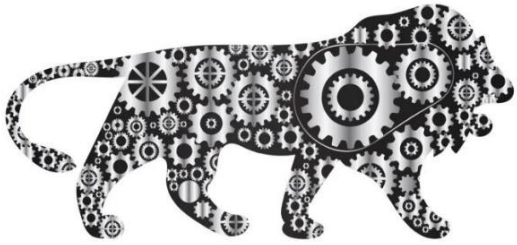
ISSN : 3048-5320 (Online)

CSIBER International Journal - CIJ

Vol 2, Issue 3, July - 2024

MULTIDISCIPLIANRY JOURNAL



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CONTENT

CIJ-India **ISSN: 3048-5320 (Online)**
Vol - 2, Issue No -3, July, 2024

The study of Operational Performance Analysis with special reference to Bengaluru Metropolitan Transport Corporation (BMTC)

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Abstract

Operating costing plays a pivotal role in effective cost management within any company. Thus, conducting a comprehensive examination of each element within the control system is crucial to assess the sufficiency and optimal level of operating costs for each vehicle. It encompasses an analysis of the operational performance of the corporation. The efficiency and effectiveness of public transport organizations heavily hinge on their operating costs, which are pivotal in ensuring success. Challenges or complications with these costs can pose significant hurdles, potentially compromising operational efficiency. This research endeavours to delve into the operating costs of the Bengaluru Metropolitan Transport Corporation (BMTC), aiming to dissect its various components. Through this study, we seek to gain a comprehensive understanding of these operational elements. Furthermore, the research intends to shed light on the efficiency of each operational component during service provision.
Key Words: Cost, Operating Costing, Operational Performance, Transport Service.

I. Introduction

Transportation, defined as the intentional movement of humans, animals, and goods from one location to another, plays a crucial role in business for the movement of goods, services, and people. There are various modes of transport available worldwide, each serving specific needs. These modes include airways, roadways, and waterways. Transportation can be broadly categorized into two main types: Public Transport and Private Transport. Public transportation is owned and operated by government authorities or state-owned companies. Funding for public transportation typically comes from a combination of local, state, and federal agencies. In contrast, private transportation is operated by individuals or companies with the primary goal of generating profits. This distinction between public and private transportation underscores the diverse ways in which transportation services are provided to meet the needs of society. In India, buses take up over 90% of public transport in Indian cities, and serve as an important mode of transport. Services are mostly run by state government owned transport corporations.

Operating costing is highly relevant to the transport industry. As it involves determining the expenses associated with running transportation services. Performance analysis is crucial in the transport industry for evaluating various aspects of operations to ensure efficiency.

II. Literature Review

•Daniels. C., (1974) in his journal “Vehicle operating costs in transport Studies: With special reference to Economist Intelligence Unit" London, London Cost times. In addition to referencing published research findings that relate some of the factors, the report looks at the factors that go into vehicle operating costs, which are split into running and standing costs. Presented and discussed is a wealth of data from African transport studies. In particular, the relative operating costs of vehicles on various types of roads—from good bitumen surfaces to gravel and earth—as well as on various road widths are highlighted. The cost differentials are said to vary significantly between studies, especially in these areas.

•Author: B Gary Barnes, Peter Langworthy (17T" January 2003) "The Per-Mile Costs of Operating Automobiles and Trucks" Magazine from International Journal Academy. A spreadsheet model for figuring out how much it costs to operate cars and trucks is provided in this report. The budget for highway projects will be used to plan this expense. The fact that highway projects change the costs associated with vehicle operations presents one challenge for the researchers. The fixed costs of car ownership were subtracted from the travel cost estimates by the researcher using creative methods based on usage. The study also provides strategies for modifying the expenses to account for

various road conditions, such as smooth or uneven surfaces. The report also makes recommendations for how to project future operating costs for a personal car or truck.

Their analysis of the following specific costs has led them to the conclusion that, in a "baseline" scenario of highway driving on smooth pavement and gasoline prices of $1.50 per gallon, trucks would typically cost 43.04 cents per mile. City driving conditions: 9 p.m. for trucks, with lots of stops and starts. Extremely uneven pavement results in a 2 cent increase in base cost.

•DYER, RIHA AND WALKER (1995) In order to develop a state transportation vitality strategy that accounts for all financial and non-financial costs to the state, it is stated that this work attempted to fully assess the financial and ecological costs of petroleum use, as well as the financial and natural costs of other transportation powers, including the costs and estimates of natural externalities. Comprises obstruction, accident, maintenance of the foundation, management, and air pollution.

Objectives of the Study:

1) To identify cost data with respect to operating costing.
2) To examine operational performance of the organization.

