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## A Study of State-Owned Public Bus Transit Performance in Addis Ababa City, Ethiopia

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### **Abstract:**

*The State-Owned bus transit enterprises; Anbessa and Shger city bus play a lead role in the Mass Transit System of Addis Ababa city. So, this study examined the operational and financial performance of each bus transit enterprise. Data have been collected from Annual Reports of each Transit Agency for three years (2016/17 to 2018/19). Ratio and percentage were used to measure and analyze the performance of transit operators.*

*The results of this study indicate, Anbessa city bus performs well with the following operational performance indicators: service utilization and vehicle utilization; but it shows a problem on Staff bus ratio, staff productivity, and operational safety indicators. Whereas, Sheger city bus performs well in terms of fleet utilization, Staff bus ratio, manpower productivity, and operational safety indicators. Moreover, findings on the financial performance show both enterprises provide services with the deficit; but recently there is an improvement on Anbessa city bus and the amount of deficit for Sheger city bus is growing at higher rate for recent years.*

*Last, the result suggests that even if they are the state-owned bus transit operators and subsidized by the Government, they need great improvements in utilizing their resources to enhance their financial and operational performance and deliver services incompetent with other operators in the city.*

**Keywords:** Bus transit, operational performance, financial performance, Addis Ababa

### **1. Introduction**

Developing countries are commonly characterized by a low level of income, low level of private car ownership, high population density in the cities, and rapid growth of urbanization coupled with a shortage of financial resources to invest in rail mass transit services (Iles, 2005; Verma and Ramanaya, 2014). Owing to that Bus transit is the dominant mode of public transport in most cities of developing countries. Bus-based mass transit provides mobility and offers a cost-effective alternative to the majority of urban poor in cities. Besides, it offers a viable solution to various problems associated with the urban transportation system; such as traffic congestion and pollution (Ibid).

However, the bus transit system of most cities is characterized by poor quality, insufficient capacity, and low standards of safety and inefficient in providing transit services for residents. Therefore, to overcome the above problems and enhancing the performance of the bus transport system by measuring the existing operational and financial performance of each transit operator is a solution rather than trying to implement a new system and importing a new mode that may need higher costs.

Similarly, Mass Transit System in Addis Ababa is composed of mainly Light Rail Transit and Bus operations. The major Mass Transit Operators in the city are Addis Ababa Light Rail Transport, Anbessa City Bus Service Enterprise, Sheger Mass Transport Service Enterprise, Alliance City Bus, and Public Service Employees Transport Service Enterprise. Among these Anbessa and Sheger city buses are the major road-based bus transit operators in the city and owned by the State.

So, the State-Owned bus transit enterprise (Anbessa and Sheger citybus) plays a lead role in the public transportation system of the city. For instance, in 2017/18 these transit agencies together carried on average 424,126 passengers per day, which is 92.2% from all road-based mass transit operators. However, as their financial data indicates these two enterprises also provide services with a deficit for long years and they are subsidized by the city Administration every year. For instance, in 2017/18, 52.2% of the revenue for Anbessa city bus obtained from AACA through Subsidy; while 49% for Sheger city bus (AATA, 2017/18).

Therefore, giving important attention to measuring and analyzing the performance of mass transit systems is vital to handle the severe operating environment and financial challenges of the sector in the provision of transit services in the city. Moreover, measuring the operational and financial performance of the State-Owned bus transit operators is an important tool for ensuring continuous improvement of the quality of service and allocating resources among competing transit operators in the city.

Thus, considering the above issues, this study aims to measure and analyze the Operational and Financial Performance of the State-Owned bus transit operators in Addis Ababa city; emphasizing Anbessa and Sheger city bus for the year 2016/17 to 2018/19.

## 2. Data and Methodology

This study primarily based on secondary data collected from Annual Reports of Anbessa and Sheger city bus for three years. Besides, reports, magazines, books are used as a source of data for the analysis of the study. To evaluate the operational and financial performance of the bus system, performance indicators are selected based on objectives of transit agencies, literature review on the performance of measurement used in other studies and the availability of data. Lastly, the analysis has been done by using ratio-analysis method.

