

UPCOMING LONGEST ELEVATED FLYOVER CARRIDOR OF THE STATE OF MADHYA PRADESH IN THE CITY OF JABALPUR IS CONTROL THE NOISE POLLUTION

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Abstract - Our project deals with the study of upcoming flyover, its design and thereafter adding suggestion to it. The flyover will be from Damoh Toll plaza to Ranital Madan Mahal Chowk, Medical College. The flyover stretch is 5.9km and the estimated cost of the project is Rs 758.54 corer. It is the longest flyover till date to be constructed. While the traffic on road is increasing day by day and there is no space left in both dimension, and finally the only option left is to go to third dimension and that is made all the way through flyover construction. Flyover is a bridge that carries one road or else railway line above another moreover with or lacking subsidiary roads, for communication connecting the t. The main purpose is to get better present state of affairs vastly and make association traffic convenient to possible extend, although a completely difference free situation can not be understood. Scope of work includes collection of data concerning existing pavement crust composition as well as features and existing sub grade type conditions. To reduce traffic congestion at an at-grade intersection near a big city, one method is construction a flyover bridge at the old junction in two direction on one of the main highway. The flyover facilitates the traffic flow in the directions of the bridge but the infrastructure cannot full solve all of the problems especially on the secondary road. Under the bridge, although it relives the traffic congestion at the intersection; the traffic signal still uses the same control as the "befor" situation, that is the fixed time control plan. With the flyover bridge in place, it was found that about 30-35% of all traffic volumes diverted to the bridges, and time delay reduced by 30% over the same period. This paper which is one part of the first author thesis presents the issues that still exist at the flyover improved junction and makes suggestion to increase the benefits of the flyover such as creating a new cycle and phase time and improving the physical area under the bridge



1. INTRODUCTION

Piles during these in the Middle Ages, pile foundations supported a wide assortment of structures in Venice and in Holland. Many years were made from trees, whose branches were trimmed, and were driven down with the small diameter at the bottom, until penetration of the soil was no longer possible. This condition, known as refusal, was a combined function of the soil stratigraphy and the limits of the driving mechanism. Driving was probably by hand mauls, hand-operated machine mauls, treadmill drivers, water wheel drivers and gang operated rams. The industrial revolution, with its utilization of steam power, changed the situation drastically. The first steam-activated pile hammer was invented by Nesmith in 1845 and ushered in modern pile driving. Parallel to these developments, structures larger than those previously built, e.g. bridge piers and large buildings required pile capacities greater than those already available. A limited-access road known by various terms worldwide, including limited-access highway, dual carriageway and expressway, is a highway or arterial road for high-speed traffic which has many or most characteristics of controlled-access highway (freeway or motorway), including limited or no access to adjacent property, some degree of separation of opposing traffic flow, use of grade separated interchanges to some extent, prohibition of some modes of transport such as bicycles or horses and very few or no intersecting cross-streets. A controlled-access highway provides an unhindered flow of traffic, with no traffic signals, intersections or property access. They are free of any at-grade crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway. Entrance and exit to the highway are provided at interchanges by slip roads (ramps), which allow for speed changes between the highway and arterial roads and collector roads

STUDY AREA

Jabalpur (formerly Jubbulpore) is a tier 2 city in the state of Madhya Pradesh, India. Jabalpur word combines Arabic word Jabal (meaning- rock) and Sanskrit word- Pur (meaning- city). It is one of the most famous cities of Madhya Pradesh. According to the 2011 census, it is the third-largest urban agglomeration in Madhya Pradesh, and the country's 30th-largest urban agglomeration. Jabalpur is a city in the central Indian state of Madhya Pradesh and one of the fastest growing cities in the country. As per 2011 censuses the population of Jabalpur district is 24.61 lakhs out of which 10.54 lakhs live in Jabalpur city, in 79 wards, covering a gross area of 224.47 sq. km. The city is located on the banks of Narmada River and sprawls over the plains of its tributaries (23° 10' North latitude and 79°57' East longitude). National Highway 12 (Jaipur - Jabalpur road), links the city to many important cities in the northwest and National Highway No 7 connect the city to Varanasi and Nagpur The broad gauge railway line to Mumbai and Kolkata (via Allahabad) connect the city to Mumbai and Kolkata. The High Court of MP is located in Jabalpur and so are many Government administrative headquarters. It is one of the major centers for the production of arms and ammunition and military base in India. The city is a major trading center and producer of forest products. Industrialization is on verge of taking off for private entrepreneurs. Nevertheless, city is experiencing fast growth in all sectors. Jabalpur is the administrative headquarters of Jabalpur district (the Orissa, Bihar, and Jharkhand) are located in Jabalpur. The city is also home to the Gun Carriage Factory [Ordnance Factory] [, Vehicle Factory].second-most-populous district in Madhya Pradesh) and the Jabalpur division. Historically, a center of the Kalachuri and Rajgond dynasties, the city developed a syncretism culture influenced by intermittent Mughal and Maratha rule. During the early nineteenth century, it was annexed by British India as Jubbulpore and incorporated as a cantonment town. Since Indian independence there have been demands for a separate state of Mahakoshal, with Jabalpur its capital. The High Court of Madhya Pradesh, headquarters of the West Central Railway and Army headquarters of five states (Madhya Pradesh)