III. **Research Design:**

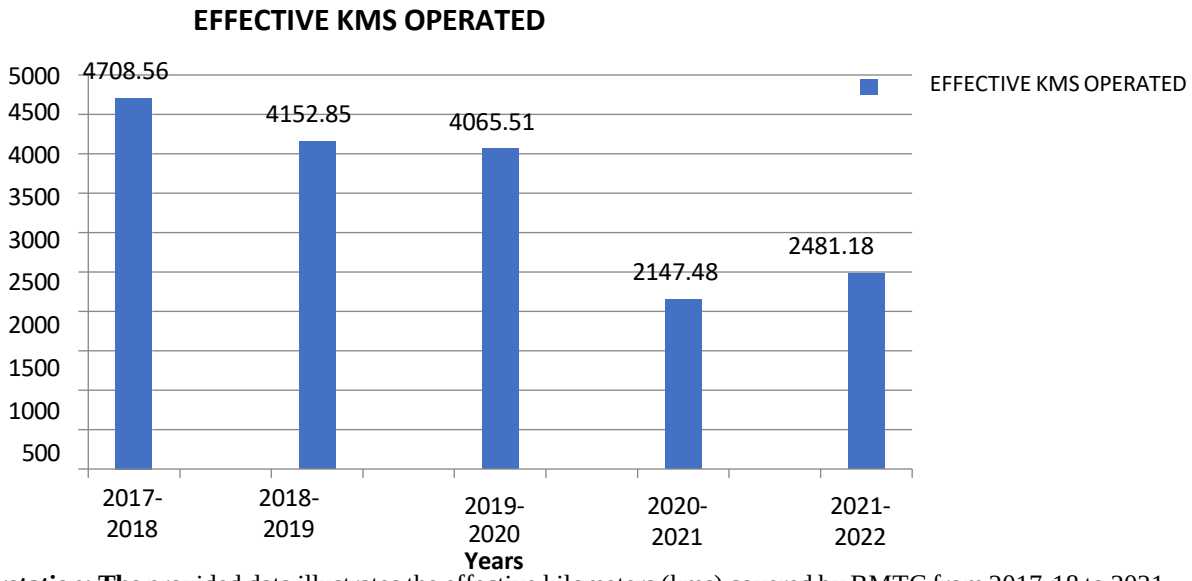
The research used Descriptive and Analytical research design for research. The whole study is based on only secondary data. The data is collected from Profit and Loss Statement, Balance Sheet and Operational Performance Statement from Bengaluru Municipal Transport Corporation. Other information is collected from annual report, Internet. This research is done with the data collected from the year 2017-18 to 2021-22.

Data Analysis and Interpretation

The Effective Km Operated (Lakhs)

Year	Effective Kms Operated
2017-2018	4708.56
2018-2019	4152.85
2019-2020	4065.51
2020-2021	2147.48
2021-2022	2481.18

Table No.1

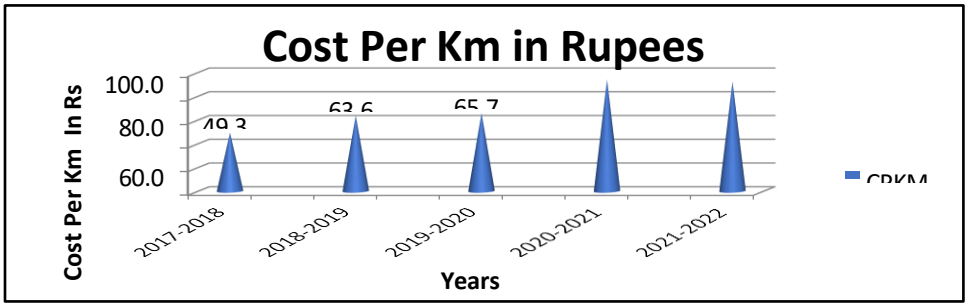


Interpretation: The provided data illustrates the effective kilometers (kms) covered by BMTC from 2017-18 to 2021-22, showcasing fluctuations in performance. There were notable changes in the percentage growth rates, with decreases observed from 2017 to 2020 and a momentous increase in 2021-22, rebounding from the previous year's downturn. Specifically, in 2021-22, BMTC operated 2481.18 lakh effective kms, reflecting a positive uptick in performance.

The Cost Per Kilometre

Year	Cost Per Km (in rupees)
2017-2018	49.3
2018-2019	63.6
2019-2020	65.7
2020-2021	93.9
2021-2022	92.3

