

IDENTIFICATION OF EXPECTED MAJOR ISSUES DURING THE EXECUTION OF SEWRI TO WORLI ELEVATED CONNECTOR- A CASE STUDY

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Abstract:-

The geography of Mumbai is like elongated strip (having relatively small land width), running in North South directions and surrounded by Arabian Sea on West and Thane creek on its East. Naturally, the main roots for Transport communications run North and South directions. Similarly, it has been known that the present state of City of Mumbai has been brought by connecting old Seven Island, Colaba, Mahim, Parel, etc. From this it will be understood that the main land was bifurcated from the Island City due to presence of Thane Creek. With increase in activities within the City of Mumbai it was considered necessary also to develop areas in Main Land so that growth and developments does not get choked. This need got further eventuated with opening of national economy with which besides usual trade and commerce activities in financial sectors also started expanding. As of this time, an all-weather port JNPT is already developed and giving excellent services. The new international Airport is also on the way of commencing near to Panvel on Main Land. Naturally, there is every need to have speedy road link between Main Land & the Island so that developments in hinterlands would happen rapidly.

Key Words: - Elevated Corridor, Conflict, FOB, ROB, Monorail.

1. Background: -

Mumbai has changed considerably after it was first inhabited in the 1500s and its prominence and the constant pace of change have ensured that Mumbai of 2018 is not the same as Mumbai of 2008. In the last one decade, the city witnessed numerous changes including infrastructure developments such as the Mumbai Metro, Monorail, the Santacruz-Chembur Link Road, the Bandra-Worli Sea Link, Eastern Freeway and the new terminal at the Chhatrapati Shivaji International Airport. However, the changes that India's financial capital is now poised for is set to change the face of the city and its satellite cities in a much more prominent

manner. The Mumbai Trans Harbour Link (MTHL), also known as the Sewri-Nhava Sheva Trans Harbour Link, is a proposed 21.8 km, freeway grade road bridge connecting the Indian city of Mumbai with Main Land. When completed, it would be the longest sea bridge in India. The bridge will begin in Sewri, South Mumbai and cross Thane Creek north of Elephanta Island and will terminate at Chirle village, near Nhava Sheva. The road will be linked to the Mumbai Pune Expressway in the east, and Island City Mumbai. The sea link will contain a 8 lane highway, which will be 31 meters in width, in addition to edge strip and crash barrier.

2. Present Scenario:-

Presently Sewri Railway Station act as dead end for Archarya Donde Marg. Eastern freeway don't have any connection ramp to get down as well as up from Archarya Donde Marg. Once The Mumbai Trans Harbour Link (MTHL), project completed there is no arrangement at Sewri west side to disperse the coming traffic from MTHL. Lot of construction of residential and commercial structures had taken place around Sewri Bus Stop and Sewri Railway Station. CST-Panvel Fast Rail Corridor is proposed in between Eastern Express Way & CTSM –Panvel (Harbour line) which is traversing at 23 m Height from ground. the Metro line is under DPR stage on sea side of Eastern Express Freeway. There is an existing FOB which crosses Acharya Dhonde Marg and the alignment passes over the FOB Also temporary structures /stall are observed at the edge of footpath and will have to be vacated as per necessity. Elevated corridor will go second level above monorail then it will cross Hindmata Flyover (Parel Flyover) then it will cross Elphinstone station(Prabhadevi) at second level above Churchgate-Virar Elevated corridor then it will cross Senapati Bapat Road on second level and finally it will cross Dr. Annie Basant Road and join Narayan Hardier marg.

3. Need of Project: -

It is to note that the said link was envisaged as back in year 1974 when it was known as the Main Land Link. However, with development of Sea Port etc. on Main Land the Alignment was modified and the Link was nomenclature as Sewri Nava Sewa link. The same link is now termed as Mumbai Trans Harbour Link (MTHL). Though this road connectivity was planned long back due to one or the other reason it had not become possible to start works on it.

