University of Baghdad
College of Engineering
JOURNAL OF ENGINEERING

Journal of Engineering

journal homepage: www.jcoeng.edu.iq

Volume 31 Number 9 September 2025

Factors Affecting the Success of Road Construction Projects: The Case of Iraq

Almutasim B. Nasser *, **Kadhim R. Erzaij**

Department of Civil Engineering, College of Engineering, University of Baghdad, Baghdad, Iraq

ABSTRACT

Given the pivotal role that roads play in a nation's development, their construction often entails significant risks and challenges. Therefore, road construction projects must be successfully implemented. Numerous studies have been conducted to discover the key factors affecting road construction projects and their improvement. The aim of this study was to examine and pre-determine the factors affecting the success of road construction. Data was collected from experts in the field of road management to identify the factors influencing road construction projects in Iraq. Data was also used from interviews with road construction project managers. After analyzing this data, the study concluded that there are several external and internal constraints that affect project success. These constraints include site preparation, implemented infrastructure, land ownership restrictions, technical design constraints, administrative constraints, financial constraints, and security constraints. A plan-based analysis revealed that the highest percentage of constraints was related to technical design (22%). The study recommended addressing these constraints proactively to avoid future problems during project implementation while increasing the accuracy of planning and managing bills of quantities to reduce change orders. While ensuring cash flow for projects to avoid delays, the availability of skilled labor is also essential. This work contributes to existing knowledge by providing academics and project management experts with an additional set of variables to consider when attempting to predict the outcomes of road construction projects. Project managers and stakeholders in Iraq can benefit from the study's findings to enhance the likelihood of success of road construction projects.

Keywords: Project management, Road factors impact, Road construction obstacles.

1. INTRODUCTION

Road constructions refer to the public highways that connect towns and cities. **(Högselius et al., 2015; Rahman et al., 2020)** showed that road networks boost economic activity by efficiently transporting people and goods to suit local demands, making them crucial for

*Corresponding author
Peer review under the responsibility of University of Baghdad.
https://doi.org/10.31026/j.eng.2025.09.02

Article received: 02/03/2025
Article revised: 21/03/2025
Article accepted: 28/04/2025
Article published: 01/09/2025

national development. **(Onyango, 2023; Wanjira and Ngari, 2018)** Roads are crucial to a nation's economic, social, and political development, making them high-risk construction projects. Successful projects follow the budget, meet all goals, have minimal environmental impact, and are extensively publicized. Due to the importance of roads, governments are pressuring road-building projects to succeed. Delays and cost overruns are hurting Iraq's economy. Thus, these success criteria are essential for road construction. Project success is crucial. **(Alfahad et al., 2024; Dissanayaka et al., 2004)** However, budget issues, poor planning, and building faults can delay road development projects. Researchers in Egypt, Cambodia, and Kenya are trying to understand their construction industries by identifying critical components for road construction projects. Unfortunately, the present study lacks Iraqi construction project managers' data. Researchers and industry experts can benefit from a better understanding of local road-building project elements to suggest opportunities for improvement. Road-building projects may avoid problems and accidents if major issues are overcome. **(Ali et al., 2024; Matějka, 2017)** showed that the variables affecting Iraqi road construction must be examined. This article discusses Iraqi road construction project factors from the standpoint of road builders. The writers do this by thoroughly examining in-depth interviews with Iraqi road-building project management. This paper expands the knowledge of road construction to provide resources and help scholars and industry specialists improve road-building success **(Radzi et al., 2019; Benjamin, 2014)**. A pilot study was conducted on the risk assessment module of public road development **(Dave et al., 2018)**. This research examines a case study of a road construction project to connect a university on the east coast of Malaysia, linking the state highway with the federal highway. These roads included four lanes with an approximate length of 5 km. A delay risk assessment was conducted using the Analytical Hierarchy Model (AHP) to identify the factors causing delays based on the design of the AHP model. **(Alashwal et al., 2016)** showed that the analysis results showed that land acquisition risks were the primary risk, followed by environmental and operational risks that could cause project delays. The study concluded that this assessment was important for the project team to avoid delays and additional project costs based on the risks identified previously **(Muturi et al., 2016)**.

