Novelty Journals

ISSN 2394-7357

International Journal of Novel Research in Civil Structural and Earth Sciences
Vol. 12, Issue 3, pp: (7-13), Month: September - December 2025, Available at: www.noveltyjournals.com

Framework for an Appropriate Procurement Option that Will Fast Drive a Sustainable Infrastructural Development in Delta State, Nigeria

Aduze C.O.[1], Okolie K.C.[1]

[1]Department of Building, Nnamdi Azikiwe University, Awka, Nigeria.

DOI: https://doi.org/10.5281/zenodo.17045346

Published Date: 03-September-2025

Abstract: **This study develops a framework for selecting an appropriate procurement option to accelerate sustainable infrastructural development in Delta State, Nigeria, with emphasis on Public–Private Partnerships (PPPs) as an alternative to traditional procurement models. The research adopted a mixed-method approach, engaging 30 purposively selected construction professionals, including architects, engineers, quantity surveyors, builders, land surveyors, and town planners. Quantitative data were analyzed using the Relative Importance Index (RII), while qualitative insights were thematically interpreted. Findings reveal that inadequate funding, bureaucratic delays, and suboptimal project quality hinder infrastructure delivery under conventional procurement systems. Drawing lessons from the Lagos State PPP model, a tailored framework was proposed for Delta State, outlining institutional roles, project selection criteria, and operational procedures through the Office of Public–Private Partnership Infrastructure Development Agency (OPPPIDA). The framework aims to enhance efficiency, cost-effectiveness, and transparency in project delivery, aligning with Sustainable Development Goal (SDG) 9. The study recommends adopting this PPP model, strengthening institutional capacity, and prioritizing high-impact projects in housing, transport, and water supply to bridge infrastructure gaps sustainably.**

Keywords: **Public–Private Partnerships (PPPs); Procurement Framework; Infrastructure Delivery; Sustainable Development; Delta State.**

I. INTRODUCTION

Globally, the adoption of Public–Private Partnerships (PPPs) has intensified due to deteriorating public infrastructure, fiscal constraints, bureaucratic inefficiencies, and the rising demand for public services resulting from rapid urbanization and economic growth. Infrastructure serves as the backbone of national development and remains a core governmental responsibility; however, the scale of investment required to deliver and maintain it has compelled governments to explore alternative delivery mechanisms (Deloitte, 2005; Ogunsanmi, 2014). PPPs, defined as contractual arrangements between government agencies and private sector entities that allow for substantial private participation in infrastructure delivery, have emerged as a strategic tool to enhance efficiency, stimulate economic growth, and improve service delivery (Akintoye, 2015). Their historical roots can be traced to the late 1970s in the United States and the United Kingdom, with global development platforms such as the G20, the World Bank's Global Infrastructure Facility (GIF), and Africa50 strongly advocating for their adoption to bridge infrastructure gaps and accelerate sustainable development.

In Nigeria, the rapid pace of urbanization rising from approximately 7% in the 1930s to over 40% in recent years has placed significant strain on infrastructure provision (Okupe, 2002; Jiboye, 2019). Although the Federal Government enacted the Infrastructure Concession Regulatory Commission (ICRC) Act in 2005 to encourage private sector participation, infrastructure deficits remain a persistent barrier to economic growth, sustainable development, and poverty reduction. Delta State, in particular, faces critical challenges in delivering essential infrastructure, with traditional public procurement methods often hindered by inadequate funding, delays, and poor-quality outcomes. While PPPs have been introduced in selected projects within the state, empirical evidence assessing their suitability and performance compared to conventional procurement methods remains scarce.

This study addresses this gap by evaluating the appropriateness of procurement models for infrastructure delivery in Delta State, with specific attention to the potential of PPPs to enhance efficiency, cost-effectiveness, and sustainability. The findings aim to contribute to policy formulation, strategic infrastructure planning, and the broader discourse on achieving Sustainable Development Goal (SDG) 9, which advocates for quality, reliable, sustainable, and resilient infrastructure to foster economic growth and human well-being.

