



Police Perceptions of the Use and Effectiveness of Technology in Combatting Carjacking Within the Tshwane Metropolitan Policing Precinct

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Abstract

Increased carjacking in South Africa is a cause for concern, especially in metropolitan areas such as Tshwane. This article explores police perceptions of the use and effectiveness of technology in combatting carjacking within the Tshwane Metropolitan policing precinct. The objectives were to identify innovative technological systems and devices that are currently utilised by the police, and to determine their effectiveness. A qualitative research method was employed in this study and semi-structured interviews were used to collect data. Participants were sourced from various police stations across the Tshwane Metropolitan policing precinct, including Soshanguve, Atteridgeville, Pretoria West, Silverton, and the forensics department. A non-probability sampling procedure was followed and participants were purposively selected. The study found that different types of technological devices are used by the police, with an improvement based on the introduction of the commonly used application WhatsApp. The effectiveness of technological devices does not seem to militate against the ever-improving technology used by carjackers. Recommendations for practical application are made based on the findings of this study.

Keywords: *Carjacking; Technology; Tshwane Metropolitan; Crime.*

Introduction

South Africa has the highest rate of motor vehicle crimes in the world, especially carjacking, which negatively impacts the safety and security of the citizens and the economy (Burgers, Wright, & Nel, 2007, p. 98). In 2019 it was estimated that a motor vehicle is hijacked every 40 to 54 minutes in South Africa (Maluleke & Dlamini, 2019), which on its own was a sufficient cause for concern. However, more recently, due to a continuous increase in carjacking cases, it was estimated in the last quarter of 2022 that a motor vehicle is hijacked in South Africa every 22 minutes (South African Police Service [SAPS], 2022). It is evident that carjacking in South Africa is at an all-time high, with recent statistics showing that the SAPS recorded 22 742 carjacking cases between April 2022 and March 2023. This is a 24% increase in carjacking cases from the 18 299 recorded in the 2021/2022 financial year, which marked the highest count for the crime on record.

While Stone (2022) rightfully argues that it is best to first professionalise the police by strengthening performance management systems to ensure that basic skills such as data capturing and reporting are timely, accurate, and complete before relying on the use of technology due to the identified shortcomings, crime, particularly carjacking, continues to affect the citizens of this country. It could be for this reason that in its 2020/2021 annual performance plan, the SAPS, through Minister Cele, aspired to see a modernised SAPS that is technologically equipped and technologically capable, as crime patterns evolve in the era of digitisation. The Police Ministry further committed to monitor the SAPS's progress in introducing technology that enhances basic policing and crime detection (SAPS, 2020). Two years later, during the 2022 budget vote speech, Minister Cele alluded to the department's spending focus on investment in technology for the year (Cele, 2022), supposedly to enhance and introduce new technology to combat crime by the SAPS. At this stage, it is not clear whether the SAPS is currently technologically equipped and technologically capable, particularly with the latest technology, or whether the talked-about investment in technology has been made; however, this is not what this study intended to investigate.

Studies regarding technology and service delivery in the SAPS have been conducted but none has captured the essence of the effectiveness of technology and what technology is used to combat which type of crime. For instance, Alberus' (2019) study aimed to explain the impact of a digital strategy on SAPS performance for effective service delivery in efficiently dealing with crime. Wolvaard (2007) conducted a study with the primary objective of determining if the acceptance of electronic payments will improve the service delivery by the SAPS in King William's Town. Eloff's (2006) study aimed to determine whether remote sensing technology could contribute to the science of criminology as a spatial tool to better analyse and understand crime within a specific area. These studies are evidence of the fact that knowledge in the area of the use of technology to combat crime, particularly carjacking, is limited. It is against this backdrop that this study explored police perceptions of the use and effectiveness of technology in combatting carjacking within the Tshwane Metropolitan policing precinct and the type of technology used for this purpose. This study is organised in such a way that it is understood from a particular perspective through a literature review on the inevitable use of technology in almost everything we do, including combatting crime. This is followed by an attempt to provide guiding principles and a specific perspective through which to examine the topic by means of a theoretical framework. The study's conclusion is preceded by a discussion of the research methods, as well as the results and findings.

