

University of Bahrain

College of Engineering



**Department of
Mechanical Engineering**

**An Investigation on the causes of delays
with the Planning Permission Processes in
Road Projects in the Kingdom of Bahrain**

**Research Proposal submitted in partial fulfillment of the requirements
for the degree of M.A in Engineering Management**

Prepared by:

Jaafar Mohammed Mohsen Abdulla Ebrahim

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Supervised By:

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University of Bahrain

Kingdom of Bahrain

June 2022

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Thesis Discussion Committee Decision

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The student awarded grade **A-** In the thesis subject

☐ Without making any changes to the thesis

☒ After making the modifications attached with this decision

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ABSTRACT

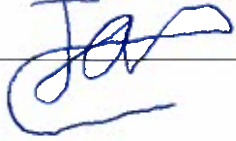
Planning Permission (PP) Processes is a system of seeking requests of permit approvals from the local authorities (stakeholders) during the planning stage of projects. This is done to avoid any delays of coordination or conflicts which might happen with other authorities during the implementation stage of projects and incorporate all of the government's future project requirements which will be executed on the same location in the future. Based on PP statistical data, it has been noticed that 59% of the PPs have been pending for more than 300 days and only 10% pending for less than 50 days. This means there are high delays on this system and is considered as one of the most common problems causing delays in project planning stages. This study attempts to investigate the factors that are causing the delays in the PP processes in roads projects in the Kingdom of Bahrain about processing planning applications by the Roads Affair to obtain approvals from the local authorities and the consultants. The study will help improve the understanding of these factors and their impact on road projects. In order to achieve the aim of the research, a literature review was conducted to identify the initial contributing factors that cause those delays in the PP. Subsequently, a qualitative technique was adopted by conducting eight interviews with experts to finalize the initial list (semi-final) of these factors. Finally, a questionnaire based on the semi-final factors list was used across some local authority organizations and engineering consultants in Bahrain. A total of a hundred and one (101) questionnaires were distributed. Eighty-Four (84) responses were received, which gave an answer response rate of 83.2%. One-Sample T-Test and Bivariate Analysis were used as statistical tools to analyse the comprised descriptive statistics. The survey results have found that the most important factors that cause delays in the PP processes are the prolonged time to reach an agreement on stakeholders' assets relocation and protection, insufficient Right of Way (ROW) to accommodate all the stakeholders' requirements and needs, the time required to investigate the existing utilities (trial holes, etc.) and, non-existence of enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers. All these caused high effects on the efficiency, functionality, and economics of the projects. Based on the survey's responses, the study provided several recommendations that suggests some solutions which may help the local authorities to improve the PP system with a proposed new timeframe (model) to complete the processes on the stipulated timeline.

DEDICATION PAGE

Name of Student: Jaafar Mohamed Mohsen Abdulla Ebrahim

ID No.: 20081635

I hereby declare that this project paper is the result of my own work, except for quotations and summaries, which have been duly acknowledged.

Student Signature:  Date: 25/06/2022

LIST OF ABBREVIATIONS

PP	- Planning Permission
CPO	- Central Planning Office
BRDM	- Bahrain Roads Design Manual
HOAI.	- Official Scale of Fees and Services for Architect and Engineering
MOW	Ministry of Works
RPDD	Road Planning & Design Directorate
RPMD	- Road Projects and Maintenance Directorate
SAN	- Sanitary Engineering Planning & Design Directorate,
EWA	- Electricity and Water Authority
PSDE	- Planning & Studies Directorate Electricity
PSDW	- Planning & Studies Directorate Water
WDD	- Water Distribution Directorate
DPS	- Damage Prevention Section
EDD	- Electricity Distribution Directorate
TRA	- Telecom Regulatory Authority
NOGA	- National Oil and Gas Authority
SLRB	- Survey & Land Registration Bureau
MoH	- Ministry of Housing
AGA	- Agricultural Engineering Affairs
GDUP	- General Directorate of Urban Planning
MTT	- Ministry of Transportation & Communications
BACA	- Bahrain Authority for Culture and Antiquities
SCE	- Supreme Council for Environment
BDF	- Bahrain Defense Force
MOICSIC	- Ministry of Industrial
ROW	Right of way

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CHAPTER 1: INTRODUCTION

1.1 Introduction:

Today, while the world witnesses enormous developments in various sector, the construction sector is one of the most important. It signifies a developed country that necessitates a modern life that reflects sophistication.

Indeed, in the Kingdom of Bahrain, the construction industry has vastly progressed in last few years. According to the statement made by the Crown Prince of Saudi Arabia Prince Mohamed Bin Salam during the 2018 Future Investment Initiative, Bahrain will witness a huge number of construction projects in next five years particularly in the building construction and roads infrastructure projects.

Reflecting from this statement, a success of any project starts from the preparation of a good plan. For that reason, focusing on the planning stage is crucial to ensure the success during the execution stage. Detailed planning exercises will ensure all requirements and expectations are covered that will reflect positively in the execution stage.

However, in road infrastructure projects in the Kingdom of Bahrain, the delay during the planning stage of have indeed becomes a common issue, as most design did not finish according to the proposed schedule.

Utility coordination or local authorities' permit approval is usually cited as one of the main causes of delaying the planning stage. In these processes, a project's client or who represents them (consultant) contacts the local authorities to seek their permit approval from the planning stage, which then helps to avoid any delays of coordination or conflict with the

other authorities during the execution stage and incorporates all the government's future proposals at same project's location. This system is called the Planning Permission (PP).

The PP system is the only official communication channel to contact and request for the local authorities' approval permits to start working on a site. All approvals, even when received from one of the authorities through an official letter, must be reflected in the PP. In other words, the PP processes cover the utility coordination and permit approvals from all local authorities (stakeholders).

These processes were initiated and driven by the original Team Bahrain, where the approach, adopted in the 1980s, refined over the years into a world standard for planning and design integration to collaborate between partners (concerned Stakeholders) equally. The processes and procedures of the PP is handled and controlled by the government and represented by the Central Planning Office (CPO) in the Ministry of Works (MOW).

There are several contributing factors that cause the delay in the PP processes. This research will investigate the cause of delays in the Planning Permission Processes in Road Infrastructure Projects in the Kingdom of Bahrain and recommends improvement to the current processes.

1.2 Background of Planning Permission Processes

1.2.1 Definition of “Planning Permission”

The Planning Permission is a procedure used in the Kingdom of Bahrain to deal with and coordinate the planning and design of major infrastructure projects with other local authorities and stakeholders. It is the only official communication channel to contact and request the local authorities’ permit to commence site execution. Even when the approval is received from one of the authorities through an official letter, it must be reflected on the PP. The PP processes cover utility coordination and permit approval from the local authorities (stakeholders).

These procedures were initiated and driven by the original Team Bahrain approach adopted in the 1980s and refined over the years into a world standard approach for planning and designing integration to collaborate between partners (concerned Stakeholders) equally. The entire processes and procedures of the PP’s, is handled and controlled by the government, represented by the Central Planning Office (CPO) in the Ministry of Works, Municipalities Affairs and Urban Planning.

1.2.2 Benefits of Planning Permission:

In Bahrain, there are two ways to request for the local authorities’ approval before commencing work on a site. The first, is the planning permission, and as stated above, applied during the design and planning stage. The second, is Wayleave; which is applied after the design is complete, right before execution.

When the PP is granted, the Wayleave clearance will be smooth and fast, as all the required coordination approval was granted during the planning stage. However, if the approval is not granted, the wayleave clearance will

take more time and delays sets in.

An approved planning permission added value to the projects, where it shares validations of a proposed project, provides the platform and the data for the space allocation. All conflicts, whether in technical, financial and time becomes visible to other stakeholders. For that reason, most of the authorities do not start work on-site before obtaining approval.

During the PP application, the stakeholders discuss their plan on a project location and agree on the location of the corridor and requirements for each stakeholder. For example, if there is a new development, the issuing stakeholder for the PP should consider other stakeholders' requirements in their design. An example is shown in Figure (1) below about considering other local authorities' requirements on road cross-section.

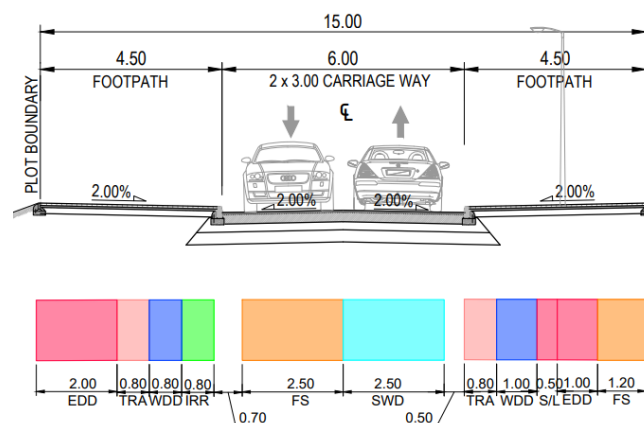


Figure (1) Typical Road Cross Section (BRDM 2018)

Note. Reprinted from “Bahrain Road Design Manual”, by Government of the Kingdom of Bahrain, 2018, P. 15, Bahrain: Ministry of Works.

Another example would be, if there is a widening of an existing road that will affect some existing utilities. This should be agreed on the method of protecting or diverting the affected services and reaching the final agreement during the PP application processes. This agreement will then be implemented during construction.

As the coordination and approval from local authorities is done during the planning stage, that will accelerate the task of utility coordination during the construction stage. Subsequently with this approval, it will not impact the project's schedule, and more importantly, will save time and money for all affected parties. Some previous studies about delays during construction due to utility coordination will be shown in the next sections.

1.2.3 Time for Planning Permission

Planning permission is applied during the planning stage and before going to construction on site. There are several phases in the pre-construction stage and the PP is one of these phases.

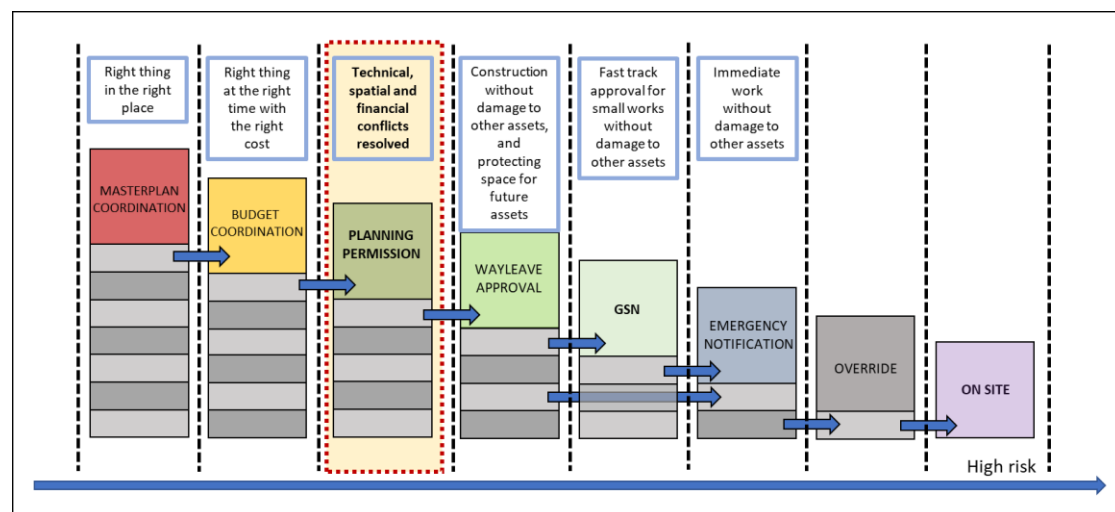


Figure (2) Typical Phases in the Pre-construction Stage (CPO Adoption Manual)

To be more specific about the time for applying for the PP, in Bahrain, the phases of the planning step are assigned based on the Official Scale of Fee and Services for Architect and Engineering (HOAI). It can be noted that in the Figure (3) the PP application is done after determining and agreeing on a project design (Sözüer et al, 2014).

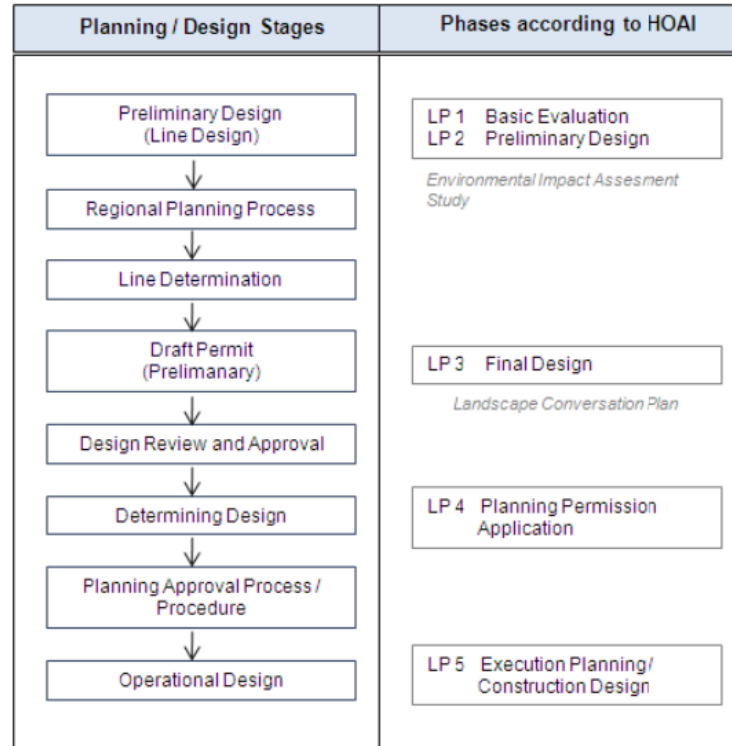


Figure (3) Typical Phases for Pre-construction Stage Based on HOAI

Note. Reprinted from “The importance of project management in the planning process of transport infrastructure projects in Germany”, by Sözüer, M. & Spang, K., (2014). Retrieved from Procedia-Social and Behavioral Sciences

1.2.4 How to apply for the Planning Permission:

In the past, any authority that wants to issue a PP should send a request to the CPO with the project’s design drawings as a hardcopy (A1 and A3) and a softcopy. The CPO will then distribute those drawings to all the stakeholders affected in the project’s area, collect their responses and forward to the PP’s applicant. All submissions were done physically.

However, in 2018, a new electronic system was created, called “Tasareeh”. All planning applications must use Tasareeh System and upload all the required documents. The idea of this system is to reduce the cost and time for printing and transportation.

Tasareeh is an electronic portal available to any stakeholder involved in the development of large and/or complex infrastructural projects within the Kingdom of Bahrain.

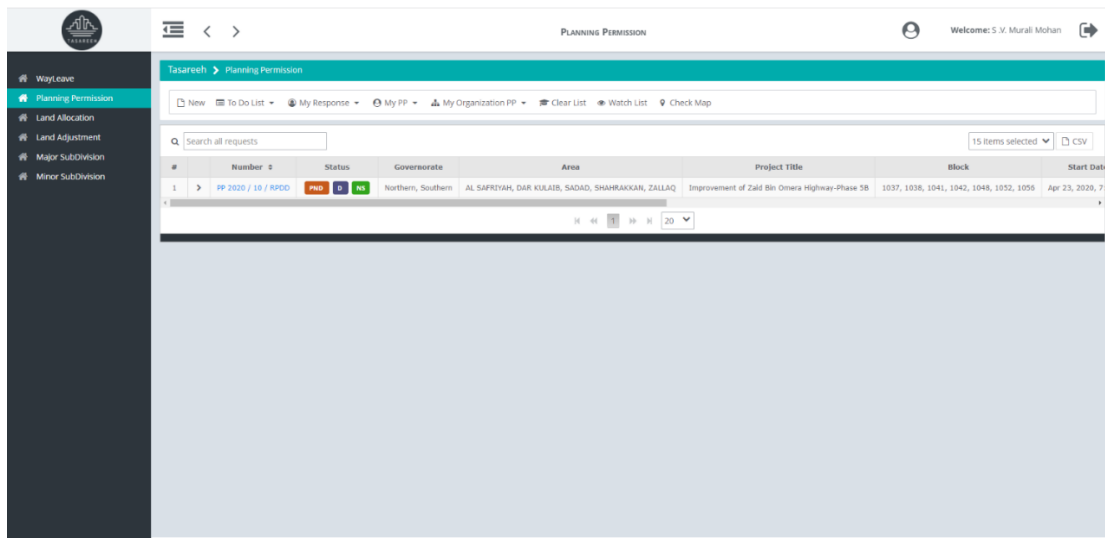


Figure (4) Home Page for Tasareeh Website

All planning applications documents uploaded electronically onto the system are traceable. This includes those of already obtained full Planning Permission, except for internal entries made by single stakeholders.

By using the Tasareeh System, printing is no longer required. All submissions are in softcopy for the affected stakeholders to review and give their feedback. Therefore, any stakeholder who wants to upload a new PP application through Tasareeh, should attach all the required information, such as plans, maps, data and charts to facilitate the approval PP process by all the stakeholders involved.

1.2.5 Planning Permission Procedure

The current planning permission application procedure is divided into three stages, the Figure (5) presents these stages:

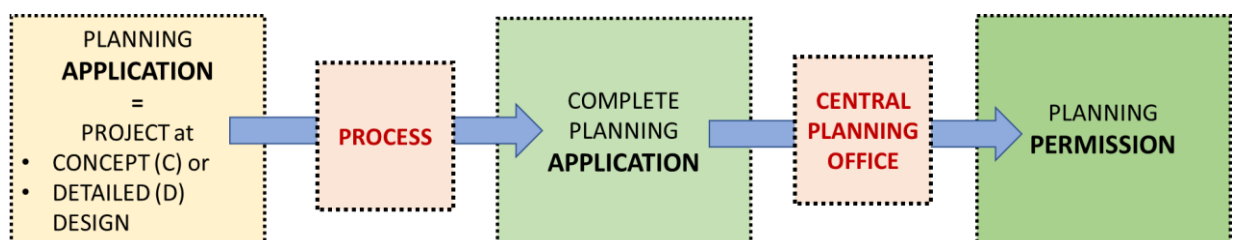


Figure (5) Planning Permission Stages (CPO Adoption Manual)

These three stages are carried out by three main stakeholders, which are:

1- Issuing Stakeholder (Planning Application):

This first stakeholder can be any public or private entity pursuing and developing the design of a complex technical and infrastructural project. In this research, the issuing stakeholder is the ***Ministry of Works, Road Affairs, Road Planning & Design Directorate (RPDD) or RPDD consultant's*** as we will focus on the delays of the PP of a road infrastructure project.

For the PP application, RPDD is responsible for the following tasks:

- *First stage:* collecting all the project's required documents (drawings, documents, etc.) to initiate the PP procedure by uploading the project documents in Tasareeh system.
- *Second Stage:* ensure all the stakeholders are actively engaged in the process & providing response to the inquiries from affected stakeholders to collect all approvals.
- *Third Stage:* seeking final approval from the CPO.

2- Responding Stakeholder:

The second stakeholder can be any private and public entity involved in a project by the RPDD (Issuing/applicant Stakeholder). The list of responders are divided into two lists, fixed and variable. The fixed list includes the following stakeholders:

- | | |
|---|--|
| • Sanitary Engineering Planning & Design Directorate, (SEPPD) | • Electricity Distribution Directorate (EDD) & Street Lighting (S/L) |
| • EWA Planning & Studies Directorate Electricity (PSDE) | • Telecom Regulatory Authority (TRA) |
| • EWA Planning & Studies | • National Oil and Gas |

Directorate Water (PSDW)	Authority (NOGA)
• Water Distribution Directorate (WDD) • Survey Directorate, SLRB • Damage Prevention Section (DPS), EWA • Agricultural Engineering & Water Resources Directorate • Bahrain Authority for Culture and Antiquities (BACA) • Supreme Council for Environment (SCE)	• Road Projects and Maintenance Directorate (RPMD) • Ministry of Housing (MoH) • General Directorate of Urban Planning (GDUP) • Ministry of Transportation & Communications (MTT) • Ministry of Industrial (MOICSIC) • Bahrain Defence Force (BDF)

The above stakeholders are included in all the PPs issued by RPDD. All have access to Tasareeh. During the planning stage, only the Municipalities Affairs as one of the stakeholders, is not required to provide any comments; receiving the PP only for their information.

However, when the PP is granted, and the project moves to the construction stage, Municipalities Affairs' approval is required. This is then applied by the contractor before commencing work on the site. Municipalities Affairs' approval is not part of the PP.

The stakeholder list differs according to a project location, if the project is near that authority, CPO will then inform and engage the relevant stakeholders in the PP process. For example, if there is a project near Bahrain Airport, Civil Aviation (as a relevant stakeholder) will be engaged in the process as it may be affected by that project.

In this research, this list will not cover Civil Aviation as their involvement is minimum with less than two PP application every year.

Usually, the affected stakeholders are responsible for the following tasks:

- **First stage:** receive all the project documents and information provided by the issuing stakeholder via Tasareeh.
- **Second Stage:** review all the documents to approve or sending response requiring further information or clarifications. When all requirements are met, the PP is approved the project via Tasareeh (within their competence area).

3- Central Planning Office:

The last stakeholder is the CPO, which may act either as an Issuing Stakeholder (on behalf of the government and non-governmental stakeholders not connected to the Tasareeh System).

CPO will act as a Responding Stakeholder to provide MOW with a final approval of the Planning Application and provide support to acquire responses from Responding Stakeholders.

The CPO is responsible of the following tasks:

- **First stage:** receives an approval request from the Issuing Stakeholder and issues the Planning Application.
- **Second Stage:** review all the material to approve or require further information or clarifications. when all the requirements are met, approve the project via Tasareeh (within their competence area). Moreover, CPO will engage

the various stakeholders based on a project location and provide all the required data in coordination with the issuing stakeholder (RPDD).

- **Third Stage:** issue approval for the PP.

1.2.6 Terminology used in the Tasareeh system:

Figure (6) presents the current terminology used in the Tasareeh:

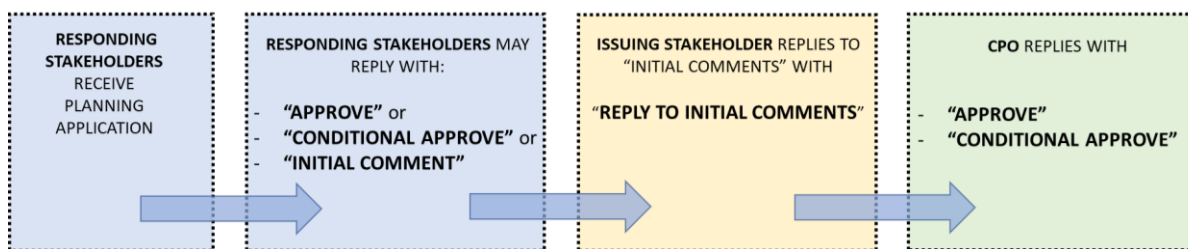


Figure (6) Tasareeh System Terminology (CPO Adoption Manual)

1.2.7 Delays on Planning Permission:

The statistics and analysis data from “Tasareeh “from 9 April 2018 to August 2021 show that 354 PPs were applied. The most stakeholders issuing PPs are SAN, PSDE and RPDD with 111, 76 and 72 PP submissions respectively. Figure (7) below presents more detailed of the number of PP submissions for each authority.

