

Effectiveness of the Philippine National Police Explosive Ordnance Disposal K9 Unit in Safeguarding the Puerto Princesa Community: Public Insights on Safety and Security

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Abstract

This study assessed the perceived effectiveness of the Philippine National Police Explosive Ordnance Disposal and Canine Unit in safeguarding the Puerto Princesa community. Anchored on Routine Activity Theory and Community Policing Theory, the study used a quantitative research design involving 60 respondents composed of 40 residents and 20 tourists. Data were gathered through a research-made questionnaire measuring the unit's visibility, approachability, training, deployment, public safety contribution, and operational challenges. Findings showed that the PNP EOD/K9 Unit was perceived as effective in visibility and deployment, and very effective in approachability and training. Public perception of safety and security in relation to the unit's operations was rated strongly agree, indicating strong confidence in its role in promoting protection and public reassurance. Significant differences were found between residents' and tourists' perceptions in terms of visibility, training, and deployment, while no significant difference was found in approachability. The main operational challenges included crowd density, weather-related limitations, public intimidation, possible mishandling, and concerns related to canine socialization. The study concluded that the unit contributes meaningfully to public safety in Puerto Princesa, although improvements are needed in visibility, deployment, communication, resource support, training enhancement, and public engagement. The study supports SDG 11 on Sustainable Cities and Communities, SDG 16 on Peace, Justice, and Strong Institutions, SDG 8 on Decent Work and Economic Growth, and SDG 17 on Partnerships for the Goals. Its sustainability impact lies in strengthening institutional readiness, community safety, tourism confidence, governance responsiveness, and evidence-based public safety planning.

Keywords: Approachability, Community Safety, Deployment, EOD K9 Unit, Public Perception, Public Trust, Puerto Princesa City, Tourism Security, Visibility

1. Introduction

Public safety in contemporary urban and tourism-centered environments increasingly requires specialized law enforcement capabilities that go beyond traditional policing. As threats involving organized crime, civil unrest, terrorism, improvised explosive devices, and hazardous materials continue to evolve, Explosive Ordnance Disposal and Canine units have become essential components of proactive security systems. In Puerto Princesa City, Palawan, the Philippine National Police Explosive Ordnance Disposal and Canine Unit serves as a preventive and responsive mechanism for safeguarding residents, tourists, and high-traffic public areas. This study focuses on the perceived effectiveness of the PNP EOD K9 Unit in terms of visibility, approachability, training, and deployment, while also examining public perceptions of safety and security, perceived operational challenges, and possible improvement strategies.

The growing complexity of public safety threats has expanded the mandate of law enforcement agencies from reactive policing to proactive threat prevention. Urban centers and tourist destinations are exposed to risks that include criminal activities, civil disorder, terrorism, and explosive-related threats. In this context, EOD and K9 units have become critical law enforcement assets because they combine technical explosive ordnance expertise with the biological detection capability of trained canines. Their work involves identifying, intercepting, and neutralizing explosive hazards before these threats can cause injury, death, or property damage. Globally, EOD/K9 units are no longer viewed merely as support units but as essential components of urban security. The New York Police Department's EOD K9 program, for instance, is deployed in high-transit and high-risk locations such as subway systems, airports, and public landmarks, including major events such as New Year's Eve celebrations in Times Square, where their sweeping operations function as deterrents against explosive-related incidents (Botelho, 2024). Beyond technical detection, visible EOD K9 deployment also influences public confidence. Department of Homeland Security (2025) reported that visible canine deployment operates as a "force multiplier" by increasing the public's sense of security and reducing perceived risk during major gatherings. In the United Kingdom, British Transport Police (n.d.) strengthened K9 security protocols after the 2005 London bombings,

integrating EOD K9 units into counter-terrorism efforts in transportation systems. These international practices provide a relevant lens for Puerto Princesa City, a major Philippine tourism destination known for its ecological attractions, biodiversity, and UNESCO-recognized sites. The city's economic recovery and tourism development depend strongly on its image as a safe and secure destination. While Puerto Princesa generally maintains a favorable peace and order environment, it remains exposed to public safety concerns such as petty crime, substance-related offenses, and the latent threat of terrorism commonly associated with high-profile travel destinations. The active deployment of the PNP EOD K9 Unit therefore reflects a proactive public safety strategy, but its effectiveness must also be assessed through public awareness, confidence, and trust.

