Public Transit Affordability in Chennai: An Emphasis on Metropolitan Transport Corporation and its Users

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Abstract:

The term "Affordability" refers to the level to which a product or service is provided cheap enough for ordinary people to access. Making a service affordable does mean that the fares charged could be afforded by all sections of the society and leaves no room for social exclusion. This concept receives more considerable attention in all countries, particularly the developing nations since most policies are pro-growth and pro-poor. Given the high cost of investment an individual needs to make for travelling by private transport, individuals look forward to an alternative that would suit their financial position. This concept of affordability of public transport is widespread, and governments frequently control fares because fares above the threshold level would be unacceptably burdensome to poor people. Transportation unaffordability causes significant problems. It imposes financial burdens and constraints on people's opportunities. Because these problems are most significant for physically and economically disadvantaged people, transport unaffordability is inequitable. The increased transport affordability can provide significant economic and social benefits by reducing burdens and expanding opportunities to disadvantaged people. Increased transport affordability is equivalent to increased income. Many planning decisions affect transportation affordability. Modern transport planning responds well to the demands of wealthy travellers but not to the needs of the poor. The transport policies of the Tamil Nadu Government aggravate economic problems since many commuters find it difficult to access many things. The transport affordability can be increased by improving the quantity and quality of affordable transportation options, and by improving land use accessibility to reduce travel distances. Some of these strategies help achieve other planning objectives, such as congestion reduction, improved safety and health, energy conservation, and pollution reductions. Affordability plays an essential role in deciding the mode of travel. This paper analyses the opinion of commuters on the cost of travel in Metropolitan Transport Corporation (MTC) services. The paper highlights the opinion of commuters on the affordability to travel in MTC. The research output enables us to measure the satisfaction of commuters on various services provided by MTC, Chennai.

Keywords: **Affordability, Corporation, Tamil Nadu, Transportation, Satisfaction.**

Introduction

The term "Affordability" refers to the level to which a product or service is provided cheap enough for ordinary people to afford. Making a service affordable does mean that the fares charged could be afforded by all sections of the society and leaves no room for social exclusion. This concept receives more considerable attention in all countries, particularly the developing nations since most policies are pro-growth and pro-poor. Given the high cost of investment an individual needs to make for traveling by private transport, individuals look forward to an alternative that would suit their financial position. This concept of affordability of public transport is widespread, and governments frequently control fares because fares above the threshold level would be unacceptably burdensome to poor people. Affordability in transportation, to the extent to which the financial cost of journeys put an individual or household in the position of having to make sacrifices to travel or the extent to which individual/ household can afford to travel as per the needs. (Robin Carruthers, 2005). It is generally driven as a policy to support the lower quintal of society. It includes the household and the individual at the lowest level to afford their necessary

expenses. Therefore Affordability is the capability to make necessary travels such as school, work, health, and other social services.

Public transport is affordable if an individual could spend less than twenty percent of their income on transportation, or a combined household could spend less than forty-five percentages of their incomes on desired travel. (Litman, 2017). Transportation affordability is when people can purchase access to essential travel activities (medical care, essential shopping, education, work, and socializing). An increase in affordability helps in the reduction of family financial stress, while a decrease in affordability leads to constrains in travel. Transportation un-affordability causes significant problems. It imposes financial burdens and constraints on people's opportunities. Because these problems are most significant for physically and economically disadvantaged people were transport unaffordability is inequitable. The increased transport affordability can provide significant economic and social benefits by reducing burdens and expanding opportunities to disadvantaged people. Increased transport affordability is equivalent to increased income. Many planning decisions affect transportation affordability. Modern transport planning responds well to the demands of wealthy travelers but not to the needs of the poor. The current planning supports automobile, air, and freight transport but does much less to improve affordable modes such as walking, cycling, and public transit travel. Transport policies aggravate economic problems since many commuters find it difficult to access education and employment, and because motorized modes require costly infrastructure, impose external costs, and are resource-intensive, leading to increasing dependence on imported oil. There are many factors to consider while evaluating transportation affordability, and many possible ways to achieve transport affordability objectives, some of which tend to be overlooked in conventional planning. The transport affordability can be increased by improving the quantity and quality of affordable transportation options, and by improving land use accessibility to reduce travel distances. Some of these strategies help achieve other planning objectives, such as congestion reduction, improved safety and health, energy conservation, and pollution reductions.

