

Prerequisites for Achieving Value for Money in the Eastern Cape Department of Transport's Roads Infrastructure Projects

Monde Manga¹, Fidelis Emuze²

¹Faculty of Engineering, Built Environment and Information Technology,
Nelson Mandela University, Port Elizabeth, South Africa

²Department of Built Environment, Faculty of Engineering,
Built Environment and Information Technology,
Central University of Technology, Free State, South Africa
mondemanga@yahoo.co.uk

Abstract

Ever-increasing service delivery protests resulting from poor or lack of service delivery and undesirable quality of workmanship of the Built Environment projects implemented in the public service adversely impact South Africa's overall economic performance, particularly the Eastern Cape (EC) Province. This paper aims to uncover areas that need improvements regarding the EC Department of Transport (DoT) getting value for Money (VfM) in procuring and delivering road infrastructure projects in the Eastern Cape Province. This study employed the qualitative approach. Twenty-five (25) semi-structured interviews were conducted with working professionals from EC DoT over Zoom and Microsoft Teams. Existing studies reflect two needful requisites for ensuring effectiveness and efficiency in infrastructure service delivery; these are 1) availability of resources and 2) a skilled workforce. The study's findings reveal that in ensuring VfM, the lack of monetary resources due to department budget cuts, hiring of unsuitably qualified contractors, corruption, and length of procurement processes require adequate resolution. These bottlenecks mentioned above to VfM cause significant delays in road projects. Contributions to achieving VfM thus includes include the appointment of competent personnel, and suitably qualified contractors, alleviation of corruption, and shortening lengthy equipment procurement processes. The need for seamless, integrated planning within the infrastructure service departments is also a prerequisite for achieving VfM.

Keywords

Client, Construction, Contractor, Road, Value for Money

1. Introduction

Construction remains a crucial sector of the national economy for countries worldwide [1]. Traditionally the construction sector comprises a significant portion of the nation's total employment and substantially contributes to its revenue as a whole [2]. South Africa's constitution provides for the mandatory delivery of adequate transport infrastructure. In South Africa's public sector, however, there remain visible disproportions between resourcing and productivity which adversely impact service delivery [3]. Ever-increasing service delivery protests continue to result from the poor or lack of service delivery and undesirable quality of workmanship of Built Environment projects implemented in the public service [4]. These adversely impact South Africa's overall economic performance, particularly the Eastern Cape (EC) Province, which remains infamous for road infrastructure backlogs spanning three thousand kilometers [5]. Therefore, resolving the road infrastructure backlogs requires effective and efficient methods to ensure good service delivery and Value for Money (VfM) [6]. Within any working environment, effectiveness and efficiency largely depend on the caliber of the workforce, their work ethic, professional experience, qualifications, the availability of sufficient resources, and the efficient use of those resources [7]. It also involves taking stringent

measures against corruption, hiring unsuitably qualified personnel for in-house positions, and outsourcing unsuitably skilled private contractors for bribes [8]. The issue of lengthy procurement times for replacing broken-down machinery parts such as grader tyres, for example, is another issue that requires attention if VfM in road service delivery is to be improved [9].

The EC-DoT employs three service delivery methods in delivering road infrastructure; outsourcing, in-house teams, and service-level agreements with other entities; the employment or utilisation of any of these three delivery methods in rendering road infrastructure must ensure that VfM is achieved [10]. VfM requires that existing resources at the disposal of the EC-DoT be used efficiently, as demonstrated by the private sector, to ensure that resource input provides maximum output [11]. When interrogating VfM, it remains vital to calculate the cost of goods and services; it also considers the combination of quality, cost, resources used, fitness for purpose, timeliness, and convenience to determine whether or not excellent value is achieved [12]. The utility of this study lies in uncovering areas in road service delivery that require improvement to ensure VfM. Within international research, this study contributes to existing literature that interrogates VfM in transport infrastructure planning, construction and maintenance. However, most international studies deal with VfM in the construction phases alone. Furthermore, with the dearth of literature regarding VfM achievement in road infrastructure service delivery, this study contributes to non-existent literature on VfM in South Africa's provinces. It is the first study to undertake VfM in road infrastructure delivery across all project phases (planning, design, construction and maintenance) in South Africa.