The literature emphasizes that EOD K9 units contribute to public safety through detection, deterrence, mobility, and public reassurance. The PNP EOD/K9 Group has been recognized as a National Operational Support Unit responsible for locating, identifying, and safely disposing of explosives through strict operational standards and risk controls (National Police Commission Resolution No. 2025-0008). Explosive detection dogs are especially valuable in transportation hubs, buildings, vehicles, and vulnerable public areas because their mobility and scent-detection capacity allow them to identify threats that may not be immediately visible. Several studies highlight the importance of coordination, training, and operational readiness in maximizing EOD K9 effectiveness. Bracamonte (2016) discussed the integration of EOD and K9 teams in Metro Manila as a response to growing security concerns, while also noting coordination and resource-utilization challenges. Perez (2025) emphasized the contribution of PNP K9 units to crisis management, operational readiness, and public reassurance. Lewis et al. (2024) underscored the complexity of EOD operations and the importance of accurate reporting for decision-making, logistics, and safety. Similarly, Evans (2004) highlighted that standardized reporting and coordination are necessary to prevent operational inefficiency and reduce risks. Training and deployment strategies are also central to EOD K9 performance. The literature indicates that the effectiveness of these units depends not only on the dogs but also on handler expertise, realistic training, and strategic deployment. Continuous training, including exposure to simulated threat environments, strengthens the detection skills of canines and handlers. Routine inspections and searches in vulnerable areas also support proactive public safety, with explosive detection dogs shown to be sensitive and reliable in preventing potentially catastrophic incidents (Philippine National Police Explosive Ordnance Disposal/K9 Group, n.d.). International studies further connect visible EOD K9 deployment with public confidence. The NYPD has demonstrated the value of EOD K9 units in major public events, while studies from the U.S. Department of Homeland Security indicate that visible deployment increases perceived safety (Department of Homeland Security, 2023). In the United Kingdom, the expansion of K9 operations after the 2005 London bombings contributed to improved commuter trust and cooperation (Smith & Clarke, 2018). In tourism contexts, safety perception strongly affects visitor satisfaction, destination evaluation, and travel decisions. Tourists' perceptions of safety can influence destination satisfaction, repeat visits, and recommendations (Fuchs & Piza, 2011). Safety and security may even become as important as price in destination choice (Pizam et al., 1997). Visible security measures can increase feelings of protection, although they may also heighten awareness of possible danger depending on individual experiences, cultural norms, personality, and cognitive biases (George, 2003; Wachter et al., 2020). Since tourists often rely on subjective impressions, media narratives, and word-of-mouth rather than crime statistics, negative safety perceptions may be difficult to reverse once formed (Mawby, 2000; Ding & Wu, 2022). Public perception of law enforcement is another important theme. K9 units can improve trust by participating in community education, demonstrations, and public engagements that make law enforcement more approachable (Custom Canine Unlimited, n.d.). Their visible and professional presence may deter crime and strengthen the image of police as community partners. By showing transparency, professionalism, and commitment to public safety, K9 units can act not only as detection teams but also as community ambassadors (3DK9, 2024; Porac, 2024). In the Philippine setting, public trust in the police is essential for public order and law enforcement legitimacy (PNP, 2019). However, trust may vary across population groups (Mangahas, 2010), and members of police auxiliary groups may view police performance more favorably than ordinary citizens (Sarmiento & Torres, 2001). Community engagement and transparency may improve trust, while allegations of corruption or abuse can weaken public confidence (PNP, 2019; Transparency International, 2024).

At the global level, EOD K9 units have become part of contemporary counter-terrorism and public safety strategies. The examples of the NYPD and British Transport Police show that specialized canine units are deployed in high-risk urban spaces, transport systems, and major public events to deter explosive threats and strengthen public confidence (Botelho, 2024; British Transport Police, n.d.; Department of Homeland Security, 2025; Department of Homeland Security, 2023; Smith & Clarke, 2018). At the national level, the PNP EOD/K9 Group functions as a specialized unit mandated to respond to explosive-related incidents, conduct security sweeping, and support high-profile public safety operations. Its designation as a National Operational Support Unit reflects the importance of specialized technical and canine capabilities in Philippine law enforcement (National Police Commission Resolution No. 2025-0008). Literature on Philippine law enforcement also shows that trust, transparency, responsiveness, and community engagement are central to public confidence in police institutions (PNP, 2019; Mangahas, 2010; Transparency International, 2024). At the local level, Puerto Princesa City presents a distinct public safety context because it is both a residential community and a major tourism destination. Its economic vitality depends partly on its reputation as a safe city for local residents and visitors. The PNP EOD K9 Unit is therefore relevant not only to threat detection but also to public confidence, tourism resilience, and community security.