| Performance indicators | Anbessa City Bus : (established in 1943 ) |             |             | Sheger City Bus : (Established in 2016) |             |             |
|------------------------|---|-------------|-------------|---|-------------|-------------|
|                        | 2016/17                                   | 2017/18     | 2018/19     | 2016/17                                 | 2017/18     | 2018/19     |
| Vehicles held          | 829                                       | 728         | 1158        | 250                                     | 316         | 321         |
| Vehicles Operated      | 447                                       | 438         | 438         | 121                                     | 251         | 240         |
| Number of employees    | 3398                                      | 3559        | 3896        | 782                                     | 1492        | 1877        |
| Total Covered km       | 18,759,848                                | 16,220,017  | 17,297,432  | 4,400,000                               | 12,500,000  | 9,100,000   |
| Number of Passengers   | 133,770,900                               | 105,758,047 | 113,109,108 | 19,800,000                              | 49,048,200  | 57,500,000  |
| Total cost             | 625,649,000                               | 591,012,000 | 587,697,444 | 168,140,908                             | 237,384,526 | 378,555,130 |
| Total revenue          | 563,985,000                               | 555,904,000 | 604,024,593 | 142,081,625                             | 245,349,419 | 175,535,697 |
| Traffic Revenue        | 275,201,000                               | 229,183,000 | 203,005,833 | 42,081,625                              | 106,394,088 | 158,167,673 |
| Number of accidents    | -   | 2046        | 2194        | -                                       | 503         | 360         |

Table 1: Basic Characteristics of Bus Operation for Each Transit Operator for the Years

## 3. Result and Discussion

### 3.1. Operational Performance

Availability and utilization of the buses considerably have an impact on the productivity and efficiency of the transit operators. Besides, so as to sustain the level of financial viability vehicles need to be well utilized throughout their period of operation. Therefore, analysis of operational performance is important as this can figure out a vital contribution to productivity.

Hence, in this study, an attempt has been made to measure and analyze the operational performance of the State-Owned Bus Transit Service Operators in city. This is because an attempt to measure only financial performance of the transit agencies is not enough; without measuring and analyzing the operational performance of each agency based on operational performance parameters which have an impact on financial performance.

So, to achieve the objective of this study, the following parameters are selected under physical and operational performance: fleet utilization, vehicle utilization, service utilization, Staff-bus ratio, and staff productivity as well as the quality of service in terms of operational safety.

#### 3.1.1. Fleet Utilization

Fleet utilization is expressed as fleet operated (number of buses on the road) as a percentage of fleet held by a transit operator in a year. It is also an important indicator of efficiency since it reflects the quality of bus services, maintenance, and deployment. This is because all buses held by an agency cannot always be put on roads; i.e. some buses are likely to be held in a workshop for maintenance and repairs and other reasons. Therefore, if fleet utilization is better, it implies that a higher percentage of buses were available on the road and the rate of cancellation of services and the rate of breakdown are also low.

Thus as figure 1, shows fleet utilization for Anbessa city bus is the highest (60%) in 2017/18 and lowest (38%) in 2018/19. Besides, Sheger city bus has a better percentage of fleet utilization for the last two years and the enterprise obtained the maximum utilization percentage as compared to Anbessa city bus (i.e. 79.4%). This implies that Sheger city bus has a better fleet utilization percentage and it has an impact on the efficiency of the enterprise. But Anbessa city bus should work to improve the percentage of fleet utilization; because it affects the efficiency of the enterprise negatively. However, as the world bank (1987), fleet utilization between 80-90% is considered reasonable. So, except the result of Sheger city bus in 2017/18, the other results show both enterprises are under standards. This shows the need for maintaining the level of fleet utilization for both enterprises so as to enhance their operational efficiency as well as profitability of the sector.

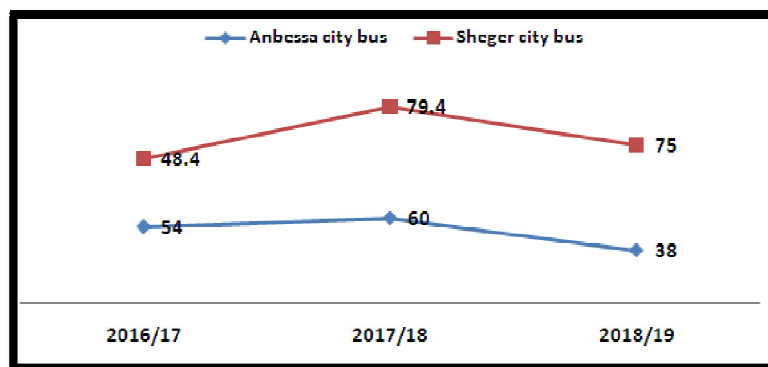


Figure 1: Percentage of Fleet Utilization (%)

**3.1.2. Vehicle Utilization**

Vehicle utilization is an important indicator in the operation of mass transit systems and sometimes termed as “bus productivity” and which revealing the effective utilization of operating capital. Vehicle utilization is the number of kilometers served per vehicle operated on the road per day. And it represents the operational efficiency of the use of vehicles in terms of the effective utilization of vehicles in the system. So, a vehicle is effectively utilized when it results in more effective kilometers performed by the vehicle on the road.

