**Demand Analysis and Commercial Viability**

The starting point for assessing any project must be the identification of demand and benefits. An understanding of these factors is critical because they determine whether the investment will be of value - either because people want to buy the output, in the case of income generating projects (housing, power generation), or because the investment contributes to the quality of their lives, in the case of social, environmental and support projects.(public park, flyover)

The method of estimating demand will vary according to the product or service being offered.

1. **Estimating Demand in the Presence of Markets**

The market is critical for any investment that is made with the intention of generating income and profits. Where a product or service is to be sold, the amount that people will buy is the measure of demand for that product. No income generating project can sustain itself if it fails to respond to the demands of the market. This means that when producing a product or service and delivering it to the buyer, the project must fulfil the characteristics that the buyers are looking for, in terms of volume, price, packaging, quality, and seasonality of supply, among other factors. If this is done, the product or service will be sold and money generated to continue operations and cover the cost of the investment.

The evaluation of demand (existing or potential) for a proposed product or service must therefore be the first step in determining whether an investment is feasible or not.

The evaluation of demand not only determines the general feasibility of the investment and often the scale of output, it may also have an important impact on the characteristics of the product to be generated, the technology applied; the inputs that can be used; and the scheduling of activities. Consequently, any investment proposal that fails to present an explicit examination of the market is, by definition, inadequate.

Some Failed projects because of inaccurate industrywide demand forecasts. For example:

* In 1974, U.S. electric utilities made plans to double generating capacity by the mid-1980s based on forecasts of a 7% annual growth in demand. Such forecasts are crucial since companies must begin building new generating plants five to ten years before they are to come online. But during the 1975–1985 period, load actually grew at only a 2% rate. Despite the postponement or cancellation of many projects, the excess generating capacity hurt the industry financial situation and led to higher customer rates.
* The petroleum industry invested $500 billion worldwide in 1980 and 1981 because it expected oil prices to rise 50% by 1985. The estimate was based on forecasts that the market would grow from 52 million barrels of oil a day in 1979 to 60 million barrels in 1985. Instead, demand had fallen to 46 million barrels by 1985. Prices collapsed, creating huge losses in drilling, production, refining, and shipping investments.

2. **Estimating Demand in the Absence of a Market**

The reliable determination of demand levels and prices can be difficult. However, in the absence of markets for the products or services generated by the investment, the estimation of the demand is even more complex. When a product is sold, the buyers of that product are its clients or beneficiaries, and the demand corresponds to the number of products sold to them. Of even greater importance is that it may be assumed that the market will give a clear indication of the value of the product, thereby facilitating the estimation of benefits. But if the product is something like the protection of an ecosystem or a campaign for vaccinating children, then who are the beneficiaries? What is the level of demand? What value can be assigned to the products or services generated?

This problem is encountered by everyone who designs and finances investment projects which generate benefits without direct consumer markets, such as roads, health care centres, reforestation, etc.

A significant market failure is the failure to produce some goods and services, despite being needed or wanted. Markets can only form under certain conditions, and when these conditions are absent markets may struggle to exist. The most extreme case of a **missing market** is the case of pure public goods.

Pure public goods clearly provide a benefit to the consumer, but, for several reasons, are unlikely to exist in a market economy. Examples of pure public goods include national defence, the police service, and street lighting. Because markets for these goods are not likely to form they are called missing markets and are considered a special case where demand exists, but supply is absent.

The market mechanism is likely to fail to supply pure public goods because entrepreneurs are unlikely to enter the market, given the impossibility of charging consumers at the point of consumption. Such as providing street lighting

Example of missing market - When a factory discharges polluted water into a river, that pollution can hurt people who fish in or get their drinking water from the river downstream, but the factory owner may have no incentive to consider those consequences.

**Commercially viable project**

A commercially viable project ensures that,

#### (1) adequate revenues from project services and from other dedicated sources will cover project capital costs and operations and maintenance (O&M);

#### (Example - [Operation & Maintenance of Water Treatment Plant at Warje, Pune](https://vilindia.com/water/water-o-m/o-m-of-water-treatment-plant-at-warje-pune)

By Vishwaraj Infrastructure Ltd)

(2) is socially inclusive and operates in a systemic and sustainable basis;

Example – Project NIRMAAN- INFRASTRUCTURE RELATED INTERVENTIONS - Darrang which is also identified as an aspirational district is situated in the central part of Assam and on the northern side of the river Brahmaputra. BPCL is supporting construction of 80 additional classrooms with allied facilities in identified 30 Government Primary Schools. The allied facilities include benches, desks, tables, chairs, etc. and the project aims to create an advantageous & safe learning atmosphere for the school students. The main beneficiaries will be around 10,000 students including both boys and girls enrolled in these 30 schools.

(3) is environmentally sustainable;

Examples - ITC Green Center, Gurugram

Patni (i-GATE) Knowledge Center, Noida

Infosys, Hyderabad

CISCO, Bangalore

(4) has a regulatory framework to enforce quality of service, preservation of public interest, and economic sustainability.

