Enhancing Police Operations: The Impact of CCTV in Monitoring, Incident Response, and Crime Investigation in Nairobi City County, Kenya

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Abstract
This study assessed the impact of Closed-Circuit Television (CCTV) on police operations in Nairobi, Kenya, focusing on its role in monitoring public space, responding to incidents, and investigating crime. Using a convergent parallel design informed by the Task-Technology Fit Theory, the study collected data from 403 purposefully and cluster-sampled police officers through questionnaires, key informant interviews, and focus group discussions. Quantitative data analysis utilised descriptive statistics, while thematic analysis helped to uncover qualitative insights. CCTV was found to be valuable for incident awareness, traffic management, and crime detection and significantly aided in incident response and investigations. However, limited camera coverage and technical issues reduced effectiveness. The study concluded that Nairobi's CCTV system is a valuable tool, but improvements like expanding coverage and providing storage solutions for investigators are recommended.

Keywords: CCTV monitoring, incident response, crime investigation, police operations

Introduction

The contemporary urban landscape is characterised by an increasing uneasiness about rising threats, particularly terrorism (Lio, 2014). In response, cities worldwide have witnessed a significant increase in the implementation of CCTV systems (Thomas et al., 2021). These ubiquitous cameras have become a permanent fixture, constantly monitoring public spaces and gathering detailed information on events, spatial dynamics, the people involved, and their interactions (Socha & Kogut, 2020). This vast amount of information is valuable for police organisations, supporting their efforts to maintain public order and safety through strategic information gathering and analysis.

CCTV systems offer a multifaceted utility within police operations, encompassing functions such as patrols, traffic management, and criminal investigations (Hess et al., 2013). Their applications range from deterring criminal activity through increased surveillance to providing crucial evidence in criminal proceedings (Khan et al., 2020). However, two functionalities stand out prominently: detection and evidence collection. Through real-time monitoring, police can quickly identify and intercept suspicious activity, potentially preventing threats from occurring (Socha & Kogut, 2020). Furthermore, CCTV footage serves as a valuable forensic tool, providing objective visual evidence to strengthen investigations and prosecutions (Morgan & Coughlan, 2018).

The use of CCTV in police operations has a long and evolving history. Early experimentation with the technology can be traced back to 1950s Germany (Kroener, 2016). By the 1960s, Piza (2018a) notes that Britain had permanently adopted CCTV for public space monitoring, traffic control, and crime prevention. Since then, its global adoption has continued to rise. Today, CCTV is undergoing a revolution with the integration of cutting-edge technologies like Artificial Intelligence (AI), Automatic License Plate Recognition (ALPR), and facial recognition (Thomas et al., 2021). This integration has transformed CCTV into a sophisticated tool for proactive policing, ushering in a new era of surveillance and public safety management (Kennedy et al., 2018; Idress et al., 2018). Kenya exemplifies this trend. In 2015, Nairobi City

County implemented a police-operated CCTV system equipped with ALPR capabilities (National Police Service [NPS], 2016, 2018).

Despite its extensive use and perceived benefits, a critical gap exists in understanding the true effectiveness of CCTV in supporting police operations, particularly within Nairobi. While research acknowledges its usefulness in investigations (Ashby, 2017; Dowling et al., 2019), its broader impact on other police activities remains less clear. This study attempted to bridge this gap by examining how CCTV supports public space monitoring, incident response, and crime investigation in Nairobi City County, Kenya.

Literature Review

This study conducted a comprehensive literature review to establish the current understanding of CCTV use in police operations. The review included both theoretical and empirical studies related to the research subject. The following subsections critically analyse and synthesise this literature, highlighting key findings, ongoing debates, and potential knowledge gaps.

Theoretical Review

The current study adopted the Task-Technology Fit Theory (TTFT) (Goodhue & Thompson, 1995; Zigurs & Buckland, 1998) as its guiding framework. This theory posits that technology effectiveness hinges on the alignment between its functionalities and the tasks and needs of users (Hsiao, 2018). It also emphasises that effective technologies should be user-friendly, reliable, and high-quality (Furneaux, 2012).

In the context of police operations, the TTFT would suggest that extensive and successful CCTV system use is contingent upon their effective alignment with the demands of police work. This translates to features such as wide-angle coverage, high-resolution images, and real-time footage capabilities (Furneaux, 2012). Such features directly address officers' needs for swift and accurate incident detection, efficient response and informed decision-making during interventions. Additionally, integrating advanced analytics and emergency systems can further enhance coordination efforts during incident response.

