RESEARCH ARTICLE OPEN ACCESS

Sustainable Urban Transport System: A Case Study of Manpada Road

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ABSTRACT

Sustainable transport refers to any means of transport with low impact on the environment, and includes walking and cycling, as well as technology to move people, goods, and information in ways that reduce its impact on the environment, the economy, and society. Ropeways may well provide the most elegant connection between urban centres and passenger transport systems on both sides of the water, while ferries and, possibly bridges, can be optimised for vehicle and goods transport. Smaller and medium-sized developing cities, especially ones which are dense and compact, have great potential to develop sustainable transport systems. Ropeways don't provide a free ride and a number of energy consumptions do contribute to the operating bill. The ropeway's unique advantage is of course its capacity to climb steeply and to fly over obstacles and geographical barriers, which seduce many urban planners. The most thrilling opportunities, however. The idea of using ropeways for urban passenger transport is not new, but it has evolved gradually.

Keywords:- Sustainable urban transport system, Cost benefit Analysis**.**

I. INTRODUCTION

The Indian road transport sector has been marked by an unprecedented growth in the number of personal vehicles. As shown in fig. , the number of personal vehicles i.e. cars and two-wheelers added to Indian roads in the last decade (2001-2009) has been higher (52.1 million) as compared to the total number of cars and two-wheelers added in the first five decades (1951-2000) after independence (45.6 million). During the same period, the share of public transport has declined steadily. A significant share of the cars and two-wheelers in the country is concentrated in just 22 cities having a population of over 1 million. These and other such large cities in India, which are growing at a very rapid pace, are witnessing a growing demand for mobility. In the absence of organized public transport services and infrastructure for non-motorized transport in these cities, the demand for mobility is being met either by personal modes (for those who can afford) or by informal modes (for those who cannot afford personal vehicles).

Cities are witnessing an exponential increase in the use of personal transport and a steady decline in the modal share of public transport and non-motorized transport.There has been a growing realization, both internationally and nationally, that the current unsustainable trends in urban transport should be arrested and urban transport placed on a low carbon and sustainable path

II. LITERATURE REVIEW

Sergej Težak, Ph.D., Drago Sever, Ph. D., Marjan Lep, Ph.D. Journal Of Public Transportation, Vol. 19, No. 1, 2016

Cable car transport is carried out using aerial cable cars, surface lifts, and funiculars (Doppelmayr 1997). With ski lifts and funiculars (or funicular railways), passengers are carried above ground level; with aerial cable cars, passengers are carried in the air. For this reason, aerial cable cars are more suitable for use in urban environments because they do not burden existing urban traffic routes.

Aerial cable cars have the following advantages compared with other transport modes:

• Independent transport relief (suitable for hilly areas)

• Powered by electricity

• No CO2 emissions, if renewable energy is used for electricity

• No exhaust emissions

• Significantly-reduced noise emissions (Nikšić 2010)

• No need of surfaces for transport

• High level of traffic safety (according to Oplatka [2008], the rate of injuries in Switzerland was 7,8 persons per 100 million passengers)

• Comfortable transport in the air by rope (vibrations occur only when vehicles pass over the roller batteries)

Queretaro, Mexico, Improving The Practice Of Cost Benefit Analysis In Transport , Discussion Paper No. 2011

CBA is first a method for project appraisal, i.e. for assessing the impact that a project is likely to have on social welfare. Such evaluation implies comparison to other projects and/or to a do-nothing-scenario. Projects are broadly defined as discrete changes to the prevailing situation, often with multi-faceted impacts and objectives (Small, 1999, 137-138). CBA can be used for the appraisal of technical variants of a project, e.g. comparing different alignments for a planned bypass of a congested transport link. It can also be used for assessing clusters of projects, e.g. the construction of rail networks, for programming and hierarchizing a set of independent projects, either for the same mode or for different modes under a given budget allocation, and for strategic policy choices, e.g. in the context of decarbonisation or broader sustainability policy, or for deciding the relative shares of the public budget to allocate to transport versus other sectors.

III. OBJECTIVE

- To study and address problem related to present transport system for Manpada road.
- To highlight need and advantages of ropeway urban transport system.
- To study and compare various features of sustainable and traditional transport systemusing cost benefit analysis

Role of Sustainable urban transport in smart city project:-

- Better integration of transport and land use planning.
- Better public transport services and facilities.
- Better use of clean energy as the backbone of the passenger transport system.
- Better environmental protection.
- Better use of advanced technologies in transport management (ITS).

IV. METHODOLOGY

- Review and understand terminology and concept of ropeway urban transport system.
- Comparative study of transport systems for Manpada road.
- Assessment of existing transport scenario through primary and secondary data collection with respect to energy consumption, environment effect, efficiency, time, economic cost, policies, etc.
- Assessment of above all above features of sustainability for ropeway urban transport system.
- Cost-benefit analysis.
- Comparing results and defining need of Sustainable Urban Transport System.
- Recommend steps to help improve existing transport infrastructure and conclusion.