4. Objectives: -

- To observe the challenges that are expected during construction of viaduct structure at the junctions

- To observe the challenges that are expected during construction of viaduct structure at major roads & railway line
- To Develop the Mainland and reducing traffic pressure on Mumbai City
- To Facilitate decongestion on other transport systems
- to update the technical, economic and financial viability

5. Literature Review:-

Mary Jane CASTILLO, Crispin Emmanuel DIAZ, Economic Impacts of Roadway Utility Obstructions in the Philippines, Proceedings of the Eastern Asia Society for Transportation Studies, Vol.13, 2021

Road widening is a critical public investment that is aimed at alleviating traffic congestion and to bring about economic benefits in terms of savings in vehicle operating costs and travel time. Obstructions of electrical poles along the highways, including the recently-widened portions, inhibit the full realization of these benefits, and in addition, expose the travelling public to unnecessary hazards. In order to prevent delays in road widening and utility relocation, it is recommended that closer collaboration of both the highway and utility sectors be enhanced. The study suggests that the existing policies be modified to provide better strategies in addressing the issues observed in the previous implementation, as well as the identified institutional weaknesses of both highway and utility sectors.

Steven Chien, Liuhui Zhao, Evaluating the Effectiveness of Traffic Diversion and Managed Lanes on Highway Work Zones, April 2016

Highway repair and maintenance projects (e.g. deck replacement, resurfacing, joint repairs, utility works, etc.) occupy the road and disrupt traffic operations, which increase delays because of reduced capacity. According to an urban mobility report conducted by Schrank et al.

(2010), 2009 traffic congestion data suggests that urban Americans travelled an additional 4.8 billion hours and consumed extra 3.9 billion gallons of fuel, which is equivalent to 115 billion U.S. dollars. In New Jersey (NJDOT, 2008), the annual congestion cost is 8.6 billion U.S. dollars (i.e., \$1,465 per licensed driver), including 129 million gallons of wasted fuel while sitting in traffic (Spasovic et al., 2008). This Report introduces the methodology developed here has demonstrated a feasible way to optimize a combinatorial, multi-dimensional work-zone scheduling problem considering traffic diversion. By considering a realistic, discrete time-cost relation and time varied traffic demand, this study provides a practical approach to schedule minimum total cost operations for highway maintenance work

Construction of Sewri to Worli Elevated connector. Public consultation, Mumbai Metropolitan Region Development Authority, Meeting month January 2020

Mumbai Metropolitan Region Development Authority (MMRDA) has proposed to construct the Sewri- Worli Elevated Connector (SWEC) for dispersal of traffic dispersal for Mumbai Trans Harbour Link on Mumbai side. The alignment of the Sewri -Worli link starts from Sewri Interchange of MTHL project, crosses the Harbour Railway line, goes along the Acharya Donde Marg, crosses flyover at Dr. Ambedkar Road, crosses the Central Railways and Western Railways at Elphinstone Road station, further crosses the flyover at Senapati Bapat Road, goes along Jagannath Bhatankar Road, further traverses through the Kamgar Nagar-I and Kamgar Nagar-II (drainage -channel road), crosses Dr. Annie Besant Road thereafter terminates on Narayan Hardikar Road (road connecting Dr. Annie Besant Road to the Worli Sea face). The total length of Sewri-Worli connector is about 4.5 km. A Public Consultation is being undertaken for the proposed Sewri- Worli Elevated Connector project for resident of Worli Sea face area as per the

directions of Maharashtra Coastal Zone Management Authority (MCZMA). The Public Consultation regarding the project will be held at Podium Floor, Auditorium Room, New Building MMRDA at 11:00AM on 20th December 2019

Abdul-Rahman Taiwo Ajala, Traffic Management Strategies and Best Practices, ISBN 978-978-52640-9-8 October 2017.

This book introduced traffic management as a field of study that is just emerging in this part of the world. It exposed readers to the fact that the largest percentage of practitioners in the field had backgrounds in other fields of study other than transportation, civil or highway engineering and/or urban planning which were the related. Understanding the different varieties of roads, their hierarchies, characteristics, designs and structures have been presented in this chapter emphasising engineering elements that structurally determine traffic flows on the network. Traffic operations and flow pattern are greatly affected and/or controlled by different structural elements such as channelization, interchange and link roads.