Source:BMTC Annual & Audit Report Table No: 2

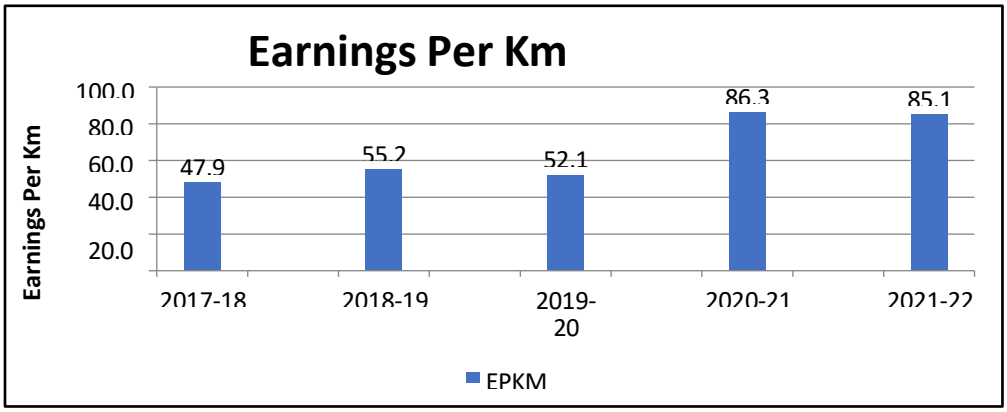


Graph: 2

The Earnings per Kilometre

Year	The Earnings Per Km (in rupees)
2017-2018	47.9
2018-2019	55.2
2019-2020	52.1
2020-2021	86.3
2021-2022	85.1

Table No.3 Source: Annual Reports



Graph No.3

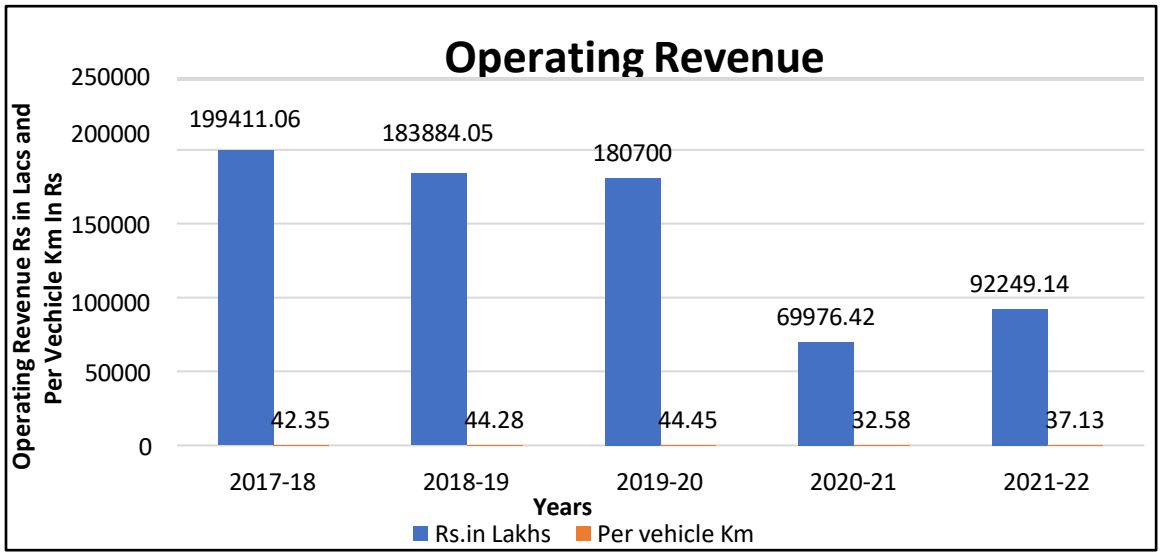
Interpretation:

The table illustrates BMTC's earnings per kilometer from 2017 to 2022, with a fluctuating trend depicted in the graph. Notably, earnings per kilometer were 47.9, 55.2, 52.1, 86.3, and 85.1 for the respective years 2017-2018, 2018-19, 2019-20, 2020-21, and 2021-22.

The Operating Revenue Of BMTC

Year	Rs.in Lakhs	Per vehicle Km (in rupees)
2017-2018	199411.06	42.35
2018-2019	183884.05	44.28
2019-2020	180700	44.45
2020-2021	69976.42	32.58
2021-2022	92249.14	37.13

