

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

Tramways System: A case study of Kolkata

Ansar Tausif Ahmed¹, Ajmira Khatun²

M.Tech Student, Department of Highway Engineering, Dhruva Institute of Engineering and Technology, Hyderabad, India¹

M.Tech Student, Geotechnical Engineering, Aliah University, Kolkata, India²

ABSTRACT: The crisis of North Kolkata Traffic is prolonging day by day which suffocates the traveller due to Low speed and long travel time by sharply rising motor vehicle ownership, population and a wide range of motorized and non-motorized transport modes sharing same narrow roadways.

Nowadays the value of time to the people is more precious than other, but the huge growth of vehicles has increased the congestion, travel delay. But still people are using tramway system in North Kolkata having speed of 25 KMPH as a public transit.

This article summarizes the comprehensive discussion on Tramway system of Kolkata: the travel behaviour, necessity of Tramway system in 21st century, causes of the most severe problems, and recommends policy improvements that would help to mitigate transport crisis of Kolkata.

KEYWORDS: Tramways System, Public transport, Traffic congestion, Pollution, Safety.

I. INTRODUCTION

Kolkata, formerly Calcutta is the capital of the Indian state of West Bengal. Located on the east bank of the Hooghly River, it is the principal commercial, cultural, and educational centre of East India. As of 2011, the city had 4.5 million residents, which comprises the city and its suburbs, was home to approximately 14.1 million, making it the third-most populous metropolitan area in India. Many people come to Kolkata from different places nearly every day.

Development of some part of it, comparatively newer areas like Salt Lake, Rajarhat, Dum Dum, Garia, mainly besides the Eastern Metropolitan Bypass is rapid. On the other side some part, comparatively older areas like Sealdah, Shyambazar, Boubazar growth is in stagnant position.

It is seen that usually people or corporate officials have a tendency to avoid the older part of Kolkata. So, majority of private as well as public enterprises are shifting some of their offices to comparatively newer areas. The main reason for this negligence is the transport problem. Transportation system of central Kolkata is suffering from Traffic congestion, Low speed and long travel time due to sharply rising motor vehicle ownership and population. The transport system of Kolkata is a mix of modern mass rapid transport and the old transport modalities. Here people are using high speed and modern system of transit like Metro, High speed buses. Besides, they are also using low speed and underdeveloped system like Tramway system.

Kolkata is connected to rest part of India and neighbourhood country Bangladesh through major Railway stations extensively i.e. Howrah Station, Sealdah Station and Kolkata Station. Nearly of all stations are located at central part of Kolkata. Howrah station is connected to Kolkata through Burrabazar (one of the largest wholesale commercial markets in India). Traffic congestion, including the approach road to Howrah Bridge, has been a long-standing problem for people passing through the area.

There are some significant issues which may be responsible for transport problem of central Kolkata are narrow road width, old and underdeveloped motorized and non-motorized vehicles e.g. Tramways System and human-pulled Rickshaw.

Tram line through this area stokes the Traffic congestion in various ways. In this article we will focus on Tramways system of Kolkata.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

II. TIMELINE OF KOLKATA TRAM

Kolkata tramways is only operating tram network in India the oldest operating electric tram in Asia, running since 1902 which is now under administration of the Calcutta Tramways Company, a government of West Bengal Undertaking, popularly called CTC.

Electric trams were the sole public transport until 1920, when the public bus was introduced in Kolkata. However, tram service until the 1950s was quite smooth and comfortable. In 1950 there were around 300 tram cars, which were regularly operated on many routes in Kolkata and Howrah. Due to the large number of tram cars, the trams ran frequently (about a 5- to 7-minute wait between trams on all routes). This was possible due to less motor traffic on the roads than today.

Anti-tram sentiment began about 1955, and spread around the world. After independence of India tram service was closed in almost every city except Kolkata. Govt. considered to close Tram service in some areas (Bandhaghat, High Court route, Shibpur and Nimtala etc.) due to narrowness of street, for making flyovers and national highway etc.. But after 1990 tram service got a new life as world began to think of harmful effect of air pollution, price hike of fossil fuels in international market.

