

# Investigating Effective Infrastructure Delivery in South Africa: An Assessment of Infrastructure Delivery Reforms

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## Abstract

South Africa, like many other developing nations, faces significant challenges in delivering effective and fair public services. Africa in particular suffers from a catastrophic shortage of public infrastructure, and a variety of factors contribute to the infrastructure deficit. Public entities around the world are battling with effective service delivery and have adopted different models to enhance and improve infrastructure delivery. However, the models currently deployed have shortcomings, thus frustrating the efforts to deliver infrastructure effectively to the general populace. South Africa has similarly had its fair share of false starts. The 2010 introduction of Infrastructure Delivery Management System (IDMS) was specifically to facilitate effective, timely and sustained infrastructure development, and tackle the challenges in public sector infrastructure delivery. The study employs a multi-case study, qualitative approach through content analysed data to look at four nations that implements infrastructure projects in Europe and Sub-Saharan Africa and analyze the advancement of infrastructure delivery. A systematic review of infrastructure delivery models/reforms in the context of public sector was carried out through literature and descriptive analysis was applied. The findings reveal a knowledge vacuum about the diverse techniques taken by various countries in the execution of public sector infrastructure projects, and provide little precise evidence on the performance of delivery systems and lessons learned. It is here recommended that interventions such as IDMS should be contextualized cognizant of the country's developmental imperatives.

**Keywords:** reforms; infrastructure; delivery; construction industry; public sector

## Introduction

Infrastructure is a crucial engine of long-term economic growth and social well-being, yet public infrastructure development in many countries has proven to be sluggish and poor [50]. The nature of infrastructure delivery is evolving, and reforms that bring infrastructure solutions to the public sector have emerged around the world. Infrastructure delivery is challenging because of financial, technological, and institutional constraints [8]. [49] elucidate that overcoming infrastructure difficulties is critical for delivering value through the planning, delivery, and operations stages, as well as for developing and implementing national infrastructure strategies and policies. Effective public administration is necessary for modern states to function, whether they are developing or not [37].

The level of confidence the public sector has in its infrastructure should influence the delivery strategy. The construction industry provides society with conveyance or delivery techniques for a variety of political, economic, social, and environmental needs, making its products fundamental to people's societal and physical lifestyle changes [16]. A brief scan of literature indicates that numerous researchers, including [28, 16, 18, 27] indicate on research in other countries that nonperformance is quite common in the construction discipline. Furthermore, there appears to be a dearth of research looking at the infrastructure delivery systems needed to ensure successful implementation of infrastructure projects.

Given the importance of infrastructure to socioeconomic development, an integrated delivery approach that results in greater expertise and effective infrastructure solutions is required. According to [39], a sound policy framework is required to efficiently construct, maintain, and manage a country's infrastructure stock. While this study aims to contribute to this evaluation, it focuses on setting the groundwork for an investigation into infrastructure delivery systems by identifying the changes that have been implemented in other nations to ensure long-term delivery. The remainder of this paper is organized as follows: a review of current literature on infrastructure delivery system, a thorough examination of the infrastructure delivery models, justification of the research methods used, presentation and discussion of findings, and a conclusion.

## Literature Review

As more infrastructure is developed and maintained, the requirement to properly manage projects and adapt to new possibilities needs organizations to effectively draw on lessons gained in order to prevent repeating mistakes and, ultimately, to provide infrastructure more efficiently and sustainably [29].

### *The elucidation of 'effective and efficiency' concepts*

There are substantial variances in how 'effectiveness' and 'efficiency' are regarded and portrayed depending on the author's professional environment and study disciplines. According to [47], "effectiveness" refers to an activity's capacity to deliver the targeted outcomes, it has to do with how well the outputs achieve the desired results. Meanwhile, [34], state there is no efficiency without effectiveness, hence effectiveness is a prerequisite for reaching efficiency. Efficiency is defined as performing things in the most economical way possible [9]. The goal of efficiency is to maximize output for a given input or to minimize input for a given output while maintaining quality [47]. The distinction between efficiency and effectiveness is that efficiency relates to how successfully you do a task, whereas effectiveness refers to its usefulness. Being efficient and effective, according to [27], implies that team members and stakeholders achieve project goals to the maximum satisfaction and acceptance of all parties involved. The concepts of efficiency and effectiveness are used to evaluate the infrastructure delivery management system.

