GOVERNMENT OF KARNATAKA

EVALUATION OF KARNATAKA STATE ROAD TRANSPORT CORPORATIONS (KSRTC, NWKRTC AND KKRTC) FROM 2014-15 TO 2019-20

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Karnataka Evaluation Authority

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DEPARTMENT OF PLANNING, PROGRAMME MONITORING AND STATISTICS
GOVERNMENT OF KARNATAKA
FEBRUARY 2022

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NAME OF ECO:
ATHENA INFONOMICS INDIA PRIVATE LIMTED

DEPARTMENT NAME:
DEPARTMENT OF PUBLIC ENTERPRISES

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FOREWORD

Road transport is vital to economic development, commerce and trade, and social integration. The State is a key role player in provision of transport facilities to promote the principles of equity, social justice and sustainability. The evaluation of Road Transport Corporations was taken up by Department of Public Enterprises with the objectives of evaluating the Managerial, Financial and Operational performance of road Transport corporations and get feedback for framing suitable measures to increase competitive strength and service delivery. The evaluation was conducted for the period from 2014-15 to 2019-20 for KSRTC, NWKRTC and KKRTC by Karnataka Evaluation Authority through M/s. Athena Infonomics India Private Limited.

The present study adopts a mixed approach to evaluate the corporations using the DAC framework (criteria, relevance, effectiveness, efficiency, impact, and sustainability and equity). The primary survey is conducted among the RTC bus users (1440) and Non-RTC bus users (189) using the quantitative method in 12 divisions and 36 depots. The qualitative data was collected from 54 Key informant Interviews and Focus group Discussions.
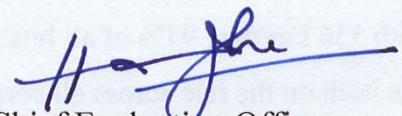
The findings indicate that the KSRTC has the highest number of passengers carried (10.53 lakh), NWKRTC has a higher number of passengers carried per bus per day (488), with KSRTC at 375 and KKRTC at 338. The fleet size shows a slight increasing trend for all corporations, with the largest increase observed for KKRTC (400 buses, 9.3%), On an average, a KSRTC bus runs around 361 km/day, followed by NWKRTC at 348 km/day and KKRTC with 336 km/day. 94% of all bus services depart on time, and 95.2% arrive on time. Fleet Age has been on the rise across all corporations and NWKRTC has the largest share of buses above 9 lakh km (the scrapping threshold). There is decline in accidents and breakdowns over the period. The margin per km (EPKM–CPKM) is negative INR -5.23 and INR -5.34 for KSRTC and KKRTC respectively indicating high operational costs and low earnings due to inappropriate pricing structure and maintenance costs. More than 50% of passengers report satisfaction on all components for RTC services.

The major recommendations are -Road transport corporations should monetize the assets to use as shopping malls, parking lots and food courts to improve their revenue and capital position. Transfer of concessions of transport directly to the beneficiaries account (DBT) and customers paying full price to transport corporations. Use of ERP technology to reduce the staff and administrative costs. Rationalization of Commercial and Non-commercial routes through use of CUBE Software. Enhancement of Revenue through increase in fares. Exploring

a compensation from the Government on Diesel price increase and operation of unviable routes. Implementation of ITS system in corporation would increase the passenger usage by providing the services like SMS, IVRS and Commuter Portal for public usage etc. pricing structure should be arrived at based on cost and earnings per KM over a reasonable period. To increase the operational efficiency of luxury bus services, establish a separate division that operates only luxury buses common for all three corporations. Capital restructuring by writing off losses and infusion of capital for sustained operations of the corporations.

I expect that the findings and recommendations of the study will be useful to the Government & Transport Department as well as Corporations to bring in the necessary technology and operational efficiency to improve the service delivery at low cost and attain sustainability over time.

The study received support and guidance of the Additional Chief Secretary, Planning, Programme Monitoring and Statistics Department, Government of Karnataka. The report was approved in 52nd Technical Committee meeting. The review of the draft report by KEA, the department and members of the Technical Committee and an Independent Assessor, has provided useful insights and suggestions to enhance the quality of the report. I acknowledge the assistance rendered by all in successful completion of the study.

Chief Evaluation Officer
Karnataka Evaluation Authority

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

KSRTC   Karnataka State Road Transport Corporation

NWKRTC   North Western Karnataka Road Transport Corporation

KKRTC   Kalyana Karnataka Road Transport Corporation

RTC   Road Transport Corporation

BMTC   Bangalore Metropolitan Transport Corporation

KEA   Karnataka Evaluation Authority

TOC   Theory of Change

AHP   Analytical Hierarchy Process

DEA   Data Envelopment Analysis

EXECUTIVE SUMMARY

Evaluation of Karnataka State Road Transport Corporations (KSRTC, NWKRTC and KKRTC) for the year of 2014-15 to 2019-20 was assigned to Athena Infonomics India Private Limited in February 2021 by Karnataka Evaluation Authority (KEA) at the directive of Department of Public Enterprises and Karnataka State Transport Corporations, and the Government of Karnataka. The study aims to examine the extent of objectives of the Corporations achieved with respect to operational efficiency, technology adoption and delivery of services, and suggest suitable measures to increase competitive strength and service delivery. The evaluation was conducted for the period starting from 2014-15 to 2019-20 for KSRTC, NWKRTC and KKRTC.