(Rashid et al., 2016; Hassan, 2013) investigated the primary causes of budget and schedule delays in Pakistani highway construction projects. A questionnaire was used to determine what causes highway construction costs and time overruns. Ten consumers, twenty-one consultants, and twenty-five contractors were surveyed. The relative importance index was used to evaluate thirty-two delays and twenty-eight cost overruns **(Karunakaran et al., 2018)**. Extra work is the main cause of highway construction cost overruns, according to the report. This result was obtained by examining all 28 cost overrun areas. **(Mohamed et al., 2021; Nguyen et al., 2023)** poor government policies and priorities, insufficient planning, rising prices of essential construction materials, fluctuating costs, difficulties in acquiring land and resettling populations, inconsistent cash flow, delayed employer decision-making, design errors and modifications, and inaccurate service and utility relocation estimates all contribute to rising project costs. Mike Black **(Mohamed et al., 2017; Nusa et al., 2015)** comprehensively analyzes the project's geological history and highlights early geotechnical risk detection. The researchers in **(Jalhoom et al., 2023)** described how intensive desk study, detailed field investigations, and full interpretative reporting by clients improved the assessment of these hazards' specific threats. Proactive measures were taken to reduce these risks during design and delivery. **(Larsen et al., 2015; Marwa et al., 2022)** investigated geological forecasting methods. Research has revealed

that unanticipated geological conditions and geotechnical issues greatly impact large-scale civil engineering project finances and timelines. **(Eliwa et al., 2024)** showed that despite attempts to fix them by adding alternative terms to commercial agreements, problems persist. To avoid surprises, quickly assess geological conditions. **(Koc et al., 2020; Aziz et al., 2016)** examined how geotechnical concerns affect project costs and timetables. Geotechnical problem cost, schedule, and frequency indices were developed from the literature study. The indices were then used to assess risk significance.

In this paper, the researcher collected specific data to investigate the factors affecting the success of road construction projects in Iraq. This data was applied to classify the road projects into two categories: internal and external. The analytical results will help the project managers to be able to handle the internal factors that contribute to a project's success, which may be resolved via the use of asset management protocols.

2. ROAD CONSTRUCTION PROJECTS IN IRAQ

Iraqi researchers have studied private-public partnerships, privatization evaluations, knowledge management, and project teams' environmentally sensitive measures for road-building projects. According to a questionnaire study, defective design, bad weather, poor site evaluation, poor site supervision, and improper subterranean utilities delay road construction projects in Iraq. The study identified the causes of problems in construction projects and adopted a quantitative and qualitative analysis method **(Rahimi et al., 2017)**. The results showed that the main cause of the problems is the processes and people, not the technology**. (Saleh et al., 2024; Sebru et al., 2015)** studies have demonstrated the pivotal role of building information modelling and identified several alternative ways to enhance integration between production and building information management. Specialists have extensively evaluated and validated Kerim Koc et al.'s risk variables **(Rahman et al., 2017; Rashid et al., 2023)**. Generalizing data from individual interviews might be difficult, but it gives researchers significant insights into participants' opinions, practical expertise, and personal experiences. This study examines Iraqi road development project variables through in-depth interviews with specialists. **(Sinaga et al., 2022; Vivek et al., 2022)** showed that this will help overcome questionnaire survey knowledge gaps. These items were chosen for their versatility. Iraq is vulnerable to 15 natural calamities, according to research. The Iraq-wide quadrangles are located throughout 39 regions. A comprehensive Iraqi Geological Hazards Map was created using weather data. Geological hazard data is scarce in Iraq **(Sissakian et al., 2015; Sissakian et al., 2022)**. Each location was analyzed thoroughly to determine its unique qualities. The topics covered were groundwater recharge, high-quality groundwater movement, groundwater basin hydraulics, groundwater industrial concerns, and innovative concepts. **(Jankowski et al., 2015; Nguyen et al., 2004)** showed that the country has seven hydrogeological areas based on its physical, structural, geographical, and hydrogeological aspects. Each location has distinct hydrogeological and hydro chemical characteristics.