II. LITERATURE REVIEW

A. Overview of Procurement Options in Public Building Projects

Project procurement has been described as an organized method or process and procedure for clients to obtain or acquire construction products (Ashworth and Hogg, 2017). The procurement of construction project is vast in scope because it involves the gathering and organizing of myriads of separate individuals, firms and companies to design manage and build construction products such as houses, office buildings, shopping complex, roads, bridges etc. for specific clients or "customers". Masterman (2012) describes project procurement as the organizational structure needed to design and build construction projects for a specific client. It is in a sense very true because the process of "obtaining" a building by a client involves a group of people, who are brought together and organized systematically in terms of their roles, duties, responsibilities and interrelationship between them. Apart from the traditional approach, there are now other "fast-tracking" or innovative procurement systems used by the construction industry worldwide. The different procurement systems differ from each other in terms of allocation of responsibilities, activities sequencing, process and procedure and organizational approach in project delivery. These differences have invariably affected the project performance.

Determining the procurement method is a critical step in the project delivery process. It is important to consider which method will best balance the control of project cost and risk against achieving project objectives and outcomes. The key question is which form of project delivery provides the best value for money in meeting the government's service objectives? The selection of an appropriate procurement method could reduce construction project costs by an average of 5%, while an appropriate procurement system may enhance the probability of project success (Luu, Thomas and Chen (2013). In Nigeria, project procurement seems to be one of the key areas which have to be developed to a great extent; this is because wrong procurement method often leads to project failure or client's dissatisfaction Love, Skitmore, and Earl (2008). The selection of procurement system therefore becomes a very important task and imperative because the client is faced with various options to procure his project (Okunlola, and Olugbenga, 2012).

The selection of an appropriate procurement method for a project is critical to both the client and other project participants as it is an important factor which contributes to the overall client's satisfaction and project success. Owing to the strategic nature of construction projects, the manner in which they are procured and the measures to ensure their success should not be underestimated. That means that all activities related to the process of procurement must be informed, structured and carried out in a manner designed to meet or enhance those objectives strategic to the needs of the client. Consequently, Richard (2015) recommends that any measure of project performance ought to be tied to the strategic outcome required by the construction client in terms of the investment/business case, the product, and the desired organizational and stakeholders' outcomes.

The following criteria were used to examine client requirements and experts preferences for the performance of each procurement method Singh (2019) suggests employing the following criteria to establish a profile of the clients requirements: speed (during both design and construction); certainty (price and the stipulated time and knowledge of how much the client has to pay at each period during the construction phase); flexibility in accommodating design changes;

quality (contractors reputation, aesthetics and confidence in design); complexity (client may specify particular subcontractor, or buildability analysis); risk allocation/avoidance; responsibility (completion of program, price, product quality, design and construction); price competition (covering such issues as value for money, maintenance costs and competitive tendering); and disputes and arbitration. Similarly, Arazi, Mahmoud, and Mohamad (2011) analyses project performance criteria using severity index method as follows; Construction cost, Construction time, Quality of finish project, Occupational health and safety, Level of technology, Environment friendliness, Contractor's flexibility, Labour dependency, Quality of coordination by construction team, Contractor's project management and Contractor's capacity of manpower.

B. Concept of Public Infrastructure and Current State of Infrastructure for the Period under Review

Infrastructure refers to the fundamental facilities and systems serving a country, city, or other area, including the services and facilities necessary for its economy to function (O'Sullivan and Sheffrin, 2013). Infrastructure is composed of public and private physical improvements such as roads, bridges, tunnels, water supply, sewers, electrical grids, and telecommunications (including Internet connectivity and broadband speeds). In general, it has also been defined as "the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions" (Fulmer, 2019).

There are two general types of ways to view infrastructure, hard or soft. Hard infrastructure refers to the physical networks necessary for the functioning of a modern industry (Hamutak, 2019). This includes roads, bridges, railways, etc. infrastructure refers to all the institutions that maintain the economic, health, social, and cultural standards of a country (Hamutak, 2019). However, public works such as government-owned and operated infrastructure as well as public buildings, like schools and court houses are also generally referred to as physical assets needed to deliver public services. Public services include both infrastructure and services generally provided by government. Furthermore, the US National Research Council panel (1987) adopted the term "public works infrastructure", referring to: both specific functional modes highways, streets roads, and bridges; mass transit; airports and airways; water supply and water resources; waste water management; solid-waste treatment and disposal; electric power generation and transmission; telecommunications; and hazardous waste management.

