King Fahd University of Petroleum and Minerals
College of Industrial Management

Construction Management

CEM – 520

Term paper Project of:

Build, Operate and Transfer (BOT) Project Delivery System in Saudi Arabia (Thesis)

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December 2003

Preface

This is a brief term paper of a thesis written and presented by "Muhammad Jalaluddin Shah" to the deanship of graduate studies of King Fahd University of Petroleum & Minerals, in partial fulfillment of the degree requirements of the master of science in Construction Engineering and Management (Decemeber 2001).

The title of the thesis is (BOT) Build, Operate and Transfer – Project delivery system in Saudi Arabia. This term paper includes power point presentation of the same subject. And it has been prepared, compiled and collected by Sameer Ibrahim Al Mubarak.

Introduction

Saudi Arabia's privatization and economic diversification efforts have gained a new momentum with the formation of the Supreme Economic Council (SEC) in 1999. Formation of such a high-powered economic body is a serious step toward vital economic reforms and privatization process. Traditionally, financing of large-scale investment projects such as infrastructure development was solely considered the responsibility of the public sector. However, recently, a growing number of counties have started to implement various privatization programs such as, "Build-Operate-Transfer", "Build-Operate-Own", "Build-Lease-Transfer", "Build-Own-Operate-Transfer" and "Build-Transfer-Own".

Build-Operate-Transfer (BOT) is a project delivery method in which a private entity, usually a consortium is responsible for financing, construction, operation and maintenance of the facility for agreed duration called concession period and at the end of the period, transfers the ownership of the facility to the Government.

- Keeping in tune, with the recent developments, the Saudi Government is also encouraging he private sector participation in the development of infrastructure facilities such as railways, airports, power plants, water supply facilities, ports etc. The Government in an attempt to reduce it's spending is attracting private capital in increasing volumes to overcome the financing limitations. The Saudi Arabia government has already put forward a program to restructure communication and electricity sectors etc.

STATEMENT OF PROBLEM

Saudi Arabia has witnessed a remarkable economic transformation. However, as the funding for large scale investment projects are becoming increasingly scarce, there is a growing trend of involving the private sector in the development of infrastructure facilities such as roads, bridges, railways, airports, power plants, water treatment facilities, etc. There are also serious problems associated with expanding the infrastructure in such areas as electricity, education, housing and health care facilities.

In this environment, increased private sector participation will help in the realization of large-scale infrastructure projects with minimum burden on government. Moreover, in recent years, the high population growth rate has necessitated the construction of new facilities as well as maintenance and rehabilitation of existing structures. "Build-Operate-Transfer", "Build-Operate-Own", and "Build-Lease-Transfer", "Build-Own-Operate-Transfer" and "Build-Transfer-Operate" models are popular project delivery systems adopted globally for development of infrastructure. These models can stimulate economic activity and create substantial foreign direct investment create opportunities for local private sector in the kingdom and help in creating stronger private sector and jobs. Thus, the feasibility of implementing BOT project delivery system in Saudi Arabia needs an investigation.

Objectives of the Research

The Objectives of the research are:

1. To study the feasibility of implementing BOT delivery system in Saudi Arabia.
2. To identify and assess the impact of obstacles and success factors for successful implementation of BOT delivery system in Saudi Arabia.
3. To identify appropriate type of construction project/markets which could be possibly implemented through BOT procurement system.

SIGNIFICANCE OF STUDY

The study on the feasibility of implementation of Build Operate Transfer delivery system in Saudi Arabia is timely, as it coincides with the Saudi Government desire to increase the role of private sector. The privatization drive, which is currently underway, would contribute to the expansion of infrastructure development relying less on the Government's budget. The current Seventh "Five Year Development Plan" emphasizes continued strengthening of private sector participation in infrastructure development. In this environment, increased private sector participation in through "Build-Operate-Transfer", "Build-Operate-Own", and "Build-Transfer-Own" models can stimulate economic activity and create opportunities for the local private sector as well as attract foreign capital and also provide employment opportunities. Moreover in Saudi Arabia, a very limited research has been conducted in the field of BOT and privatization, and hence this study will be directed towards understanding the issues and success factors involved in the implementation of BOT and such a study will help in understanding the roles of private and public sectors.

