

# Effect of Stamp Duty & Transfer of Development Rights (TDR) Factor in EIRR and Feasibility of Infrastructure Projects



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*The road infrastructure projects increase the personal mobility and quality of life. The transportation investment also boosts productivity and the economy. Land is a premium asset, which is a major source of revenue to the Government in the form of sale of land; lease/ground rent and conversion charges and infrastructure development. However, for the purpose of calculation of Economic Internal Rate of Return (EIRR) of Road Infrastructure project the factor of increased revenue to the State/Municipal Corporation by way of Stamp Duty and transfer of development rights (TDR) is not directly or completely taken into account. This leads to an erroneous EIRR projection. The proposed area of this research is “Effect of Stamp duty & Transfer of Development Rights (TDR) factor in EIRR and Feasibility of Infrastructure Projects”*

**Key words:** Transfer of Development Rights, Feasibility of Infrastructure Projects, Economic Internal Rate of Return, Effects of Stamp Duty

## 1. Introduction

### 1.1 Background of Research

Land is a premium asset, the value of which always shows an increasing trend due to which it has an impact on economy of the State. Land is a major source of revenue to the Government in the form of sale/alienation of land; lease/ground rent and conversion charges and infrastructure development. As per the World Bank Survey of 2011 it is estimated that India requires 500 cities like to accommodate the young generation between the age group of 20-42 years and these cities should be capable of accommodating the ever increasing IT/ITES industry. Infrastructure Projects lead to development of new cities and better connectivity between cities. The road infrastructure projects increase the personal mobility and quality of life. The transportation investment also boosts productivity and the economy.

Any infrastructure project involves financial and Economic evaluation. The financial evaluation is the general idea as to the feasibility of the project and the cost of the project. Whereas economic evaluation involves the assessment of the net value of projects, policies and its usefulness to the general public. In infrastructure especially in the transport sector we value projects in terms of their net worth, the difference between the value of their benefits and their costs, both measured so far as is possible in terms of monetary units. This leads to many questions; evaluation by whom, for whom, from what perspective, at what stage. One of the features of transport decisions is that they typically impact on many parties – transport operators, individual transport users, local residents and businesses, land and property owners, national and local taxpayers. Each of these stakeholders will seek to assess the impact of a project from the perspective of his/her own interest. But the perspective of transport evaluation needs to be a social one, that is, one which takes account of significant impacts of the project or policy whoever is affected.

### 1.2 Objective of Research

This research paper seeks to address the following:-

- Whether a project or a policy intervention is worthwhile from an overall social point of view.
- What is the pattern of gains and losses? Do the benefits and costs accrue to the rich or the poor? What is the impact on identified social groups?
- Is the project financially sustainable? Is there a revenue stream to maintain the asset? How will the project actually be funded and how will the debt be repaid?
- Is the project practicable? Are there social or technical barriers to implementation? “Are there any fatal flaws in the project”?

The viability of any infrastructure project especially in Urban cities should be based on economic evaluation rather just the financial evaluation as certain projects the EIRR (Economic Internal Rate of Return) plays the important role than IRR (Internal Rate of Return) which is a financial measure for project feasibility.

## 2. Research Methodology

### 2.1 Literature Review

The first report on Urban Transport Project for Traffic Planning in Mumbai was prepared by the consultants appointed by the Central planning Commission was prepared by M/s. Wilbur Smith and Associates in mid of 1962. This report was prepared

within a period 18 months and was submitted to the Union ministry for Urban Transport. This report was a combined report for

- i) Western Express Highway
- ii) Eastern Express Highway
- iii) Lal Bahdur Shashtri Marg
- iv) Swami Vivekanand Road
- v) Dr B A Road
- vi) Worli Bandra Sea Link
- vii) Mumbai Pune Expressway
- viii) Eastern Freeway

As for purpose of this research the Eastern Freeway has been considered. Out of the above projects the Eastern Freeway was initially proposed to give the connectivity from Eastern part of South Mumbai to Western Express Highway near Bandra. The state authority took the projects at Sr. (1) to Sr (5) gradually. However, the Eastern Freeway, Worli Bandra Sea Link and Mumbai Pune Expressway were kept on hold as these require the clearances from the Central Government. By the report of Wilbur Smith Eastern Freeway was to start from Prince of Wales Museum as an elevated six lane structure which covers the P'Dmello Road to Carnac Road which was planned as an eight lane Road and it was originally planned from the Prince of Wales Museum. However, the Wilbur Smith Report was silent on Economic impact of these projects.