Thus as shown, in Figure3, vehicle productivity for Anbessa city bus is high in 2016/17 (115km/bus/day) and low in 2017/18 (101km/bus/day). Similarly, vehicle productivity for Sheger city bus is high in 2017/18 (136km/bus/day) and low in 2016/17 (100km/bus/day). In general, vehicle productivity is almost similar for both enterprises but better for Sheger city bus.

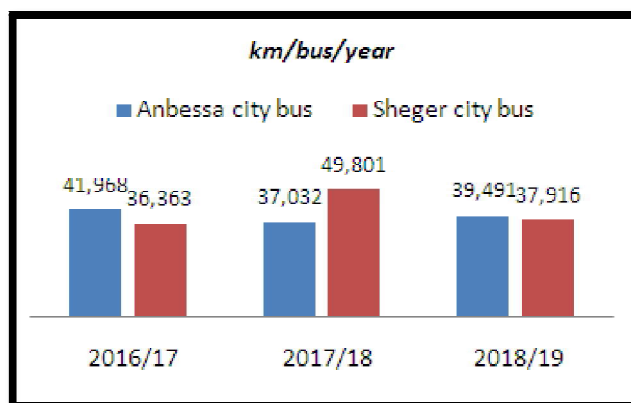


Figure 2: vehicle productivity: km/bus/year

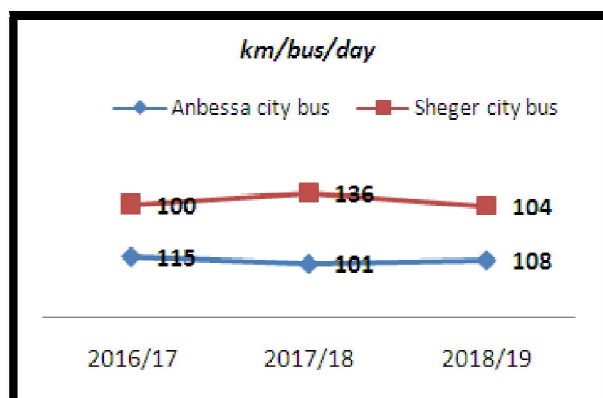


Figure 3: vehicle productivity: km/bus/day

**3.1.3. Service Utilization**

It indicates the extent to which the delivered capacity is utilized by the public and the quality of bus service. Thus, it is mainly based on the number of passengers carried and the effective kilometers generated by each mass transit agency in the system.

So, the next figures indicate data on the volume of operation of each operator with elements of the average number of passengers carried per bus per year and per day and an average number of passengers per km for each operator in the city.

To begin, Table 1, indicate the number of passengers carried by Anbessa and Sheger city bus each year in the city. Though the total number of passengers for Anbessa city bus is higher as compared to Sheger city bus, as shown in figure 4, the number of passengers varies and the users' percentage is declined from 2016/17 to 2017/18 by 19.3% and increased also by 6.9% from 2017/18 to 2018/19. Similarly, the number of Passengers for Sheger city bus is increased by 19.4% from 2016/17 to 2017/18 and by 22.6% from 2017/18 to 2018/19. So, the result indicates the number of users is growing for Sheger city bus with high rate than Anbessa bus in the city and it implies services utilization for Sheger city bus is better as compared to Anbessa in the city.

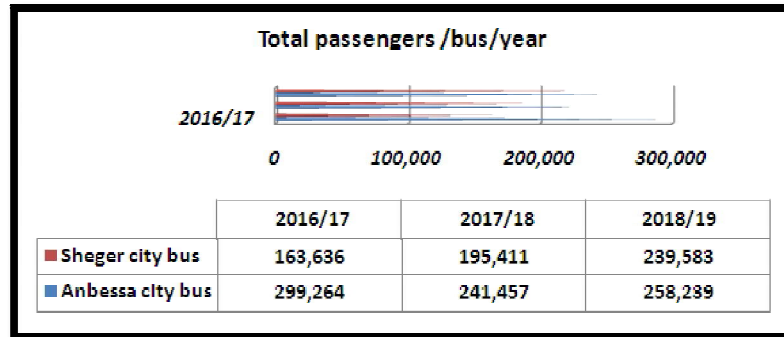


Figure 4: Service Utilization (Total Passengers/Bus/Year)

Besides, Figure 5 shows the number of passengers per bus/day for each bus transit operator and as shown in the figure, the ratio of passengers per bus per day is higher for Anbessa city bus and lower for Sheger city bus during the period. So, it implies that the carrying capacity of Anbessa city bus is better than Sheger city bus and the service of Anbessa bus is utilized very well as compared to Sheger city bus during the period.

