigators were contacted a minimum of four weeks after their request to allow sufficient time for the footage to be obtained and used in the investigation (noting that footage is retained by Sydney Trains for 14 days). Surveys were conducted between June and August 2018.

A total of 249 investigators who requested footage during the study period consented to being contacted by a researcher. Researchers successfully contacted 165 of these investigators. The remaining 84 investigators could not be contacted because they were on extended leave, their contact details were out of date, or they did not return repeated calls. A maximum of three attempts were made to contact each investigator, each at least one day apart, before they were removed from the list of contacts. No incentives for participation were offered to investigators, although they were assured that their participation and responses would remain confidential. They were also offered an information sheet specifying the details of the research project, including its approval by the AIC's Human Research Ethics Committee, Sydney Trains and NSWPF. One hundred and forty-six investigators agreed to participate when contacted, while 19 indicated that they were either too busy to take part, or that the footage related to an especially sensitive case (ie a case that had received substantial publicity or intensive oversight from the executive) which they were not comfortable discussing, even confidentially.

Footage requests were classified based on the principal offence type recorded by investigators in their iAsk request. Surveys focused on the five offence types that were most likely to result in a request for footage, or which appeared most often among the requests for footage recorded by Sydney Trains (see Morgan & Coughlan 2018). These included assault (n=32; 22%), robbery (n=31; 21%), theft (n=31; 21%), sexual offences (n=29; 20%) and property damage (n=23; 16%). Importantly, a little over a third of the incidents being investigated (37%) occurred outside of the rail network. In these cases, footage was requested either to capture events in the rail network connected with these incidents (eg suspects boarding a train after breaking into a nearby residence), or in the hope that incidents occurring just off rail network property were captured by one or more of the network's cameras (eg in a nearby car park or bus interchange). Around two-thirds of requests were for footage covering less than one hour (64%). Of the 146 investigators who consented to participate, 136 (93%) reported they had received the footage they requested.

The current study examines only the retrospective use of CCTV footage in criminal investigations, not its role in the real-time monitoring and disruption of ongoing offences. The investigations examined in this study related to volume crimes and may not be representative of larger investigations, such as those related to national security and organised crime. Additionally, the small number of investigators who refused to participate due to case sensitivities means that investigations of more serious crimes may also be under-represented in the current sample. Further, it is important to note that police can request footage for a variety of reasons other than criminal investigations, including welfare checks, missing person investigations, general intelligence collection and other non-criminal inquiries (Morgan & Coughlan 2018). The current study does not examine police use of CCTV in relation to these matters. Finally, the use of this footage beyond the investigation—specifically, as part of the court process—was outside the scope of this study.

Results

Why do police request CCTV footage during criminal investigations?

Most investigators (80%) reported having requested CCTV footage to locate or confirm the identity of a suspect (Table 1). The next most common reasons included determining whether an offence had occurred (30%); corroborating victim, suspect and/or third party statements (29%); observing relevant events surrounding incidents (20%); and generating intelligence or other investigative leads (eg establishing time lines, obtaining footage of damaged or stolen property or vehicle licence plates; 13%). Fewer than 10 percent requested footage to pinpoint the time or place of incidents (6%), or to identify or confirm the identity of victims or third parties (4%).

There was some variation between offence types in the reason for requesting footage. Investigators of assault (52%) and sexual offence incidents (74%) were less likely than investigators of other offence types to have requested footage to locate or confirm the identity of suspects, but were more likely to have requested it to determine whether an offence had occurred (62% and 37%, respectively) and to corroborate statements (55% and 37%, respectively). Investigators of theft incidents were more likely to have requested footage to generate intelligence or investigative leads (33%).