In 1983 CRRI (Central Road Research Institute) had done report on Eastern Freeway. It has recommended the Eastern Freeway to be connected on Western suburbs. However, this plan was never given serious consideration till 2003. By this time South Mumbai being a port area was encroached by the hutment dwellers and unauthorised shopkeepers and the salt pans belongs to the Bombay Port Trust. The whole study was based on for Easement of container movement from port area to Western Suburb through Western Express Highway which will cater the container movement for the industrial population in Western Suburbs.

The CRRI further suggested that one approach of Eastern Freeway should lead to Eastern Express Highway towards Thane and Eastern part of Mumbai which will cater the container movement to Eastern part of Mumbai as well as towards Pune via Sion Panvel Highway. When the Maharashtra state Road Development Corporation undertook the project in 2002 with the aid of State Government whereas Mumbai Metropolitan Region Development Authority took up the work for Eastern Freeway with help of its own funding (35%) and with the state funding (65%).

MMRDA has studied both the reports of Wilbur Smith, 1962 and of CRRI, 1983 which were silent on the economic impact of the Eastern Freeway. MMRDA then appointed Consulting Engineering Services (CES) in the 2003 for preparation of detailed project report on Eastern Freeway. The Detailed project report was submitted by CES in the year 2006. M/s. CES has bifurcated the approach of Eastern Freeway and they have said that by considering approach to Western Expressway will be a cumbersome job as there were crossings over the suburban railway. And therefore the original suggestion of Wilbur Smith Report was divided into two parts one is East-West connectivity via the Santacruz- Chembur Link Road, Jogeshwari-Vikhroli Link Road and Goregaon- Mulund Link Road, and Eastern Freeway which now connects South Mumbai to Eastern Suburbs of Mumbai.

## 2.2 Primary Data

In this research paper, considering the Eastern Freeway as case study, the following primary data have been analysed

- i. Ready Reckoner rates over the period of 1982 to 2014
- ii. Increased Stamp duty Revenue by development of Salt pans and de-reservation of Salt pan
- iii. Total FSI allotted for Development around the Eastern Freeway

## 2.3 Secondary Data

Prior to the of planning of Eastern Freeway the P'Dmello road connecting the harbours i.e Sewree, Curry road, Dockyard road and Wadala was under the private ownership of Bombay Port Trust and hence the public vehicles were not allowed. The P'Dmello road was a four lane road and was congested due to encroachment on footpath & parking on both the sides of road. The road has become two lane instead of 4 lanes which remains congested throughout the day. This has affected the business of container yards and the business has started shifting from Mumbai to outskirts of Mumbai. In the meantime government has developed Jawaharlal Nehru Port Trust at Nhava Sheva and development of Navi Mumbai has taken place.

It was observed that the report submitted by Wilbur Smith in 1963 and by CRRI in 1983 have not provided the Economic Impact analysis they have talked only on financial impact in terms of the construction budget. The detailed project reports of Eastern Freeway submitted by Consulting Engineering Services (CES) have done the economic analysis. The main steps followed for the economic analysis are:-

- i) **Estimation of Economic Cost Of Project:** - Capital Cost alongwith its phasing, routine and periodic maintenance cost. In the study estimated financial cost capital as well as maintenance have been converted into economic cost by applying conversion factor of 0.9 as during that period most of the projects were under the Mumbai Urban Transport Project funded by World Bank, which were with the discounting factor 0.9. The construction period was three years with the cost phasing of 20:40:40. The cost for first phase was INR 3426 million the annual maintenance was 2 lakhs per kilometre and the periodic maintenance cost was Rs. 9 lakh per kilometre
- ii) **Estimation of Economic Benefits:-** This is divided into two parts namely the