Since the city attracts domestic and foreign tourists, the perceived visibility, approachability, training, and deployment of the EOD K9 Unit may influence how safe and secure residents and tourists feel in public spaces.

This study is anchored in Routine Activity Theory (Cohen & Felson, 1979), which explains that crime occurs when three elements converge: a motivated offender, a suitable target, and the absence of capable guardians. In this study, the PNP EOD K9 Unit functions as a capable guardian in public spaces by providing visible deterrence, technical threat detection, and rapid response capacity. Its presence may reduce opportunities for explosive-related threats and contribute to public perceptions of safety. The study is also informed by Community Policing Theory, which emphasizes police visibility, community engagement, and trust-building as elements of effective law enforcement. The PNP EOD K9 Unit, as a specialized and visible unit, may strengthen public trust when its presence is perceived as professional, approachable, and responsive, especially in tourist-centered areas. Conceptually, the study follows an input-process-output framework. The inputs include data on perceived effectiveness in terms of visibility, approachability, training, and deployment; public perception data on safety and security; and survey responses from residents and tourists. The process involves analyzing operational effectiveness, evaluating public perceptions of safety and security, and comparing the perceptions of residents and tourists. The expected outputs include the perceived effectiveness level of the PNP EOD K9 Unit, public perception of its contribution to safety and security, comparison of resident and tourist perceptions, recommendations for improvement, and proposed strategies.

Although EOD K9 units are widely recognized for their technical role in public safety, limited localized evidence is available on how residents and tourists perceive the effectiveness of the Puerto Princesa PNP EOD K9 Unit. Existing literature discusses the operational value of EOD K9 teams, their role in public safety, and their contribution to public confidence; however, there remains a need to examine these issues in the specific context of Puerto Princesa City, where tourism, community safety, and law enforcement visibility intersect. The study addresses this gap by assessing perceived effectiveness according to four parameters: visibility, approachability, training, and deployment. It also examines whether residents and tourists differ in their perceptions, how the public views safety and security in relation to the unit's operations, and what operational challenges may affect the unit's performance. The study is perception-based and limited to Puerto Princesa City, focusing only on the PNP EOD K9 Unit and excluding other law enforcement or emergency response teams. It does not assess internal training protocols or technical procedures beyond what is publicly observable or reported. Its rationale lies in generating empirical insights that may guide training, deployment, community engagement, public communication, resource allocation, and future policy support for specialized police units.

This study aligns most directly with SDG 11 – Sustainable Cities and Communities because it examines public safety mechanisms that support secure, resilient, and livable urban and tourism spaces. The PNP EOD K9 Unit's role in safeguarding high-traffic public areas, transport terminals, tourist destinations, and community spaces contributes to the broader goal of maintaining safe human settlements. The study is also aligned with SDG 16 – Peace, Justice, and Strong Institutions because it focuses on law enforcement effectiveness, public trust, community security, and institutional responsiveness. By examining public perceptions of a specialized police unit, the study contributes to discussions on transparent, trusted, and effective public safety institutions. The research further relates to SDG 8 – Decent Work and Economic Growth because Puerto Princesa's tourism economy depends on public confidence in safety and security. A secure destination can support tourism recovery, local enterprise activity, visitor satisfaction, and community livelihood stability. Finally, the study has supportive relevance to SDG 17 – Partnerships for the Goals because improving public safety requires coordination among law enforcement agencies, local government, tourism offices, community groups, and academic institutions.

The study contributes to multidisciplinary sustainability by connecting criminology, public administration, tourism management, community development, psychology, and governance. From a public safety and governance perspective, it provides evidence that may help law enforcement agencies and policy makers improve deployment strategies, resource allocation, community engagement, and emergency preparedness. From a tourism and socio-economic perspective, it supports the importance of perceived safety in maintaining Puerto Princesa's attractiveness as a destination and protecting tourism-related livelihoods. The study also contributes to community sustainability by examining how residents and tourists perceive the safety value of the PNP EOD K9 Unit. Since public trust and perceived protection influence cooperation with law enforcement, the findings may help strengthen the relationship between police units and the communities they serve. Institutionally, the study may serve as a localized reference for other PNP EOD K9 units, academic researchers, and local government offices interested in improving specialized law enforcement operations. Overall, the study supports sustainable public safety by emphasizing that effective security requires not only technical capability but also visibility, approachability, public trust, and evidence-based improvement.