Literature Review

Definition of BOT

The term Build-Operate-Transfer (BOT) was project delivery method, a private entity, usually a consortium is responsible for financing, construction, operation and maintenance of the facility for agreed duration known as Concession period and at the end of he period, transfers the ownership of the facility to the government.

BOT as defined "the granting of a concession by the government to private promoter, known as concessionaire, who is responsible for financing, construction, operation, and maintenance of a facility over the concession period before finally transferring the fully operational facility to the government at no cost." Although BOT is a new concept, it has been widely used in Asian countries like China, Philippines, Hong Kong and Malaysia. Most of the BOT projects are power plants, and toll roads.

Increased acceptance of BOT projects can be attributed to the following factors

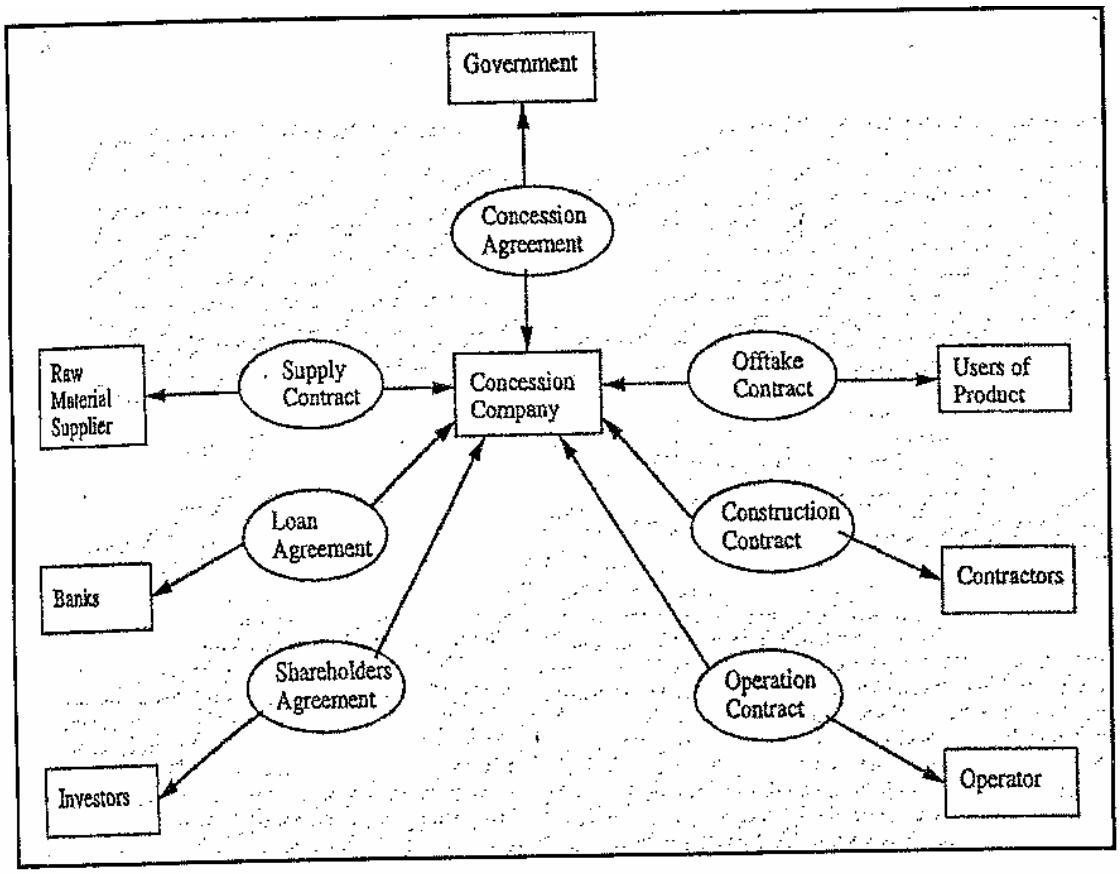
- "Rapid economic growth and urbanization coupled with trend towards globalization of economies
- Demand for better quality and service
- Cost effectiveness and choice of infrastructure services are increasingly important for international competitiveness."

