

1. INTRODUCTION

1.1 BACKGROUND

Mumbai, with a population of over 13 million is the largest metropolis in India and one of the most populous cities in the world. It is expected to have a population of 34.0 million by 2031. To cater to the mobility needs, an efficient suburban rail system runs across of MMR. The existing suburban rail system is one of the most crowded and overloaded suburban systems in the world.

Two zonal railways, the Western Railway (WR) and the Central Railway (CR), operate the Mumbai Suburban Railway system. Western Railway operates the Western Line from Churchgate to Dahanu Road (124 km) and the Central Railway operates the Central and Harbour Lines.

The Corridor from Churchgate to Mumbai Central and from Borivili to Virar consists of quadruple lines, while Mumbai Central to Borivili has 5 lines except Mahim to Santacruz, where 5th line is under construction. Further, two harbour lines of Central Railway run parallel to Western Railway network from Santacruz to Andheri.

The City is expanding towards Virar and beyond. Many large and medium scaled industries have come up between Virar and Dahanu Road due to comparatively cheaper land. To meet the mobility requirements, Indian Railways (IR) and Government of Maharashtra (GoM) through Mumbai Rail Vikas Corporation (MRVC) Ltd., Metropolitan Regional Development Authority (MMRDA) and the World Bank (WB) have planned a comprehensive investment scheme for improving and expanding the transportation network of Mumbai, through Mumbai Urban Transport Project (MUTP).

MUTP I & II has given the kick to provide 5th & 6th Lines between Kurla – Thane, Quadrupling of section between Borivali – Virar, 5th Line between Mahim – Santacruz, conversion of services from DC to AC, 5th & 6th lines between CSTM – Kurla and Thane – Diwa, 6th line between Borivali – Mumbai Central, Extension of Harbour line from Andheri to Goregaon and DC to AC conversion from CST Mumbai to Thane.

In its third phase, it has target to provide new Suburban line on Virar – Vasai – Diva – Panvel Section, Extend Harbour line from Goregaon to Borivali, Add 3rd & 4th Line Virar – Dahanu Road, construct 5th & 6th Line between Borivali – Virar and introduce Fast Corridor on Harbour Line.

1.2 NEED OF THE STUDY

Virar – Dahanu Road Section does not fall under MMR however; it's location with reference to the western suburbs of Mumbai (where WR suburban services are extended) have induced the growth over the years. Many large and medium-scaled industries have come up due to relatively easier land availability, encouraging the physical and economic growth of this belt.

At present, EMUs (Electric Multiple Units) ply up to Virar, while MEMUs (Mainline Electrical Multiple Units) serve the double line section of Virar – Dahanu Road (63.80 km). There are no direct suburban services, only Passenger, shuttle, MEMUs, DMUs and express trains run. **Table 1.1** gives a brief of number of trains on this section on an average day.

Table 1.1: Number of trains running on Virar-Dahanu Road Section

Sr. No.	STATIONS	TRAIN SERVICES											
		SHUTTLE		PASSENGER		EXPRESS		MEMU		DMU		TOTAL	
		DN	UP	DN	UP	DN	UP	DN	UP	DN	UP	DN	UP
1	VIRAR	6	6	4	5	3	5	9	9	1	1	23	25
2	VAITARNA	6	6	3	4	0	0	9	9	1	1	19	20
3	SAPHALE	6	6	3	5	2	2	9	9	1	1	21	23
4	KELVE RD.	6	6	4	5	0	0	9	9	1	1	20	21
5	PALGHAR	6	6	4	5	10	10	9	9	1	1	30	31
6	UMROLI	1	1	0	1	0	0	9	9	1	1	11	12
7	BOISAR	6	6	9	5	9	6	9	9	1	1	34	27
8	VANGAON	6	6	4	5	1	1	9	9	0	0	20	21
9	DAHANU RD.	6	6	4	5	13	7	9	9	0	0	32	27

Source: Western Railway Time Table, Revised Version, July 2012

Mumbai Rail Vikas Corporation (MRVC) in Phase – III of MUTP has sanctioned the proposal of commissioning the suburban rail services up to Dahanu Road by expanding the capacity and introducing 3rd and 4th line (**Figure 1.1**). MRVC have commissioned the services of M/s RITES Ltd. to undertake the pre-feasibility of constructing the additional lines for operation of suburban services.