Road transport is vital to economic development, trade, and social integration, which rely on the conveyance of both people and goods. The state government must provide easy accessibility, trade, flexibility of operation etc. While the transport corporation plays an active role in economic development, it also helps the large-scale labour force. Karnataka is considered to be one of the leading states in India effectively delivering services to the public including in delivering the road transport services. Government road transport service is delivered through three corporations in Karnataka (a) Karnataka State Road Transport Corporation (KSRTC), North-western Karnataka Road Transport Corporation (NWKRTC) and (iii) Kalyan Karnataka Road Transport Corporation (KKRTC). The objectives of the evaluation of the corporations are to:

- Estimate the efficiency of the corporations and depots and suggest measures for promoting efficiency.
- Conduct comparative analysis of KSRTC, NWKRTC and NEKRTC across all types of services and terrains.
- Examine existing pricing policy (fare structure) of the corporations for all types of services and terrains and suggest effective pricing policy.
- Perform supply-demand analysis considering both public and private service providers across all types of services and terrains.
- Study the modern technological developments, best and sustainable practices (including e-mobility) in road transport from national and state experiences and suggest its relevance for Karnataka.
- Evaluate impact of COVID-19 on functioning of corporations in general, on operational modalities and financial status of the corporations and contract workers and hiring services.
- Review existing policies of the organizations and hurdles in flexibility of operations indicative information on indicators.

To address those objectives, this study has adopted a mixed-method approach based on the DAC framework (relevance, effectiveness, efficiency, impact, and sustainability). The primary quantitative survey was conducted among the RTC bus users and private bus users. RTC users include the public that utilise various services within each depot/division/corporation such as interstate, intrastate, A/C, night service, sub-urban, rural

buses etc., and the non-RTC users were interviewed in selected depots. The sample size of the RTC users and non-RTC users were 1440 and 189, respectively. Overall, 1629 samples were interviewed in 12 divisions (six divisions in KSRTC, three divisions in NWKRTC, KKRTC); 36 depots were identified based on their financial performance across all three transport corporations in Karnataka. For qualitative data collection, we adopted the Key Informant interviews (KIIs) and Focus Group Discussions (FGDs) with stakeholders at different levels. The analysis of the data included estimation of the efficiency, consumer satisfaction, pricing, Data Envelopment Analysis (DEA) along with basic statistical analysis. We estimated the corporations' and divisions' efficiency using three broad categories viz., managerial aspects, operational aspects, and service delivery to the end-users. DEA-AHP was adopted to estimate the unique weights for each depot based on the performance on broad indicators. DEA was used for both the primary and secondary data collected in the division, and corporations. Some of the key findings from the primary and secondary data analysis were underlined below:

Some major findings

❖ Based on the physical data analysis, the KSRTC has the highest number of passengers carried (10.53 lakh), NWKRTC has a higher number of passengers carried per bus per day (488), with KSRTC at 375 and KKRTC at 338. This is primarily because NWKRTC has a relatively smaller fleet and higher ridership compared with other corporations.

❖ All corporations show a declining trend for fleet utilisation, with the values in 2019-20 being 91% for NWKRTC, 90% for KSRTC, and 85% for KKRTC. With large fleet sizes, Bagalkot (96.4%) and Belgavi (94.02%) show high levels of fleet utilisation.

❖ There is an overall slight increasing trend when it comes to Scheduled and Effective kilometres for KSRTC and KKRTC, while the value drops slightly for NWKRTC.

❖ For KSRTC the evaluation average for Fuel Efficiency is the lowest at 4.84 KMPL, over 0.3 KMPL less than the other two corporations, that have efficiencies of 5.14 KMPL (KKRTC) and 5.19 KMPL (NWKRTC) respectively.

❖ Based on the financial analysis, it was observed that the depreciation fund is utilized only for the replacement of operating assets and the purchase of new buses by all three corporations.

❖ CPKM should be arrived at year-wise for a five-year period, projecting the expenses, factoring inflation and increase in employee expenses. The share of non-traffic revenue should be deducted from the EPKM. Ideally non-traffic revenue should constitute about 30% of the total revenue

❖ Based on the Data Envelopment Analysis (DEA), all 33 divisions in the model are actually efficient in at least one functional head (Manpower, Traffic Revenue, Expenses, Maintenance, Road Safety, Vehicle operation) with all but 6 divisions having an OE value > 0.9. Some divisions, like Mysuru Urban and Hubballi are at 21st and 29th ranks respectively

❖ Based on the quantitative data, the KSRTC, the passenger highly preferred to use ordinary (9%) buses followed by express (24%) and semi sleeper (45%). In NWKRTC, within intra state services, the express (55.3%) services were preferred by the passenger followed by ordinary services (16.1%). In KKRTC, nearly 45% of the passengers used sleeper services and 19.2% of the passengers used express services.

❖ With more than 60% of passengers reporting satisfaction on most components, passenger satisfaction for NWKRTC. However, 34% of passengers for this corporation also reported that the driving quality of bus drivers was very good. A high proportion (78%) of passenger's found the current grievance redressal system in place to be good.

Key Recommendations

The recommendations are structured around key themes of the evaluation viz. at the level of operational, financial, service delivery. **Please refer to section 14 for a detailed discussion on the recommendations**.

Enhancement of Operational Efficiency	Enhancement of Financial Efficiency	Enhancement of Service Delivery

• Digitizing the depot level route maps and integrate with corporation level.
• Corporation may look for Incentivize people to increase their utilization of public transport
• Incentivize people to increase their utilization of public transport for private players
• Corporation may be incentivised to reach the Fuel Efficiency.
• Creating the separate division operates only luxury buses by merging all corporations.
• Setting up of a common MIS database.
• Adopt ITS system to provide real time updates to passengers.
• Establish better inventory level management practice.
	• Enhancement of Revenue through increase in fares.
	• Work out the compensation from government on
	   ○ Diesel price increase
	   ○ Operation of unviable routes
	• Capital infusion by the government for sustainable operations.
	• Identification of assets that can be monetized
	• Government shall explore Direct Benefit Transfers (DBT) to the passengers who are provided with concessions.
	• Ensure depreciation fund utilised only for replacement of operation asset and purchase of new buses.
		• Conduct regular demand assessment by providing training to depot managers and traffic managers.
		• Extend the COVID19 safety measure to sub-urban and rural buses.
		• Unutilised land may be converted for commercial purposes.

