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# CONTRACTOR'S PERSPECTIVE TOWARD CONSTRUCTION DELAY IN ROAD PROJECTS

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## **Abstract:**

Delay in the construction projects occurs when the project is unable to be completed on time. It is a common issue and considered one of the most recurrent problems in the construction industry. Therefore, the aim of this study is to improve construction delay in road projects. Three objectives have been formulated, namely, to identify the main causes that contributed to the construction delay in road projects, to determine the effects of the main causes of construction delay and to recommend solutions to improve construction delay in road projects. To achieve aim of this study, questionnaires have been distributed to G7 contractors in Kuala Lumpur who involved in road projects. The collected data were analysed in descriptive analysis by using Statistical Package for Social Science (SPSS). There are four factors that contributed to the main causes of construction delay namely contractor, client, consultant and external factor. The finding identified thirteen solutions to improve construction delay in road construction projects. This study reveals the most effective solutions agreed by the respondent are proper project planning and scheduling by the contractor while from client group the most effective way to improve delays are speed up progress payment. Most of the respondents agreed that frequent inspection by the consultant may reduce construction delay in road projects and from external group contractor need to speed up in submission of permits to the local authorities are the most appropriate way to minimise delay.

**Keywords:** *Delay, Project delays, Road construction projects, Contractor's perspective*

## **1.0 INTRODUCTION**

Roads plays an important role in a country's growth, as these infrastructures are suggested to have positive connections with economic activities by enabling rapid delivery of people and goods to meet regional demand (Rahman et al., 2020). Furthermore, compared to other construction projects road projects are often inevitably recognised as high-risk projects due to their importance to the economy of a nation's economic, social and political development. In the event of delays in road construction, a common challenge may trigger a slew of issues for not only road users, but also contractors, owners, consultant and the government (Cabahug et al., 2018) Moreover, their planning has affected, and they need to endure the cost overrun that will increase. Road construction projects, particularly those in the early stages are prone to delays. In fact, completing road construction projects on time is a major challenge for construction professionals.

### **1.1 Problem Statement**

Time and cost overruns are common problems in construction projects all over the world (Sweis et al., 2013). According to (Endut et al., 2009), it is a serious problem in the Malaysian construction industry. While it is an older concern, it still occurs in the construction sector. Typically, delays are caused by several causes and reasons that are beyond contractor's or the client's expectations. There is traffic restriction for heavy vehicles in the city of Kuala Lumpur, which will affect the on-site delivery period and may cause the overall schedule to be delayed. There are also unforeseeable events such as natural disasters which have led to the delay. Moreover, the implementation of the Movement Control Order in March 2020 which requires all construction to be stopped for a period of time. Besides, certain materials used in road construction projects differ from those used in construction building projects. Road projects are part of heavy construction activities, and since they require a high degree of mechanisation and a large volume of materials, failures and a lack of these resources can cause delays. Delay of construction completion in road projects are the main problems that result in failures to meet the region's development demands in general and the road infrastructure. End-users' dissatisfaction may result from unfulfilled demand.

### **1.2 Aim**

This study attempts to improve delay in road construction projects.

### **1.3 Research Objectives**

- i. To identify the main causes that contributed to the delay in road projects.
- ii. To determine the effects of the main causes of delay in road projects.
- iii. To recommend the solutions to improve construction delay in road projects.

### **1.4 Research Questions**

- i. What are the main causes that contributed to the delay in road projects?
- ii. What are the effects of the main cause that contributed to delay in road projects?
- iii. What are the solutions to improve construction delay in road projects?

## **2.0 LITERATURE REVIEW**

### **2.1 Main causes of delay in road construction projects**

#### *2.1.1 Causes of delay related to contractor.*

Financial factors are one of the most critical issues causing delays in construction projects (Alaghbari et al., 2007). According to (Ali et al., 2010) the financial state of a contractor can be really bad and adversely impact on the project which is due to many changes made by clients during construction and leads in an increase in construction cost. Inexperienced contractors are one of the factors that will cause havoc in the overrun of a construction project. Inexperienced contractors will confront adversity in understanding the complexity of the construction project. According to (M. Alzara et al., 2016), poor site management and supervision are considered as critical factors that could cause delays in the construction projects. Poor site investigations on road construction may confront difficulties during and after the project construction. Construction of road projects is very unique since the construction method is irreversible and any wrong procedures would require rework from the beginning such as milling and paving. Moreover, (A. H. Memon, I. A. Rahman, M. Akram, 2014) noted that ineffective planning and scheduling are typical delay risks for highway and road construction projects that have frequently occurred in construction projects. Besides, consistent material supplies are crucial to the success of every project. According to (Rahman et al., 2020) materials shall be instant during road construction. Besides, highway projects are suggested to face difficulties in having those materials right on time due to several reasons including absence of the required materials in local markets.