3. MATERIALS AND METHOD

Qualitative data was collected from road construction project managers through interviews. The qualitative data were analyzed using theme analysis. The following text details the data collection and analysis methods used for this research. Unstructured interviews with project managers were used to study road construction project factors. Instead of questionnaire

surveys, researchers can better comprehend respondents' viewpoints and experiences by conducting one-on-one interviews. Open-ended questions allow people to provide as much exact information as they like. Therefore, project managers are intentionally interviewed using these methods to gather their unique perspectives, practical knowledge, and background information. Iraqi organizations with different licenses cannot build projects larger than their registration grade. Individual interviews start with an introduction and an open-ended question. This poll asks about road construction issues. Participants also receive extra open-ended questions based on their past answers. Follow-up questions were used to improve data comprehension and confirm participant remarks. The interviewer would repeat the topic and give the participant time to react if they couldn't answer or elaborate on the initial questions. The moderator encouraged the interviewees to conclude their explanations. We send participants interview summaries for approval after each interview. This study interviewed valid people.

4. RESULTS AND DISCUSSION

The factors impacting the success of road construction projects in Iraq were identified by analyzing individual interview data with real project managers of these projects. The elements are succinctly outlined in **Fig. 1**. This study adopts a project manager's perspective and classifies the reasons into two categories: internal and external. In other words, project managers can handle the internal factors that contribute to a project's success, such as a shortage of equipment, which may be resolved via the use of asset management protocols. Conversely, external variables refer to circumstances that project managers have limited control over, such as customers' payment for project milestones. Process-related variables are among the internal factors.

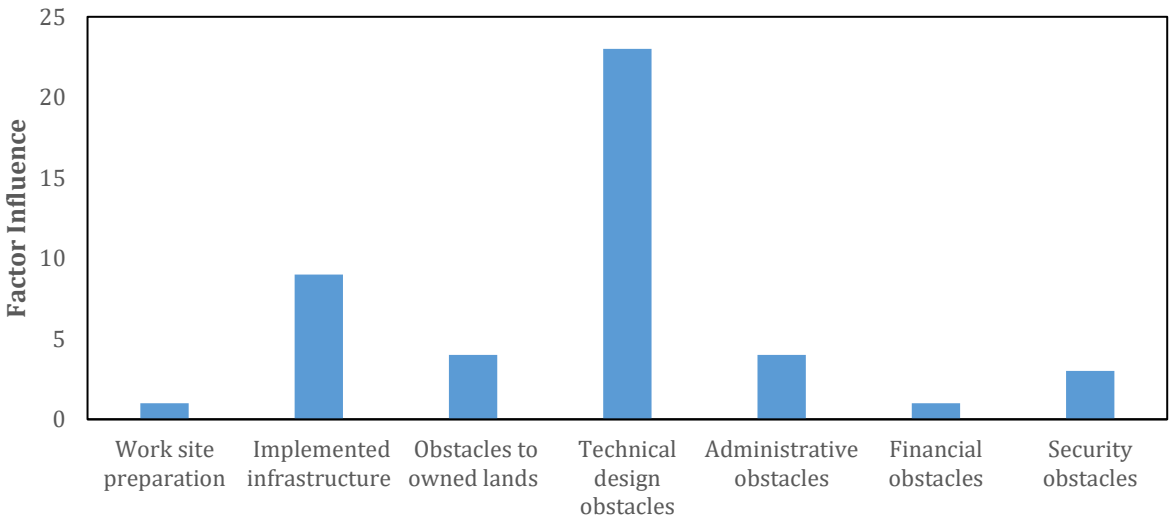

Figure 1. The results of road construction effective factors impact.

