

ENVIRONMENTAL IMPACTS OF FLYOVER CONSTRUCTION FROM JEHANGIRCHOWK TO RAMBAGH AND NATIPORA DURING ITS CONSTRUCTION PHASE IN SRINAGAR (JAMMU AND KASHMIR, INDIA).

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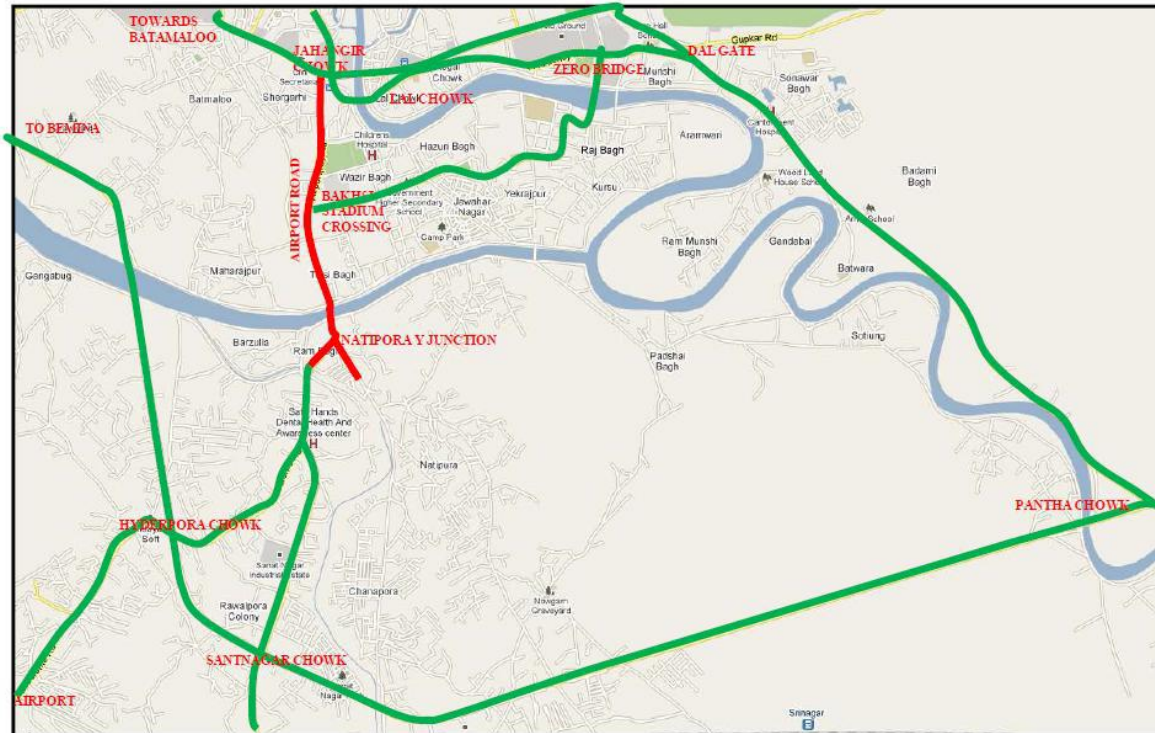
Abstract: Flyover construction from Jehangir chowk to Rambagh, Natipora undertaken by Economic Reconstruction Agency (ERA) government of Jammu and Kashmir and financed by Asian Development Bank (ADB) with an estimated cost of \$ 485 million is a glaring example of engineering marvel. The project hanging since 2013, after missing several deadlines, expected to get completed in June 2018 is still hanging in ambiguity. The study was undertaken to analyze the impacts of Flyover during its construction phase leaving aside its socioeconomic benefits post completion. The whole length of flyover seems to be influence area of problems. Project site encompasses a lot of sensitive areas like schools, religious places, hospitals all of which appear to face the music of constructional phase in form of increasing SPM(Suspended Particulate Matter), elevated noise levels beyond standards, decreasing values of property, detrimental health effects, resettlement and relocation of displaced people producing long term psychological impacts, affecting socioeconomic conditions of area.

KEY WORDS: Flyover, Environment, Impacts, Suspended Particulate Matters, Construction Phase.