Table 1: Reasons for requesting CCTV footage, by offence type

	Offence type % (n)					
	Assault (n=31)	Property damage (n=21)	Robbery (n=27)	Theft (n=30)	Sexual (n=27)	Total (n=136)
Identify/confirm suspects	52 (16)	86 (18)	100 (27)	93 (28)	74 (20)	80 (109)
Determine whether offence had occurred	62 (19)	24 (5)	22 (6)	3 (1)	37 (10)	30 (41)
Corroborate statements	55 (17)	10 (2)	15 (4)	20 (6)	37 (10)	29 (39)
Observe relevant events surrounding incident	16 (5)	24 (5)	15 (4)	23 (7)	22 (6)	20 (27)
Intelligence/investigative leads	3 (1)	10 (2)	11 (3)	33 (10)	4 (1)	13 (17)
Pinpoint time/place of incident	0 (0)	10 (2)	11 (3)	3 (1)	7 (2)	6 (8)
Identify/confirm victims or other third parties	0 (0)	5 (1)	4 (1)	0 (0)	11 (3)	4 (5)

Note: Limited to investigators who had received footage. Investigators could provide multiple responses
Source: AIC CCTV NSWPF survey dataset [AIC data file]

The investigators were asked about the other types of evidence available to them before they requested footage. There was little variation in their responses, suggesting that the reason for requesting footage is more likely to be influenced by the characteristics or circumstances of the incident (see Table 2). Seventy-nine percent of investigators had collected at least one other type of evidence prior to requesting footage. This typically included statements (69%) and visual/audio recordings (including photographs, mobile phone footage and other CCTV footage from outside the Sydney Trains network; 33%). Medical/forensic and other physical evidence had each been collected prior to footage being requested in 10 percent of cases. Investigators of property damage incidents were less likely than other investigators to have collected statements prior to requesting footage (52%), while investigators who requested footage as part of theft (26%) and sexual assault incident (24%) investigations were less likely to have collected visual/audio recordings than those investigating other offence types. Investigators were more likely to have collected medical/forensic evidence (23%) for theft incidents.

	Offence type % (n)					
	Assault (n=32)	Property damage (n=23)	Robbery (n=31)	Theft (n=31)	Sexual (n=29)	Total (n=146)
Statements	72 (23)	52 (12)	74 (23)	71 (22)	72 (21)	69 (101)
Visual/audio recordings	38 (12)	35 (8)	42 (13)	26 (8)	24 (7)	33 (48)
Medical/forensic	0 (0)	9 (2)	10 (3)	23 (7)	10 (3)	10 (15)
Physical	6 (2)	17 (4)	16 (5)	6 (2)	7 (2)	10 (15)
Other/unspecified	0 (0)	4 (1)	0 (0)	3 (1)	0 (0)	1 (2)
Any evidence	81 (26)	74 (17)	81 (25)	81 (25)	79 (23)	79 (116)

Note: Investigators could provide multiple responses
Source: AIC CCTV NSWPF survey dataset [AIC data file]

Information on the time between the incident and the request for footage indicates that police requested CCTV footage early in the investigative process (Table 3). The median number of days from the incident to the request for footage was three (range=0–37 days). One in three investigators (32%) submitted a request on the same day as the incident or the next day, while 20 percent of investigators submitted a request more than one week after the incident.

The median number of days between the incident and the request for footage was lowest for assault and robbery incidents (2 days). Those investigating theft (32%) and sexual offence incidents (25%) were the most likely to request footage more than one week after the incident. Importantly, the additional time taken to submit a footage request for some theft, property damage and sexual offence incidents may reflect delays in the reporting of these incidents to police, either because of the time taken for victims to determine an offence had occurred (for theft and property damage) or because of a reluctance to report (in the case of sexual offences). Only six percent of requests in the sample were submitted after the 14-day footage retention period.

Table 3: Time between incident and footage request, by offence type

	Offence type % (n)					
	Assault (n=28)	Property damage (n=23)	Robbery (n=29)	Theft (n=31)	Sexual (n=28)	Total (n=139)
≤1 day	50 (14)	22 (5)	38 (11)	36 (11)	11 (3)	32 (44)
2–7 days	43 (12)	61 (14)	45 (13)	32 (10)	64 (18)	48 (67)
8≥ days	7 (2)	17 (4)	17 (5)	32 (10)	25 (7)	20 (28)
Median days	2	4	2	3	4	3

Source: AIC CCTV NSWPF survey dataset [AIC data file]

How do police use CCTV footage during criminal investigations?