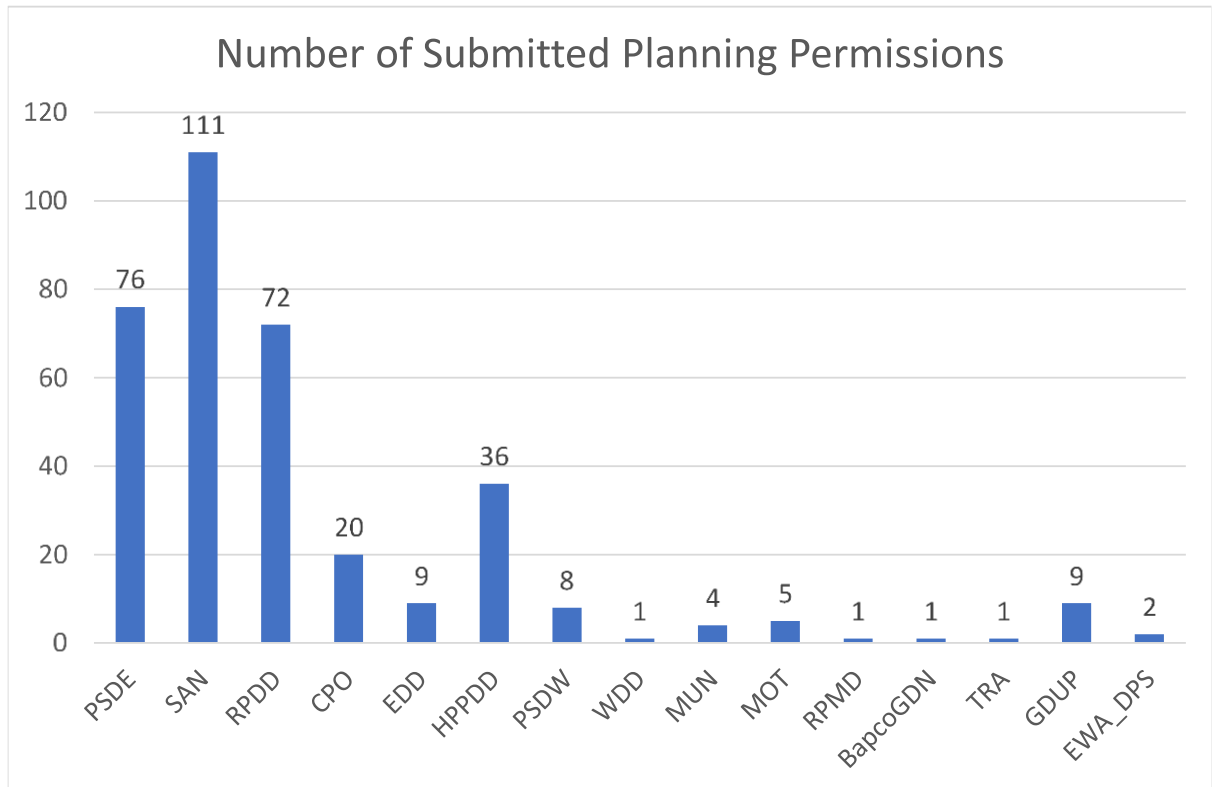


Figure (7) Number of Issued Planning Permission from April 2018 to August 2021

Of the total PPs submitted, only 14% are granted and 67% are pending. The allocated time for the CPO to finalise the PP processes is 10 weeks. However, the historical data shows that 59% of the PPs have been pending for more than 300 days and only 10% pending for less than 50 days. Figure 8 and Figure 9 present self-explanatory statistics.

From these statistics, it is clear that there are huge delays in the processes of the PP as the contributing factor(s) that cause the project's delay. These factors are discussed in detail in the following sections.

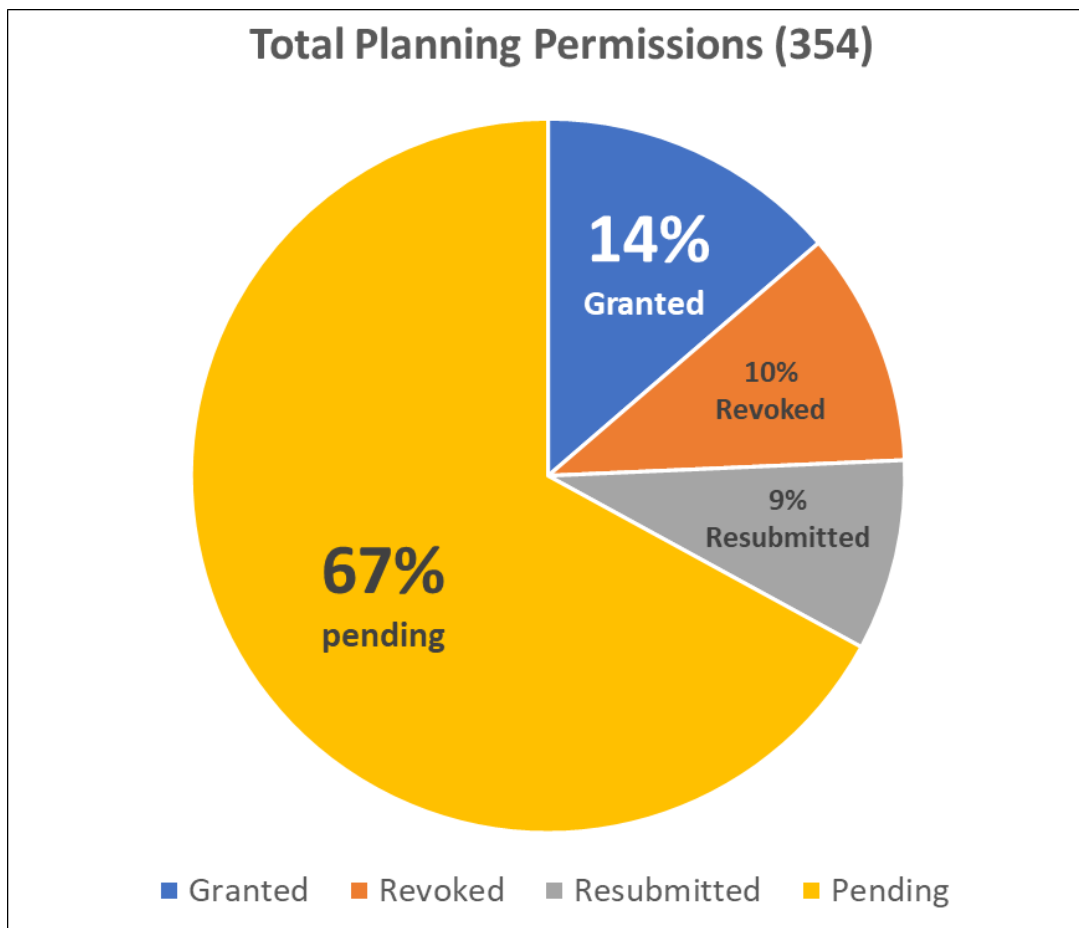


Figure (8) Status of Issued Planning Permission

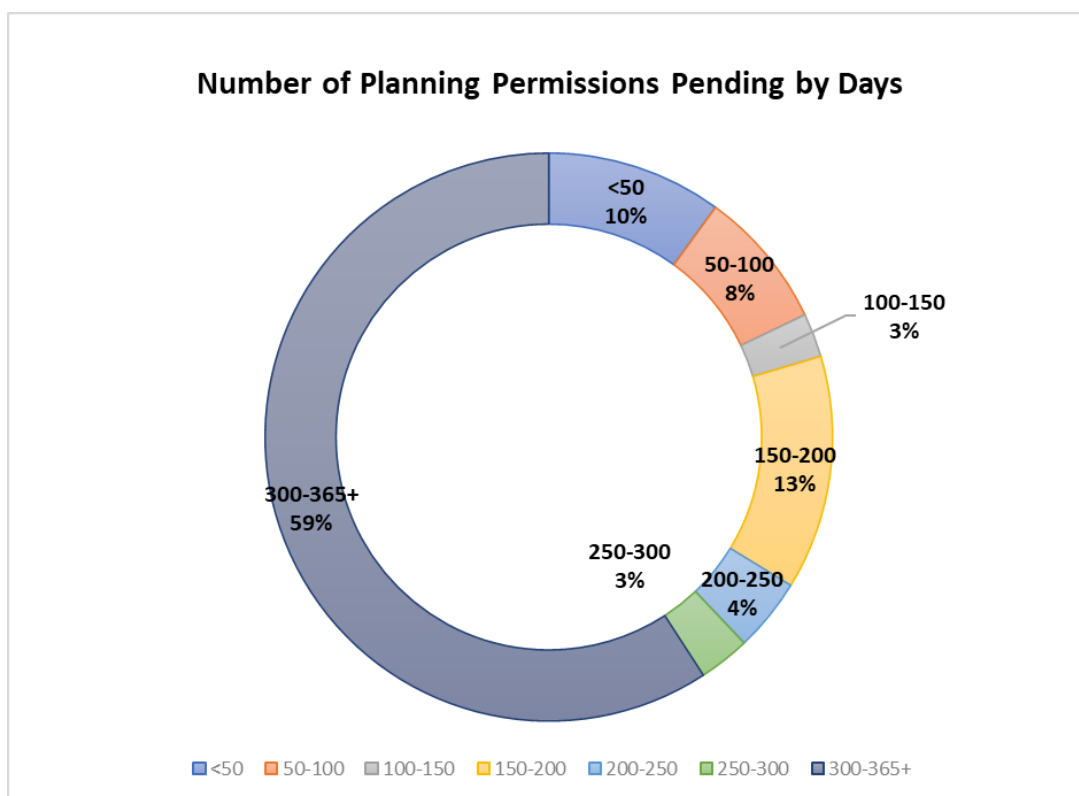


Figure (9) Number of Planning Permissions Pending by Days

1.3 Research Problem Statement:

The infrastructure industry players in the Kingdom of Bahrain foresee difficulties with the process of issuing the planning permission approvals by the local authorities. Some of these difficulties cited are related to the issue of planning permission applications, staff, the masterplans and application processes.

The statistics in the above shown that there are big delays in the PP processes, where 59% of the PPs have been pending for more than 300 days and only 10% pending for less than 50 days. This means that it is a very long period to get approvals, and in some projects, it exceeds the duration of the project's execution.

Thus, delays occur mainly due to several contributing factors, that will be investigated in this research.

1.4 Research Questions:

This research will focus on finding the answers to the following questions:

1. What are the current PP processes and the procedures used in the Kingdom of Bahrain? Are there delays in these processes?
2. What are the contributing factors that cause delays in the planning permission processes and what are the ranking of these factors?
3. What is the level of effect of the PP processes' to the delays on the projects' development and the PP system in terms of efficiency, functionality, and economics?
4. What are the recommended planning permission practices that could overcome the delays in the PP processes in road projects in the Kingdom of Bahrain?

1.5 Research Hypothesis:

This research aimed to prove the following hypothesis:

Ho. “The investigated contributing factors do not cause delays to the Planning Permission Processes”.

1.6 Project Objectives:

The objectives of the research are the following:

1. Evaluate current PP processes and the procedures used in the Kingdom of Bahrain and confirm if there is delay or not.
2. To identify factors that have an impact on the progress of the planning permission approval processes starting from the initiation stage to the final approval and, determine the most frequent cause of delays in the Bahraini planning permission processes.
3. To evaluate the effect of these delays in terms of efficiency, functionality, and economics of roads infrastructure projects.
4. To generate recommendations to help the various parties (i.e., clients and consultants) to manage, mitigate and prevent the reoccurrence of delays in the Planning Permission Processes.

1.7 Significance of the Study:

This research contributes to a great service improvements to the ministries and government agencies to help understand and measure the delays by identifying the delay factors and provide recommendations and a proposed model to improve the whole PP process.

The result of the study will provide information that will benefit the PP

processes, and consequently, will save a lot of time and costs for the Government in a long run. It will also contribute to finalizing the planning stage faster by resolving all the utility coordination issues before proceeding to the implementation (construction) stage.

1.8 Research Methodology:

The procedures in the studies of Yang et al. (2009) was followed in this research. The methodology of this study is based on the following:

- 1- **Literature review:** the initial contributing factors that cause the delays on the PP will be identified from previous studies.
- 2- **Expert Interview:** the initial contributing factors will need to be confirmed by an expert's judgment before being incorporated into a questionnaire survey. Based on their opinion and outcomes from these interviews, the final contributing factors that cause the delays in the PP will be identified and the first version of the questionnaire survey will be created.
- 3- **Pilot Study:** a pilot study will be conducted to examine the suitability, feasibility, and comprehensibility of the questionnaire before issuing the questionnaire. The outcome will be the final version of the questionnaire survey.
- 4- **Questionnaire survey and data analysis:** prioritize and group factors that have an impact on the progress of the Planning Permission Processes and rank them based on the questionnaire's results.

Figure 10 shows the research framework of this study.

Details about the research design, population of the study, samples of the study, instrumentation, data collection procedures and data analysis adopted methods will be provided in chapter 3.

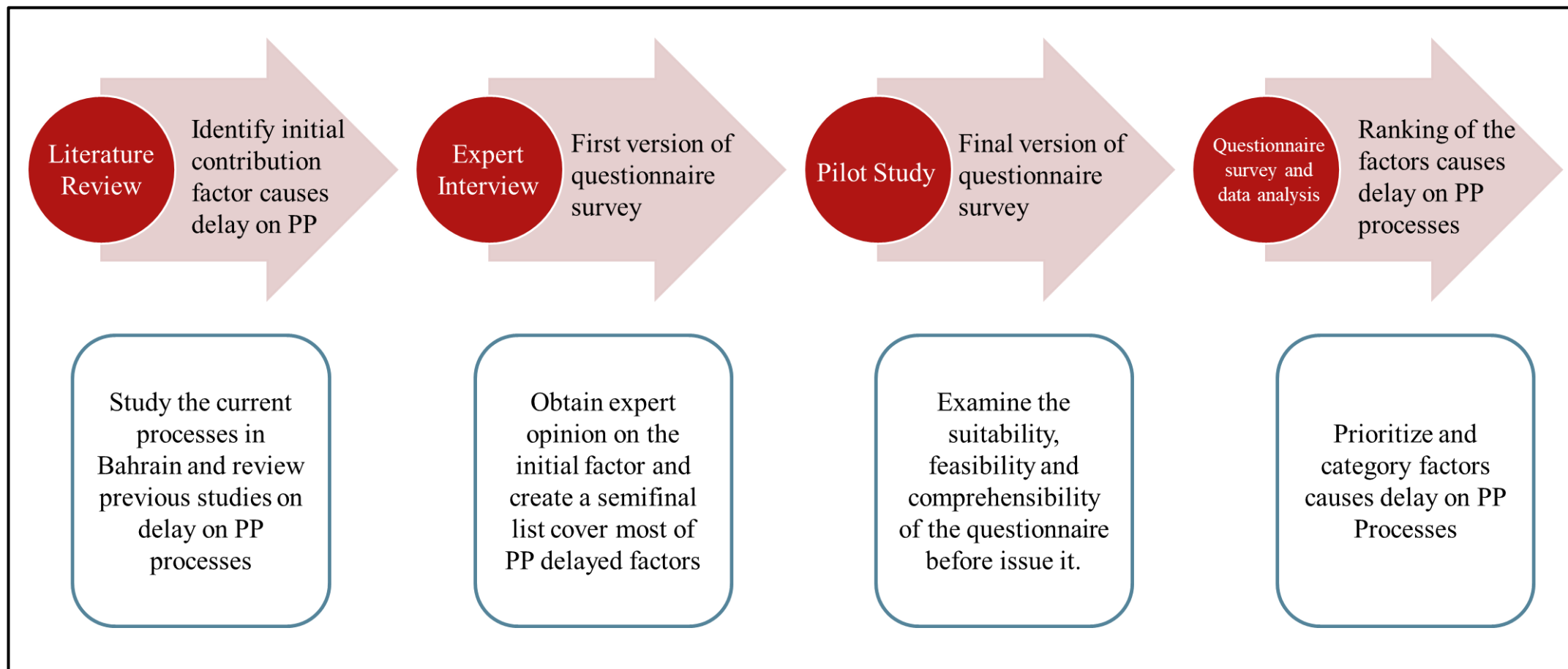


Figure (10) Research Framework

1.9 Organization of the Study:

There is six (6) chapters for this research:

Chapter 1: Introduction:

This chapter presents the background about the current planning permission procedures, research problem statement, research questions, research aims, project objectives, significance of the study and research methodology.

Chapter 2: Literature Review:

In this chapter the researcher will go through previous the studies and the status of their research and start from that point. The literature review will present the initial contributing factors from previous studies.

Chapter 3: Research Methodology:

The researcher will finalize the list of the contribution factors that founded on the literature review by conducting interviews with experts. Additionally, the research design, the population of the study, the sample of the study, instrumentation, data collection procedures and data analysis adopted methods will be covered in this chapter.

Chapter 4: Questionnaire Results & Data Analysis:

This chapter will present and illustrate the questionnaire's results statistically. The questionnaire's outcomes will enable the researcher to evaluate the existing PP system along with the contributing factors that cause delays in the PP processes.

Chapter 5: Discussions:

Results from the previous phase will be discussed and analysed in this chapter. Comparison between survey results will be demonstrated in this chapter.

Chapter 6: Recommendations:

The final part will be the study's recommendations. Based on the research's results, recommendations that need to be undertaken to improve the process will be presented. A new model will be proposed to improve the Planning Permission Processes with respect to the timeframe and stages.

A suggestion for future studies will also be covered in this chapter.

1.10 Limitation of the study:

- 1- This study focused on road infrastructure projects in public sectors, while there may be some factors that are related to the private road sector which were not covered in this study.
- 2- The research does not analyze the associated cost (as amount) of delays in planning permission in road projects.
- 3- The Study was focused only on the PP for Road infrastructure Projects while there might be some other factors related to other projects, such as housing and reclamation projects, which were not covered in this study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This study will investigate the delays in the Planning Permission Processes for road infrastructure projects, in the Kingdom of Bahrain that usually have significant impact on other sectors.

This chapter explores the available literature related to the delays in obtaining a planning permit from the local authorities. It is, meant to shed some insights on the previous papers and articles which have investigated the delays in projects and the effects of utilities coordination and cooperation with local authorities in granting the required approval as one of the main sources of delays in these projects. The initial contributing factors that cause delays in the planning permission stage, in the Kingdom of Bahrain, will be identified too.

The Roads Affairs, MOW, is the authority responsible for determining the Right of Way width and the distribution of all services among the approved corridors. Therefore, generally, the most delays of Planning Permission approval are within this directorate.

With regards to building construction, there is another processing system called “Building Permit” which is not a part of this study.

2.2 Literature Review:

2.2.1 Introduction:

Factors contributing to the causes of delays in the Planning Permission Processes in road projects were identified by several previous studies on this subject. Twelve top journals (International Conference on Civil Infrastructure and Construction, Developing Country Studies, Journal of Construction Engineering and Management (ASCE), International Journal of Construction Management, Theoretical and Empirical Researches in Urban Management, International Conference on Computer in Urban Planning, Urban Management Journal of construction engineering and project management, KICEM Journal of Construction Engineering and Project Management, International Journal of Research in Engineering and Science, International Journal of Project Management, Procedia Engineering and International Journal of Construction Engineering and Management) and several university theses' (Graduate School of Engineering and Sciences of Ġzmir Institute of Technology, University Technology of Malaysia, Iowa State University, University Of Kentucky Lexington, Kentucky, Haruna Monri, University of Toronto, University of Bolton, Bolton, Uk and University of Bahrain) and five (5) search engines (Google Scholar, University of Bahrain Library, ABI database, and ProQuest website and Proceeding website) were searched by using the keywords “planning permission”, “delays in planning”, “delays in building permit”, “delays in construction permit”, “utility relocation delay” and “delays in stakeholders approval”.

These sources were searched to find some publications that investigate the delays in the PP processes, and procedures with some recommendations to improve the whole process. In the first step, the abstract of selected

publication was reviewed. Then, related information from each publication was extracted to find the impact of utility coordination or building permit processes on delays of a whole project and the initial contributing factors that cause delays on the PP.

Most of the papers and theses discussed delays in construction in general. Their results show how the utility coordination and permit approval from stakeholders or local authorities created major delays on projects. On the other hand, only a few publications investigated the contributing factors that cause delays in these processes.

The first phase of this study will investigate the delays on projects; how the utility coordination and gaining approval from local authorities is one of the main reasons for the delays on those projects. The second phase will identify the initial contributing factors that cause delays in the Planning Permission Processes in the Kingdom of Bahrain.

2.2.2 Delays on a Project Due to Permit Approval:

Several papers studied the factors that cause delays at the initiation and during project construction. Indeed, a lot of studies found that utility coordination or gaining permit approval from local authorities (or stakeholders) is one of the main causes of delays in construction.

In 2003, Ellis et al. investigated in the USA the root causes of highway construction delays. They did a survey to the concerned professionals where results showed that utility relocations and differing site conditions are the most frequent causes of delays in highway projects. Similarly, in Turkey, Gündüz et al. (2013) also qualified the delays factors for construction projects. The results consistently showed that obtaining permits and the global financial crisis are the key factors that are causing delay.

Gandhak et al. (2014) studied the causes of delays in a construction project in India and its impact on the project's delivery based on the stakeholder's perception. The study found that the Building Permits Approval is the most frequent reason cited for delays on projects. In another study by Hemanta et al. (2012), who analyzed and found that similar finding, i.e., obtaining a permission from local authorities and weather conditions were critical in causing delays in construction projects.

Karunakaran's et al. (2018) study about the causes of delays on a highway construction projects in Malaysia, has ranked his finding that dealing with underground utilities as the fifth factor that contributes to the highway projects delays. While Thapanont et al. (2018) studied the same topic in Thailand, also rank the relocation of the existing utilities structures as the third factor on highway projects' delay.

Bajjou et al. (2020) studied in Morocco, showed that obtaining permits from governmental agencies is "the" factor in the external factor category that causes delay in construction projects.

This is similar and common in the GCC region, where a study by Emam et al. (2015) on the same topic, that more than 80% of infrastructure projects suffer delays with an average delay of 25%. Two main factors were found: the long response time from the utility agencies and, major changes in design during the construction. Further, Elawi et al. (2016) investigated 49 case studies of roads and bridges projects in Saudi Arabia also found several factors where unexpected underground utility ranks as the fourth factor after a land acquisition, contractors' lack of expertise and re-designing with an average of 48% extension of time to the affected projects. While in Alsuliman (2019) study, found that lack of planning by

government entities as one of main reason for a public construction project delays in Arab Saudi.

In Bahrain, in a study by Hasan (2014) who conducted a survey for different participating groups (client, consultant, and contractor) found that long response time from utilities agencies and diverting obstructing services are the two main factors causing delays related t with an average mean of 4.00 and 3.88 respectively.

In Serdar et al. (2018) study, who made a comprehensive list from one hundred (100) papers, discussed the causes of delays on construction projects that are regional and international. They found that “Poor communication, coordination and conflicts between stakeholders” have been identified in 63 papers and became the second most reason cited for delays after “Weather/climate conditions”.

Clearly, the above studies as illustrated above from various regional and international, agreed that, the delays on getting permit approvals and utility coordination are the two of the most key factors cited in project delays.

The next section will discuss selected previous studies that have investigated the reasons behind the delays in obtaining permit approval, utility coordination and identify initial contributing factors that cause delays in the Planning Permission Processes.

2.2.3 Factors causing delays in the PP Processes

As mentioned in 2.2.1, several journals and university theses searched through five (5) search engines to investigate the factors that cause delays in the PP processes. Ten (10) papers reported investigated the delays in the planning permission and building permit from Turkey (Demirciefe, 2009), New York (National Conference of States on Building Codes and

Standards Inc., 2003), Ghana (Botchway et al. , 2014) and (Kpamma et al. , 2013), the Netherlands (Meijer , 2007), Malaysia (Maideen, 2018) (Yaakup et al., 2007), Whatcom Country, Washington DC. (The Latimore Company, 2005), Canada (Monri, 2015), Needham -Massachusetts (Systems Consulting Group, 2003) and Saudi Arabia (Al-Swailem et al., 2022) were analyzed.