1. BACKGROUND

The social, economic and cultural progress of a nation largely depends on the transportation system. A well-managed transport system acts as a catalyst of economic transformation. If the wheels take rest, the manufacturing, merchandising, banking and other businesses come to a standstill. Along with socio-economic transformation, cultural transformation also halts. W.E. Ogburn states that transport is the de facto barometer of economic, social and commercial progress and has transformed the entire world into one organized unit. It carries ideas of inventions to the people and has considerably contributed to the evolution of civilization (Shinde, 2008). The availability of a widespread passenger transport network that is safe and comfortable is an important index of the economic development of any country.

International and domestic transport networks are ever-growing, connected through multiple avenues; the primary ones being air, rail, road and water, as permitted by geography. Of these, road transport is vital to economic development, trade, and social integration, which rely on the conveyance of both people and goods. Public transport systems and their users have grown many-fold in railway and bus travel, but the latter accounts for a sizable share of human traffic, carrying more than 90 per cent of the public transport in Indian cities (Pucher et. al. 2004). This is also a consequence of the fact that certain Indian cities have no rail transport at all, and instead rely on a combination of all other sources – buses, minivans, autorickshaws, cycle rickshaws and taxis. Easy accessibility, flexibility of operations, door-to-door service and reliability have earned road transport an increasingly higher share of both passenger and freight traffic vis-a-vis other transport modes. India has the second largest road network in the world, at 58.98 lakh km as of 2017, with the total length growing nearly 15-fold from 3.99 lakh km in 1951, at a Compound Annual Growth Rate (CAGR) of 4.2% (MoRTH, 2019). Rural road networks have grown at a very high rate, as compared to all other roadway types - National Highways, State Highways and District Roads, Urban Roads, Project Roads (ibid). Road mobility in India has risen from around 3400 billion passenger-km in 2004-05 to over 8000 billion passenger-km in 2012-13 and was touching 11000 billion back in 2016 (TIFAC, 2016).

An effective bus-based road transport system contributes to the socio-economic development of the country given its affordable reach to the interior locations. In fact, the public transport sector is one of the largest contributors to the GDP, being a major revenue source to the government in the form of various taxes such as road tax, motor vehicle tax (varying from state-to-state for private operators), Passenger tax, GST, Toll etc (Patwardhan, 2020). The robust bus connectivity and the planned structure makes it one of the most favourable modes of transport in both cities and rural areas. The road transport system also generates huge employment opportunities given the large cost in construction and maintenance of the roads and the system. In addition, bus transport makes the most optimum use of the available road space and fossil fuel by transporting the maximum number of people per unit of road space and passenger km/litre. In terms of per passenger kilometre, it is estimated that on average, a car consumes nearly 6 times more energy than an average bus, while two wheelers consume

about 2.5 times and three wheelers 4.7 times more energy (Report of Working Group on Road Transport for the 12th Five Year Plan).

Bus services in India are provided by both Private Bus Operators (PBOs) as well as publicly owned State Road Transport Undertakings (SRTUs)/ Corporations). SRTUs are bus-based public transport undertakings set up under the Road Transport Corporation Act, 1950. There are altogether 54 SRTUs comprising 24 State Road Transport Corporations (SRTCs), 12 Companies, 8 Government Departmental Undertakings and 10 Municipal Undertakings. These provide passenger transport services for rural, inter-city and urban areas. They are the dominant players in the bus-based public transport system in most States and Union Territories, in terms of both coverage and patronage (MoRTH, 2017). These SRTUs cover substantial ground each year, performing 148 crore passenger-kilometres per day and carried over 6.8 crore passengers per day on average, during the FY 2015-16[1].

The public bus transport systems in India, however, have not been able to keep pace with the very rapid and substantial increase in demand of the past few years. STUs' service quality in particular has deteriorated, and their market share has been further reduced as passengers have turned towards personalized transport and intermediate public transport (Padam and Singh, 2004). It is well known that the objectives of STUs are to provide adequate, economical and efficient transport services, following, of course, business principles in their operations (Singh, 2014). However, STUs' financial performance has not been very encouraging. Apart from public criticism of inadequate and irregular services provided under unhealthy conditions of overcrowding and with minimal passenger comforts and amenities, STUs' financial performance has also been extremely poor and deteriorating over the years (Raghav and Singh, 2014). In their existence of nearly seven decades, the STUs together, recorded their deepest loss of over Rs. 9,500 crores during 2014-15. Every bus-km operated by the STUs results in a loss of around Rs. 6.50. Only two STUs, UPSRTC and OSRTC, could make a profit of Rs. 4 crore and Rs. 5 crore respectively during the year 2014-15. Across the country, every mofussil bus-km incurred a loss of nearly Rs. 3.66, while every urban bus-km resulted in a loss of Rs. 30.25. (Singh, 2017). When it comes to the expenditure side, the operating and capital investment costs for STUs (State Transport Undertakings) are covered by a combination of state and local government subsidies, grants, and loans that vary from state to state (Pucher et al, 2004). Significantly, there is no dedicated tax whose proceeds would be automatically earmarked for public transport. With the background on the transport sectors in India, the Karnataka transport corporations were one among the leading performers in the Indian state transport corporation.