Research Problem

An increase in carjacking, as demonstrated in the foregoing section, is under no circumstances what the country aspires to. This kind of crime instils fear among motorists and passengers and often leads to deaths that could have been prevented. This is a problem that warrants research.

Literature Review on the Use of Technology to Combat Crime

In the 21st century, efforts to tackle the challenge of crime should be assisted significantly by developments in innovative technology (Gkoukoudis, Pissanidis, & Demertzis, 2022). From the use of technological devices in locking and alarm systems, to new devices for location, identification, and surveillance, to means of restraining individuals who pose a risk to themselves or others, the crime control tasks that confront both the community and police services should be made easier (Al Zaabi & Zamri, 2022; Coole, Evans, & Brooks, 2022). Previous studies have demonstrated the significance of the utilisation of innovative technologies in combatting crime and argued that innovative technology has been the driving force in leading to the reform of crime prevention and crime control strategies, both by individual citizens and concerned groups and by formal police agencies (Laufs & Borrión, 2022; Adejoh

& Lawal, 2022; Lytvynov, Topolnyk, Chumak, Prykhodkina, Antoniuk, & Kramska, 2022; Tymoshenko, Kozachenko, Kyslenko, Horodetska, Chubata, & Barhan, 2022).

Di Nicola (2022) points out that the serious and organised crime landscape has changed drastically in the past years; largely in part due to advancements in technology. Criminals quickly adopt and integrate new technologies into their modus operandi or build brand-new business models around them (Barros, Van der Zwet, Westerveld, & Schreurs, 2022; Kotsias, Ahmed, & Scheepers, 2022). The use of new technologies by criminal groups has an impact on criminal activities across the spectrum of serious and organised crime (Valero, 2022). Technology has become the most valuable instrument of trade for most criminals in the 21st century. Research shows that most carjackers in South Africa use some kind of technological device to compromise the security of targeted vehicles before, during, or after committing carjacking (Murray, 2022; Mlepo, 2022; Makhdoom, Abolhasan, & Lipman, 2022).

If combatting carjacking is a priority for the SAPS, any developments in the use of technology by criminals must be matched and countered by an appropriate and effective police response (Hill, O'Connor, & Slane, 2022). The obvious challenge that the police is faced with is to keep pace with new technological advancements and the continuously changing threat landscape (Flynn, Powell, & Hindes, 2023). In order for the police to effectively fight technology-enabled crime, they must embrace technology themselves. Innovative technology can also be a significant aid to the police in their effort to combat the crime of carjacking. Martinu and McEwen (2019, p. 23) state that the use of innovative technology by the SAPS has considerable resource implications; not only in gaining access to or the ownership of the technology in question, but also in ensuring that adequate training is available to capitalise on the technology. This means that a harmonised and coordinated approach to training and capacity building across the SAPS is essential (Harkin & Whelan, 2022; Gupta, Shukla, & Rawat, 2022). Well-trained police officers with the right technological tools will perform much better in the fight against crime, which will lead to effective arrest, successful prosecution, and crime reduction.

Combatting crime, however, is not something the SAPS can or should do alone. Mlamba, Mangai, Masiya, and Holzhauseni (2022) are of the view that a critical factor for success is to develop working relationships with different stakeholders such as private companies and academia. Wides (2014) echoes this sentiment by stating that stakeholders have no choice but to come together in the fight against crime. With vehicle safety technology and more coordinated efforts between the SAPS and other stakeholders, great strides can be made against criminals. Stakeholders often have access to data, resources, technology, and expertise that are simply unavailable to the SAPS. Most devices, gadgets, and technological systems used by the police to combat crime today are manufactured by private companies (Liao, 2022). Relationships with these companies are therefore of the utmost importance, and should be maintained at all times.