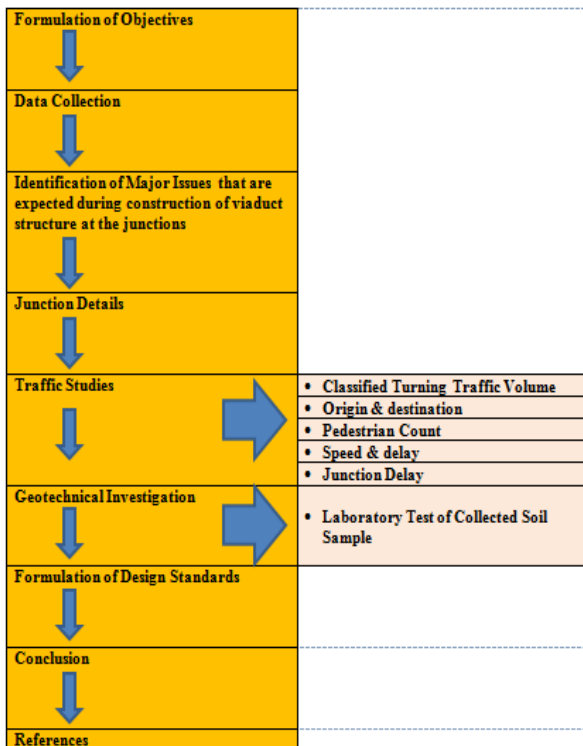
Dr. Prashant D. Hiwase, S Venkat Shubham, Ashlesh S Reddy, Arshad A Ali, Comparison of Foot-Over Bridge with Different Configuration of Members, Helix The Scientific Explorer, February 2020

Foot over bridge is an important civil engineering structure designed for the free movement of pedestrians in heavy vehicle traffic regions across roads, railway line etc.

There is a critical comparison between foot over bridges having different configurations based on Strength, Safety, Economy and Sustainability using the concept of Influence Line Diagram (ILD). The comparison between compression and tension members having equal forces has been highlighted by designing and cost comparing of both. In foot-over Bridge tensile force should always be preferred over compressive force. Foot-over bridge is a walkway bridge designed for the free movement of pedestrian across railway line

canals and marshy land etc. Foot over bridge are also located across roads for free movements of pedestrians in high Vehicular traffic region For two members carrying same forces of tension and compression respectively, steel required for tension member is nearly 50% that of steel required for compression member.

6. Methodology:-



7. Case Study, Location-I-Sewri Station & Eastern Freeway:-

CST-Panvel Fast Rail Corridor is proposed in between Eastern Express Way & CTSM Panvel (Harbour line) which is traversing at 23 m Height from ground. It is also learned that Metro line is under DPR stage on sea side of Eastern Express Freeway. The project starts from the eastern side of Eastern Freeway and will cross Eastern Freeway & Harbour Railway Tracks. Few encroachments have to be vacated from the footpath and road areas. Proper safety & traffic

diversion plans especially during construction of bridge over tracks is envisaged.

8. Case Study, Location-II-Existing Foot Over Bridge:-

Initial study shows that EWC gradient need to check between Sewri Bus Stop to G.D. Ambedkar road as Foot Over Bridge crosses the alignment. Level of Foot Over Bridge is approximately 6 m above GL and with considering; required clearance of about 8 m. Final Gradient and Alignment will decide demolition of existing Foot Over Bridge.

9. Case Study, Location-III- Conflict with Monorail Alignment

Project alignment is in conflict with Monorail alignment coming from G.D. Ambedkar Marg, running parallel to project alignment and going right from Khanolkar Chowk towards Dr. Earnest Borges Road. It is expected that elevated corridor will go at 2nd level above monorail & the viaduct structure will rest on portal foundation that will come near footpath on either sides

10. Case Study, Location-IV- Major Junction (Hindmata Flyover)

Elevated corridor will cross the existing flyover at 2nd level. This is a major junction and it is well understood that execution of work has to be done in a planned manner. Utmost care is required to ensure that traffic is not disrupted during actual execution of works. All safety precautions have to be taken in full Force.