2. Methods

This study employs Saunders's research onion ring to ensure a systematic research process in undertaking this investigation [23]. This study is heavily influenced by the interpretive research philosophy, employs the inductive approach, adopts the single case study strategy, and utilises the qualitative method as a mono-method of data collection [24]. The qualitative approach was primarily chosen because it is predominantly associated with the interpretive philosophical paradigm [25]. The most common data collection method used in qualitative research are interviews and focus groups thus, a qualitative research approach based on an interview research design was adopted to conduct this empirical study [26].

The sample stratum of this study was limited to working professionals within the public sector, namely the EC-DoT's transport infrastructure unit. Working professionals were selected based on prior experience in road service delivery projects and more than one year of working experience within the EC-DoT. This was ensured to uncover the multifaceted perspectives of the built environment professionals regarding their experience in road service delivery. The sampling technique was purposive in that the questions formulated in the interview schedule were designed and distributed to a specific set of professionals relevant to the selected case study. Semi-structured interview questions were drafted to capture professionals' views based on their experience in road service delivery in the EC-DoT. With the EC-DoT's permission, 25 respondents were contacted via email to solicit their willing participation. Twenty-five of the contacted respondents agreed to participate in the semi-structured interview willingly. The semi-structured interviews were then conducted remotely over Zoom and Microsoft Teams.

3. Results

The predominantly descriptive nature of the results presented in this study owes to the qualitative method applied in obtaining its primary data. Table 1 illustrates the number and percentage of professionals who willingly partook in the semi-structured interviews. Civil Engineers 84%. A Land Surveyor, Project Manager, Mechanical Engineer and Geotechnical Engineer represented the remaining 16% of willing participants. The years of experience of each respondent were captured and averaged at least ten years within EC DoT, reflecting their requisite experience to appropriately respond to the interview questions.

Table 1. Number and percentage of interviewed EC DoT professionals

Profession	Response	Percentage (%)
Civil Engineer	21	84.0
Mechanical engineer	1	4.0
Land Surveyor	1	4.0
Geotechnical Engineer	1	4.0
Project Management	1	4.0

According to Connelly [19], the merit of collecting and presenting demographic data to describe the people or organisations who form part of a research inquiry is critical for a study. The importance of collecting demographic data of interview respondents serves as proof that the data was collected and provides some form of validity, indicating that the interviews took place. Moreover, attributes such as gender, age, race, years of experience, and highest qualifications are provided from the respondents' demographic data from the EC DoT. The majority of the respondents were black males and black females, while white males, white females and mixed-race participation were much less in comparison. All respondents possessed a form of post-secondary school qualification, with the highest qualification being Masters's Degree. Also, regarding years of work experience, the respondent's answers indicated that they all had worked in the EC DoT for two years or more, having involvement in road infrastructure-related projects. The respondents thus possessed the requisite experience and qualifications to answer the questions in the interview schedule. A pie chart showing the percentage of various qualifications held by respondents is illustrated in Figure 1.