Theoretical Framework

Varpio, Paradis, Uijtdehaage, and Young (2020, p. 7) state that a theoretical framework is a logically developed and connected set of concepts and premises, developed from one or more theories, which a researcher creates to support a study. In order to create a theoretical framework, the researcher must properly define any concepts and theories that will provide grounding to the research, combine them through logical connections, and narrate these concepts to the study that is being conducted. In a nutshell, a theoretical framework reflects the work that the researcher has engaged in to utilise a theory in a given study (Varpio et al., 2020, p. 7). Against this background, the researchers selected and utilised the following theories to examine the phenomenon of carjacking:

Routine Activity Theory

Routine activity theory assumes that for a crime to take place, three necessary elements must converge in time and space. Firstly, a motivated offender; secondly, a suitable target; and, thirdly, the absence of a capable guardian (Miró, 2014; Atkins et al., 2017, pp. 31-32). In other words, for a crime to occur, a potential victim must be in the vicinity of a motivated offender, where there is no guard to hinder or discourage the offender from committing a crime. This is often the case with carjacking. In most cases, carjackers (motivated offenders) commit the crime of carjacking on motorists (victims) where there is no police (guardian) presence. In our modern world where almost everything is controlled by technology, the police can utilise innovative technologies as their eyes and ears to monitor criminal activities that occur in their physical absence. Criminals often hesitate to commit crime once they realise that they are being watched.

Rational Choice Theory

Rational choice theory assumes that offenders are rational beings who, out of their own free will, make decisions to commit crime, based on the costs and benefits involved in the process of committing it (Lutya & Lanier, 2012, p. 557). Carjackers decide and plan to commit carjacking, and they are often encouraged to commit the crime because of the minimal chances of apprehension and prosecution. The low conviction rate for serious crimes is one of the most critical issues confronting the South African criminal justice system. According to City Press (2019), the country's law enforcement has essentially crumbled, with conviction rates for severe crimes as low as 2% in some circumstances. According to Mybroadband (2019), only 2.3% of 16 026 car hijackings were prosecuted and resulted in a guilty judgement. The findings of this study will hopefully guide the SAPS and its stakeholders to realise the important role played by modern technology in combatting crime.

Economic Theory

This theory is of the view that people make a decision to commit crime in a way that represents their decisions about other, non-criminal activities (Witt & Witte, 2000, pp. 4, 6). This means that criminals may commit crimes if the benefits to be obtained from lawful acts are fewer than the benefits to be obtained from the unlawful act. The essential principle that the economic theory presents is that criminals often commit crime when they have observed and found the profits of the crime to be more than the possibility of being prosecuted and the associated costs thereof (Eagle & Betters, 1998, p. 166; Persson & Siven, 2007, p. 213). For the purposes of this study, carjackers may commit the crime of carjacking due to its lucrative nature. Carjacked vehicles are in high demand in neighbouring countries. Regardless of the danger involved in committing carjacking, carjackers continue to commit the crime because the benefits outweigh the risks.

Broken Windows Theory

The broken windows theory implies that community disorder leads to crime, and that the elimination of disorder will result in crime reduction (Johansen, Neal, & Gasteyer, 2015, p. 2). In this theory, the environmental setting plays a crucial role when it comes to crime. This explains that most carjackers may be committing the crime of carjacking because the environment allows them to do so. While the level of unemployment is very high in South Africa, it does not justify crime. The researchers are of the view that if known carjacking hotspots can be provided with innovative technological devices (e.g., closed-circuit television [CCTV] cameras, etc.) most carjackers could easily be identified, apprehended, and prosecuted. This on its own would serve as a deterrent.

Methods

The objective of this study was to explore police perceptions of the use and effectiveness of technology in combatting carjacking in the Tshwane Metropolitan policing precinct and to identify the type of technology that can be used for this purpose. This is a relatively unknown research area. To gain a broader understanding of this phenomenon, a phenomenological qualitative research design was deemed appropriate for this study. Creswell (2013) states that phenomenology is an approach to qualitative research that focuses on the commonality of a lived experience in a particular group. The fundamental goal of the approach is to arrive at a description of the nature of the particular phenomenon. Against this background, interviews were conducted to acquire information based on the participants' perceptions, experiences, and understanding of the phenomenon regarding the use and effectiveness of technology to combat carjacking and what type of technology can be used for this purpose.