For crime investigations, TTFT implies that high-quality video with detailed metadata serves as valuable forensic evidence. Additionally, advanced search functionalities speed up the identification of relevant footage. Integration with facial recognition and ALPR technology enhances the ability to track suspects or vehicles. Furthermore, considering police officers' experiences with CCTV systems aligns with Wu and Du's (2010) suggestion to incorporate user feedback. Understanding these experiences is crucial for identifying challenges and offering remedies to improve the system's effectiveness in promoting public safety and order.

Empirical Review

This review delves into extant research on police use of CCTV for public space monitoring, incident response coordination and crime investigations.

CCTV and public space monitoring

CCTV monitoring, defined as viewing live or recorded camera footage (Ratcliffe, 2011), is a critical police operation function, especially in major cities. It offers a range of benefits, including real-time crime detection and response, traffic monitoring and post-event investigation through footage review (La Vigne et al., 2011a; Piza et al., 2019). However, research on CCTV's monitoring effectiveness is mixed and contradictory (Lawson et al., 2018).

Several studies have examined specific applications of CCTV monitoring. Kurdi (2014), for example, explored its role in traffic management, suggesting its potential to optimise traffic flow, identify congestion points, and improve overall operational efficiency. However, the study acknowledged a lack of empirical data on the real-world effectiveness of CCTV in traffic management, a gap that this research sought to bridge in the context of Nairobi.

Socha and Kogut (2020) investigated the efficacy of urban video surveillance in enhancing public security in Katowice City, Poland. Their findings revealed no significant correlation between CCTV implementation and improved crime detection rates. While their work highlights the lack of conclusive evidence, limitations

such as outdated data (2001-2005) restrict its generalisability. Therefore, further research with more recent data and in different contexts, such as Nairobi, was necessary.

Similar questions arise regarding the role of private security in CCTV operations. Moyo's (2019) study in South Africa found that while private security actively monitoring CCTV systems did detect suspicious activity, police were still the primary source of incident reports. This finding casts doubt on the true effectiveness of private security personnel in CCTV operations. Additionally, Eggarsasi and Sa'diyah's (2018) research in Indonesia demonstrated that active CCTV surveillance aided in detecting traffic violations and enforcing penalties. However, the broader impact of CCTV monitoring on diverse settings like Nairobi remains unclear, prompting further investigation within this research.

CCTV and incident response coordination

Effective incident coordination, encompassing all stages and activities in managing crimes and emergencies from detection to resolution, is crucial for minimising their impact and preventing recurrence (Sommer et al., 2014). CCTV can be a valuable tool in this process by providing real-time situational awareness, potentially leading to improved police response times and overall incident management. This view is reinforced by studies like Levesley and Martin's (2005) in the United Kingdom (UK). Their research found over 75% of officers valued CCTV for clarifying incidents, dispatching resources, guiding responding officers, and providing updates on emerging issues. This suggests that CCTV can facilitate a prompt, efficient and safe response. However, the same study identified a significant barrier: communication gaps between CCTV operators and patrol officers. These constraints can impede effective coordination in critical situations. Other studies present a mixed picture. Some, like Weisburd and Majumdar (2018) and Taylor and Gill (2014), suggest CCTV can improve response times and lessen incident severity. However, Piza et al. (2017) highlight potential delays due to the time required to mobilise officers and other resources. They propose collaboration with private security in monitored areas for a quicker initial response.

La Vigne et al. (2011b) highlight another benefit – improved officer safety. Real-time CCTV updates provide crucial incident details, allowing officers to assess potential dangers before arriving on the scene. Notably, a key goal of implementing Nairobi's CCTV system was to improve coordination among police units during incident response (NPS, 2019). However, the system's effectiveness in achieving this goal remained unclear, prompting the present study to investigate this specific aspect of CCTV's impact.

CCTV and crime investigations

Criminal investigations are a cornerstone of police operations following patrol activities (Hess et al., 2013). These investigations aim to answer fundamental questions surrounding a criminal incident, such as who committed the crime, what transpired, where and when it occurred, the motive, and the method employed (Fahsing, 2016). To address these questions, investigators typically examine suspects, crime scenes, potential motives, and timelines of events (Osterburg et al., 2019). High-quality CCTV footage can play a significant role in this process. It can directly contribute to suspect identification in two primary ways. First, individuals familiar with the perpetrator might recognise them in the footage (Gibson, 2017). Second, clear footage can capture the suspect touching objects that could yield forensic evidence, such as fingerprints (Socha & Kogut, 2020). Additionally, CCTV recordings can be instrumental in locating potential witnesses to the crime (La Vigne et al., 2011a). The timestamps embedded within most footage can also assist in establishing the exact time and location of the incident (Ratcliffe, 2011).