A comprehension of infrastructure spans not only these public works facilities, but also the operating procedures, management practices, and development policies that interact together with societal demand and the physical world to facilitate the transport of people and goods, provision of water for drinking and a variety of other uses, safe disposal of society's waste products, provision of energy where it is needed, and transmission of information within and between communities (Infrastructure report, 2017). Schraven, Hartman, Dewulf (2011) carried out research on the effectiveness of infrastructure asset management challenges for public agencies with the aim to understand the decisions in infrastructure asset management at public agencies and the challenges of these agencies to improve their decision making. The study of the literature reviewed asset management for public agencies, and case study conducted to investigate the decision making of a provincial agency in Netherlands; Also the study observed that the key challenges to achieving effective infrastructure asset management are: the establishment of alignment between infrastructure objectives, situation and intervention; the formulation of different interest. They concluded that public agencies should pay more attention to clearly defined infrastructure objectives which are consistent with the agencies strategic policy goals and interests of multiple stakeholders.

They stated that airport has gone from public sector operation to being privatized or a combination of the two. This implies that airport corporation have to finance their own expansions, which is the reason why their real state and infrastructure asset must be seen and managed as valued asset and not only as support for the business. However, such management is unfortunately not established in many of the large organizations today. The study argues that complex organization and corporations could potentially benefit from incorporating a strategic approach with tactical actions, challenges such as defining roles and responsibilities could be overcome by synergy effects captured, resulting in an overall high performance and more effective management. The study clearly argues for the need of the corporation in public sector to adopt a private sector governance approach regarding asset management to satisfy government demand and ensure the interest of shareholders. Also, the study provides another perspective on how company in the public sector can make their asset more effective by wider utilization of management tools used in the private sectors to generate higher profitability.

International Journal of Novel Research in Civil Structural and Earth Sciences
Vol. 12, Issue 3, pp: (7-13), Month: September - December 2025, Available at: www.noveltyjournals.com

High quality infrastructure is a fundamental part in encouraging higher productivity and competitiveness in any national economy (Hardwicke, 2010). However, operating infrastructure assets and buildings are the top financial expenses and consume a lot of resources (Mandele, Walker, and Bexelius, 2016). Hence, to avoid financial setbacks, an effective management of these assets is necessary. The development and delivery of infrastructure assets typically require significant planning and long lead times, causing them to be a challenge for any organization and especially for large and complex organizations.

III. METHODOLOGY

This study adopted a mixed-method research design, engaging thirty (30) purposively selected registered construction professionals in Delta State, Nigeria, comprising nine (9) Architects, six (6) Civil/Structural Engineers, six (6) Quantity Surveyors, four (4) Builders, three (3) Land Surveyors, and two (2) Town Planners, all involved in public project delivery. Data were collected through structured questionnaires to obtain quantitative responses and semi-structured interviews to gather qualitative insights. Quantitative data were analyzed using SPSS version 24, with the Relative Importance Index (RII) employed to rank identified factors, while qualitative data were thematically analyzed. Findings were presented in tables and figures, integrating both data strands to provide a comprehensive understanding of procurement model effectiveness for infrastructure delivery in the study area.

IV. RESULTS AND DISCUSSION

Table 1: Profession of Respondents

S/No	Profession	No. of Respondents	Percentage (%)
1	Architects	9	30
2	Civil/Structural Engineers	6	20
3	Quantity Surveyors	6	20
4	Builders	4	13.3
5	Land Surveyors	3	10
6	Town Planners	2	6.66
	Total	**30**	**100**

Table 1 shows the distribution of respondents by profession, indicating that architects constituted the largest group with 9 respondents (30%), followed by civil/structural engineers and quantity surveyors, each representing 20% of the sample. Builders accounted for 13.3%, while land surveyors made up 10% of the respondents. Town planners formed the smallest group, representing 6.66% of the total. This distribution reflects a fair representation of key professional categories within the construction sector in Delta State, ensuring that the study captured diverse perspectives on the factors militating against infrastructure delivery.

A. Development of PPP Procurement framework using Lagos State template

Delta state is situated in the region known as the south-south geo-political zone with a population of over seven (7) million and a population growth of three percent annually. With such a staggering population, the resources of the government can definitely not meet every growing demand of the people in term of good roads, housing and water supply, among others.

To ensure that available infrastructure commensurate with the ever-increasing population, and to achieve its vision of making Delta state an investment destination of choice in Nigeria and Africa, the state as a matter of priority should made rapid infrastructure renewal and upgrade a cardinal policy. To achieve this objective, the government should embrace a strategic policy thrust, the public – private partnership, PPP model in accelerating infrastructure delivery, having arrived at the conclusion that its current resources are insufficient to deliver the state of our dream.