4.1 Work Site Preparation

Site preparation prepares the site for construction. This involves clearing the building site, levelling the ground, and compressing the dirt. It's crucial to a successful and secure building project. According to individual interviews with Iraqi project managers, weather and site location greatly impact road-building project effectiveness. Early on, road construction is

more subject to rain than building projects. Rain delays the crew's work and has a greater impact on these projects. The site's location may also affect the road construction progress. Earthmoving and drainage management are more difficult for road construction projects in mountainous or rocky terrains. Forest or swampy terrain may be harder to navigate. Bridge construction is arduous, especially for transportation constructions crossing lakes or rivers. Urban building sites must manage traffic, relocate subterranean utilities and services, build storage, and get permissions. These obstacles are in addition to rural road development challenges. Whether rural or urban, a project's site's proximity to the nearest quarry affects accessibility and cost. In addition to site conditions caused by insufficient site study, site location can severely impact road-building projects.

4.2 Implemented Infrastructure

One of the main reasons for project delays, especially those related to infrastructure, is the lack of proper coordination between the entities implementing projects in the country. Therefore, good coordination between these service entities removes many of the obstacles that delay excavation work. Sometimes, a lack of coordination between sectors within the Public Works Authority appears. For example, the roads sector implements the paving of a road, and then the sanitation sector re-excavates the street after a short period to extend the sewage drains. Therefore, identifying this obstacle in advance by project managers avoids an expected delay during implementation.

4.3 Obstacles to Owned Lands

Road construction is a complex process, and each project presents its own challenges. However, given the long history of the construction industry spanning thousands of years, there are several risks that must be identified before project implementation. One of the most significant obstacles facing road developers is owned land. Therefore, these risks related to land acquisition must be identified and addressed in advance, including compensation or other solutions, as determined by the relevant authorities, as they may hinder project implementation or delay the project's scheduled completion date.

4.4 Technical Design Obstacles

Miscalculations, incorrect design code use, misinterpretation of project requirements, insufficient or inaccurate site investigation data, inadequate change control, lack of technical knowledge, ineffective project interfaces, inadequate checking procedures, inaccurate mapping, limited understanding of site limitations, and other factors can cause design errors. The significant number of CRUX causality ranking conflicts may be due to the extensive list of design defects. Design responsibility varies by procurement type. Design-bid-build projects are usually designed by the owner and its consultant. The contractor may receive a basic design and refine and detail it under the design-build technique. This may split the duty between the contractor and the owner/consultant. In design-build, the contractor can subcontract these duties to an independent designer. This works best when the design is properly defined and managed. If not, disputes are likely.

4.5 Administrative Obstacles

Project management is not easy task, as most projects fail to fully achieve their objectives. Managing small projects presents significant challenges for teams and managers, as these

projects require working within a limited budget and timeframe while maintaining quality. Among the obstacles facing these projects are the failure to reduce project controls and the lack of sufficient attention from senior management. Managing medium- and large-scale projects, however, faces different challenges, such as marketing, social, and cultural issues.

4.6 Financial Obstacles

Construction businesses deal with a particular set of financial challenges, often beyond their own control. Smart companies must learn how to evade pitfalls like poor job estimation while best managing unavoidable situations like inflation and change orders. A keen eye out for the most common stumbling blocks in accounting for construction will keep the company completing jobs without missteps.

4.7 Security Obstacles

Construction sites are subject to several threats, against which security should be applied by the site operator. These include theft, vandalism, deliberate damage, and terrorism.