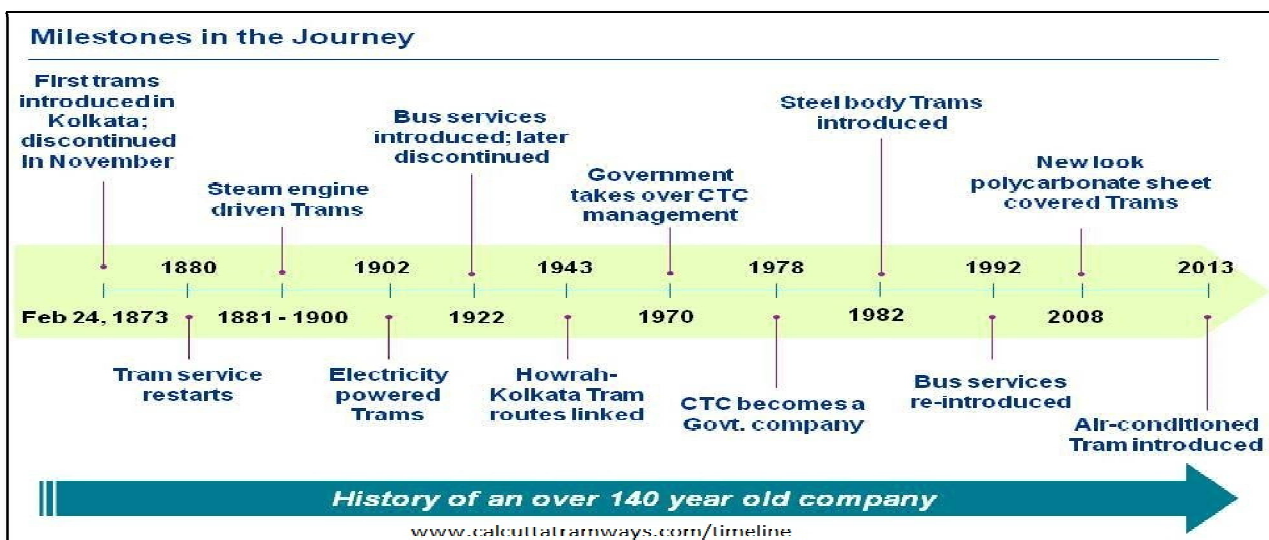


Fig. 1. Milestones in the journey of Kolkata tramways (Source: <http://www.calcuttatrampways.com/timeline>)

III. ISSUES

Nowadays Kolkata tram is passing through a critical phase. The transport demand in Kolkata has increased substantially outstripping the road capacity. Greater congestion and travel delays are widespread indicate the seriousness of transport problems. Analysing the transport demand of Central Kolkata, the rate of increment of transport demand is much higher than the development of transport system. The Tramway System is one of the major barriers to the development of Kolkata transport system because; in spite of being the heritage of Kolkata its development is very slower comparing to the other transport systems.

Traffic flow in Kolkata is mix in nature. One of the major drawbacks of tram is its low speed, which is around 25KMPH in Kolkata. For this at the peak hour, the traffic flow is interrupted by it. All the Motorized and Non-motorized vehicle are sharing same narrow road having no space of expansion of it. So other vehicles are to follow that speed behind the tram, the maneuver of driving is restricted and to change lane is tough. In some places the road was

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

previously narrow and so then tram line was set at the middle of the road. It was not creating any problem at that time, but now the road has widened and tram line is at the same position. So the passengers are to cross some portion of the road to reach the tram interrupting the flow of the other vehicles which reduces the mobility as well as the passengers' safety.



Fig. 2. (a) Old modelled tram bus and undulated pavement (b) Improper stoppage to ride the tram. (Source: www.flickr.com/photos/asienman)

Above figures shows the present conditions of Kolkata tramways which are almost similar in several areas. Calcutta Tramways Company uses old engine in most of the tram which are low speed in nature, creates noise pollution and irritation. Although very few number of new modelled tram engines have been introduced but it is not sufficient.