INTRODUCTION

Flyover connects two points usually as an alternate route to what is beneath. Its purpose is to shorten or quicken the travel time and ease out traffic congestion. Of late a number of flyovers have been constructed all over India. Mumbai, Delhi, Chennai, Kolkata, Hyderabad and Bangalore account for more than 300 flyovers (Shreedhar, R. 2015). Flyover construction is indispensable for traffic control system which is necessary in Kashmir where age old roads have not been expanded as needed and being below desirable standards, increase the congestion, risk of accidents and potential conflict within area, increasing time of travelling due to frequent traffic jams and encroachments on pedestrian footwalls leading to inefficient circulation of traffic. The growing requirements of a large city in wake of the increasing population and to help give Srinagar city a planned look, compatible and comparable to a city of repute, ERA was given powers to rapidly give the facelift to whole city. In order to keep the entrusted faith intact, ERA sprang into action and undertook the Jammu and Kashmir Urban Sector Development Investment Program (JKUSDIP) of Flyover Construction, financed by the Asian Development Bank (ADB) through a Multitranch Financing Facility (MFF). The total estimated cost of the program is about \$485 million, out of which \$300 million will be financed by Asian Development Bank ADB. (Inputs from ERA)

STUDY AREA



Map Showing the Location of the Subproject (Marked Red) and Other Major Road Networks of Srinagar City (Marked Green)...Source GOOGLE

Flyover site sprawls southwest to northwest in build up area of Srinagar, with varying elevation between 1,585m and 1,590 above mean-sea-levels. The site has been chosen as the one characterized by high volume of traffic, pedestrians and commercial activities competing for limited space. The project has neither been classified as category A nor as category B of the EIA notification. As a result, subsequent environmental assessment and clearance requirements is not required, either from the state or central government,

Description of project include its length of 2,410m, with carriage way width of 7.5 m, vertical clearance of 5.5m, loading; two lanes of IRC class-A or single lane of 70R², Zone V as seismic zone, span arrangement includes one continuous module of four spans; with length of 84.2m, pile foundation of 1m-diameter piles, precast prestressed concrete girders with monolithic reinforced cement concrete(RCC) deck slab over girders for general sections and for individual carriageways and ramp sections, prestressed concrete deck slabs with promised life span of 50 years.

Project construction uses pile/well foundation in order to minimize collateral damage, framed sub structure to reduce risk of concrete and seismic effect, precast prestressed superstructure to take up the constructional activity to uninhabited areas.

METHODOLOGY

1. Research relevant to proposed project
2. Inputs from affected parties
3. Site visits and observations
4. Evaluation of impacts based on personal experience

RESULTS AND DISCUSSION

The comprehensive planning approach seems to be lacking especially in the constructional phase. The construction of Flyover seemed to present us with beautiful picture of bridging the traffic movement, reducing time travel of 28 min to mere 2.5 min after completion, offering orderly movement, safe movement of pedestrians, diversion of heavy volume traffic and route alignment problems. The flyover has taken toll, in terms of its wide area requirement. During morning peak hours when the activity just starts, one can't stop feeling suffocating, gasping for breath as heavy, uninterrupted traffic movement facilitates addition of Suspended particulate matter. The dust emanating from project activity poses

health hazards to workers ,shopkeepers, pedestrians, commuters especially residents complaining of nausea, headache, numbness, chest lightness, respiratory problems, persistent cough, restriction in activity, reduced performances, problems in getting married etc(ESMP 2004; ANON; WHO 2003-2004; Gobish 2004) (slide-1a). As if this wasn't enough the project involved axing of decades old Chinars (*Platanus orientalis*) and Mulberry (*Morus alba*) which attracted the attention from people belonging to all corners of life. The remaining roadside vegetation seems to be drenched in dust which affects growth scenario in existing vegetation through its affects on photosynthetic performance (Ulrichs, et. al., 2009) and (reduced) gaseous exchange (Hussan, et al., 2013)(Slide-1b). Drainage of water from road surface and land along the alignment, used for various activities and even slight pouring during rains presents a picture of temporary river leaving behind mud puddles along whole stretch of site presenting a slum site (slide-2). The debris lying everywhere, undeclared and illegal parking lot is a common view to observe under the bridges which further creates traffic problems adding to already existing chaos. The huge and heavy machinery, construction vehicles, equipments, excavations further add huge amount of suspended particulate matter reducing the visibility; drilling, blasting, earthworks, transportation of constructional material adds to already elevated noise levels which happens to be deafening even for commuters (slide-3), the thick crusts of dust seem to mar the aesthetic value of nearby properties further draining them economically; surplus excavated earth all along the length of project site, oversized blocks, exposed reinforcements, gravels, stones, cement, aggregate all posing risk to pedestrians, traffic as well as laborers. In construction phase it simply seems to alleviate recurring congestion and problems for all. Vehicles seem to be squeezing in the leftover available space increasing the wear and tear of existing roads. Hazardous wastes including bitumen, asphalt layers, petrochemicals, chemical additives, oils, paints ;concrete wastes, spoil material ,iron all pose threat and risk until and unless disposed off as per norms. All this provides unsafe environment for all people involved whether on temporary or permanent basis which will mar the redevelopment and growth in the area. There seems to be absence of signal system in recently operative phases of flyover. Proper control at intersections is needed for sure as it can otherwise increase coincidence of accidents.