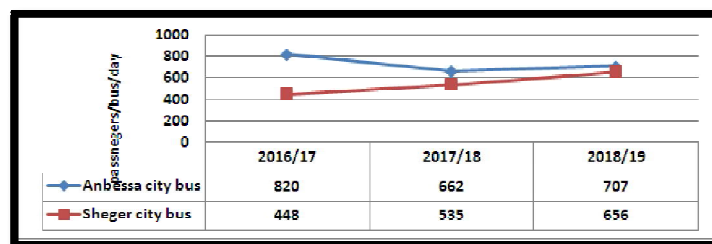


Figure 5: Service Utilization (Passengers/Bus/Day)

Moreover, as shown in Figure 6, the analysis of service utilization is measured in terms number of passengers/km for each operator. Thus passenger /km is higher for Anbessa city bus and it is the same for three consecutive years (i.e. 7 passenger/km). It means that on average seven passengers were transported in one km using Anbessa city bus. For Sheger city bus the ratio is lower but it is improved in 2018/19 and it becomes 6 passengers/km. So, Anbessa city bus has better service utilization in the city as compared to Sheger city bus.

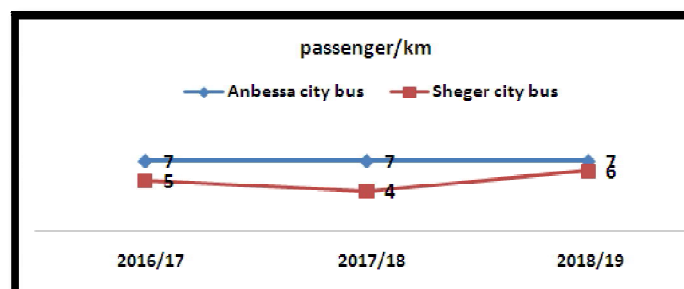


Figure 6: Service utilization (passenger/km)

**3.1.4. Staff-Bus Ratio and Staff Productivity**

Maintaining an optimal staff-bus ratio is a significant indicator of the operational efficiency of the enterprise. It can be also considered as an indicator of labor utilization, and it helps to understand whether or not the available staff is being systematically and economically employed. Then, it is the ratio of total staff employed on the specified period to the number of buses on the road in the same period. Although a higher ratio denotes more employment generation, it indicates the low productivity of the staff employed and higher establishment expenses. Hence, a lower ratio is always desirable as it indicates high productivity of staff employed.

In this study, the staff denotes the total employment in the enterprise, which includes operating crew, mechanical staff, and administration staff. Considering that, the next figures show the result for Staff-bus ratio and manpower productivity for the two state-owned bus transit operators in the city during the years.

**3.1.4.1. Staff-Bus Ratio /SBR/**

Figure 7, shows SBR for Anbessa and Shger city bus during the three years. So, as shown below SBR for Sheger city bus is lower as compared to Anbessa city bus for the period. It indicates that SBR for Sheger city bus enterprise is good and the productivity of the staff per bus is better than Anbessa city bus.

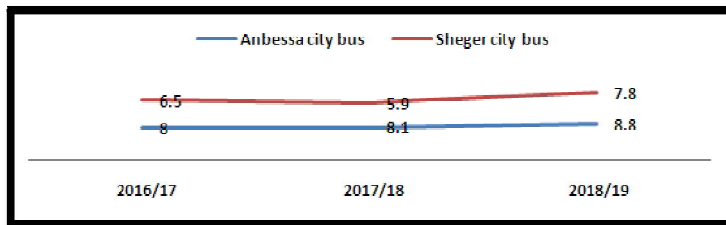


Figure 7: Bus- Staff ratio

**3.1.4.2. Manpower Productivity**

Moreover, Staff productivity denotes the input-output ratio. Input is the number of persons employed in the agency and output is the services delivered to the traveling to the users in the form of effective Kms and km/staff/day. As figure 8 shows, manpower productivity in terms of km/staff/day, Sheger city bus has the highest result (i.e. 22.9); it means that in 2017/18 Sheger city bus covered 22.9 km per employee per day; whereas, in the same year Anbessa covered 12.5 km per employee per day. Therefore, the productivity of the staff is higher for Sheger city bus than Anbessa city bus in 2018/19.