The Tram line reduces the smoothness of road which creates discomfort to the other vehicle users. In some places the undulation of road is very high which is very dangerous for the two wheelers mainly at rainy season. The manhole system is improper in those areas, which lead some portion of road to go under water making the tram lines slightly invisible. This increases the accidental tendency for the other vehicles.

As the tram is run by Electricity, it does not consume diesel/petrol and does not emit pollutants. So it is eco-friendly. But it causes the emission of more pollutants of other motor vehicles than they normally did. As the tram itself is the bar on the way of speed of other vehicles. According to the Centre for Science and Environment (CSE), the quantity of all three major air pollutants (namely, CO, hydrocarbons, and nitrogen oxides) drastically increases due to reduction of motor vehicle speeds. For example, at a speed of 75 kmph, emission of CO is 6.4 gm/veh.-km, which increases by five times to 33.0 gm/ veh.-km at a speed of 10 kmph. Similarly, emission of hydrocarbons, at the same speed, increases by 4.8 times from 0.93 to 4.47 gm/veh.-km.

As the tram lines are permanent way which is laid over roadway, the maintenance is difficult. At some places the elevation of road has been increased but the tram line remains at same level which creates level difference between two ways resulting undulated and unsafe condition of the road.

All the above causes eventually reduce the Level of Service (LOS) of the road.

IV. METHODOLOGY

For this study primarily 'Observation Method' of researchers has been adopted. Thorough study of literature helped to make the work smoother. To enforce it an 'On-Street Public Survey' has been conducted on March & April, 2016 with six basic questions on current status of Kolkata Tramways with sample size of 200 people from different major places of Kolkata having tramway junctions e.g. Shyambazar, Esplanade, M G Road, Park circus, Kalighat, Sealdah etc.

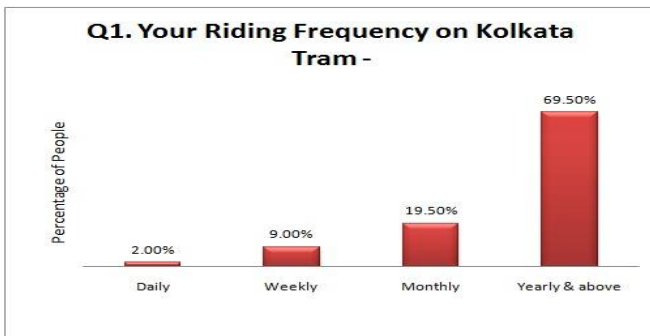
International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

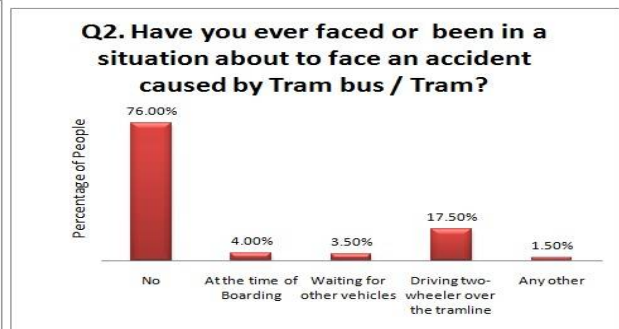
Vol. 5, Issue 5, May 2016

V. DATA ANALYSIS OF SURVEY

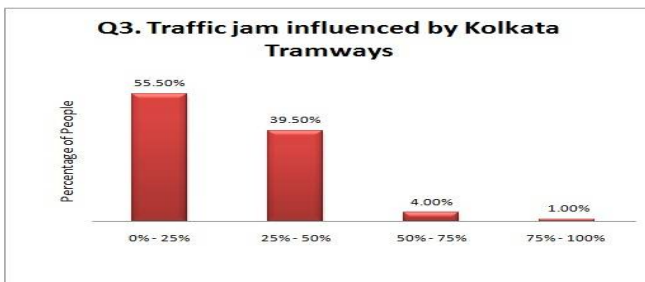
Some responds of six questions are shown in bar chart separately as follows-



