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MITIGATING MAINTENANCE COST OVERRUNS IN NON-STRATIFIED GATED AND GUARDED COMMUNITY (GACOS) DEVELOPMENT

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Abstract

Maintenance cost overruns have become a significant challenge in non-stratified Gated and Guarded Community (GACOS) housing scheme in Malaysia, leading to financial strain on property owners and affecting the overall performance and longevity of buildings. In contrast to stratified developments where maintenance costs are managed through a maintenance account fund and a formal management body governed under the Strata Title Act 1985 (Act 318) and Strata Management Act 2013 (Act 757), non-stratified properties including GACOS often lack a structured approach to ensure sufficient financial planning and cost control. In addition to the absence of legal frameworks that govern maintenance and management of the non-stratified properties, a clear strategy to overcome cost overruns in GACOS has also not received adequate attention in existing research. Therefore, this paper attempts to explore key factors contributing to maintenance cost overruns in non-stratified developments and propose practical solutions to mitigate these issues. Two focus group discussions with 13 and 16 participants in each group were conducted to examine stakeholders' perspectives regarding root causes of cost overruns and recommendations to prevent maintenance cost overruns for GACOS. The findings demonstrated that cost overruns in GACOS were exacerbated following to the absence of legislative frameworks, financial management problem, and ineffective maintenance practices. The paper ends with the conclusion that handover the facilities and infrastructure to local authority, long term strategic and saving planning, fund raising, active participation and collaboration, structured in-house teams, and termination of redundant facilities could improve overall cost efficiency. This research contributes to the limited body of knowledge on the long-term management of non-stratified GACOS by foregrounding resident-driven strategies that enable financial resilience and operational sustainability.

Keywords: Cost Overruns, Gated and Guarded Community (GACOS), Maintenance, Non-Stratified, Strategies

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INTRODUCTION

The concept of Gated and Guarded Community Housing Scheme or GACOS is gaining traction globally and is particularly prevalent in urban areas of many countries such as the United States of America, Latin America, Canada, England, China, Hong Kong, and South Africa (Pekelsma, 2024; Tan, 2016). Due to their diverse forms across different countries, there is no universally accepted definition of the concept. Existing interpretations typically reflect the specific socio-cultural and economic contexts in which these developments occur. As spelt out by Grange (2018), the various interpretations of gated communities appear very similar in terms of their common characteristics, yet differ considerably in their institutional context. Gooblar (2010) for example, defined gated communities as residential areas that are characterized by restricted access and the privatization of spaces that are typically public. For Blakely (2007) and Tahir and Hussin (2012), gated communities are neighbourhood areas with controlled access points and enclaved with physical barriers such as walls, fences or gates to restrict entry solely for its residents and authorized visitors. While many scholars focus on physical gating in the current definition of GACOS, others such as Atkinson and Blandy (2006) and Zainudin and Hussin (2015) referred gated communities as walled housing developments to which the residents are bound to a set of rules that is set up either by the developers or through consensus among homeowners. This is important as gated developments typically involve privatization of spaces, facilities and services including internal infrastructure such as roads and drainage that would otherwise fall under the jurisdiction of public authorities (Fernandez, 2007; Gooblar, 2010). Hence, the privatized model of governance necessitates the establishment of the rules in maintaining functionality, safety, and aesthetic quality of the development, in the absence of direct public oversight.