However, the productivity of the staff also varies between years for both enterprises. For instance, staff productivity for Anbessa city bus is declined by 17.2% from 2016/17 to 2017/18 and with 2.4% from 2017/18 to 2018/19. In contrast, staff productivity for Sheger city bus is increased by 48.7% from 2016/17 to 2017/18 and decreased by 42.4% between 2017/18 to 2018/19. But staff productivity for Sheger city bus is better as compared to Anbessa city bus and the highest in 2017/18.

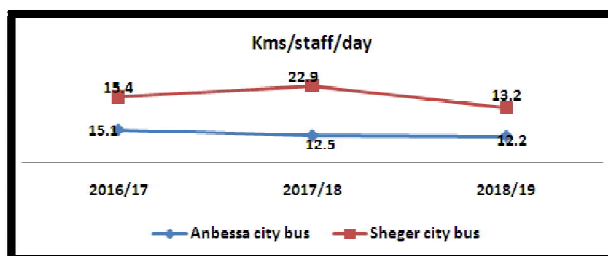


Figure 8: Manpower Productivity: km/staff/day

**3.1.5. Operational Safety**

This study also tries to analyze the operational efficiency of the major state-owned bus transit operators in terms of the number of accidents per 100,000kms for two years. As shown in figure 9, accident/100,000kms is higher for Anbessa city bus 12.6% in 2017/18 and 12.7 in 2018/19; similarly, it is low for Sheger city bus. The accident percentage is also increased by 0.7% for Anbessa city bus and decreased by 1.7% for Sheger city bus between the two years. This implies that the occurrence of accidents per 100,000km is higher in Anbeesa city bus than Sheger city bus. This is maybe due to poor vehicle condition and maintenance problem of the enterprise; since Anbessa city bus serves the city for long years and the percentage of fleet utilization also declined from year to year and reach 37.2% in 2018/19.

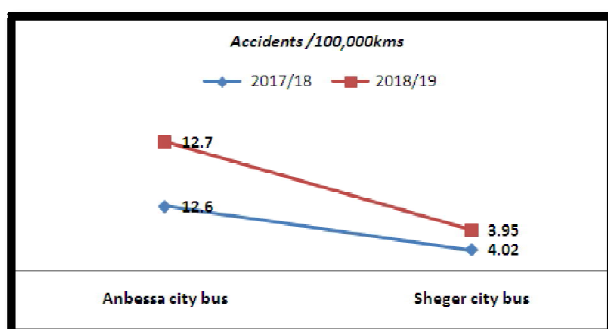


Figure 9: Operational Safety (Accidents/100,000kms)

### 3.2. Financial Performance

Financial performance is a subjective measure of how well an organization can use assets from its primary mode of business and generate revenues (Greenwood and Jovanovic, 1990). Besides, as Sunita and Rajnalka (2017) it is also used as a general measure of a firm's overall financial health over a given period of time and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. There are many different ways to measure financial performance, but all measures should be taken in aggregation (ibid). Thus, this section of the paper devoted to the analyze the financial performance of the State-owned bus transit enterprise in Addis Ababa City for three years. And table 2, shows the financial data of Anbessa city bus and Sheger city bus from 2016/17 to 2018/19.

| Agencies         | Total revenue ('000) |             |             | Total Cost ('000) |             |             | Net profit/loss ('000) |           |              |
|------------------|----------------------|-------------|-------------|-------------------|-------------|-------------|------------------------|-----------|--------------|
|                  | 2016/17              | 2017/18     | 2018/19     | 2016/17           | 2017/18     | 2018/19     | 2016/17                | 2017/18   | 2018/19      |
| Anbessa City bus | 563,985              | 555,904     | 604,024,593 | 625,649           | 591,012     | 587,697,444 | -61,664                | -35,108   | 16,327,149   |
| Sheger city bus  | 142,081,625          | 245,349,419 | 175,535,697 | 168,140,908       | 237,384,526 | 378,555,130 | -26,059,283            | 7,964,893 | -203,019,433 |

Table 2: Financial Performance Indicators (2016/17- 2018/19) in Birr

So, as shown in the above table, Total Revenue (TR) and Total Costs (TC) vary for each enterprise with years. TR for Anbessa city bus is decreased by (-1.4%) from 2016/17 to 2017/18 and increased by 8.6% from 2017/18 to 2018/19. Total cost also declined by 5.54% and 0.6% from 2016/17 to 2017/18 and 2017/18 to 2018/19; respectively. Similarly, TR and TC for Sheger city buses also vary within years. For instance, total revenue for Sheger city bus is increased by 72.6% and decreased by (-28.5%) in the years of 2016/17 to 2017/18 and 2018/18 to 2018/19; respectively. But the total cost is increased by 41.2% from 2016/17 to 2017/18 and by 59.5% from 2017/18 to 2018/19. Then TR and TC vary between years and had a significant impact on the profitability of the agencies. So, based on the above result, the net profit/loss of each enterprise during the period is measured and shown in Figure 10. Thus as indicates in the figure, Net profit for Anbessa city bus is improved from year to year and gets a net profit of 16,327,149 birr in 2018/19. Besides, Net profit /loss for Sheger city bus indicates a high loss in 2018/19 and an incurred deficit of 203,019,433Ethiopian Birr. So, the enterprise should work to minimize the cost of the enterprise so as to keep in the sector.