Measurement of Affordability:

Affordability Index is to measure the average person's ability to purchase a particular element, in transportation, it is the ticket. (Kenton, 2019). Public Transportation should uphold pro-poor policies for low income and mobility constrained individuals at a sustainable cost. A particular income group is calculated by the burden of public transport costs on an average household in a specific demographic group. (Li, 2019) Affordability index can also be measured in terms with representation family-based approach, based on fare structure (standard and concessional) for second quintile families. $AIi = Average\ Expenditure\ on\ PT\ for\ Group\ /\ Disposable\ House\ old\ Income\ of\ Grou$p. Affordability is also calculated by an expenditure-based approach (Li, 2019), representation commuter based approach, which was sponsored and reviewed under the World Bank. In this index, the calculated amount of money spent from the monthly income of developing country households on public transportation. (Robin Carruthers, 2005)

Cities on the move, 2002: -

In 2002, the World Bank published a report named cities on the move that targeted the need for public transportation to be more economical to serve the socially excluded driven people. The urban poor can be helped out of poverty by urban transportation with economic consideration, providing it at an affordable price, which helps the poor to take care of their daily needs; on the other hand, urban growth also increases the cost of living in a city. Based on their study, reports were released, which compares per capita incomes with Bottom quintile income as a percent of average, fare for 10 Km travel, which produces these cities affordability index.

Figure 1- Affordability Index Value for Twenty-Seven Cities

	City	Per Capita Income U$PPP	Bottom Quintile Income as Percent of Average	Fare for 10km Travel (PPP U$cents)	Affordability Index	
					Average	Bottom Quintile
1	Sao Paulo	8,732	10.0%	130.1	11%	107%
2	Rio de Janeiro	14,325	10.0%	125.4	6%	63%
3	Brasilia	12,985	10.0%	106.8	6%	59%
4	Cape Town	14,452	10.0%	75.8	4%	38%
5	B. Aires	15,493	15.5%	87.6	4%	26%
6	Mumbai	8,585	41.0%	112.2	9%	23%
7	Kuala Lumpur	18,351	22.0%	121.6	5%	22%
8	Mexico City	9,820	15.5%	39.3	3%	19%
9	Chennai	3,717	41.0%	39.3	8%	19%
10	Manila	9,757	27.0%	63.0	5%	17%
11	Krakow	15,579	36.5%	130.6	6%	17%
12	Amsterdam	28,170	36.5%	226.6	6%	16%
13	Moscow	16,154	24.5%	84.6	4%	15%
14	Guangzhou	9,165	30.0%	55.1	4%	14%
15	Warsaw	26,024	36.5%	142.5	4%	11%
16	New York	51,739	27.0%	200.0	3%	10%
17	Los Angeles	42,483	27.0%	160.0	3%	10%
18	Chicago	48,300	27.0%	180.0	3%	10%
19	Singapore	38,797	25.0%	130.3	2%	10%
20	Beijing	14,379	30.0%	55.1	3%	9%
21	Seoul	16,784	40.0%	85.5	4%	9%
22	Shanghai	20,814	30.0%	55.1	2%	6%
23	Cairo	7,117	43.0%	26.1	3%	6%
24	Budapest	22,106	50.0%	89.3	3%	6%
25	London	53,057	30.5%	116.4	2%	5%
26	Prague	32,757	52.0%	88.0	2%	4%
27	Bangkok	20,386	31.0%	32.2	1%	4%

Source: The World Bank Groups.

The above table depicts the various data collected from world bank groups. The income is taken from the Millennium cities database, the bottom quintile is derived from the world bank database and fare for 10 km is divided from the world bank country office. (Robin Carruthers, 2005) The study reveals Transportation poverty being at a higher rate, as poor people in these cities spend a considerable amount of income over Transportation. The study also included other aspects such as city income distribution, passes, and concessions, changes in fare structures and levels, additional and corrected index values.