- DASHMESH DWAR
- MADAN MAHAL STATION
- TELEGRAPH GATE NO 2
- RANITAL SQUARE
- BALDEV BAGH SQUARE
- GOPAL MARKET
- DAMOH NAKA SQUARE

Necessity of flyover

Flyovers help to streamline the traffic control system by helping to reduce traffic congestion. Reduced horizontal curvature reduces risk of off-road crashes. The impact of the flyover construction to curb traffic congestion problem has been assessed in terms of traffic decongestion, time saving and fuel saving. Road from Ranital Square to Madan mahal station , passing from Rail Under Bridge , destined to Madan mahal Chowk is observed to be heavily populated. Due to restricted road width , one fourth population of Jabalpur face traffic jams to reach Ranital and places. Also the three fourth population can't travel to Madan mahal chowk from different parts of Jabalpur. This problem of traffic congestion near that location necessitates the construction of flyover.

Noise Pollution Standards

In India, the Noise Pollution (Regulation and Control) Rules, 2000 have been framed under the Environment (protection) act, 1986 to control community noise, Noise Pollution (Regulation and Control) Rules, 2000 notified in February 2000 and amended from time to time. The recent amendments to Noise Rules, 2000 have been published in the official Gazette on 11th January, 2010. The ambient levels of noise for different areas/zones specified in the rules indicated in Table1.1 [19]

TABLE 1.1 Ambient Noise Quality Standards as given by CPCB

Area Code	Category of Area/Zone	Leq dB (A)	
		Day time (6a.m.-10 p.m.)	Night Time (10 p.m - 6 a.m.)
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Noise standards for automobiles have been notified in Part 'E', Schedule-VI of Environment (Protection) Rules, 1986, as amended on 19th May,1993,as given in the Tables [19] below.

TABLE 1.2 Noise standards for automobiles as per Environment (Protection) Rules, 1986

<i>S.No.</i>	<i>Types of vehicles</i>	<i>Noise level in dB</i>
1	<i>Motorcycle, scooters and three wheelers.</i>	<i>80</i>
2	<i>Passenger Cars</i>	<i>82</i>
3	<i>Passenger or Commercial Vehicle up to 4 MT</i>	<i>85</i>
4	<i>Passenger or Commercial Vehicle above 4 MT and up to 12 MT</i>	<i>89</i>
5	<i>Passenger or Commercial Vehicle exceeding 12 MT</i>	<i>91</i>

In WHO noise quality guidelines, values are summarized with regard to specific environments and effects. For each environment and situation, the guideline values take into consideration the identified health effects and are set, based on the lowest levels of noise that affect health (critical health effect). Guideline values typically correspond to the lowest effect level for general populations, such as those for indoor speech intelligibility. Noise guideline values are for the onset of health effects from noise exposures [19].The role of WHO about the control of noise pollution is noteworthy. Although WHO is not an authority to prescribe the limits of noise, it recommends some permissible limits of noise, which are just advisory for its member states [16].

TABLE 1.3 WHO Guidelines for Environmental Quality Standards

<i>Specific Environment</i>	<i>Critical Health Effects</i>		<i>Allowable Noise Level (dB)</i>	<i>Time Duration (Hrs)</i>
<i>Outdoor living area</i>	<i>Serious Annoyance Day time</i>		<i>50</i>	<i>16</i>
<i>Indoor, Inside bed room</i>	<i>Moderate</i>	<i>Day time</i>	<i>35</i>	<i>16</i>
	<i>Annoyance</i>	<i>Night Time</i>	<i>30</i>	<i>08</i>
<i>Outside bed room</i>	<i>Sleep disturbance, window open</i>		<i>45</i>	<i>08</i>
<i>Class room</i>	<i>Disturbance of information, message communication</i>		<i>35</i>	<i>During class</i>
<i>Hospital ward room</i>	<i>Sleep disturbance</i>	<i>Night time</i>	<i>30</i>	<i>08</i>
		<i>Day time</i>	<i>30</i>	<i>16</i>
<i>Industrial, commercial, shopping and traffic areas</i>	<i>Hearing impairment</i>		<i>70</i>	<i>24</i>
<i>Public address indoor and outdoor</i>	<i>Hearing impairment</i>		<i>85</i>	<i>01</i>
<i>Music through head phone</i>	<i>Hearing impairment</i>		<i>85</i>	<i>01</i>

1.4 Statutory provisions of noise pollution

Apart from Art. 21 of the Constitution of India, which guarantees right to life, Arts. 48A and 51A (g) of the Constitution are as under: -