### *Infrastructure Delivery*

The acquisition and delivery of infrastructure is a complicated process [4]. There are a variety of ways that can be used to plan and construct a successful project, and the delivery method chosen has an impact on the infrastructure output. A project delivery method, according to [35], is a system for organizing and financing design, building, operation, and maintenance operations, as well as facilitating the delivery of a good or service. A competent and established organization is the cornerstone of an infrastructure environment conducive to effective project execution [10]. In a project-specific environment rife with unpredictability, infrastructure is designed

and supplied through a disconnected supply chain linked together by contracts. [30] alludes that in a planned economy, the planning and construction of projects are solely carried out by government institutions and agencies, while private entities, on the other hand, can execute the function for public works projects through competitive bidding processes.

### ***Progression of infrastructure delivery in other countries***

The public sector's infrastructure delivery units are feeling the pinch as demand for infrastructure grows. The severity of infrastructure problems varies significantly by nation type; unstable governments are swamped, while resource-rich countries, despite their wealth, lag behind [25]. Governments all over the world have embraced a variety of innovations and ways to build and improve infrastructure delivery.

#### ***United Kingdom***

The UK has been a pioneer in developing innovative public infrastructure project delivery systems. The biggest hurdles to infrastructure investment in the UK, according to [39], a 2011 study of British firms, are a lack of a clear overarching government policy, delays and expenditures in the planning system, and regulatory constraints. The Gateway Review Process was designed as a critical tool for enhancing infrastructure as a result of the options presented, and it has been embraced across government [43]. [41] elucidate that the method was first implemented in the United Kingdom in 2001, then adopted by the Victorian government in 2003, the New Zealand government in 2006, the Australian government in 2007, and Texas in 2013. The Gateway review process is a project management/development system that seeks to minimize budget/time overruns and scope changes in departmental projects, increase alignment with government policy goals and departmental corporate strategies, and improve portfolio evaluation across government [43]. The program's focus is to enhance the procurement process, make tracking easier, enhance monitoring and authorisation evaluation simpler, and increase the governance framework for project development phases [41]. Policy formulation and execution, organizational reform, acquisition programs, and construction development are all part of the system. [43] defines gateway as a systematic process that encompasses policy development, activity implementation, and analysis.

#### ***Ethiopia***

Ethiopia has achieved significant infrastructure improvements, and its infrastructure indicators compare favorably to those of low-income nations [21]. Ethiopia's construction sector, has risen enormously in the preceding eleven years, as has the expansion of other infrastructure projects [11]. As part of its attempts to overhaul the pre-sent public service structure and achieve rapid economic growth, the Ethiopian government has initiated a number of public sector reform programs. According to [45], in the early 1990s, the Ethiopian government implemented reforms to improve government institutions in the delivery of the country's public services. To promote and maintain human rights, the government has created a multiparty legislative framework, devolved authority to regional state and local administrations, and developed norms, policies, and institutional structures [3]. Business Process Reengineering (BPR), Balanced Scorecard (BSC), Change Army, Citizens Charter, and Deliverology, according to [22], have been implemented in the country's public sector institutions. Observations of [1], the reform efforts have shown that they have not achieved their objectives at the level anticipated. [45] state that there is inadequacy during the implementation of Ethiopia's rehabilitation programmes. This is correlated with the competitiveness of the construction sector, sustainability, efficiency and community service capability [44].

#### ***Rwanda***

In recent years, Rwanda has reprioritized infrastructure and achieved great progress. After defining critical sector policies to repair infrastructure and improve service delivery, the government has initiated infrastructure reforms. Rwanda's Vision 2020, Poverty Reduction Strategy, Economic Development and Poverty Reduction Strategy, 2008-2012, and Economic Development and Poverty Reduction Strategy II, 2013-2018, are among the measures that have been implemented to achieve rapid economic growth [46]. To solve service delivery challenges, Rwanda's infrastructure planning is guided by strategy and vision documents in the National Vision 2020 framework. Infrastructure development, institutional frameworks, good governance, and a competent state are all interwoven into the

framework [46, 51]. The government has made headway in reconstructing the country, as seen by infrastructure project development, planning, and procurement. The growth of Rwanda's infrastructure, however, is constrained due to inadequate institutional capacity among government and parastatal institutions, project selection, prioritizing, and planning [51]. The issue in relation to infrastructure is whether the policies of the government and the effectiveness with which they are enforced are adequate to attain the goals of the country.