- a) Travel Time Benefits in terms of Vehicle Operating Time (VOT)/ PCU(Passenger Car Unit). The basic assumption and the calculation for VOT are as under

Sr	Mode	VOT (Rs/hr/Veh) 2006 prices
1	Bus	753.04
2	Car	96.02
3	Two Wheeler	35.55
4	Taxi	49.89
5	Auto	45.49

- b) Vehicle Operating Cost (VOC) Benefit: - In terms of fuel consumption, vehicle maintenance cost etc. The unit VOC values at different speeds and roughness of pavement (mm/Km) have been taken from latest road user cost study and updated to suit urban road conditions
- iii) Comparison of Economic cost and benefits for study period (23 years) and Estimation of EIRR using Discounted Cash Flow Technique. The basic assumptions for the Economic Analysis are-
- Economic Analysis done at 2006 price level
  - Analysis Period- 23 years (2007-2029)
  - Construction period- 03 years
  - Cost Phasing- 20:40:40 in 2007, 2008 & 2009
  - Factor of 0.9 is used for converting financial cost to economic cost

Based on above the Economic Internal Rate of Return was 12.07% over a length of 12km and total cost of INR 3809.32 Millions.

### 3. Present Scenario for Feasibility of Infrastructure Projects

#### 3.1 Financial Appraisal

The essence of financial appraisal is the identification of all expenditures and revenues over the lifetime of the project, with a view to assessing the ability of a project to achieve financial sustainability and a satisfactory rate of return. The appraisal is usually done at constant market prices and in a cash flow statement format. It is the difference of all revenues and expenditures at the time at which they are incurred.

##### 3.1.1 Revenues

The cash flow statement sets out the revenues to be derived from a project. These revenues can take several forms. The easiest to identify are the products and services from the project sold through normal commercial channels as well as any commercially exploitable by-products and residues. Revenue valuation is then simply a matter of estimating the sales values of these products and services.

##### 3.1.2 Expenditures

The cash flow statement embraces both capital and operational expenditures. Capital expenditures are simply the expenditures of those items needed to set up or establish the project so that it can be operated. Operating expenditures are those incurred in operating and maintaining the project. Capital expenditures usually cover items related to construction of facilities, including site preparation and other civil costs; plant and equipment, comprising not only the acquisition cost but also the cost of transport, installation and testing; vehicles; and working capital.

Operating expenditures typically comprise raw materials, labour and other input services, repairs and maintenance. Pre-operating expenses, sunk costs, and working capital may be included under certain conditions. In a financial appraisal used as the basis of an economic appraisal, other costs such as depreciation, interest and loan repayments are not included. Depreciation is excluded, because it would double count the capital cost. Interest payment and loan repayment are not included, because one of the major purposes of deriving the cash flow is to determine the rate of interest the project can bear.

##### 3.1.3 Financial Profitability

The financial profitability evaluates the returns to the financial stakeholders in the project, by calculating the rates of return to the holders of equity and therefore providing indications about improvements in the financing structure of the project. The cash flow statement describes the ability of a project to raise its own financing and to assess whether it is financially sustainable. The latter is summarised by indicators such as the financial internal

#### 3.2 Project Performance Indicators

##### 3.2.1 Net Present Value (NPV)

In this method the stream of costs/ benefits associated with the project over an extended period of time is calculated and is discounted at a selected discount rate to give the present value. Benefits are treated as positive and cost as negative and the

summation gives the net present value (NPV). Any project with positive NPV is treated as acceptable. In comparing more than one project, a project with higher NPV should be accepted.

This is a concise performance indicator of an investment project it is actual amount of all net flows generated by the investment expressed in one single value with the same unit of measurement. It is important to note that the balance of first year from the investment is generally negative which becomes positive after some years. As it decreases over a period of time negative values in the first years are weighed more heavily than the positive values in the last years.