This study utilised non-probability sampling procedures and, more specifically, purposive sampling. This method makes provision to choose research participants on the basis of the researcher's judgement (Bailey, 1987, p. 94). For this study, this judgement was informed by two factors, namely years of work experience, which ranged between five and 11 years, and the nature of the work the participants were doing. This means that only those police officers involved in combatting carjacking and related crimes operating in detective units at the police station level, and those working in the forensics branch of the SAPS, were sampled. Table 1 presents the sampled participants' demographics.

Table 1. Participant demographics

Police station/unit	Number	Province	Years of work experience
Soshanguve SAPS	2	Gauteng	6 – 11
Atteridgeville SAPS	5	Gauteng	11 – 30
Pretoria West SAPS	5	Gauteng	5 – 28
Silverton SAPS	5	Gauteng	2 – 14
SAPS Forensics Investigation Unit	5	Gauteng	2 – 21
Language proficiency	English	African languages	Afrikaans
	22	12	10
Gender of participants			
Male	12	Gauteng	
Female	10	Gauteng	
Race of participants			
African	12		
White	8		
Coloured	2		
Total number of participants	22		

In order to ensure consistency in the line of questioning, an interview guide with a set of questions was prepared as the research instrument. Follow-up questions, which were not written down, were also asked to allow the participants to divulge more information in relation to the utilisation of innovative technologies in combatting carjacking. The participants were interviewed one on one and did not give permission to have their interviews recorded for fear of victimisation. This in essence meant respect for their right to privacy and ensuring their anonymity. The researchers took fieldnotes, which were later analysed and recorded. As alluded to earlier, this study was qualitative in nature and semi-structured interviews were used to collect rich, detailed data (Gordon, 2019, p. 21). This qualitative study utilised thematic analysis to analyse the collected data.

The data analysis of this study was guided by following Creswell’s (2009, p. 185) six data-analysis process steps:

- **Step 1:** Data were organised and prepared for analysis. The data obtained from the interviews were transcribed during this step.
- **Step 2:** The transcribed data were read through. This was done with the aim to gain a general sense of the data and to secure the opportunity to reflect on its overall meaning.
- **Step 3:** At this stage, a detailed analysis with the coding process begun. The collected data were organised by categorising the text and then labelling the categories with specific terms.
- **Step 4:** The coding process was used to develop a description of the people, setting, or categories/themes for analysis.
- **Step 5:** The descriptions of the themes were presented in qualitative narrative. During this step, the researcher merged the themes into narrative passages, so that the findings could emerge logically from the participants’ responses.
- **Step 6:** At this stage, the research findings, as well as the information gleaned from personal experiences, history, and/or the literature, were provided under the results and discussion sections of this study.

Results

The participants of this study comprised members from Soshanguve SAPS, Atteridgeville SAPS, Pretoria West SAPS, Forensics Investigation Unit SAPS, and Silverton SAPS. All other SAPS members (except members from the forensics department) worked in the detective units that deal with the investigation of vehicle-related crimes and were thus included in this study. SAPS members from the forensics department deal with the processing of crime scene substances and materials. In the event of a carjacking, they play a huge role in processing fingerprints and DNA for the identification of potential carjackers. Due to the technology they use, and the role they play in combatting carjacking, they were included as participants in this study. The participants were numbered as follows:

Table 2. Participant numbers

Soshanguve SAPS	Atteridgeville SAPS	Pretoria West SAPS	SAPS Forensics Investigation Unit	Silverton SAPS
• Participant 1	• Participant 3	• Participant 8	• Participant 13	• Participant 18
• Participant 2	• Participant 4	• Participant 9	• Participant 14	• Participant 19
	• Participant 5	• Participant 10	• Participant 15	• Participant 20
	• Participant 6	• Participant 11	• Participant 16	• Participant 21
	• Participant 7	• Participant 12	• Participant 17	• Participant 22

Fieldnotes taken by the researchers during the interviews also facilitated data analysis. These notes provided direction during the data-analysis process and aided in the categorisation of the data into themes. The data analysis of this group’s responses yielded two themes: (1) innovative technologies utilised by the SAPS in combatting carjacking, and (2) the role of each innovative technology.