Commercially viable projects are capable of attracting private and institutional investment to pay for the capital costs. Repayment of this initial investment occurs over many years, and therefore, an owner needs to pay special attention to the long-term sustainability of the O&M of the infrastructure. For this reason, project risks need to be identified and addressed up front. Market demand is equally important to sustainability from the point of fully utilizing the services and paying user charges.

From the financial perspective, a project or contract is considered to be feasible when the expected revenues (inflows) under a reasonable scenario are considered to be sufficient to cover all expected costs (outflows), that is, all operation and maintenance costs, financial costs (interests), taxes, payback of debts, and payback of the invested equity with a reasonable return. The purpose of the commercial feasibility exercise is different depending on the revenue regime assumed.

* In the case of the user-pays revenue regime, the analysis will be focused on evaluating the project’s capability to raise funds (that is, the existence of a financial surplus after covering the current costs), the capability of such free cash flow to service debt and equity in order to fund the capital expenditure needs

( tolls collected directly by the private partner in road concessions, or the fees paid to privately-operated metro trains.

- PPPs solely funded with user charges are known as user-pays PPPs.)

- Monthly subscriptions, licence fee, Adobe Photoshop)

- Pay-per-use pricing tactic is mostly used by different cloud-based products and services that charge you for the computing powers/memory/resources/time used. Examples are Amazon Web Services, and Google Cloud Platform.

* When the project is not financially self-sustainable, the exercise estimates the amount of public resources that will make the project commercially feasible. Different alternatives for government support should be considered, including direct government payments to the project company; and
* In projects that do not include user charges in the revenue mix, such government contributions are directly estimated.

The commercial feasibility must be assessed from two different points of view: lenders (the debt providers) and investors (the equity providers).

* 1. The Lenders’ Perspective (bankability)

The key aspect of the lenders’ concerns is the capacity of the project company to repay its debt on the agreed schedule.

To measure this ability, lenders usually define some criteria to judge a project’s bankability. Some of these criteria are the stability of project revenues, the ability of shareholders to provide collateral security (especially during the Construction Phase), and, particularly relevant to this section, the ratio between the cash resources generated by the project and the total amounts required to service debt.

The fact that the project can incorporate the required level of debt, however, is not enough to classify it as commercially feasible. The capacity of the project to remunerate the equity investors is also paramount if the project is to attract bidders.

2 The Investors’ Perspective

For an equity investor, a project must be both bankable and provide an acceptable return for the risk of the investment. The two most common techniques used to assess the commercial feasibility, from the investors’ perspective, are the calculation of the Net Present Value, based on the discounted equity cash flow, and the internal rate of return of the equity cash flow. Both techniques are based on the assumption that, for a project to be considered commercially viable, the investment must provide a return over time for at least as much as an alternative and comparable investment.

**The Net Present Value of the equity is the sum of the investor’s future cash flow in today’s values**

The NPV is a representation of the present value generated by the project above the returns represented by the discount rate.

please watch this video - <https://www.youtube.com/watch?v=SpHIBfPGwx8&t=713s>

Another methodology, which is very similar in principle with the NPV calculations, is the Internal Rate of Return (IRR). Mathematically speaking, the IRR is the discount rate that makes the NPV of any given cash flow equal zero. In other words, the IRR is an output of the cash flow that indicates the return offered by the project on the invested amount, and it is the preferred technique by many financial advisors.

So, if the equity IRR of the equity cash flow is **higher than the required rate of return of the investors (sometimes called a hurdle rate),** a project is said to be commercially attractive. If the IRR is lower than the required return, the project is not viable.

Please watch this - <https://www.youtube.com/watch?v=x6eXfx2Tv-w&t=35s>

Both techniques demand the estimation of the rate of return required by investors as the minimum threshold below which the project is not commercially feasible.

The estimation of these financial indicators, as well as the analysis of bankability, allow the project team to observe the project from the private sector’s perspective, which is an essential exercise in order to guarantee that a commercially feasible project will eventually be launched to the market.

1. *There are several examples of innovative partnership models from around the world. The Dubai Sports City, a mega project in Dubai that called for an estimated investment of over $4 billion, is a classic example of how commercial and residential development has been planned around sports facilities. Sports cities provide private developers opportunities for commercial exploitation on a larger scale.*
2. According to a newspaper report nearly half of the solar power generation capacity worth Rs 28,000 crore currently under implementation in India is facing viability risk because of the continuous fall in the value of the Rupee. The currency depreciation has made imported solar modules costlier and has increased the cost of setting up solar power projects.

Project developers do not generally hedge the exchange rate before placing orders for modules. Developers had anticipated low module prices while bidding at low tariffs.  
However, a sharp depreciation in the Rupee to more than Rs 73 per dollar has wiped off the gains from lower module prices. That, in turn, will compress the debt servicing cushion available for these projects.