5. CONCLUSIONS

Highway construction projects are a complex process that requires effective management to ensure project success. To ensure the success of these projects, several factors must be considered, including the availability of raw materials and equipment, the recruitment of qualified personnel to achieve the required efficiency, and project schedule management to avoid any delays. Quality is also an important factor. The study identified seven characteristics that influence the performance of road development projects in Iraq. Several variables must be considered, including the design process, project manager skills, availability of personnel, materials, and equipment, weather conditions, project location, senior management involvement, customer support, public acceptance, and agency effectiveness. These factors can be categorized into seven main groups, including: site preparation, land ownership constraints, technical design constraints, administrative constraints, financial constraints, security constraints, and implemented infrastructure.
The study recommends the following:

- Recognize and address internal constraints that may hinder the project's success.
- Properly manage external constraints.
- Increase the accuracy of planning and bills of quantities to reduce change orders.
- Ensure the flow of cash for projects to avoid delays.

Credit Authorship Contribution Statement

Almutasim B. Nasser: Writing – review & editing, Writing – original draft, Validation, Software, Methodology. Kadhim R. Erzaij: review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

Alashwal, A.M., Abdul-Rahman, H., and Radzi, J., 2016. Knowledge utilization process in highway construction projects. *Journal of Management in Engineering,* 32(4), pp. 1–9. https://doi.org/10.1061/(asce)me.1943-5479.0000429

Alfahad, A.A., and Burhan, A.M., 2024. Evaluating the knowledge for integrating RM and VM using BIM in the Iraqi construction sector. *Journal of Engineering*, 30(02), pp. 154–178. https://doi.org/10.31026/j.eng.2024.02.11

Ali M.H. and Hatem K.B., 2024. Global post-evaluation for highway construction projects. *Journal of Engineering*, 30(8), pp. 169–183. https://doi.org/10.31026/j.eng.2024.08.11.

Aziz, R.F., and Abdel-Hakam, A.A., 2016. Exploring delay causes of road construction projects in Egypt. *Alexandria Engineering Journal*, 55(2), pp. 1515–1539. https://doi.org/10.1016/j.aej.2016.03.006

Benjamin, K., and Njenga, K., 2014. Factors influencing effective and efficient delivery of road construction projects in Kenya : a case of Nairobi County. *International Journal of Business & Social Science*, *2*(3), pp. 92–98.

Dissanayaka, S.M., and Kumaraswamy, M.M., 2004. Factors affecting cost and time performance on highway construction projects: Evidence from Thailand. *Journal of Financial Management of Property and Construction*, *11*, pp. 3–20.

Donaldson, D., 2018. Railroads of the Raj: Estimating the impact of transportation infrastructure. *American Economic Review* 108 (4-5), pp. 899–934**.** https://doi.org/10.1257/aer.20101199.

Eliwa, H.K., Jelodar, M.B., Poshdar, M., and Zavvari, A.,2024. Organizational infrastructure and information and communication technology infrastructure alignment in construction organizations. *Journal of Construction Engineering and Management*, 150(7), P. 04024057. https://doi.org/10.1061/JCEMD4.COENG-13808.

Hassan, A.I., 2013. An investigation of structural capacity as a component of monitoring and evaluation in project success of road construction projects in Kenya. *International Journal of Academic Research in Business and Social Sciences*, *3*(8), pp. 443–452. https://doi.org/10.6007/ijarbss/v3-i8/169

Högselius, P., Kaijser, A., Van der Vleuten, E., and Schot, J., 2016. *Europe's infrastructure transition: Economy, war, nature*. Basingstoke: Palgrave Macmillan. https://doi.org/10.1007/978-1-137-31891-6.

Jalhoom, R.J.K., and Mahjoob, A.M.R., 2023. An extensive literature review on risk assessment models (techniques and methodology) for construction industry. *Journal of Engineering,* 29(08), pp. 76-93. https://doi.org/10.31026/j.eng.2023.08.06.