Slide-1a: layer of dust particles settled on vehicles, shops, a mosque and traffic congestion along the whole stretch of flyover.



Slide-1b: Dust laden vegetation near project site.



Slide-1c: Daily routine activities during construction phase posing threat to common people.



Slide -2: Mud pools due to collected rain and water used in construction.



Slide-3: Heavy machinery on the site is the main cause of elevated noise level.

CONCLUSION

The growing economy and increasing number of vehicles though need to be streamlined but it wasn't possible to expand the road on either dimensions, constrained by sensitive land parcels, initiative to opt for third dimension was felt and hence construction of flyover resulted. Project site encompasses a lot of sensitive areas like schools, religious places, hospitals all of which appear to face the brunt of project. The noise standards, for sensitive receptors are 50dB during day time and 40dB during night time which seems to be exceeding enormously during operational phase. Construction Contract Specifications should specify use of equipment generating noise of not greater than 90 dB. Lack of discipline seems to prevail everywhere. Flyover right now seems to have worsened urban congestion by attracting more traffic (induced demand), in the long run. Heterogeneity in traffic component might also be one of the reasons for keeping the operating speed low. To reduce mobile emissions, the construction should have been more restricted to non-peak hours. Ready mix concrete carried in enclosed container would have been better option. Fugitive dust emissions could have reduced by watering the area especially along sensitive zones. Selecting

innovative design concepts and construction methodologies could have taken care of problems arising in construction phase. A well-conceived construction mythology can result into least traffic disturbance, construction delays and noise & visual pollution (Shewale et. al. 2017). Adequate arrangements could have been provided for crossover of residents, school children, ambulances etc. The provisions made should have been carefully considered with due considerations to presence of people and sensitive features (Binder, Chapter 7). The Project will though allow free flow traffic condition, evenly dispersed vehicular traffic and better transportation efficiency in the future but admittedly the development of flyover has been plagued by delays. Presently the flyover seems to be a liability rather than a priority.

REFERENCES

1. Anon, 'Health impacts of air pollution', <http://edugreen.teri.res.in/explore/air/health.htm>.
2. ESMAP (2004). Toward Cleaner Urban Air in South Asia. Tracking Transport Pollution, Understanding Sources; UNDP/World Bank Report, 2018/04.
3. Hussan, A. Sheikh, M. A. and Rahim, A. (2013). Effects of Air Pollution on Diversity and Distribution of Lichen in Pampore Industrial Area of Jammu and Kashmir. *International journal of current injctr* (2013). 2(1): 151-155.
4. Shewale, R. Dhande, B. Gavit, A. Asware, R. Patil, H., and Mali, T. (2017). CASE STUDY ON FLYOVER AT NASHIK ON NH-3. Volume: 04 Issue: 04. *International Research Journal of Engineering and Technology (IRJET)*.
5. shodhganga.inflibnet.ac.in/bitstream/10603/7656/12/12_chapter%207.pdf. Chapter7. Environmental Impact and Mitigative Measures Adopted during Construction and Operation of the Project Highway.
6. Shreedhar, R. (2015). Recent Trends in Design and Construction of flyovers. 10.13140/2.1.3950.8804.
7. Ulrichs, C., Schmidt, U., Pelzer, M.T., Gosmani, A., and Mewis, I., (2009). Hard coal flyash and silica. Effect of fine particulate matter deposit on *Brassica chinesis*. *American Journal of Agricultural and Biological Sciences*, 4(1): 24-31.
8. WHO (2003) Health Aspects of Air Pollution with Particulate Matter, Ozone and Nitrogen Dioxide, Report on a WHO Working Group, Bonn-Germany, January 13-15, ([http:// www.euro.who.int/document/e79097.pdf](http://www.euro.who.int/document/e79097.pdf)).
9. WHO (2004) Systematic Review of Health Aspects of Air Pollution in Europe; Health Aspects of Air Pollution- Results from the WHO Project. WHO Working Group, Bonn- Germany, January 15-16, (www.euro.who.int/document/e82790.pdf).