The Table shows Top Ten Private Infrastructure Investment Projects during 1984-1995

Location	Project	Contract	Cost (US$ millions)
France/United Kingdom	Channel Tunnel	BOT, 55 years	19,000
Taiwan (China)	Taipei Mass Rapid Transit System	BOT	17000
Japan	Kansai International Airport	BOT	15,000
Argentina	Buenos Aires water and sewer Services	ROT, 30 years	4,000
Thailand	Telecom Asia communication Network	BTO, 25 years	4,000
China	Daya Bay Nuclear Power Plant, Phase 1	BOO	3,700
Malaysia	North-South Toll Expressway	BOT, 30 years	3,400
Mexico	Petacalco Coal-fired power Plant	BOT	3,000
Thailand	Bangkok Elevated Road and Train System	BOT, 30 years	2,981
BOO= Build-Own-Operate; BOT=Build-Operate-Transfer; BTO=Build-Transfer-Operate ROT= Rehabilitate-Operate-Transfer			

BOT Contractual Structure

Table shows the typical contractual structure for a BOT project (Ngee et al, 1997)



A BOT mechanism is a complex structure comprising multiple, inter-dependent agreements among various participants. Major participants in BOT project include government, private company called concessionaire, lenders (Banks), equity investors, contractors, suppliers, operators and financial advisers. Typically the government grants concession to the private sector (concessionaire). The concession is awarded through concession agreement. The concessionaire is responsible for design, finance, construction, and operation of the facility. The concessionaire retains he title of ownership during the concessionary period, which is normally 10-50 years, after which the title of ownership is transferred back to the government.

A BOT project has the following agreements

- Concession agreement
- Loan agreement
- Shareholders agreement
- Construction contract
- Supply contract (Equipment/Material/Fuel supply contract)
- Off-take agreement
- O & M agreement

Concession Agreement

The concession agreement is between the government and the concessionaire. The concession agreement is regarded as the "heart" of a BOT project as it determines the commercial viability and profitability.

A concession agreement includes the following:

The concession period
The construction duration
Toll/tariff structure with toll/tariff revision provisions
Rights and obligations of both parities
Government guarantees: The host government offers guarantees to the project promoters (concessionaire) like supporting loans, guarantees of minimum operating income etc.

Loan Agreement

The loan agreement is between the lenders (i.e. Banks) and the concessionaire. The Banks provide the much necessary debt to the concessionaire. Bank debt is the primary source of financing for a BOT infrastructure project.

Shareholder Agreement

The shareholder agreement is between the equity investors and the concessionaire.

Construction Contract

The construction contract is between the contractor and the concessionaire. The contract is usually let under fixed price turnkey contract.

Supply Contract (Equipment/Material)

An agreement between the supplier and the concessionaire. The supplier in a supply contract is often government agency that supplies raw material such as coal to power plant and oil.

Off-take Agreement

An agreement between the government and the concessionaire to purchase minimum quantity of services such as electricity, water at fixed price for fixed term.

Operation and Maintenance Contract (O & M Contract)

An agreement between the concession company and the operator. The operation phase Plays a very important role in the success of BOT project as is success is tied to its revenue generating ability. The operation phase of build-operate-transfer projects presents the great management challenge and demands the highest level of attention.

Types of BOT

Build-Operate-Transfer (BOT) is a generic term taking different forms. The other major types are Build Operate Own (BOO), Build Transfer Operate (BTO), Build Lease Transfer (BLT).