Given the crucial role of the RTCs in the city's transportation and the challenges faced by the corporations, the study aims to evaluate their organisational, financial, managerial performance and service delivery over the period 2014-15 to 2019-20.

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[1] 47 of the 54 SRTUs reported data as part of the MoRTH report and were included in this calculation.

a. Description of Karnataka Transport Corporation

The transport corporations are a vital player to connect the remote villages to nearby towns and state capitals. The State Road Transport Corporations, operated by the Road Transport Corporations Act 1950, emerged as premier transportation companies. In Karnataka, the State Road Transport Corporation was divided into four corporations, namely, (i) Karnataka State Road Transport Corporation (KSRTC), (ii) Northwestern Karnataka Road Transport Corporation (NWKRTC), (iii) Kalyana Karnataka Road Transport Corporation (KKRTC) and (IV) Bangalore Metropolitan Transport Corporation (BMTC). The boundaries for the corporation were presented in figure 1. The present evaluation study is limited to the first three corporations. Organisational structure, geographical spread and other critical statistics about the corporations were discussed below:
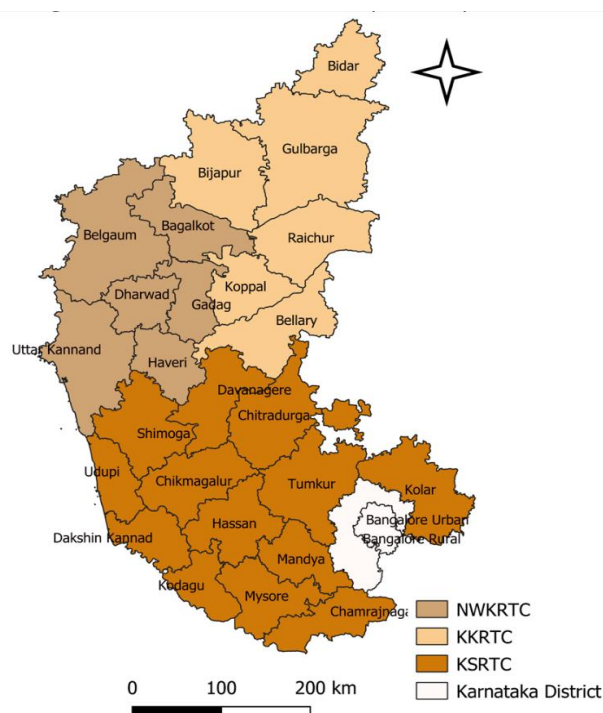
Figure 1: Karnataka State Transport corporation boundaries

i. Karnataka State Road Transport Corporation (KSRTC)

The **Karnataka State Road Transport Corporation (KSRTC)** was established in 1961 with the aim to provide efficient, adequate, economic, and well-coordinated transport services to the commuters of the State with its head office at Bangalore. Along with the rapid progress of Karnataka in all spheres of activity, KSRTC has emerged as one of the foremost organizations in meeting the aspirations of Kannadigas and the people of neighbouring states of Karnataka. Some years into its functioning, the State Government decided to divide the Corporation into four separate corporations based on geographical location to fulfil the diverse needs of commuters through effective and efficient control. Hence, over a period of 4 years between 1997 and 2000, the Karnataka State Road Transport Corporation was split into the Bangalore Metropolitan Transport Corporation (BMTC), North Western Karnataka Road

Transport Corporation (NWKRTC) and North Eastern Karnataka Road Corporation (NEKRTC). The KSRTC remained as an independent Corporation catering to the needs of the remaining 17 southern districts.

As of 2021, the KSRTC operated its services in 16 operating Divisions. 83 Depots, 2 Regional Workshops and a Central Office at Bangalore. There were 281 permanent and 11 temporary bus stations with 337 wayside shelters and 1009 pick-up shelters. The total number of employees deployed was 36280 and the staff ratio per schedule was 6.22. The total number of routes operated was 13273 with 9493 schedules, route length of 9.49 lakh Kms. and average daily scheduled kms of 19.84 lakh kms. The total number of inter-state routes operated by the Corporation on a reciprocal basis with the neighbouring states were 602 i.e., 282 in Maharashtra, 37 in Goa, 223 in Andhra Pradesh, 33 in Tamil Nadu and 27 in Kerala. The total number of vehicles held was 10476 with average vehicle utilization of 299.6Kms. The average number of passengers carried per day was 57.82 lakh. The rate of breakdown per 10000 kms was 0.02 and the rate of accident per lakh kms was 0.10 during 2018-19. The total capital expenditure incurred by the Corporation during the year 2018-19 for its developmental activities was Rs.22748.49 lakhs as against the proposed amount of Rs.33568.80 lakhs as per the revised budget estimates. 391 new bus bodies were built during the year 2018-19. During the year 2018-19, the Corporation has incurred a loss of Rs.13493.15 lakhs as against a profit of Rs.450.01 lakhs during 2017-18 (Refer Table 1)

ii. **North-western Karnataka Road Transport Corporation (NWKRTC)**

The **North-western Karnataka Road Transport Corporation (NWKRTC)** was established in the year 1997, under provision of the Road Transport Corporation Act 1950. The Corporation jurisdiction covers the Belgavi, Dharwad, North Canara, Bagalkot, Gadag & Haveri districts. NWKRTC operates its services to all villages, which have motorable roads in its jurisdiction and also covering intra and inter-state operations. The entire jurisdiction of the corporation is the nationalised sector. The corporate office of NWKRTC is situated at Hubballi, under which eight division headquarters situated at Belgavi, Hubballi, Sirsi, Bagalkot, Gadag, Chikodi, Haveri and Dharwad and 48 Depots are functioning under the administrative control of respective divisions and one Regional workshop at Hubballi having one bus body building unit, one Regional Training Institute at Hubballi. The corporation has a total of 4031 schedules across the 7 divisions. The corporation has a total of 21009 employees as on 2012 (refer to Table 1).