Theme 1: Innovative Technologies Utilised by the South African Police Service (SAPS)

The participants were asked to identify innovative technological devices and systems that they were aware of that were utilised by the SAPS in combatting carjacking. Their responses varied. Some participants indicated that the Circulation System was the technology currently used to deal with carjacking and other vehicle-related crimes. Others mentioned devices such as cameras, tracking devices,

radios, tracking apps, vehicle sensors, the Crime Scene Management System, the Automated Fingerprint Management System, CCTV, the Vehicle Identification System, and cellphones. The following are some of the participants' responses:

"Circulation, we circulate details of carjacked vehicles" (Participant 1).

"We don't have Vehicle Tracking Systems installed on our vehicles here at our police station" (Participant 3).

"We use radios that are fixed in SAPS vehicles and radios in the Community Service Centre" (Participant 4).

"We use WhatsApp groups" (Participant 7).

"We work with tracking companies who installed tracking systems in our SAPS cars" (Participant 8).

"SAPS vehicles are fitted with tracking devices" (Participant 9).

"SAPS has partnership with cartracking companies. Detective devices are installed in SAPS vehicles" (Participant 10).

"Vehicle sensors" (Participant 12).

"We use cameras, gunshot residue kit, Crime Scene Management System, Automated Fingerprint Identification System" (Participant 13).

"CCTV footage and Vehicle Identification System" (Participant 14).

"Forensic Unit is equipped with Polyflare lights to investigate all carjacked vehicles, even during the night" (Participant 17).

"Radio, computer and cellphones" (Participant 18).

"Detector machine and Circulation System" (Participant 19).

"The Circulation Software System for testing the registration and for making enquiries" (Participant 20).

The above responses demonstrate that different units in the SAPS utilise different devices and systems in the execution of their duties. For instance, the detective units at police stations rely heavily on Circulation System and radios, whereas SAPS members from the forensics department utilise systems such as the Crime Scene Management System and the Automated Fingerprint Identification System. Furthermore, it appears that detectives use common devices to circulate information pertaining to reported crimes of carjacking, whereas at the forensic level, they utilise more sophisticated systems to aid in the identification of potential carjackers. There were differing opinions in the participants' responses regarding the utilisation of tracking devices and systems by the SAPS. Some participants stated that SAPS vehicles are fitted with tracking devices and systems that aid in the identification of carjacked vehicles. These claims corresponded with the claims made by other participants that some SAPS vehicles are fitted with sensors, which sense the targeted carjacked vehicle once it is driving or parked within a certain range of the SAPS vehicle that is on the lookout. One participant, however, disputed these claims by stating that SAPS vehicles are not fitted with any tracking systems or sensing devices.

Theme 2: The Role of Each Innovative Technology

The participants were asked to name the technologies and devices they were using and to explain how these technologies are used to combat carjacking. Some participants mentioned similar technologies; however, they provided varying answers in relation to the functionality thereof. Some participants provided detailed descriptions of the role of these technologies, while others provided brief descriptions.

Some participants explained that technologies such as Circulation System are used the most in circulating information about reported incidents of carjacking, which inform members of different police stations about crimes. Regarding the Circulation System, the participants said the following:

“Circulation System stores information of stolen or carjacked vehicles. We are able to check vehicles if they are stolen from this system” (Participant 1).

“Circulation System is used to test the stolen vehicles” (Participant 2).

“The Circulation Software System is utilised for testing the registration of the motor vehicle and for making enquiries” (Participant 20).

Some participants mentioned radios as technological devices utilised by the police to communicate carjacking information with patrol officers on the ground. Below are their explanations:

“We use radios to inform every officer who is on our channel about carjacking crimes” (Participant 3).

“We use radios to update members on the ground and other police stations about the carjacked vehicles so that they may also be on the lookout” (Participant 4).

“Each police station has a radio control room, so we use these radios to inform other stations about carjacking crimes” (Participant 5).