Build-Operate-Transfer (BOT): The private sector (concession company) is responsible for design, finance, construction, operation and maintenance of the facility. The title of ownership is retained by the concession company during the concession period. The facility is transferred to the government at the end of concession period. Example: Channel tunnel, France and UK.

Build-Operate-Own (BOO): The private sector (concession company) is responsible for design, finance, construction, operation and maintenance of the facility. Here the title of the ownership remains with the concessionaire. There is no transfer of ownership to government. Example: Taweelah A2, Abu Dhabi.

Build-Transfer-Operate (BTO): The private sector (concession company) constructs the facility and transfer the ownership to the government. The concessionaire operates the facility by taking a contract to operate the facility. Example: Telecom Asia communication network, Thailand.

Build-Lease-Transfer (BLT): The private sector (concession company) constructs the facility and leases the facility o the government. The facility will be transferred to government at the end of concession period.

Characteristics of BOT Project

BOT projects have unique characteristics that distinguish them from other project delivery methods. The following are some of the their unique characteristics:

1. BOT projects are financed on a project finance basis with limited recourse. Typically in limited recourse financing, the lenders provide debt to the concession company solely based upon expected cash flow/revenue generating capacity of the project. Financing is provided on the merit of the revenue generating capacity of the project rather than the assets of the concessionaire company.
2. A key characteristic of BOT projects is raising of finance entirely by the private sector without the involvement of government. The private sector is fully responsible for a design, construction, finance and operation and maintenance.
3. BOT projects are complex structures comprising multiple interdependent agreements among the various participants.
4. BOT projects are typically large-scale infrastructure projects. Transaction costs amount on average 5 to 10% of total project cost.
5. BOT projects are associated with uncertainties and high risk.
6. BOT projects transfer the risk to the private sector.
7. BOT formula can be applied to any sector of the economy. But it has been used widely in power plant sector, transportation and telecommunications.

Advantages of BOT Projects

1. Key advantages of privatization are as follows.
    - The private firms are more efficient, hence project or service can be delivered at lower cost
    - Private firms are more innovative in selection of design and operation phases of a project or service.
2. The private sector invests directly in the development of infrastructure, thereby reducing public debt, balancing the budget deficit, and reduced role of public sector.
3. BOT projects create business opportunities for the local private sector, create employment avenues as well as attract substantial foreign direct investment.
4. BOT projects help in facilitating transfer of technology by introducing international contracts in the host countries.

Disadvantages of BOT

I. Transaction costs are high, they amount to 5-10% of total project cost

2. Not suitable for smaller projects. Victorian Government of Australia has suggested that projects with a value of less than Australian dollar $15m are unlikely to gain benefits from BOT delivery method.

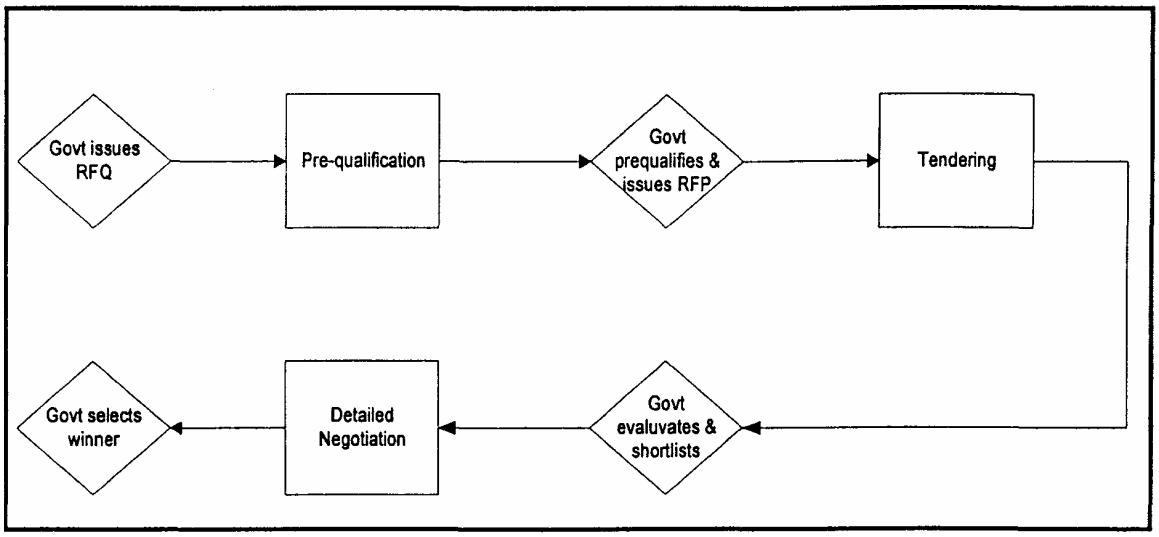
3. The success of BOT project depends upon successful raising of necessary finance. Various costs such as cost of construction, equipment, maintenance should be committed during the life of the project.