A survey was conducted by the people regularly traveling in the MTC. Affordability plays an important role in deciding the mode of travel. This section analyses the opinion of commuters on the cost of travel on the MTC bus. The table shows the opinion from commuters on the affordability to travel in MTC. The opinion of commuters varies from 'highly not reasonable' to 'highly reasonable'. It is observed that 35.25% of respondents are not satisfied with the amount of travel fare that is collected by MTC from the commuters which constitute for 705 respondents, little more than one-third of total respondents.

Table 1- Travel affordability in MTC bus services

Commuters' opinion	Frequency	Percent	Valid percent	Cumulative percent
Highly unreasonable	385	19.2	19.2	19.2
Not reasonable	320	16.0	16.0	35.2
Moderate	570	28.5	28.5	63.8
Reasonable	581	29.0	29.0	92.8
Highly reasonable	144	7.2	7.2	100.0
Total	2,000	100.0	100.0	

Problems of Transportation Unaffordability

Unaffordability creates stress, reduces economic opportunity, and can lead to medical and social problems. It is particularly burdensome to lower-income households, and so is inequitable. High housing

costs can force workers to commute long distances, exacerbating transportation problems. Unaffordability can also reduce economic development, particularly in economically prosperous communities. In communities with high living costs, businesses often have difficulty filling positions, resulting in higher turnover and employees working long hours and multiple jobs, reducing work quality. Some potential workers may stay on social assistance rather than move to areas with better job prospects but high living costs.

Factors Affecting Transportation Affordability

Various factors that affect transportation affordability in Chennai are discussed below.

Individual Needs and Abilities: People's transportation needs and abilities vary. People who have more responsibilities, such as working or care giving, tend to have more transportation needs. People with physical and mental disabilities may be unable to use some affordable travel options (such as walking and cycling, and conventional public transit). These factors should be taken into account in transport affordability evaluation.

Transportation Options: The transportation options refer to the quantity and quality of transport modes and services available in a particular situation. In general, the higher the quantity and quality of affordable modes, like, walking, cycling, and public transport, the more affordable the transportation system. High-quality transport options allow travelers to choose the combination that best meets their needs.

Community Affordability: Transportation affordability can be evaluated from society's perspective, that is, the overall costs and cost efficiency to the entire community, including indirect, external, and non-market costs (Litman, 2005). The concept of transportation affordability, its importance, how to evaluate it for transport planning, and practical ways to improve it are being investigated in this chapter. This research investigates the concept of transportation affordability, describes practical ways of evaluating it, and identifies various practical strategies for improving transportation affordability. The modern economy provides a beautiful array of goods and services to affluent consumers but tends to be less responsive to people with lower incomes. This is particularly true of transportation. Indian transport systems are not very affordable for all sections of people uniformly. Commuters of Chennai public transport have an opinion that the transport is designed to serve motorists. Affordable options, such as walking, cycling, ridesharing, and public transit, are generally inferior and poorly integrated. Transportation unaffordability is a significant economic and social problem. It constrains people's economic opportunities and forces households to spend an excessive portion of their budgets on transport, limiting their ability to purchase other essential goods. Improving transport affordability can significantly increase disadvantaged people's opportunity and happiness, and so it helps support economic development and increase social equity. It is, therefore, a vital transport planning objectives.

Transport poverty:

In the past decade, the world is witnessing a change in transport, where lower-income groups measured through class are excluded socially and economically due to their transportation-based barriers such as spending high on travel, which is termed as transport poverty. (Mattisson, 2016). Through this context, the public value of public transport. Public value is referred to as the government value, where the state held the responsibility to priorities social equity, yet at instances, its primary goal lies in economic development. (Velde, 2016) In the Case of MTC, the organization compromised on its economic growth to support urban transport poverty-driven people.