Jankowski, B., Prokocki, J., and Krzemiński, M., 2015. Functional assessment of BIM methodology based on implementation in design and construction company. *Procedia Engineering, 111(TFoCE)*, pp. 351–355. https://doi.org/10.1016/j.proeng.2015.07.100

Karunakaran, S., Ramli, M.Z., Malek, M.A., Musir, A.A., Imran, N.F., Fuad, N.F.S.M., Zawawi, M.H., and Zainal, M.Z., 2018, November. Causes of delay on highway construction project in Klang valley. In *AIP Conference Proceedings*, 2030(1). AIP Publishing. https://doi.org/10.1063/1.5066883

Koc, K., Gurgun, A.P., and Ozbek, M.E., 2020. Effects of geotechnical risks on cost and schedule in

infrastructure projects. *Proceedings of International Structural Engineering and Construction, 7(2), CON-18-1-CON-18-6*. https://doi.org/10.14455/ISEC.2020.7(2).CON-18

Larsen, J.K., Shen G.Q., Lindhard, S.M., and Brunoe, T.D., 2015. Factors affecting schedule delay, cost overrun, and quality level in public construction projects. *Journal of Management in Engineering,* 32(1), P. 04015032. https://doi.org/10.1061/(ASCE)ME.1943-5479.00003

Marwa, M., and Altaie, M.R., 2022. Use the risk score method to identify the qualitative risk analysis criteria in the tendering phase of construction projects. *Journal of Engineering*, 28(7), pp. 31-42. https://doi.org/10.31026/j.eng.2022.07.03

Matějka, P., and Tomek, A., 2017. Ontology of BIM in a construction project life cycle. *Procedia Engineering, 196(June),* pp. 1080–1087. https://doi.org/10.1016/j.proeng.2017.08.065

Mohamed A, Yusof, Z.M, Mohamed, S.F, Misnan, M.S., and Islam, R., 2017. A framework and evaluation technique for the viability of privatization road construction projects in Iraq. *International Journal of Engineering and Technology,* 9(6). https://doi.org/10.21817/ijet/2017/v9i6/170906027

Muturi, W., and Oguya, S.A., 2016. Factors affecting performance of road construction projects in arid and semi-arid areas in Kenya. *International Journal of Social Science and Information Technology*, *3*(8), pp. 908–929.

Nguyen, T., 2023. Land Tenure and land acquisition enforcement in Vietnam. *Journal of Management in Engineering,* 32(6), P. 05016020. http://dx.doi.org/10.1177/21582440231163102.

Nguyen, L.D., Ogunlana, S.O., and Lan, D.T.X., 2004. A study on project success factors in large construction projects in Vietnam. *Engineering, Construction and Architectural Management*, *11*(6), pp. 404–413. https://doi.org/10.1108/09699980410570166

Nusa, F.N.M., Endut, I.R., Takim, R., and Ishak, S.Z., 2015. Green road construction for Iraq: A literature review. *Journal of Civil Engineering and Architecture,* 9(1), pp. 64-71. https://doi.org/10.1063/5.0119338

Onyango, D.J., 2023. Project planning and success of road construction projects in Siaya County, Kenya. *International Journal of Management Studies and Social Science Research*, *05*(05), pp. 200–212. https://doi.org/10.56293/ijmsssr.2022.4717

Radzi, A.R., Bokhari, H.R., Rahman, R.A., and Ayer, S.K., 2019. Key attributes of change agents for successful technology adoptions in construction companies: A thematic analysis. Computing in civil engineering 2019: Data, sensing, and analytics - selected papers from the ASCE *International Conference on Computing in Civil Engineering* 2019, October, pp. 430–437. https://doi.org/10.1061/9780784482438.055

Rahman, R.A., Radzi, A.R., Saad, M.S.H., and Doh, S.I., 2020. Factors affecting the success of highway construction projects: The case of Malaysia. *IOP Conference Series: Materials Science and Engineering*, *712*(1). https://doi.org/10.1088/1757-899X/712/1/012030

Rahman, R.A., and Ayer, S.K., 2017. Prevalent issues in BIM-based construction projects. In *Proceedings of Joint Conference on Computing in Construction*, 1, pp. 645-652. https://doi.org/10.24928/jc3-2017/0051

Rashid, H.A.,2023. Empirical study for capturing and allocating significant risk factors in school construction projects in Iraq. *Journal of Engineering*, 29(12), pp. 81-103. https://doi.org/10.31026/j.eng.2023.12.06.