4. BOT projects are successful only when substantial revenues are generated during the operation phase.

Competitive Tendering Process / Bid Evaluation Procedures

The typical evaluation and selection process in a competitive tender is shown in Figure 2.

Pre-qualification: The main aim of the request for qualification (RFQ) is to shortlist a of competitive proposals by consortia that consists of reputable and experienced operators and bankers *(Tiong*, 1997).



The figure shows the: Selection Process in a Competitive Tender of BOT Project

Nonetheless pre-qualification would eliminate and discourage the non-serious promoters.

Critical Success Factors (CSF):

BOT projects are characterized by high risk and cost overruns. Tiong et al (1992) identified six Critical Success Factors (CSF) that are vital for project promoters in winning a BOT contract. These factors are:

- Entrepreneurship and leadership
- Right project identification
- Strength of consortium
- Technical solution advantage
- Financial package differentiation
- Differentiation in guarantees

Risk Sharing/Management

Risk Allocation:

Risk management plays an important role in the BOT projects. Given the multiple complex agreements between the various members of the consortium, in which each member is interested in different stages of project, proper allocation of risk is a prerequisite for the success of BOT project.

Types of Risk:

The major types of risk in BOT project are:

- Political risk
- Currency and foreign exchange risk
- Cost overrun risk
- Delay risk
- Tariff adjustment risk
- Market risk
- Operation risk
- Force majure risk

Case Studies of BOT Projects

The Following are the case studies (examples) that illustrate the different characteristics and aspects of BOT project delivery method.

Each of these cases presented highlight the contractual structure employed, major participants and their roles and responsibilities.

These are as follows:

- Sydney Harbour Tunnel, Australia
- Labin 'B' Power Plant, China
- Taweelah A2 Project, Abu Dhabi
- Tates Carin Tunnel, Hongkong

Sydney Harbour Tunnel, Australia

A joint venture of Kumagai Gumi of Japan and Transfield, a local Australian construction company was awarded the concession by the Australian government. It was the first BOT project and one of he largest privately funded project in Australia.

Labin 'B' Power Plant, China

The authorities of the Province of Guangxi in the People's Republic of China awarded in 1996 a consortium of Electricite de France (EDF), and GEC ALSTHOM a concession for a period of 18 years including the construction period of 3 years.

Taweelah A2 Project, Abu Dhabi

Taweelah A2 project consists of four main contractual agreements:

- Power and Water Purchase Agreement (PWPA)
- Project Company Shareholders' Agreement
- Shared Facilities Company Shareholders' Agreement
- Land Lease Agreements

Tates Carin Tunnel, Hongkong

Tates carin tunnel project was won by Tates Carin Tunnel Company, a joint venture between Gammon and Nishimatsu. The concession period for Tates carin tunnel project is 30 years.

Research Methodology

Research Plan

The study identities and assesses the impact of obstacles and success factors that affect application of BOT delivery system in Saudi Arabia.

