Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 5, Issue 03, March -2018

WHY UNDERGROUND METRO IS BETTER THAN ELEVATED METRO.

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Abstract: *As the world's population has increased, particularly in urban centres, cities have turned increasingly frequently to underground transportation systems to help solve problems of traffic congestion, noise and air pollution, and densely built-up urban areas. This report briefly considers the issues involved in planning an urban underground transportation system.*

Keywords: *METRO TUNNNELING, ELEVATED TUNNEL*.

1. INTRODUCTION

A metro railway system is a passenger transport system needed in an urban area having a higher traffic. Metro railway system is typically located either underground or elevated railway bridge above the street level. Elevated metro system is a rapid transit railway with tracks above the street level elevated structures. On the other hand, underground metro, as the name suggests the tracks are below the ground surface.

We definitely need a very good public transport system which can solve the traffic congestion problems which are increasing due to the increase in the number of vehicles on road.

2.Literature review

Literature Review AamnaShakeelAbbasi, Wajiha Khalid, MadeehaAzam and Adnan Riaz (2010), have found that the customer expectations regarding the services is the most dynamic verb in the lexis of customer satisfaction is 'to improve'. Hence the railways like other industries is realizing the significance of customer centered philosophies with the overall goal in terms of customer satisfaction, Determinants of Customer Satisfaction in Hotel Industry of Pakistan, European Journal of Scientific Research Anand K Sharma & Mathew J Manimala (2007) outline that there were external as well as internal causes for the declining performance of Indian Railways. The budgetary support from the Central Government was dwindling and its financial situation did not allow higher budgetary support to the Ministry of Railways, besides the competition from road and air was increasing - Sustainability Of The Indian Railways Turnaround: A Stage Theory Perspective - The International Workshop on Innovation and Entrepreneurship held at Cankaya University, Ankara, Turkey. Anil K. Lal and Ronald W. Clement (2005) outline India's economic development strategy immediately after Independence was based primarily on the Mahalanobis model, the Mahalanobis model placed strong emphasis on mining and manufacturing (for the production of capital goods) and infrastructural development (including electricity generation and transportation). Over time, India created a large number of government institutions to meet the objective of growth with equity - Economic Development In India: The Role Of Individual Enterprise (And Entrepreneurial Spirit), Asia-Pacific Development Journal. Arpita Mukherjee (2009) analyzed that Mass rapid transport such as the DMRC (Delhi Metro Rail Corporation) built with government and private initiatives have increased speed, reduced congestions, and saved time and fuel. Prior to the DMRC, about 12 million people in the Indian capital commuted by buses and private transports. The DMRC has provided a comfortable and reliable mode of transportation at reasonable prices for the middle and low-income groups - Social Impact of Globalizing Transport Services: The Case Of India - Indian Council on International Economic Relations - International Transport Forum.

3. DIFFERENT TYPES OF METRO

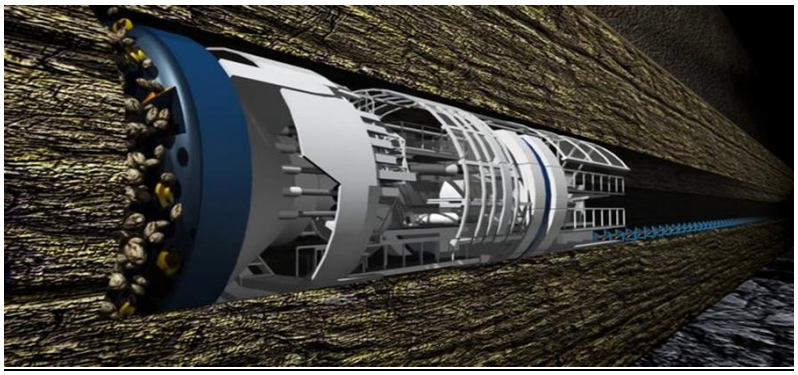
There are two types of metro

- Underground metro
- Elevated metro

1.Underground metro: -
underground metro, as the name suggests the tracks are below the ground surface.