Despite its potential benefits, research on the effectiveness of CCTV in criminal investigations remains limited and presents conflicting findings (Ashby, 2017). Levesley and Martin (2005) reported that most officers (95%) believe CCTV aids investigations by expediting suspect identification, location, arrest, and witness interviews. However, they also noted that poor image quality often reduces the evidentiary value of CCTV footage. Coupe and Kaur's (2005) study found a doubled detection rate for burglaries in non-residential buildings with CCTV, suggesting its potential for suspect identification. However, the study's limitations include its focus on a single crime type and the use of data from 2000, potentially limiting its applicability to contemporary situations and other crime types.

Further research, like Farrington et al. (2010), highlights the value of CCTV in suspect identification and securing convictions, mainly when the footage provides clear facial features. However, the generalisability

of these findings to non-jury systems like Kenya remains unexplored. Ngwenya's (2012) examination of CCTV use in South African gas station robberies revealed a different picture, with limited CCTV usage and a training gap among officers regarding evidentiary requirements. The narrow focus and small sample of this study further restrict the generalisability of its findings.

While Ashby (2017) identified CCTV as a valuable tool for investigating railway crime in Britain, its effectiveness varied depending on the specific crime type and the timeliness of footage access. However, the study's focus on railways limits its broader applicability. Similarly, Vilalta et al. (2018) found an inverse relationship between the number of CCTV cameras and non-violent crime investigations in Mexico but did not explore the impact on conviction rates.

Australian studies within the Sydney Trains network revealed a heavy reliance on CCTV by police, particularly in high-crime areas (Morgan & Coughlan, 2018; Dowling et al., 2019; Morgan & Dowling, 2019). Footage aided investigations in over 60% of cases, but its effectiveness varied depending on the crime type and time of day. However, the findings may not be universally applicable due to the railway focus. Investigations in the United States of America (USA) by Jung and Wheeler (2019) suggest a slight rise in crime clearance rates in Dallas, Texas, following CCTV installation, particularly for property crimes. However, the long-term effectiveness and contextual influences remain unclear.

Furthermore, research into CCTV systems integrated with ALPR technology shows promise for vehicle recovery and suspect identification (Cohen & Plecas, 2007; Roberts & Casanova, 2012). However, conflicting results, a lack of concrete evidence, and the newness of this technology call for more investigation, particularly within Nairobi's CCTV system, which incorporates ALPR technology.

Methodology

This study employed a convergent parallel mixed-methods design. This design treats qualitative and quantitative data equally (Edmonds & Kennedy, 2017). Both are collected concurrently, analysed separately, and then integrated during interpretation (Orodho et al., 2016). Specifically, the study combined a cross-sectional survey design to gather quantitative data on police CCTV usage across various tasks with a phenomenological design to gain qualitative insights into their experiences with CCTV technology.

Data collection involved 403 police officers from Nairobi City County's police stations and CCTV control centre. A cluster sampling technique, informed by Yamane's 1967 formula ($n = N/(1+N(e)2)$), yielded a sample of 374 from a target population of 5650. Of these, 347 officers completed and returned self-administered questionnaires, reflecting a response rate of 92.8%. To enrich the qualitative perspective, 24 officers who did not participate in the survey were purposively selected for focus group discussions (FGDs). Additionally, five senior police officers, purposively chosen for their expertise, provided insights as key informants.

Quantitative survey data were analysed using descriptive statistics, generating percentages visualised through figures. Qualitative data gathered through FGDs and interviews underwent thematic analysis, with key findings reported verbatim. Finally, a comprehensive comparison integrated these findings with existing literature.

Results And Discussions

This section presents the study's findings and interpretations, organised into thematic categories and elucidated through figures, percentages and direct quotations.

Impact of CCTV on Police Public Spaces Monitoring

Survey respondents evaluated the impact of CCTV monitoring based on five tasks: detecting suspicious activity, crime, traffic violations, traffic flow monitoring and intelligence gathering. Figure 1 displays the results.