Investigators were asked how they used the footage they received as part of their investigation (Table 4). One investigator could not disclose details. Of the 135 investigators remaining, almost all (87%) reported using the footage as part of their investigation in some way, most commonly to locate or confirm the identity of suspects (46%), generate intelligence or investigative leads (33%), corroborate statements (24%) or to determine whether an offence had actually occurred (16%).

Footage was most likely to be used in assault investigations (97%), and least likely to be used in investigations into property damage (76%) and robbery (78%). Investigators of assault (43%) and sexual offence incidents (30%) were most likely to report having used the footage to corroborate statements. Those investigating assault (30%) and sexual offence incidents (26%) were also the most likely to have used footage to determine whether an offence had occurred. In contrast, investigators of robbery (56%) and theft (53%) were the most likely to report having used footage to identify or confirm suspects. Investigators of theft were also the most likely to report having used footage to generate intelligence or investigative leads (47%).

Most importantly, footage provided by Sydney Trains to police investigators was used for its intended purpose—meaning it was used for at least one of the reasons it was requested—in 62 percent of cases examined. This ranged from 48 percent of property damage investigations to 77 percent of assault investigations. The reasons given by investigators for not being able to use footage for its intended purpose are examined in the next section.

Table 4: Use of CCTV footage, by offence type

	Offence type % (n)					
	Assault (n=30)	Property damage (n=21)	Robbery (n=27)	Theft (n=30)	Sexual (n=27)	Total (n=135)
Identify/confirm suspects	43 (13)	38 (8)	56 (15)	53 (16)	37 (10)	46 (62)
Determine whether offence had occurred	30 (9)	10 (2)	11 (3)	3 (1)	26 (7)	16 (22)
Corroborate statements	43 (13)	10 (2)	11 (3)	20 (6)	30 (8)	24 (32)
Observe relevant events surrounding incident	7 (2)	5 (1)	0 (0)	3 (1)	0 (0)	3 (4)
Intelligence/investigative leads	23 (7)	33 (7)	26 (7)	47 (14)	33 (9)	33 (44)
Pinpoint time/place of incident	0 (0)	5 (1)	0 (0)	0 (0)	7 (2)	2 (3)
Identify/confirm victims or other third parties	7 (2)	5 (1)	0 (0)	0 (0)	11 (3)	4 (6)
Any use	97 (29)	76 (16)	78 (21)	93 (28)	89 (24)	87 (118)
Used for intended purpose ^a	77 (23)	48 (10)	56 (15)	67 (20)	59 (16)	62 (84)

a: Indicates whether investigators used the footage for at least one of the reasons they requested it, as specified in Table 1

Note: Limited to investigators who had received footage. Excludes one investigator who did not answer this question. Investigators could provide multiple responses
Source: AIC CCTV NSWPF survey dataset [AIC data file]

Investigators were asked to rate the overall usefulness of the CCTV footage in achieving desired outcomes for their investigation (eg identifying or apprehending a suspect, confirming an offence occurred, corroborating statements, or supporting charges and prosecution) on a five-point scale (Table 5). Four in five investigators rated the footage they received as at least somewhat useful (81%), with around half rating it as very useful (56%). While the majority of investigators across all offence types reported the footage was at least somewhat useful, assault investigators were the most likely to rate the footage as useful or very useful (84%), followed by investigators of sexual offences (77%) and theft (70%). Conversely, around one in five robbery (22%), property damage (19%) and theft (17%) investigators rated the footage as not useful at all, compared with less than 10 percent of assault (6%) and sexual offence (4%) investigators.

Table 5: Usefulness of CCTV footage, by offence type

	Offence type % (n)					
	Assault (n=31)	Property damage (n=21)	Robbery (n=27)	Theft (n=30)	Sexual (n=27)	Total (n=136)
Not useful at all	6 (2)	19 (4)	22 (6)	17 (5)	4 (1)	13 (18)
Not very useful	6 (2)	5 (1)	7 (2)	3 (1)	7 (2)	6 (8)
Somewhat useful	3 (1)	24 (5)	7 (2)	10 (3)	11 (3)	10 (14)
Useful	16 (5)	19 (4)	11 (3)	10 (3)	18 (5)	15 (20)
Very useful	68 (21)	33 (7)	52 (14)	60 (18)	59 (16)	56 (76)