Based on these studies, twenty-two (22) factors have been identified causing delays in the Planning Permission Processes in road construction projects. These 22 factors are grouped under 5 different categories:

- 1. Issuer of Planning Permission Application:** This category is related to the PP issuer, which in this case, is RPDD and its consultants. Their PP applications have some issues that cause delays in the process.
- 2. Staff and Employees:** the issuer and the reviewer may have issues related to their staff and employees.
- 3. Right of Way (ROW):** in the New Oxford American Dictionary, the term ROW means “the legal right, established by usage or grant, to pass along a specific route through grounds or property belonging to another”, or "a path or thoroughfare subject to such a right”. However, in Bahrain, this has slightly different definition that ROW means, the allocated corridor of the road that includes other utilities like gas, water, electricity etc.
- 4. Process and Regulations:** related to the process and regulations followed by stakeholders.
- 5. Technology and Software:** factors related to the technology & software used to communicate between stakeholders.

Table (1) lists all the stated factors with their groups.

Table (1) Initial List of Factors Causing Delays in the Planning Permission Processes

Groups	Initial factors causing delays in the Planning Permission Processes
Issuer Planning Permission Application	1. Submitted applications are incomplete or the detailed drawings not final
	2. Non-Geo referenced (incorrect coordination X, Y, Z)
	3. Submitted unreadable or non-compatible format
Staff and Employees	4. Insufficient number of staff for PP processes reviewer
	5. Untrained staff
	6. Interstaff conflict (conflict between staff on same authority)
	7. Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)
	8. Staff attitude (unfairness, uncooperative, unhelpfulness and untimeliness)
	9. An “anti-IT” culture (old mindset)
Right of Way (ROW)	10.Lack of ROW
	11.Unrealistic Requirement from stakeholders
Process and Regulations	12.No regulation states limit time to respond
	13.Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.
	14.Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders
	15.Ineffectiveness and inefficiency of the permit process

Groups	Initial factors causing delays in the Planning Permission Processes
Technology and Software	16. Ineffective and inefficient use of information technology in the Planning Permission processes
	17. Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.
	18. Lack of a user-friendly IT system
	19. Lack of online permit status tracking system
	20. Failure of development firm to provide support to software inadequacies
	21. Failure on-line interconnection between permit department and other departments in the local government
	22. Need for improvement of web site (need for website to provide easy access to permit status tracking)

2.3 Summary:

Throughout chapter 1 & 2, including from previous studies and, the statistical data analysis from Tasareeh, it can be confirmed that the delays in the PP process as the initial factor identified as the main cause of delays.

This initial factor will be discussed with an expert's judgment to confirm and sum up with more factors in the chapter 3.

Using these factors, a project's survey (questionnaire) is created based on the semi-final list of factors. The target population is the RPDD's employees working in the PP processes, government authorities and the consultants representing the PP applicants.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Design:

Despite previous recognition for the nature of the research's problem and a constraint to access government authorities' offices due to the Corona virus. Therefore, based on the objectives', "Descriptive Research" is found to be the most suitable approach. This will enable the researcher to investigate the delays in the current Planning Permission Processes in road infrastructure projects in the Kingdom of Bahrain. As the first step, the researcher will identify the contributing factors in the PP process and provide recommendations to improve the process, as this is the research's main objective.

The second step was to collect official data from identified sources. The MOW and the CPO are the main sources for the research's secondary data. In first part of collection data, a qualitative technique is adopted by doing face to face or Teams interviews with selective staff in the road's construction field to finalise the contributing factors. Then, other data will be collected from the stakeholders: the PP issuer (RPDD), and the responding stakeholders and consultants working on this process. Previous studies done locally and internationally for the research topic and the population's size of the study were also collected.

The third step is to study the survey population and choosing the sample of the study. The fourth step is to build the instruments to be used and depending on a population, the survey will be conducted to the selected sample. This is followed by the fifth step: conducting a pilot study to examine the suitability, feasibility, and comprehensibility of the

questionnaire before issuing to a larger survey population. The sixth step is to conduct the survey and finally the last step is to do data editing and analysis to generate the final results and recommendations.

Research Methodology Flow Chart is shown in the Figure (11) below:

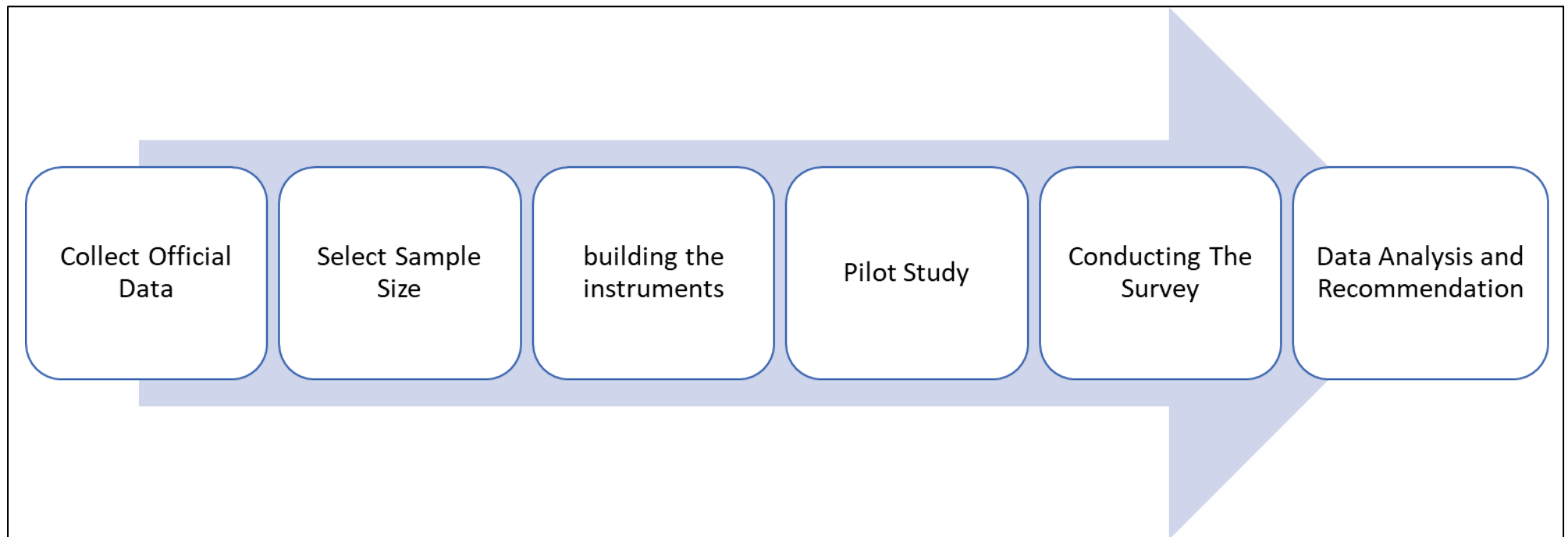


Figure (11) Research Methodology Flow Chart

3.2 Research Hypothesis:

This research aimed to prove the following hypothesis:

Ho. “The investigated contributing factors do not cause delays to the Planning Permission Processes”

H1. “The investigated contribution factors cause delays to the Planning Permission Processes”

3.3 Experts Interviews:

Upon identifying the initial factors that cause delays in the Planning Permission Processes through literature review, the following step is to confirm these factors by an expert’s judgment before incorporating into a questionnaire survey. The experts are selected based on their sector, role, position, and experience.

Table 2 shows eight qualitative expert profiles (8) who agreed to be interviewed under anonymous conditions. Some interviews were conducted face-to-face and others by Teams based on the interviewee’s preference. Each interview lasted for about 30 to 60 minutes, depending on the number of comments.

Table (2) Interviews Participants' Profiles

#	Sector	Qualification.	Position	Years(s) of Experience	National.
1	Stakeholder Issuing (RPDD)	Bachelor	Chief, Project Management Section	More than 20 Years	Bahraini
2	Stakeholder Issuing (RPDD)	Bachelor	Senior Civil Engineer	Between 15 -20	India
3	CPO	Master	Head, Central Planning Engineering	More than 20 Years	Italian
4	CPO	Master	Supervisor, advisory and research	More than 20 Years	Sri Lanka
5	Consultant	Master	Director, Infrastructure	More than 20 Years	Bahraini
6	Consultant	Bachelor	Project Manager	Between 10 -15 Years	Bahraini
7	Local Authority	Master	Supervisor, advisory and research	More than 20 Years	Sri Lanka
8	Local Authority	Bachelor	Utility Specialist	More than 20 Years	Bahraini

A structured interview format adopted in the questions to allow investigation when necessary. Two main questions asked are from the compilation of the factors that cause delays in the PP processes from the literature review, which are: “From your opinion as an expert, do you agree that these factors cause delays in the Planning Permission Processes in the Kingdom of Bahrain?”, “which factors do you think are not applicable in Bahrain “and “Are there any further factors you want to add?”

All interviewees agreed that 18 out of the 22 factors found in the literature review were applicable in Bahrain. Factors number 6 (Interstaff conflict), 8 (Staff attitudes) and 9 (An “anti-IT” culture) are the factors that were not applicable in their entity but may apply to other local authorities. Based on

these, it was agreed to keep on the list to be evaluated in the research survey. Only one factor was disagreed by all interviewees that is factor number 19 (Lack of online permit status tracking system) since the online permit system “Tasareeh” is in existence in Bahrain.

Some interviewees provided valuable comments on the groups’ name and factor statement and suggested that there are more factors. For example, the third group changed the “Right of Way” to a “Master Plan”. Factor number 12 was divided into two sub-factors which are “no enforcement on the stipulated timeline (time frame) on the stakeholders’ reviewers.” and “no enforcement on the applicant to respond to a stakeholders’ comment within the stipulated timeline (time frame), comments on the time limit” to provide a more detailed description.

For the same reason, factors number 10, 21 and 22 were changed to “Insufficient Right of Way (ROW) to accommodate all stakeholders’ requirements/needs”. The other, “System failure to issue the PP online to agencies/authorities outside the registered stakeholders with the system” and “need for improvement of the “Tasareeh” website (need for a website to provide easy access to permit status tracking)” respectively.

Another important comment raised by the CPO’s experts related to the availability of data which creates a new group with four (4) new factors. While the consultant experts, mentioned the issues and their difficulties during the PP process, also created new groups with three (3) new factors to include these issues.

Several interviewees provided further factors, for example, “not including all the required information (ex. Design calculation, utility cross-sections)” from the issuer of the PP’s application and “system failure to add additional stakeholders’ concern after issuing the PP”.

In the Master Plan group, the following factors were added:

- Commence the work without final approval of the master plan
- Approved master plan but with conflict with private lands
- ROW assignment does not consider the comprehensive picture (lack of coordination between the stakeholders' requirements)
- Lack of coordination between different projects' owners (Master Plan, Subdivision, ROW etc.)

As an outcome of the interviews and literature review, a list of thirty-seven (37) contributing factors that cause the delays on the planning permission which were seen fit to the Bahraini construction industry were created. The final list of causes results presented in the Table (3) below:

Table (3) Semi-Final List of the Factors Causing Delays in the Planning Permission Processes

Groups	Semi-Final factors cause delays in the Planning Permission Processes
Issued Planning Permission Application	1. Submitted applications are incomplete or the detailed drawings not final
	2. Non-Geo referenced (incorrect coordination X, Y, Z)
	3. Submitted unreadable or non-compatible format
	4. Not include all required information (ex. Design calculation, utility cross sections)
Staff and Employees	5. Insufficient number of staff for PP processes reviewer
	6. Untrained staff
	7. Interstaff conflict (conflict between staff on same authority)
	8. Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)
	9. Lack of collaboration spirit between authorities
	10. Staff attitudes (unfairness, uncooperative,

Groups	Semi-Final factors cause delays in the Planning Permission Processes
	unhelpfulness and untimeliness)
	11.An “anti-IT” culture (old mindset)
Master Plan	12.Commence the work without final master plan approval
	13.Approved master plan with conflict with private land.
	14.Insufficient Right of Way (ROW) to accommodate all stakeholders’ requirements / needs
	15.Unrealistic requirements from stakeholders
	16.Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)
Process and Regulations	17.No enforcement on the stipulated timeline (time frame) on the stakeholders’ reviewers.
	18.No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame).
	19.Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.
	20.Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders
	21.Ineffectiveness and inefficiency of the permit process
	22.Prolonged time to reach an agreement on stakeholders’ assets relocation/ Protection.
	23.Lack of proper process for Inter Utility Work Request (IUWR).
Technology and Software	24.Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)
	25.Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.
	26.Lack of a user-friendly IT system
	27.Failure of development firm to provide support to software inadequacies

Groups	Semi-Final factors cause delays in the Planning Permission Processes
	28.System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.
	29.Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)
	30.System failure to add additional concern stakeholder after issuing the PP
Data	31.Provide incorrect data / outdated
	32.Time required to investigate the existing utilities
	33.Difficulty to get data in-time
	34.Incorporate data from previous projects in same location
Consultant's Issues	35.The comments responses are not directly forwarded to the consultant.
	36.No direct meetings with concern stakeholder are allowed.
	37.No access to Tasareeh System to know the PP status

3.4 Population of the Study & Sample Size:

This study is aimed for those who are working in the PP processes in roads infrastructure projects in the Kingdom of Bahrain. Therefore, the target participants are specific and not everyone could be considered. Following the results from the literature review, the study population is divided into three groups, comprised of:

1- Issuer stakeholder (planning application): this group included three sections on RPDD:

- a. The Project Management Section (PMS): responsible for the PP and responses to another stakeholder applicant.
- b. Traffic Planning Section (TPS) and Road Design Section (RDS): in these two sections, the Project Managers raised and responsible for issuing the PP for RPDD projects.

The PMS, TPS and RDS staff dealing with the PP processes are four (4), five (5) and three (3) respectively. Therefore, the total number of populations in this group is twelve (12).

2- Responding Stakeholders included all the stakeholders' responses on the PP raised by RPDD, which approximately eighteen (18) stakeholders including the Central Planning Office. Details of these stakeholders are shown in chapter 2.

The Table (4) presents the number of employees responsible for the PP for each stakeholder:

Table (4) Numbers of employees

No.	Stakeholder Name	Number of employees (Population)
1	Water Distribution Directorate (WDD)	4
2	Electricity Distribution Directorate (EDD)	4
3	EWA Planning & Studies Directorate Electricity (PSDE)	4
4	EWA Planning & Studies Directorate Water (PSDW)	4
5	Damage Prevention Section (DPS), EWA	4
6	Sanitary Engineering Planning & Design Directorate (SAN)	4
7	Road Projects and Maintenance Directorate (RPMD)	4
8	Ministry of Housing (MoH)	3
9	General Directorate of Urban Planning (GDUP)	3
10	Ministry of Transportation & Communications (MTT)	5
11	Ministry of Industrial (MOICSIC)	3
12	National Oil and Gas Authority (NOGA)	3
13	Telecom Regulatory Authority (TRA)	2
14	Agricultural Engineering & Water Resources Directorate	4
15	Survey Directorate, SLRB	3
16	Bahrain Authority for Culture and Antiquities (BACA)	2
17	Supreme Council for Environment (SCE)	3
18	Bahrain Defence Force (BDF)	4
19	Central Planning Office (CPO)	6
Total		69

3- Consultants’ practitioners working on the PP Processes as representative of RPDD in the road infrastructure design projects. Based on the data received from the Cost Engineering Department (CED) at the end of November 2021, MOW had contracts with ten (10) engineering consultancy firms to provide consultancy and design services.

The average number of employees working in the PP processes from each consultant are two (2), because they are only responsible for their assigned projects. This makes the total number of populations in this group are $10 \times 2 = 20$.

Table (5) summarizes the size of the population for this study:

Table (5) Summarizes and classifies the Size of the Population

No.	Group name	Number of Populations
1	Issuing stakeholder (planning application)	12
2	Responding stakeholder	69
3	Consultants’ practitioners	20
Size of Populations		101

3.5 Sample of the Study:

One of the important steps in any questionnaire is the sample of the study, which comes after selecting the population of the study. In this step, the researcher needs to establish the number of questionnaires to be distributed.

Based on Israel (1992) and Singh, et al. (2014), there are three criteria that are required to be specified to calculate the proper sample size. They are: the level of precision (sampling error), confidence level and degree of variability and in this study, the following values $\pm 5\%$, 95% and 50% (Maximum value) were specified respectively.

The same studies (i.e., Israel, G. D. (1992) and Singh, et al. (2014)) also presented several strategies to calculate the sample size, as below:

- 1- Using a census for small populations
- 2- Using a sample size of a similar study
- 3- Using published tables
- 4- Using formulas to calculate a sample size

In this study, using the formula, a strategy is selected to calculate a sample size.

It is to apply Yamane's (1967:886) formula to calculate the sample population will get the following:

$$n = \frac{N}{1 + N (e)^2} = \frac{101}{1 + 101 (0.05)^2} = 80.64 \cong 81$$

As a result of this formula, the sample size should be at least eighty-one (≥ 81). However, to be certain, that this number has been covered, a full sample size (101 surveys) are selected as the sample size for this questionnaire (usually there are some questionnaires are lost, ignored or sometimes surveys were disqualified).

3.6 Instrumentation

The main purpose of the research is to identify the contributing factor that causes delays in the PP processes, and to determine the high sources of delays in the Bahraini Planning Permission Processes. It will assist in evaluating the effect of those delays in terms of efficiency, functionality, and economics of the project. Based on these, appropriate recommendations to assist various parties (i.e., clients and consultants) to manage, mitigate and prevent the causes of delays in the Planning Permission Processes will be generated.

The questionnaire consisted of three main parts: (see Appendix A)

Part1: Personal profile and job-related data: Participants were asked to fill in some personal information, likes gender, age...etc.

Part 2: Factors That Causes Delays in the Planning Permission Processes (evaluate the factors behind the current delays): in this part, we asked the participants for their opinion about which were the main factors that cause the delays in the PP processes.

Part3: Evaluate the effect of those delays in terms of efficiency, economics and functionality participants were asked to evaluate the impact of PP delays on the project in terms of efficiency, functionality & economics

Part 4: Estimate the required time: participants were asked to give their

opinions about the time required to respond to the planning permission applicant, reach an agreement regarding the initially raised comments and the granted PP.

Part 5: Open-ended Question: It was the last part, in which the participants were asked to write down any recommendations, or suggestions or any further factors that cause delays in the PP processes.

The main part of the survey is requesting the respondent to rank the level of agreement or disagreement of given group of conflict sets. More precisely, the survey was in the form of a self-administrated printed questionnaire with a-five points Likert-scale, ranging from '1' that equals "Strongly Disagree" to '5' that equals "Strongly Agree". The questionnaire is fashioned after careful reviewing of previous studies and conducted a pilot study (ACM, AIS, & IEEE-CS, 2005).

3.7 Pilot Study:

Before sending the questionnaire, a pilot study was conducted. Three project managers, the first one was the issuer (RPDD) representative, the second, was a stakeholders' representative and the last, was a consultant, these were selected to answer the preliminary questionnaire.

The pilot study aimed to examine the suitability, feasibility, and comprehensibility of the questionnaire before issuing it to larger-scale survey population. With no adverse comments were received from the pilot survey population, the questionnaire was finalized the same as the first version.

3.8 Data Collection Procedures:

In order to minimize the time for data collection, the survey was conducted to all the groups of respondents' (i.e., issuer stakeholder (planning application), responding stakeholder (local authorities) and consultants' practitioners) in parallel. The Data collection was carried out in the following manner:

- A shortlist of the candidate's organizations to be surveyed was created.
- A contact list or a social network links were created to enabled data collection and to ease the of reaching to the respondents where the researcher ha followed the personal presentation method.
- Created a link for the questionnaire in Google Forms to provide an option for those who want to answer the questionnaire electronically.
- Distributed the questionnaire or the questionnaire's link (via email, WhatsApp or by hand) to be answered by the respondents.
- As the responses were by emails, they were less and constraints in reaching respondents' offices because of COVID-19, therefore, the sharing the link with the responders to answer the questionnaire via mail or WhatsApp was chosen as a main distribution channel.
- All three groups (i.e., issuer PP applicant, stakeholders, and the engineering consultant) were given a maximum of three days period to answer the questionnaire. A follow-up reminder via WhatsApp, SMS, email or social network channels was sent to contact the person or member at the end of each week.
- The data collection processes were given a maximum of three weeks period to end.

3.9 Data Analysis:

The analysis for the questionnaire was divided into three parts. The first one was descriptive statistics, which was used to describe the sample of the study. The statistics included frequency counts and measures of central tendency (i.e., mean, and standard deviation) for the variables used in this study. Then, the results of the time required to respond to the planning permission applicant reached an agreement regarding the initial comments raised and granted the PP. Finally, factors' assessments started by statistically ranking the factors according to their importance and level as evaluated by the survey participants.

While the second analysis was a Bivariate Analysis, in which Spearman's correlation analysis was conducted by calculating the correlation coefficient based on the Work Organization for each group (i.e., issuer stakeholders, received stakeholder and consultant engineering), to validate the responses of different participants in the survey.

Finally, to test the significance of the mean and standard deviation, a One Sample T test was used to ensure that the descriptive statistics had no material external factors affecting the representation of the mean and dispersion measures.

Based on the above survey responses and its statistical measures, the research concluded with testing its stated hypothesis, whether to accept or reject it.

CHAPTER 4: RESULTS & DATA ANALYSIS

4.1 Introduction:

The research started in January 2022, and during one month of the survey period, a total of hundred and one (101) surveys was distributed. The questionnaires were written in simple English language to prevent any misunderstanding. As mentioned above, because of COVID-19's restrictions, the main distribution channel was through a shared link with the responders to answer the questionnaire. A questionnaire link was shared with all participants in different organizations (a copy of the questionnaire is attached in Appendix A).

One hundred and one questionnaires were distributed to all the target participants. Only eighty-four (84) responses were returned with a responding percentage of 83.2% and seventeen (16.8%) of the surveys the participants lost or ignored. All returned questionnaires were completely answered. As a result, the total number of surveys that were submitted and eighty-four (84) surveys was approved. The data entered into the SPSS software to get the desired statistics. Table (6) shows the number of respondents according to their field of work.

Table (6) the Response Rate for the Questionnaire Returned

No.	Work Field	Sent no.	Received No.	Response Rate (% of total)	Response Rate (% of sample)
1	Issuer Planning Permission (RPDD)	12	11	10.9%	91.7%
2	Responding stakeholders	69	55	54.5%	79.7
3	Consultants' practitioners	20	18	17.8%	90%
Size of Populations		101	84	83.2%	

In this chapter, statistical results for each question are represented in a graph, table, or both with a brief description of that result. The results will be divided into five (5) major sections:

- 1- Section 1 Respondents Background:** Personal profile and job-related data of the participants.
- 2- Section 2 Statistical analysis for the factors that cause delays in the PP Processes:** the participants' responses will be analyzed to find the mean and standard deviation for each factor. some necessary comparisons between the results based on work fields (i.e., issuer stakeholder (RPDD) responses will be compared with the stakeholders and consultants' responses) to check if there is a difference in the ranking of the factors that cause delays in the PP processes.
- 3- Section 3 Statistical analysis for the effects of the delays on the PP processes:** the participants' responses will be analyzed to find the effect of the delays in terms of efficiency, functionality, and economics on the PP processes and projects' development processes

by finding a mean and a standard deviation for their responses with relative important index (RII).

4- Section 4 Estimate the time required to finalize the PP processes: participants' responses will be analyzed to find the reasonable time to reply to the planning permission applicant, then discuss, negotiate, and respond to the stakeholders' initial comments to reach agreements. Based on that, the optimum time to complete and grant the planning permission from all the stakeholders will be selected and adopted in the future.

5- Section 5 Suggestions and recommendations from participants: any recommendations, suggestions or any further factors that causes the delay in the PP processes were written by the participants will be presented and discussed in this section.