iii. **Kalyana Karnataka Road Transport Corporation (KKRTC)**

The **North East Karnataka Road Transport Corporation (NEKRTC)** was established in the year 2000 at Kalaburagi, to cater to the north eastern districts of Karnataka. The NEKRTC was renamed as **"Kalyana Karnataka Road Transport Corporation (KKRTC)"** by the State Government on 06 July 2021. The Corporation had 6 divisions, 26 Depots 74 bus stations, 82 wayside shelters, 26 city shelters and 2027 vehicles at the time of establishment. It was operated with 10,005 employees initially and 7.88 lakh passengers were carried per day. The organization has grown tremendously since then. Currently (as on 2019-2020) the Corporation with headquarters at Kalaburagi, has 9 divisions, 53 depots, 152 bus

stops, 971 Wayside Shelters and 160 City-Transport Shelters, Regional Workshop at Yadgiri, Regional Training Centre at Humanabad, Driver's Training Centre at Hagaribommanahalli, Civil Engineering divisions at Kalaburagi and Ballari. The Corporation currently has 20574 employees and operates 4254 schedules with 4700 vehicles 13.87 lakh km per day carrying 13.58 lakh passengers (Refer Table 1). Inter-State services are being run for Maharashtra 434, Telangana 236, Andhra Pradesh 139, Tamil Nadu 2 and for Goa state 40. The rate of breakdown per 10000 kms was 0.10 as per 2011-12 and the rate of accident per lakh kms was 0.12.

Table 1: Overall comparison statistics of the three corporations

Factors	KSRTC	NEKRTC	NWKRTC
Managerial			
No. of Directors	6	8	7
Divisions covered	17	9	9
Depots covered	84	52	51
Permanent bus stations	166	149	158
Size of workforce (no. of employees)	38880	20574	23171
Operational			
Fleet size at the end of the year	8695	4835	5013
Avg. Effective kms operated/day (in lakhs)	29.04	13.83	16.14
Avg. passengers carried/day (in lakhs)	30.12	13.52	22.46
Fleet Utilisation (in %)	92.1	90.5	94.4
Avg. vehicle utilisation (in km)	361	340	343
Routes operated at the end of the year (no.)	5495	4159	4067
Route length at the end of the year (in lakhs)	95.82	3.98	3.62
Earnings per kilometre – EPKM (in paise)	2954.8	2955	2826.7
Daily Traffic revenue (in Rs. lakhs)	858	417.83	456.16
Service Level (% of villages covered in jurisdiction)	78% (16181/20792)	92% (3859/4203)	98% (4519/4609)
Breakdown rate (per 10000 km)	0.02	0.04	0.03
Accident rate (per 100000 km)	0.10	0.06	0.07
Public Complains (/ lakh passengers)	0.87	0.09	0.03
Financial			

Total Receipts	3724.35	1635.45	2027.60
Operating Expenses in Crore	3597.16	1189.90	1998.47
Non-Operating Expenses in Crore	86.77	404.72	37.43
Taxes (Passenger tax, motor vehicle tax, other taxes)	166.83	74.13	80.77
Profit (+)/Loss (-) in Crore	-134.93	-33.30	-89.07

Sources: Economic Survey of Karnataka 2019-20 & Administrative Reports of KSRTC, NWKRTC, NEKRTC for the year 2018-19

2. LITERATURE REVIEW

A thorough literature review was conducted to understand the nuances which go into the evaluation study of this sort. The following sections will elaborate on the general challenges faced by STUs, evaluations previously conducted in Karnataka and evaluations conducted in other states across India.

a. Issues faced by State Transport Undertakings (STUs)

Public bus transport systems in India have not been able to keep pace with the very rapid and substantial increase in demand of the past few years. STUs' service quality in particular has deteriorated, and their market share has been further reduced as passengers have turned towards personalized transport and intermediate public transport (Padam and Singh, 2004).

It is well known that the objectives of STUs are to provide adequate, economical and efficient transport services, following, of course, business principles in their operations (Singh, 2014). However, STUs' financial performance has not been very encouraging. Apart from public criticism of inadequate and irregular services provided under unhealthy conditions of overcrowding and with minimal passenger comforts and amenities, STUs' financial performance has also been extremely poor and deteriorating over the years (Raghav and Singh, 2014). In their existence of nearly seven decades, the STUs together recorded their deepest loss of over Rs. 9,500 crores during 2014-15. Every bus-km operated by the STUs results in a loss of around Rs. 6.50. Only two STUs, UPSRTC and OSRTC, could make a profit of Rs. 4 crore and Rs. 5 crore respectively during the year 2014-15. Across the country, every mofussil bus-km incurred a loss of nearly Rs. 3.66, while every urban bus-km resulted in a loss of Rs. 30.25. (Singh, 2017).

The issues with financing can be traced back to both the revenue and the expenditure associated with STUs. The overall cost recovery level of STUs was also only 83% during 2014-15. There is a wide gap between total revenue and total cost, particularly, in urban region STUs. Rural STUs recovered 89% of their total cost, hilly region STUs recovered 92% of their total cost, but urban STUs could recover only 61% of their total cost. The cost of personnel in STUs is close to 42% of the total cost, though it is more than 47% of the total cost in urban STUs. It is alarming to note that 78% of the revenue goes only on personnel cost in urban STUs, 46% in rural STUs while it is only 43% in case of hill-region STUs (Singh, 2017).