Jones et al. (2003) stated that the concept of gated communities have originated in the United States prior to the 1960s. Growing concerns over urban crime and safety have been claimed as the main driver of GACOS development (Grant, 2005; Muiga & Rukwaro, 2017; Pekelsma, 2024). As stated by Grange (2018), feelings of threat and insecurity is a well-documented reason for strong demand to live behind the gates. The presence of security guards and installation of boom gates as well as security devices have also been identified as common features for gated estate (Tan, 2016; Zainudin & Hussin, 2015). According to Jones et al. (2003), these features are frequently highlighted by developers as key selling points in their marketing strategies. However, Abdul Mohit and Abdulla (2011) argued that GACOS may create false impression of security. For example, drugs worth about RM145 million were raided in two gated and guarded communities in Kuala Lumpur, Malaysia (Thean, 2020). Wu and Tan (2023) further found that neighbourhood safety is influenced not only by the physical

elements of the development but also by its social qualities particularly residents' interactions and awareness. Nevertheless, individuals' perceptions of what constitutes a safe environment contribute to their sense of peace of mind and remain an important influence on residential choice.

Second motivation for choosing to reside in a gated community is the symbolic value it carries, where such developments are often perceived as indicators of social status and income level. Grange (2018) contends that residents of Hong Kong are willing to pay premium prices for GACOS due to prestige image and lifestyle it offers enabling them to distinguish themselves from lower-income households. Similarly, exclusive amenities contribute to residents' identities of eliteness in Egypt cities (Elyamany, 2024). Although GACOS is increasingly seen as a mechanism that divides society along lines of economic status (Alkurdi, 2017; Roitman & Recio, 2020), cities have traditionally been organized in ways that reflect ethnic and religious segregation. In Malaysia, colonial policies produced spatial and economic segregation, with the Chinese community predominantly concentrated in urban centers engaged in commerce and industry, while the Malay and Indian populations were largely situated in suburban areas, typically involved in agriculture and estate labor (Tedong et al., 2015).

The current trend of gated community scheme in Malaysia has resulted in two distinct forms of residential enclaves (Fernandez, 2007; Tedong et al., 2015). In newly developed areas, private developers construct gated communities under strata titles featuring perimeter walls and appealing shared facilities. Conversely, in more established urban neighborhoods, the residents take the initiative to create guarded communities by installing barriers on public roads and employing security personnel to restrict access to non-residents. According to Town and Country Planning Department (2010), the latter comprised of individually titled properties and often emerge on ad-hoc basis without formal oversight or legal regulation. Legally, it is unlawful to have physical barriers on public roads and enforce any restrictions on entry and exit for residents and the public (Choong, 2023). As stated under Section 46(1) of the Street, Drainage and Building Act 1974 (Act 133), any person can be held liable to a fine not exceeding RM500 and subsequent conviction of fine RM1,000 if builds, erects, sets up or maintains any wall, fence, rail, post or any accumulation of any substance, or other obstruction, in any public place without prior written permission of the local authority. Beyond raising legal concerns, the absence of a specific regulatory framework also creates governance and financial management challenges, particularly in coordinating maintenance responsibilities and funding. As a result, non-stratified GACOS frequently experience maintenance cost overruns (Haroon, 2019; Jia & Morrison, 2025; Nik Yahya et al., 2018). Known for offering exclusive amenities, enhanced security, and a high degree of privacy,

such communities require substantial financial resources to ensure their ongoing upkeep and sustainability. Although extensive research has examined cost overruns in construction projects and general housing developments (Ammar et al., 2026; Chadee et al., 2023; Lee et al., 2022; Mohd Rahim et al., 2025; Soundarya et al., 2025), limited attention has been given to non-stratified gated community schemes which possess unique management and financial arrangements due to absence of a formal strata governance structure. Therefore, this study fills the gap by identifying factors contributing to maintenance cost overruns in non-stratified GACOS and presents realistic strategies to mitigate them based on the development stakeholders' perspectives.