“We communicate carjacking cases to our members via radio” (Participant 6).

“We use radio to inform members about the reported carjacking” (Participant 7).

Some of the participants mentioned that some SAPS vehicles had vehicle tracking devices installed, which helped to detect and locate carjacked vehicles. Their responses on how these tracking devices operate are as follows:

“When the information of carjacking crime is circulated to us, we dispatch SAPS vehicles with tracking systems to be on the lookout for the carjacked vehicle” (Participant 8).

“As long as the carjacked vehicle is circulated, SAPS vehicles with tracking devices can detect the vehicle” (Participant 9).

“The tracking system in our SAPS vehicles are able to track or sense stolen vehicles wherever we drive past them. There is a beep sound from the device in our vehicle that notifies us of a carjacked vehicle” (Participant 10).

“When a carjacking crime is reported, coordinates are sent to us. Whenever we get closer to the vehicle, our sensor system senses the carjacked vehicle. This is how we recover the vehicle” (Participant 12).

“Tracking devices installed in highway patrol track carjacked vehicles; however, this technology is only available in Gauteng province” (Participant 15).

“Flying squad vehicles are equipped with tracking devices to track down carjacked vehicles” (Participant 17).

Some participants mentioned that CCTV cameras help with the investigation of carjacking crimes. They capture carjacking crimes as they occur and keep records thereof. Mobile cameras are also used to take photographs on the crime scene. Participant 16 stated:

“Detectives monitor CCTV for evidence of carjacking.”

Some participants elaborated on how the Crime Scene Management System and the Automated Fingerprint Identification System play a crucial role in combatting carjacking in South Africa. They explained the roles played by each system in combatting carjacking as follows:

“Crime Scene Management System keeps the record of the crime scene, the names of investigating officers, the details of the carjacking crime scene, and name of the police station in which the crime occurred” (Participant 13).

“Automated Fingerprint Identification System keeps the database of criminals’ [carjackers] fingerprints and the fingerprints of every person in South Africa. Crime scene fingerprints are matched with prints in this database for potential identification of the suspect” (Participant 14).

One participant indicated that WhatsApp groups play a huge role in combatting carjacking, in that images, vehicle registration numbers, and other crucial information related to carjacking crimes are posted and shared via WhatsApp groups. Upon seeing such vehicles of interest posted on the group, SAPS members on patrol are able to apprehend the criminals and recover the vehicle. A participant said:

“We use WhatsApp to inform our members about carjacked vehicles” (Participant 7).

The participants named various technological systems and devices that are utilised by the SAPS to combat carjacking. Furthermore, they described the roles of each type of technology. It is worth noting that in some instances, members from the same station offered different opinions, thoughts, and experiences. Some mentioned technologies that others knew nothing about; some demonstrated knowledge of technology utilised to combat carjacking, whereas others only knew the basic ones. This is consistent with Holmgren and Sjöberg’s (2022) assertion that in the police environment, police knowledge and understanding of the value of technology in crime prevention differ from one police officer to the next.

Theme 3: The Effectiveness of Innovative Technologies

The participants were asked to explain if the technologies they mentioned were effective in combatting carjacking. Most participants indicated that they were effective and that they assisted in the recovery of carjacked vehicles and the arrest of carjackers. However, a few participants indicated that the technology was not effective in combatting carjacking because of their vulnerabilities. The following were their responses during the interviews:

“It is highly effective. Most vehicles are recovered and suspects are arrested and removed from the community” (Participant 1).

“They are not effective because we currently don’t have a face recognition system” (Participant 2).

“They are effective, but these days we are negatively affected by load shedding” (Participant 3).

“It is very effective. The Circulation System produces a case number, and circulates the registered case of carjacking to other police stations” (Participant 4).

“The radio system is very effective. We make follow-ups on members who received the message to see how long it took them to attend to the carjacking complaint after it was lodged” (Participant 5).

“It is sometimes effective because after receiving the complaint, they do recover the carjacked vehicles, but sometimes they don’t” (Participant 6).