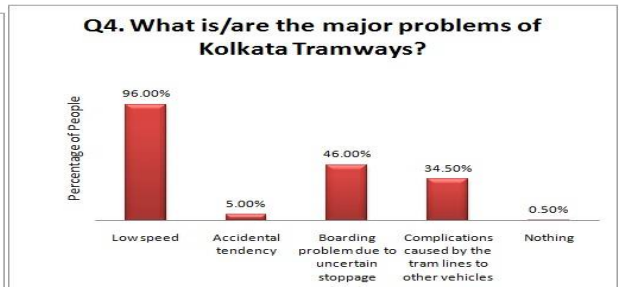
(a)



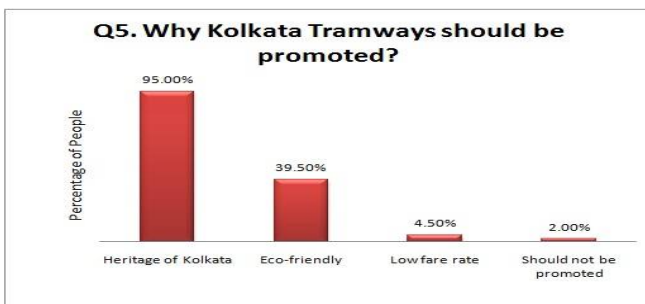
(b)



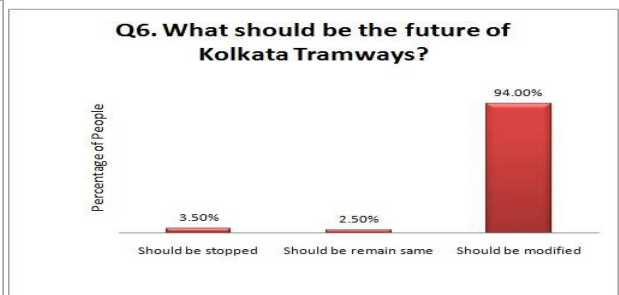
(c)



(d)



(e)



(f)

Fig. 3. (a) Responds no. [i] Daily [ii] Weekly [iii] Monthly [iv] Yearly of question 'Your riding frequency on Kolkata tram-'
(b) Responds no. [i] No [ii] At the time of Boarding [iii] Waiting for other vehicles [iv] Driving two-wheeler over the tramline [v] Any other of question 'Have you ever faced or been in a situation about to face an accident caused by Tram bus / Tram Line / Tram Electric Pole?'
(c) Responds no. [i] 0% - 25% [ii] 25% - 50% [iii] 50% - 75% [iv] 75% - 100% of question 'Traffic jam influenced by Kolkata Tramways'
(d) Responds no. [i] Low speed [ii] Accidental tendency [iii] Boarding problem due to uncertain stoppage [iv] complications caused by the tram lines to other vehicles [v] Nothing of question 'What is/are the major problem(s) of Kolkata Tramways?'
(e) Responds no. [i] Heritage of Kolkata [ii] Eco-friendly [iii] Low fare rate [iv] Should not be promoted of question 'Why Kolkata Tramways should be promoted?'
(f) Responds no. [i] Should be stopped [ii] Should be remain same [iii] Should be modified of question 'What should be the future of Kolkata Tramways'

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

The most significant items are as follows. In the first question, we found 69.50% of the people have riding frequency of yearly or less where 19.50% have monthly, 9.00% have weekly and 2.00% has daily riding frequency on Tram. The tram which is running occupying 15% to 50% width of the road with very low speed mostly found to be with many seats vacant even during peak hours, on the other hand buses are running over loaded.

In the second question, we asked about facing an accident or been in a situation about to face an accident caused by Tram bus / Tram Line / Tram Electric Pole. 24.00% people said 'yes' among them 72.92% people faced accident or had been in a situation about to face an accident for the tramline at the time of driving two-wheeler over it. It is true that tram causes less accidents comparing to other vehicles due to its low speed. But its improper, unmaintained tram line plays a significant role behind the accidents of other vehicles.