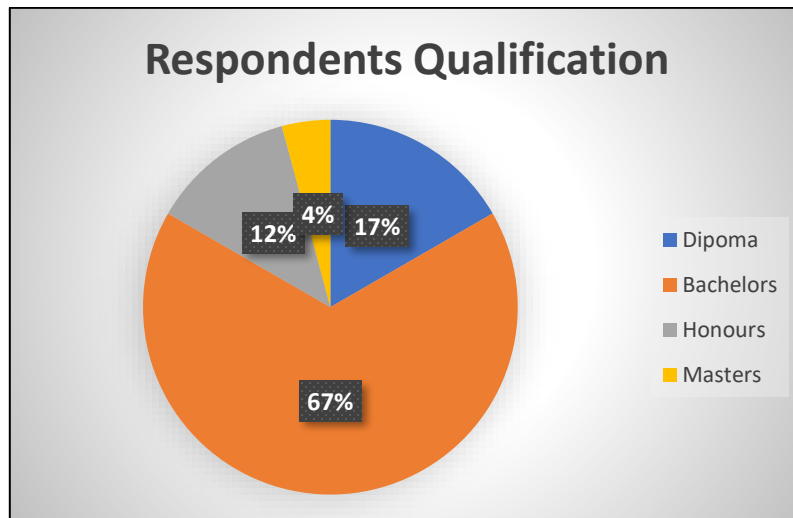


Figure 1. EC DoT Respondents' qualification composition

4. Discussion

From the interviews conducted and information from existing literature, it is apparent that the existing structure of the EC DoT is well-thought-out, with the necessary support structures required to ensure cost-effective service delivery. The programs and their various sub-units are geared to ensure that the implementation of services is within budget and in line with stipulations from existing guidelines. The delays in newly constructed roads infrastructure, existing roads maintenance and upgrades began with budget constraints which the EC DoT has experienced due to imposed budget cuts and limited funding [20]. The budget cut hindrances relate somewhat to the findings of [15], which indicate the importance of fiscal efficiency and discounted rates in ensuring successful infrastructure service delivery. Respondents also mentioned the cost of delays, the cost of unsuitably qualified personnel or competent service providers, and the need for more availability of resources or finance as additional VfM bottlenecks. The aforementioned factors were also mentioned in the literature review (section 2) by Malek [11], Sanni-Anibire, Mohamad Zin and Olatunji [17] and Park, lee and Kim [15]. All respondents mentioned project delays as the leading cause of project cost escalations at the planning, design, construction and maintenance stages. One example of uncertainty was when a road project was earmarked for completion within 24-36 months but took ten years. Apart from previously mentioned hindrances to VfM achievement, such as lack of finances and appointment of unsuitably qualified, other conditions in the EC DoT include slow procurement of damaged machinery parts, such as replacement of a grader's punctured tyres. Ameyaw, Adjei-Kumi and Owusu-Manu [20] Gave indications of the detrimental effects of project delays on VfM.

Additionally, in corruption, money allocated to undertake road projects used to pay bribes leads to an insufficient budget, thus reflecting fiscal and contract management incompetence [15]. Sufficient funding leads to either an incomplete or complete project with cost overruns or a compromise on project quality. Other causes of road project delays result from the illegal occupation (squatting) in areas earmarked for road construction. In instances of unlawful occupations, tensions among the illegal occupants. Another cause of contention mentioned by the respondents is the use of burrow pits within the boundaries of specific communities. In the case of the EC DoT, other arguments involving communities include socio-political interferences in projects and protests, all of which contribute to road service delivery delays [18, 19]. With the recorded dwindling of experienced professionals in-house due to their exent from the industry and entry into their retirement, the transference of skills from experienced professionals to emerging professionals remains essential. In addition, there must be an effort to ensure that the recruitment of in-house professionals have suitable qualifications and work experience per the job position's requirements. Also, existing in-house professionals must upgrade their capabilities. Professional registrations, skills and job competencies by attending local and international workshops, conferences, and other upskilling activities.

The first limitation encountered was the need for more existing studies dealing specifically with VfM in EC DoTs road service delivery initiatives. Existing literature dealt primarily with the housing backlogs in the EC DoT, for which information existed in existing scholarly studies. Further developments in infrastructure service delivery, especially roads, needs to be more varied and requires extensive interrogations from various perspectives of public and private service providers and service users. Another limitation was that this study was primarily based on a qualitative research design. The use of quantitative data could have enhanced the robustness of the study; however the use of qualitative research design allowed for an in-depth understanding of the current state of VfM in EC DoTs roads infrastructure delivery in the EC. Another limitation of the study is that, as a single case study, its focus is on the EC DoT in the EC province. Future studies could focus on interrogating VfM in road service delivery in other areas such as the Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West and Western Cape. The case of contentions regarding borrow pit use is another area worth investigating: communities' perspectives on using their borrow pits.

To uncover the requirement for ensuring VfM in EC DoT road service delivery projects within the EC DoT, it was necessary to first find out factors impacting the effective and efficient delivery of roads during the infrastructure design, construction and maintenance phases. Table 2, therefore, illustrates the existing factors that impede road delivery as per the perceptions of the various interviewees. The perceptions regarding VfM bottlenecks are recorded in the table. Overall the general perception within the EC DoT is that the department is only achieving an average of 50% of its potential in delivering road services due to the presence of the intersecting factors.