Phases of Research

Phase 1: Literature Review

The required information was collected from the following sources:

- Local business magazines, journals and newspaper articles
- International journals related to Construction Engineering & Management
- Publications and research reports prepared by various commercial books,
- World Bank and other organizations
- Internet
- Published BOT contracts/conditions

Phase 2: Identification of Factors that have an impact on Application of BOT

Data regarding the following issues was collected:

- Major attraction or positive factors affecting the application of BOT delivery system in Saudi Arabia
- Obstacles or negative factors hindering the application of BOT delivery system in Saudi Arabia
- Areas of construction project/markets where BOT project delivery system could be implemented

Phase 3: Assessment Of Impact Of Obstacles And Success Factors

The third phase included assessment of impact of obstacles and success factors identified in phase 2.The assessment was determined from content analysis of documented publications from multiple sources including:

- Local business magazines, newspapers
- Research reports
- Publications prepared by various commercial banks
- Official documents concerning the Saudi Arabian five year development plan
- Investment rules etc.

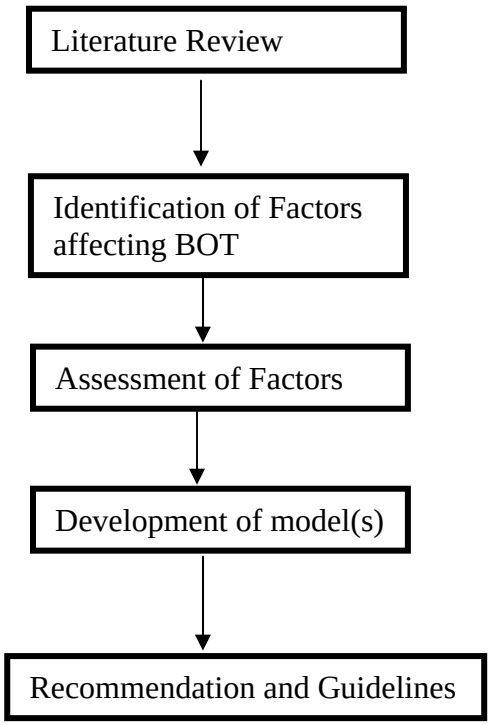
This. approach was selected over the traditional "opinion survey" for the following reasons:

- Lack of familiarity of potential respondents with the BOT delivery system.
- Difficulty in formulating a questionnaire or an interview schedule to accurately communicate the factors and their impact.
- Very low response rate of survey studies in previous CEM research conducted in Saudi Arabia.

The initial phase of the study was focused on identifying the factors, (both positive and negative) which affect the application of BOT in Saudi Arabia. This was followed by studying the evidence to assess the relevance and impact of the factors identified in phase 2. An analytical framework was developed in the form of model by a thorough examination of success factors and obstacles. Through this examination process, specific issues were identified that required the input of experts or decision makers. Once deemed appropriate, the input of such individuals was solicited.

Development of Model(s) and Guidelines / Recommendation for Implementation of BOT

Based upon a positive outcome of phase 3 in regards to the feasibility of adopting BOT, phase 4 will propose model(s) and associated parameters/conditions for implementing BOT delivery system in Saudi Arabia. It will propose formal guidelines for the implementation of BOT delivery system in Saudi Arabia. It will also identify the appropriate type of construction projects/markets, which could be possibly implemented through Build Operate Transfer (BOT). the Figure presents the methodology in a flowchart form.



CONCLUSION & RECOMMENDATIONS

Summary of the Study:

In Saudi Arabia, financing of large-scale investment projects such as infrastructure development was predominantly undertaken by the Government through its budgetary allocation. Millions of dollars have been invested for the development of modem and efficient infrastructure. Nonetheless, rapid urbanization, industrialization and population growth have dramatically increased the demand for the development of new and expansion of the existing facilities. It is estimated that $250 billion will needed to be invested to finance projects related to power, water desalination, roads, etc. in the next 10 to 20 years. Based upon 25 year long term electricity plan. about $117 billion need to be invested in electricity alone between 1998 and 2023. Thus it is becoming clear that the investment requirements are huge and immense and Government alone cannot bear the burden of provision of infrastructure development. It is also widely recognized that private sector participation will be needed for the development and expansion of power generation, water desalination, roads, ports, airports and railways.