Figure. 3.1 NPV as a function of I

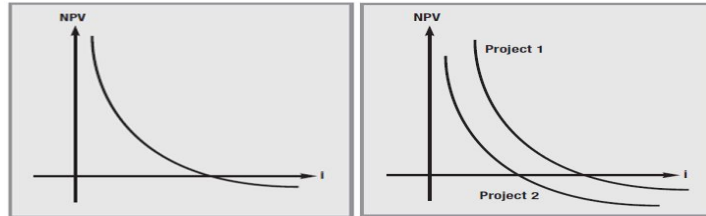


Figure 3.2 Project Ranking by NPV Values

(Source: Guide to Cost Benefit Analysis of Investment Project by European Union Commission)

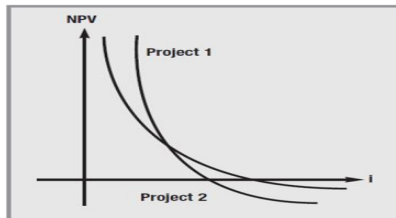


Figure 3.3 A Case of Non-Comparable NPV

(Source: Guide to Cost Benefit Analysis of Investment Project by European Union Commission)

This indicator could be very simple and precise evaluation criteria for an investment:  $NPV > 0$  means that the project generates a net benefit (because the sum of the weighted  $S_n$  is still positive) and it is generally desirable. In other words it can be a good measure of the value added of a project for the society in monetary terms. It is also useful ranking projects on the basis of their NPV values and decide which is the best.

**3.2.2 The Internal Rate of Return**

The internal rate of return is defined as the interest rate that zeroes out the net present value of the investment. All the most commonly used data management software automates the calculation of the value of these indicators by applying the appropriate financial function. The results of the calculation of the IRR are the interest rates shown in Figure. 3.4

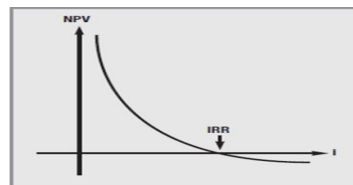


Figure 3.4 The Internal Rate of Return

(Source: Guide to Cost Benefit Analysis of Investment Project by European Union Commission)

As seen from the definition of IRR no discount rate is needed for the calculation of this indicator. The observer mainly uses the financial rate of return in order to judge the future performance of the investment which is in fact an opportunity cost of equity. Thus IRR could be an evaluation criterion for project appraisal: under a specific value of IRR the investment should be considered not suitable.

Either NPV or IRR could be used as an evaluation criterion for ranking the projects. However, it is useful for considering always the NPV value and IRR values together.

**3.2.3 Benefit to Cost Ratio**

In this method all costs and benefits are discounted to their present worth and the ratio of benefit to cost is calculated. Negative flows are considered as costs and positive flows are benefits. It is a pure number, like IRR, and it is independent of the size of the investment. If the B/C ratio is more than one the project is worth undertaking.

### 3.2.4 Using EIRR Analysis to Evaluate Infrastructure Projects

The EIRR calculation formula is a modified version of the Financial Internal Rate of Return calculation. However, this analysis tool is used to evaluate commercial projects with routine and measurable cash flows which are balanced or amortized against the initial capital investment, maintenance costs and routine debt servicing, to produce a rate of return for the project. In a commercial setting the benchmark for viability is simply a Rate of Return above the prevailing bank interest rates.

Unlike commercial projects, the infrastructure projects are not designed to be financially sustainable or profit making (with the possible exception of cost recovery objectives for some water projects). For these reasons, a project's financial return may not be an adequate indicator for the desirability of the project for society at large. Therefore, they are assessed by using Economic Internal Rates of Return which calculate the broader (non-cash) benefits that accrue to these projects. Examples of the benefits measured to calculate EIRRs are listed below:

For Roads and Bridges:

- Time savings due to faster transportation.
- Increase in the value of land adjacent to the new road.
- Cost savings from personal travel.
- Cost savings due to more efficient transportation of goods to market.
- New employment in the transport sector.

## 4. Effects of Urban Infrastructure Projects on Revenue: A Case Study of Mumbai

**4.1** Mumbai is the financial and commercial capital of India. It is also among the largest cities in the world, with a total metropolitan area population of over 20 million as of 2011, and a population growth rate of around 2% per annum. As per the World Property Journal's worldwide ranking, Mumbai ranks as the world's 6th most expensive city for commercial space & 16th most expensive city for residential space. As per the Knight Frank's prime international residential index, the financial capital is also among the few global cities that saw realty prices going up even during global economic slowdown.