Figure 1 : Respondents' views on the extent to which CCTV monitoring has influenced operational tasks
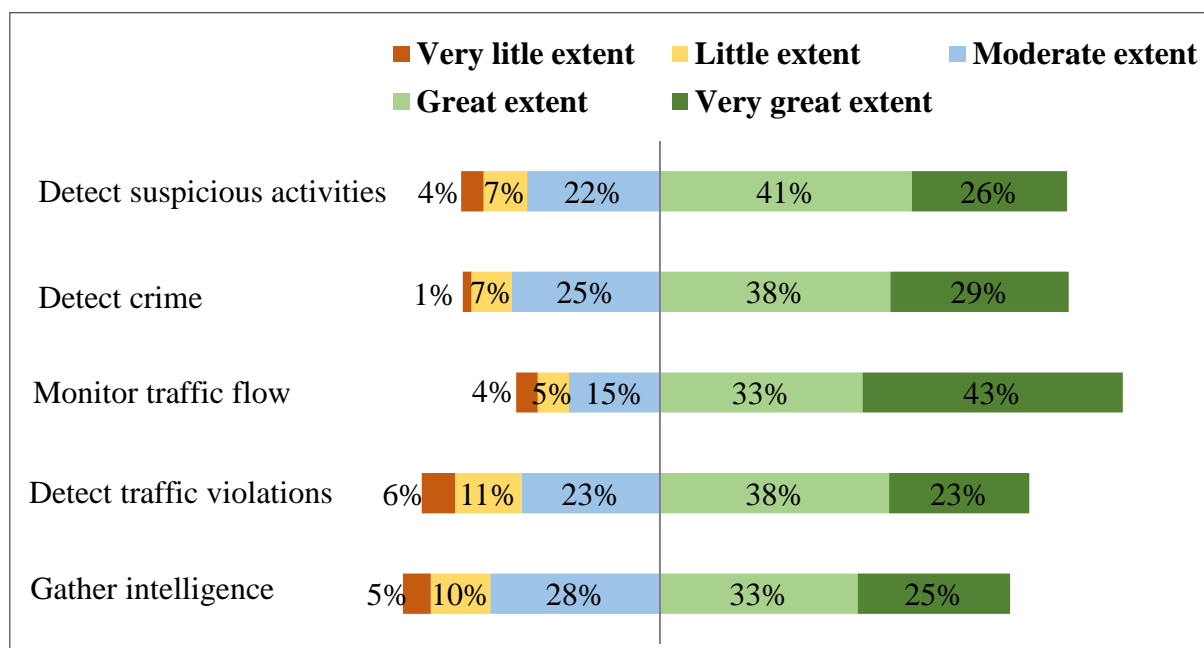
Source: Field Data

According to Figure 1, traffic flow monitoring ranked first among CCTV monitoring tasks, with 76% of respondents saying it greatly aided police. This extensive use is likely due to the concentration of cameras on major roads, which aligns with research indicating that CCTV effectiveness rises with camera density (Piza et al., 2019; Morgan & Coughlan, 2018; Ashby, 2017; Welsh & Farrington, 2009). A key informant (KIF) confirmed this: "We rely heavily on CCTV cameras, especially in the evenings, to monitor traffic flow, identify congestion, and dispatch officers" (KIF03). These findings support TTFT, which suggests technology is most successful when its capabilities closely match the task requirements. Here, CCTV's wide field of view and high density on major roads make it a good fit for traffic monitoring.

Figure 1 also reveals that a substantial proportion of respondents felt that CCTV greatly aided police in detecting suspicious activities (67%), crimes (67%), and traffic violations (61%). This finding was corroborated by key informants and FGD participants who emphasised CCTV's importance for real-time monitoring of public spaces. One participant stated: "These cameras give us a 24/7 view...They've been a big help in spotting crimes and traffic violations. Officers on the ground often keep in touch with the command centre to stay updated on what's happening in their areas" (PTA01). These findings are consistent with prior research on CCTV's effectiveness in detecting incidents (Eggarsasi & Sa'diyah, 2018; Weisburd & Majmundar, 2018). The convergence of survey results, insights from FGDs and interviews, and existing research suggest that CCTV effectively complements officers in detection tasks due to its features, such as real-time monitoring, wide field of view and scalability, as TTFT indicates.

Despite the benefits, insufficient CCTV coverage emerged as a significant barrier. A key informant stated, "The cameras are a significant boost... However, they only cover a few areas. There are no cameras in slums and backstreets...which are areas with high crime rates" (KIF04). This limited coverage restricts police's ability to respond to incidents countywide, potentially explaining persistent crime despite CCTV use. These findings corroborate NPS's (2019) claim that the current CCTV coverage in Nairobi County is inadequate for effective crime detection. The findings also align with research on the reduced effectiveness of CCTV systems with insufficient density (Morgan & Coughlan, 2018; La Vigne et al., 2011).