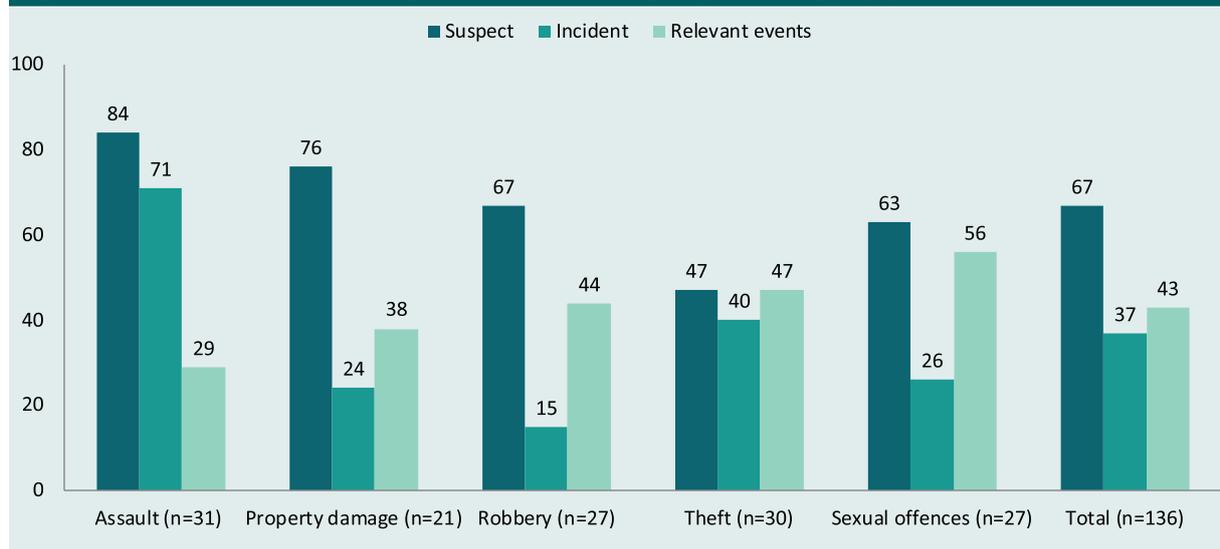
Note: Limited to investigators who had received footage. Percentages may not add to 100 due to rounding
Source: AIC CCTV NSWPF survey dataset [AIC data file]

What factors influence the usefulness of CCTV footage?

There was some variability in whether the suspect, incident or relevant events surrounding the incident were captured on CCTV footage, which might help to explain the variability in the perceived usefulness of the footage (Figure 1). Overall, two-thirds of investigators (67%) reported having received footage of the suspect, and one-third (37%) reported receiving footage of the incident. Forty-three percent received footage of relevant events surrounding the incident.

However, substantially more assault incidents (71%) were captured on CCTV than any other offence types, while footage of the suspect was also more likely to be available in assault investigations (84%). Suspects in theft investigations were by far the least likely to be captured on CCTV (47%), while robbery incidents were the least likely to be captured on CCTV (15% of investigations), followed by property damage (24%) and sexual offence incidents (26%). Investigators most commonly reported that footage captured events surrounding the incident for sexual offence incidents (56%), theft (47%) and robbery (44%).

Figure 1: Incident characteristics captured on CCTV footage, by offence type (%)



Note: Limited to investigators who had received footage
Source: AIC CCTV NSWPF survey dataset [AIC data file]

To better understand why footage was or was not useful, investigators were asked whether there were any problems with the footage they received (Table 6). One-third of investigators (32%) identified at least one issue with the footage, most commonly image quality or difficulty accessing it with available software (13%). The fact that the footage did not capture incidents (11%), suspects (9%), or relevant events surrounding incidents (7%) at all or in sufficient detail was rarely identified by investigators as an issue, despite being a frequent occurrence.