11. Case Study, Location-V- Major Crossing at Elphinstone Crossing Western and Southern Railway:-

The execution of works at these major crossings is expected to be of most complex type. The centre line of elevated corridor and that of existing Elphinstone Bridge (ROB) is expected to

coincide. The task becomes more herculean due to the planned Church gate Virar elevated corridor which is expected to go at 2nd level. Biggest Challenges will be Space constraint at bridge location, Construction of Foundation & Substructure in close proximity to running tracks, The sheer height at which the elevated structure is to be constructed

12. Location-Wise Constraints & Issues Expected:-

12.1 Sewri Station & Eastern Freeway:-

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**Image:-
Sewri
Railway
Station**



12.2 Existing Foot Over Bridge:-

Initial study shows that EWC gradient need to check between Sewri Bus Stop to G.D. Ambedkar road as Foot Over Bridge crosses the alignment. Level of Foot Over Bridge is approximately 6 m above GL and with considering; required clearance of about 8 m. Final Gradient and Alignment will decide demolition of existing Foot Over Bridge.



Image: - Foot Over Bridge

12.3 Conflict with Monorail Alignment

Project alignment is in conflict with Monorail alignment coming from G.D. Ambedkar Marg, running parallel to project alignment and going right from Khanolkar Chowk towards Dr. Earnest Borges Road. It is expected that elevated corridor will go at 2nd level above monorail & the viaduct structure will rest on portal foundation that will come near footpath on either sides

Image: - Monorail Station Near Haffkine



Image: - Monorail Enters in Alignment at GD Ambedkar Marg

Conclusion:-

Presently Sewri Railway Station act as dead end for Archarya Donde Marg. Eastern freeway don't have any connection ramp to get down as well as up from Archarya Donde Marg. Once The Mumbai Trans Harbour Link (MTHL), project completed there is no arrangement at Sewri west side to disperse the coming traffic from MTHL. Lot of construction of residential and commercial structures had taken place around Sewri Bus Stop and Sewri Railway Station. CST-Panvel Fast Rail Corridor is proposed in between Eastern Express Way & CTSM –Panvel (Harbour line) which is traversing at 23 m Height from ground. the Metro line is under DPR stage on sea side of Eastern Express Freeway. There is an existing FOB which crosses Acharya Dhonde Marg and the alignment passes over the FOB Also temporary structures /stall are observed at the edge of footpath and will have to be vacated as per necessity. Elevated corridor will go second level above monorail then it will cross Hindmata Flyover (Parel Flyover) then it will cross Elphinstone station(Prabhadevi) at second level above Churchgate-Virar Elevated corridor then it will cross Senapati Bapat Road on second level and finally it will cross Dr. Annie Basant Road and join Narayan Hardier marg.

Based on the data collected and study of parameters that impinge upon the travel demand the CTS report has projected the need of railway and highway network by the year 2031. Giving due consideration to the complexity of the job, proper safety & quality measures have to be taken during execution of the project. The seriousness of the issue (Observed issues, in the chapter named Data Collection & Analysis) that needs to be handled.

References:-**Papers/ Books:-**

1. Mary Jane CASTILLO, Crispin Emmanuel DIAZ, Economic Impacts of Roadway Utility Obstructions in the Philippines, Proceedings of the Eastern Asia Society for Transportation Studies, Vol.13, 2021
2. Steven Chien, Liuhui Zhao, Evaluating the Effectiveness of Traffic Diversion and Managed Lanes on Highway Work Zones, April 2016
3. Construction of Sewri to Worli Elevated connector. Public consultation, Mumbai Metropolitan Region Development Authority, Meeting month January 2020
4. Abdul-Rahman Taiwo Ajala, Traffic Management Strategies and Best Practices, ISBN 978-978-52640-9-8 October 2017.
5. Dr. Prashant D. Hiwase, S Venkat Shubham, Ashlesh S Reddy, Arshad A Ali, Comparison of Foot-Over Bridge with Different Configuration of Members, Helix The Scientific Explorer, February 2020

Links:-

- <https://indianexpress.com/article/cities/mumbai/elevated-road-between-hindmata-and-parel-flyover-opens-to-traffic-7376232/>
- [https://indianexpress.com/article/cities/mumbai/worli-sewri-elevated-connector-could-face-further-delay/ \(The Indian Express, E Paper, Dated 31.12.2022\)](https://indianexpress.com/article/cities/mumbai/worli-sewri-elevated-connector-could-face-further-delay/ (The Indian Express, E Paper, Dated 31.12.2022))
- https://en.wikipedia.org/wiki/Annie_Besant
- <https://www.lawinsider.com/dictionary/elevated-structure>
- <https://www.projectmanager.com/blog/project-quality-management-quick-guide>