Table 2. Factors impacting VfM in roads service delivery

Stages	Factors				
	Budget cuts	Hiring unsuitably qualified - in-house	Corruption	Service delivery protests	Lack of community compliance
Infrastructure Planning	√	√			
Infrastructure design	√	√	√		
Infrastructure Construction	√	√	√	√	√
Infrastructure Maintenance	√			√	√

The results from Table 2 indicate that all respondents from the various sub-units of the road infrastructure department indicated that the most predominant factor hindering the successful delivery of road services are due to budget cuts. The second-most discussed theme was the issue of hiring unqualified or unsuitably qualified personnel in-house. It was emphasised by the respective respondents the importance of having both a suitable qualification and certain years of experience, thus covering the theoretical and practical demands of their respective road service delivery functions and duties. In conjunction with the topic of in-house staff is the mirroring issue of hiring unqualified contractors, which fits within the ambit of corrupt activity. As an in-house staff, contractors should also possess the required work experience and qualifications for their respective positions.

5. Conclusions

This study's primary aim was to uncover areas to determine if the EC DoT obtains VfM from procured road infrastructure in the Eastern Cape Province. Both primary and secondary data reveal that the EC province experiences the most severe backlogs regarding road infrastructure service delivery in South Africa. The backlogs result from budget cuts to EC DoT project funds, lengthy procurement processes due to red tape, especially when procuring machinery parts during construction or maintenance phases, and inefficiency regarding the use of in-house resources compared to the private sector that can ensure optimum output. Moving towards a solution-oriented approach for resolving the backlog involves hiring and contracting suitably qualified and competent in-house personnel and contractors. Procuring resources such as machinery or damaged parts must be undertaken as quickly as possible by reducing red tape if VfM in road services is to ensue.

Further studies within the confines of road service delivery in the EC DoT need qualitative and quantitative comparisons between the private and public sectors regarding effectiveness and efficiency in road infrastructure service delivery. Future studies could include the perspective of private contractors and service beneficiaries

using quantitative surveys to obtain their views of the EC DoT roads service delivery performance. The target should be a larger and more comprehensive sample size hence the suggestion of questionnaire survey use. The perspectives of in-house professionals can then be compared to the views of various private contractors and existing literature to achieve triangulation of results to provide further rigour to the recommended study. Future studies could seek to develop a framework that promotes skills transfer from senior professionals, retiring or retired professionals to inculcate VfM practices among junior EC DoT professionals. Practice recommendations include the involvement or intervention of third parties in the tendering process to ensure that personnel can provide necessary services. Also, hiring suitably qualified in-house personnel must have a third-party intervention. Third parties in outsourcing and in-house recruitment will ensure the alleviation of bias and hiring based on favourites and pre-determined outcomes before interviews or tendering processes. Secondly, regarding corruption, stringent measures must be taken, and repercussions should exist for professionals engaged in corrupt activity.