#### *2.1.2 Causes of delay related to client.*

Late in honouring budget are one of the most vital causes of leads to project delay. According to (Gebrehiwet and Luo, 2017) clients need to release payment on time unless the contractors impairs ability to finance the work. According to (Sambasivan, M., and Yau, W.S., 2007) noted that poor decision making by the client are one of the major causes of delay in construction projects in Malaysia. The most important causes were delays in decision making and approval by the owner, difficulties in obtaining permit work. Besides, (Jeffrey et al., 2017) mentioned that, main factors that cause rework are redesign arising from inadequate client's brief. Any changes made by the client during construction period would have an impact on the construction period. During construction, the client may face financial problems arising from unexpected emergencies or financial mismanagement and global financial crises which refer to a condition in which a client is unable to meet, or has difficulty paying off its financial obligations to the contractors involved in the project.

#### *2.1.3 Causes of delay related to consultant.*

The main delay factor caused by the consultant is the inability of effectively manage and prepare the contract document including bill of quantity and the approved drawings which give rise to a large margin of errors and omission in quantity (Ataout 2016). Moreover, the factor contributed to the projects delay are caused by the consultant who delaying the progress of inspection during work operations. Therefore, if consultant did not perform an inspection, contractor may not follow the specifications and this will lead to rework for the project. (Ataout 2016)

#### *2.1.4 Causes of delay related to external factor.*

Weather is one of the major problems of delay in many construction projects especially in road projects and highway (Honrao and Desai, 2015). In Kenya, (Atibu Seboru, 2015) found that the existence of underground utilities was a critical factor affecting the duration of the project. The route along the highway construction project would have hidden sources that requiring relocation and would result in extra time. Land acquisition is the most frequent and serious cause of delay that affecting the projects in Mecca. Land acquisition issues have made a significant contribution to the timely achievement of road construction projects (G.Saad et al., 2016). According to (Aziz and Abdel-Hakam, 2016) site accessibility considered as an obvious problem which leads to project delay. Delivery of heavy machinery requires a large area for long trailers to access the site in and out, but due to limited space, the delivery process will be delayed. The quality of materials may delay their usage on site if the materials does not meet the standard. Construction material such as asphalt that used in road projects could not be stored before the construction starts, as asphalt is quite sensitive to the temperature. Moreover, equipment and machinery are important elements in the road construction projects, as poor handling of machinery will result in a failure of the machinery, thus will extend the duration of the project.

### **2.2 Effects of the main causes of delay in road construction projects**

Time overrun can be categorised as delaying the project due to the expected and unexpected causes. Meanwhile, a project experiences schedule overrun if the stipulated completion time is exceeded (Sunjka and Jacob, 2013). Contractor experience financial difficulties as they involve additional administrative costs, including administrative management, the extension of the period of use or on-site rental of equipment and the extension of the source of labour services (Kamanga and Steyn, 2013). In fact, contractors also need to add some more cash flow to ensure that the new work schedule can be implemented over the completed period of time. The parties involved, such as clients, contractors and consultants, risk their public reputation when the project is delayed which leads to bad reputation especially for the contractor who cannot complete the awarded project on the right schedule. Delay in road construction leads to disruption of traffic movement which closes main roads for development and construction (Honrao and Desai, 2015). At the point when delay occurs, it creates a caustic situation between the owner and the contractor, such as dispute, ligation, arbitration, and sometimes the complete abandonment of the project (Islam and Trigunarsyah, 2017). Labour productivity and efficiency will be affected if the projects were subjected to delay. When the rework occurs as a result of construction errors, the workload of the workers would increase and could indirectly influence their efficiency and productivity (Bramble and Callhan, 2000).

### **2.2 Solutions to improves delay in road construction projects**

#### *2.3.1 By Contractor.*

Proper project planning and the scheduling are the keys to efficient time management. An effective planning phase must be planned in detail and carefully, as losses in the construction project can be avoided (C. Kaliba et al. 2009). Another solution to prevent project delay is to ensure timely delivery of materials equipment and the effective strategic planning (Mohamed, 2015). Moreover, to improve delay in road construction contractors need to improve site management and supervision to reach completion of work within the specific time. (Ghulam et al, 2012)

#### *2.3.2 By Client.*

The clients should take a quick and prompt decision on the execution of the construction (R. F. Aziz, 2013). Client needs to conduct a meeting or follow up visit to the contractors and consultants to update with their current work progress. Frequent meetings with management to supervise construction activities on site may help to speed up the construction project. Delay can be minimised through timely payment to the contractor. Payment should be paid for ongoing and completed works being carried out according to the contract (El-rasas, 2014). Proper communication and coordination between main parties (client, contractor, and consultant) need to be built and well established. Clear information and communication channels are effective methods to avoid delays (Kang Sik Wei, 2010). Other than that, appoint contractors that have a good history of timely completion of projects (Sohu and Chandio, 2019). In order to minimize delay, clients need to appoint experienced consultants as consultants with reliable experience may avoid any rework later.

**2.3.3 By Consultant.**

The on-site inspection by the consultant may maintain and increase the progress of the work, as well as minimise delays in construction. Inception is necessarily activated by the consultant to verify the quality of the construction project (M. Gunduz et al., 2012). Another way that has been identified to improves construction delay in road project are accurate initial cost estimate and initial time estimates by the consultant (Mohamed, 2015). Besides, build up the knowledge and skill of technical staff is one of the effective ways to prevent delay which with the qualified technical staff to manage the project in a proper way, they will be able to overcome the problem occurs before proceed to another work (Ghulam et al, 2012).

