

Urban Infrastructure Project Feasibility and Increased Revenue to State- A Case Study of Eastern Freeway, Mumbai

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BACKGROUND:- *The Urban 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.*

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) LalBahdurShashtriMarg
- iv) Swami Vivekanand Road
- v) Dr B A Road
- vi) WorliBandra 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 South Mumbai to Eastern Suburbs and Western Express Highway near Bandra. The state authority took up the projects at Sr. (1) to Sr (5) gradually. However, the Eastern Freeway, WorliBandra Sea Link and Mumbai Pune Expressway were kept on hold for long time as these required 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. However, the Wilbur Smith Report was silent on Economic impact of these projects.

In 1983 CRRI (Central Road Research Institute) have submitted a report on Eastern Freeway. The report recommended that 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 and the salt pans owned by the Bombay Port Trust were encroached by the hutment dwellers and unauthorised shopkeepers. The whole study was based on oriented towards the easement of container movement from port area to Western Suburb through Western Express Highway aiming to 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 SionPanel Highway. When the Maharashtra state Road Development Corporation (MSRDC) undertook the project in 2002 with the aid of State Government and thereafter it was taken up by Mumbai Metropolitan Region Development Authority (MMRDA) with help of its own funding (35%) and with the state funding (65%).

The MMRDA studied both the reports of Wilbur Smith, 1962 and of CRRI, 1983 which were silent on the economic impact of the Eastern Freeway. The 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.

Time Line and Hurdles in Project Completion

- The Eastern Freeway was to connect Eastern Suburbs to south Mumbai which was proposed in CRRI's transport improvement plan for Mumbai in the year 1983
- The work commenced in January 2008 on P'Dmello Road and the originally planned target completion date was 18th January 2011
- The Eastern Freeway is 16.8 km long. A 13.59 km stretch of the freeway, from Orange Gate on P D'Mello Road up to Panjarpol, Chembur, was opened to the public on 14 June 2013
- The second tunnel was opened on 12 April 2014
- The third and final segment from Panjarpol to Ghatkopar-Mankhurd Link Road (GMLR) was opened on 16 June 2014

The Eastern Freeway faced several delays on account of obtaining various permissions for construction in forest and salt pan areas, the reclamation of land, difficulties due to unmapped underground utilities in construction work and rehabilitation of Project Affected Persons (PAP). The delays also escalated the cost of 9.29 Km elevated road from INR 5.31 billion to 5.72 billion. The construction of AnikPanjarpole Link Road was also delayed due to the issue of rehabilitation and resettlement of project affected people. The MMRDA has so far rehabilitated 4694 PAPs at Vashi Naka, Chembur and Tata Nagar at Mankhurd. Amongst the 4694 PAPs, 4241 were Residential, 414 Commercial and 39 comprised of both Residential as well as Commercial. Thus the work of AnikPanjarpole Link Road ultimately began in August 2013.

The MMRDA has razed 52 structures on P. D'Mello Road at the Orange Gate junction in south Mumbai. The demolished structures include eight public utilities, two residential and 42 commercial structures that were given on lease by the Mumbai Port Trust to the occupants. Of the 52 structures, the residents of 44 structures were to be rehabilitated. However, as only 37 of the 44 project affected persons (PAPs) could prove their eligibility and were resettled at Bhakti Park, Wadala.

Another major cause for delay was in getting clearance from the salt pans commissioner, to take the elevated freeway for about a kilometre through salt pan land near Mahul. Despite the MMRDA sending a letter seeking clearance in 2003, they received approval only in 2011, with the rider that the MMRDA had to pay lease at 6% of the ready reckoner rate for erecting a few pillars. Delays were also caused as the MMRDA had to coordinate with more than 10 agencies, including the Mumbai Port Trust (MbPt), customs, the salt pans commissioner, the environment department, the municipal corporation, the traffic police, BSNL, Hindustan Petroleum, Bharat Petroleum, Indian Oil and Tata for acquiring land, for shifting underlying utilities, and/or for general permissions.

I. CONSTRUCTION OF THE EASTERN FREEWAY

The freeway was built in three segments - a 9.3 km elevated road from Orange Gate on P D'Mello Road to the beginning of Anik-Panjarpol Link Road, a 5 km mostly at grade road featuring twin tunnels from Anik to the beginning of Panjarpol-Ghatkopar Link Road, and a 2.5 km flyover from Panjarpol to Ghatkopar. The three segments had originally been conceived as separate projects, with only the Orange Gate-Anik section known as the Eastern Freeway. However, the MMRDA decided to merge the three projects after construction began. The 4-lane Eastern Freeway, starts on D'Mello Road near Wadi Bandar, and further enters into Mumbai Port Trust road and eventually joins the EEH via AnikPanjarpol Link Road (APLR), near Wadala.[30] The stretch from Orange Gate on P D'Mello road to Anik and from Panjarpol to Ghatkopar, near the Indian Oil Nagar junction, will be an elevated 4-lane road, while the AnikPanjarpole link road (APLR), which has the twin tunnels, will be an 8-lane at grade section.