4.2 Section 1 Respondents' Background:

Respondents were asked questions about their background. The questions are about their personal information (age, gender & highest educational qualification) and field of work (work organization, job status and period sign started working on Planning Permission).

4.2.1 Personal Information

1- Age Group:

After analysing the statistical responses and as shown in table 7 and Figure 12, the age group 40-45 has the highest number of respondents that amounts to 18 (21.5%) surveys, then groups 25-30 and 35-40 with 14 (16.7) respondents for both.

Table (7) Age group frequency

Age	Frequency	Present
25-30	14	16.7%
30-35	12	14.3%
35-40	14	16.7%
40-45	18	21.4%
45-50	6	7.1%
50-55	9	10.7%
55 and above	11	13.1%
Total	84	100

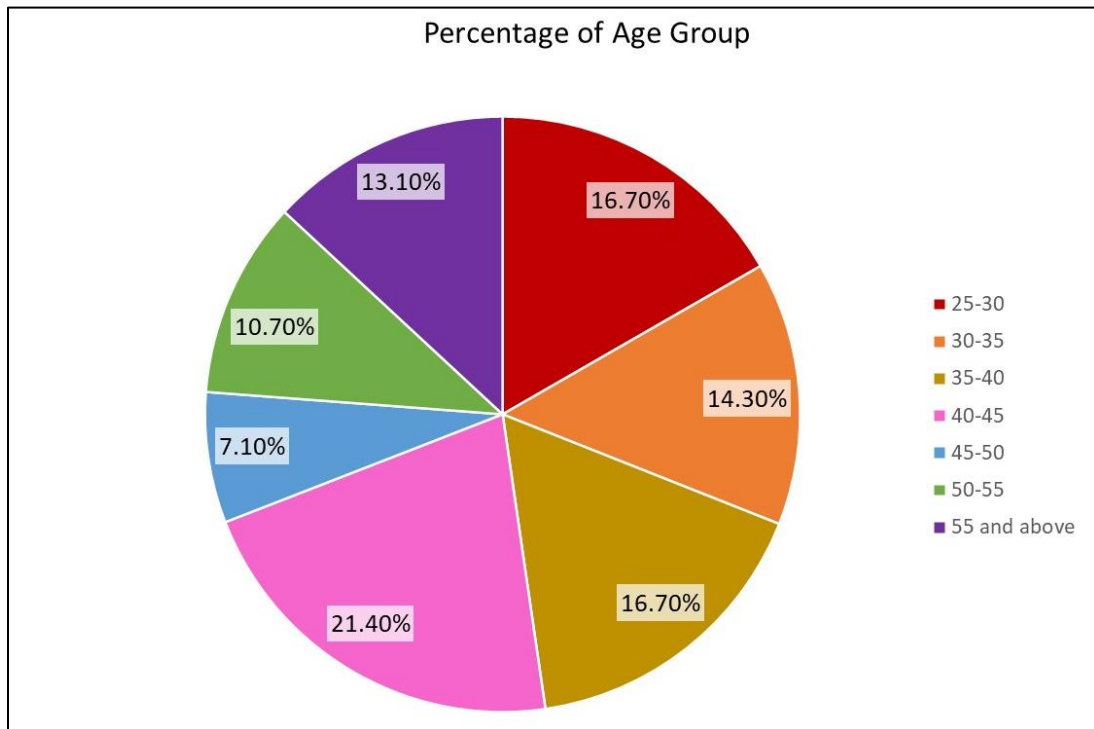


Figure (12) Percentage of Age Group

2- Gender:

As presented in Table 8 and Figure 13, the number of male is more than the number of female respondents. From the 84 surveys, there were 60 (71.4%) males and 24 (28.6%) females. It can be concluded that most of the employees working on the PP processes are males. The big difference might have happened because most of the population from the consultancy side are males (out of 20 participants, 19 of them were males).

Table (8) Respondents' Gender frequency

Gender	Frequency	Present
Female	24	28.6%
Male	60	71.4%
Total	84	100%

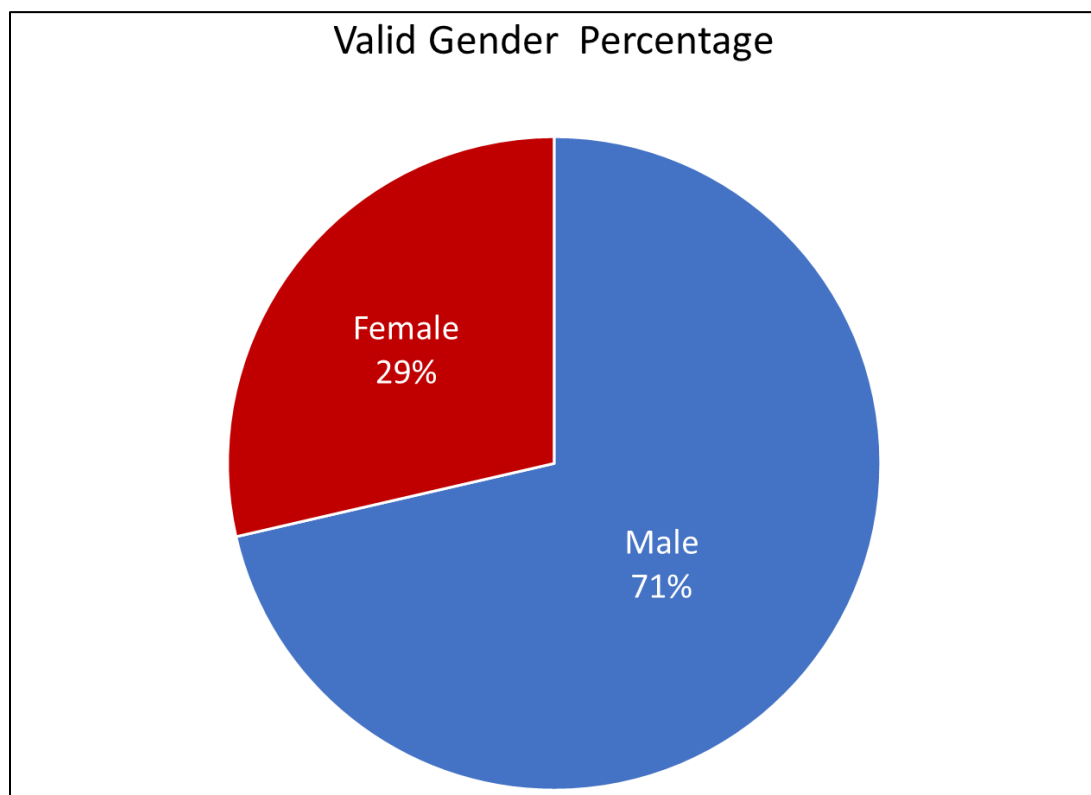


Figure (13) Percentage of Age Group

3- Academic Qualification:

Table 9 and Figure 14 Clearly shows the majority of the respondents' highest educational/academic qualification is BSc with 61.9%, then master's degree with 27.4% of the respondents and 7.1% of the respondents come last with high national diplomas.

Table (9) Participants' Academics Profile

Academics Profile	Frequency	Present
BSc.	52	61.9%
High National Diploma	6	7.1%
Master's Degree	23	27.4%
Post Graduate Diploma	3	3.6%
PhD	0	0
Total	84	100

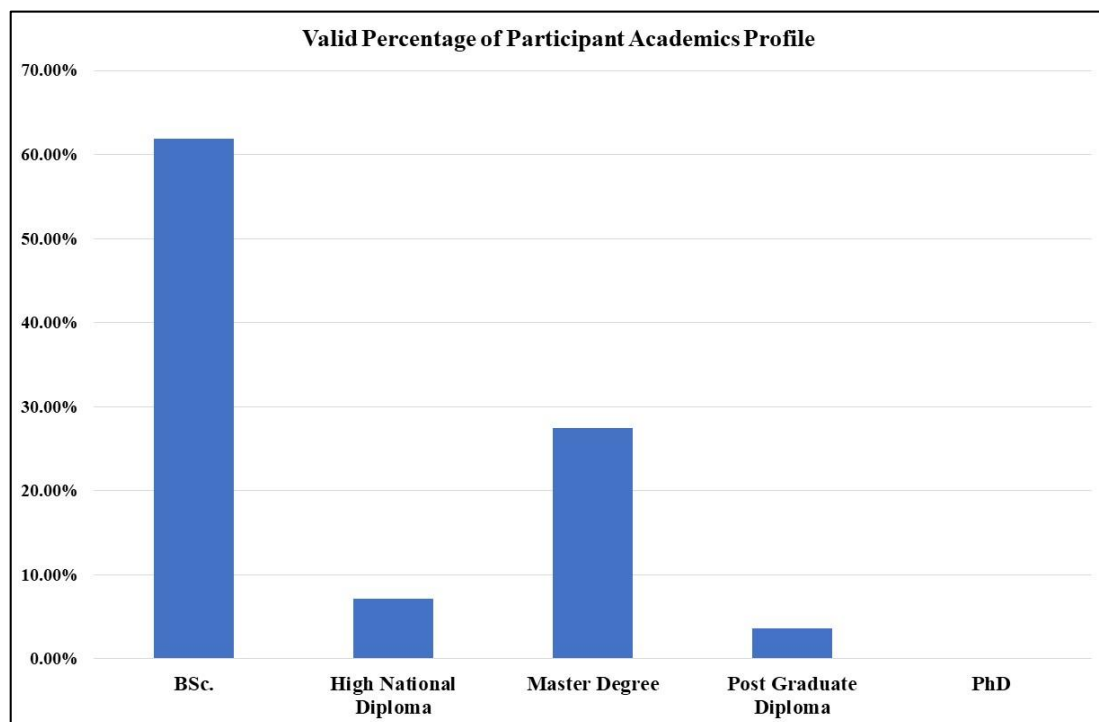


Figure (14) Valid Percentage of Participants' Academics Profile

4.2.2 Work Field

1- Work Organization:

Table 10 below presents the participants' work organization in the survey.

Table (10) Participants' Work Organization

#	Work Organization	Frequency	Percent
1	RPDD	11	13.1%
2	AGA	2	2.4%
3	BACA	1	1.2%
4	CPO	4	4.8%
5	DPS	4	4.8%
6	EDD	3	3.6%
7	GDUP	2	2.4%
8	MoH	2	2.4%
9	MOICSIC	3	3.6%
10	MoTT	5	6.0%
11	NOGA	3	3.6%
12	PSDE	4	4.8%
13	PSDW	4	4.8%
14	BDF	0	0.0%
15	RPMD	4	4.8%
16	SAN	3	3.6%
17	SCE	2	2.4%
18	SLRB	3	3.6%
19	TRA	2	2.4%
20	WDD	4	4.8%
21	Engineering Consultant	18	21.4%
Total		84	100%

2- Job Status:

After analysing the responses for the participants' job status and as shown in Table 11 and Figure 15, approximately half (50%) of the participants worked as a senior engineer and an engineer.

Table (11) Participants' Job Status

Job Status	Frequency	Percent
Adviser	2	2.4%
Chief	7	8.3%
Director	2	2.4%
Engineer	20	23.8%
Head	13	15.5%
Project Manager	11	13.1%
Senior Engineer	21	25.0%
Specialist	7	8.3%
Sr. Technician	1	1.2%
Total	84	100.0

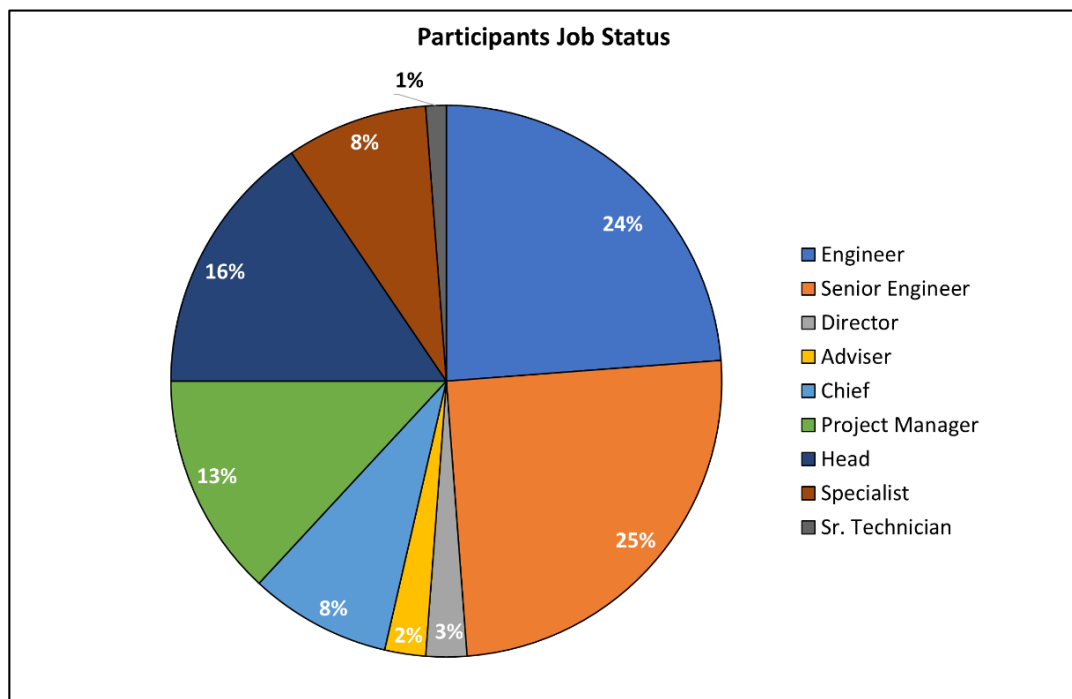


Figure (15) Valid Percentage of Participants' Job Status

3- Work Experience in the PP Processes:

This question asked the participants about the period since they started working in the PP processes. From Table 12 and Figure 16, around 65% of the respondents who participated in the survey have worked in the planning permission processes for 5-10 years and 0-5 years, which from 84 respondents, there are 36.9% (n=31) of them who worked for 5-10 years and 29.8% (n=25) of them who worked for 0-5 years in the PP processes.

Table (12) Participants' Work Experience in the PP Processes

Work Experience	Frequency	Percent
0-5 years	25	29.8%
10-15 years	15	17.9%
15-20 years	4	4.8%
5-10 years	31	36.9%
More than 20 years	9	10.7%
Total	84	100%

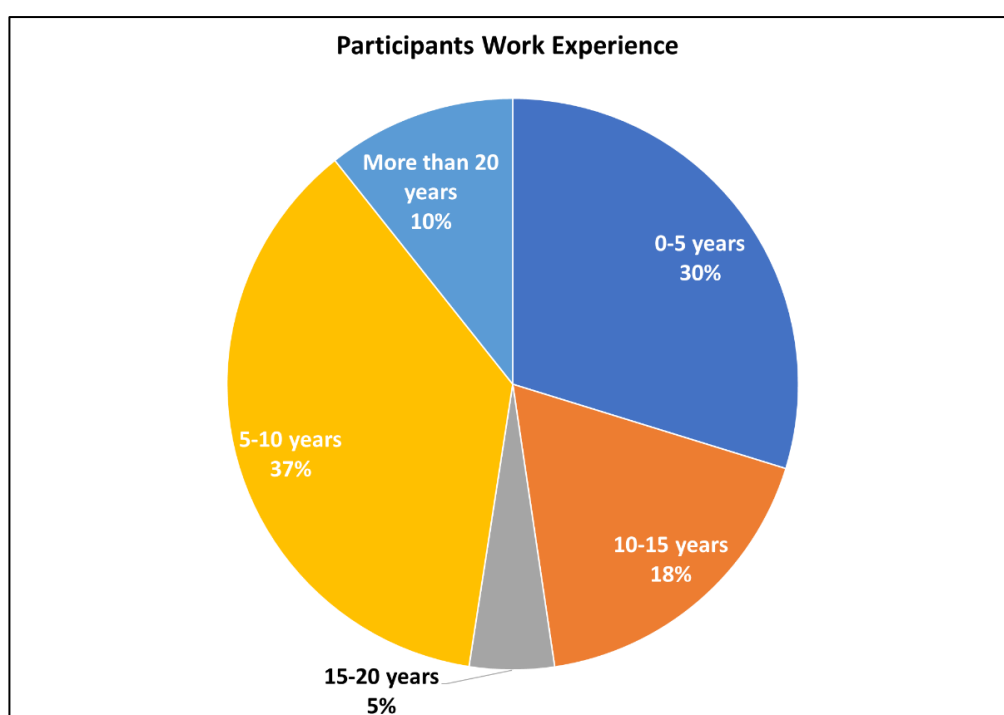


Figure (16) Participants' Work Experience in the PP Processes

4.3 Section 2 Statistical analysis for the factors that causes a delay in the PP Processes:

4.3.1 Statistical analysis for each factor based on their categories:

The purpose of this survey is to identify and evaluate the contributing factors that cause delays in the planning permission processes in road projects in the Kingdom of Bahrain.

Respondents were asked to rank from 1 "Strongly Disagree" to 5 "Strongly Agree" for a listed factor that cause delays on the PP processes, this list was created mainly from the literature review and experts' interviews and divided into seven categories (Issued Planning Permission Application, Staff & Employees, Master Plan, Process & Regulations, Technology & Software, Data, and Consultant's Issues) as describe in detail on chapter two.

The mean of the responses give the actual effect of that factor on the PP processes and the standard deviation will confirm the accuracy of the result. The following tables show in detail the statistical results of these assessments based on the seven categories above.

1- Issued Planning Permission Application:

Table (13) Factors of issued PP Application category

No.	Factors of issued PP Application category	Rank	Mean	RII	Std. Deviation (S.D)
1	Submitted applications are incomplete or the detailed drawings not final	1 st	3.75	0.7500	1.00
2	The submitted application has problem with Non-Geo referenced (incorrect coordination X, Y, Z)	3 rd	2.95	0.5905	1.20
3	*Submitted unreadable or non-compatible format	N/A	N/A	N/A	N/A
4	The submitted application is not include all required information (ex. Design calculation, utility cross sections)	2 nd	3.64	0.7286	0.99

*Missing from survey

Table 16 shows that “Submitted applications are incomplete or the detailed drawings are not final” and “the submitted application does not include all the required information (ex. Design calculation, utility cross-sections)” are rated as the highest rank in this category with a mean of 3.75 and 3.64 respectively. While the “Submitted unreadable or non-compatible format” factor was missed by mistake from the survey, it will be ignored from this study (the second factor was repeated twice).

2- Staff and Employees:

Table (14) Factors of staff and employee's category

No.	Factors of staff and employee's category	Rank	Mean	RII	S.D
1	Insufficient number of staff for PP processes reviewer	1 st	3.74	0.7476	1.21
2	Untrained staff	4 th	3.10	0.6190	1.23
3	Inter-staff conflict (conflict between staff on same authority)	7 th	2.35	0.4690	1.24
4	Interpersonal conflict (conflict between different stakeholders, which they may be unwilling to resolve conflicts rising in between them)	2 nd	3.36	0.6714	1.36
5	Lack of a collaborative spirit between authorities	3 rd	3.11	0.6214	1.30
6	Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)	5 th	2.57	0.5143	1.14
7	An "anti-IT" culture (old mindset)	6 th	2.35	0.4690	1.08

Mostly, respondents ranked "Insufficient number of staff for PP processes reviewer" as the factor that causes the most delays on PP processes in this category followed by "Interpersonal conflict (conflict between different stakeholders, which they may be unwilling to resolve conflicts rising between them)" and "Lack of a collaborative spirit between authorities" (refer to table 17). On the other hand, the following factors "Inter-staff conflict (conflict between staff on same authority)", "An "anti-IT" culture (old mindset)" and "Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)" get a mean less than three (3) which means it is not an important factor.

3- Master Plan:

Table (15) Factors of the master plan category

No.	Factors of the master plan category	Rank	Mean	RII	S.D
1	Commence the work without final master plan approval	3 rd	3.50	0.7000	1.20
2	Approved master plan with conflict with private land.	5 th	3.30	0.6595	1.33
3	Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements / needs	1 st	3.99	0.7976	1.25
4	Unrealistic requirements from stakeholders	4 th	3.50	0.7000	1.31
5	Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)	2 nd	3.55	0.7095	1.13

As shown above the "1st" to "5th" rated competencies raw means were more than three. This means they were rated as high important category. "Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements/needs" is the highest factor that causes delays followed by the "Lack of coordination between different project owners (Master Plan, Subdivision, ROW etc.)", "Commence the work without final master plan approval" and "Unrealistic requirements from stakeholders" with a mean value of 3.55, 3.5 and 3.5 respectively.

4- Process and Regulations:

Table (16) Factors of process and regulations category

No.	Factors of process and regulations category	Rank	Mean	RII	S.D
1	No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers.	2 nd	3.86	0.7714	1.15
2	No enforcement on the applicant to respond on stakeholders' comment within the stipulated timeline	3 rd	3.83	0.7667	1.13
3	Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.	6 th	3.24	0.6476	1.14
4	Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders	4 th	3.38	0.6762	1.05
5	Ineffectiveness and inefficiency of the permit process	7 th	2.67	0.5333	1.13
6	Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection.	1 st	4.02	0.8048	1.10
7	Lack of proprot process for IUWR.	5 th	3.27	0.6548	1.06

Respondents rated “the long time” to reach an agreement with the stakeholders as the most factor that causes a delay in PP processes. More than 70% of the respondents reported that "Prolonged time to reach an agreement on stakeholders' assets relocation/Protection" is between strongly agree and agree (refer to appendix B). The “No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers” and “No enforcement on the applicant to respond on stakeholders' comment within the stipulated timeline (time frame)” came after with a mean value of 3.86 and 3.83 respectively.

5- Technology and Software:

Table (17) Factors of technology and software category

No.	Factors of technology and software category	Rank	Mean	RII	S.D
1	Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)	4 th	3.20	0.641	1.32
2	Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.	3 rd	3.29	0.657	1.32
3	Lack of a user-friendly IT system	6 th	2.85	0.569	1.33
4	Failure of development firm to provide support to software inadequacies	7 th	2.80	0.560	1.35
5	System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.	5 th	3.02	0.605	1.40
6	Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)	1 st	3.50	0.700	1.25
7	System failure to add additional concern stakeholder after issuing PP	2 nd	3.38	0.676	1.27

Mostly, respondents ranked " Need for improvement of Tasareeh website (need for a website to provide easy access to permit status tracking)" as a factor that causes an extreme delay in the PP processes in this category followed by "System failure to add additional concern stakeholder after issuing the PP". On the other hand, the following factors of "Lack of a user-friendly IT system" and "Failure of a development firm to provide support to software inadequacies" scored a mean of less than three (3) which means it is not an important factor.

6- Data:

Table (18) Factors of data category

No.	Factors of data category	Rank	Mean	RII	S.D
1	Provide incorrect data / outdated	4 th	3.32	0.6595	1.13
2	Time required to investigate the existing utilities (request for trail holes, etc.)	1 st	3.98	0.7952	0.90
3	Difficulty to get data in-time	2 nd	3.77	0.7500	1.03
4	Incorporate data from previous projects in same location	3 rd	3.71	0.7429	1.05

Table (21) shows that three out of four factors have a mean more than 3.70 and the fourth factor also has a mean more than 3.30. This means they were rated as a high importance category.

7- Consultant's Issues:

Table (19) Factors of Consultant's Issues category

No.	Factors of consultant's Issues ta category	Rank	Mean	RII	S.D
1	The comments responses are not directly forwarded to the consultant.	2 nd	3.49	0.6976	1.12
2	No meetings with concern stakeholder are allowed.	3 rd	2.86	0.5714	1.22
3	No access to Tasareeh System to know the PP status	1 st	3.60	0.7190	1.37

The above table clearly indicates that “No access to the Tasareeh System to know the PP status” and “comments responses are not directly forwarded to the consultant.” are the highest rated factors in this category. Surprisingly, the "No meetings with concern stakeholder are allowed" ranked last based on the participants' opinion.