LITERATURE REVIEW

Factors Affecting Cost Overrun in Maintenance of GACOS

The concept of cost overrun which also termed as cost escalation or budget overrun generally refers to a situation where the actual expenditure of a project surpasses its estimated or approved financial allocation. In the context of building maintenance, the term can be more precisely understood as the circumstance in which maintenance expenditures exceed the forecasted or allocated budget due to unplanned costs required to sustain a building's operational performance. Recognizing and addressing the underlying factors that lead to such overruns is crucial, as maintenance-related expenses typically account for a substantial share of a building's total operating costs, often ranging between 20% and 50% (Ali et al., 2010; Obradovic et al., 2024). As highlighted by Mong et al. (2018), the nature of maintenance work is inherently more complex than building construction as it involves sustaining the building's performance throughout its life cycle. Prior research has identified a wide range of factors that contribute to cost overruns such as inadequate contract planning, weak supervision, ineffective coordination and communication between project teams, schedule delays, frequent design and scope alterations, poor management practices, and market price fluctuations (Abdelalim et al., 2025; Daoud et al., 2023; Sohu et al., 2024). However, Widiaputra and Arumsari (2021) argued that these determinants tend to vary depending on the specific phase of a project particularly during planning, implementation, or after completion. Given that the present discussion focuses on mature gated and guarded residential communities, greater attention is placed on the cost overruns that occur during the post-construction phase, where aging buildings often face distinctive operational and financial challenges that demand higher maintenance expenditure and specialized management responses. Due to limited number of studies examining maintenance cost overruns in non-stratified GACOS, this section synthesizes evidence from the broader literature on building and housing maintenance to establish the theoretical basis for understanding the factors that may also influence GACOS.

As a property ages, the cost of maintenance generally rises due to the progressive deterioration of its structural components and service systems (Kwon et al., 2020; Mahpour, 2023; Yasin et al., 2023). Common age-related problems include weakening structures, subsidence, weather-induced damage, and reduced operational performance (Kazar et al., 2024). The authors further added that older buildings often contain outdated infrastructure such as electrical wiring, plumbing, and mechanical systems that are inefficient, unreliable, or unsafe by contemporary standards. These systems typically require costly upgrades or complete replacements to ensure compliance with modern codes and performance expectations. Within older gated and guarded community developments (GACOS), the issue extends to shared amenities such as swimming pools, gymnasiums, community halls, prayer rooms, ornamental parks, and guardhouses which also deteriorate over time and necessitate continuous maintenance (Xuerui & Gabriel, 2022). Without systematic and preventive upkeep, minor defects may evolve into major structural failures that are far more expensive to repair. Implementing preventive maintenance regimes is therefore essential not only for maintaining safety and comfort but also for extending the service life of building components and reducing the risk of unexpected emergency repairs. Nevertheless, in many older GACOS, maintenance tends to be reactive rather than proactive due to poor budget forecasting and limited financial planning, further contributing to cost inefficiencies and overruns (Twum-Bobie et al., 2025). Che-Ghani et al. (2016) highlighted that maintenance should be carried out only when necessary based on the actual condition and performance of the buildings. As supported by Holmes and Droop (1982), maintenance is budget oriented rather than needs-oriented. Adoption of an optimized maintenance strategy is crucial following to the extensive range of shared facilities and infrastructure under private management.

The issue of maintenance cost overrun is further intensified by the lack of formal governance and financial management mechanisms in non-stratified gated communities. The governance structure determines how maintenance responsibilities, financial contributions, and decision making processes are organized. Consequently, the absence of a formal regulatory framework may affect the ability of communities to plan, finance, and implement maintenance activities effectively. Unlike stratified housing schemes governed under the Strata Title Act 1985 (Act 318), Strata Management Act 2013 (Act 757), and the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), where the management of common property is legally regulated, non-stratified gated and guarded neighbourhoods (GACOS) do not operate under a legally mandated structure such as Joint Management Body (JMB) and Management Corporation (MC). Stratified developments benefit from statutory mechanisms that enable compulsory collection of maintenance charges through