“They are effective. They help us to quickly locate the movement and the position of carjacked vehicles. Sometimes we even find and recover the carjacked vehicle before Cartrack members arrive” (Participant 7).

“The tracking system is working a lot. I advise vehicle owners to have tracking devices installed in their vehicles. It helps us to recover both the carjacked vehicle and the victim” (Participant 8).

“The recovery rate is very low; however, they do track carjacked vehicles sometimes. That is because not all our police vehicles are installed with tracking systems” (Participant 9).

“Most carjacking vehicles are recovered because of this system. I can safely say the technology is effective” (Participant 10).

“Very effective because it helps us to locate and recover the hijacked vehicle” (Participant 11).

“Very effective. The technology helps in the location and recovery of carjacked vehicles” (Participant 12).

“The technology is very effective. Most carjackers are linked to the crime by DNA and fingerprints” (Participant 13).

“It is very effective. We are able to identify the real suspect of carjacking” (Participant 14).

“The technology is effective in certain areas where the incident takes place, more especially where cameras are monitored” (Participant 15).

“The technology helps to identify and arrest the suspect” (Participant 16).

“They are effective, as arrests are made, and statistically carjacking is kept on average” (Participant 17).

“Sometimes it works perfectly well, but sometimes we lose the system” (Participant 18).

“The vehicle detector technology is good but we need one on all vehicles” (Participant 19).

“The system notifies us when we drive past the vehicle that was carjacked” (Participant 20).

“The Circulation System notifies us immediately if a vehicle is carjacked, giving details as well as the case number” (Participant 21).

Discussion

This study was conducted to explore police perceptions of the use and effectiveness of technology in combatting carjacking within the Tshwane Metropolitan policing precinct and the type of technologies used for this purpose. It was found that different devices and systems are utilised by the SAPS in the effort to combat carjacking; however, these technologies are less sophisticated and made little impact on the crime of carjacking – hence the continuous increase in carjacking incidents. Most participants of this study indicated that the SAPS at the station level relied heavily on the Circulation System to combat carjacking. It is clear from these findings that the SAPS is not well equipped with modern technological systems and devices that help in locating and recovering carjacked vehicles. The Circulation System is meant for communicating carjacking incidents, but has no direct role in or impact on the investigation of the crime. This means that the technology used by the SAPS does not match that which is used by criminals. According to Di Nicola (2022), Barros et al. (2022), and Kotsias et al. (2022), criminals use the latest technology to commit crimes, including carjacking. Gkoukoudis et al. (2022) found that police efforts to tackle the challenge of crime and to conduct successful investigations should be assisted significantly by developments in innovative technology.

When the participants were asked to describe how the Circulation System works, they stated that whenever a carjacking crime is reported and a docket is opened, SAPS officers record this information on the Circulation System, so that other police stations may receive the information and pass it to police officers on the street, who in turn will be on the lookout for the reported vehicle. This study found that although this system is crucial for circulating carjacking cases to members in different police stations, police officers on the street are not technologically equipped to be able to locate these vehicles in real time. They often use vehicle registration numbers, which are communicated to them by their radio controller, to look for a match as they drive around. It is for this reason that very few carjackers are apprehended. The routine activity theory explains that criminals commit crime when the chances of being caught and prosecuted are low (Atkins et al., 2017, pp. 31-32). Recent statistics, as highlighted above, affirm the challenge of low prosecution and conviction rates for carjacking in South Africa. The routine activity theory offers the best explanation as to why carjacking statistics in South Africa keep increasing. The police are simply technologically underequipped and carjackers take advantage of this vacuum to commit carjacking with impunity.