Social Sustainability: -

Sustainability is generally measured in terms of ecological factors. These ecological factors are credited only through social willingness. Social aspects are essential in transport policy, and it cannot be confined to tangible measures. The political will of the policymakers to change the mode to sustainability, a transformation from diesel to electric and peoples' will to use these alternatives than burning fossil fuel. (Cristina López, 2019). A study was conducted in Great Britain, where the study displayed both Transport poverty and social sustainability. The study revealed that this social exclusion is not letting people use public transportation for extra activities such as shopping for food and accessing healthcare. The study

incorporated an essential aspect of the transport service – serving the periphery. The more Public transportation is served to the deprived, the higher it will reduce the social fragmentation. (Wadiwe, 2006)

Provision of Concessions by MTC

The analysis of commuters' opinions on the concessions provided by the MTC gives an understanding of the benefits availed by the different sets of commuters. The study enables us to measure the satisfaction of commuters. Table 5.16 explicates that 25.6% (n = 513) are not satisfied with the concessions provided by the MTC and only 37.2% (n = 742) are satisfied. 37.2% are moderately satisfied.

Table 2- Concession schemes offered by MTC

Commuters' opinion	Frequency	Percent	Valid percent	Cumulative percent
Highly Not reasonable	235	11.8	11.8	11.8
Not reasonable	278	13.9	13.9	25.6
Moderately reasonable	745	37.2	37.2	62.9
Reasonable	643	32.2	32.2	95.0
Highly Reasonable	99	5.0	5.0	100.0
Total	2,000	100.0	100.0	

Based on MTC's claim, they collect the lowest fare for certain services when compared to most of the other regions of India. The respondents feel that rationale is absent in fixing fares for MTC services. The measures have to be taken by the respective authorities for fixing realistic norms to collect different fares for different services of MTC.

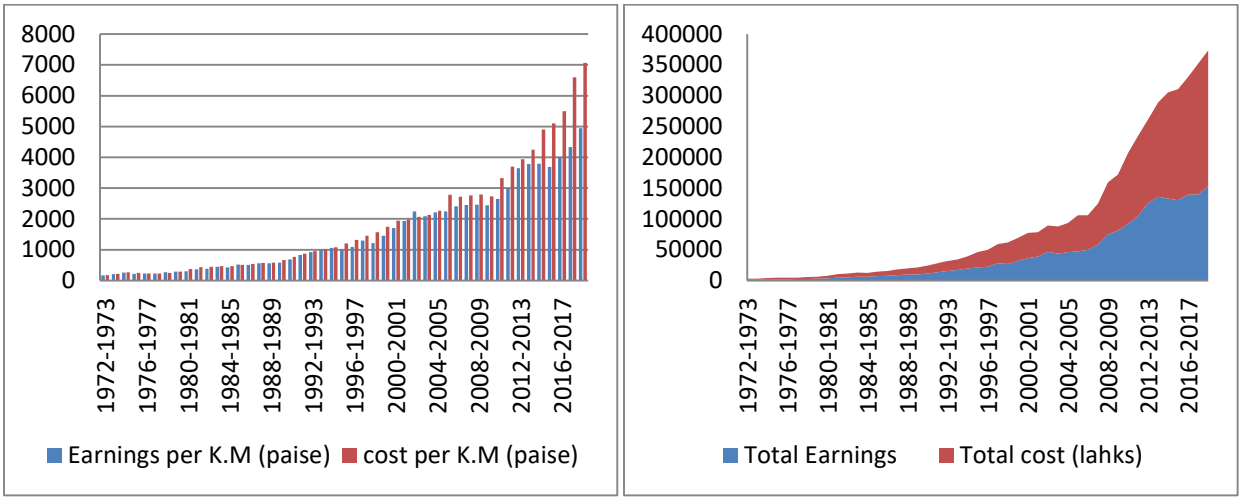
Transit Expenditure: The MTC's Affordability in maintaining the system:

Transit Expenditure:

Transportation affordability is also considered as the planning for affordable transportation such as vehicle operating costs and transit fares — the evaluation of total transport cost based on vehicle purchase, registration fees, maintenance, and fare. Travel speed is also a critical evaluating tool; for instance, of the public transit system, it is slower yet affordable compared to Private vehicles. (Litman, 2017). The functioning of the MTC per bus per kilometer, spending over the revenue received per kilometer per bus is depicted in the table below. The table illustrates that the expenditure per km is increasing over the years. Increase in another private vehicle, road/ traffic congestion, and increase in employment/ fuel might be the reason behind.