**Economic Viability**

Many governments undertake some form of economic viability analysis (also known as socio-economic viability) to decide whether a proposed project is a good use of public resources. A project is economically viable if the economic benefits of the project exceed its economic costs, when analysed for society as a whole.

The economic costs of the project are not the same as its financial costs. Externalities (positive or negative) are economic impacts that affect persons who are not necessarily part of the project scope. The economic benefits are a measure of the value the project will deliver to society as a whole. The revenue a project will generate is usually a lower-bound estimate of its economic benefits; however, benefits can be much higher than revenues. For example, the benefits from improved transportation, for drivers, can far exceed the tolls paid on a highway—faster connections, reduced vehicle maintenance, lower accident rates, may be significant factors. In addition, the project may enhance regional economic activity and quality of life for the people living in the vicinity of the project. Similarly, the value of education at a high school should be measured by the enhancement in the lives and prospects of the children who attend that school, even if no school fees are charged. Economic viability analysis can also include a cost-effectiveness analysis to determine whether the project is the lowest-cost alternative to achieve the identified benefits.

**PPP Model Contracts**

There are several different types of public-private partnership contracts, depending on various aspects such as the type of project (for example, a road or an airport), level of risk transfer, investment level and the desired outcome. Some types of PPPs include:

**1.Build-Own-Operate (BOO):** BOO projects can be likened to the actual privatisation of a facility because often there is no provision of transfer of ownership to the host government. At the end of a BOO concession agreement, the original agreement may be renegotiated for a further concession period.

 This is the most common form of private participation in the power sector in many countries. For a BOO power project, the Government (or a power distribution company) may or may not have a long-term power purchase agreement (commonly known as off-take agreement) at an agreed price from the project operator.

Many BOO projects have also been implemented in the transport sector. Examples include, **Kutch and Pipavav Railways** in India (joint venture BOO projects); **Xiamen Airport Cargo Terminal**in China and **Sukhothai Airport**in Thailand; and in the port sector, **Wuhan Yangluo Container Port** in China and **Balikapapan Coal Terminal**in Indonesia.

**2.Build-Operate-Transfer (BOT):** The facility is paid for by the investor but is owned by the host. The investor maintains the facility and operates during the concession period.

The BOT scheme refers to the initial concession by a public entity such as a local government to a private firm to both build and operate the project in question. After a set time frame, typically two or three decades, control over the project is returned to the public entity.

BOT projects are normally large-scale, greenfield infrastructure projects that would otherwise be financed, built and operated solely by the government. Examples include a highway in Pakistan, a wastewater treatment facility in China and a power plant in the Philippines .

**3.Second Vivekananda Bridge (now Sister Nivedita Bridge) in Kolkata** is one the first BOT projects, undertaken in 1995. The concession agreement was signed in September;2002. The consortium members are from USA, UK, Mauritius and India. The concession period of the project is 30 years.

DND Delhi Noida link road

**4.Build-Own-Operate-Transfer (BOOT):** Ownership of the facility rests with the constructor until the end of the concession period, at which point ownership and operating rights are transferred free of charge to the host government.

A BOOT (build, own, operate, transfer) project is seen as a means of developing large public infrastructures with private funding. The public sector partner enters into a contract with private developers, usually a consortium of businesses with experience and expertise in a particular industry or a corporation that specializes in designing and implementing large projects.

A BOOT project is operated by the private sector company for perhaps 30 years or more in a bid to recoup its investment before transferring ownership to the government. Examples of BOOT projects include power plants in the Philippines, waste treatment facilities in China, and highways in Pakistan.

**5. Build-Transfer-Operate (BTO):** The private sector finances a facility and, upon completion, transfers legal ownership to the public sector. The agency then leases the facility back to the private sector under a long-term lease. During the lease, the private sector operates the facility.

Since the late 1980s, the private sector has been allowed to operate within the Thai telecommunications market by obtaining concessions in the form of [**Build-Transfer-Operate (BTO**](https://www.lawinsider.com/dictionary/build-transfer-operate-bto)).

**6.Design-Build-Finance-Operate (DBFO):** The private sector partner finances the project and is granted a long-term right of access of about 30 years. The DBFO partner is given specified service payments during the life of the project.

Larsen and Toubro Limited was awarded the Hyderabad Metro Rail Project by the then Government of Andhra Pradesh. L&T incorporated a Special Purpose Vehicle (SPV) - L&T Metro Rail (Hyderabad) Limited ("The Company") to implement the Project on Design, Built, Finance Operate and Transfer (DBFOT) basis. The Company signed the Concession Agreement with the then Government of Andhra Pradesh on 4th September, 2010 and completed the financial closure for the Project on 1st March, 2011 in a record period of six months. A consortium of 10 banks led by State Bank of India has sanctioned the entire debt requirement of the project. This is the largest fund tie-up in India for a non-power infrastructure Public Private Partnership (PPP) project.