Experts are of the view that PPP offers a timely and cost-effective alternative approach to financing, building, operating and maintaining infrastructure and beyond the benefit of mobilizing private capital for the speedy delivery of public infrastructure, PPP has a considerable number of other benefits which perhaps is why it is becoming a popular tool for infrastructure delivery.

Novelty Journals

ISSN 2394-7357

International Journal of Novel Research in Civil Structural and Earth Sciences
Vol. 12, Issue 3, pp: (7-13), Month: September - December 2025, Available at: www.noveltyjournals.com

This is to ensure that the citizens of the state derive maximum benefit from the infrastructural renewal energized by the private sector, in some cases, through the Build, Operate and Transfer System, (BOT model). Be fully aware that the infrastructure concession regulatory commission Act, 2005 of Federal government has no power to regulate state public – private partnership. Therefore, it is incumbent on the state government to swing in action as a way of coming up with a more robust framework to take care of the implementation of PPP in Delta State.

The proposed framework governing PPPs in Delta State shall allocate specific roles and responsibilities to various entities within the state framework. These specific DTSG entities roles and responsibilities for PPP development and how they work together in the PPP process are referred to as the framework for PPP development.

In order to make sure that there are checks and balances in the system, as well as oversight of the decision-making process, many DTSG entities are involved in the PPP process from beginning to end. The figure 4.1 explains more on the proposed Public-Private Partnership (PPP) framework.