Summary:

After presenting each category individually and showing the main causes of delays in the Planning Permission Processes, this section will summarize that by combining and ranking these main factors on the Table 20:

Table (20) Ranking the factors that cause delays in the PP processes

Final Factors causes delays on PP Processes	Category	Mean	RII	Rank
Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection.	Process and Regulations	4.02	0.8048	1 st
Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements / needs	Master Plan	3.99	0.7976	2 nd
Time required to investigate the existing utilities (request for trail holes, etc.)	Data	3.98	0.7952	3 rd
No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers.	Process and Regulations	3.86	0.7714	4 th
No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame).	Process and Regulations	3.83	0.7667	5 th
Difficulty to get data in-time	Data	3.77	0.7500	6 th
Submitted applications are incomplete or the detailed drawings not final	Issued Planning Permission Application	3.75	0.7500	7 th

Final Factors causes delays on PP Processes	Category	Mean	RII	Rank
Insufficient number of staff for PP processes reviewer	Staff and employees	3.74	0.7476	8 th
Incorporate data from previous projects in same location	Data	3.71	0.7429	9 th
The submitted application is not include all required information (ex. Design calculation, utility cross sections)	Issued Planning Permission Application	3.64	0.7286	10 th
No access to Tasareeh System to know the PP status for the consultant.	Consultant's Issues	3.60	0.7190	11 th
Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)	Master Plan	3.55	0.7095	12 th
Commence the work without final master plan approval	Master Plan	3.50	0.7000	13 th
Unrealistic requirements from stakeholders	Master Plan	3.50	0.7000	14 th
Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)	Technology and Software	3.50	0.7000	15 th
The comments responses are not directly forwarded to the consultant.	Consultant's Issues	3.49	0.6976	16 th

Final Factors causes delays on PP Processes	Category	Mean	RII	Rank
Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders	Process and Regulations	3.38	0.6762	17 th
System failure to add additional concern stakeholder after issuing the PP	Technology and Software	3.38	0.6762	18 th
Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)	Staff and employees	3.36	0.6714	19 th
Provide incorrect data / outdated	Data	3.32	0.6595	20 th
Approved master plan with conflict with private land.	Master Plan	3.30	0.6595	21 st
Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.	Technology and Software	3.29	0.6571	22 nd
Lack of proprot process for Inter Utility Work Request (IUWR).	Process and Regulations	3.27	0.6548	23 rd
Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.	Process and Regulations	3.24	0.6476	24 th

Final Factors causes delays on PP Processes	Category	Mean	RII	Rank
Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)	Technology and Software	3.20	0.6405	25 th
Lack of collaboration spirit between authorities	Staff and employees	3.11	0.6214	26 th
Untrained staff	Staff and employees	3.10	0.6190	27 th
System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.	Technology and Software	3.02	0.6048	28 th

4.3.2 Bivariate Analysis:

To validate the responses of various participants in the survey, a Spearman's rho correlation analysis was conducted by calculating the correlation coefficient between participants based on their Work Organization (i.e., issuer stakeholders, received stakeholder and consultant engineering).

Table (21) presents the Spearman's rho correlation analysis between these three groups:

Table (21)

Spearman's rho correlation analysis between the Work Organizations of the participants

Correlations				
		Issuer Stakeholder (RPDD)	Stakeholder (Local Authorities)	Engineering Consultant
Issuer Stakeholder (RPDD)	Correlation Coefficient	1.000	.725**	.590**
	Sig. (2-tailed)	.	.000	.000
	N	37	37	37
Stakeholder (Local Authorities)	Correlation Coefficient	.725**	1.000	.606**
	Sig. (2-tailed)	.000	.	.000
	N	37	37	37
Engineering Consultant	Correlation Coefficient	.590**	.606**	1.000
	Sig. (2-tailed)	.000	.000	.
	N	37	37	37
**. Correlation is significant at the 0.01 level (2-tailed).				

As shown in the table above, there is a good correlation between the responses of each organization which means that the correlation is significant at the 0.01 level (2-tailed).

4.3.3 Hypothesis Test:

After the contributing factors were recognized, the hypothesis must be tested to verify and confirm the validity of the participants' responses.

The Hypothesis stated that "The investigated contribution factors do not cause delays on the Planning Permission Processes "In other words, the null hypothesis stated that these factors do not cause significant delays in the PP Processes. A typical hypothesis of a one sample test is set as follows:

i.e., $H_0: U = U_0$

$H_1: U > U_0$

Where H_0 denotes the null hypothesis and H_1 denotes the alternative hypothesis which reflects accepting these factors as the reason for the delay.

To achieve that, one sample T Test will be used to analyze the significantly deviant sample mean from the average mean for all the responses for each factor and that will find if the result is statistically significant or not.

The null hypothesis will be rejected when $p \text{ value} < 0.05$, in which p is the significance level of α , which was discussed on chapter 3.

The low value of p indicates the restriction to the null hypothesis is improper and that mean rejected of the hypothesis

Table (22) below presents the t-test results:

Table (22) One T-Test Results

Factors causes delays on PP Processes	t	df	Sig. (2-tailed)
1.Submitted applications are incomplete or the detailed drawings not final	34.215	83	.000*
2.The submitted application has problem with Non-Geo referenced (incorrect coordination X, Y, Z)	22.522	83	.000*
4. The submitted application is not include all required information (ex. Design calculation, utility cross sections)	33.738	83	.000*
5.Insufficient number of staff for PP processes reviewer	28.231	83	.000*
6.Untrained staff	23.094	83	.000*
7.Interstaff conflict (conflict between staff on same authority)	17.377	83	.000*
8.Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)	22.641	83	.000*
9.Lack of collaboration spirit between authorities	21.924	83	.000*
10.Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)	20.606	83	.000*
11.An “anti-IT” culture (old mindset)	19.884	83	.000*
12. Commence the work without final master plan approval	26.790	83	.000*
13. Approved master plan with conflict with private land.	22.667	83	.000*

Factors causes delays on PP Processes	t	df	Sig. (2-tailed)
14. Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements / needs	29.320	83	.000*
15. Unrealistic requirements from stakeholders	24.439	83	.000*
16. Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)	28.662	83	.000*
17. No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers.	30.668	83	.000*
18. No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame).	31.138	83	.000*
19. Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.	26.109	83	.000*
20. Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders	29.463	83	.000*
21. Ineffectiveness and inefficiency of the permit process	21.559	83	.000*
22. Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection.	33.606	83	.000*
23. Lack of proprot process for Inter Utility Work Request (IUWR).	28.391	83	.000*

Factors causes delays on PP Processes	t	df	Sig. (2-tailed)
24. Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)	22.163	83	.000*
25. Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.	22.772	83	.000*
26. Lack of a user-friendly IT system	19.595	83	.000*
27. Failure of development firm to provide support to software inadequacies	18.975	83	.000*
28. System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.	19.840	83	.000*
29. Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)	25.731	83	.000*
30. System failure to add additional concern stakeholder after issuing the PP	24.405	83	.000*
31. Provide incorrect data / outdated	26.896	83	.000*
32. Time required to investigate the existing utilities (request for trail holes, etc.)	40.276	83	.000*
33. Difficulty to get data in-time	33.457	83	.000*

Factors causes delays on PP Processes	t	df	Sig. (2-tailed)
34. Incorporate data from previous projects in same location	32.486	83	.000*
35.The comments responses are not directly forwarded to the consultant.	28.425	83	.000*
36. No meetings with concern stakeholder are allowed.	21.399	83	.000*
37. No access to Tasareeh System to know the PP status	24.017	83	.000*
*P<0.05			

As the value $p < 0.05$ for all factors, that means the hypothesis was rejected and the alternative hypothesis H1 was accepted which denotes that these factors significantly cause delays in the Planning Permission Processes.

So, based on all the analyses above, it can be concluded that there are 28 factors that cause delays in the PP processes and the survey results are statistically significant based on the result of the bivariate analysis and one sample T-test.

4.4 Section 3 Statistical analysis for the effect of the delays in the PP processes:

In this section, participants were asked to evaluate the impact of the PP delays on the PP system itself and the projects' development process in terms of efficiency, functionality & economics by choosing a rank from 1 "Very Low" to 5 "Very High".

The mean of the responses gives the actual impact of that delay, and the standard deviation will confirm the accuracy of the result. The tables 23 & 24 show in detail the statistical results of these assessments:

Table (23) Responses evaluating the effect of the PP process's delays on the PP system itself

#	Effect of PP process's delays on the PP system	Mean	RII	S.D
1	The delays on PP processes affects the efficiency of PP system	4.15	0.831	0.94
2	The delays on PP processes affects the functionality of PP system	3.98	0.795	0.97
3	The delays on PP processes affects the economics of PP system.	3.92	0.783	0.98

Table (24) Responses evaluating the effect of the PP process's delays on the projects

#	Effect of PP process's delays on the projects' development processes	Mean	RII	S.D
1	The delays on PP processes affects the efficiency of projects' development process	4.23	0.845	0.78
2	The delays on PP processes affects the functionality of projects' development process.	4.18	0.836	0.78
3	The delays on PP processes affects the economics of projects' development process.	4.25	0.850	0.73

These two Tables confirm that the delays in the PP processes affect the PP

system and projects' development processes in terms of efficiency, functionality and economically as the mean values for all responses in this section is almost four or above (high level).

4.5 Section 4 Estimate the time required to finalize the PP processes:

Respondents were asked to select (based on their opinion) the optimum time to complete and grant the planning permission from all the stakeholders (i.e., include all the necessary time to discuss and negotiate between stakeholders). The idea of this section is to draw a plan for a future model to adopt the result of this section.

1- Reply to the planning permission applicant:

This question asked the participants about the time required to reply to the PP applicant issued by roads (RPDD). From Table 28 and Figure 17, the responses were very close to each other on the option of 1-2, 2-3 and 3-4 weeks. Because of that, the mean for the interval will be used to find a reasonable time to reply to the planning permission applicant based on the participants' responses.

Table (25) Reasonable time to reply to the planning permission applicant

Time to reply on PP	Frequency	Percent of Responses
within 1 week	5	6.0%
1-2 weeks	20	23.8%
2-3 weeks	22	26.2%
3-4 weeks	21	25.0%
4-5 weeks	11	13.1%
More than 5 weeks	5	6.0%
Total	84	100.0%

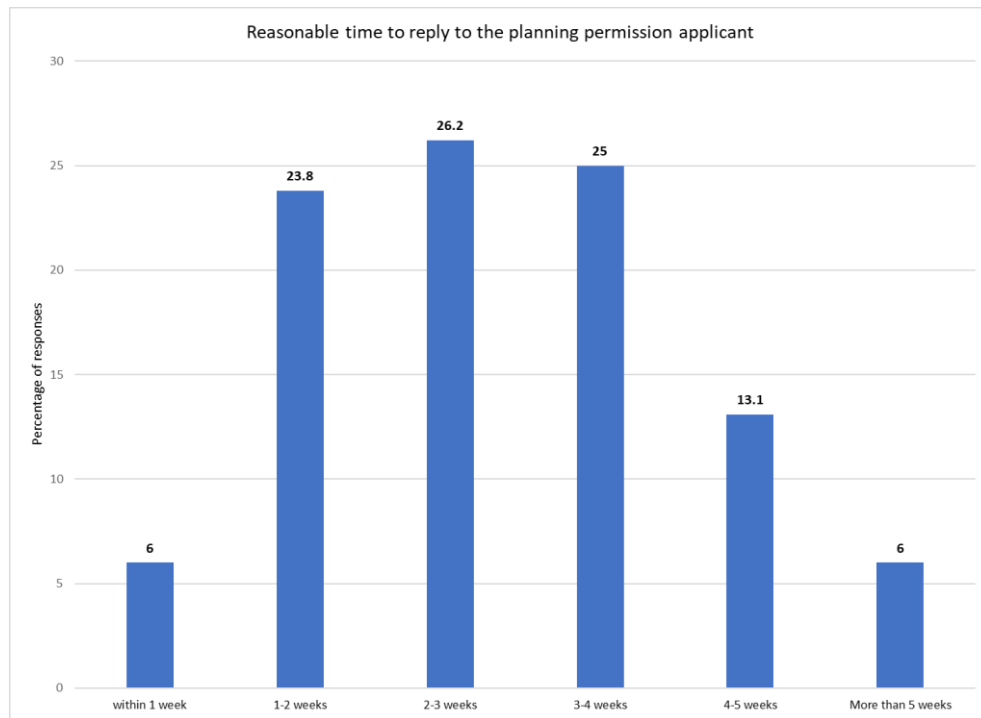


Figure (17) Reasonable time to reply to the planning permission applicant

Table (26) Mean interval for a reasonable time to reply to the PP applicant

Time	Frequency (f)	Mid-Point (m)	f.m
within 1 week	5	0.5	2.5
1-2 weeks	20	1.5	30
2-3 weeks	22	2.5	55
3-4 weeks	21	3.5	73.5
4-5 weeks	11	4.5	49.5
More than 5 weeks	5	5.5	27.5
Total	84		238

$$Mean = \frac{\sum f.m}{f} = \frac{238}{84} = 2.833 \approx 3 \text{ weeks}$$

Therefore, based on the calculation above, the reasonable time to reply to the planning permission applicant according to participants' responses is three (3) weeks. It can be noticed that the result match the answer selected the most (mode method), which is 2-3 weeks.

2- Respond to the stakeholders' initial comments:

Participants were asked about what the reasonable time is to discuss, negotiate and respond to the stakeholders' initial comments to reach an agreement between them. Table 27 and Figure 18 show that more than 60% of the responses selected "2-4 weeks" and "less than 2 weeks".

Table (27) Reasonable time to respond to the stakeholders' initial comments

Time to response on stakeholder initial comments and reach to agreement	Frequency	Percent of Responses
Less than 2 weeks	18	21.4%
2-4 weeks	36	42.9%
4-6 weeks	13	15.5%
6-8 weeks	11	13.1%
8-10 weeks	3	3.6%
More than 10 weeks	3	3.6%
Total	84	100.0%

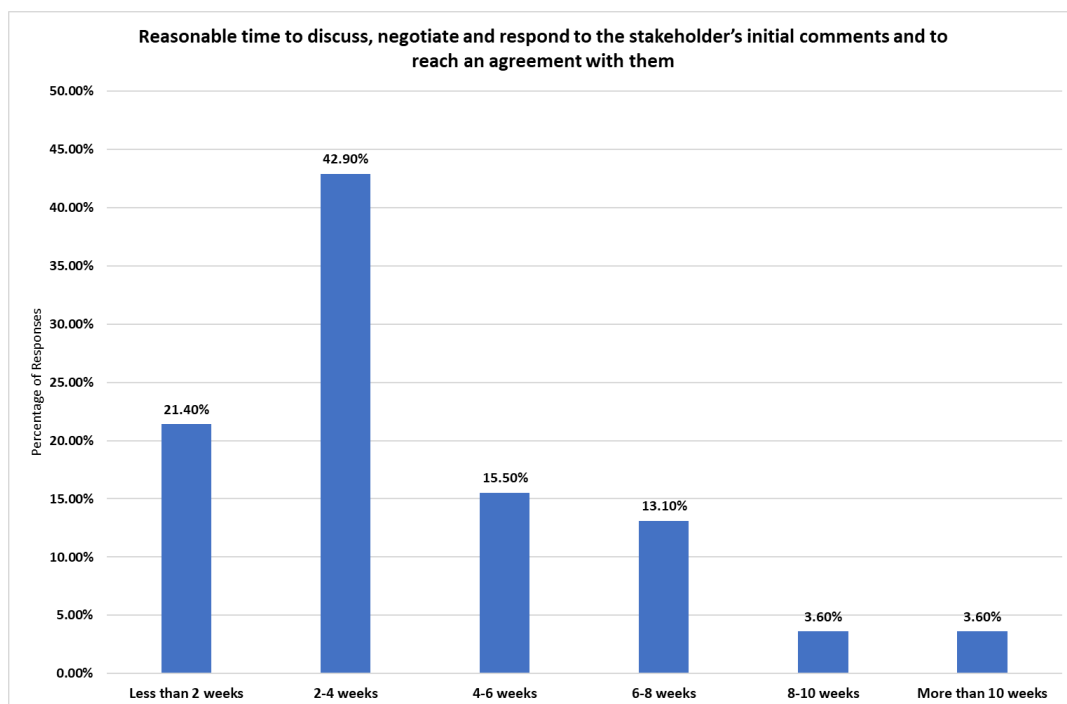


Figure (18) Reasonable time to respond to the stakeholders' initial comments

The mean for the interval will be used to find the reasonable time to respond to the stakeholders' initial comments and reach an agreement with them based on the participants' responses.

Table (28)

Mean interval for a reasonable time to respond to the stakeholders' initial comments

Time	Frequency (f)	Mid-Point (m)	f.m
Less than 2 weeks	18	1	18
2-4 weeks	36	3	108
4-6 weeks	13	5	65
6-8 weeks	11	7	77
8-10 weeks	3	9	27
More than 10 weeks	3	11	33
Total	84		328

$$Mean = \frac{\sum f.m}{f} = \frac{328}{84} = 3.904 \approx 4 \text{ weeks}$$

So, based on the calculation above, the reasonable time to respond to the stakeholders' initial comments to reach an agreement between them according to participants' responses is four (4) weeks. It can be noticed that the result match the answer selected the most (mode method), which is 2-4 weeks.

3- Granting the planning permission:

From Table 29 and Figure 19, it is shown clearly that the majority of the respondents believed that the optimum time to complete and grant the planning permission is “less than 10 weeks” with 36.9%.

Table (29) The optimum time to complete and grant the planning permission

Optimum time to complete and grant PP	Frequency	Percent of Responses
Less than 10 weeks	31	36.9%
10-12 weeks	24	28.6%
12-14 weeks	13	15.5%
14-16 weeks	7	8.3%
16-18 weeks	3	3.6%
18-20 weeks	1	1.2%
More than 20 weeks	5	6.0%
Total	84	100.0%

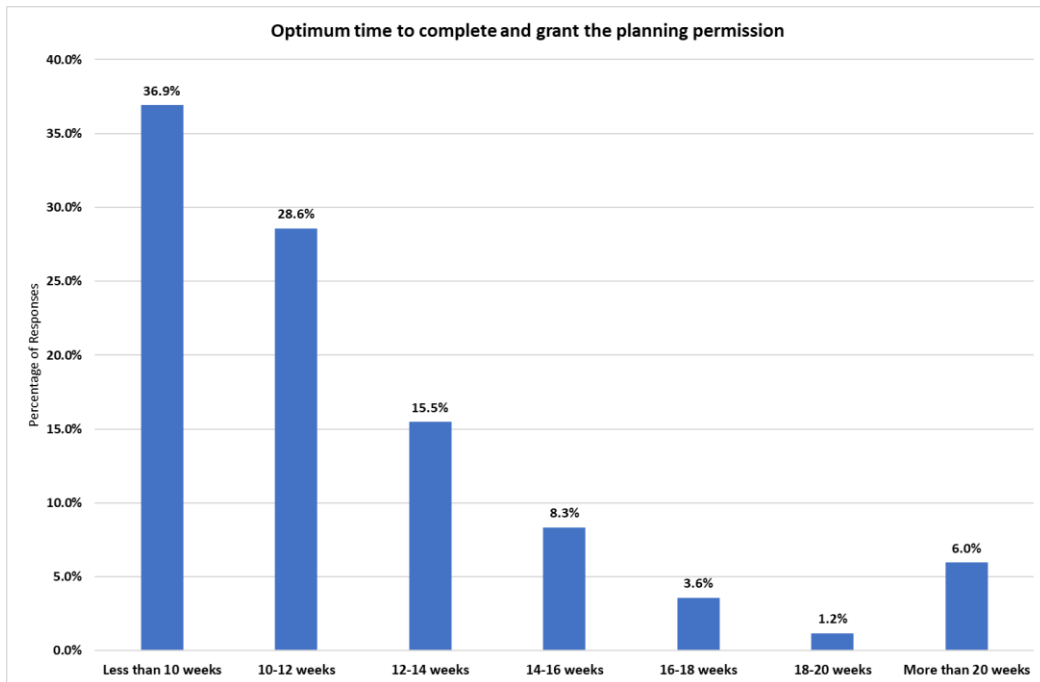


Figure (19) The optimum time to complete and grant the planning permission

It can be noticed the interval for the first option is not equal to the other options, which means the mean interval method cannot be applied. Therefore, a mode method will be adopted for this question.

4.6 Section 5 Suggestions, recommendations, and comments from participants:

The last part of the questionnaire was open-end questions, where the participants were asked two questions only. The first question was asked to suggest any further factors that cause a delay in the PP processes. While the second one was asked to provide any suggestions or recommendations or comments to improve the process.

1- Suggesting further factors that cause delays on the PP:

Out of the 84 responses, only 25 answered this question. Most of the responses suggested factors are already covered on the survey, while only few of them provide new factors.

In Appendix B, all the responses were presented and evaluated. The results ended with only new three factors which are:

Table (30) Suggesting further factors that cause delays on the PP

#	Suggesting further factors	Frequency
1-	Performance of utilities consultants	2
2-	Comments are not given at once	1
3-	Issuer PP re-submit the same PP before completing the fulfilment of the conditions listed in the initial comments.	1

It can be noticed that the frequency for these factors is very small. Thus, it will be ignored and will not be considered as a factor that causes delays in PP.

2- Any extra comments, suggestions, or recommendations:

20 out of the 84 responses answered this question. 10 of them provided recommendations to improve the PP processes while 7 and 3 provided comments and suggestions respectively. The responses to this question will be considered in the final research's recommendations. All responses were presented and classified in Appendix B.

CHAPTER 5: DISCUSSIONS

5.1 Introduction:

Descriptive Research” was selected as the chosen type to conduct this survey based on the reasons discussed in chapter 3. The researcher used mixed approaches of qualitative and quantitative techniques to identify the causes of delays in the PP processes.

In the qualitative technique, the contributing factors that cause delays in the planning permission processes were initially investigated by reviewing previous studies and conducting interviews with experts to finalize the initial list (Semi-Final) of these factors.

As the research hypothesis (Ho) stated that: “The investigated contributing factors do not cause delays to the Planning Permission Processes”. So, a quantitative technique was applied by conducting a survey to test this hypothesis. The quantitative survey discusses the factors that were found in the qualitative technique and other related issues that had not been covered on the previous stage. “

The results of the issuer stakeholders, responses stakeholders and consultant engineers were compared by conducting a correlation analysis. The comparison results along with the hypothesis test were used to find out if the results of the survey were statistically significant or not.

5.2 Survey results:

5.2.1 Respondents' Background:

The participants in this survey were from different age groups who provided an almost equal number of responses in each one. That means that the survey covered all age groups.

Concerning gender, 70% of the responders were males, which signifies that most of the employees working in the PP processes are males. The big difference indicated that because most of the population from the consultancy's side are males (out of 20 participates, 19 of them were males).

Regarding the academic qualifications and job status for the participants, the results were similar to what was expected, with more than 60% of the participants have a BSc and worked as an engineer or a senior engineer. There was no PhD holders who took part in this survey. This was also expected, as most of the PhD holders work in higher positions or in the academic sector.

Table (11), demonstrated that there is a big difference between the number of responses on RPDD and engineering consultants compared with the other stakeholders. That happened because the population for each one of them is different as shown in chapter 3.

To know the actual percentage of the responses for each stakeholder, the following table will compare tables (4) and (5) in chapter 3 with table (12):

Table (31) Comparison between the number of surveys sent &received for each stakeholder

Work Organization	Sent No.	Received No.	Percent of Responses
RPDD	12	11	91.7%
AGA	4	2	50%
BACA	2	1	50%
CPO	6	4	66.7%
DPS	4	4	100%
EDD	4	3	75%
GDUP	3	2	66.7%
MoH	3	2	66.7%
MOICSIC	3	3	100%
MoTT	5	5	100%
NOGA	3	3	100%
PSDE	4	4	100%
PSDW	4	4	100%
*BDF	4	0	0%
RPMD	4	4	100%
SAN	4	3	75%
SCE	3	2	66.6%
SLRB	3	3	100%
TRA	2	2	100%
WDD	4	4	100%
Engineering Consultant	20	18	90%
Total	101	84	83.2%

All the stakeholders were participating in this survey, except BDF who rejected to answer due to security and requiring permit of approvals from their top management.

