

# Elevated Rail Corridor for Mumbai

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**ABSTRACT:** Mumbai has one of the highest densities of the population due to which the suburban systems are always overcrowded. There are more people travelling on the train than each train can accommodate for journeys as little as 4 min. Mumbai being a small city has problems expanding the railway track laterally, thus the concept of an “Elevated rail corridor” which would utilize the space above the railway tracks has been proposed. This paper researches the difficulties faced by the commuters and then proposes the elevated corridor.

**KEYWORDS:** Western Suburban Railway, Public Transport Services, Passenger Transportation, Mumbai local trains

## I. INTRODUCTION:

Mumbai Suburban Railway line running with the same alignments linking Oval Maidan with Virar. 42.72 km (approx.) of the corridor was envisioned to be elevated. 8.04 km will possibly be underground and the rest at grade. A decision was taken later that the earlier plan will be altered and an additional stretch of 8.05km from Bandra to Jogeshwari will be underground by the Railway officials that were announced on 29 September 2012 saving over 100 buildings extent on the planned route from demolition. However, the proposal was rejected due to lack of feasibility and conflict between State and Central Government. Later, the Churchgate-Virar corridor was proposed to be a public-private-partnership construction, for such a model, the Government had to allow the bidder to keep a margin of profit by analyzing the potential of land and airspace above the stations but was later scrapped amidst fear of it becoming a real estate project instead of a transport project. [1] Since the proposed Corridor plan was scrapped the following Proposal consists of a notion based on the idea of Elevated Local Trains.

## II. CHALLENGES FACED BY RAILWAYS:

### 2.1 TRAVELLERS

The urban population of Mumbai generally prefers travelling by public transport, keeping in mind the enormous rise in the population of Mumbai has put a strain on all transport systems which shoots up demand for travel, which surpasses the supply of transport infrastructure currently available, which makes public transport completely overwhelmed. Mumbai's bus and train services run at over its capacity at all-time which makes it overcrowded, unreliable. Slow, and dangerous. Mumbai desperately needs improved and expanded public transport services.

The Railway has been the lifeline of Mumbai and it is one of the keys for it to become the financial capital of India. Due to the population dynamics of Mumbai, millions of people travel a long distance every day to reach the places of their job, profession, business and education. This makes local trains an absolute necessity for an urban population like Mumbai. There are three main lines in the local railway network of Mumbai – Western Harbor and Central, each connecting a distinct part of the city to another. It is one of the best examples of strategic management in transport. For Daily travellers, the Mumbai railway has an option for issuing monthly/annual passes to make their travel easy in their pockets. Even then the Public transport system faces many problems due to the lack of financial resources required to maintain, enhance the transport system. This is the case in almost all countries of the developing world. Narrow Roads add to the burden of bus transport services which makes it uncontrollable and in a mess.

The per capita income of India is as of 2019 is 6920 US dollars which is far less than the Western countries such as U.S. and U.K. Which make most urban population in India which relies

on public transport for daily commute making the public transport business an attractive investment on the contrary, many people in India cannot even afford low fare rates of public transport.



Fig.1 Over-crowding at railway station.

The peak hour traffic for local trains in Mumbai is one of the highest in the world. The average Peak Hour Passengers per Direction (PHPPD) is 80573 across all four lines of local trains in Mumbai.

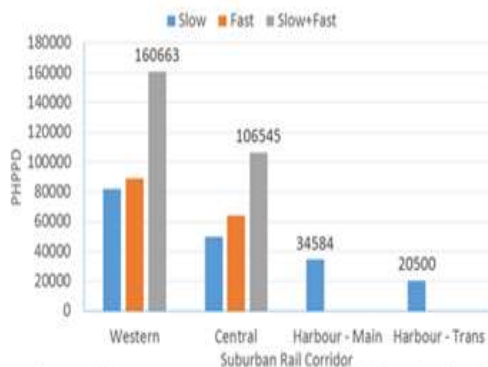


Fig.2 Peak hour Passengers per Direction (PHPPD) for each railway line.

The total urbanized region with its total area connected by all 3 lines:

Virar fast: Vasai - Virar (350 sq. km) + Mira Bhayandar (80 sq. km) + Western Suburbs

Kalyan fast: Kalyan - Dombivali (137 sq. km) + Thane (147 sq. km) + Eastern suburbs

Panvel slow: Half of Navi Mumbai (180 sq. km) + Eastern suburbs

Moreover, the Eastern suburbs are not as wide as the Western suburbs of Mumbai Dahisar to Dadar (28 km), Mulund to Dadar (20 km), Mankhurd to Wadala (12 km).

## 2.2 FLOODING

Indian Railways have approximately 35,000 wagons that are passed their age similarly 1300 coaches 1600 stations closed to 260 distresses bridges and over-aged signalling system moreover

due to improper drainage facility water logging in the rain season is a common affair during which many trains face delays and cancellation and commuters cannot reach their destination on time.



Fig.3 Flooded Railway Station Mumbai.

On July 26 2005 when Mumbai has recorded one-meter rainfall daily which usually is recorded annually the rainfall and flooded the Mumbai railway tracks to an extent that the floodwaters reach the station formation.