Transportation infrastructure economics have historically proven to have a positive impact on real estate values. The residential and commercial properties located close to Transportation infrastructure tend to command a premium.

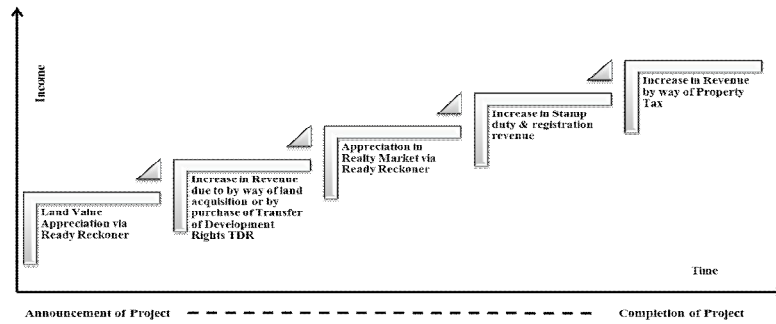
### 4.2 The Recent Infrastructure Projects which Commenced around the year 2000 such as –

1. Santa Cruz - Chembur link road (SCLR) - The SCLR is a 6.45 km road which links Western suburb of Santa Cruz to the Eastern Suburb of Chembur and Ghatkopar. During the peak hours, this travel may take from 90 minutes upto 120 minutes. After the SCLR project the travel time has now reduced to a mere 20 minutes. The six-lane road project cost is ₹435 crore (US\$80 million).
2. Jogeshwari – Vikhroli Link Road (JVLR) is a 10.6 km long road in Mumbai that links Jogeshwari in the Western Suburbs to Vikhroli in the Eastern Suburbs. The JVLR is an important arterial road connecting the Western Express Highway and Eastern Express Highway. The JVLR was constructed at a cost of ₹221.45 Crores (US\$ 41 million). During peak hours, travel time has reduced by 50%.
3. Bandra Worli Sea Link - The Bandra–Worli Sea Link is a 5.6 Km cable-stayed bridge that links Bandra in the Western Suburbs of Mumbai with Worli in South Mumbai. The bridge is a part of the proposed Western Freeway that will link the Western Suburbs to Nariman Point in Mumbai's main business district. The cost of project was ₹1640 Crores (US\$ 320 million). The bridge was commissioned by the Maharashtra State Road Development Corporation (MSRDC), & all eight lanes were opened on 24 March 2010. The sea-link reduces travel time between Bandra and Worli during peak hours from 60–90 minutes to 20–30 minutes.
4. Eastern Freeway- The Eastern Freeway connects Fort in South Mumbai to the Eastern Express Highway (EEH) at Ghatkopar. It is 16.9 km long and its estimated cost is ₹888 Crores (US\$160 million). The Eastern Freeway has reduced travel time between South Mumbai and the Eastern Suburbs by 25-30 minutes and reduced the travel distance by 4-5 km.
5. Mumbai Metro One – The Line 1 connects Versova, Andheri in the Western Suburbs to Ghatkopar in the Eastern Suburbs, covering a distance of 11.4 kilometres (7.1 mi). The line opened for service on 8 June 2014. The main objective of the Mumbai Metro is to provide mass rapid transit services to people within an approach distance of between 1 and 2 kilometres, and to serve the areas not connected by the existing Suburban Rail network. A study by Metro One and consultant MVA Systra estimated the daily ridership at 1.5 million. Estimated Travel time from Versova to Ghatkopar has reduced from 90 minutes to 21 minutes.

All the above infrastructure projects had started showing their results on realty market right from the date of their announcement and the incremental trend continuing after commencement and on completion of the project

### 4.3 Revenue Impact of Infrastructure Project on Revenue

It can be seen from the graph below the impact of the Urban Infrastructure projects on revenue to State. It starts from the announcing the project and gradually increases till completion of the project.