JMB or MC, and provide legal enforcement against payment defaulters. In contrast, non-stratified GACOS rely on ad hoc arrangements designed by developers, often formalized through a Deed of Mutual Covenant (DMC). While DMCs may include provisions for the collection of maintenance or service fees, this arrangement typically expires once the developer's management period ends, leaving future management uncertain (Zainudin & Hussin, 2015). These arrangements do not provide the same level of statutory authority as JMB or MC structures. After the handover, residents may choose to form a voluntary Residents' Association (RA) unless it has been incorporated earlier in the DMC, but its effectiveness largely depends on community participation and willingness to contribute financially (Khoo, 2020). In the absence of such initiative, the management responsibilities may revert to local authorities, undermining the original intent of private or self-managed gated neighbourhoods. This lack of a consistent legal framework and institutional oversight often results in fragmented management, unclear accountability, and financial mismanagement which exacerbate the problem of maintenance cost overruns in these developments.

Studies on residential building maintenance suggest that increasing resident expectations regarding the standard, comfort, and image of the living environment are important factors influencing maintenance expenditure (Horner & El-Haram, 2002; Johari & Saleh, 2018; Wahedy & Alim, 2022). Residents often expect their shared amenities to be maintained to high standards, reflecting the exclusivity and prestige associated with gated living. Consequently, their elevated expectations frequently translate into demands for more frequent maintenance, aesthetic enhancements, and high-end upgrades that extend beyond essential operational requirements, thereby driving up maintenance expenditure. For Aripin et al. (2024) and Fakhrudin et al. (2011), these expectations are understandable as individuals spend a significant portion of their time within or around their neighbourhood, making building condition and environmental quality integral to overall well-being and lifestyle satisfaction. However, managing these expectations can be financially challenging, particularly when maintenance funds are constrained. The problem is further aggravated by resident behaviour, including vandalism, improper use of facilities, and delays or failure to report defects, which create unanticipated costs and inefficiencies in the maintenance process. To address these challenges, Salleh et al. (2016) suggested that active resident participation and promoting awareness on the cost implications can help balance service quality with financial sustainability. As supported by Au-Yong et al. (2022) and Thakur and Patel (2025), incorporating residents' feedback allows facility managers to make evidence-based maintenance decisions, hence ensuring it operates as intended. According to Horner and El-Haram (2002), the heightened expectations of residents may be attributed to the

absence of formal agreements between residents and developers therefore to be incorporated into tenancy or occupancy agreements.

Technical and administrative factors are among the most significant contributors to maintenance cost overruns in gated and guarded housing schemes. From the technical perspective, poor workmanship resulting from the appointment of unqualified contractors often leads to recurring defects and inefficient maintenance. According to Au-Yong et al. (2023) management teams tend to prioritize the lowest tender bids as directed by owners with little consideration given to contractor competency. This practice undermines the quality of maintenance works and increases long-term costs. Another major issue is the unavailability or poor quality of spare parts and materials. Replacement components are often difficult to source locally especially for outdated systems, leading to delays, import costs, and temporary disruption of facilities (Au-Yong et al., 2023). The use of low-quality or second-hand parts further exacerbates maintenance failures and escalates overall expenses. Additionally, limited technological adoption such Building Information Modelling (BIM), Cloud and real time collaboration, Internet of Things (IoT), Blockchain and Artificial Intelligence (AI), within maintenance management contributes to inefficiency (CIDB Malaysia, 2020; Sakhaf & Ayob, 2024). However, Au-Yong et al. (2023) warned that while modern maintenance software can enhance decision-making and budget allocation, its benefits remain unrealized when personnel lack the necessary technical understanding or training.

From an administrative standpoint, weak maintenance management practices, poor budgetary control, and the failure to execute maintenance at the appropriate time are key issues (Che-Ghani et al., 2016; Mong et al., 2018; Wen et al., 2022). Insufficient technical knowledge among staff and inadequate financial planning often result in deferred maintenance and eventually increasing repair costs over time (Wahedy & Alim, 2022). Kazar et al. (2024) further highlighted that maintenance cost overruns can also arise from external factors beyond the control of the management team including unforeseen site conditions, changes in project scope, scheduling delays, inflation, and fluctuations in market prices. Overall, these technical and administrative challenges highlight the need for effective strategies to mitigate maintenance cost overruns, which will be further examined in the following section through the adopted research methodology to identify realistic solutions for gated and guarded communities.