Different methods of tunnelling

- Tunnel Boring Machines(TBMs): Highly Mechanized device which is used as an alternative to drilling and blasting methods to construct tunnels with circular cross section



- Civil construction will be carried out by following methods

Cut and cover method

- New Austrian Tunnelling method(NATM):

Modern Tunnel construction methods where the surrounding rock or soil formation of a tunnel is integrated into an overall ring like support structure.

2. ELEVATED METRO: -

Most of viaduct structures are being constructed using pre-cast segments installed using the underslung girder technique. The advantage of this technique is that it enables the viaduct deck spans to be erected very rapidly on site with minimal disruption to traffic below. Viaducts are essentially multi-spanned bridges crossing over roads or rivers or valleys. On the Gautrain project, viaducts typically span in the order of 40 to 50m between piers. Over the past month's erection of viaduct decks has been ongoing at many locations along the route. Three girders are being used simultaneously and together they will erect approximately 10.5 kilometres of viaduct deck structure.

4.**PROBLEMS RELATED TO ELEVATED METRO**

- Elevated metro has to run on the road at a height of about 10mtr. There will be a flyover like structure called via duct with pillars on road. Reduction in total road carriageway width by about 3mtr. 9mtr of central road portion will be barricaded during construction causing a traffic chaos as no suitable alternative roads are available. (examplekarve road, jm road, sasoon road, railway station area etc.)
- 35-40mtr wide, 140mtr long and 23mtr high metro stations will be constructed at a distance of 1km increasing traffic congestion. Parking space will not be available at metro stations due to the location in congested city areas. Alignment of the metro-
- It cannot be at the centre of the road because in case of an obstruction the metro cannot take any sharp turns.
- Because of the construction of elevated metro system there will be a risk to the existing buildings. Mental trauma to citizens due to continuous disturbance, disruption of utility services, mobility problems, changes & daily life pattern, rehabilitation due to demolitions, land acquisitions etc. Violation of fire safety norms and DC rules in metro construction- Insufficient space for metro stations and alignment.
- Part or full demolition of existing buildings.

- The construction will encroach on the footpaths and side margins of road side buildings. It could be very close to existing buildings without sufficient circulation of space between them.
- Natural light, ventilation for buildings will be affected.
- All portions and floors of buildings will not be easily accessible for fire engines and in case of any emergencies, the rescue will be severely hampered.
- Visual impact and quality of life.
- Hundreds of trees on the roads will be cut down.
- Building side margins and road side open spaces, beautification will vanish.
- Huge metro stations across the entire road will also create problems in traffic congestion.
- The overall aesthetical view of a particular road will change due to this elevated metro.
- The view of all the historical monuments will be distorted.
- This visual pollution on prime roads will reduce the quality of life for the citizens. shifting of surface and underground utilities required.
- serious problems in physical shifting.
- poor co-ordination between different agencies.
- availability of suitable space for re location will be a problem.
- citizens will suffer due to disruption of services during shifting, relocating and replacement traffic management during construction a big problem.
- suitable roads for traffic diversion are not available.
- there are severe traffic congestion and unsafe road conditions.
- insufficient traffic police strength for traffic management.

5. ADVANTAGES OF UNDERGROUND METRO

- Underground metro electrification system has less number of components and a very simple design as compared to overhead or elevated electrification system.
- These projects are usually funded by the World bank with very low interest rates at free of custom duty because they reduce large amount of co2 emission done by the vehicles.
- Expected life of elevated metro is much less than underground metro- due to the above ground steel and concrete structures.
- Interconnectivity of elevated metro route with other routes cannot be done but it is possible in the case of underground metro.
- Operation andmaintenance cost of underground metro is very less because it is unaffected by external weather conditions.
- Additional traffic capacities were provided for individual transport.

6. CONCLUSION

As per above theory underground metro system is much better than elevated metro system. In a metropolitan city to avoid traffic congestion which may be caused due to piers and metro stations of elevated metro system can be avoided by implementing this idea. This study examines the cost and benefits of underground metro projects for achieving the twin goals of inclusive and sustainable development.