When it comes to the expenditure side, the operating and capital investment costs for STUs (State Transport Undertakings) are covered by a combination of state and local government subsidies, grants, and loans that vary from state to state (Pucher et al, 2004). Significantly, no government level has any dedicated taxes whose proceeds would be automatically earmarked for public transport. In fact, the public transport sector is one of the largest contributors to the GDP, being a major revenue source to the government in the form of various taxes such as road tax, motor vehicle tax (varying from state-to-state for private operators), Passenger tax, GST, Toll etc (Patwardhan, 2020). This is in contrast with actions taken by the rest of the

world, where public transport is often subsidised to offset the gap between costs and revenues. Tax exemptions and rebates form an important part of this subsidy. It has been estimated that taxes contribute to nearly 20% of an STU's operating cost, resulting in both the depletion of capital available for service improvement as well as the pushing up of fares by the corporations to make ends meet (Mukherjee, 2017). In both outcomes, unfortunately, the consumer is the one who loses.

The financial crisis in STUs may be attributed as a result of excessive government control. Generally, public transport services work most efficiently with minimum government control. In particular, the freedom to set fares in response to market forces is more likely to mean that supply and demand balance each other. In addition, the freedom to determine the routes, size of vehicles, and frequency of services, particularly where competition exists enhances the likelihood of economic viability and public satisfaction (Singh and Raghav, 2013).

The problems already faced by STUs are further compounded by the ongoing COVID-19 crisis. Increased risks associated with crowded places combined with social distancing measures in public and shared transport are likely to affect modal choices of commuters. In an online survey conducted to elicit the perceptions of respondents related to work trips, pre and post COVID-19, about 35 percent of respondents stated that they are likely to change their mode of transport for work trips post COVID-19 (TERI, 2020). A sharp decrease has been reported in the usage of bus and metro services, and instances of shared mobility have dropped as well. This is expected to shift to the use of private vehicles and intermediate public transport (IPT) such as taxis and auto rickshaws (ibid).

b. Evaluations conducted in Karnataka

There are a number of evaluations that have been conducted in Karnataka, both by government bodies and as part of research studies conducted by various organisations.

A 2014 evaluation conducted by Institute of Public Enterprise, Hyderabad focusing only on the NEKRTC and its performance since inception up until the period of publishing, found that there were a lot of gaps to be filled in terms of the operations and finances of the branch. The corporation had been losing a lot of revenue due to a low occupancy ratio, pertaining to rural areas as a result of the frequency of bus timings, bad road and seasonal effects. The fleet utilisation showed a declining trend, while the number of dead kilometres rose continuously over the years, indicating rising cancellations and/or poor maintenance. The staff/bus ratio was also much higher than any other SRTC, indicating a lack of productivity in operation. Many passengers and officials had declared that there were issues related to the quality of service and scheduling in different seasons, which were not meeting the full demand on the ground. The corporation was paying around 35 to 45% of their total expenses incurred per kilometre rate for the fuel price, and around the same amount for staff costs. It was also observed that the corporation was incurring rising expenditure towards the payment of interest on the borrowed funds either from the commercial banks or any financial institutions. There was also a need to build confidence in passengers, by spreading awareness about the frequencies of the buses availability at the important locations. In addition, the frequency of the buses was to be enhanced at peak hours depending on the directions of path flow so that

revenue may be increased. On the positive end, the corporation performed well in terms of vehicle utilisation, with an increase from 324 in 2001-02 to 339 in 2012-13. In comparison to other corporations from the south (NWKRTC, KSRTC, Andhra Pradesh State Road Transport Corporation), the fuel efficiency results were also satisfactory.

A separate study was conducted on the financial performance of NEKRTC over a period of 10 years starting from 2005-06. The researchers observed that while the gross revenue of the corporation showed an increasing trend multiplying five-fold in 10 years (from 395 crore to 1459 crore), there was a considerable gap between the cost per kilometre (CPKM) and the earning per kilometre (EPKM), on which the health of the STU was assessed. For the entire study period, the corporation incurred losses in every financial year, due to higher CPKM over EPKM with the margin per kilometre ranging from Rs. -5.6 to Rs. – 1.8 in that span. Furthermore, there was no support funding from the State Government to the SRTC for its increasing expenditures, leaving the survival of the corporation completely dependent on the traffic revenue and other miscellaneous revenue from its operations.

The Ministry of Road Transport and Highways (MoRTH) conducted a review of the SRTUs, the latest edition being carried out for the 2015-16 FY. A quick breakdown of the performance of each of the Karnataka corporations is given in the table below, along with the relative change to the statistics recorded in 2011-12.

Table 2: Comparative Analysis of Karnataka Corporations: 2011-12 vs 2015-16

The data format here is: 2015-16 Value, (% change from 2011-12 to 2015-16), Rank Held (No. change from 2011-12 to 2015-16)			
Indicator	**KSRTC**	**NEKRTC**	**NWKRTC**
Average Fleet Held (No.)	8172 (7%), 5 (0)	4447 (11%), 12 (0)	4736 (13%), 9 (2)
Average Age of Fleet (Years)	4.94 (24%), 36 (-3)	6.12 (21%), 25 (0)	6.55 (13%), 19 (-3)
Staff Strength (No.)	37129 (2%), 6 (0)	20341 (9%), 15 (0)	23586 (12%), 12 (2)
Fuel Efficiency (km/litre of HSD)	4.83 (-1%), 15 (-2)	5.15 (-3%), 12 (-6)	5.18 (2%), 10 (-2)
Passenger kms performed (lakhs)	343937 (-2%), 5 (-1)	158481 (3%), 15 (-1)	178564 (18%), 13 (2)
Passengers carried (lakhs)	10104 (14%), 10 (2)	4923 (4%), 18 (0)	8272 (8%), 13 (2)
Total Revenue (Rs. Lakh)	317724 (37%), 5 (0)	150125 (53%), 13 (2)	173380 (50%), 9 (2)
Total Cost (Rs. Lakh)	312629 (36%), 6 (0)	152317 (53%), 18 (-1)	177258 (50%), 16 (-1)
Net Profit/Loss (Rs. Lakh)	5095 (162%), 1 (2)	-2192 (21%), 18 (-8)	-3878 (65%), 20 (-7)