Currently Build Operate Transfer (BOT) is promoted as an integral part of the privatization policy in Saudi Arabia. BOT is a project delivery method m which a private entity, usually a consortium is responsible for financing, construction, operation and maintenance of the facility for agreed duration called concession period and at the end of the period, transfers the ownership of the facility to the Government. As Saudi Arabia is gearing up for the introduction of BOT, it is very important to identify the factors, which effect the application of BOT in Saudi Arabia. One of the major challenges is to identify the impact of obstacles and success factor on the successful implementation of BOT delivery system in Saudi Arabia. The objective of this research is to study the feasibility of implementing BOT delivery system in Saudi Arabia. For this reason a critical review of the operating environment in Saudi Arabia was analyzed by employing content analysis.

The major positive factors for application of BOT in Saudi Arabia are:

• Strong government commitment
• Availability of finances from Government and commercial institutions
• Demand for electricity generation, water desalination, etc.
• New foreign investment law.

The major obstacles in Saudi Arabia for the application of BOT are:

• Lack of adequate awareness among owners and contractors regarding the BOT concept
• Lack of independent regulatory body
• Insufficient cost recovery

Conclusions and Recommendations:

The following conclusion and recommendations can be drawn up from the study.

General Recommendations

BOT delivery method is an attractive and desirable.

The study indicated that across all the types of infrastructure projects, power generation and water desalination appear at present to leading the push for the application of BOT delivery method.

There are considerable opportunities for the private sector to be involved in BOT type arrangements in transportation infrastructure projects such as railways, roads, and airports.

In assessing the obstacles for the application of BOT in Saudi Arabia, lack of adequate awareness among owners and contractors regarding the BOT concept and low service fee represent significant impediment in the way of adopting BOT.

Establishment of BOT center can be the key to disseminate the knowledge and help in the understanding the issues involved, best practices in the design and structuring of BOT projects. An example of such a unit is the Philippines BOT center. The BOT center in the Philippines is a pioneer and one of the most successful in the world. Similarly a BOT center should be established with the following objectives:

- To disseminate information and knowledge regarding the public-private partnership practices
- To serve as the main channel between the private sector investors and government with aim of coordinating the implementation of BOT projects.
- To pool specialized resources and specialists to provide better understanding of fundamentals of BOT arrangements.

To promote BOT investment opportunities to the project promoters locally and internationally.

To gain better understanding on drafting concession agreements and other contractual aspects of BOT.

Thus In order for the successful implementation of BOT in Saudi Arabia significant changes to existing laws will be required. This includes the need to create independent regulatory bodies in each of the infrastructures sectors, namely Power sector, water sector, and transport sectors.

There is a need for dealing for legislation dealing with the implementation of BOT projects. Existence of such legislation would provide guidelines for potential private sector participation. The legislation should include, evaluation criteria, procurement rules of tenders/proposal, the role of government support, sectors where BOT project are allowed, etc.

Each infrastructure sector has unique characteristics and significant differs from other sectors. Hence it is recommended that a more narrow approach in needed to investigate each type of infrastructure sectors and study to determine the applicability of BOT. For example. BOT for power generation, or BOT for water supply, BOT for waste water treatment etc.

It would be sound to explore the role of international institutions such World Bank. UNIDO in design and structuring of the BOT projects, providing training and knowledge build m various legal, financial, economic aspects of BOT.

With the establishment of Supreme Commission for Tourism (SCT), airport expansion and development is being looked as part of provision of tourist related infrastructure considering the strategic national importance of airports, BO projects are more acceptable compared to BOT type projects.

The private sector can play a role in expansion of existing airports, rehabilitation, operation and maintenance of the airports.