**2.3.4 By External.**

Parties involved should make sure that project is complying with local authorities’ development plan. Other than that, they need to make sure that they submit all required documents to local authority on time to ensure the project will run smoothly without any error later. (Sohu and Chandio, 2019). In acquiring land for road projects, a qualified external consultant can be hired to provide a fair assessment of the land value of the affected community.

**3.0 METHODOLOGY**

This study adopted quantitative method and convenient sampling. Kuala Lumpur is the place where the questionnaires were distributed. It is a developed area with the high chance in gaining the data. The population of contractor G7 in Kuala Lumpur that involves in road construction are 601. According to (Krejcie and Morgan, 1970), the sample size for the population of 601 is 234. However, according to (Nulty, 2008) the acceptable online respond rate is 20% which means that in order to reach adequate data collection, the research must reach the minimum of 20% of respond rate. Therefore, this research minimum of 20% respond rate is compulsory to reach adequate data collection as in Table 1.

**Table 1:** Population and sample size of this research

<b>Sample size</b>	<b>Percentage</b>	<b>Expected return</b>	<b>Respondents return for this research</b>
234	20%	47	60

**4.0 FINDINGS**

**4.1 Main causes that contributed to the construction delay in road projects**

Table 2 depicts the top three (3) causes by each groups which categorized into four (4) major groups namely by contractor, client, consultant and external factor. From the data, it can be inferred that equipment failure in road construction project is at the highest rank which this causes are the main contributor to construction road delay. Then followed by poor site management by contractor group and bad weather conditions from external factor group. Inadequate consultant’s experience and delay in performing inspection was rate as the least causes contributed to construction delay in road projects.

**Table 2:** Ranking of the main causes of delay

<b>Causes of delay</b>	<b>Category</b>	<b>Rank</b>
Equipment failure	External factor	1
Poor site management	Contractor	2
Bad weather conditions	External factor	3
Inadequate contractor’s experience	Contractor	4
Shortage of material	Contractor	5
Financial difficulties	Client	6
Slow in decision making	Client	7
Slow permits by local authorities	External factor	8
Delay in honouring payment	Client	9
Inadequate consultant’s experience	Consultant	10
Delay in performing inspection	Consultant	11

**4.2 Effects of main causes that contribute to the construction delay in road projects**

As the result from the study, there are six (6) effects that were identified, which consists of time overrun, cost overrun, bad reputation/performance, disruption in traffic movement, dispute between parties and low productivity by labourers. In general, most of the respondent agreed that the effects of delay in road construction projects are cost overrun which the cost will be more than the estimated cost of the project. Generally, this excess cost is an inconvenience to the parties involved for instance the contractor need to pay extra cost for overhead, labours and machinery. In fact, contractors also have to append some more cash flow to ensure that the new work schedule can be implemented over the completed timeframe (Kamanga and Steyn, 2013)

**4.3 Solutions to improves construction delay in road projects**

Table 3 represents the top three (3) solutions by each groups which categorized into four (4) major groups namely by contractor, client, consultant and external factor. From the data, it can be inferred that top three (3) solutions to improves delay are from contractor group which includes proper project planning and scheduling, assuring the availability of materials and improve site management. Accurate initial cost and time estimate by consultant rank as the least solutions to improves construction delay in road projects.

**Table 3:** Ranking of solutions to improves construction in road delay

<b>Solutions to improves delay</b>	<b>Category</b>	<b>Rank</b>
Proper project planning and scheduling	Contractor	1
Assuring the availability of materials	Contractor	2
Improve site management	Contractor	3
Speed up progress payment	Client	4
Frequent inspection	Consultant	5
Build up expertise	Consultant	6
Submission of permit to local authorities	External factor	7
Granting contracts to the right contractor	Client	8
Allocated contingencies	External factor	9
Speed up reviewing design and approving design	Client	10
Accurate initial cost and time estimate	Consultant	11

**5.0 CONCLUSION**

Delays in construction projects, as well as their impact on time, cost and quality are often obstacles to project success. There are eleven causes in contributing to construction road delay as showed in Table 2. The first rank main causes contributed to the construction delay in road projects are equipment failure from external factor group. In the construction of roads, it involves with many machinery and equipment. In this cases, where machinery and equipment are faulty, progress of the project has to be temporarily stopped while awaiting the

arrival of another machinery. As the result from the findings, most significant effects that contributes to the construction delay in road projects are cost overruns. The cost overrun will be more than the estimated cost of the project. This excess cost is an inconvenience to the parties involved in the construction project. As well as that, delay causes cost overrun because time is money. The contractor will pay more cost for overhead, labours and machineries. There are eleven solutions to improve construction in road delay as stated in Table 3. Proper project planning by contractor is the most effective way to improves construction delay in road project. Proper planning is important for the construction project to be pre-planned and scheduled from the start phase and strictly followed by the construction parties in order to avoid delays in the project.

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