While survey results (Figure 1, lowest score) indicated a moderate perception of CCTV for intelligence gathering, with only 58% saying it greatly aided this task, qualitative data revealed a more proactive approach. Interviews and FGDs indicated officers routinely reviewed the footage to identify recurring crime patterns, enabling targeted strategies. An FGD participant explained: "Analysing weekly and monthly recordings has helped us identify crimes occurring at specific times and locations and understand criminal methods. Consequently, we've been able to focus our efforts on high-crime areas and closely monitor known

suspects" (PTB03). This proactive approach to CCTV use for intelligence gathering partially contradicts prior studies by Agarwal et al. (2018) and Piza et al. (2015), who suggested a predominantly reactive approach. TTFT can explain this discrepancy. The survey may not have fully captured how officers leverage CCTV for proactive intelligence gathering through video analysis. Analysing footage can be a passive form of intelligence gathering requiring less real-time intervention compared to what the survey question likely implied. This makes CCTV a partial fit for proactive intelligence gathering under TTFT. Nonetheless, while CCTV excels at large-scale monitoring and historical data analysis, real-time video analysis for intelligence requires dedicated personnel and significant time investment. This adds to workload burdens and likely explains why respondents felt CCTV has not greatly aided police in real-time intelligence collection.

Impact of CCTV on Incident Response Coordination

Figure 2 explores how CCTV aided police in coordinating responses to incidents.

Figure 2 : Respondents' views on how CCTV aided police incident response coordination
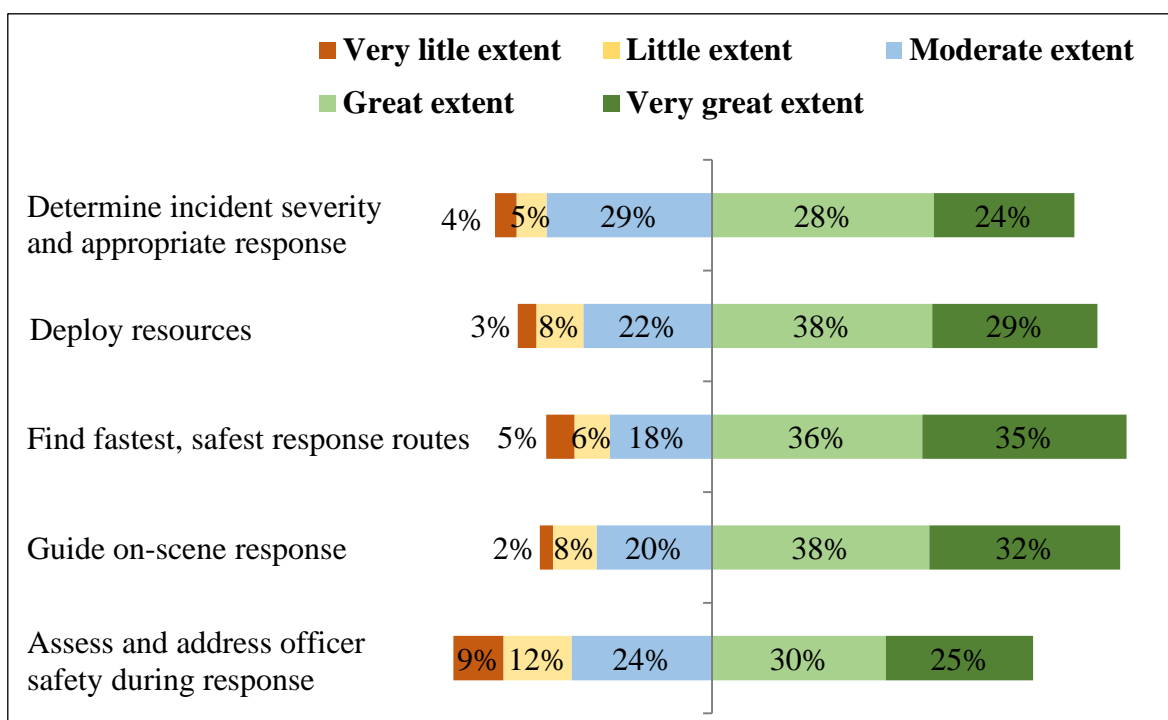
Source: Field Data

Figure 2 shows that police officers overwhelmingly endorsed CCTV's role in incident response. More than half (52%) said it greatly aided them in determining incident severity and choosing the appropriate response. Similarly, over two-thirds (67% & 71%) found it greatly aided resource deployment and planning optimal routes, suggesting improved decision-making and faster response times. Additionally, 70% said it greatly aided on-scene actions, and 55% said it greatly assisted in threat assessment and mitigation. These findings echo prior research on CCTV's effectiveness in identifying and deploying suitable response resources, guiding on-scene reaction, and assuring safe and fast incident resolution (La Vigne et al., 2011a; Levesley & Martin, 2005). Based on the TTFT perspective, the high positive responses (>50%) across various areas in Figure 2 demonstrate a strong alignment between CCTV functionality and the demands of police incident response tasks. This good fit can improve decision-making, faster response times, and create a safer environment for officers and the public.