About traffic jam, 55.50% people said 0%-25% traffic jam is influenced by Kolkata tram. Whereas 39.50% people said 25%-50%, 4.00% people said 50%-75% and 1.00% people said 75%-100% traffic jam is influenced by Kolkata tram.

Next question was 'what is/are the major problem(s) of Kolkata Tramways?' - 96.00% people said the 'low speed', 5.00% said the 'accidental tendency', 46.00% people said 'Boarding problem due to uncertain stoppage', and 34.50% said 'complications caused by the tram lines to other vehicles' and 0.50% people said there is 'no problem'.

Again people were asked 'Why Kolkata Tramways should be promoted?' 95.00% people said it is heritage of Kolkata, 39.50% people said it is Eco-friendly and 2.00% people said it should not be promoted.

The reaction of people about future of Kolkata tram, 3.50% People have opined that it should be stopped, 2.50% people said that it should remain same as now but 94.00% people said that it should be modified.

VI. PROPOSALS

Poor mobility has become a major dampener to economic growth and deteriorated the quality of life. A policy is, therefore, needed to dealing with this rapidly growing problem. To enhance the mobility of people belonging to all age groups and class of society and to uplift the present condition of transport system in Kolkata, this section recommends some proposals which may serve various purposes.

- To segregate the heterogeneousness of public transit a separate tram route should be provided. This will enhance the speed, mobility and easy access not only to the tram but also to the other vehicles.
- The old Tram engine which can't achieve the high speed comparing to other motorized vehicles for its less power should be replaced by new or modified one, so that speed should be achieved by 40 to 50KMPH to reduce the pollutant emission and less fuel consumption by the other vehicle. Old tram engine has an annoying sound which should also be reduced.
- Those places where Tram speed is hampered by the pedestrians, a separate Foot Bridge or underground subway should be provided to cross the road.
- Frequency of tram should be increased so that people can access it with short duration of time. To maintain the timing Intelligent Transportation System (ITS) can be installed.
- Separate tram stoppage should be provided so that other vehicles don't get disturbed.
- Those areas having the tram route and the Level of Service (LOS) is very low, should be re-designed so that the level of service of the road becomes at least D
- Those areas occupying tram lines should have good drainage system, because of the poor drainage system, at the rainy season tram lines go under water and becomes dangerous for the two wheeler motorized vehicle.
- People should be encouraged for using the tram or metro as public transit. In that case private vehicles will be reduced reducing the tendency of traffic jam.

VII. CONCLUSIONS

A developed tramway system will improve the economic development and grow interest among public to use public transit. It will enrich urban environment, recreational activity and tourism industry of Kolkata. In order to reduce environmental pollution people should have good public transit like Metro and Tram. To improve urbanization and to save the pride of Kolkata tramways tram development oriented schemes, integrating and coordinating policies and

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 5, May 2016

interventions should be vigorously adopted. As a consequence of the same some environmentalists favoured tram service. As a result, the Kolkata tram survived.

Although there are lot of problems of Kolkata tram to fit for this century, people has an emotional attachment to it. Kolkata tram deserves a better future not only for the people of Kolkata but also for the People of India.

REFERENCES

- [1] <http://www.calcuttramways.com> [Accessed April 2016]
- [2] Hariom Maheshwari, Soumya Mondal," Pedestrianisation of an Urban Area: A Case Study of Nagerbazar, Kolkata" INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH, Volume : 3 ,Issue : 9 , 2014 • ISSN No 2277 - 8179, September, 2014
- [3] "Kolkata tops Indian cities in public transport: Study". Times of India, Retrieved 20 December 2013.
- [4] www.flickr.com/photos/asienman [Accessed April 2016]
- [5] https://en.wikipedia.org/wiki/Trams_in_Kolkata [Accessed April 2016]
- [6] https://en.wikipedia.org/wiki/Transport_in_Kolkata [Accessed April 2016]