- Article 51 A (g)-"to protect and improve the natural environment including forest, lakes, rivers and wildlife and to have compassion for living creatures"[16].
 - Article 48A-"Protection and improvement of environment and safeguarding of forests and wildlife. The State shall Endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country" [16]. In order to legally enforce control on noise levels, GOI has notified the Noise Pollution (Regulation and Control) Rule, 2000 under Environment (Protection) Act, 1986. The major highlights of the provision of Noise Pollution (Regulation and Control) Rule, 2000 are indicated below :
- 1) The noise levels in any area / zone shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule [14] [19].
 - 2) The State Government shall take measures for abatement of noise including noise emanating from vehicular movements and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules [14] [19].
 - 3) All development authorities, local bodies and other concerned authorities while planning developmental activity or carrying out functions relating to town and country planning shall take into consideration all aspects of noise pollution as a parameter of quality of life to avoid noise menace and to achieve the objective of maintaining the ambient air quality standards in respect of noise [14] [19].
 - 4) The authority shall be responsible for the enforcement of noise pollution control measures and the due compliance of the ambient air quality standards in respect of noise.
 - 5) A person may, if the noise level exceeds the ambient noise standards by 10 dB (A) or more given in the corresponding columns against any area / zone, make a complaint to the authority [14] [19].
 - 6) The authority shall act on the complaint and take action against the violator in accordance with the provisions of these rules and any other law in force [14] [19].

Noise control techniques can be in four fundamental ways to reduce noise. Reducing the noise at the source, blocking the path of noise to receiver, increasing the path length and protecting the receiver and the best method of control are reducing noise

CONCLUSION

The conclusion of major project is that so far we have spent months into visiting places , reading and understanding the flyover. But then being smarter in terms of technology will ease you and eventually if we see government opting smarter techniques then the smart world is created. We learned how creativity and technology with speed breakers can generate electricity. How the use of geoweb , reuses the plastic which cant be decomposed? How congestion is thought to be solved even where in formative years generations will be relieved?

How groundwater will still be in replenished form? Therefore smarter suggestions and ideas would construct an ideal flyover. Most road projects today involve modifications to existing roadways, and the planning, operation, and maintenance of such projects often are opportunities for improving ecological conditions. A growing body of information describes such practices for improving aquatic and terrestrial habitats. The objective of the study was to know the condition of vehicular noise pollution at different squares of Jabalpur City. Traffic noise level at all the Intersection of Jabalpur city are well above the standard prescribed by CPCB of India. In this study, Leq value fluctuates between 77.3 dB (A) – 84.7 dB(A), 79.6 dB(A) – 83.5 dB(A) & 76.9 dB(A) – 84.5 dB(A) at three different commercial areas of Jabalpur city i.e. at Ranital Intersection& Damoh Naka Intersection respectively. Although, according to CPCB & Noise Pollution (Regulation And Control) Rules, 2000 under Environment (Protection) Act, 1986 permissible noise level at commercial area during day time i.e. between 6 am to 10 pm (our study time) is limited to 65 dB(A). Similarly permissible noise level at silence zone by this source is limited to 50 dB (A). Whereas silence zone under our study i.e. Ranital Intersection fluctuates between 85.1 dB (A) – 74.4 dB(A). All the basic noise parameters have maximum value at Ranital Intersection at morning. During afternoon and evening, they have maximum value at Damho Naka Intersection. Leq values at all the squares during each portion of day at all the Intersection are well above the prescribed limit of CPCB. Thus, we can say that traffic noise levels at all the squares of Jabalpur city are well above the standard prescribed by CPCB of India. Traffic jams and unregulated traffic has become an endemic feature even at major squares of

Jabalpur city due to insufficient street capacity. Although heavy vehicles are not permitted to enter the city in the daytime 06:00 – 22:00 o'clock but still the main fraction of transport activities are relied to personal gasoline cars and diesel buses which generate the high level of noise pollution due to poor maintenance and old technology. The major parts of public buildings situated near Ranital Intersection are directly exposed to excessive traffic noise. Since, TNI and LNP has maximum value at Ranital Intersection, it is most annoyed place during morning. On the similar basis Damoh Naka Intersection can be called most annoyed place due to noise pollution in evening in Jabalpur. Most annoyance responses at afternoon due to traffic will be at Ranital Intersection due to maximum value of TNI. Also, Distraction and annoyance due to fluctuation of noise will be considered maximum at Damoh Naka Intersection due to maximum LNP value. From the above observations we can concluded that there is a need to apply guidelines to control the noise level by relevant authorities. Strategic approach to noise pollution control in small urban areas like Jabalpur is crucial and should start with proper noise measurement and mapping program. If properly enforced, a series of effective and applicable control measures are available, starting from limitation of vehicles access, speed limits reduction, tires quality specification or even changes in road material. Low-noise behavior of drivers should be encouraged as well, by advocating defensive driving manners. Our government and we must bring this noise pollution to an end for our own peace.

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