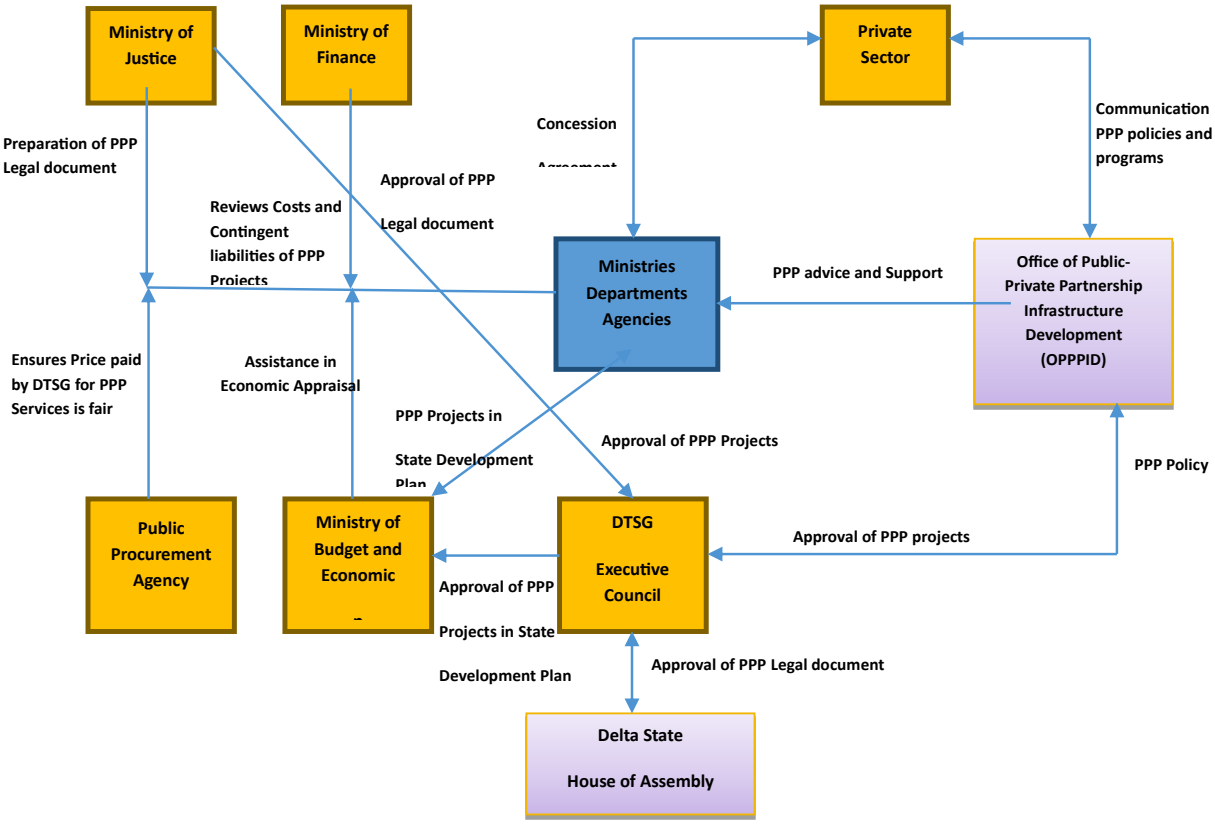

Figure 1: A Hypothetical Framework of Delta State public private partnership (PPP) option for the State infrastructure Delivery

Source: Adapted from Lagos State PPP Manual (2020)

B. Proposed operationalization of PPP Procurement framework in Delta State

Operationalizing a Public-Private Partnership (PPP) framework could be as follows:

Step 1: The Ministries, Departments and Agencies (MDAs) with the assistance of the Office of Public Private Partnership Infrastructure Development Agency (OPPPIDA) select and prioritize the projects to be implemented on a PPP basis for each sector;

Step 2: For the projects selected to be implemented through the PPP route, the respective Ministries, Departments and Agencies (MDAs) with the assistance of the Office of Public Private Partnership Infrastructure Development Agency (OPPPIDA) prepares an Outline Business Case;

Step 3: The Outline Business Case is then submitted by the MDAs to the Delta State Executive Council for approval;

Step 4: The Exco with the assistance of the Office of Public Private Partnership Infrastructure Development Agency (OPPPIDA) approves the projects to be implemented through the PPP route for various sectors;

Step 5: The OPPPID will then communicates to the respective MDAs about the projects approved by the State Executive Council for implementation through the PPP route;

Step 6: The MDAs in consultations with the Office of Public-Private Partnership Infrastructure Development Agency (OPPPIDA) select the private developer for the implementation of the project through open competitive tendering process;

Step 7: Once the Preferred Bidder is selected, the MDA prepares a Full Business Case on the basis of the Outline Business Case and the proposal of the Preferred tender and submits the same with the assistance of the OPPPIDA to the State Executive Council for approval; and

Step 8: Upon approval of the Full Business Case by the State Executive Council, the Office of the Public-Private Partnership Infrastructure Agency (OPPPIDA) enters into a PPP contract with the Preferred Bidder.

As indicated in figure 4.1 of the framework, it is imperative to further explain the roles and responsibilities of the Ministries, Department and Agencies (MDA) and the office of the Public-Private Partnership Infrastructure Development Agency (OPPPIDA) in the PPP Infrastructure development:

The Ministries, Departments and Agencies (MDAs) in consultation with the office of the Public-Private Partnership Infrastructure Development Agency (OPPPIDA) shall prepare long-term plans for infrastructure investment and maintenance. These plans are incorporated into the Delta State Development Plan being prepared by the Delta State Ministry of Budget and Economic Planning. As part of this process, the MDAs, in consultation with the office of the Public-Private Partnership Infrastructure Development Agency (OPPPIDA) identify where PPP is likely to offer better Value-for-money over other forms of public procurement and the same is factored into the Investment Strategy of the relevant MDA. The MDAs shall be guided by the Delta State Ministry of Budget and Economic Planning in consultation with the office of the Public-Private Partnership Infrastructure Development Agency (OPPPIDA) for the criteria to be adopted for measurement of the Value-for-Money and assessment of the risks associated.

V. CONCLUSION AND RECOMMENDATION

The study revealed that infrastructure delivery in Delta State was hindered by persistent financial, administrative, political, and environmental challenges, with traditional procurement models proving inadequate for the state's increasing infrastructure demands. Findings indicated that Public–Private Partnerships (PPPs) offer a viable alternative, capable of enhancing cost efficiency, reducing delivery time, and promoting sustainability. Drawing lessons from the Lagos State PPP framework, a tailored operational model was proposed for Delta State, specifying institutional roles, selection criteria, and monitoring mechanisms to ensure transparency and accountability.

It is recommended that the Delta State Government adopt this PPP framework, establish a dedicated Office of Public–Private Partnership Infrastructure Development Agency (OPPPIDA), and strengthen the capacity of Ministries, Departments, and Agencies (MDAs) in PPP planning and management. Emphasis should be placed on competitive bidding, innovation-driven private sector participation, and prioritization of high-impact projects in housing, transport, and water supply. Such measures will close the infrastructure gap more effectively while ensuring long-term value-for-money and alignment with Sustainable Development Goal (SDG) 9.