2. Material and methods

2.1 Research Design

The study used a quantitative research design to assess the perceived effectiveness of the Puerto Princesa PNP EOD K9 Unit in safeguarding the community. Quantitative data were collected, analyzed, tabulated, and interpreted to provide a comprehensive picture of the unit's effectiveness based on visibility, approachability, training, and deployment.

2.2 Locale of the Study

The study was conducted in Puerto Princesa City, the capital of Central Palawan and widely known as the "City in the Forest." The city is composed of sixty-six barangays, consisting of thirty-five urban and thirty-one rural areas. As a major travel gateway and tourist destination, Puerto Princesa receives both domestic and foreign visitors and is known for its environmental attractions, beach resorts, seafood restaurants, and reputation as a clean and green city. Data collection was focused on high-traffic tourist areas, including the Puerto Princesa Baywalk, Honda Bay Island hopping wharf, Puerto Princesa Subterranean River National Park, and selected restaurants in the Poblacion area. These sites were selected because they provided access to qualified respondents who were likely to have direct or indirect exposure to the city's public security environment.

2.3 Respondents of the Study

The respondents of the study were residents and tourists in Puerto Princesa City. The resident respondents were individuals residing in the city, while the tourist respondents were domestic or foreign visitors present during the data collection period. The study involved a total of sixty respondents, composed of forty residents and twenty tourists. These groups were selected because they directly experience or observe the security environment where the PNP EOD K9 Unit operates.

2.4 Sample and Sampling Procedure

The study employed a non-probability sampling approach described in the manuscript as convenience sampling and purposive random sampling. Respondents were selected from accessible and relevant population groups in high-traffic and security-sensitive areas of Puerto Princesa City. Participants were screened based on their established exposure to the city, legal age, and willingness to participate. Qualified respondents included residents with sufficient length of residence in Puerto Princesa and tourists who had stayed in the city long enough to observe its public safety environment. Newly relocated residents, first-day tourists, tourists with insufficient stay, and those unwilling to participate were excluded from the study.

2.5 Research Instrument

The study used a research-made survey questionnaire developed based on the factors measured in the study. The instrument was divided into three parts. The first part measured the perceived level of effectiveness of the PNP EOD K9 Unit in terms of visibility, approachability, training, and deployment, with each category containing five statements rated through a four-point Likert scale: 4 as Very Effective, 3 as Effective, 2 as Least Effective, and 1 as Not Effective. The second part assessed public perceptions of safety and security in relation to the unit's operations using a four-point scale from Strongly Agree to Strongly Disagree. The third part measured perceived operational challenges or constraints affecting the performance of the PNP EOD K9 Unit using the same four-point agreement scale.

2.6 Data Gathering Procedure

The data gathering procedure involved the use of survey questionnaires administered to qualified residents and tourists in selected high-traffic areas of Puerto Princesa City. The study also identified possible supporting data sources, including the Puerto Princesa City Police Office for crime statistics, official reports, and information on EOD K9 operations; the City Tourism Office for tourism statistics and visitor-related safety feedback; local community organizations and leaders for community perspectives; and ethically approached online forums and social media platforms for public discourse on safety and security. Relevant reports from the Philippine National Police at the national level were also considered to provide broader context on PNP EOD and K9 operations.

2.7 Data Analysis Techniques

The collected data were processed, analyzed, and interpreted using descriptive and inferential statistics. Microsoft Excel, the Real Statistics add-in, and Statistical Package for Social Sciences (SPSS) Version 17 were used in treating the data. The perceived effectiveness of the PNP EOD K9 Unit was interpreted using a four-point scale, where 3.26–4.00 was interpreted as Very Effective, 2.51–3.25 as Effective, 1.76–2.50 as Least Effective, and 1.00–1.75 as Not Effective. The same scale range was used for public safety perception and operational challenges, interpreted as Strongly Agree, Agree, Disagree, and Strongly Disagree. Since Likert-scale responses have ranked categories, the manuscript treated them as ordinal data and identified the median as the appropriate measure of central tendency. To determine significant differences in perceived effectiveness between residents and tourists, an independent t-test was applied, with a p-value of 0.05 considered significant (McClenaghan, 2024).