Interviews and focus groups confirmed that CCTV greatly aided police response coordination. Participants emphasised its value in pinpointing incident locations and guiding responding officers effectively. That would mean officers' risk of being lost or spending too long to identify incidents has decreased. An FGD participant (PTC06) explained: "When an incident is reported or captured on CCTV, the command centre assesses it and directs officers on the ground on the best route for a swift reaction. This helps them locate scenes even in unfamiliar surroundings."

Furthermore, participants reported that CCTV enabled remote incident evaluation, allowing for better-informed decisions on response types and resource allocation. A key informant stated: "The cameras help commanders assess the nature and gravity of situations like riots and robberies and deploy the right number of officers and specialised equipment" (KIF02). Furthermore, participants stated that CCTV allowed for real-time assessment and guidance during response, ensuring responding officers have vital information and precautions. An FGD participant said: "Officers on the ground always get relevant guidance via both CCTV and police radio, such as information on the identities, positions and routes taken by the targets they are pursuing (PTA05)." This translates to officers responding with a clearer picture of the situation and real-time support, ultimately improving their situational awareness and decision-making. These findings are in tandem with those of prior studies conducted in Ghana, the UK and the USA by Ansong & Ofori-Dwumfuo (2015), La Vigne et al. (2011b), and Levesley & Martin (2005), showing CCTV's value in informed, measured and safe incident responses.

Impact of CCTV on Crime Investigations

Table 1 summarises respondents' ratings on CCTV's impact on eight investigative tasks.

Figure 3 : Effectiveness of CCTV in supporting investigative tasks
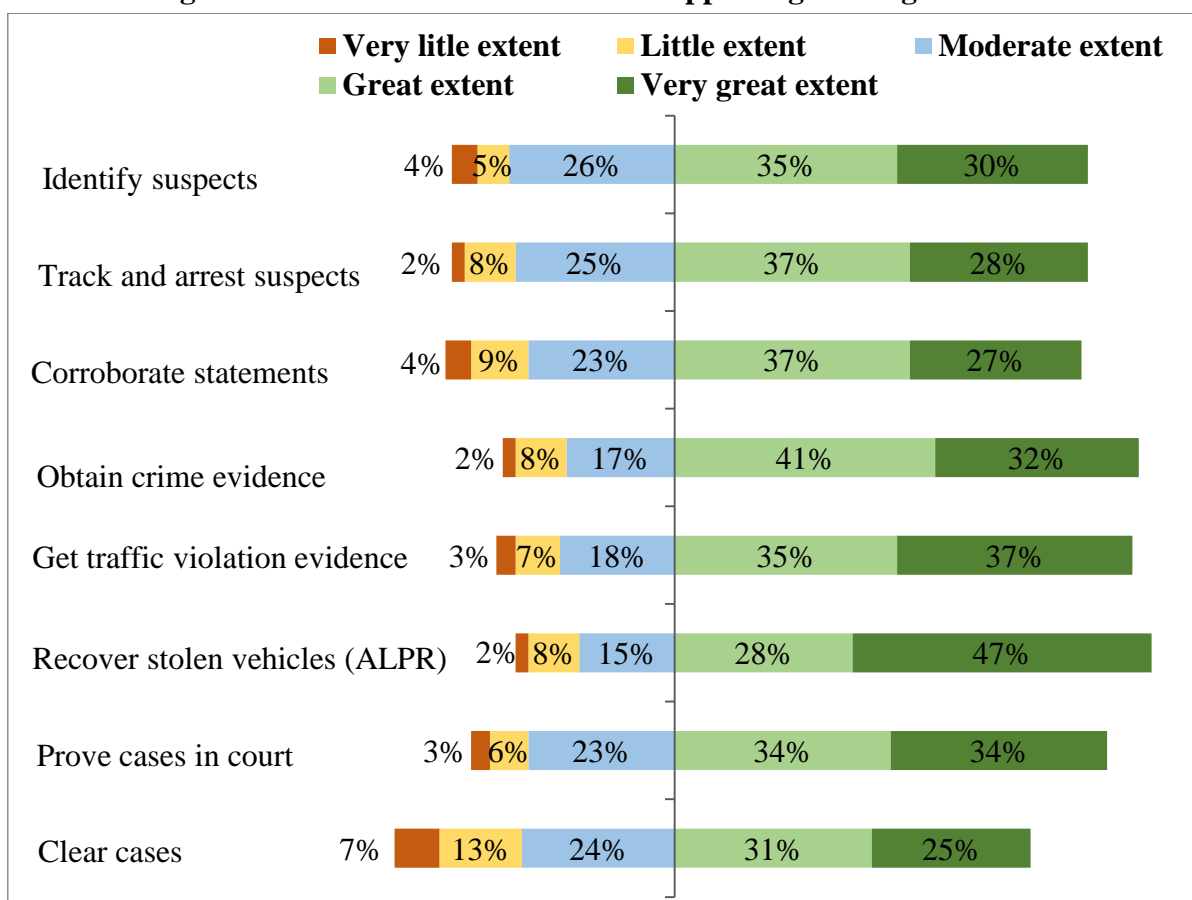
Source: Field Data