To classify the work organisations for the participants based on the issuer planning permission (RPDD), the results of the responding stakeholders and engineering consultants, are shown in table 33 and figure 20:

Table (32) Participants' Work Field

No.	Work Field	Frequency	Percent of Responses
1	Issuer Planning Permission (RPDD)	11	10.9%
2	Responding stakeholder	55	54.5%
3	Engineering Consulting	18	17.8%
Size of Populations		84	83.2%

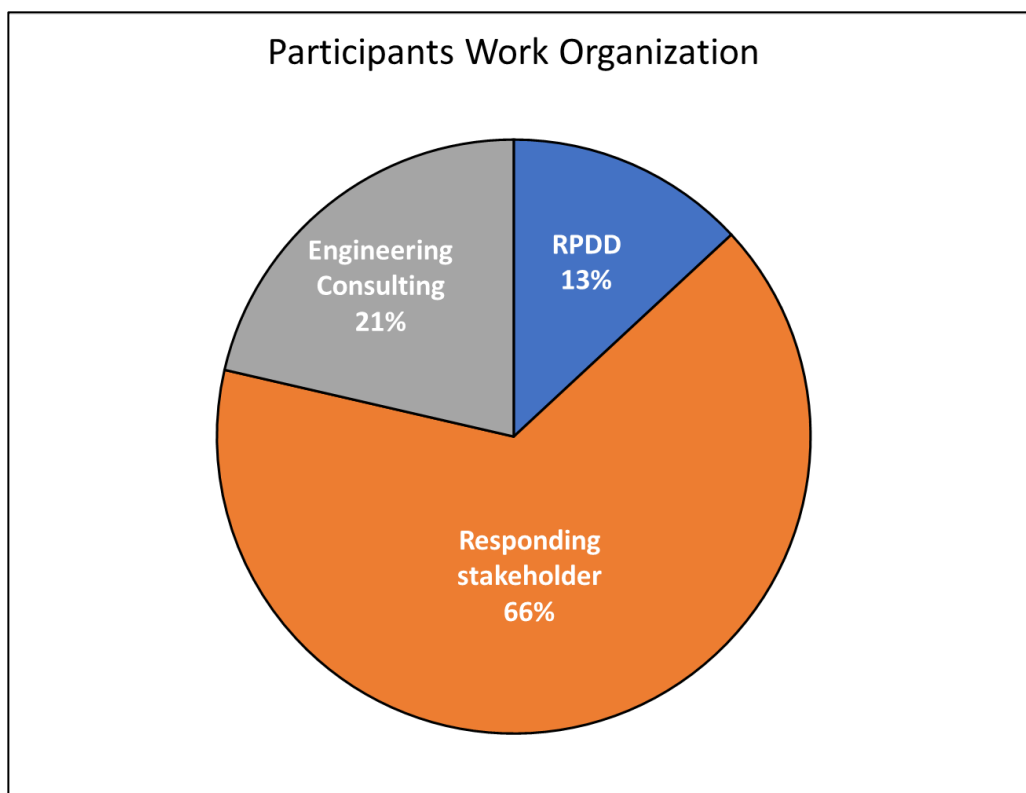


Figure (20) Participants' Work Organization

The results show that the survey covers all the targeted work organizations.

With regards to the working experience for those who work in the PP processes, shows that around 65% of the participants have work experience from 0 to 10 years. This result matches with the expected result of government employees who usually advance to a higher position within 10 years, as these are the laws and the regulations that apply in Bahrain.

5.2.2 Factors that cause delays in the PP Processes:

The results from the survey show that twenty-eight (28) factors out of thirty-six (36) that are found in the qualitative analysis that are causing delays in the planning permission processes with the MIS being more than 3.0 and RII more than 0.6. It was also noticed that most of the factors became in range between 3 and 4, that means between the “neither agree nor disagree” & the “agreed” scale.

In the “Process and Regulations” category, there are three out of the top five factors that cause delays in the PP processes. While all factors under “Master Plan” and “Data” categories have an MIS more than 3.3, which means the factors in these three categories are very high importance.

Table 33 is for ranking the five (5) factors that cause the most delays in the PP processes which supports that.

Table (33) Ranking of significantly highest factors that cause delays in the PP processes

Factors Causes Delays on PP Processes	Category	Mean	RII	Rank
Prolonged time to reach an agreement on stakeholders’ assets relocation/ Protection.	Process and Regulations	4.02	0.805	1 st
Insufficient ROW to accommodate all stakeholders’ requirements	Master Plan	3.99	0.798	2 nd
Time required to investigate the existing utilities	Data	3.98	0.795	3 rd
No enforcement on the stipulated timeline on the stakeholders’ reviewers.	Process and Regulations	3.86	0.771	4 th
No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline	Process and Regulations	3.83	0.767	5 th

On the other hand, “Staff & Employees” and “Technology & Software” have three and two unimportant factors respectively with MIS less than 3. In general, there were eight (8) factors that were specified as minor and unimportant as shown in the table 34:

Table (34) Ranking of the lowest factors that cause delays in the PP processes

Factors Causes Delays on PP Processes	Category	Mean	Rank
Inter-staff conflict (conflict between staff on same authority)	Staff and Employees	2.35	1 st
An “anti-IT” culture (old mindset)	Staff and Employees	2.35	2 nd
Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)	Staff and Employees	2.57	3 rd
Ineffectiveness and inefficiency of the permit process	Process & Regulations	2.67	4 th
Failure of development firm to provide support to software inadequacies	Technology & Software	2.80	5 th
Lack of a user-friendly IT system	Technology & Software	2.85	6 th
The submitted application has problem with Non-Geo referenced (incorrect coordination X, Y, Z)	Issued PP Application	2.95	7 th

It can clearly be noticed that the lowest three factors in the ranking are related to the staff and employees. This matches with what was expected from the expert interviewees, who said that “these factors are not applicable in their entity but maybe applied in other local authorities”. Consequently, the result shows that these three factors are less important and not applicable for most of the local authorities.

For factors, “The submitted application has a problem with Non-Geo referenced (incorrect coordination X, Y, Z)” and “Lack of a user-friendly IT system”, it was unexpected that they were unimportant. This can be assumed that the improvement in the technology reduces their impact.

1- Bivariate Analysis:

To confirm if there is a correlation between the responses of each organization, the Bivariate Analysis (Spearman's rho correlation) was conducted as shown in the Table 35:

Table (35) Spearman's rho correlation analysis between Work Organizations

Correlations				
		Issuer Stakeholder (RPDD)	Stakeholder (Local Authorities)	Engineering Consultant
Issuer Stakeholder (RPDD)	Correlation Coefficient	1.000	.725**	.590**
	Sig. (2-tailed)	.	.000	.000
	N	37	37	37
Stakeholder (Local Authorities)	Correlation Coefficient	.725**	1.000	.606**
	Sig. (2-tailed)	.000	.	.000
	N	37	37	37
Engineering Consultant	Correlation Coefficient	.590**	.606**	1.000
	Sig. (2-tailed)	.000	.000	.
	N	37	37	37
**. Correlation is significant at the 0.01 level (2-tailed).				

The results show that the highest correlation is between the responses of RPDD and the stakeholders. While the lowest correlation between the responses of RPDD and the engineering consultants.

In general, there is a good correlation between the responses of each organization, which denotes that the correlation is significant at the 0.01 level (2-tailed).

2- Hypothesis Test:

As shown in section 4.3.3, one sample T-test was conducted to test the hypothesis. This technique is used to analyze a significantly deviant sample mean from the average mean for all the responses for each factor, which will find if the result is statistically significant or not.

The results in table (23) show the p value <0.05 for all factors, that means that the null hypothesis was rejected and the alternative hypothesis H1 was accepted which denote that these factors significantly cause delays in the Planning Permission Processes.

Hence, it can be concluded that the survey results are statically significant based on the result of the bivariate analysis and one sample T-test.

5.2.3 Evaluate the effect of the PP delays:

The data analysis described the effect of the PP process's delays in the PP system and projects' development processes in terms of efficiency, functionality, and economy. The impact levels were measured by calculating the raw mean of the effective rate of all respondents, which is the mean that gives the actual impact of that delay, and the standard deviation will confirm how the participants agreed on this evaluation.

Tables (24) & (25) show that the means' values were almost four or above for all the questions in this section. This suggests that the participants believed the effect of the PP process's delays on the projects' development processes and the PP system itself in terms of efficiency, functionality & economics are very high and easy or clear to indicate.

The standard deviation for the responders' answers is less than one (1.00) for all the questions in this section. This implies that the participants agreed on the results in this evaluation as their answers were near to the mean.

5.2.4 Time required to finalize the PP processes:

Respondents were asked two questions regarding what is a reasonable time to reply to a planning permission applicant and to respond to a stakeholder's initial comments.

A mean interval was used to calculate the time required based on the participants' responses and the results are shown as follows:

- 1- Time to reply to a planning permission applicant = 3 weeks
- 2- Time to respond to the stakeholder's initial comments= 4 weeks

While the third question was regarding the optimum time to complete and grant the PP, the mean interval method cannot be used because the interval for the first option is different than the other option. For that reason, mode method was adopted, and the selected time is "less than 10 weeks".

It can be observed that if calculating the time for a reply plus the time to respond to the initial comments the total time becomes seven (7) weeks. As mentioned in chapter two, the PP process has one more stages related to clearing from the CPO that takes one (1) week. Based on that, the total time to finalise the PP processes based on the participants' responses is eight (8) weeks, which matches with the answer to the third question (i.e., "less than 10 weeks").

As mentioned in chapter two, the CPO's target is to finalise the PP processes within ten (10) weeks. On the same point, most respondents believed that can be achieved, as they select the optimum time to complete the PP processes is "less than 10 weeks". That means the CPO's vision and research result are matched and it can be implemented in real life if the delayed factor is avoided.

Based on the above, the total completion time for the PP processes will be considered as 10 weeks to match with the survey results and the CPO's target.

This result will be adopted in the recommendations to improve the Planning Permission Processes Model.

5.3 Research Methodology Evaluation:

The strengths and weaknesses of the methodology, which were undertaken in this study, were evaluated. The evaluation's findings for the methodology are summarized below:

A- Strengths:

- 1- The research used mixed approaches of qualitative and quantitative techniques. In the qualitative analysis, several interviews were conducted to collect the primary data regarding factors that cause delays in the PP processes. While in the quantitative analysis, those factors were evaluated by conducting a survey questionnaire.
- 2- The interviews that were conducted to collect qualitative data targeting personnel from the main work organizations (i.e., RPDD, CPO, Stakeholders, and engineering consulting) helped in creating a strong semifinal list of the factors that cause the delays in the PP Processes.
- 3- The responders are all from the stakeholders and their working positions.
- 4- The study applied to methods for ranking the factors causes delays in PP processes, which are Mean and RII and both methods give same sequence. That confirmed the raking of each

factor.

B- Weaknesses

- 1- The Study was focused only on the PP for Road Projects while there might be some other factors related to other projects, such as housing and reclamation projects, which is not covered in this study.
- 2- The questionnaires were lengthy, which impacted the number of responders that were willing to participate.
- 3- Due to COVID-19's restrictions, the main distribution method was through a link shared with the responders to answer the questionnaire. Because of this, contact with the responders was done mainly through phone or people working within the organization. This has eased the data collection despite no direct contact with the responders.
- 4- BDF rejected to respond to the questionnaire for security and safety reasons. Also, the variables list of another stakeholder is not covered in this research. Thus, their point of views is unknown, which denotes that not all stakeholders are covered in this research.

CHAPTER 6: SUMMARY AND RECOMMENDATIONS

6.1 Summary:

The objective of this research is to investigate the contributing factors that cause delays in the planning permission processes in roads infrastructure projects in the Kingdom of Bahrain and recommend improvements in these processes.

The research problem statement that drives these main questions:

1. What are the current PP processes and the procedures adopted in the Kingdom of Bahrain? Are there delays in these processes?
2. What are the contributing factors that cause delays in the planning permission processes and what are the ranking of these factors?
3. What is the level of effect of the PP processes' delays on the projects' development process and the PP system in terms of efficiency, functionality, and economics?
4. What are the recommended planning permission practices that can overcome the delays in the PP processes in road projects in the Kingdom of Bahrain?

This research use "Descriptive Research" method followed a methodological approach that combined literature review, expert interviews (qualitative technique) and a subsequent questionnaire survey (quantitative technique) to answer the above questions. The findings are summarized in the followings:

6.1.1 Current Planning Permission:

This question was answered in chapter one as a part of reviewing the current processes and the following were the findings:

- 1- Planning Application, Stakeholders Responses and the CPO's clearances are the current three stages adopted in the PP processes.
- 2- From 2018, a new electronic portal became available to all stakeholders involved in the development of large and/or complex infrastructural projects in the Kingdom of Bahrain, which is called "*Tasareeh*".
- 3- Tasareeh's Website changes the PP's application from physical (printed applications with drawings that are submitted by hand) to electronic soft copy documents.
- 4- The proposed time for the CPO to finalize the PP processes is 10 weeks. However, the historical data from Tasareeh on the period of 9th April 2018 to August 2021 shows that 59% of the PPs have been outstanding for more than 300 days and only 10% for less than 50 days, which confirmed the presence of significant delays in the current processes.

6.1.2 Investigating the contributing factors that cause delays in the PP processes:

This is the fundamental question in this research, and it has been addressed by the following steps:

- 1- Investigate the initial contributing factors from previous studies as part of the literature review.
- 2- Create a semi-final list of contributing factors by conducting eight interviews with experts from different working organizations as part

of the qualitative technique.

- 3- Assessing the previous list of contributing factors by using a questionnaire instrument and rank on a five-points Likert scale as part of the quantitative analysis.

Thirty (30) factors were identified as causes of delays in the planning permission processes. The following are the top ten (10) factors:

1. Prolonged time to reach an agreement on stakeholders' assets relocation/protection.
2. Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements / needs
3. Time required to investigate the existing utilities (request for trail holes, etc.)
4. No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers.
5. No enforcement on the applicants to respond to the stakeholders' comments within the stipulated timeline (time frame).
6. Difficulty to get data on-time
7. Submitted applications are incomplete or the details drawings are not final
8. Insufficient number of personnel for the PP processes reviewer
9. Incorporating data from previous projects in the same geographical location
10. The submitted application did not include all the required information (ex. Design calculation, utility cross sections).

A Bivariate analysis and one sample T-test were conducted, and the results of these tests confirmed that the survey results are statically significant.

6.1.3 The effect of the PP processes' delays:

The third question was answered through a five-point Likert question on the impact level of the delays in the PP system itself and the projects' development processes in terms of efficiency, functionality, and economics. Participants rated their effect level on a scale of 1 to 5, 1 being "very low" and 5 is "very high"

The results show that there is a highly significant impact on the PP system and the projects' development processes in terms of efficiency, functionality and economics as the mean value is almost equal to four or above.

The efficiency of the planning permission is the element most impacted by the delays of the PP processes, while in the projects' development processes the most effected element by this delay is the economics.

The above results are consistent with the researcher's expectations, as the significant impact of the PP delays was found on the project's development and the PP system

6.1.4 Recommendations to improve the PP processes:

This question will be addressed in the last part of this chapter as part of the research's recommendations.

6.2 Recommendations:

This section will present the research recommendations based on the results of this study and it will be divided into three parts:

- 1- Presenting the research's recommendations which are extracted from the research's results.
- 2- Proposing a new model to improve the PP processes
- 3- Recommendations for future research

6.2.1 Recommendations of this Research:

The research was focused on the factors that cause delays in the planning permission processes for road projects in the Kingdom of Bahrain.

The following are recommendations to reduce the time required to complete and grant the planning permission on roads infrastructure projects. Based on the findings and results of this study and according to the categories of factors are:

1- Planning Permission Application:

- The drawings attached to the PP application shall be the final detailed design drawings. The drawings of the road layout should be the final and approved ones, even when it is still in the preliminary design stage. The uploaded drawings should be readable and in a compatible format.
- The submitted application must include all the required information (ex. Design calculation, utility cross sections and Topographic Survey).
- It should not be allowed to upload a new application for the reason of obtaining information and data from another stakeholder.

2- Staff and Employees:

- Each stakeholder should have sufficient personnel to address all the required work for the planning permission processes, whether that work is to issue, respond or review the PP.
- Interpersonal conflict should be avoided. The staff must be professional and ready to resolve conflicts rising between them. The collaborative spirit should be the general character among the local authorities.
- Provide training to improve the staff's performance and further develop their skills.

3- Master Plan

- The road corridor must be sufficient to accommodate all the stakeholders' needs. The ROW should not be less than 100m and 15m for the main highway and local road respectively.
- Effective coordination and communication are a must between different projects owners (Master Plan, ROW etc.) making planning for the utility corridors faster and easier.
- Stakeholders need to re-study their requirements to be more realistic. This is especially with a new construction technology which can help reduce the corridor width requirement.
- Before starting the planning or design stages of any road project, the master plan should be approved first and without any conflict with the existing private land.
- Affected stakeholders shall be involved in the master planning process with UPDA to avoid various conflicts at the

design/implementation stage.

4- Process and Regulations:

- Establishing clear regulations regarding the protection or diverting the stakeholder's assets. For example, in the event of a conflict with an existing EWA cable, the length of the affected part shall be categorized as a diversion or protection accordingly. These categories must be applied to all conflict's cases. This pre-agreed categorization will reduce the conflict time required to reach an agreement with concerned stakeholders. However, to get the most out of this recommendation, all stakeholders must collaborate and cooperate to achieve the main objective of improving the infrastructure system in the Kingdom of Bahrain.
- Issuing a new regulation to obligate the stakeholders' reviewers to respond within a specific time frame. The same applies to the source of the request.
- Creating appeals process for resolving conflicts between applicants and local authorities/concern stakeholders.
- Improving the Inter-Utility Work Request (IUWR) process and setting a specific timeline for its preparation and feedback.
- Schedule a weekly meeting between the concern stakeholder to discuss and negotiate all the outstanding issues in the PP. For any strategic project, CPO shall conduct a workshop at the beginning of any project to give a brief detail to the concerned stakeholders. This will improve stakeholders' management and increase coordination to complete the reviewing process.

5- Technology and Software:

- Holding workshops or focus groups among the stakeholders to develop list of recommendations to improve the “Tasareeh” permit system. These recommendations should at least include the following:

- Provide easy access to track permit status
- Provide an online PP issuance option to agencies/authorities from external stakeholders registered in the system and another option to add relevant stakeholders after PP issuance

or other IT suggestions or recommendation that will improve the Tasareeh online system.

- Stakeholders should use the same or compatible software to review the PP application to ensure there is no issue arising when converting the file format.
- Update the existing base map to reflect the existing situation and share with affected stakeholders. This base map should be a live document and be updated regularly.
- For variable stakeholder list, it highly recommended to provide a specific entry permit to a specific project to access Tasareeh permit system for that particular project to view the status of the PP and receive feedback responses directly

6- Data:

- Cooperation required among stakeholders to generate the permit approval process to investigate the existing utilities faster, easier and without incapacitating terms or conditions.
- Create a SharePoint control center by the CPO that contains all the projects' data for all stakeholders.
- This SharePoint will be responsible for providing correct and updated data in a short time to any authority working in the same location. For example, if a Roads Affairs completed a construction on a selected road, the as-built drawings for that road must be submitted to the CPO and placed in the SharePoint. Any stakeholders, then, can acquire the latest updated data from the CPO directly to avoid unnecessary delay. The same concept can be applied to the ground investigation of existing facilities and any other data required. This will assist in getting the correct and updated data on time without additional cost.
- To ensure that proper set of documents are submitted, authorities should provide a checklist of all the documentation, this can also be reflected in the PP form itself with checkboxes to confirm submission of information.

7- Consultant Issue:

- Provide a specific entry permit for a consultant working on a specific project to access Tasareeh permit system for that particular project to view the status of the PP and receive feedback responses directly. This will lead to a direct communication among the affected stakeholders and the project

consultant and at the same time while maintaining the confidentiality of other projects.

- The Consultant assigned for a project must have the ability to handle the PP operations and respond on time. This reflects the importance of the consultant's performance.

8- Center Planning Office:

- The CPO should play a lead role in resolving all the PP's issues. They need to appoint planners instead of coordinators, to circulate and follow up the planning permission requests with affected stakeholders. This committee, with a variety of professions/backgrounds such as engineers, economists, lawyers, etc., may assist in improving the efficiency of the PP's operations.
- It would be more efficient should CPO's committee consists of at least one member representing the concerned stakeholders.
- The CPO's office must have the authority and power over all the stakeholders. To do this, it is highly recommended to appoint the CPO under the Prime Minister's Office or the Royal Court to give them the necessary upper hand to control the process of the PP.

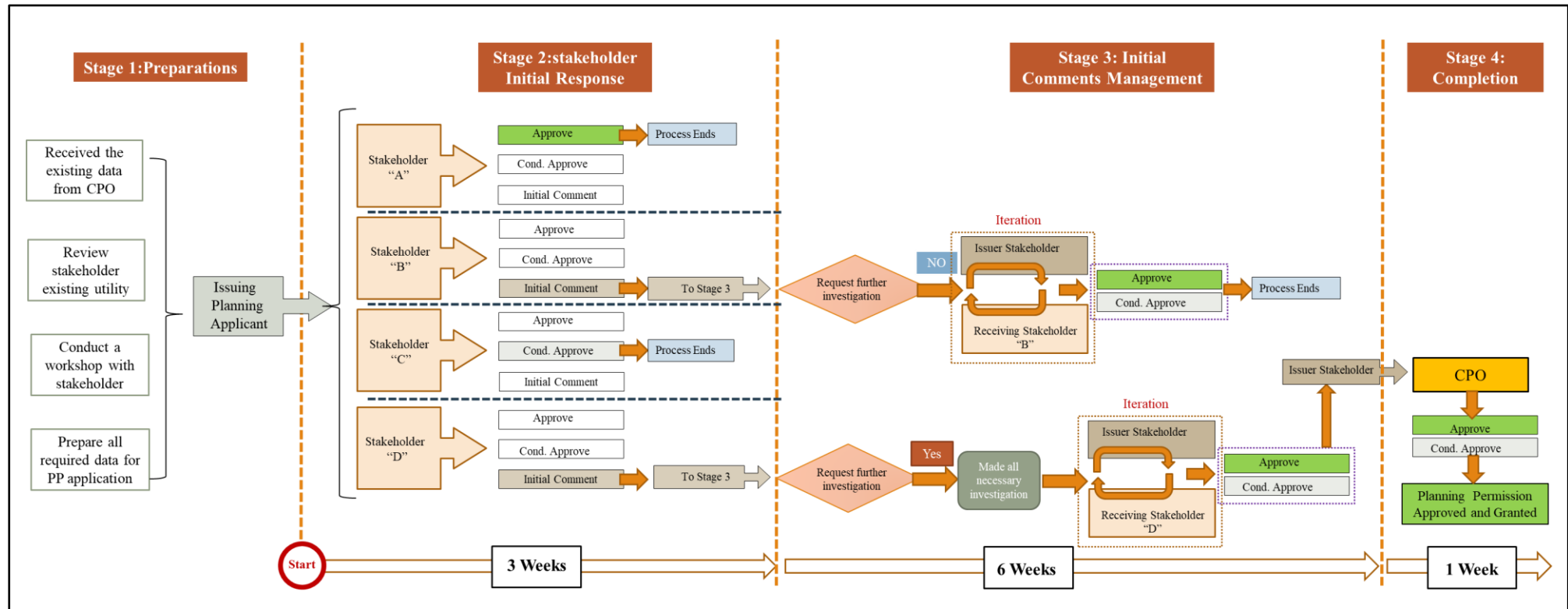
6.2.2 A New Proposed Framework for the PP Processes:

Based on the results of this research, the following stages are proposed:

- 1- Preparation Stage:** At this stage, the stakeholder (RPDD) must complete the collection of the PP data to share with the responding stakeholders and upload the planning application into the Tasareeh permit system. During this stage, RPDD should collect all the required data from the stakeholders regarding their existing utilities. The recommendations in the previous part should be applied here and no time count at this stage in which the PP will be just issued.
- 2- Stakeholder's Initial Response:** the stakeholders that receive the planning application request, to review, and respond with approval/conditional approval/initial comments. The estimated time for this stage is three (3) weeks based on the survey's results. If one of the stakeholders does not respond on time, the CPO must use their authority and approve it.
- 3- Initial Comments Management:** At this stage, the initial comments received from the stakeholder, discussed, and negotiated until reaching an "approved" or "conditional approval" status. The estimated time for this stage is four (4) weeks, and based on the survey results and another two (2) weeks are required if any further investigation is required.
- 4- Completion:** The CPO will receive the Notice of Completion from the RPDD and provide a final comment: "Approved" or "Conditional Approval" and then forward to the Planning Application to Planning Permission.