2.8 Ethical Considerations

Ethical considerations were observed throughout the conduct of the study. Informed consent was obtained from the participants before their involvement, with clear explanation of the research purpose, data collection procedures, possible risks and benefits, and their right to withdraw at any time without consequence. Participation was voluntary, and respondents were informed that they could decline participation without penalty. The anonymity and confidentiality of participants were maintained by removing personal identifiers during analysis and reporting. Data storage and management procedures were implemented to prevent unauthorized access. The study also maintained cultural sensitivity by respecting the norms and values of the Puerto Princesa community and avoiding questions or procedures that could be considered intrusive or offensive. When required by an academic institution or government collaboration, approval from the appropriate Institutional Review Board or ethics review committee was considered a prerequisite before data collection.

3. Results and Discussion

3.1 Perceived Effectiveness of the PNP EOD/K9 Unit

3.1.1 Visibility

The PNP EOD/K9 Unit's visibility obtained a composite mean of 3.15 with a standard deviation of 0.75, interpreted as Effective. The highest-rated item was the unit's patrol of important public areas, with a mean of 3.25, interpreted as Very Effective. The lowest-rated item was the unit's ability to cover wide and complex areas during patrols, with a mean of 3.05, interpreted as Effective. These results indicate that the unit is generally noticeable and present in the community, although wider patrol coverage remains an area for improvement. This finding suggests that the unit's visibility contributes to public awareness, deterrence, and reassurance. According to Custom Canine Unlimited (n.d.), the active participation of PNP EOD/K9 units in public events and demonstrations allows residents to interact with them in a non-threatening setting, observe their capabilities, and understand their role in public safety. Visible deployment is also recognized as a proactive strategy for improving public safety, reassurance, and deterrence in high-risk and crowded environments (US Department of Homeland Security, 2026; Balog et al., 2002).

3.1.2 Approachability

The PNP EOD/K9 Unit's approachability obtained a composite mean of 3.31 with a standard deviation of 0.63, interpreted as Very Effective. The highest-rated item was the unit's friendly and professional demeanor toward the public, with a mean of 3.37. The lowest-rated item was the unit's encouragement of public engagement and questions about its duties, with a mean of 3.23, interpreted as Effective. These results indicate that the unit is viewed as accessible, respectful, and professional, although it may still improve in actively encouraging public interaction. This result shows that approachability strengthens public trust and police-community cooperation. Kwong (2018) emphasized that approachable officers encourage community cooperation and information-sharing. Martinez (2018) similarly supports the importance of approachable law enforcement in bridging gaps between police and the public. Brevia (2018) also concluded that officers who are both visible and approachable create a deterrent effect while reassuring the community, which supports the perception of the PNP EOD/K9 Unit as an effective community-oriented security presence.

3.1.3 Training

Training obtained a composite mean of 3.33 with a standard deviation of 0.52, interpreted as Very Effective. The highest-rated item was the unit's ability to remain focused in crowded and noisy environments, with a mean of 3.47. The lowest-rated item was the unit's quick response to threats and criminal activities, with a mean of 3.08, interpreted as Effective. These results indicate that the unit is perceived as technically competent and disciplined, but response speed remains an area that may still be strengthened. This finding emphasizes the importance of continuous training in maintaining operational readiness and credibility. Kaufmann and Stroud (2024) emphasized that specialized K9 training improves operational effectiveness in law enforcement, particularly when dogs are trained for patrol and detection functions. Sargent (2020) noted that canine training should be aligned with risk management and liability reduction. Bracamonte (2016) also found that specialized training strengthens responsiveness to terrorist threats and bombing incidents, while Rojek et al. (2020) highlighted that structured and consistent training programs improve law enforcement performance.