REFERENCES

[1] Akintoye, A. (2015). *Public private partnerships: An integrated approach to infrastructure provision*. Abingdon, UK: Routledge.

[2] Arazi, M., Mahmoud, A., & Mohamad, Z. (2011). Analysis of project performance criteria using severity index method. *International Journal of Project Management, 29*(3), 250–260. https://doi.org/10.1016/j.ijproman.2010.03.003

[3] Ashworth, A., & Hogg, K. (2017). *Willis's practice and procedure for the quantity surveyor* (13th ed.). Hoboken, NJ: Wiley-Blackwell.

[4] Deloitte. (2005). *Closing the infrastructure gap: The role of public-private partnerships*. Deloitte Research. Retrieved from https://www2.deloitte.com/

[5] Fulmer, J. (2019). What in the world is infrastructure? *PEI Infrastructure Investor*. Retrieved from https://www.infrastructureinvestor.com/

[6] Hamutak, J. (2019). *Hard and soft infrastructure: Definitions and examples*. New York, NY: Nova Science Publishers.

[7] Hardwicke, M. (2010). Infrastructure and competitiveness: The role of quality infrastructure in national economic performance. *Journal of Infrastructure Development, 2*(1), 23–35. https://doi.org/10.1177/097493061000200103

[8] Infrastructure report. (2017). *Infrastructure for sustainable development*. Washington, DC: World Bank.

[9] Jiboye, A. D. (2019). Urbanization and housing for low-income earners in Nigeria: Policy, challenges, and prospects. *Journal of Geography and Regional Planning, 12*(3), 45–54. https://doi.org/10.5897/JGRP2018.0731

[10] Love, P. E. D., Skitmore, M., & Earl, G. (2008). Selecting a suitable procurement method for a building project. *Construction Management and Economics, 16*(2), 221–233. https://doi.org/10.1080/014461998372501

[11] Luu, V. T., Thomas, S., & Chen, S. E. (2013). Selecting procurement systems for large building projects using case-based reasoning. *International Journal of Project Management, 21*(7), 509–520. https://doi.org/10.1016/S0263-7863(02)00012-7

[12] Mandele, R., Walker, C., & Bexelius, A. (2016). Asset management for infrastructure: Strategic approaches to improve efficiency. *Journal of Infrastructure Asset Management, 3*(2), 101–112. https://doi.org/10.1680/jinam.16.00015

[13] Masterman, J. W. E. (2012). *An introduction to building procurement systems* (2nd ed.). London, UK: Routledge.

[14] Ogunsanmi, O. E. (2014). Impact of risk on performance of public private partnership projects in Nigeria. *Journal of Facilities Management, 12*(1), 5–33. https://doi.org/10.1108/JFM-07-2013-0040

[15] Okunlola, O. F., & Olugbenga, A. S. (2012). An appraisal of procurement methods in the Nigerian construction industry. *Journal of Civil Engineering and Architecture, 6*(12), 1507–1514. https://doi.org/10.17265/1934-7359/2012.12.013

[16] Okupe, L. (2002). Nigeria's urban infrastructure: Agenda for reform. *Housing Today, 1*(5), 20–26.

[17] O'Sullivan, A., & Sheffrin, S. M. (2013). *Economics: Principles in action*. Upper Saddle River, NJ: Pearson Prentice Hall.

[18] Richard, R. (2015). Strategic procurement for construction: Ensuring alignment with client objectives. *International Journal of Construction Management, 15*(4), 292–304. https://doi.org/10.1080/15623599.2015.1077305

[19] Schraven, D., Hartman, T., & Dewulf, G. (2011). Effectiveness of infrastructure asset management: Challenges for public agencies. *Built Environment Project and Asset Management, 1*(1), 61–74. https://doi.org/10.1108/20441241111143705

[20] Singh, R. (2019). Client requirements and procurement method selection in construction projects. *Journal of Construction in Developing Countries, 24*(1), 23–44. https://doi.org/10.21315/jcdc2019.24.1.2

[21] US National Research Council. (1987). *Infrastructure for the 21st century: Framework for a research agenda*. Washington, DC: National Academies Press.