Property damage investigators were the most likely to identify at least one issue with the footage they received (48%), followed by those investigating theft (37%), sexual offence incidents (33%) and assault (29%). Robbery investigators were the least likely to identify an issue (19%). Property damage investigators were the most likely to report that the footage did not show suspects (24%), incidents (24%) or events surrounding incidents (14%) in sufficient detail. Thirteen percent of theft investigators also identified issues with footage not showing incidents (20%) or the events surrounding them (13%). It was rare for assault, robbery and sexual offence investigators to report that the footage did not capture incidents, suspects or relevant events surrounding the incident. Sexual offence investigators were the only respondents to identify that the footage they received contained crowds or other physical obstacles obstructing their view (11%).

Table 6: Issues with CCTV footage, by offence type

	Offence type % (n)					
	Assault (n=31)	Property damage (n=21)	Robbery (n=27)	Theft (n=30)	Sexual (n=27)	Total (n=136)
Image quality or access issues	13 (4)	14 (3)	11 (3)	10 (3)	15 (4)	13 (17)
Does not show part/all of incident	10 (3)	24 (5)	0 (0)	20 (6)	4 (1)	11 (15)
Does not show suspects at all or in sufficient detail	0 (0)	24 (5)	7 (2)	7 (2)	11 (3)	9 (12)
Does not capture relevant events surrounding incident at all or in sufficient detail	6 (2)	14 (3)	0 (0)	13 (4)	4 (1)	7 (10)
Distance of camera from incident hinders view	3 (1)	5 (1)	0 (0)	3 (1)	4 (1)	3 (4)
Crowds/physical obstacles obstruct view	0 (0)	0 (0)	0 (0)	0 (0)	11 (3)	2 (3)
Does not show victims or other relevant third parties at all or in sufficient detail	0 (0)	0 (0)	0 (0)	3 (1)	4 (1)	1 (2)
Any issue	29 (9)	48 (10)	19 (5)	37 (11)	33 (9)	32 (44)

Note: Limited to investigators who had received footage. Investigators could provide multiple responses
Source: AIC CCTV NSWPF survey dataset [AIC data file]

Summary and conclusions

Findings from this study show that, overall, CCTV footage is highly valued by investigators. Over 80 percent of investigators rated the footage they received as at least somewhat useful. Nine in 10 investigators reported using the footage as part of their investigation, and two-thirds were able to use it for the reason they had requested it. Encouragingly, this was despite the fact that, in one-third of cases, investigators encountered at least one problem with the footage. These problems mostly related to image quality or access issues or the suspect or incident not being captured on camera. Notably, however, around two-thirds of investigators were given footage of a suspect and around one-third footage of the incident under investigation.

CCTV footage was particularly useful in the earlier stages of investigations. While CCTV footage was rarely the first item of evidence investigators collected, it was typically requested soon after the incident occurred. One-third of footage requests were lodged within 24 hours of the incident, and 80 percent within a week. Further, it was most often requested and used to help police to identify or confirm the identity of suspects, again pointing to the importance of footage early in the investigation. This in turn reinforces the need for efficient information sharing mechanisms between police and CCTV network administrators to facilitate the prompt provision of footage to investigators.

Importantly, while most investigators requested footage to identify or confirm the identity of a suspect (80%), only 46 percent were able to use it for this purpose. This was lower than the proportion of investigators who reported being given footage of the suspect (67%). Qualitative responses from investigators revealed that, in most of these cases, the footage provided a clear image of the suspect; however, they were not recognised by the victim, witnesses or police. Nevertheless, footage was used for suspect identification in almost half of all cases and, for assault offences, all but three investigators who requested footage for this reason were able to use it as intended.

Critically, in around one-third of investigations CCTV footage was requested to determine whether an offence had actually occurred, and it was used for this purpose in around one in six investigations. Prior research into the investigative value of CCTV footage has done so by examining criminal justice outcomes such as the apprehension, charging and prosecution of suspects (Ashby 2017; Morgan & Dowling 2019), but these findings suggest that footage can be useful in helping police decide whether or not to continue investigations that may consume substantial time and resources.

The use of CCTV footage varied by offence type. For example, footage was more likely to be requested and used to corroborate statements and to confirm whether an offence had occurred in assault and sexual offence investigations. Investigators can receive multiple, often conflicting accounts of these incidents, particularly if suspects are apprehended at the scene. Footage may play an important role in mediating these conflicting accounts.