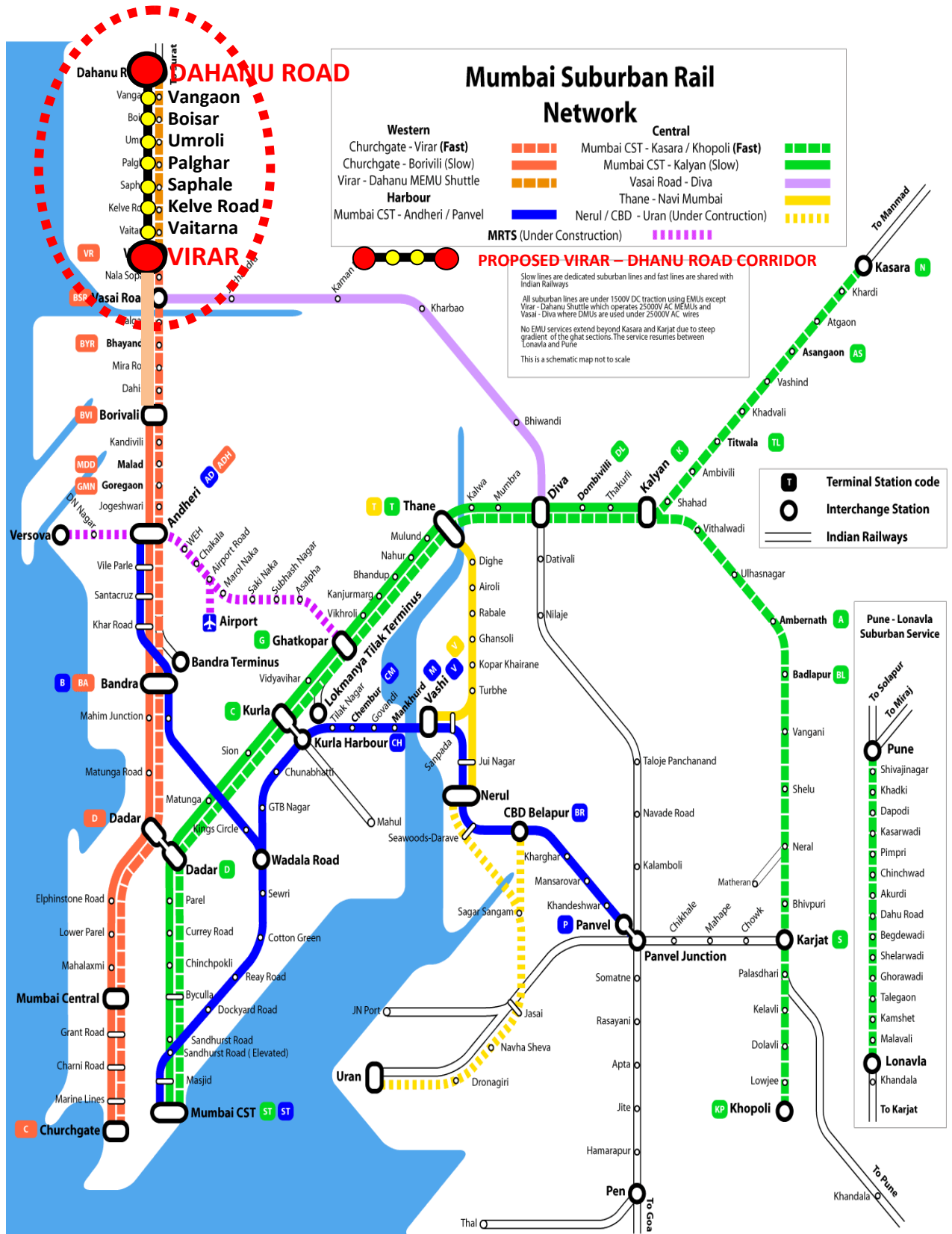
1.3 CORRIDOR CHARACTERISTICS

The section between Virar and Dahanu Road is under significant industrial development and important features of major developments are as follows;

- i. **VAITARNA:** Vaitarna is a small habitation of about 500 people along the Vaitarna River. Vaitarna is one among the six supplies of water in Mumbai. Primary occupation of people here is farming and removing sand from river & creek. The region is expected to attract new employment and habitation with the working of 'Middle Vaitarna Water Supply Project - dam on Vaitarna River at Kochale village which will store water for supply and generate electricity from hydropower'.
- ii. **SAPHALE:** Saphale station on existing rail system serves more than 40 villages. On west side, Makunsar, Aagarwadi, Dativare, Chatale, Usarani, Kore, Mathane, Mande, Makane, Rambag are while on east side, Pargaon, Lalthane, Varai and many small villages are present.
- iii. **KELVA ROAD:** This station is at about 5 Km from Kelva Beach and connects tourists to Kelva Fort, Sheetla Devi Temple & Shirgaon Fort. Majority of the residents of Kelva are involved in the fishing industry due to the proximity of Satpati, Maharashtra's biggest fishing centre. Tourism industry is growing due to the increasing popularity of Kelva beach.
- iv. **PALGHAR:** Palghar is a town of about 53000 population (2011 census). The town is well placed with social and physical amenities like schools, colleges, hospitals, cinemas, restaurants, shopping centres etc. The town is a major hub for all the facilities. Industrialization is gradually changing the face of Palghar. Many industrial units are located within and nearby Palghar which have given employment to the locals.