References

1. Chuai, X., Lu, Q., Huang, X., Gao, R., & Zhao, R. (2021). China's construction industry-linked economy-resources-environment flow in international trade. *Journal of Cleaner Production*, 278, p.123990.
2. Zid, C., Kasim, N., Soomro, A.R., & Laidoune, A. (2020). The discrepancy in the construction industry of Malaysia: one of the most contributing industries in Malaysia's economy and the highest contributor of the fatal accidents. In *IOP Conference Series: Materials Science and Engineering* (Vol. 788, No. 1, p. 012034). IOP Publishing.
3. Kroukamp, H., & Cloete, F. (2018). Improving professionalism in South African local government. *Acta Academica: Critical views on society, culture and politics*, 50(1), pp.61-80.
4. Matebesi, S., & Botes, L. (2017). Party identification and service delivery protests in the Eastern Cape and Northern Cape, South Africa. *African Sociological Review/Revue Africaine de Sociologie*, 21(2), pp.81-99.
5. Ross, D., & Townshend, M. (2019). The road maintenance backlog in South Africa. Southern African Transport Conference.
6. Volden, G.H. (2019). Assessing public projects' value for money: An empirical study of the usefulness of cost-benefit analyses in decision-making. *International Journal of Project Management*, 37(4), pp.549-564.
7. Pandey, D.L. (2020). *Expected training benefits and employee commitment: a study of the Nepalese service sector*. Ashok Yakkaldevi.
8. Ujah-Ogbuagu, B.C. (2019). A Competence-Based Recruitment System Using Mean Deviation. *IUP Journal of Information Technology*, 15(2).
9. Wasike, W.S., (2001). *Road infrastructure policies in Kenya: Historical trends and current challenges* (No. 1). Kenya Institute for Public Policy Research and Analysis.
10. Mcwari, Z.P. (2019). *A Comparative Analysis Between Outsourced and Insourced Public Infrastructure Projects' Performance in a Provincial Department of Public Works*. University of Johannesburg (South Africa).
11. Malek, M., & Gundaliya, P. (2021). Value for money factors in Indian public-private partnership road projects: An exploratory approach. *Journal of Project Management*, 6(1), pp.23-32.
12. McArdle, G., & Gunning, J.G. (2018). Enhancing value for money in public procurement of Northern Ireland construction projects. *Proceedings of the Institution of Civil Engineers-Management, Procurement and Law*, 171(5), pp.207-219.
13. Medeni, T.D., Güçlü, A.N., Medeni, T., & Alır, G. (2016). Learning, Knowledge and Impact Assessment from the Perspective of Complexity and Chaos. In *Chaos, Complexity and Leadership 2014* (pp. 365-375). Springer International Publishing.
14. Olatunji, S.O., Olawumi, T.O., & Awodele, O.A. (2017). Achieving value for Money (VFM) in construction projects. *Journal of Civil and Environmental Research*, 9(2).
15. Wickens, D. (2021). Deterministic application of process-centric law to the system-centric requirements of procurement procedures. *Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad*, 24(1).

16. Ngumbela, X.G. (2020). We are building a province: an evaluation of the performance of Eastern Cape Province's 5th administration. *Journal of Nation-building & Policy Studies*, 4(1), pp.35-54.
17. Sanni-Anibire, M.O., Mohamad Zin, R. & Olatunji, S.O. (2022). Causes of delay in the global construction industry: a Meta analytical review. *International Journal of Construction Management*, 22(8), pp.1395-1407.
18. Roux, N. (2018). 'A house for dead people': memory and spatial transformation in Red Location, South Africa. *Social & Cultural Geography*, 19(4), pp.407-428.
19. Aigbavboa, C.O., Aghimien, D.O., Thwala, W.D., & Ngozwana, M.N. (2022). Unprepared industry meet pandemic: COVID-19 and the South Africa construction industry. *Journal of Engineering, Design and Technology*, 20(1), pp.183-200.
20. Ameyaw, C., Adjei-Kumi, T., & Owusu-Manu, D.G. (2015). Exploring value for money (VfM) assessment methods of public-private partnership projects in Ghana: a theoretical framework. *Journal of Financial Management of Property and Construction*.
21. Byaruhanga, A., & Basheka, B.C. (2017). Contractor Monitoring and Performance of Road Infrastructure Projects in Uganda: A Management Model. *Journal of Building Construction and Planning Research*, 5, pp.30-44.
22. Kissi, E., Adjei-Kumi, T., Twum-Ampofo, S., & Debrah, C. (2020). Identifying the latent shortcomings in achieving value for money within the Ghanaian construction industry. *Journal of Public Procurement*, 20(3), pp.313-330.
23. Mardiana, S. (2020). Modifying Research Onion for Information Systems Research. *Solid State Technology*, 63(4), pp.5304-5313.
24. Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students Eight Edition. *QualitativeMarket Research: An International Journal*.
25. Alharahsheh, H.H., & Pius, A. (2020). A review of key paradigms: Positivism VS interpretivism. *Global Academic Journal of Humanities and Social Sciences*, 2(3), pp.39-43.
26. Goldkuhl, G. (2019). The generation of qualitative data in information systems research: the diversity of empirical research methods. *Communications of the Association for Information Systems*, 44, pp.572-599.