### **South Africa**

Poor infrastructure has long been a thorn in the side of the South African economy and inadequate maintenance in certain regions has resulted in service loss or degradation [33, 36]. Despite limited resources, South Africa has worked hard to achieve a balanced socioeconomic growth by extensively investing in infrastructure [2]. The government has gone through several reforms [31]. Various governmental efforts have been established over the years, the government has implemented a number of initiatives to address structural imbalances, including: Growth, Jobs, and Redistribution (GEAR), 1996; National Development Plan (NDP), 2012; Reconstruction and Development Program (RDP), 1994; Accelerated and Shared Growth Initiative (AsgiSA) structure, 2006 (GEAR extension); and Accelerated and Shared Growth Initiative (AsgiSA) structure, 2006 (GEAR extension) [17]. The various reforms had similar goals, but they were different in terms of how they were formulated and which regulatory frameworks they employed [32]. The observed shortcomings were evaluated during the execution of each plan to shape the building blocks for formulating new development plans aimed at satisfying the citizens' infrastructure needs, which is a continuous process. The fundamental issue, however, was that poor service delivery remained even after the various changes were implemented. The government was obliged to reconsider, which resulted in the creation of IDMS [12]. The intervention is to enhance effective infrastructure delivery and address the problems confronting infrastructure institutions.

### **Infrastructure Delivery Management System (IDMS)**

IDMS is a collection of processes and a body of knowledge for public sector infrastructure delivery management introduced in 2010 [36] and offers a documented body of information and procedures that outlines common and established best practices in managing infrastructure project delivery, with a goal to improve project capabilities in organizational structure, procurement, governance, risk management, systems integration, and asset management [40]. It is created under the National Treasury's aegis, in partnership with national and provincial departments, the Construction Industry Development Board (CIDB), and the Development Bank of Southern Africa (DBSA) with the objective of offering critical guideline needs and procedures for delivering, utilising, maintaining, and managing infrastructure [36].

The system provides for government, technical support, planning, procurement and management processes which it categorizes into delivery phases [36]. This helps the project implementation management team to drive a uniform motion for project management and compliance with the applicable statutory criteria [13]. IDMS ensures linkages between people, tasks, information, and resources in order for stake-holders to have a shared understanding of the project's objectives [15; 26]. The infra-structure delivery management system promotes progress in delivery of projects, construction, rehabilitation and maintenance, or change in scope of infrastructure which cannot be executed in separation from acquisition and program management systems [36]. IDMS has evolved over a number of years and developed over time, with various modifications and the intention to tackle the challenges of inadequate capacity and organisational non-performance [13].

### **Research Methodology**

Research is a process followed to investigate certain subject areas whilst broadening knowledge [40]. Any methodology must describe the research process in sufficient detail for the research findings to be credible to the research report's readers, and the analysis methods used must be able to substantiate its validity [24]. The research methodology adopted is a qualitative multicase study. A case study is an extensive probe into certain circumstances in their natural state [52]. The case study strategy does enable retainment of the holistic and significant factors of literal events. This design was chosen because it could be used to conduct an indepth investigation

into phenomena in its natural setting. Within the case study research orbit, there are various data sources namely documentation, history logbooks, interviews, and observations [52]. The research was carried out using content analysis. With the goal of obtaining a greater understanding of the research field, the study was done through a comprehensive assessment of literature on infrastructure delivery. The paper, is part of an on-going study focusing on the effectiveness of infrastructure delivery management systems in the public sector. The study's focal point is to explore and analyse the effectiveness of infrastructure delivery management system in the public sector.

## Findings and Discussion

Infrastructure development uses a substantial amount of natural and capital resources and has a long-term impact on society's socio-culture; therefore, infrastructure delivery and service must be sustainable [38]. According to the literature, efforts have been made to address inefficiencies and ineffectiveness in a variety of ways using various methodologies. The intensity of the obstacles and issues vary depending on the type of program, the methodology, and the circumstances of the participating countries. The desktop comparison demonstrates that South Africa is not alone in this situation; other developing and expanding countries face similar serious infrastructure delivery issues. The fundamental concern of the public sector is to improve the provision of social infrastructure, which has an impact on the economy and the lives of citizens.