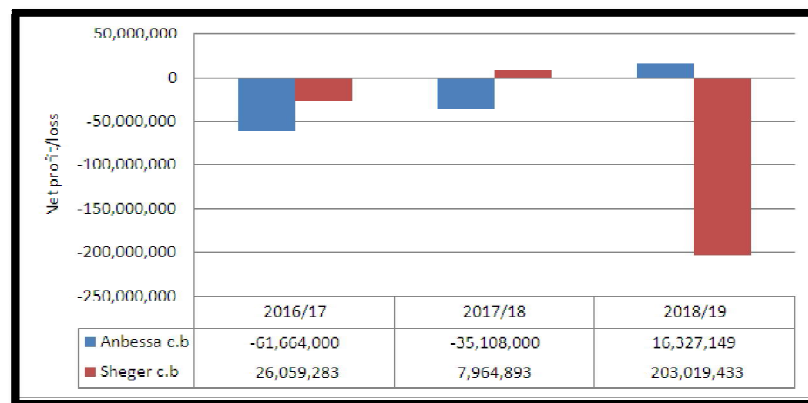


Figure 10: Net profit/loss for Bus Transit Operators (in birr)

Moreover, based on the above cost-revenue relationships of the enterprise and net profit/loss of each enterprise, this study tries to analyze net profit/loss per bus/year, per/day, per/km for each bus transit agency. And the next figures show each in detail.

#### 3.2.1. Revenue/Cost and Net Profit per Bus/Year

Based on the above financial data, the following table shows revenue/cost per bus per year and measures and analyzes net profit/loss per bus each year for each bus transit agency.

| Year    | Revenue/bus  |             | Cost/bus    |             | Net profit/loss/bus |            |
|---------|--------------|-------------|-------------|-------------|---------------------|------------|
|         | Anbessa c.b  | Sheger c.b  | Anbessa c.b | Sheger c.b  | Anbessa c.b         | Sheger c.b |
| 2016/17 | 1,261,711.41 | 1,174,228.3 | 1,399,662.2 | 1,389,594.3 | -137,950.8          | -215,365.9 |
| 2017/18 | 1,269,187.22 | 977,487.72  | 1,349,342.5 | 945,755.1   | -80,155.3           | 31,732.6   |
| 2018/19 | 1,379,051.6  | 731,398.74  | 1,341,774.9 | 1,577,313   | 37,276.6            | -845,914.3 |

Table 3: Revenue/Cost and Profit per Bus/Year (Inbirr)

As shown in table 3, the total revenue per bus is higher and growing from year to year for Anbessa city bus; while declined for Sheger city bus during the period. It means that TR/bus for Anbessa city bus is increased by 0.6% from 2016/17 to 2017/18 and by 8.65% from 2017/18 to 2018/19. But TR/bus for Sheger city bus is declined first by (-16.8%) and then by (-25.2%) during the period.

On the other hand, TC / bus for Anbessa city bus is declined by (-3.6%) first and then by (-0.6%) during the two consecutive years. But, TC/bus for Sheger city bus is almost similar with Anbessa city bus but the rate of change is high; i.e. TC/bus is decreased by (-31.9%) from 2016/17 to 2017/18 and then increased by 66.8% from 2017/18 to 2018/19 and it is the highest as compared to Anbessa city bus.

Then based on the above data, figure (11) shows Net profit/loss of each enterprise per each bus during the period. Thus, Anbessa city lost a huge amount birr in 2016/17 and lost 137,950.8 birr per bus and obtained 37,276.6 birr/bus as a profit in 2018/19. Besides, Sheger city bus lost a huge amount of birr (i.e. 845,914.3 birr/per bus) in 2018/19. This is the highest as compared to Anbessa city bus and it is a huge challenge for the enterprise.

Therefore, even if the main responsibilities of these public transit operators are to facilitate services for residents to achieve their social and economic tasks; the enterprise should also try to enhance their profitability by using resources efficiently and effectively and minimizing the rate of cost and improve their revenue.