RESEARCH METHODOLOGY

This study adopts a qualitative research approach and conducted in two main phases. The qualitative method was chosen to enable an in-depth exploration of the complex issues surrounding maintenance cost overruns in non-strata gated and guarded community housing schemes (GACOS) where management

structures and maintenance practices are highly context dependent. The first phase involved an extensive review of relevant literature on the concept of gated and guarded housing schemes and the factors contributing to maintenance cost overruns in such developments. A wide range of materials were reviewed including government publications, documents from Residents' Associations (RAs), books, newspaper articles, and peer-reviewed academic publications. Government documents such as relevant legislation, planning guidelines, and policy documents were reviewed to establish the legal and regulatory context of non-stratified gated communities. Documents obtained from the participating RAs including maintenance records and financial information were used as documentary evidence to support and contextualize the findings from the Focus Group Discussion. Owing to the confidential nature of these documents, only selected information is reported. Academic sources were retrieved primarily from databases such as Google Scholar, ScienceDirect, Emerald, JSTOR Archive, and Taylor & Francis Online. Additionally, reference lists from selected articles were examined to identify further relevant studies considering the limited research available on non-stratified GACOS developments in Malaysia. The literature review established a conceptual foundation and provided insights into key variables influencing maintenance cost escalation in gated communities.

The second phase comprised a Focus Group Discussion (FGD) which served as the primary data collection method for the study. The FGD is an effective qualitative tool for eliciting participants' attitudes, perceptions, knowledge, and experiences through group interaction (Akyildiz & Ahmed, 2021; Eeuwijk & Angehrn, 2017). As argued by Shabina et al. (2024), the method enables participants to express their opinions freely regardless of agreement or disagreement with others thereby producing rich, unbiased, and high-quality data. FGDs were considered particularly appropriate for this study because they facilitated interaction among diverse stakeholders, allowing participants to discuss different perspectives, and collectively identify practical strategies for mitigating maintenance cost overruns in non-stratified gated and guarded housing. This approach is especially relevant given the scarcity of empirical studies on maintenance management strategies for such communities. Four FGDs were conducted over a period of six (6) months involving members of Management Committee from two (2) non-stratified gated and guarded neighborhoods (hereafter referred to as A and B) with 13 and 16 participants respectively. Multiple case studies are considered to yield more robust results compared to single case study (Kass et al., 2024). Each discussion lasted approximately 60 to 90 minutes and was moderated by the principal researcher, and all discussions were audio-recorded and subsequently transcribed verbatim for analysis with participants' consent. The selection of the two communities was purposive, as both were established in the early 2000s and share similar

characteristics in terms of age, size, location, and common challenges related to aging facilities. This allowed for meaningful comparison of their maintenance strategies under comparable environmental and operational conditions. Despite these similarities, both communities exhibit distinct financial and management practices. Due to the confidential nature of RA financial records, detailed annual expenditure breakdowns could not be disclosed. However, available financial indicators were used to demonstrate differences in maintenance management approaches between the case studies.

Case study A, for instance, has maintained its maintenance fee at RM0.07 per square foot since 2011, yet continues to provide high-quality services and facilities, including landscape upkeep, security, and communal amenities. In contrast, Case study B imposes a higher maintenance fee of RM0.17 per square foot, but has demonstrated robust financial management, accumulating over RM4 million in sinking fund reserves while maintaining service quality and operational efficiency. A comparative summary of both neighborhoods is presented in Table 1.