Figure 3 shows CCTV with ALPR as the most valuable tool for investigations, with 75% of respondents saying it is greatly helpful in recovering stolen vehicles. This likely stems from ALPR's accuracy, as highlighted by Ozer (2016). It can rapidly identify vehicles of interest, allowing for real-time tracking and police response. Qualitative data reinforced this view. A key informant (KIF04) emphasised the system's effectiveness, stating, "Rarely does a blacklisted vehicle evade ALPR cameras." Similarly, FGD participants (PTA07 & PTB03) praised its real-time alerts, image capture and usefulness in hit-and-run investigations, especially lacking witnesses.

However, the study also revealed ALPR weaknesses, including inadequate data and criminal evasion strategies like using fake plates or strategically avoiding cameras. For instance, a key informant (KIF04) wished the system had data on all vehicles stolen in Kenya. Despite these limitations, participants

overwhelmingly viewed ALPR as a valuable tool, matching findings from studies undertaken in Canada and the USA (Roberts & Casanova, 2012; Cohen & Plecas, 2007) on its effectiveness in vehicle crime investigations.

Besides its success in recovering stolen vehicles, Figure 3 shows that CCTV greatly supported other investigative tasks. Over 70% of respondents indicated it greatly helped in obtaining evidence for crimes (73%), traffic violations (72%), and court cases (68%). It also greatly assisted in identifying (65%) and apprehending suspects (65%), as well as corroborating statements (64%) and clearing cases (56%). These findings are consistent with Dowling et al. (2019) and Ashby (2017), who revealed CCTV's usefulness in criminal investigations.

Qualitative data further demonstrated the value of Nairobi's police-operated CCTV system footage, especially in cases with multiple suspects and no witnesses. One officer (PTB04) explained how it "greatly assisted investigating officers (IOs) in isolating suspects and identifying the real perpetrators," leading to swifter investigations. Similarly, a key informant (KIF02) emphasised the priority IOs placed on checking the footage, requesting it swiftly when available. These remarks highlight the routine inclusion of CCTV into police investigations, reflecting research by Morgan and Coughlan (2018) and Piza (2018b).

The benefits of CCTV extend beyond suspect identification. Participants highlighted its multifaceted role in investigations, including verifying witness and suspect statements, confirming alibis, exonerating the wrongly accused, reconstructing events, uncovering criminal methods, and generating investigative leads. One FGD participant (PTC06) emphasised this in the context of traffic disputes, noting, "Drivers in this country rarely admit fault, so the footage is crucial to determine who's responsible." A key informant (KIF05) echoed this sentiment: "The clips... have helped IOs verify statements and get evidence to prove cases in court. They have also used them to challenge or corroborate alibis and exonerate suspects." These findings resonate with research by Ashby (2017), Dowling et al. (2019), and Morgan & Dowling (2019), who emphasise CCTV's broader role in criminal investigations, and align with La Vigne et al. (2011b) and Levesley and Martin (2005) regarding its value in verifying alibis.

However, the study found barriers to using footage from Nairobi's police-operated CCTV system to secure convictions for criminal cases. While the footage had successfully resulted in traffic convictions, many criminal cases incorporating it as evidence were still pending in court. These delays could be due to prosecutorial hurdles or potential corruption concerns, as highlighted by a key informant (KIF04), "We've secured traffic offence convictions, but numerous criminal cases linger in court due to defence lawyers' delay tactics for selfish gains." These findings are consistent with Eggarsasi and Sa'diyah's (2018) observation that CCTV can effectively support traffic prosecutions. However, they contradict Farrington et al.'s (2010) UK study, in which police obtained no convictions using CCTV footage. This variation suggests that CCTV's usefulness in achieving convictions depends on jurisdiction and crime type, among other factors.