- The Gateway model provided by the European governments was introduced with the aim of improving infrastructure delivery. [20] state that there is no sufficient evidence to confirm that the Gateway initiative is a success.
- [45] provides interesting insights into the transformation of Ethiopian infra-structure and confirms that there is inadequacy during the enforcement of the rehabilitation programs in Ethiopia. [51] acknowledges that the issue in relation to infrastructure is whether the government's policies and the effectiveness with which they are implemented are sufficient to achieve the country 's goals.
- A study conducted to identify the challenges in the delivery of social and economic infrastructures through public-private partnership procurement arrangements in the Sub-Saharan African region, using South Africa as a case study, found that there is a lack of capacity, policy direction, and clarity among political leaders and implementing agencies in the delivery of social and economic infrastructures through public-private partnership procurement arrangements [37]. [48] opine that many of these delivery management duties are currently being failed by government institutions in South Africa, which is one of the key contributors of poor infrastructure out-comes.
- A lack of governance, as well as inadequate procurement and delivery management methods, are frequently the core causes of project failure or bad project outcomes, all of which are under the control of the government [48].

The reform models have been adopted in a range of countries, still face inherent challenges in reform program adoption and implementation. In terms of attempting to solve the problem of public infrastructure requirements, certain third-world nations have made progress. The solutions that attempted to solve delivery issues did not take a holistic approach to achieve a specified goal, and the results were inconsistent. Reforms have frequently failed not because they were not properly implemented, but because they failed to generate the desired results, only superficially matching donor-endorsed best practices [12]. Management controls that have shown to be effective in one country can prove ineffective or even inefficient in another country [5]. According to [23], there is a rising realisation that policies do not succeed or fail on their own; rather, their success is determined by the implementation process.

The dominant leadership and delivery model for infrastructure projects has not evolved to reflect profound changes [14]. Evidence-based decision-making, lead to greater effectiveness and efficiencies in achieving strategic results across the government [3]. Therefore, to enhance the efficiency of infrastructure projects, there is a desperate need to deal with the ambiguities in an integrated manner in order to accomplish the best practice in effective infrastructure delivery. Establishing an institutional architecture that allows for a specific degree of public service necessitates precise process, policy, skills, leadership, and capacity, all of which are required for successful infrastructure delivery.

Though experiences differ greatly by country, there is evidence of limited success in terms of effective infrastructure delivery systems in the public sector in both developed and developing countries. In this aspect, empirical evidence gathered from throughout the world isn't particularly helpful. Considering the evolving nature of the infrastructure sector, systems implemented to deliver infrastructure should be reviewed to allow for any improvements that might become essential. This suggests that there is a lot of room for improvement in infrastructure delivery processes in the public sector around the world. It's important that the systems in place allow for sufficient adaptability and flexibility in responding to infrastructure demands and implementing changes. [3] contributes that an efficient government is one that can protect residents from any aggression while simultaneously providing and maintaining infrastructure that allows for the interchange of goods and the delivery of services.

## Conclusion

Public infrastructure reforms have a direct role to play in improving infrastructure delivery, but as discussed, they have not been able to make the necessary progress to date, a fundamental shift in the way these policies are designed, implemented, and evaluated is required. The literature shows most countries have made progress in infrastructure provision through various systems, the solutions in different countries have been found to be constrained in effective delivery of infrastructure. Most strategies administered by countries on various continents to rehabilitate their public bodies were in vain, primarily due to inadequate strategy enforcement [7]. Although the relations between infrastructure reforms and performances are complex, the conclusion can be drawn that enhancing processes can have significantly improved performance. While the IDMS promotes a standardized approach to infrastructure delivery, there is a knowledge vacuum regarding how infrastructure delivery systems affect the performance of public-sector service delivery. It will take systematic collection of cross-country infrastructure data to empirically untangle the ties between distinct infrastructure delivery systems and ultimate industry results. A deeper understanding of how to develop effective delivery systems is urgently required.

Governments should evaluate their institutional capabilities considering the infrastructure delivery systems and intended outcomes. This evaluation will assist governments in determining how to enhance current processes by integrating new ideas, developing targeted skills, and having an integrated delivery model. Since the implementation of IDMS, it has been important to monitor current performance and trends to enhance processes, examine potential alternatives, and prescribe appropriate remedial action. Infrastructure gains are fully realized only when initiatives result in demonstrable public benefits. Drilling down and more operationally into the system to fill the gap in relevant literature in enhancing infrastructure delivery and establishing an integrated delivery model for public infrastructure is of interest.

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