## III. REJECTED RAILWAY CORRIDOR:

The earlier rejected proposal for the Oval Maiden was proposed by the western Railways Announced. Into 2008, the proposed corridor project was 63km long with 24 Stations included in the plan, Out of which 13 stations to be elevated, 8 stations underground and the rest 3 stations on ground level. An estimated 76acres of railway land was required to make the railway corridor successful

On 7 Aug 2013, a request for Rs.225 billion was issued under Request for Qualification (REQ). Ministry of Railway (MOR) was planning to implement Design Build Finance Operate and Transfer (DBFOT) via a Public-Private Partnership. However, the MOR was concern that the corridor will have capacity constrain and wanted to take several measures to improve the system capacity. [2]

There were concerns in lateral expansion as required land along the length of the corridor was not feasible. MOR proposed a twin-track

corridor which would serve about 90000 passengers during peak hours also air condition couches will help facing capacity issues and comfort in the travel of passengers.

There is a lack of space for the construction of columns for elevation between Mumbai Central and Churchgate Station. A no of buildings are in the vicinity of the corridor for which they will have to be aligned and this corridor will be extended up to Nariman Point. On Mumbai Central to Borivali Station stretch clearance between railway boundaries and the outermost line is restricted MRVC has also taken the work of 6th line of the railway track this will need a special design and a unique construction method to complete this corridor.

On the contrary, there is enough land available which can be acquired between Borivali and Virar this corridor already consists of four lines and the proposed corridor will keep provision for two new feature lines. This corridor also passes the Vasai Creek, thus will require a bridge with headway clearance and special design. Also provision of raised corridors will also require elevating the Extra High Voltage (EHV) lines. Therefore, the corridor between Dahisar and Bhayandar South has been kept at grade raising of EHV lines has been avoided in the corridor. Also, the corridor between Santa Cruz and Vileparle has been brought at grade due to restriction of height by the Airport Authority of India [3]

On 5 may 2015, as per DNA Mumbai the project was scraped due to lack of support from the State Government despite having amazing design changes. [4]

#### IV. PROPOSED RAILWAY CORRIDOR:

The proposed corridor will be on Oval Maidan to Virar stretch of Mumbai consisting of Nalasopara, Vasal Road, Naigoan, Bhayandar, Dahisar, Borivali, Kandivali, Malad, Goregaon, Jogeshwari, Andheri, Santa Cruz, Bandra, Mahim Junction, Matunga Road, Dadar, Elphinstone Road, Lower Parel, Mahalaxmi, Mumbai Central, Charni road, and Churchgate which will Stretch for 62.3 km approx.

This Stretch will have 19 elevated stations, 2 at grade and 5 underground Stations which will sum up to be 26 stations. Below will be details of each of the corridors.

Particular	Borivali to Virar	Mahalaxmi to Borivali	Oval Maidan to Mahalaxmi	Total
Station (in Nos)	7(2 at Grade, 5 Elevated)	14 (Elevated)	5 (Underground)	26
At Grade (in Km)	10.311	2.2		12.511
Elevated (in Km)	17.507	25.213		42.72
Underground (in km)			8.04	8.04
Length in km	27.818	27.41	8.04	63

Table 1 Elevated Railway Corridor Details

Modified proposal of rail corridor in the Andheri to Virar:

1. The Andheri Virar corridor will be fully elevated which will require acquiring land around the existing railway line.
2. It will be 38 kilometres in length.
3. It will constitute Virar, Nalasopara, Vasia Road, Naigoan, Bhayandar, Mira Road, Dahisar, Borivali, Kandivali, Malad, Goregaon, Jogeshwari, and Andheri stations.
4. It will be the first corridor in the country to have A/C local trains.
5. Fast food joints and other revenue-generating businesses can be set up in the elevated section of the railway stations, which will in turn generate extra cash flow for the railways.

Particular	Borivali-Virar	Andheri-Borivali	Total
Stations in Nos.	7	6	13
Elevated in %	68	32	Full Elevated
Length in km	26	12	38

Table 2 Modified Plan for Mumbai Elevated Corridor

#### V. CONCLUSION

The Elevated corridor will solve numerous problems for the travellers who rely on public transportation mainly trains for their daily commute to earn their livelihood. This will also fix many drawbacks of the existing transportation system. This elevated Corridor will also provide Jobs to many people because of businesses established on the corridor.

#### REFERNCES

- [1]. "Oval Maidan-Virar elevated rail corridor: After elevating commuters hopes, railways ditch proposed corridor". 26 April 2014.
- [2]. "Underground suburban stretch to cost WR Rs. 1,200 crore more". Hindustan Times. 4 October 2012. Retrieved 27 June 2013.
- [3]. Sanjeev Devasia (16 October 2012). "Help us get land for elevated corridor: Railways". Dnaindia.com. Retrieved 27 June 2013.
- [4]. "Mumbai elevated corridor plan falls by wayside". 5 May 2015.



- [5]. Sandeep Ashar (16 October 2012). "Western Railways seeks commercial use of land along route to fund new corridor". The Times of India. Archived from the original on 2 February 2014. Retrieved 27 June 2013.