Table 1: Summary of case study background

	Case study	
	A	B
Age (years)	23	20
Area (acre)	40	53
Maintenance fee rate (RM per square foot)	0.07	0.17
Development	136 units bungalows	53 units bungalows 62 units semi-detached house 170 units link houses
Facilities	Playground, swimming pool, jogging tracks, clubhouse, 3 ponds	Playground, swimming pool, jogging tracks, wading pool, gymnasium, barbecue area

Unlike stratified developments, , both case studies are individual-title gated and guarded communities. While their management structures and practices often emulate those of stratified developments, they are not legally bound by the same regulations hence providing greater flexibility in establishing site-specific management arrangements. In most cases, GACOS developments voluntarily adopt Act 318 to manage their RAs, particularly in the absence of dedicated legislation for non-strata schemes. However, certain statutory provisions such as Section 2(6) of the Act 318 which limits committee members to three consecutive terms may be applied at the discretion of each community. Accordingly, FGD participants were purposively selected from the RA management committees. Participants were at least 21 years of age, eligible to serve on the committee based on property ownership requirements, had served on the committee for a minimum of three (3) years, and were directly involved in management and maintenance

decision making. In Case study A, committee members are permitted to serve beyond three terms with the approval of the residents, resulting in long-serving members. Many of them with over five (5) years of continuous service, and some for as long as nine (9) years. These individuals possess deep institutional knowledge and firsthand experience managing maintenance issues since the RA's inception, making them valuable informants for this study. In Case study B, while committee terms are limited to one (1) year, many members have served multiple consecutive terms often rotating roles. This practice ensures a comprehensive understanding of various management aspects, including finance, maintenance, security, and legal matters, while maintaining continuity through mentoring and guidance from senior members.

FINDINGS AND DISCUSSION

The findings of the FGD focused on factors contributing to cost overruns and mitigation strategies and were analysed using thematic analysis. The credibility of the findings was enhanced through data triangulation by comparing the FGD results with relevant literature and previous empirical studies. Results from the FGD in Table 2 showed several interrelated factors contributing to cost overruns in the maintenance of non-stratified gated and guarded housing communities (GACOS). Legislative and governance gaps emerged as an important theme where participants highlighted the absence of legally mandated legislation or formal regulatory frameworks for non-stratified GACOS. Unlike strata developments that operate under established management structures, non stratified GACOS depend on voluntary agreements and informal arrangements among residents, resulting in ambiguity regarding authority, responsibility, and accountability for maintenance decisions. As supported by Khoo (2020), management of non-stratified GACOS is uncertain as it rely only on ad hoc arrangements designed by developers. This finding extends previous research by demonstrating that the regulatory gap does not merely create administrative challenges but also directly influences the financial sustainability of these communities. The problem is further exacerbated in managing ageing GACOS as compliance with modern safety standards and performance requirements has become increasingly complex, particularly in meeting rising expectations of the residents. As argued by Kazar et al. (2024), older buildings often have outdated infrastructure and services that are inefficient, unreliable or unsafe by today's standards. These systems usually require costly upgrades or full replacement to meet current codes and performance needs. Therefore, the findings suggest that legislative and governance gaps represent a critical factor contributing to maintenance cost overruns particularly when ageing GACOS face increasing technical requirements and rising expectations from residents.

Table 2: Factors contributing to cost overrun in maintenance of GACOS

Concepts	Emergent themes	Constructs
Factors of maintenance cost overruns	Legislative and governance gaps	Absence of legally mandated legislation for non-stratified gated and guarded communities
		Complexity in ensuring compliance with modern requirements
	Maintenance planning and strategic management	Short term and inconsistent maintenance planning
		Plans changing every management team
		Focus on daily operations and handling arising matters
	Stakeholder engagement	Low levels of awareness, motivation, and participation among residents

The analysis also identified ineffective maintenance planning and strategic management as another significant contributor to cost overruns. Participants reported that maintenance plans were often short-term and subject to change with each management term, with greater emphasis placed on daily operational issues and immediate problem solving rather than systematic preventive maintenance. As one participant explained:

‘Repair and maintenance work is usually carried out only after a complaint has been received. The work...is often intended to resolve immediate issue without considering its long-term sustainability...but the practice tend to change whenever there is a change in the committee’.