3.1.4 Deployment

Deployment obtained a composite mean of 3.14 with a standard deviation of 0.66, interpreted as Effective. The highest-rated item was the unit's ability to work well with other law enforcement agencies during deployment, with a mean of 3.67, interpreted as Very Effective. The lowest-rated item was the unit's speed when deployed to multiple areas, with a mean of 2.88, interpreted as Effective. These results indicate that the unit performs competently during deployment, particularly in inter-agency coordination, but may still improve in consistency, coverage, and timeliness. This result suggests that deployment is effective but remains the weakest among the four dimensions. Mommsen (2025) emphasized that K9-assisted deployment in disaster response depends on standardized training and clear operational protocols. Bracamonte (2020) similarly concluded that effective deployment improves responsiveness and public safety. Baylon (2020) found that EOD/K9 deployment may be affected by limited personnel and logistical constraints, which supports the need to strengthen

resource allocation. Rojek et al. (2020) also reinforced the importance of structured deployment strategies in improving operational performance.

3.2 Difference in Perceived Effectiveness Between Residents and Tourists

3.2.1 Visibility

The analysis showed a significant difference between residents and tourists in their perception of the unit's visibility. Residents reported a higher mean score of 3.31 with a standard deviation of 0.38, while tourists reported a lower mean score of 2.84 with a standard deviation of 0.49. The computed t-value was 2.18, with 32.80 degrees of freedom and a p-value of 0.036, indicating a significant difference at the 0.05 level. This result suggests that residents perceive the PNP EOD/K9 Unit as more visible because they are more familiar with its presence and operations in the community. Tourists may have lower ratings because of limited exposure to the unit's activities. The finding implies that visibility strategies should be strengthened in tourist-heavy locations to ensure that both residents and visitors feel equally reassured.

3.2.2 Approachability

Residents rated the unit's approachability slightly higher, with a mean of 3.41 and a standard deviation of 0.57, compared with tourists, who reported a mean of 3.11 and a standard deviation of 0.73. However, the computed t-value of 1.61 and p-value of 0.118 showed that the difference was not statistically significant at the 0.05 level. This finding indicates that both residents and tourists generally share similar perceptions of the unit's approachability. Although residents gave slightly higher ratings, the absence of a significant difference suggests that the unit is commonly viewed as accessible, professional, and approachable by both groups.

3.2.3 Training

The results showed a significant difference between residents and tourists in their perception of the unit's training. Residents reported a higher mean score of 3.44 with a standard deviation of 0.57, while tourists reported a mean of 3.10 with a standard deviation of 0.73. The computed t-value was 2.46, with a p-value of 0.017, indicating a significant difference at the 0.05 level. This result suggests that residents may have greater familiarity with the unit's operations and training outcomes, leading to higher ratings. Tourists, having limited exposure to the unit's training activities, may not fully recognize the unit's technical preparation. The finding implies that public communication about the unit's training and capabilities may help strengthen confidence among tourists.

3.2.4 Deployment

The analysis revealed a significant difference between residents and tourists in their perception of deployment. Residents gave a higher mean rating of 3.30 with a standard deviation of 0.62, while tourists gave a mean rating of 2.81 with a standard deviation of 0.64. The computed t-value was 2.84, with a p-value of 0.006, indicating a significant difference at the 0.05 level. This result shows that residents perceive the unit's deployment more positively than tourists, likely because residents have greater exposure to its operational presence. Tourists may have fewer opportunities to observe deployment activities, resulting in lower ratings. Therefore, the null hypothesis is rejected in terms of visibility, training, and deployment, while no significant difference is observed for approachability.

3.3 Public Perception of Safety and Security in Relation to PNP EOD/K9 Unit Operations

Public perception of safety and security in relation to PNP EOD/K9 Unit operations obtained a composite mean of 3.54 with a standard deviation of 0.42, interpreted as Strongly Agree. The highest-rated item was the statement that respondents feel safe living in Puerto Princesa, with a mean of 3.72. The lowest-rated item was the statement that respondents feel more confident attending public events when the PNP EOD/K9 Unit is deployed, with a mean of 3.47. These results indicate strong public confidence in the unit's contribution to safety and security. This finding suggests that the unit's presence contributes to protection, reassurance, and public trust. The New York Police Department (NYPD) has demonstrated the value of EOD K9 units in enhancing public confidence during major events, consistent with studies from the U.S. Department of Homeland Security showing that visible deployment increases perceived safety (Department of Homeland Security, 2023). In the United Kingdom, the British Transport Police expanded K9 operations after the 2005 London bombings, resulting in improved commuter trust and cooperation (Smith & Clarke, 2018). The National Capital Region Police Office also emphasized the role of canine units in narcotics and explosive detection to strengthen community safety and confidence in crowded urban areas (Marquez, 2020). The Police Executive Research Forum (2020) further stressed that handler selection, canine training, and deployment strategies are essential for maximizing public safety and community trust.