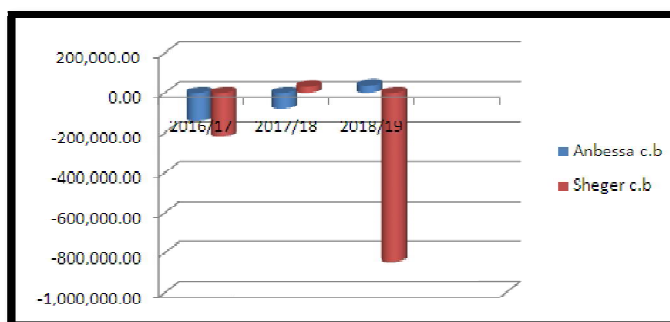


Figure 11: Net Profit/Loss per Bus per Year

**3.2.2. Total Revenue/Cost/ and Net Profit/Loss per Bus per Day**

Table 4, shows the outcomes of TR and TC per bus per day for each bus transit operator during the period. Then as shown, TR per bus/day for Anbessa city bus enterprise is increasing for the mentioned years; while for Sheger city bus it is also declined.

Besides, TC per bus/day for Anbessa city bus is declined by (-3.6%) from 2016/17 to 2017/18 and by (-0.6%) from 2017/18 to 2018/19. However, TC per bus /day for Sheger city bus is declined by (-32%) from 2016/17 to 2017/18 and increased by 66.8% from 2017/18 to 2018/19. So, it implies that Sheger city bus cost/bus/day is the highest in 2018/19 and it enhances the deficit of the enterprise. So, the enterprise should manage and minimize the cost per bus per day as soon as possible to improve the profitability status of the sector.

| Year    | Revenue/bus/day |            | Cost/bus/day |            | Net profit/loss/bus/day |            |
|---------|-----------------|------------|--------------|------------|-------------------------|------------|
|         | Anbessa c.b     | Sheger c.b | Anbessa c.b  | Sheger c.b | Anbessa c.b             | Sheger c.b |
| 2016/17 | 3,456.7         | 3,217.1    | 3,834.7      | 3,807.1    | -378.0                  | -590.0     |
| 2017/18 | 3,477.2         | 2,678      | 3,696.8      | 2,591.1    | -220                    | 87.0       |
| 2018/19 | 3,778.2         | 2,003.8    | 3,676.1      | 4,321.4    | 102.1                   | -2,317.5   |

Table 4: Total Revenue/Cost and Profit/Loss per Bus/Day (In Birr)

Based on the above data, net profit/loss per bus per day is also calculated and shown as follows. Then as figure 12 shows, net profit/ loss for Anbessa city bus is improved; the loss per/bus/day is reduced from year to year and incurred a profit in 2018/19; which means Anbessa obtained 102.1 birr per bus per day as a profit in the year. On the other way, Sheger city bus losses 2,317.5 birr per bus/day in 2018/19 and it is the highest figure as compared to Anbessa city bus.

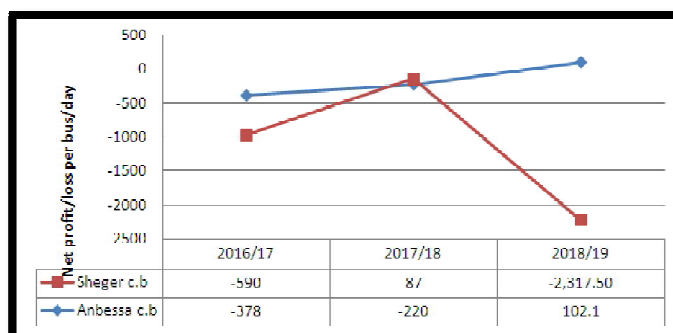


Figure 12: Net profit/loss per bus/day(in birr)



### 3.2.3. Total Revenue/Total Cost per Km

Figures 13 and 14 show, total revenue and total cost per km for each bus transit enterprise in Addis Ababa city for the three years. So, as indicates in figure 13, TR/km for Anbessa city bus is increased from 30.1 birr/km to 35 birr/km from 2016/17 to 2018/19. But, TR/km for Sheger city bus is declined from 32.3 birr/km to 19.3 birr/km. Therefore, Sheger city bus obtained less birr/km as compared to Anbessa city bus during the period.

On the other hand, figure 14 shows, TC/km for both transit operators. Thus, Anbessa city bus costs per km nearly the same during the mentioned years. For instance, Anbessa costs 33.35 birr per km in 2016/17 and 34 birr/km in 2018/19. But, Sheger city bus cost a high amount of birr /km in 2018/19 (i.e. 41.6 birr/km). Hence, as the result indicates, Sheger city bus earns less/km and costs high birr/km as compared to Anbessa city bus.