**Graph 4.1** Impact of the Urban Infrastructure Projects on Revenue to State  
(Source-Author's Computation)

The key factors which really benefits the Urban Infrastructure Projects are-

- **Transfer of Development Rights (TDR)** means making available certain amount of additional built up area in lieu of the area relinquished or surrendered by the owner of the land, so that he can use extra built up area either himself or transfer it to another in need of the extra built up area for an agreed sum of money.
- **Floor Space Index (FSI)** - FSI is a development tool that indicates the extent of construction permissible on a plot. It is the ratio of built-up area to the total area of the plot.

Independent analyses of pricing reveal that proximity to a Metro station can single-handedly account for a 22% variation in land values, the other factors being location, distance of the land from the central point and income groups.

On the back of the execution of a string of surface transport infrastructure projects – viz. the Jogeshwari-Vikhroli Link Road (JVLR), the Santacruz Chembur Link Road (SCLR) and the Wadala-Chembur Monorail – the VAG corridor and Eastern Freeway has further stoked the already buoyant Mumbai realty market.

The areas which will benefit from Metro connectivity have already seen price rises of 400% over the past eight years, and this trend is set to continue with this imminent launch. A more detailed impact analysis follows below:

Among the series of mega-projects such as the Eastern Freeway, SCLR and Monorail in the past one year, the Metro is the biggest so far. The combined effect reflect positively on Mumbai's real estate market – the residential and retail markets in Andheri, Jogeshwari and Ghatkopar will witness tremendous growth, especially those near the Metro stations.

Long-term value capture would be possible through increase in FSI. If the proposal of granting FSI of 4 to areas near the Metro is approved, it will have a far-reaching impact and potentially transform the entire landscape of areas surrounding the Metro.

## 5. Effect of Revenue on Eirr and Project Feasibility

It can be seen that the effect of Urban Infrastructure projects as detailed in Chapter 3 have an incremental effect on the ready reckoner prices declared by the state govt. which leads to the increase in the revenue income by way of–

- Transfer of Development rights and its charges paid to the local Municipal body by the developer of land
- Stamp Duty and Registration paid by individual purchaser of a Residential/ Commercial premises
- Property taxes on Residential/ Commercial premises
- Parking charges by way of property tax

This factor of increase in revenue has not been taken into consideration while calculating the EIRR of these infrastructure projects.

In case of Eastern freeway the Land which was never used i.e Marshy Land & Salt pans is now being developed to build the residential and commercial complexes. The previously unused land is also being projected as the second Cuffe Parade of Mumbai (the most exclusive & upmarket residential/ commercial part of Mumbai). Due to this the Ready Reckoner rates published by the State Govt has increased upto 400% which means the revenue to the government by way of stamp duty and transfer of development rights (TDR) has also increased.

Infrastructure bottleneck has been a serious concern in India in its way of robust pace of economic progression. While many advanced economies and fiscal constrained developing countries have developed their physical infrastructure successfully either through private participation or through public-private partnership (PPP) model, in India, private participation in the process of infrastructure development has received lacklustre response. Hence, there is need to develop more innovative funding models which involve various stakeholders and take into consideration this revenue increase to undertake more infrastructure development in Urban cities.

## 6. Conclusion and Recommendation

It can be seen from the Urban Transport Planning reports of Wilbur Smith, 1963 and CRRI, 1983 that Economic Analysis of project has not been done. However, the report prepared by the Consulting Engineering Services (CES) published in 2006 have given economic analysis while considering economic benefits of Vehicle Operating Time (VOT) and Vehicle operating

Cost (VOC) as these were the direct benefits of the project. The prevalent practice of Economic analysis of all infrastructure projects does not include the indirect benefits such as appreciation of Land value and subsequent increase in revenue by way of Transfer of Development rights (TDR)/ Additional Floor Space Index and Stamp Duty. The appreciation of Land value is considered to be a social benefit only. However, the volume of revenue by way of Transfer of Development rights (TDR)/ Additional Floor Space Index and Stamp Duty in Urban areas such Mumbai where real estate values are at premium rates if considered for calculation of EIRR would cause major impact on Return on Investment of project.

The viability of any Urban Infrastructure project is to be seen from the revenue angle which has an effect on EIRR and payback period.

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