(AS02)

This finding suggests that maintenance decisions in non-stratified GACOS are frequently driven by short-term priorities rather than long-term asset management objectives. This finding is consistent with previous studies (Kwon et al., 2020; Yasin et al., 2023) highlighting that ineffective maintenance planning can accelerate deterioration and increase lifecycle cost. Another contributing factor found related to low levels of awareness, motivation, and participation among residents. For example, stringent standard practices limiting capital expenditure in Case study B were intended to control spending, however inadequate member engagement often hindered consensus building for necessary capital investments and eventually leading to higher corrective maintenance costs in the long term. This finding highlights the complex relationship between cost control and asset sustainability, where excessive emphasis on immediate expenditure reduction may unintentionally increase future financial liabilities. Following the identification of cost overruns factors, the FGD further examined participants’ views on strategies to address these issues as demonstrated in Table 3.

Table 3. Strategies to mitigate cost overruns in GACOS

Concepts	Emergent themes	Constructs
Strategies to mitigate maintenance cost overruns	Strategic transfer to local authorities	Selective handover of infrastructure and facilities
		Cost savings from utility and service transfer
		Trade-offs between cost reduction and community identity
	Long term maintenance and financial planning	Multi year maintenance planning
		Budget forecasting and fee increment planning
		Continuity of management decision making
	Financial governance	Stringent approval procedures for expenditure
		Balancing cost control with lifecycle replacement needs
	Alternative financing	Fundraising for non-essential or enhancement projects
		Participation in government and community schemes
	Optimization of existing resources	Leveraging residents' professional expertise
		In-kind contributions and cost-price services
		Elimination of redundant facilities

Table 3 illustrated that both case studies adopt a combination of institutional, financial, social, and operational strategies to mitigate long-term maintenance cost overruns in the absence of formal regulatory frameworks. One of the most prominent strategies identified involves the selective handover of infrastructure and services such as roads, drainage systems, street lighting, waste collection, and landscaping to local authorities. Participants emphasized that such decisions are community driven and contingent upon cost-benefit considerations. For example, Case study A reported immediate savings in electricity expenditure following the handover of street lighting, while both case studies highlighted waste collection as a costly recurring service better managed by local authorities. However, the handover process was not without complications. As one participant highlighted:

‘Of course...we can certainly hand over some infrastructure or facilities back to the local authority...but it can create other issues that need to be carefully considered’.

(DI08)

Case study A experienced disputes regarding public access regarding the reclassification of internal roads as public infrastructure. These challenges were mitigated through legal clarification, drawing on precedent from *Au Kean Hoe v. Persatuan Penduduk D'Villa Equestrian* (2015) which affirmed the right

of gated communities to restrict access for security reasons under valid grounds. Furthermore, resistance to handing over landscape areas reflected concerns over the erosion of community identity and exclusivity, underscoring the trade-off between cost reduction and place branding. Previous study by Guiheng et al. (2025) warned that the implementation of such strategies require careful consideration as the immediate consequences for residents particularly in terms of mental well-being and sense of belonging should not be overlooked. Although transferring certain facilities or infrastructure to local authorities may reduce maintenance burdens on residents, such approach requires careful consideration.

Participants further identified the absence of structured long-term planning as a key contributor to cost overruns (Table 2). In response, both case studies advocated for five-year strategic maintenance plans supported by financial projections. Such plans function as operational blueprints, guiding committees in preventive maintenance, refurbishment cycles, and incremental fee adjustments. More importantly, these plans were perceived as institutional memory tools that support continuity across changing committee memberships. For Twum-Bobie et al. (2025), this strategy is crucial in enhancing the life cycle of the assets. Furthermore, strong internal financial governance also emerged as a critical mitigating factor. In particular, Case study B demonstrated a stringent approval system whereby all expenditures require committee consent and AGM endorsement. This approach was perceived to enhance transparency and minimize corruption risks. Nevertheless, participants acknowledged unintended consequences including delayed replacement of ageing facilities due to conservative spending practices, which highlighting the tension between fiscal prudence and asset lifecycle management.