3.4 Operational Challenges or Constraints Affecting PNP EOD/K9 Unit Effectiveness

Operational challenges or constraints obtained a composite mean of 3.33 with a standard deviation of 0.46, interpreted as Strongly Agree. The highest-rated challenge was that large crowds can distract dogs or make movement and patrol difficult, with a mean of 3.60. The lowest-rated item was that the public may feel intimidated or uncomfortable by the presence of

K9 units, with a mean of 3.13. These results show that respondents recognize operational limitations that may affect the unit's performance despite its perceived effectiveness. This finding indicates that crowd density, weather conditions, public discomfort, possible mishandling, and public-interaction concerns can influence the effectiveness of EOD/K9 operations. Dalizon (2024) noted that amid bomb threats affecting schools and government offices, the PNP EOD/K9 Group received capability upgrades to strengthen deployment in crowded public areas. The Police Executive Research Forum (2020) stressed that canine units face operational challenges in crowded environments because distractions and restricted movement may reduce detection accuracy. Sargent (2020) also stated that public events and crowded spaces can increase stress for dogs, while Bracamonte (2016) observed that crowd density during public events in Metro Manila limited canine mobility and responsiveness.

3.5 Proposed Strategies or Improvement Measures

The proposed strategies focus on addressing the operational challenges identified in the study. For large crowds, the recommended measures include deploying multiple K9 units in rotation, training dogs in simulated crowded environments, and establishing controlled patrol routes with event organizers. For weather-related concerns, the recommendations include climate-controlled rest areas, hydration stations, adjusted deployment schedules, and protective gear. To reduce public intimidation, the proposed measures include awareness campaigns, public demonstrations, approachable communication by handlers, and signage explaining the unit's purpose. To address mishandling and public interaction concerns, the study recommends strengthening handler certification, supervision, accountability protocols, refresher courses, socialization exercises, gradual exposure programs, and pairing inexperienced dogs with seasoned handlers or canines. These strategies aim to improve canine focus, mobility, health, adaptability, handler professionalism, public acceptance, and overall operational efficiency. Collectively, the proposed measures balance technical capability with community relations and reinforce public confidence in the PNP EOD/K9 Unit as a vital contributor to safety and security in Puerto Princesa.

4. Conclusion & Recommendations

The study concluded that the PNP EOD/K9 Unit in Puerto Princesa is performing well in safeguarding the community, particularly in terms of training and approachability, while visibility and deployment still require improvement to maximize its contribution to public safety and community security. The findings also showed significant differences between residents' and tourists' perceptions in terms of visibility, training, and deployment, while public perception of safety and security in relation to the unit's operations was rated as strongly agree. However, operational challenges were also strongly recognized, indicating that despite the unit's value, limitations related to crowd density, weather conditions, public intimidation, mishandling risks, and limited dog socialization may still affect its effectiveness.

It is recommended that the PNP EOD/K9 Unit enhance its visibility and deployment through increased presence in public and tourist-heavy areas, signage, announcements, demonstrations, rotational schedules, layered coverage, and alignment with peak activity periods. The unit should also bridge perception gaps between residents and tourists by strengthening training, improving engagement, sustaining consistent deployment, expanding community awareness, institutionalizing feedback mechanisms, supporting canine health, strengthening professional standards, procuring modern EOD robots and bomb suits, providing logistical support, and expanding international training. Further studies should focus on environmental impacts, community engagement, technological integration, and training development to support evidence-based improvements responsive to operational needs and public expectations.

The study was limited to Puerto Princesa City and did not cover other municipalities or regions. It focused only on the PNP EOD K9 Unit and excluded other law enforcement or emergency response teams. The findings were perception-based rather than performance-based, and the study was limited to selected residents and tourists with direct or indirect exposure to the unit's activities. Access to PNP EOD K9 personnel and other operational data was also limited, and the study did not examine internal training protocols or technical procedures beyond what was publicly observable or reported.

Compliance with ethical standards

The study was conducted in accordance with institutional ethical standards, with voluntary participation, informed consent, and confidentiality of respondents' information strictly observed. Ethical approval was secured when applicable, and all data were used solely for research purposes. The authors declare no conflict of interest, acknowledge all contributions to the study, and affirm responsibility for the originality, integrity, and copyright ownership of the manuscript.

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