Source: Review OF Performance of SRTC Undertakings 2015-16, Ministry of Road Transport and Highways (MoRTH)

It is important to note here that the final three columns related to financing are prone to a lot of fluctuation from year to year, especially in the case of KSRTC. The RTC recorded a net profit of 1,941 lakh rupees in 2011-12 and in 2013-14, a loss of 7,554 lakh rupees. As we can see in 2015-16, this again increased to a profit of 5,095 lakh rupees. It was also interesting to note that during 2015-16, while there were seven profit-making SRTUs after paying tax, there were 13 SRTUs that made profit before paying taxes.

A paper published by Kumar et al in 2020 conducted an evaluation of the efficiency of the public transportations systems in India, focussing specifically on SRTCs as subjects of the study. Utilising the MoRTH data for 2015-16 as well as expert inputs to decide relative weights of indicators, an efficiency index was created to assess the relative performance of states (for the year 2015-16) as well as the improvement from the previous year for individual states. Based on the efficiency scores, RTCs were classified into very good, good, average, modest and poor performers respectively.

For the year 2014-15, KSRTC was classified among the average performers, while both NWKRTC and NEKRTC fell in the modest performer category. The corporations of Thane, Navi Mumbai, Odisha and Chandigarh were considered to be very good performers. At the other end, RTCs of Gujarat, Telangana and South Bengal were classified among the poor performers. In 2015-16, all corporations in Karnataka dropped into lower tiers, with the KSRTC falling into modest performers, while the NEKRTC and NWKRTC fell to poor performance levels. At the top, the 4 very good performers from 2015-16 were joined by two new RTCs in the form of Ahmedabad and Andaman & Nicobar. Among the poor performers, the two northern Karnataka corporations along with Andhra Pradesh and Mizoram, joined Gujarat and Telangana at the bottom, while the South Bengal STC moved into the modest performer category. In terms of disaggregated efficiency across the 6 categories – Accident, Traffic Revenue, Expenses, Vehicle operations, Manpower and Maintenance, 4 corporations remained efficient in 5 categories, namely Thane, Navi Mumbai, TN STC (Kumbakonam) and Chandigarh. No corporation achieved efficiency under all heads.

In terms of rankings, the KSRTC dropped 8 spots from 26 to 34 across the two years. Both NEKTRC and the NWKRTC were already at relatively lower ranks and fell 4 spots (to 42) and 3 spots (to 39) respectively. Upon measuring the change in productivity over the two years, all corporations had increased in productivity levels in 2015-16, albeit by different quantities, as we saw rankings shuffle considerably across transport corporations. Some big climbers in this duration were Ahmedabad (17 spots up to 3rd), Pune Mahamandal (15 spots up to 18th), North Bengal STC (12 spots up to 15th), Meghalaya (11 spots up to 8th) and South Bengal STC (11 spots up to 31st). In the other direction, Rajasthan dropped 12 places to 36, Haryana dropped 9 places to 19th and Calcutta dropped 9 places to 16th.

In 2017, KMPG conducted the research on strategic evaluation of PSE's and road map for the optimization of operational efficiency. The evaluation includes PSEs of Karnataka State government and statutory corporations. The evaluation was conducted to investigate the operational efficiency of the PSEs in Karnataka. The study concludes, with the degree of priority to address the current scenario was ineffective governance, lack of financial

autonomy, legacy systems affecting performance, lack of transparency in operation, political interference, Bureaucracy, lack of right talent, lack of continuous learning. It concluded with various recommendations for governance, human resource, operation, research and development, administration, finance and strategy.

c. **Evaluations conducted in other states in India**

Some other state specific evaluations were also reviewed as part of the literature study. In order to assess the efficiency of the public transport system in Bhopal, four different surveys on Volume, Origin Destination, Occupation and Public Opinion, were conducted in the state of Madhya Pradesh in 2011. The survey found that the reasons for not using public transport were mainly due to poor accessibility (11%), lack of comfort (25%), less frequency between trips (10%), more waiting time (12%), more travel time (13%) compared to owned vehicle and no feeder services (11%). Among the recommendations, it was advised to subsidize public transport, optimize bus services and improve organisation of the public transport system.

A study in Lucknow was conducted where passengers were surveyed in 2014 to understand satisfaction with the public transport services in the city. It was found that respondents were mostly dissatisfied with the transport services provided in the city. A Principal Component Analysis (PCA) of the responses revealed that comfort and safety during travel were among the top concerns of passengers, followed by adequate availability of public transport services across the city. The maintenance and cleanliness of the facilities and vehicles were also of high importance to passengers.

In Tamil Nadu, a study was conducted to assess the efficiency of the public transport in 8 districts in 2014-15. It was found that only 2 of the 8 district corporations were considered to be efficient, while the remaining would require some adjustment in their input/output mix to reach optimum efficiency.