Table No.4 Source: Annual Reports



Graph No: 4

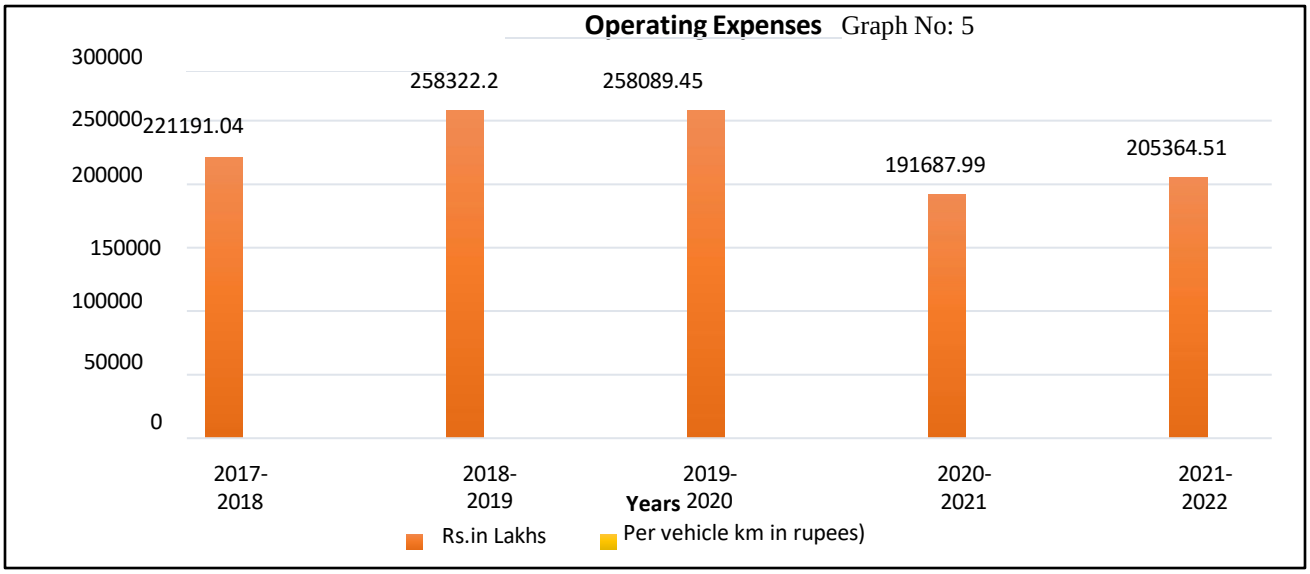
Interpretation:

The graph depicts operating revenue in lakhs of rupees and per vehicle kilometer (in rupees). Notably, there was a gradual decline in revenue over the first three years (2017-18, 2018-19, 2019-20) with minor fluctuations. However, there was a significant drop from 180,700 lakhs to 69,976.42 lakhs between 2019-20 and 2020-21. Subsequently, there was a slight increase in revenue for the last year.

The Operating Expenses

Year	Rs.in Thousand	Per vehicle km (in rupees)
2017-2018	221191.04	46.98
2018-2019	258322.2	62.20
2019-2020	258089.45	63.48
2020-2021	191687.99	89.26
2021-2022	205364.51	82.67

Table No. 5 Source: Annual Reports



Graph No: 5

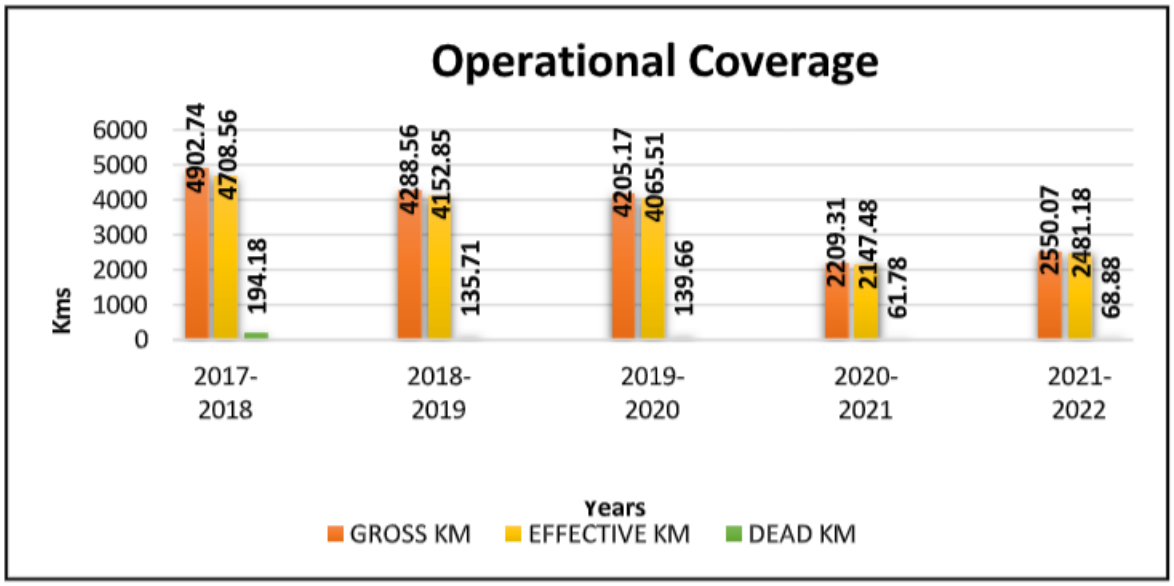
Interpretation:

The table displays operating expenses incurred by BMTC from 2017-18 to 2021-22. There were increases in expenses for 2017-18 and 2018-19, followed by decreases from 2018 to 2021. Notably, there was a significant decrease from 258,089.45 to 191,687.99 in operating expenses between 2019-20 and 2020-21. Subsequently, a slight increase was observed from 2020-21 to 2021-22.