Another device that SAPS members utilise the most in combatting carjacking is police radios. The participants explained that every SAPS vehicle is equipped with a radio that their police stations utilise to transmit messages to patrol members. When carjacking is committed or reported, members on the street often receive messages through these radios. They use them to communicate with their stations

but also among themselves on the ground. Social media platforms are also used by police officers. The most common platform is a mobile application called WhatsApp. Officers unofficially use WhatsApp groups to communicate work-related matters. In cases of carjacking incidents, detailed information, images, and videos are shared with fellow SAPS members and at times also with other crime prevention stakeholders such as private security companies (Mlamla et al., 2022). WhatsApp is a commonly used platform in South Africa; not only by the police, but also by neighbourhood watch groups and community police forums. According to Mols and Pridmore (2019), neighbours exchange warnings, concerns, and information about incidents, emergencies, and suspicious situations. These exchanges often lead to neighbours actively protecting and monitoring their streets, sending messages about suspicious activities, and using their camera phones to record criminal events (Mols & Pridmore, 2019). The captured criminal events are often sent to the police for further investigation. The effectiveness and impact of WhatsApp to combat carjacking is, however, not yet clear, given the high rate of carjacking in South Africa.

It was also found that the forensics department of the SAPS is in possession of crucial technological systems, which in most cases help to provide the identities of carjacking suspects using evidence collected from crime scenes. According to the participants, whenever there is a carjacking, the collected information is recorded on the Crime Scene Management System. This system records all information of reported crimes and the information can be accessed by investigators of carjacking. The forensics department's Automated Fingerprint Identification System helps to link fingerprints collected from carjacking scenes with known fingerprints. When a carjacking occurs and the vehicle is recovered, police officers collect fingerprints from the vehicle involved and compare them with fingerprints on the Automated Fingerprint Identification System, which produces the real identity of the suspect, who is then arrested and charged. Regardless of the crucial role played by these technological systems, this study found that the systems have certain shortfalls that must be addressed. The Crime Scene Management and Automated Fingerprint Identification systems are currently not linked with the Department of Home Affairs' systems. As a result, the forensics department is sometimes not able to link evidence collected from carjacking scenes with information on these systems, which thus makes it difficult to produce suspects' true identities. The systems only reflect the identities of individuals who were formerly captured onto the systems, and not new ones. This lack of integration between the SAPS's systems and Home Affairs' systems therefore makes it difficult for the police to effectively identify, arrest, and charge carjacking suspects. This boils down to the notion of the importance of collaborative work between stakeholders, as suggested by Mlamla et al. (2022).

The recent announcement by Gauteng Premier, Mr Panyaza Lesufi, regarding the introduction of the use of drones and street cameras could be a step in the right direction to counter criminals' ways of integrating new technologies into their modus operandi, as confirmed by Barros et al. (2022) and Kotsias et al. (2022). This notion is supported by the broken windows theory, which states that for crime to be effectively prevented, the environment must change and opportunities for crime must be eliminated (Johansen et al., 2015, p. 2). If successfully implemented, the Gauteng Premier's initiatives are expected to discourage criminals from committing crime since they know they are being watched. Whether the initiatives will have an impact on carjacking remains to be seen.

It is rather ironic that most of the participants perceived the technology they used to combat carjacking as effective given the increased rate of carjacking not only within the area of study but also across many major cities in South Africa. This could mean that the police are faced with the challenge of not being able to keep up with the new technologies used by criminals (Flynn et al., 2023).

Recommendations

In line with the findings of this study, the following recommendations are made:

Policy Development

The SAPS should consider developing a policy that will ensure that it stays up to date with the latest technology to combat any form of crime that requires the use of technology.

Continuous Training of Police Officers

Police officers should undergo training and retraining in the use of ever-developing technology.

Collaborative and Integrated Technological Systems

The SAPS must enter into agreements with private sector organisations to work together with Home Affairs in the use of technology to combat crime in general.

The Use of Drones and CCTV Cameras

The SAPS should consider using drones and CCTV cameras not only in the Gauteng province but also in other major cities in the country. This can be gradually introduced throughout the country.

Conclusion

This study explored police perceptions of the use and effectiveness of technology in combatting carjacking within the Tshwane Metropolitan policing precinct and the type of technology used for this purpose. It was found that various innovative technological devices are utilised by the SAPS; however, despite technological measures put in place, the crime of carjacking continues to increase in South Africa. This claim is underpinned by recent SAPS crime statistics. This thus raises questions regarding the effectiveness of the technology used by the SAPS to combat carjacking, not only in the area of study but also across the country.

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