In addition, fundraising was also primarily utilized for enhancement projects beyond essential maintenance such as the proposed construction of an indoor gymnasium in Case study A. While this strategy reduces pressure on maintenance and sinking funds, it introduces challenges related to equity and participation. Participants noted that unequal contributions and free-rider behaviour can undermine collective moral and slow project implementation, and eventually suggesting limitations to voluntary financing mechanisms in residential settings. Following this, the participants further added that active engagement with external organizations and government programmes such as security initiatives and community partnerships served as another alternative for GACOS to secure grants and sponsorships for maintaining and upgrading their communities. Beyond financial gains, these collaborations also enhance resident participation, awareness of maintenance issues, and volunteerism. This finding highlights the role of social capital and institutional networking as indirect yet impactful cost mitigation strategy.

Both case studies further leveraged residents' professional expertise to reduce operational costs. Legal advice, architectural and engineering services, financial planning, insurance brokerage, and landscaping supplies were provided at nominal or cost prices by residents. For instance, supplier of different fertilizers for turfing, trees, and shrubs were provided at cost price from a resident in Case study A who is a manufacturer himself. In Case study B, residents with construction backgrounds provide building maintenance advises and recommend trusted contractors with reasonable pricing. Additionally, communities in both case studies shared that they undertook systematic reviews of existing facilities, leading to the consolidation or termination of underutilized and aesthetic driven amenities. These include the removal of redundant water features, consolidation of playgrounds, and replacement of outdated intercom and CCTV systems with cost-effective technological alternatives. Overall, these findings demonstrate that cost overrun mitigation in non—stratified GACOS relies heavily on self-governance, social capital, and adaptive management strategies rather than formal regulatory compliance. This highlights the importance of strengthening governance arrangements throughout the neighbourhood lifecycle particularly during the transition from developer-led management to resident-led administration. Clearer roles for RAs supported by local authorities through appropriate policy guidance could contribute to the long term sustainability and resilience of non-stratified gated communities.

CONCLUSION

This study examined realistic strategies for mitigating maintenance cost overruns in non-stratified gated and guarded community neighbourhoods (GACOS) through focus group discussions with resident associations members managing mature developments. By drawing on case studies that have remained operational for more than two decades, the research provides rare empirical insights into how long-established communities sustain their physical assets and financial viability in the absence of prescriptive regulatory frameworks. The findings demonstrated that cost overrun mitigation in non-stratified GACOS is not driven by formal statutory mechanisms but by adaptive and resident-led governance practices. Strategies such as selective handover of facilities to local authorities, long-term maintenance and financial planning, stringent internal financial controls, optimization of residents' professional expertise, external collaborations, and rationalization of redundant facilities reflect context-sensitive approach to neighbourhood management. The proposed strategies may not be equally applicable across all non-stratified GACOS as they depends on contextual factors such as residents' willingness to contribute, and availability of institutional support. These strategies are shaped by lived experience, accumulated institutional knowledge, and continuous negotiation between cost efficiency,

security, and community identity. The significance of incorporating ground level input from resident associations lies in its ability to capture decision making processes that are often undocumented yet critical to long term sustainability. Furthermore, the use of mature case studies highlights the importance of social capital, collective action, and institutional continuity in sustaining neighbourhood maintenance. Most importantly, the study illustrated how human and social resources can compensate for financial limitations and regulatory gaps. The findings have practical implications for resident associations, policymakers, and local governments by providing evidence to strengthen existing governance frameworks for neighbourhood maintenance and improve the financial sustainability of non-stratified gated communities.

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