The Operational Coverage by BMTC Busses

Year	Gross Km	Effective Km	Dead Km
2017-2018	4902.74	4708.56	194.18
2018-2019	4288.56	4152.85	135.71
2019-2020	4205.17	4065.51	139.66
2020-2021	2209.31	2147.48	61.78
2021-2022	2550.07	2481.18	68.88

Table No: 6 Source: Annual Reports



Graph No: 6

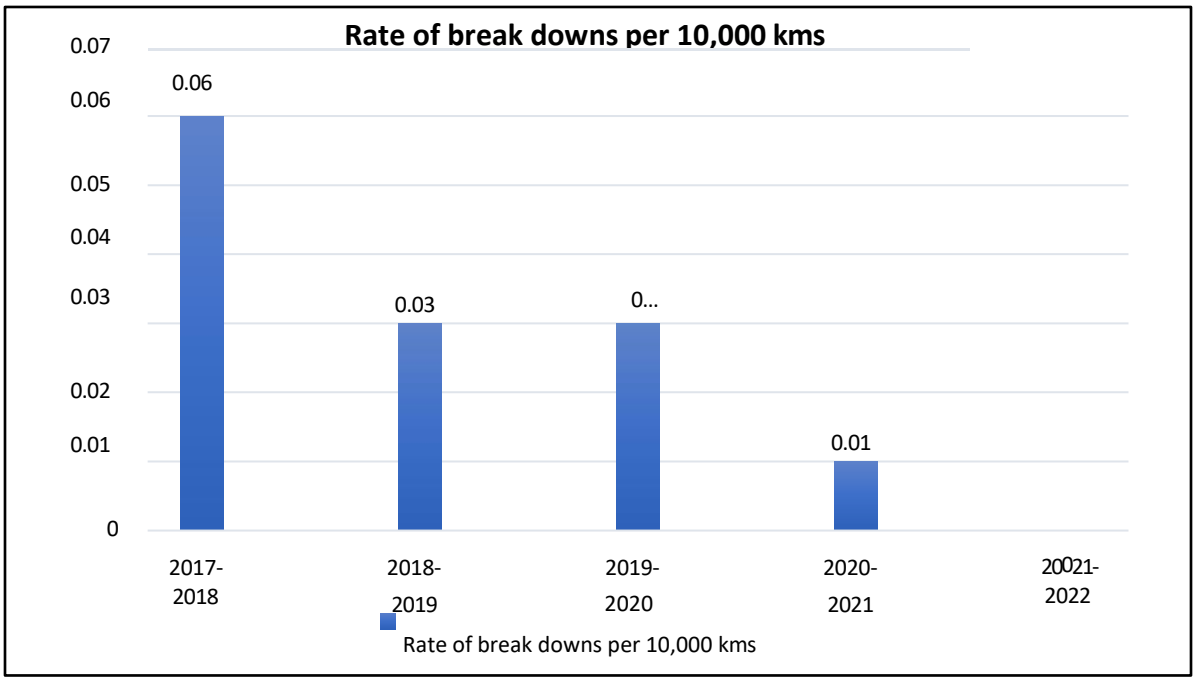
Interpretation:

The graph illustrates operational coverage details. Gross kilometers operated experienced a decrease from 2017-18 to 2019-20, with values of 4902.74, 4288.56, and 4205.17 respectively. However, there was an increase in the last two years. Similarly, effective kilometers operated followed a similar trend as gross kilometers. Notably, dead kilometers seen fluctuations till the year 2019-2020. But it shifted downward substantially in the year 2020-2021 i.e., from 139.66 to 61.78 K

The Rate of Break Downs per 10000 Kms of BMTC Buses

Year	Rate of break downs per 10,000 kms
2017-2018	0.06
2018-2019	0.03
2019-2020	0.03
2020-2021	0.01
2021-2022	0