Therefore, based on the stages proposed above, the proposed framework (model) is presented in Figure 21:

Figure (21) A new proposed framework (model) for the PP Processes



Please note that this framework should work if the research's recommendations are adopted and implemented.

6.2.3 Research Implications:

This research help to understand and measure the delays in PP Processes by identifying the delay factors and provide recommendations with a proposed framework to improve the whole PP process which that will contributes a great service improvement to the ministries and government agencies.

The outcome of this research will save a lot of time and costs for the Government in a long run. It will also contribute to finalizing the planning stage faster by resolving all the utility coordination issues before proceeding to the implementation (construction) stage.

6.3 Recommended future research

- 1- Study and analyze the associated cost of delays in planning permission in road projects.
- 2- Conduct a feasibility study for the proposed model in this research and check its workability.
- 3- Investigate the causes of delays on planning permission for different types of projects, such as housing, reclamation, and electricity projects.
- 4- This study focused only on roads infrastructure projects in public sectors, while there may be some factors that are related to the private roads sector which is not covered in this study. Hence, it is highly recommended to further study the planning permission issued from the private sector.

REFERENCES

1. Alsuliman, J. A. (2019). Causes of delay in Saudi public construction projects. *Alexandria Engineering Journal*, 58(2), 801-808.
2. Al-Swailem, Y., Al-Dossary, S., Aljadhai, S., & Mahmoud, A. B. (2022, May). Pre-planning Coordination for Co-located Infrastructure Projects in Saudi Arabia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1026, No. 1, p. 012042). IOP Publishing
3. Bajjou, M. S., & Chafi, A. (2020). Empirical study of schedule delay in Moroccan construction projects. *International Journal of Construction Management*, 20(7), 783-800.
4. Botchway, E. A., Afram, S. O., & Ankrah, J. (2014). Building permit acquisition in Ghana: The situation in Kumasi.
5. Demirciefe, A. (2009). Delays in issuing of building permit and occupancy permit: An analysis of causes and duration (Master's thesis, İzmir Institute of Technology).
6. Elawi, G. S. A., Algahtany, M., & Kashiwagi, D. (2016). Owners' perspective of factors contributing to project delay: case studies of road and bridge projects in Saudi Arabia. *Procedia Engineering*, 145, 1402-1409.
7. Ellis R. D. and Thomas H. R., "The root causes of delays in highway construction", 82nd Annual Meeting of the Transportation Research Board, Washington, D.C., 2003, .
8. Emam, H., Farrell, P., & Abdelaal, M. (2015, September). Causes of delays on infrastructure projects in Qatar. In *Proceedings of the 31st*

Annual ARCOM Conference, Lincoln, UK, Association of Researchers in Construction Management, Nottingham, UK (pp. 773-782).

9. FII Institute. (2018, April 24). Epic Rise – Future Investment Initiative 2018 – Day 2 [Video]. YouTube.
<https://www.youtube.com/watch?v=5MlOIJ05WCM>
10. Gandhak, P., & Sabihuddin, S. (2014). Stakeholders' Perception of the Causes and Effect of Construction Delays on Project Delivery-A Review. *Journal of construction engineering and project management*, 4(4), 41-46.
11. Gündüz, M., Nielsen, Y., and Özdemir, M., 2013, Quantification of delays factors using the relative importance index method for construction projects in Turkey, *Journal of Management in Engineering*, 29(2), pp. 133–139.
12. Hasan, R, Suliman, S and Malki, Y (2014) An Investigation into the Delays in Road Projects in Bahrain. “*International Journal of Research in Engineering and Science*”, 2(2), 38-47
13. Israel, G. D. (1992). Determining sample size.
14. Karunakaran S, Ramli M Z, Malek M A, Musir A A, Imran N F, Fuad N F, Zawawi M H and Zainal M Z 2018 Causes of delays on highway construction project in Klang valley AIP Conference Proceedings vol 2030 p 02024
15. Kpamma, E. Z., & Adjei-Kumi, T. (2013, July). Construction permits and flow of projects within the Sunyani Municipality, Ghana. In annual

meeting of International Group of Lean Construction (IGLC-21), Fortaleza, Brazil.

16. Maideen, b. A. B. (2018). Improvement of construction permit process approval at local government in malaysia.
17. Meijer F. (2005). Online Building Permit Procedures in the Netherlands: A European perspective. Paper presented at the 2005 4th Triennial International Conference on Rethinking and Revitalizing Construction Safety, Health, Environment and Quality, Rotterdam, May 17-20.
18. Monri, H. (2015, September). A survey of utility coordination practices in the Toronto area. In Conference of the Transportation Association of Canada.
19. Singh, A. S., & Masuku, M. B. (2014). Sampling techniques & determination of sample size in applied statistics research: An overview. International Journal of economics, commerce and management, 2(11), 1-22.
20. Sözüer, M., & Spang, K. (2014). The importance of project management in the planning process of transport infrastructure projects in Germany. Procedia-Social and Behavioral Sciences, 119, 601-610.
21. Systems Consulting Group, Inc. (2003, July 9). Town Of Needham, Massachusetts: Permit Streamlining Study. Retrieved December 18, 2008, from http://www.co.whatcom.wa.us/pds/pdf/planning/Assessment_Report%20_12_06_%20WhatcomCo_2.pdf

22. Thapanont, P., Santi, C., & Pruethipong, X. (2018). Causes of delay on highway construction projects in Thailand. In MATEC Web of Conferences (Vol. 192, p. 02014). EDP Sciences.
23. Yaakup, A., Johar, F., Sulaiman, S., & Ngah, M. C. (2007, September). Computerised Planning Approval System For A Local Authority In Malaysia. In 10 th International Conference on Computer in Urban Planning and Urban Management. [www. Eprints. utm. my/4273/1/YaakubAhris2007_ computer_in_urban_planning. pdf](http://www.eprints.utm.my/4273/1/YaakubAhris2007_computer_in_urban_planning.pdf). (Accessed on 11th Feb. 2010).
24. Yang, J., Shen, G. Q., Ho, M., Drew, D. S., & Chan, A. P. (2009). Exploring critical success factors for stakeholder management in construction projects. *Journal of civil engineering and management*, 15(4), 337-348.

Appendices

Appendix A : Survey Questionnaire



UNIVERSITY OF BAHRAIN
College of Engineering

Questionnaire covering letter

An Investigation on the causes of delays with the Planning Permission Processes in Road Projects in the Kingdom of Bahrain

Dear colleague,

We are conducting a survey on the causes of delays with the planning permission process in road projects, which is causing losses to the stakeholder issuer, stakeholders' responses, and the client representative (project consultant). This survey was undertaken with support from the University of Bahrain as a required subject to the master's certificate in Engineering Management Major.

The questionnaire is completely anonymous; hence you were not asked to put your name on it. We hope that you will feel comfortable with giving answers that are as frank as possible. All your answers will be treated in the strictest confidence and will only be used for this study.

Therefore, we will be very grateful if you could spend a few minutes to complete the attached questionnaire as thoroughly and as comprehensively as possible. The outcome of this study will depend significantly on how accurate your responses will be.

Thank you for your time and assistance.

Yours faithfully,

Jaafar Mohamed Mohsen Abdulla

Please complete in full or tick (✓) or circle or highlighted the appropriate box/boxes.

I- PERSONAL PROFILE/ GENERAL DATA

1) Age:

- | | |
|--------------------------------|---------------------------------------|
| ☐ 25-30 | ☐ 40-45 |
| ☐ 30-35 | ☐ 45-50 |
| ☐ 35-40 | ☐ 50-55 |
| ☐ 40-45 | ☐ 55 and above |

2) Gender: ☐ Male ☐ Female

3) Highest Educational/Academic Qualification:

- | | |
|--|--|
| ☐ High School Certificate | ☐ Post-Grad. Dip |
| ☐ High National. Diploma | ☐ Master's degree |
| ☐ BSc. | ☐ PhD |

4) Work Organization

- | | | | |
|-------------------------------|--|--|-------------------------------|
| ☐ PSDE | ☐ TRA | ☐ GDUP | ☐ SCE |
| ☐ PSDW | ☐ NOGA (BAPCO) | ☐ MoTT | ☐ RPDD |
| ☐ WDD | ☐ MoH | ☐ MOICSIC | ☐ RPMD |
| ☐ EDD | ☐ AGA | ☐ BDF | ☐ SAN |
| ☐ DPS | ☐ BACA | ☐ MUN | ☐ SLRB |
| ☐ CPO | ☐ Engineering
Consultant | ☐ Other, please specify:
_____ | |

5) Job Status

- | | |
|--|---|
| ☐ Director | ☐ Senior Engineer |
| ☐ Chief | ☐ Engineer |
| ☐ Head | ☐ Specialist |
| ☐ Project Manager | ☐ Other, please specify: _____ |

6) How long has it been since you started working in planning permission?

- | | |
|-------------------------------------|---|
| ☐ 0-5 years | ☐ 15-20 years |
| ☐ 5-10 year | ☐ More than 20 years |
| ☐ 10-15 year | |

II- FACTORS THAT CAUSE DELAYS IN THE PLANNING PERMISSION PROCESSES

In your experience, what are the main causes of delays in the planning permission process?

Please answer the questions as they apply to you by placing a Tick (✓) or highlighting in the appropriate place.

Group	Please tick (✓) one response for each item that best indicates how often you've experienced each cause of delays in the planning permission process	Strongly Agree	Agree	Neither Agree nor disagree	Disagree	Strongly Disagree
Issued Planning Permission Application	1. Submitted applications are incomplete or the detailed drawings not final					
	2. Non-Geo referenced (incorrect coordination X, Y, Z)					
	3. Submitted unreadable or non-compatible format					
	4. Not include all required information (ex. Design calculation, utility cross sections)					
Staff And Employees	5. Insufficient number of staff for PP processes reviewer					
	6. Untrained staff					
	7. Interstaff conflict (conflict between staff on same authority)					
	8. Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)					
	9. Lack of collaboration spirit between authorities					
	10. Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)					
	11. An “anti-IT” culture (old mindset)					
Master Plan	12. Commence the work without final master plan approval					
	13. Approved master plan with conflict with private land.					
	14. Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements / needs					
	15. Unrealistic requirements from stakeholders					
	16. Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)					

Process and Regulations	17. No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers.					
	18. No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame).					
	19. Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.					
	20. Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders					
	21. Ineffectiveness and inefficiency of the permit process					
	22. Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection.					
	23. Lack of proposit process for Inter Utility Work Request (IUWR).					
Technology and Software	24. Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)					
	25. Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.					
	26. Lack of a user-friendly IT system					
	27. Failure of development firm to provide support to software inadequacies					
	28. System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.					
	29. Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)					
	30. System failure to add additional concern stakeholder after issuing the PP					
Data	31. Provide incorrect data / outdated					
	32. Time required to investigate the existing utilities (request for trail holes, etc.)					
	33. Difficulty to get data in-time					
	34. Incorporate data from previous projects in same location					
Consultant's Issues	35. The comments responses are not directly forwarded to the consultant.					
	36. No meetings with concern stakeholder are allowed.					
	37. No access to Tasareeh System to know the PP status					

III- Evaluate the effect of that delays in terms of efficiency, functionality, and economics

A- Effect of PP process's delays on the PP system itself In your experience, what are the effects of that delays in terms of efficiency, functionality, and economics of Planning permission system? Please answer the questions as they apply to you by placing a Tick (✓) in the appropriate place.	Very Low	Low	Moderate	High	Very High
1. The delays on PP processes affect the efficiency of PP system					
2. The delays on PP processes affect the functionality of PP system					
3. The delays on PP processes affect the economics of PP system.					

B- Effect of PP process's delays on the projects' development processes In your experience, what are the effects of that delays in terms of efficiency, functionality, and economics on the projects' development process? Please answer the questions as they apply to you by placing a Tick (✓) in the appropriate place.	Very Low	Low	Moderate	High	Very High
1. The delays on PP processes affect the efficiency of projects' development process					
2. The delays on PP processes affect the functionality of projects' development process.					
3. The delays on PP processes affect the economics of projects' development process.					

IV- Estimate the required time

1) Based on your experience, what is the reasonable time to reply to the planning permission applicant?

- ☐ within 1 week
- ☐ 1-2 weeks
- ☐ 2-3 weeks
- ☐ 3-4 weeks
- ☐ 4-5 weeks
- ☐ More than 5 weeks

2) Based on your experience, what is a reasonable time to discuss, negotiate and respond to the stakeholders' initial comments and to reach an agreement with them?

- ☐ Less than 2 weeks
- ☐ 2-4 weeks
- ☐ 4-6 weeks
- ☐ 6-8 weeks
- ☐ 8-10 weeks
- ☐ More than 10 weeks

3) Based on your experience, what is the optimum time to complete and grant the planning permission from all the stakeholders?

- ☐ Less than 10 weeks
- ☐ 10-12 weeks
- ☐ 12-14 weeks
- ☐ 14-16 weeks
- ☐ 16-18 weeks
- ☐ 18-20 weeks
- ☐ More than 20 weeks

V - Open-ended Questions

Are there any more factors that cause delays in the PP processes? If so, please write them below:

If you have any comments, suggestions, or recommendations, then please note them below:

THANK YOU FOR PARTICIPATING IN THIS SURVEY.

Jaafar Mohamed Mohsen

Appendix B: Survey Detail Statistics

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 25-30	14	16.7	16.7	16.7
30-35	12	14.3	14.3	31.0
35-40	14	16.7	16.7	47.6
40-45	18	21.4	21.4	69.0
45-50	6	7.1	7.1	76.2
50-55	9	10.7	10.7	86.9
55 and above	11	13.1	13.1	100.0
Total	84	100.0	100.0	

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Female	24	28.6	28.6	28.6
Male	60	71.4	71.4	100.0
Total	84	100.0	100.0	

Highest Educational/Academic Qualification

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid BSc.	52	61.9	61.9	61.9
High National. Diploma	6	7.1	7.1	69.0
Master's degree	23	27.4	27.4	96.4
Post-Grad. Diploma	3	3.6	3.6	100.0
Total	84	100.0	100.0	

Work Organization

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid AGA	2	2.4	2.4	2.4
BACA	1	1.2	1.2	3.6
CPO	4	4.8	4.8	8.3
DPS	4	4.8	4.8	13.1
EDD	3	3.6	3.6	16.7
Engineering Consultant	18	21.4	21.4	38.1
GDUP	2	2.4	2.4	40.5
MoH	2	2.4	2.4	42.9
MOICSIC	3	3.6	3.6	46.4
MoTT	5	6.0	6.0	52.4
NOGA	3	3.6	3.6	56.0
PSDE	4	4.8	4.8	60.7
PSDW	4	4.8	4.8	65.5
RPDD	11	13.1	13.1	78.6
RPMD	4	4.8	4.8	83.3
SAN	3	3.6	3.6	86.9
SCE	2	2.4	2.4	89.3
SLRB	3	3.6	3.6	92.9
TRA	2	2.4	2.4	95.2
WDD	4	4.8	4.8	100.0
Total	84	100.0	100.0	

Work Field Category

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Issuer Stakeholder (RPDD)	11	13.1	13.1	13.1
Stakeholder (Local Authorities)	55	65.5	65.5	78.6
Engineering Consultant	18	21.4	21.4	100.0
Total	84	100.0	100.0	

Job Status

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Adviser	2	2.4	2.4	2.4
Chief	7	8.3	8.3	10.7
Director	2	2.4	2.4	13.1
Engineer	20	23.8	23.8	36.9
Head	13	15.5	15.5	52.4
Project Manager	11	13.1	13.1	65.5
Senior Engineer	21	25.0	25.0	90.5
Specialist	7	8.3	8.3	98.8
Sr. Technician	1	1.2	1.2	100.0
Total	84	100.0	100.0	

How long has it been since you started working in planning permission?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0-5 years	25	29.8	29.8	29.8
10-15 years	15	17.9	17.9	47.6
15-20 years	4	4.8	4.8	52.4
5-10 years	31	36.9	36.9	89.3
More than 20 years	9	10.7	10.7	100.0
Total	84	100.0	100.0	

Descriptive Statistics			
	N	Mean	Std. Deviation
1.Submitted applications are incomplete or the detailed drawings not final	84	3.7500	1.00451
2.The submitted application has problem with Non-Geo referenced (incorrect coordination X, Y, Z)	84	2.9524	1.20145
3. Submitted unreadable or non-compatible format	N/A		
4. The submitted application is not include all required information (ex. Design calculation, utility cross sections)	84	3.6429	.98962
5.Insufficient number of staff for PP processes reviewer	84	3.7381	1.21357
6.Untrained staff	84	3.0952	1.22837
7.Interstaff conflict (conflict between staff on same authority)	84	2.3452	1.23692
8.Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)	84	3.3571	1.35898
9.Lack of collaboration spirit between authorities	84	3.1071	1.29891
10.Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)	84	2.5714	1.14372
11.An “anti-IT” culture (old mindset)	84	2.3452	1.08099
12. Commence the work without final master plan approval	84	3.5000	1.19739
13. Approved master plan with conflict with private land.	84	3.2976	1.33335
14. Insufficient Right of Way (ROW) to accommodate all stakeholders’ requirements / needs	84	3.9881	1.24662

15. Unrealistic requirements from stakeholders	84	3.5000	1.31259
16. Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)	84	3.5476	1.13440
17. No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers.	84	3.8571	1.15271
18. No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame).	84	3.8333	1.12831
19. Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.	84	3.2381	1.13667
20. Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders	84	3.3810	1.05173
21. Ineffectiveness and inefficiency of the permit process	84	2.6667	1.13364
22. Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection.	84	4.0238	1.09738
23. Lack of proprot process for Inter Utility Work Request (IUWR).	84	3.2738	1.05683
24. Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)	84	3.2024	1.32428
25. Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.	84	3.2857	1.32239
26. Lack of a user-friendly IT system	84	2.8452	1.33077
27. Failure of development firm to provide support to software inadequacies	84	2.7976	1.35130

28. System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.	84	3.0238	1.39687
29. Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)	84	3.5000	1.24668
30. System failure to add additional concern stakeholder after issuing the PP	84	3.3810	1.26971
31. Provide incorrect data / outdated	84	3.3214	1.13180
32. Time required to investigate the existing utilities (request for trail holes, etc.)	84	3.9762	.90482
33. Difficulty to get data in-time	84	3.7738	1.03378
34. Incorporate data from previous projects in same location	84	3.7143	1.04791
35.The comments responses are not directly forwarded to the consultant.	84	3.4881	1.12469
36. No meetings with concern stakeholder are allowed.	84	2.8571	1.22369
37. No access to Tasareeh System to know the PP status	84	3.5952	1.37200
Valid N (listwise)	84		

Correlations

			Issuer Stakeholder (RPDD)	Stakeholder (Local Authorities)	Engineering Consultant
Spearman's rho	Issuer Stakeholder (RPDD)	Correlation Coefficient	1.000	.725**	.590**
		Sig. (2-tailed)	.	.000	.000
		N	37	37	37
	Stakeholder (Local Authorities)	Correlation Coefficient	.725**	1.000	.606**
		Sig. (2-tailed)	.000	.	.000
		N	37	37	37
	Engineering Consultant	Correlation Coefficient	.590**	.606**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	37	37	37

** . Correlation is significant at the 0.01 level (2-tailed).

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
1.Submitted applications are incomplete or the detailed drawings not final	34.215	83	.000	3.75000	3.5320	3.9680
2.The submitted application has problem with Non-Geo referenced (incorrect coordination X, Y, Z)	22.522	83	.000	2.95238	2.6916	3.2131
3.The submitted application has problem with Non-Geo referenced (incorrect coordination X, Y, Z)	22.649	83	.000	2.88095	2.6280	3.1340
4. The submitted application is not include all required information (ex. Design calculation, utility cross sections)	33.738	83	.000	3.64286	3.4281	3.8576
5.Insufficient number of staff for PP processes reviewer	28.231	83	.000	3.73810	3.4747	4.0015
6.Untrained staff	23.094	83	.000	3.09524	2.8287	3.3618
7.Interstaff conflict (conflict between staff on same authority)	17.377	83	.000	2.34524	2.0768	2.6137
8.Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them)	22.641	83	.000	3.35714	3.0622	3.6521

9.Lack of collaboration spirit between authorities	21.924	83	.000	3.10714	2.8253	3.3890
10.Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness)	20.606	83	.000	2.57143	2.3232	2.8196
11.An “anti-IT” culture (old mindset)	19.884	83	.000	2.34524	2.1106	2.5798
12. Commence the work without final master plan approval	26.790	83	.000	3.50000	3.2402	3.7598
13. Approved master plan with conflict with private land.	22.667	83	.000	3.29762	3.0083	3.5870
14. Insufficient Right of Way (ROW) to accommodate all stakeholders’ requirements / needs	29.320	83	.000	3.98810	3.7176	4.2586
15. Unrealistic requirements from stakeholders	24.439	83	.000	3.50000	3.2152	3.7848
16. Lack of coordination between different projects owner (Master Plan, Subdivision, ROW etc.)	28.662	83	.000	3.54762	3.3014	3.7938
17. No enforcement on the stipulated timeline (time frame) on the stakeholders’ reviewers.	30.668	83	.000	3.85714	3.6070	4.1073
18. No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame).	31.138	83	.000	3.83333	3.5885	4.0782

19. Weaknesses in the stakeholder management and lack of coordination between them to conclude the review.	26.109	83	.000	3.23810	2.9914	3.4848
20. Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders	29.463	83	.000	3.38095	3.1527	3.6092
21. Ineffectiveness and inefficiency of the permit process	21.559	83	.000	2.66667	2.4207	2.9127
22. Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection.	33.606	83	.000	4.02381	3.7857	4.2620
23. Lack of proposit process for Inter Utility Work Request (IUWR).	28.391	83	.000	3.27381	3.0445	3.5032
24. Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map)	22.163	83	.000	3.20238	2.9150	3.4898
25. Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders.	22.772	83	.000	3.28571	2.9987	3.5727
26. Lack of a user-friendly IT system	19.595	83	.000	2.84524	2.5564	3.1340
27. Failure of development firm to provide support to software inadequacies	18.975	83	.000	2.79762	2.5044	3.0909