V. EXPECTED OUTCOME

- Sustainable urban ropeway system should improve the efficiency and effectiveness of city's transport systems.
- Sustainable urban ropeway system should ensure that the development of the

transport system contributes to the protection and enhancement of the natural and built environment.

VI. STUDY AREA

Manpada road or Dombivli station – Shil phata road is one of the most densely congested road in the city. Dombivli being busiest stations on centre line, the Manpada road attracts huge traffic. Kalyan, Dombivli are developed as residential hub of MMR. The area is mainly developed as the job feeder for capital city of Mumbai. Due to major job opportunities but lack of affordable housing in Mumbai, people have shifted away from island city for affordable and better standard of living. Manpada road also serves as link between Navi Mumbai and KDMC. Navi Mumbai being newly developed, it also attracts heavy traffic. Thus adding to its importance.Selection of the most appropriate mass transit mode can be difficult to all those who are interested in a new medium to high-capacity transit system for their city and want to manage the investment and maintenance costs of their new public mass transit system. Buses are the backbone of the public transport system for many cities, and will remain so, for the foreseeable future. A positive reallocation of road space from cars to buses will assist operations and will capitalise on the efficiency of buses in using that road space, but even this option is not available in this case. So instead of growing horizontally, we should focus on growing vertically. The ropeways are ideal in special situations just like this.

Economic growth and spatial developments are quite often governed by the quality and quantity of transport infrastructure provided. While inadequate facilities create problems of congestion, delays and hazards causing significant socio-economic costs to society, an oversupply apart from being uneconomical often acts counter to the long term spatial development strategies of settlement and regions. Supplying and maintaining an optimal level of infrastructure is the key to planned development.

The annual average daily traffic on the Project Road is more than 15,000 PCU's. Dombivali is one of busiest station on the Central line of the Mumbai suburban network. Its 23rd station 48KM from CST & the average number of passengers buying tickets is highest on Central line. (i.e. around 2-3 lakhs.)

- The ropeway system has low space requirements. Thus no new space is needed.
- The ropeway system will have 4 stations at Gav devi mandir, Shiv Udyog society stop, Big bazar and Pimpaleshwar with origin and destination at Dombivli station and Shil phata on Manpada road. Thus major reduction in road congestion and traffic related problems.
- The ropeway transit will has capacity of 6000 pphpd. Thus road traffic volume will significantly come down from 9000 pphpd at peak hours.
- The ropeway system runs on electricity, thus reduced air and noise pollution levels and saving of fossil fuels.
- The ropeway system will also provide service to much needed Divyangs and senior citizens.
- As per traffic, the frequency of gondolas can be increased or decreased.
- The gondolas will provide a never before pleasant aerial view of city. Thus adding to the tourism coefficient of city.
- The gondola system is flexible. It can be easily moved or shifted as per need.
- The gondolas are safer than all other modes available. Thus many lives shall be saved.
- The intermediate stations can be easily integrated with business complexes, hospitals, railway station etc.
- If park and ride facility is provided, it will solve last mile crisis and attract even more number of passengers.
- It will create new job opportunities.
- It will make public transit highly efficient, comforting and will be valuable addition to system.
- It full fills most of norms of an urban sustainable transit system.
- This experience on Manpada road will help solve traffic crisis around highly dense narrow roads in station area in various parts of Mumbai & MMR.

- The speed of gondolas is average 20km/hr. Maximum speed is 45 km/hr. Which is much higher than average speed of bus, autos, cars or two wheelers, which is 13km/hr, 18 km/hr and 21 km/hr.

Ropeway From Dombivli Railway Station To Shil Phata Highway:

- **Length - 3.6 km**
- **Required Capacity - 6000 pphpd**
- **Required Avg. Speed - 25 km/h**
- **Gondola capacity - 20-25 persons**
- **Frequency - 30 sec**
- **No. of station - 6**
- **No. of ballasts - 30 (100-150m spacing)**

VII. SCOPE OF CBA

Setting such a broad scope for a CBA will result in extensive data collection and analysis that may well be expensive in terms of cost but also in terms of time required to complete, both will affect the ability to deliver the project. Given that the purpose of the CBA is to firstly ensure that a project is economically beneficial and secondly to aid the choice between alternatives.

Key issues that require addressing in defining the scope of a CBA include:

- Impacts*:* The measurement of changes in producer and consumer surplus requires the measurement of benefits, revenues and costs to transport operators and users. At a minimum these should include the investment cost and changes in infrastructure and system maintenance and operating costs, vehicle operating costs, journey times, safety, user charges and operator revenues.
- Mode of transport: Typically the modes of transport that are considered should include both those that will use the new infrastructure (e.g. a ropeway) and those from which demand may be abstracted (e.g. private transport). In addition, Non-Motorised Transport (NMT) and pedestrians should be considered where impacts on them will be significant as in the case of high density urban roads.
- Study area: should be the smallest area that allows for the development of robust results. It should therefore be large enough to capture network effects that include firstly the abstraction of demand from selected routes and modes.

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