Table No.7 Source: Annual Reports



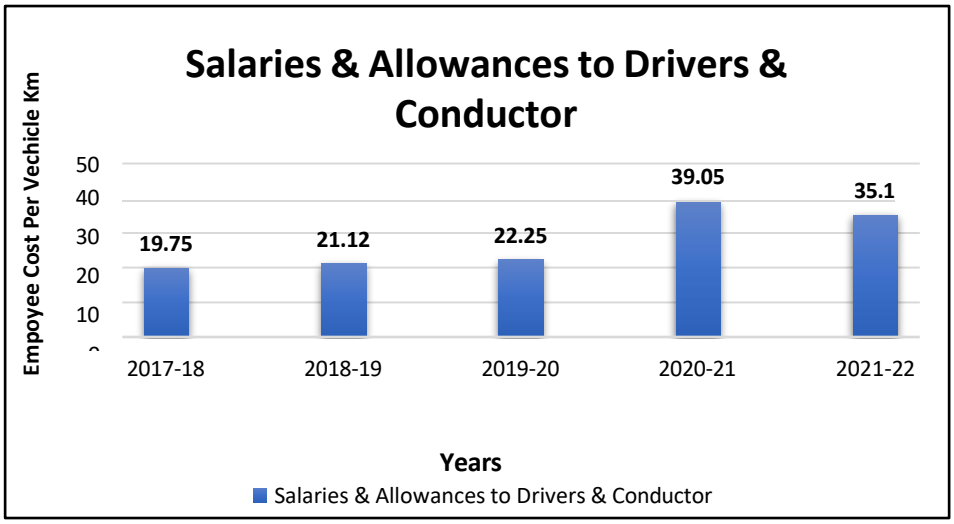
Graph No : 7

The table presents the rate of breakdowns per 10,000 kilometers of BMTC buses. Over the past five years (2017-18 to 2020-21), there has been a consistent decrease in the rate of breakdowns. Specifically, the rates were 0.06, 0.03, 0.03, 0.01, and 0.00 respectively, indicating a continual improvement in operational reliability.

Employee Cost

Year	Salaries and Allowances to Drivers and Conductors (Per vehicle km in rupees)
2017-2018	19.75
2018-2019	21.12
2019-2020	22.25
2020-2021	39.05
2021-2022	35.1

Table No.8 Source: Annual Report



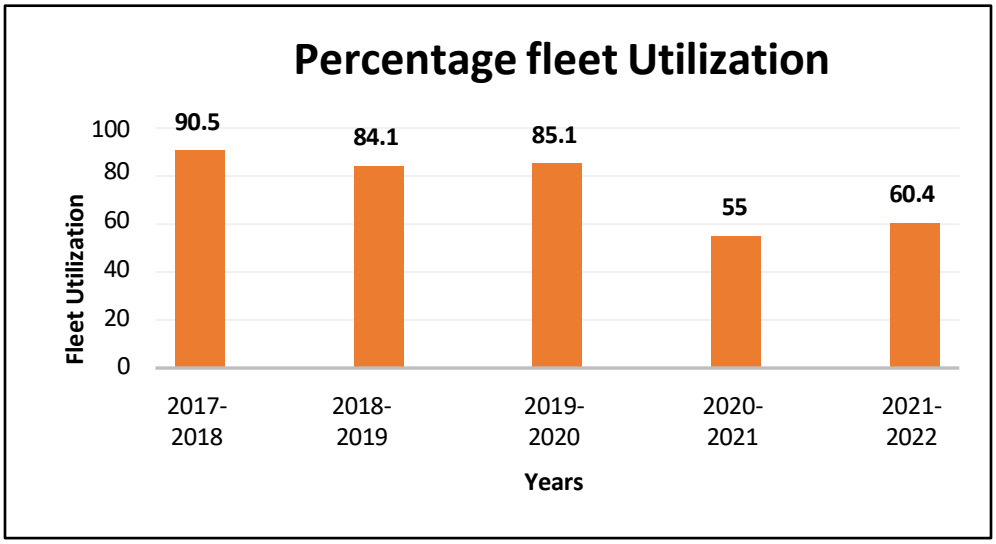
Graph No : 8

Interpretation:
The graph illustrates the salary provided to drivers and conductors per vehicle kilometer. From 2017-21, there was a steady increase in employee costs, with values of 19.75, 21.12, 22.25, and 39.05 rupees respectively. However, in 2021-2022, there was a reduction to 35.1 rupees.

The Percentage Fleet Utilization of BMTC Buses

Year	Percentage fleet Utilization
2017-2018	90.5
2018-2019	84.1
2019-2020	85.1
2020-2021	55
2021-2022	60.4