Rashid, A.A., Al-Dabbas, M.A., and Kadhim, W.H., 2016. Assessment of groundwater quality for drinking in Tuz Khurmatu area, Salahadden governorate – *Iraq. Iraqi Geological Journal*, 39–49(2), pp. 91–103. https://doi.org/10.46717/igj.39-49.2.7ms-2016-12-30

Saleh, F., Elhendawi, A., Darwish, A.S., and Farrell, P., 2024. An ICT-based framework for innovative integration between bim and lean practices obtaining smart sustainable cities. *Fusion: Practice and Applications*, 14(2), pp. 68–75. https://doi.org/10.54216/FPA.140205

Sinaga, A., and Maulana, D., 2022. Implementation of weighted product method for evaluating performance of technicians. *International Journal of Modern Education and Computer Science,* 14(4), pp. 30–42. https://doi.org/10.5815/ijmecs.2022.04.03

Sissakian, V.K., and Fayyadh, A.S., 2022. Geological hazards in Al-Anbar governorate, West Iraq. *IOP Conference Series: Earth and Environmental Science*, 1080(1). https://doi.org/10.1088/1755-1315/1080/1/012015

Sissakian, V.K., and Fouad, S.F., 2015. Geological map of Iraq, scale 1:1000000, 4th Edition, 2012. *Iraqi Bulletin of Geology and Mining*, 11, pp. 9-18. https://doi.org/10.4236/ijg.2023.145022

Vivek A., and Rao, H., 2022. Identification and analysis of risk factors affecting the cost of construction projects. *Materials Today Proceedings Journal,* 12 (2), pp. 127-138. https://doi.org/10.1016/j.matpr.2021.12.228.

Wanjira, K., and Ngari, D.C., 2018. Determinants of successful project management practices on performance of roads projects at Kenya National Highways Authority. *Journal of Entrepreneurship and Project Management*, *3*(1), pp. 1–25. https://doi.org/10.47941/jepm.251

العوامل المؤثرة على نجاح مشاريع انشاءالطرق: دراسة حالة العراق

المعتصم بالله ناصر سليمان *، كاظم رحيم رزيج

قسم الهندسة المدنية، كلية الهندسة، جامعة بغداد، بغداد، العراق

الخلاصة

نظرًا للدور الحاسم الذي تلعبه مشاريع البنى التحتية كالطرق في تنمية، الا ان تنفذها غالبًا ما ينطوي على مخاطر وتحديات كبيرة. لذلك، من الضروري تنفيذ مشاريع بناء الطرق بأسلوب يأخذ بنظر الاعتبار المعوقات التي من الممكن ان تصادف تنفيذ هكذا نوع من المشاريع. تم إجراء العديد من الأبحاث لاكتشاف العوامل الرئيسية التي تؤثر على مشاريع بناء الطرق من أجل تحسينها. من المؤسف أن هناك ندرة في البيانات المتعلقة بصناعة البناء العراقية. الهدف من هذا البحث هو جمع البيانات من الخبراء من أجل التأكد من العوامل التي تؤثر على معوقات تنفيذ اعمال مشاريع الطرق في العراق. تم العثور على سبعة عوامل مميزة تؤثر على تقدم مشاريع بناء الطرق في العراق. تشمل الاعتبارات إعداد موقع العمل والبنية الأساسية المنفذة والعقبات المتعلقة بالممتلكات المملوكة. هناك عدة أنواع من الصعوبات التي قد تنشأ في عملية التصميم الفني والإدارة والتمويل والأمن. يساهم هذا العمل في المعرفة الحالية من خلال تزويد الأكاديميين والخبراء بمجموعة إضافية من المتغيرات لفحصها عند محاولة التنبؤ بمعوقات تنفيذ مشاريع الطرق.

الكلمات المفتاحية: تأثير عوامل انشاء الطرق، معوقات تنفيذ اعمال الطرق، إدارة المشاريع.