28. System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system.	19.840	83	.000	3.02381	2.7207	3.3269
29. Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking)	25.731	83	.000	3.50000	3.2295	3.7705
30. System failure to add additional concern stakeholder after issuing the PP	24.405	83	.000	3.38095	3.1054	3.6565
31. Provide incorrect data / outdated	26.896	83	.000	3.32143	3.0758	3.5670
32. Time required to investigate the existing utilities (request for trail holes, etc.)	40.276	83	.000	3.97619	3.7798	4.1725
33. Difficulty to get data in-time	33.457	83	.000	3.77381	3.5495	3.9982
34. Incorporate data from previous projects in same location	32.486	83	.000	3.71429	3.4869	3.9417
35. The comments responses are not directly forwarded to the consultant.	28.425	83	.000	3.48810	3.2440	3.7322
36. No meetings with concern stakeholder are allowed.	21.399	83	.000	2.85714	2.5916	3.1227
37. No access to Tasareeh System to know the PP status	24.017	83	.000	3.59524	3.2975	3.8930

Descriptive Statistics			
	N	Mean	Std. Deviation
1. The delays on PP processes affect the efficiency of PP system	84	4.1548	.93775
2. The delays on PP processes affect the functionality of PP system	84	3.9762	.96912
3. The delays on PP processes affect the economics of PP system.	84	3.9167	.98431
Valid N (listwise)	84		

Descriptive Statistics			
	N	Mean	Std. Deviation
1. The delays on PP processes affect the efficiency of projects' development process.	84	4.2262	.78158
2. The delays on PP processes affect the functionality of projects' development process.	84	4.1786	.77864
3. The delays on PP processes affect the economics of projects' development process.	84	4.2500	.72602
Valid N (listwise)	84		

1. Based on your experience, what is the reasonable time to reply to the planning permission applicant?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1-2 weeks	20	23.8	23.8	23.8
2-3 weeks	22	26.2	26.2	50.0
3-4 weeks	21	25.0	25.0	75.0
4-5 weeks	11	13.1	13.1	88.1
More than 5 w	5	6.0	6.0	94.0
within 1 week	5	6.0	6.0	100.0
Total	84	100.0	100.0	

2. Based on your experience, what is a reasonable time to discuss, negotiate and respond to the stakeholder's initial comments and to reach an agreement with them?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 2-4 weeks	36	42.9	42.9	42.9
4-6 weeks	13	15.5	15.5	58.3
6-8 weeks	11	13.1	13.1	71.4
8-10 weeks	3	3.6	3.6	75.0
Less than 2 weeks	18	21.4	21.4	96.4
More than 10 weeks	3	3.6	3.6	100.0
Total	84	100.0	100.0	

3. Based on your experience, what is the optimum time to complete and grant the planning permission from all the stakeholders?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 10-12 weeks	24	28.6	28.6	28.6
12-14 weeks	13	15.5	15.5	44.0
14-16 weeks	7	8.3	8.3	52.4
16-18 weeks	3	3.6	3.6	56.0
18-20 weeks	1	1.2	1.2	57.1
Less than 10 weeks	31	36.9	36.9	94.0
More than 20 weeks	5	6.0	6.0	100.0
Total	84	100.0	100.0	

Suggestion further factors

#	Suggestion further factors	Evaluation
4-	Performance of utilities consultants	A new factor
5-	The Tasareeh system report does not show which comment has been responded and which one is not. The report should show the initial comments were received on this date and were responded back on this date.	Cover on factors number 28, 29 & 30
6-	Sometimes there is urgent projects that is not planned, which may interfere with the process, also renewal process of PP, you can't expect the complete approved PP for a project to be renewed after two years with different comments.	Cover on master plan factors
	In Addition, the corridor allocation process it is the main issue for the utility planning permission, failing to allocate corridors for the main utility will delays and sometime stop the pp approval process.	Cover on factor number 14 and 22
7-	CPO may hire planners rather than coordinators who just circulate the planning permission PP requests to the stakeholders. This committee, with a variety of professions/ backgrounds such as engineers, economists, lawyers, etc., may help in improving the efficiency of PP process.	This is suggestion more than factor. Regard the staff issue is cover on the survey.
8-	Considering the PP as not an important to all stakeholders and projects	Cover on factor number 9.
9-	Lack of suitably qualified staff and non-continuity of staff leads to conflicting of information from authorities	Cover on factor number 6.
10-	Comments are not given at once	A new factor
	PP officers don't have enough authority	Cover on Process and Regulations factors
	Different priorities among stakeholders	Cover on factor number 9.
	PP officers prefer to be in the safety zone	Cover on Process and

		Regulation Factors
11-	Parcel type - Masterplan approval - Changing of requirements - lack of infrastructure services capacity around project to accommodate demand	Cover on Master and plan Category
12-	The lack of staff and to divide the permissions into a group or responsible engineers, all construction and maintenance and special projects engineers must comment in one week and they must be in connect with Tasareeh system.	Cover on factor number 5.
13-	Detailed proposed drawing, with Profile and coordinates is necessary in the first submission.	Cover on factor number 4.
14-	Lack of co-ordination and priority of project implementation by each stakeholder	Cover on factors numbers 9 &16
15-	Upgradation of Tasareeh Portal is needed.	Cover on factors number 28, 29 & 30
16-	Design change time to time	Cover on factor number 1.
17-	In some cases, the consultant who is handling the project, provide late replies or responses to the initial comment.	Same factor suggestion by responses number 1
	Also, some utilities issue a Planning Permission but does not respond to the initial comments and be active on the Planning Permission application only when the project is going to start. In other cases, utilities apply for Planning Permission to take an overall look about the project conflicts, then apply for multiple Wayleaves. Wayleave applications are for projects with smaller scale than Planning Permission (Each granted Planning Permission could enable of applying multiple Wayleaves).	Cover on process and regulation factors
18-	No proper coordination	Cover in master plan factors
19-	Lack of utility system design and detail design before applying for PP	Cover on factor number 1.
20-	Mainly lack of staff.	Cover on factor number 1.
21-	Lack of available corridor and cost to resolve the conflict	Cover on factor number 14.

22-	Lack of coordination between various utility / services stakeholders, conflict with master plan proposals, clarity in master plan proposals implementation etc.	Cover on master plan factors
23-	Some of governmental agencies re submit the same PP before completing the fulfilment of the conditions listed in the initial comments & ask for the approval, that may contribute to wasting the time and efforts of the receiving agency.	A new factor
	Wrong or uncomplete information	Cover on Data factors
24-	Unrealistic corridor requirements by utility agencies, lack of utility corridor standards in Bahrain,	Cover on master plan factors
25-	No coordination with other stakeholder's request. Incompetent consultant throws the pp on stakeholders and expect them to solve their problems	Cover on master plan factors
26-	Planning permissions are the main requirement for the project. But the unrealistic requirements by stakeholders delays the PP as the available ROW is limited.	Cover on the master plan factors
	All the stake holders should cooperate for successful infrastructure project. As all the infrastructure elements are equally important.	Cover on factor number 9.
27-	After the pre planning consultation where the data and requirement is collected from all parties, Planning process or stakeholder management should be done comprehensively. Many stakeholders get to know about the project due to planning permission which is too late for any of the requirements to be incorporated. Thus, focus on making the scheme more inclusive should be done by the Roads or their consultants before applying for planning permission.	Cover under data factors
28-	In some cases, the PP application is forwarded to irrelevant authorities to comment and approve the PP.	Any authority received PP that mean has deal to receive any PP issue by MoW

If you have any comments, suggestions, or recommendations, then please note them below:

#	Comments, Suggestions, or Recommendations	
1-	The Project Managers from the client should be held accountable with showing warnings and colors on the Tasareeh System if the comments of the PP are not being responded on time. If the stake holder is taking more time than required to respond to the planning permission, then the planning permission should be granted. the wayleave second signature procedure should either be exempted or should be electronic as well.	Recommendation
2-	you did not cover the renewal process and its impact on the strategic projects, you can't change the proposal just because two years laps. also, the corridor issue, it is main factor and it cause all the conflict and friction between the stakeholders' representatives, you may consider interviewing some Project managers to get introduced to this problem. all the best.	Comment
3-	I hope soon that all the national strategic Projects be led by experienced committee members, who think out of the box and cover all the aspects that may affect the project prior to submitting the request, for the benefit of our Kingdom.	Suggestion
4-	CPO, UPDA and all the concerned stakeholders should think of way to improve the communication to butter understanding the stakeholder's requirements to avoid any conflict in term of time and project clash	Recommendation
5-	A- I suggest that a periodical meeting to discuss and agree on all issues related to PP B- Assign experience and sufficient staff working only on PP	Recommendation
6-	to ensure that the proper set of documents are submitted, authorities should provide a checklist of all documentation and this can be also reflected on the PP form itself with checkboxes to confirm submission of information	Recommendation
7-	CPO shall play a vital role in strengthening the process	Recommendation
8-	To include ministerial permission/ us permissions within planning permission stage and to be electronic in a good system until it has been approved	Suggestion
9-	It is always better to arrange a site meeting with all the	Recommendation

	responsible Officers of the utilities on site to see the real conflicts with the proposed projects and an immediate comment on the PP can be prepared.	
10-	National strategy to align projects to be implemented by various stakeholders so priorities for each stakeholder will be similar. Due to urbanization, luxury to have wide and separate corridors may not be possible at every location so rationalization required. All stakeholders shall be involved at master planning stage with UPDA to avoid various conflicts at design/implementation stage. Digitization for IUWR will help. Existing IT systems can be refined to make it more user friendly. One IT system to link with PP / Wayleave/ IUWR and Budget will save considerable amount of time plus dashboard view will help decision makers to make informed decisions.	Comment, Suggestion and Recommendation
11-	Precise details need to be attached while submitting the P.P. in Tasareeh system.	Comments
12-	Multiple factors are affecting. Centralized systems to be developed for reducing overall expenditure on the projects.	Comment
13-	Friendly Tasareeh system	Comments
14-	After 4 years of launching the Planning Permission system, there must be enhancements to it to serve its purpose and be more user friendly. Enhancements will increase the efficiency and reliability of the system by providing users with functionalities that help in operating the system in a more flexible manner.	Recommendation
15-	A lot of projects are coming without PP	Comment
16-	The system design including the routing and corridor availability should be finalized before applying for PP	Comment
17-	Issuance of PP to stakeholders not in the e-PP system list to be considered in the e-PP list	Recommendation
18-	CPO should play a leading role in resolving PP issues, Regular Director level meetings shall be arranged between stakeholders to address critical PP issues, PP electronic format should be revised to produce a compact report	Recommendation
19-	Consultants should be made accountable for their submission	Recommendation
20-	Better understanding and cooperation among stakeholders is required to achieve our goal. We are team Bahrain.	Comments

Appendix C: Examples of Questionnaire Responses

An Investigation on the causes of delay with the Planning Permission Processes in Road Projects in the Kingdom of Bahrain

Dear colleague,

We are conducting a survey on the causes of delay with the planning permission process for road projects, causing losses to the stakeholder issuer, stakeholders' responses and the client representative (the project consultant).

This survey is to undertake with support from the University of Bahrain as a requirement subject for the Master's Degree in Engineering Management Major.

We hope that you will feel comfortable through out the survey with a hope to express your feedback/answers as honest as possible. Please note that all your answers will be treated with upmost confidentiality and will only be used for this study.

Therefore, we will be very grateful if you could spend a few minutes to complete the attached questionnaire as thoroughly and as comprehensively as possible. The outcome of this study will depend significantly on how accurate your responses will be.

Thank you in advance for your time and assistance.

Respectfully yours,

Jaafar Mohamed Mohsen Abdulla

Are you working in Planning Permission Processes? *

- ☒ If you answer is "Yes", please answer the following questions
- ☐ If you answer is "no", please do not answer the following questions

PERSONAL PROFILE/ GENERAL DATA

Age *

- ☒ 25-30
- ☐ 30-35
- ☐ 35-40
- ☐ 40-45
- ☐ 45-50
- ☐ 50-55
- ☐ 55 and above

Gender *

- ☐ Male
- ☒ Female

Highest Educational/Academic Qualification *

- ☐ High School Certificate
- ☐ High National. Diploma
- ☐ Post-Grad. Diploma
- ☒ BSc.
- ☐ Master Degree
- ☐ PhD

Work Organisation *

- ☐ PSDE
- ☐ PSDW
- ☒ WDD
- ☐ EDD
- ☐ DPS
- ☐ CPO
- ☐ TRA
- ☐ NOGA (BAPCO)
- ☐ MoH
- ☐ AGA
- ☐ BACA
- ☐ GDUP
- ☐ MoTT
- ☐ MOICSIC
- ☐ BDF
- ☐ MUN
- ☐ SCE
- ☐ RPDD
- ☐ RPMD
- ☐ SAN
- ☐ SLRB
- ☐ Engineering Consultant

☐ Other:

Job Status *

☐ Director

☐ Chief

☐ Head

☐ Project Manager

☐ Senior Engineer

☒ Engineer

☐ Specialist

☐ Adviser

☐ Other:

How long has it been since you started working in planning permission? *

☒ 0-5 years

☐ 5-10 years

☐ 10-15 years

☐ 15-20 years

☐ More than 20 years

FACTORS THAT CAUSE DELAY IN THE PLANNING PERMISSION PROCESSES - Issued Planning Permission Application, Staff & Employees, Master Plan and Processes and Regulations

In your experience, what are the main causes of delays in the planning permission process?

Please select one response for each item that best indicates how often you've experienced each cause of delay in the planning permission process

Please note that, five points Likert-scale, ranging from '1' that equals "Strongly Disagree" to '5' that equals "Strongly Agree" were used on these questions

The following factors related into Issued Planning Permission Application Group

Issued Planning Permission Application

1. Submitted applications are incomplete or the detailed drawings not final *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

2. The submitted application has problem with Non Geo referenced (incorrect coordination X,Y,Z) *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

2. The submitted application has problem with Non Geo referenced (incorrect coordination X,Y,Z) *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

4. The submitted application is not include all required information (ex. Design calculation, utility cross sections) *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

The following factors related into staff and employees Group

Staff and Employees Factors

5. Insufficient number of staff for PP process reviewer *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

6. Untrained staff to reply on PP application *

	1	2	3	4	5	
Strongly Disagree	☒	☐	☐	☐	☐	Strongly Agree

7. Interstaff conflict (conflict between staff on same authority) *

	1	2	3	4	5	
Strongly Disagree	☒	☐	☐	☐	☐	Strongly Agree

8. Interpersonal conflict (conflict between different stakeholders, which they may unwillingness to resolve conflicts rising in between them. *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

9. The staff and employees have Lack of collaboration spirit between authorities *

	1	2	3	4	5	
Strongly Disagree	☒	☐	☐	☐	☐	Strongly Agree

10. Staff attitudes (unfairness, uncooperative, unhelpfulness and untimeliness) *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

11. The Staff and employees have an “anti-IT” culture (old mindset) *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

The following factors related into Master Plan Group

Master Plan Factors

12. Commence the work without final master plan approval *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

13. Approved master plan with conflict with private land. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

14. Insufficient Right of Way (ROW) to accommodate all stakeholders' requirements / needs *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

15. Unrealistic requirements from stakeholders *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

16. Lack of coordination between different projects owner (Master Plan, Subdivision, ROW and etc.) *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

The following factors related into Processes and Regulations Group

Processes and Regulations Factors

17. No enforcement on the stipulated timeline (time frame) on the stakeholders' reviewers. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

18. No enforcement on the applicant to respond on stakeholders comment within the stipulated timeline (time frame). *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

19. Weaknesses in the stakeholder management and lack of coordination between them to conclude the review. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

20. Lack of appeals process for resolving conflicts between applicants and local authorities/ concern stakeholders *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

21. Ineffectiveness and inefficiency of the permit process *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

22. Prolonged time to reach an agreement on stakeholders' assets relocation/ Protection. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

23. Lack of proper processes for Inter Utility Work Request (IUWR). *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

FACTORS THAT CAUSE DELAY IN THE PLANNING PERMISSION PROCESSES - Technology and Software , Project Data & Consultant's Issues Groups

In your experience, what are the main causes of delays in the planning permission process?
Please select one response for each item that best indicates how often you've experienced each cause of delay in the planning permission process

Please note that, five points Likert-scale, ranging from '1' that equals "Strongly Disagree" to '5' that equals "Strongly Agree" were used on these questions

The following factors related into Technology and Software Group

Technology and Software

24. Ineffective and inefficient use of information technology in the Planning Permission regulatory process (not updated base map) *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

25. Incompatibility of software for reviewing the application (each stakeholder uses different software) between concern stakeholders. *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

26. Lack of a user-friendly IT system (Tasareeh System) *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

27. Failure of development firm to provide support to software inadequacies *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

28. System failure to issue the PP online to agencies / authorities outside the registered stakeholders with system. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

29. Need for improvement of Tasareeh web site (need for website to provide easy access to permit status tracking) *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

30. System (Tasareeh) failure to add additional concern stakeholder after issuing the PP *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

The following factors related into Project Data

Project Data Factors

31. Provide incorrect data / outdated *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☒	☐	☐	Strongly Agree

32. Time required to investigate the existing utilities (request for trail holes, etc.) *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

33. Difficulty to get data in-time *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

34. Incorporate data from previous projects in same location *

	1	2	3	4	5	
Strongly Disagree	☐	☒	☐	☐	☐	Strongly Agree

The following factors related into Consultant's Issues Group

Consultant's Issues Factors

35. The comments responses are not directly forwarded to the consultant. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

36. No meetings with concern stakeholder are allowed for the consultant. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☒	☐	Strongly Agree

37. No access to Tasareeh System to know the PP status for the consultant. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☒	Strongly Agree

Evaluate the effect of that delay in terms of efficiency, functionality, and economics

A- Effect of PP process's delay on the PP system itself

In your experience, what are the effects of that delay in terms of efficiency, functionality, and economics of Planning permission system?

Please note that, five points Likert-scale, ranging from '1' that equals "Very Low" to '5' that equals "Very High" were used on these questions

1. The delay on PP processes affect the efficiency of PP system *

	1	2	3	4	5	
Very Low	☐	☒	☐	☐	☐	Very High

2. The delay on PP processes affect the functionality of PP system *

	1	2	3	4	5	
Very Low	☐	☐	☐	☒	☐	Very High

3. The delay on PP processes affect the economics of PP system. *

	1	2	3	4	5	
Very Low	☐	☐	☐	☒	☐	Very High

B- Effect of PP process's delay on the projects' development processes

In your experience, what are the effects of that delay in terms of efficiency, functionality, and economics on the projects' development process?

Please note that, five points Likert-scale, ranging from '1' that equals "Strongly Disagree" to '5' that equals "Strongly Agree" were used on these questions

1. The delay on PP processes affect the efficiency of projects' development process. *

	1	2	3	4	5	
Very Low	☐	☒	☐	☐	☐	Very High

2. The delay on PP processes affect the functionality of projects' development process. *

	1	2	3	4	5	
Very Low	☐	☐	☐	☒	☐	Very High

3. The delay on PP processes affect the economics of projects' development process. *

	1	2	3	4	5	
Very Low	☐	☐	☐	☒	☐	Very High

IV- Estimate the required time

1. Based on your experience, what is the reasonable time to reply to the planning permission applicant? *

- ☐ within 1 week
- ☐ 1-2 weeks
- ☒ 2-3 weeks
- ☐ 3-4 weeks
- ☐ 4-5 weeks
- ☐ More than 5 weeks

2. Based on your experience, what is a reasonable time to discuss, negotiate and respond to the stakeholders' initial comments and to reach an agreement with them? *

- ☐ Less than 2 weeks
- ☒ 2-4 weeks
- ☐ 4-6 weeks
- ☐ 6-8 weeks
- ☐ 8-10 weeks
- ☐ More than 10 weeks

3. Based on your experience, what is the optimum time to complete and grant the planning permission from all the stakeholders? *

- ☐ Less than 10 weeks
- ☐ 10-12 weeks
- ☒ 12-14 weeks
- ☐ 14-16 weeks
- ☐ 16-18 weeks
- ☐ 18-20 weeks
- ☐ More than 20 weeks

V - Open-ended Questions

Are there any more factors that cause delays in the PP processes? If so, please write them below:

If you have any comments, suggestions, or recommendations, then please note them below:

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الملخص

تتمثل عمليات " تصريح التخطيط " في نظام لطلب الموافقة وتصريح العمل من قبل السلطات المحلية (أصحاب المصلحة) خلال مرحلة التخطيط للمشاريع. تهدف هذه العمليات إلى تجنب أي تأخير في التنسيق أو التعارض الذي قد يحدث مع السلطات المحلية الأخرى أثناء مرحلة التنفيذ للمشاريع من خلال دمج جميع متطلبات المشاريع الحكومية المستقبلية التي سيتم تنفيذها في نفس الموقع في المستقبل. استنادًا إلى البيانات الإحصائية لهذا النظام، لوحظ أن 59% من الرخص معلقة لأكثر من 300 يومًا و 10% فقط معلقة لمدة تقل عن 50 يومًا. هذا يعني أن هناك تأخيرات كبيرة في هذا النظام، وهذه تعتبر واحدة من أكثر المشاكل شيوعًا والتي تسبب التأخير في مراحل تخطيط المشاريع. وعليه تهدف هذه الأطروحة لاستقصاء العوامل التي تسبب التأخير في عمليات رخص العمل المستقبلية في مشاريع الطرق في مملكة البحرين من خلال مراجعة طلبات الرخص المقدمة من شؤون الطرق للحصول على الموافقات من السلطات المحلية والاستشاريين. ستساعد هذه الدراسة في تحسين فهم هذه العوامل وتأثيرها على مشاريع الطرق. ومن أجل تحقيق الهدف من هذه الأطروحة، أجريت مراجعة للأدبيات (البحوث والنصوص) السابقة لتحديد العوامل الأولية التي تسبب التأخير في هذا النظام، ومن ثم تم اعتماد الأسلوب النوعي من خلال إجراء ثماني مقابلات مع مجموعة من الخبراء لوضع اللمسات الأخيرة على القائمة الأولية وإنشاء قائمة شبه نهائية لهذه العوامل. وأخيرًا، تم استخدام استبانة منظمة تعتمد على قائمة العوامل شبه النهائية، وقد تمت الإجابة عليها من قبل بعض مؤسسات السلطة المحلية والاستشاريين الهندسيين في مملكة البحرين. تم توزيع مئة وواحد (101) استبانة، وكان عدد الاستجابات هو أربعة وثمانين (84) إجابة، والتي أعطت معدل استجابة بنسبة 83.2%. استخدمت One-Sample T-Test و Bivariate Analysis كأدوات إحصائية لتحليل الإحصائيات الوصفية المكونة. وقد أظهرت نتائج الاستبانة أن أهم العوامل التي تسبب التأخير في عمليات رخص العمل المستقبلية هي الوقت الطويل للوصول إلى اتفاق بشأن نقل الخدمات أو الممتلكات التابعة للسلطات المحلية الأخرى وحمايتها، وعدم كفاية حرم الطريق لاستيعاب جميع متطلبات واحتياجات السلطات المحلية، إضافة إلى الوقت اللازم للتحري عن الخدمات الحالية (الحفر التجريبية، إلخ) وعدم وجود قانون يجبر أو يلزم السلطات المحلية على الرد في الجدول الزمني المحدد (الإطار الزمني). وكل ذلك تسبب في آثار سلبية ومؤثرة على كفاءة ووظائف واقتصاديات المشاريع بشكل كبير. بناءً على ردود الاستبانة، قدمت الدراسة عدّة توصيات مع نموذج جديد مقترح، يقترح بعض الحلول التي قد تساعد السلطات المحلية على تحسين نظام " تصريح التخطيط " وإكمال العمليات وفقًا للجدول الزمني المحدد.

جامعة البحرين

كلية الهندسة

قسم الهندسة الميكانيكية



الاستقصاء عن أسباب التأخير في عمليات تصريح التخطيط لدى مشاريع الطرق في مملكة البحرين

أطروحة مقدمة كجزء من متطلبات الحصول على درجة

(الماجستير) في برنامج الإدارة الهندسية

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