Table No: 9 Source: Annual Reports



Graph No. 9 Source: Annual Reports

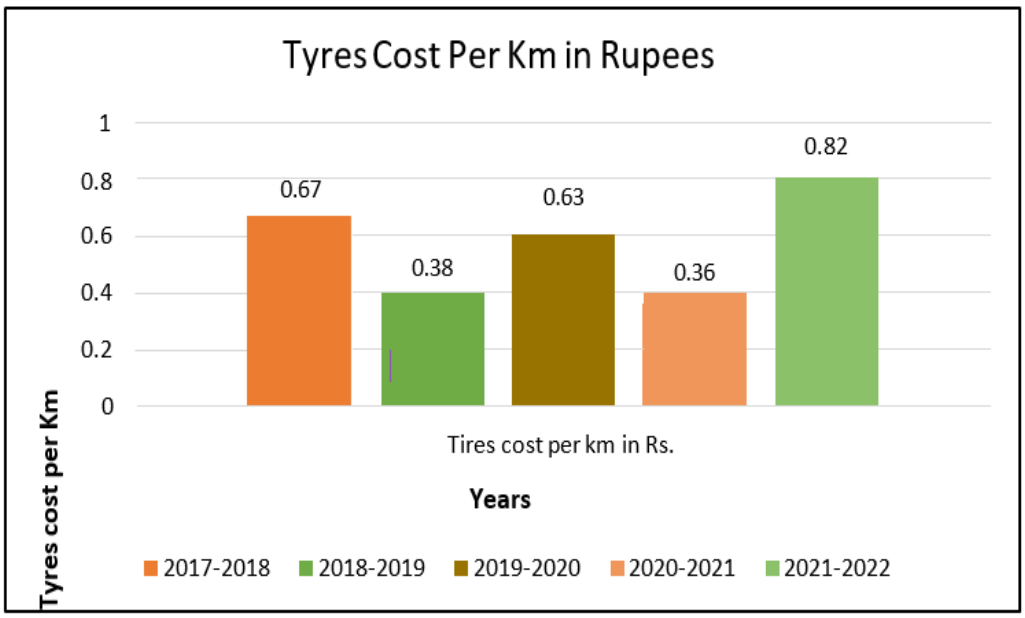
Interpretation:

Analysis of the table and graph reveals fluctuations in BMTC's percentage fleet utilization across operating years, with both upward and downward trends observed. Notably, there was a significant drop in percentage fleet utilization during the year 2020-2021.

The Tyres Cost Per Km in Rupees of BMTC

Year	Tires cost per km in Rs.
2017-2018	0.67
2018-2019	0.38
2019-2020	0.63
2020-2021	0.36
2021-2022	0.82

Table No: 10 source -Reports



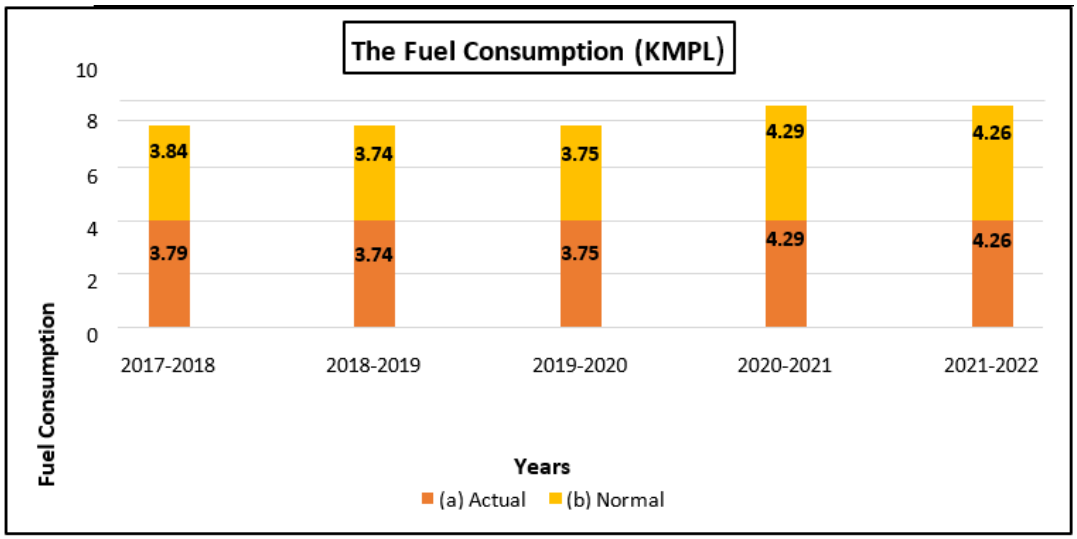
Graph No: 10

Interpretation:
The graph illustrates fluctuating trends in BMTC's tires cost per kilometer from 2017-18 to 2021-22, displaying both gradual increases and decreases over time. The year 2021-2022 shows highest cost per tire throughout the years i.e., 0.82.

The Fuel Consumption (Km per Litre)

Year	(a) Actual	(b) Normal
2017-2018	3.79	3.84
2018-2019	3.74	3.74
2019-2020	3.75	3.75
2020-2021	4.29	4.29
2021-2022	4.26	4.26