Industries located within Palghar are Welspun, Macleods, Pharma's first unit, Durian, Sundaram Notebook, Ginza Industries Ltd, R&S Electronics, Ebco, EU-Medicaments, Raghuvanshi Exports, Abby Lighting, Astamed Healthcare (I) Pvt. Ltd., Fashion Forecast (India), Rapid Valves, Kamal Containers, Thakkar & Sons, Nirali Sinks, Vinod Cookware, Macro Bars And Wires (India), Austenitic Steels etc. Along with industries, Palghar has a number of industrial townships, prominent ones being Genesis Industrial Township and Dewan & Sons.
- v. **UMROLI:** Umroli is a Village in Palghar Taluk at about 6 km in distance from its Taluk Main Town Palghar.

Figure 1.1: Proposed Virar- Dahanu Road Corridor



- vi. **BOISAR:** Boisar is a village of about 15000 populations (as per 2011 census). The town currently has more than 1500 industrial units with global Corporates like Tata Steel, JSW Steel, BARC, Tarapur power station etc providing employment opportunities for people in Boisar and adjoining areas. There is a significant level of economic activity in Boisar which created more than one lakh jobs over the last decade. Considering that an average of nearly 77,000 commuters travel the 63.8 km from Dahanu Road to Mumbai every day in shuttle services via Boisar.

Tarapur Industrial Estate, the premium industrial area, is located nearby. This huge industrial area accommodates various specialty chemical, bulk drugs, steel and alloy and textile manufacturing companies. The city currently has more than 1500 industrial units with global Corporates like Tata Steel, JSW Steel, BARC, Tarapur power station etc providing employment opportunities for people in Boisar and adjoining areas.

Asia's first nuclear power plant, Tarapur Atomic Power Station is located 12 km away from Boisar. Bhabha Atomic Research Centre is also located close by. This location consists of the waste immobilization plant and the fuel reprocessing plant.

- vii. **VANGAON:** Vangaon is a village well known for its delicious chikoo fruit, capsicum, tomatoes, coconuts and some agriculturists grow flowers like Lily. Tarapur MIDC, Tarapur Atomic Power Station and a Thermal Power Station owned by Reliance Energy Limited are located close by.
- viii. **DAHANU ROAD:** Dahanu Road railway station is the last main station within boundary of Maharashtra State en route Mumbai Vadodara Western Railway, although the track continues north to Gholvad and beyond.

Dahanu city has a population of 1.27 lakh (census, 2011) and has all the amenities which make it a self independent settlement.

Rubber balloons, rice mills and manufactured goods, are major manufacturing products which are produced in Dahanu. There is also a 500-MW thermal power plant that supplies electricity to Mumbai. The electricity is distributed by Reliance Energy.

Dahanu and surrounding area is designated by the government of India as an ecologically fragile zone, to protect the greenery from industrial pollution. Dahanu Road also has many balloon factories in the Masoli area. Industrial

development received a setback from new ecological regulations hence tourism, animal husbandry, fishing, small scale units and farming are the only industries where expansion can take place.

1.4 STUDY OBJECTIVES

The primary aim of the study is preparation of alignment plans with limited topographical surveys for proposed corridor, to estimate the ridership on the proposed corridor, preparation of block cost estimates and project appraisal.

1.5 SCOPE OF WORK

The scope of work for the Study includes:

Collection of available Railway scale plans, yard plans, index plans, longitudinal sections and Railway boundary plans from the MRVC/Railway authorities for marking the alignment proposal along the existing Rail networks.

- Collection of Google map/other open source maps for marking the alignment proposal for new corridor.
- Collection of existing Railway bridge details and suggestions for their strengthening/ extension due to above corridor.
- Reconnaissance Surveys at limited locations for preparation of alignment plans and assessment of land requirement. Identification for station location, Maintenance Depots.
- Traffic Study: Review of previous data and carrying out limited primary surveys for assessing the traffic demand expected to be served by above corridor.
- Reconnaissance surveys for identification of major overhead utilities along the corridor requiring diversion / relocation.
- Feasibility of integrated operations of above corridor with existing railway corridor.
- Preparation of the Train Operation Plan and assessing the requirement of Rolling Stock.
- Preliminary planning of maintenance facilities.
- Preparation of block cost estimates of project construction costs.

1.6 COMPOSITION OF REPORT

The Draft Final Report has eight chapters.

- i. The first chapter discusses the study background, objectives and scope.
- ii. Chapter two consists of travel characteristics in the study area and ridership assessment on the Study Corridor.
- iii. Chapter three is on Alignment Planning
- iv. Chapter four is on station planning and intermodal integration.
- v. Chapter five presents the train operation plan.
- vi. Chapter six discusses the power supply arrangements.
- vii. Cost estimates and Financial Analysis are presented in chapter seven.