2.1 P D'Mello Road to Anik

The first section has a length of 9.3 km, width of 17.2 meters and connects P D'Mello Road to Anik. This phase also includes ground improvement of existing roads, the construction of a 4-lane elevated corridor

and the construction of a missing link. This stretch is made up of 4 sections, and has 5 ramps for exit and entry at Reay Road, Port Road, Anik and Orange Gate.

Civil construction work on this section was completed on 9 March 2013. This 9.29 km stretch from Orange Gate on P D'Mello Road to the Mahul creek salt pan between Anik and Chembur is the longest flyover in Mumbai and third longest flyover in India. This segment was opened to the public on 14 June 2013, along with four lanes of the Anik - Panjarpol link road.

2.2 Anik - Panjarpol link road

The second segment is the 8-lane, 5 km long Anik - Panjarpol link road. It begins at Bhakti Park and ends near the Chhatrapati Shivaji Maharaj statue in Chembur. This stretch required the construction of Mumbai's first twin tunnel beginning from Ashok Nagar at the footsteps of the Bhabha Atomic Research Centre (BARC) mountain and ends at Gautam Nagar near Panjarpol.

2.3 Panjarpol - Ghatkopar link road

The third segment consists of a 4-lane elevated 2.8 km flyover from Panjarpol till the Ghatkopar-Mankhurd Link Road (GMLR), via Govandi. This section begins near the twin tunnels of the Eastern Freeway before the Panjarpol junction in Chembur and terminates on the Chembur- Mankhurd link road. Construction work on this phase of the project was awarded in August 2009 and was completed in January 2014.

II. PRIMARY DATA

Under this research considering the Eastern Freeway as case study the following primary data will be analysed

- i. Ready Reckoner rates published by State Govt over the period of 1982 to 2014. The land & property rates for the area around Eastern Freeway were published only after 2008. There has been an approximately 400% price rise in property rates in mere 7 years.
- 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- FSI of 4 including TDR (transfer of development rights) and FSI of 2.5 without TDR. Otherwise in the city the FSI is 1.33 and permissible upto 2.5 with TDR

Ready Reckoner Comparison Table from commencement of Project till completion of project-

Year	Area	Village no/ Zone no	Detail of properties	Rate of open land/ sq.mtr FSI	Rate of building per square meter				Average Percent increase
					Residential	Office/ commercial on above floor	Shop/ commercial on ground floor	Industrial area	
2008	Salt Pan	15/105	All properties of salt pan division.	24800	49600	62000	92800	49600	50.53
2013				37400	74600	93300	139700	74600	
2008	Trombay	90/419	All properties of Mahul village	9400	24000	29000	36000	27000	52.50
2013				14400	36500	44200	54800	41200	
2008	Kurla, village turbhe	92/421	All portion on south side of VN Puravmarg	9950	25500	30500	38000	30500	73.80
2013				17200	44200	52900	65700	52900	
2008	Govandi	99/457	On North of GMLR	20800	41500	52000	65000	41500	96.3
2013				40800	81500	102100	127800	81500	

III. 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 NhavaSheva 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-

a) Economic Analysis done at 2006 price level

b) Analysis Period- 23 years (2007-2029)

c) Construction period- 03 years

d) Cost Phasing- 20:40:40 in 2007, 2008 & 2009

e) 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

IV. CONCLUSION

The study reveals that that property prices in Chembur have risen by 70-90% over the past 5 years primarily because of its proximity to the freeway.

The study also found that the number of inquiries for residential and commercial spaces close to the Eastern Freeway had gone up, and real estate developers had begun marketing their projects with an emphasis on proximity to the Freeway. There is an emergence of areas closest to the Freeway's entry and exit ramps, specifically Orange Gate, Anik Junction, Chembur-Mankhurd Link Road and Panjarpol Link Road, as stronger locations.

The Ready Reckoner for Salt was not published till 2008-2009. However, the first rate analysis was made in 2007 and has come into effect in 2008-2009 when it was taken over by MMRDA. Generally, the land transactions in these areas were based on the valuation made by the valuer and was not based on the Ready Reckoner rates. The Marshy Land & Salt pans inspite of being in proximity to the prime area of South Mumbai was not developed due unavailability of infrastructure. A considerable area (approximately 300 hectares) is now

being developed to build the residential and commercial complexes. Thus, the previously unused land is also being projected as the second Cuffe Parade of Mumbai (the most exclusive area of South Mumbai).

Thus, by the development of infrastructure i.e the Eastern Freeway the revenue to the government by way of stamp duty and transfer of development rights (TDR) has significantly increased. 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.

It can be seen from the Urban Transport Planning reports for Mumbai City prepared first by Wilbur Smith Associates, 1963 and then CRRI (Central Road Research Institute), 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 needs to be seen from the revenue angle as it has a significant effect on Return on Investment of project.