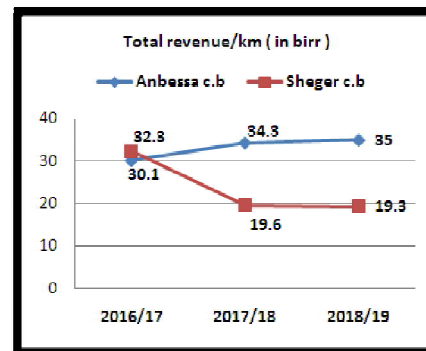


Figure 13: Total Revenue /km

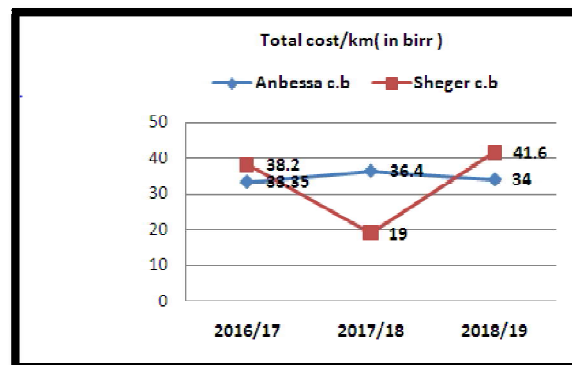


Figure 14: Total Cost /km

Next, figure 15 shows Net profit/loss per km for each enterprise. Thus, as the result for this study shows, the loss/km for Anbessa city bus is improved from year to year and earn birr 1/km as a profit in 2018/19; while Sheger city bus loss 22.3 birr per km. Therefore, it has significant impacts on the financial performance of the enterprise.

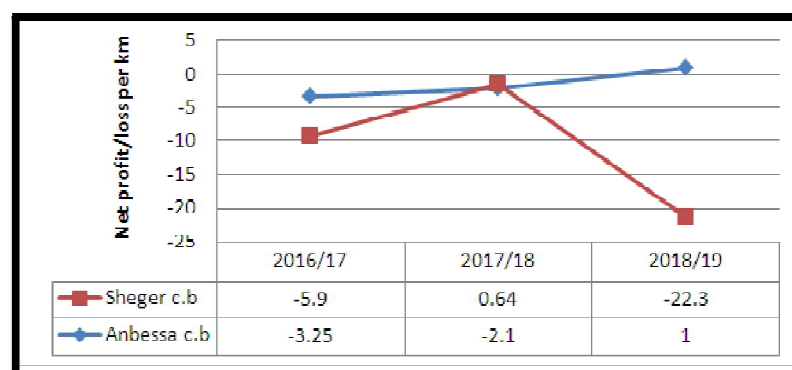


Figure 15: Net profit/loss per km (in birr)

To sum up, as the Net profit/loss result shows, both the state-owned bus transit operators in the city provide services with loss. But the loss amount varies between the two agencies; for Anbessa city bus positive progress comes from year to year and starts to get profit in 2018/19. Besides, the loss amount for Sheger city bus is growing rapidly. Therefore, the enterprise and the state should consider the operational and financial performance of the agencies in detail so as to enhance their financial status and to deliver efficient services for users in the city.



#### 4. Conclusion

The State-Owned bus transit operators; especially Anbessa and Sheger city bus play a lead role in the Mass Transit system of Addis Ababa city. These two enterprises together carried about 424,126 passengers per day which is about 92.25 from all road-based mass transit operators in the city (i.e. Anbessa, Sheger, Alliance city bus, and Public Service Employees' Transport Service Enterprise). Besides, these transit agencies had a contribution to minimizing the problem of congestion in the city and had an impact to reduce road accidents in the city.

Even if, these agencies providing services with a deficit for long years, they obtained a huge amount of capital from the city Administration through subsidies. However, to enhance their financial performance, providing a great emphasis on operational performance is very important. This is because as findings on operational performance shows Anbessa city bus performs well in some indicators; such as service utilization and vehicle utilization. But, the result shows a problem with the Staff-bus ratio, staff productivity, and operational safety indicators. Whereas, Sheger city bus performs well in terms of fleet utilization, Staff-bus ratio, manpower productivity, and operational safety indicators. Besides, as the financial performance result shows both enterprises provide services with deficit; but recently there is an improvement on Anbessa city bus and the amount of deficit is growing at higher rate for Sheger city bus. Therefore, though both are the state-owned bus transit operators and subsidized by the Government, they should work minimize their costs and enhance revenue by using their resources efficiently and effectively.

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