In the case of the overall cost and revenue also depicts the same, the cost has almost doubled the size of the revenue. In the case of the overall cost and revenue also depicts the same, the cost has almost doubled the size of the revenue. According to Litman (2009), the performance indicator is of three types. Firstly it measures the service quality, which reflects the quality of service experienced by the user, indicators of outcomes, which reflect outcomes or outputs, indicators of cost efficiency, which reflect the ratio of inputs (costs) to outputs (desired benefits). (Mazzulla). Cost efficiency is that various cities around the world are maintained through minimal cost and maximum benefits. Cities like London produce concession, but it is highly cross-subsidized by other commuters, and In terms of Singapore, affordable fares and low fare revenue per passenger kilometer comes at the cost of taxpayers. MTC is trying to incorporate this in its system; the below Tables projects the cost and earning of MTC since its inception.

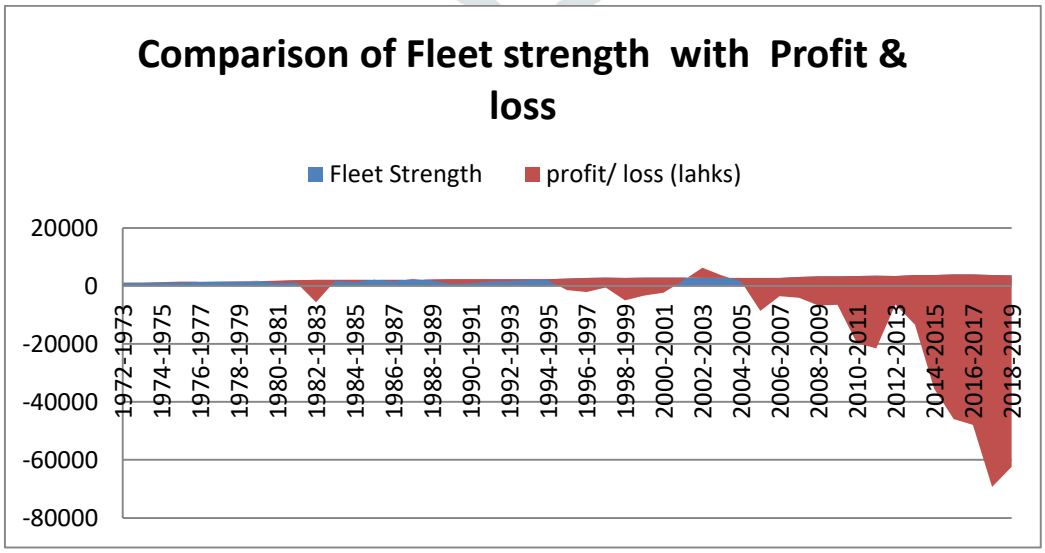
Chart 1 & 2 - Earning/ expenditure per km (in Paisa) and in Total



Source: Compiled from MTC Annual Year book from 1972 to 2017

There is an increase in cost in providing public transport services; there is a continuous rivalry between fare revenue and the cost of the service. The cost of MTC includes spending on material consumed, employee benefits expenses, finance costs, depreciation, and amortization expenses, which sums up to 211537.44 (lakhs) in 2017-2018 and 219832.07 (lakhs) in 2018-2019. (Metropolitan Transport corporation annual report, 2019-2018). Pareto's theory of economic on the allocation of resources in Public Transportation puts forth three factors in pricing equal (social) marginal costs per passenger or passenger-kilometer. The second factor elaborates on the financing of urban public transport systems i.e., the average cost of making a decrease with the increase in the passenger. The third factor is called the Mohring effect, which deals with the subsidizing of public transportation. (Fearneley, 2013). The MTC must allocate resources. It has invested a minimal amount over maintaining vehicles and purchasing new ones. The 89 AC buses in halt is an example of MTC inefficacy in maintaining vehicles. (AC buses left in the cold, MTC has no plan to keep fleet fit. , 2018). The study conducted on affordability through representative family-based approach concluded by stating that a balance in affordability, concessions, and financial sustainability will be a constant struggle for all the cities. (Li, 2019) MTC provides concession up to Rs. 3319.58 crore towards students and senior citizens, to all state corporations, (Transport Department Policy Note, 2018-2019) and provides ticket lesser than most of the state, (at least in comparison to all other southern states), therefore MTC is severely stressed in Financial sustainability.