Table No: 11 source -Reports



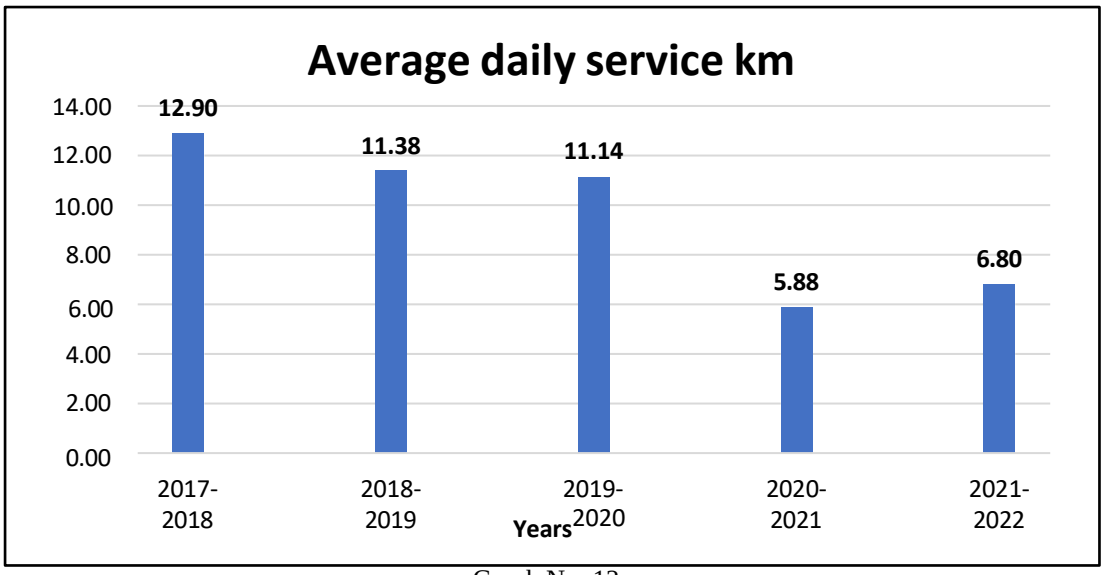
Graph No: 11

Interpretation:
The graph indicates an increase in fuel consumption KMPL (both actual and normal) in BMTC from 2017-18 to 2021-22. Notably, from 2017 to 2021, there was an increase observed in both actual and normal fuel consumption. However, a minor decrease was observed for the last year.

Average Daily Service km

Year	Average daily service km
2017-2018	12.90
2018-2019	11.38
2019-2020	11.14
2020-2021	5.88
2021-2022	6.80

Table No 12: Source: Annual Reports



Graph No: 12

Interpretation:
The table depicts the average daily service kilometers during the specified years. A declining trend in average daily service kilometers was observed from 2017 to 2021. However, there was an increase noted for the last year, 2021-2022.

Finding:
The effective kilometers operated typically indicate the efficiency of bus operations over a specific period. While there was a sudden decrease observed, it has been on the rise since 2021. The cost per kilometer increased between 2017 and 2021 but saw a decrease in 2022. Despite a slight drop in the previous year, there has been a notable increase in earnings per kilometer. Moreover, operating revenue per vehicle kilometer rose by 4.55 rupees in 2021-22, while operating expenses decreased by 6.59 rupees during the same period. This shift is advantageous for the organization as expenses decreased while revenues increased.
Analyzing BMTC's operational coverage, both gross kilometers and effective kilometers have increased compared to 2020-21. However, there has also been an increase in dead kilometers, which need to be minimized. The breakdown rate per 10,000 kilometers notably decreased, reaching 0.00% in 2022. Employee costs reduced by 3.95 rupees. Fleet utilization percentage exhibited a downward trend for the first four years but saw an increase in the fifth year. Tire costs per kilometer showed variability across the years. While there was a continuous reduction in average daily service kilometers from 2017 to 2021, there was an increase of 6.80 kilometers in 2022, up from 5.88 kilometers.

Conclusion:
The Bangalore Metropolitan Transport Corporation (BMTC) stands as a pillar of public transport, driven by a vision and mission centered on delivering outstanding service, ensuring passenger comfort, and guaranteeing utmost safety. Since its inception on August 15, 1997, BMTC has consistently provided exemplary transportation services to the community. Renowned for its excellence and efficiency, the corporation has maintained a sterling reputation throughout its years of operation. Ensuring efficient operational performance and maintaining service quality are crucial elements underpinning public transport systems. Research specifies that BMTC needs to prioritize managing escalating operational expenses, which have been on the rise. Additionally, it is imperative for the organization to diligently monitor fluctuations in costs such as cost per kilometer. The report suggests that while there hasn't been a significant rise in the overall cost of BMTC, there has been a notable decrease in the effective kilometers covered

over the years. Consequently, this decline in effective kilometers has led to a reduction in BMTC's overall revenue over time. Encouragingly, BMTC has made commendable strides in effectively reducing breakdown rates over the years, yielding promising outcomes. Moreover, BMTC has taken proactive steps by introducing electric buses and plans to expand its fleet in the coming years. This strategic move not only helps in reducing fuel consumption costs but also aligns with the organization's commitment to promoting eco-friendly modes of transportation.

Further Scope of Study:

Researchers could explore the impact of economic factors and seasonal variations on operating costs. Conducting trend analysis of cost elements may reveal repetitive patterns of fluctuations, providing a deeper understanding of their dynamics. Moreover, considering market conditions, environmental changes, technological advancements, and legal factors could offer further
insights into optimizing cost management strategies.

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