Qualitative data further revealed that footage from Nairobi's police-operated CCTV system aided police in pursuing, locating, and arresting suspects, especially when combined with data from other technologies. For example, a key informant (KIF04) recounted how the footage, along with data from a car tracker and mobile phones, helped solve a high-profile murder case. These findings support the conclusions of Gogov (2017), Taylor and Gill (2014), and Ratcliffe (2011), who suggest that CCTV's effectiveness significantly increases when used alongside other technologies.

The study also documented instances where CCTV directly facilitated arrests during or immediately after crimes, particularly for traffic violations and thefts. This can be attributed to the concentration of cameras on major roads and the overt nature of these offences. An FGD participant (PTB02) described a rapid arrest made possible by CCTV: "While monitoring cameras, I saw a vehicle hit a child and flee. I captured the car's details and alerted nearby patrol officers. We tracked the vehicle to a garage where the driver was trying to repair accident damage. The mechanics were surprised by the police's swift response." This incident illustrates CCTV's role in providing crucial evidence for investigations, even if it does not immediately result in an arrest after the fact.

Despite its potential as an investigative tool, the study found that Nairobi's police-operated CCTV system suffered from a critical technology mismatch, as articulated by TTFT. According to TTFT, a technology's usefulness depends on how well it aligns with the task it is designed to support. In this context, the task entails conducting thorough police investigations, requiring clear and comprehensive footage. The FGDs revealed this misalignment. Officers voiced dissatisfaction with the footage's quality, completeness and availability. For instance, one participant recounted a lorry hijacking where the footage, despite capturing the scene, failed to provide identifiable faces or the vehicle's license plate number (PTB05). Another described a hit-and-run incident where blurry license plates rendered the video unusable (PTA07). These examples underscore the technology's inability to provide the high-quality, detailed footage crucial for investigations. This limitation likely stems from a lack of proper system maintenance, as a key informant (KIF03) suggested: "Some CCTV cameras have been rendered useless due to malfunction and blockage by overgrown trees, newly erected billboards and buildings." These findings corroborate prior research by Gibson (2017), La Vigne et al. (2011b), and Farrington et al. (2010), who highlight the pitfalls of low-quality, incomplete, or poorly positioned CCTV footage in investigations.

Further compounding the misfit was the NPS's inadequate resource allocation. The study found officers were forced to incur personal expenses to store footage needed for investigations. According to a participant in FGD, "NPS doesn't provide storage for downloaded footage, forcing IOs to buy their own CD or flash disk or forgo taking a copy (PTB04)." This financial burden disincentivises some officers from using the footage from Nairobi's police-operated CCTV system, consequently reducing its investigative value.

Conclusion And Recommendations

This study examined the efficacy of Nairobi's police-operated CCTV system, focusing on its impact on public space monitoring, incident response, and crime investigation. The findings demonstrate its potential to enhance police operations in various ways. CCTV monitoring facilitated real-time incident awareness, traffic flow management, congestion and violation identification, and suspicious activity detection. Additionally, it aided in identifying crime hotspots, gathering intelligence on common crimes and offenders, and understanding criminal methods. However, insufficient CCTV coverage hindered monitoring in certain areas.

Although CCTV use in incident response proved beneficial for real-time tracking, severity assessment, response planning, threat mitigation, and officer safety, footage quality and missing recordings were limitations. Similarly, while CCTV footage aided investigations by facilitating suspect identification and evidence collection, its effectiveness was hampered by poor quality and incomplete footage and the non-provision of footage storage devices for investigators. Moreover, ALPR-equipped CCTV cameras significantly aided in recovering stolen vehicles within Nairobi County and investigating vehicle-related crimes. However, their effectiveness was limited by the lack of a national stolen vehicle database and criminal adaptation to ALPR technology.

The study concludes that Nairobi's police-operated CCTV system is valuable, but its effectiveness hinges on addressing existing limitations. Therefore, it recommended expanding CCTV coverage, securing adequate funding for maintenance, creating a national stolen vehicle database, and providing investigators with dedicated, write-protected storage devices for maintaining footage integrity.

This research contributes to the evolving discussion on CCTV's role in contemporary policing, offering a Kenyan-specific perspective. However, limitations exist for future exploration. The findings are specific to Nairobi's police-operated system, limiting their direct applicability to other systems in the county and beyond. Additionally, the study captured police perspectives at a single point in time and focused on TTFT. Future studies could benefit from including other CCTV stakeholders like the public and exploring different theoretical frameworks to guide CCTV use in police operations. Nonetheless, this study serves as a foundational step towards understanding and improving CCTV use in police operations, with implications for policy and practice in Kenya and beyond.

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