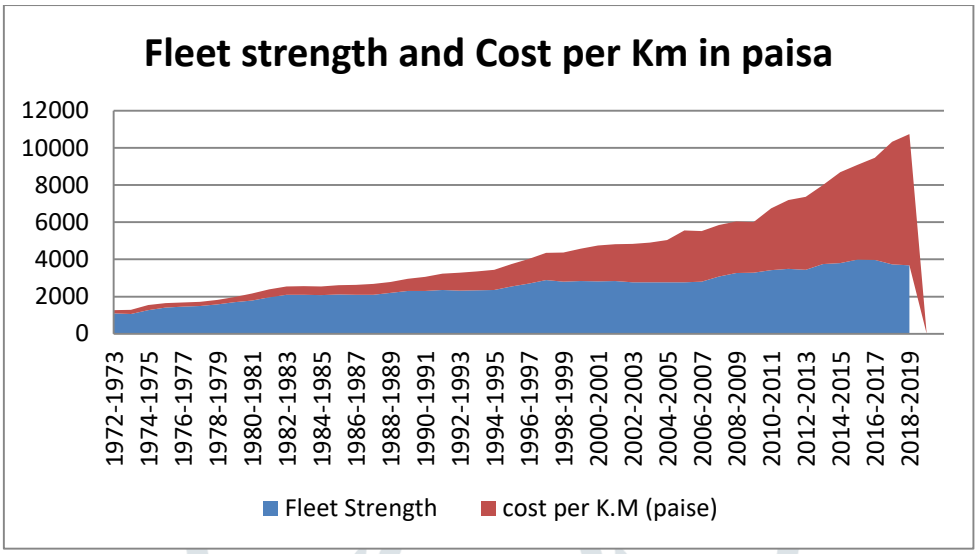
Chart 3 - Comparison of Fleet strength with Profit/ Loss



Source: Compiled from MTC annual Reports from 1972 – 2019.

The above image shows the loss in the system for a more extended period in time. There are various reasons, such as increasing private vehicles, number of trips lost, reduction in the fleet, and maintenance issues. Issues such as, the number of trips loss of MTC in the year 2017-2018 is 17,90,002 and 2165482 in the year 2018-2019, which is curtailed by the management. There are various reasons such as break down, accidents, want of crew, strikes, and other reasons. In the year 2017-2018, strikes alone cost the loss of 254021 trips. (Metropolitan Transport corporation annual report, 2019-2018)

Chart 4 – Fleet strength and Cost per Km in paisa



Source: Compiled from MTC annual reports from 1972 to 2019.

Dead kilometer or non-revenue kilometer means a distance travelled by a bus from the depot to starting point for operation and again from ending point to depot after completion of routes, was the passenger significantly less or null in some cases. MTC has reported 90.41 (in lakhs) in 2019-2018 and 82.47 (in lakhs) in 2018-2017. (Metropolitan Transport corporation annual report, 2019-2018) Non-revenue route are incorporated to attract passenger for new routes as the city is expanding. (Sitharam, 2015)

Conclusion:

The MTC claims that its services are more affordable compared to other cities in India. The findings of the study done to evaluate the performance of MTC from the commuters perspective reveals that MTC services are not affordable to all sections of people in Chennai city. Commuters feel that MTC is irrationally fixing the prices for different types of buses and services. In term of advertisement, use of technology, utilization of fleet for other aspects, MTC is failing to come up with revenue generating measures. Mumbai and Delhi earn more revenue through advertisements. Similarly more advertisement over affordable chartered trips has to be taken to schools, college and other education institutes for better revenue. The government has to focus on investing more on maintenance rather making new vehicle which could reduce the overall expenditures of MTC. MTC should also conduct research on a regular basis to get feedbacks from its users about MTC's performance to cope with the changing needs of the commuters of Chennai city.

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