The other types of evidence available to investigators prior to requesting footage did not vary notably between offence types, which suggests the reasons for requesting footage are influenced by the characteristics or circumstances of each offence. Offence characteristics that influence whether footage is requested include where the incident occurred—and whether that location has CCTV coverage—and whether the suspect was apprehended at the time of committing the offence, was known to the victim, had contact with or was observed by the victim or witnesses, or acted in a way that concealed their identity.

The perceived usefulness of footage also varied by offence type. Assault investigators were the most likely to report using CCTV footage, particularly for the reason it was requested, and to find the footage useful or very useful. This might be because they were more likely to receive footage of the suspect or the incident, the latter especially. Research into the crime prevention effects of CCTV has tended to find no effect on violent crime, indicating that violent offenders are unlikely to be deterred by the presence of cameras (Welsh & Farrington 2009). Assault incidents may be more likely to occur in view of cameras for this reason. The impulsive nature of violent offending (Felson 2013) and the potential involvement of alcohol and drugs (Ratcliffe 2006) also mean that violent offenders take fewer precautions to disguise their identity.

Conversely, theft offenders may be more likely to target locations without CCTV coverage, because they are more likely to be concerned about the risk of being caught and therefore take steps to avoid being detected by cameras (Welsh & Farrington 2009). Hence almost half of theft investigators did not receive footage of the incident. This might explain the relatively large proportion of theft investigators who rated the footage as not useful at all, and who reported issues with the footage not capturing suspects at all or in sufficient detail.

Similarly, although relatively rare, sexual offence investigations were the only investigations where the usefulness of footage was limited because views were obstructed by crowds and other physical obstacles. This could reflect the deliberate commission of public sexual offences in environments that conceal their occurrence, either through dense crowding or physical cover (Burgess & Grech 2011; Ceccato & Paz 2017; Natarajan et al. 2017).

Robbery investigators' ratings of the overall usefulness of their footage were relatively polarised. While around two-thirds rated the footage they received as useful or very useful, almost a quarter indicated that it was of no use at all. Although robbery investigators were the least likely to identify an issue with the footage they received, they were also the least likely to receive footage of the incident. UK research into investigators' use of CCTV in similar settings has found that footage rated as useful by investigators increased the likelihood of robbery cases being solved by a greater margin than any other crime type examined (Ashby 2017). This research aligns with the current study in suggesting that the outcome of robbery investigations, more so than other offences, hinges strongly on the provision of CCTV footage. Importantly, prior research into CCTV use on the rail network has shown that robbery incidents have some of the highest footage request rates of any offence types (Morgan & Coughlan 2018; Morgan & Dowling 2019).

CCTV footage was of least use overall to property damage investigations, which were the most likely to encounter problems using the footage. This most often related to the footage not showing suspects, incidents or the events surrounding them at all or in sufficient detail. Ashby (2017) and Morgan and Dowling (2019) both found that, while clearance rates for property damage were low compared with other crime types, cases where footage was requested and provided were more likely to be cleared. This suggests that, while footage is often of little use in property damage investigations, when it is useful it can lead to better investigation outcomes.

The proportion of investigations where footage was used to generate intelligence and investigative leads was much greater than the proportion for which this was given as a reason for requesting footage. This suggests that footage that cannot be used for its intended purpose may still benefit investigators by offering new investigative leads. Similar findings have been observed with other forms of police technology, namely ballistic evidence and automated matching technology (Morgan & Jorna 2018).

Read alongside two other studies on police requests for rail network footage (Morgan & Coughlan 2018) and the impact of rail network CCTV footage on clearance outcomes (Morgan & Dowling 2019), this study provides further evidence of the value police investigators place on rail network CCTV footage. While it may not be possible to generalise results from these studies to other contexts (Ashby 2017; Morgan & Dowling 2019), the results nevertheless illustrate the benefits of giving investigators access to CCTV footage to investigate crime in areas with a high concentration of incidents and good camera coverage and where there is a strong relationship between camera operators and police.

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