In Kerala, the operational and financial parameters of the corporation were reviewed, along with a comparative analysis of the efficiency of 28 depots in the state, over a period of three years (2015-18). From the analysis, only 2 (Trivandrum City and Trivandrum Central) of the 28 depots were found to be working efficiently every year with an average efficiency score of 1 (maximum), while Ernakulam was the most inefficient depot with an average efficiency score of 0.741. The overall mean technical efficiency of the depots was found to be 88.5%, indicating that on an average 11.5% of the technical potential of the depot is not in use.

d. **Modern Technological development, best and sustainable practices adopted by Transport corporation in India and other states**

In recent years, the transport industry has undergone tremendous development in terms of technology adoption, upgradation in luxury buses etc. According to the Institute of Urban Transport, 2013. The KKRTC worked towards to create attractive, user-friendly bus systems, modern buses were being procured that adhere to MoUD specifications and branded through select colour schemes for each city, advanced technology such as LED displays and GPS are being implemented, fares are being priced so as to be affordable and attractive, daily and

monthly passes are being introduced, and dozens of bus shelters. To achieve sustainability the adoption of technology would play a critical role and it benefited as follows.

- Profit per km is approximately Rs 11.
- Earnings per km is Rs 33 approx.
- Reduction of 1472 tonnes per year of CO_2.
- Reductions of NOX by 44,906 tonnes/annum and HC by 75,863 tonnes/annum

KSRTC introduced IT-based driving track (the system is based on digitally addressable, optical proximity sensors) with video surveillance for the selection of drivers and driver-cum conductors. First, a digital Body Mass Index measuring machine for capturing the height and weight of the candidate and a web camera to capture the photograph ensures fool-proof identification. The eligible candidate has to drive a bus through a rigid reverse S path, forward 8 paths, up gradient and reverse park. As a last test he has to match the traffic signal with the correct descriptive answer on a computer kiosk. The application then generates a result sheet, completing the efficient and reliable process. Later, the project was implemented by other STCs like NWKRTC, KKRTC and BMTC.

- An innovative method for automated selection inducing transparency
- Meritorious and skilled drivers selected for safety of passengers.
  Bangalore Metropolitan Bus transport corporation adapted to new technology, equipping its bus fleet with GPS, Intelligent Transport Systems (ITS), and Passenger Information Systems (PIS); has established several Traffic Transit Management Centres; and makes all essential information regarding passenger travel available online. BMTC has a bus fleet of 6476 vehicles and should continue to grow and improve with the city of Bangalore. It has implemented "Vajra," a new high quality airport direct service using Volvo buses, and "Atal Sarige," a special subsidized operation geared toward the city's urban poor. Due to the adoption of technology the BMTC has benefited as follows:

- Increased ridership by 19 % from 2008 to 2011, Reduction in accidents by 0.10 per lakh kms (2011-12).
- Increased per kilometer earnings by 31 % from 2008 to 2011.
- Financially self-sustaining system with surplus of Rs 676 crore in 2011.
- Transparency in management process.

3. EVALUATION PURPOSE, SCOPE AND OBJECTIVES OF THE STUDY

a. Evaluation Purpose

The main purpose of the evaluation of the three corporations is to examine the extent to which the corporations and their division & depot have met the efficiency in terms of operations, technology adoption and delivery of services which have resulted in increased competitiveness strength and the improved service delivery of the corporations for the period 2014-15 to 2019-20. The present study's key thrust is on the output, outcome (immediate and intermediate) and impact of the corporation on the three major broad components and the impact on users of various bus services. The study also evaluates three tiers of operations, i.e., corporation level, division level and depot level. This will provide necessary inputs to policymakers and the corporation head to enhance the efficiency of the services.

b. Evaluation Scope

The scope of the study covers the assessment of performance of the three corporations across all the divisions and districts in the State (except BMTC jurisdiction) during the period 2014-15 to 2019-20 covering interstate and mofussil services, long and short routes, rural and urban and night services and different types of bus services. We also compare the same with the private bus users in a sampled division and depot in respective corporations. This evaluation examines the extent the objectives of the corporations are achieved with respect to operational efficiency, technology adoption and delivery of services and suggest suitable measures to increase competitive strength and service delivery. The observations to enhance effectiveness and efficiency of operations along with maximum utilisation of technology across the corporation to serve the fellow citizen.

c. Evaluation Objective

The evaluation objectives were to:

- Estimate the efficiency of the corporations and depots and suggest measures for promoting efficiency.
- Conduct comparative analysis of KSRTC, NWKRTC and KKRTC across all types of services and terrains.
- Examine existing pricing policy (fare structure) of the corporations for all types of services and terrains and suggest effective pricing policy.
- Perform supply-demand analysis considering both public and private service providers across all types of services and terrains.
- Study the modern technological developments, best and sustainable practices (including e-mobility) in road transport from national and state experiences and suggest its relevance for Karnataka.
- Evaluate the impact of Covid-19 on functioning of corporations in general, on operational modalities and financial status of the corporations and contract workers and hiring services.

- Review existing policies of the organizations and hurdles in flexibility of operations indicative information on indicators.

  These main objectives were explored at a deeper level under the following five broad categories: Managerial Aspects, Operational Aspects, Financial Aspects, competitive strength, Labour Productivity and Welfare Measures, pricing, passenger satisfaction, safety & security and other issues.

Managerial Aspects
- The manpower planning strategies adopted at headquarters and district level offices and estimation of actual requirements of various staff.
- Demand-supply analysis of buses, depots, training institutes, bus stands and other facilities.
- The best and sustainable practices adopted by the corporations leading to better delivery of services including dispute settlement mechanism.
- Steps taken by the corporation for the development of professional competencies of the employees and to what extent these trainings have translated into efficiency of the staff.
- Review the existing policy for quality control in comparison with other such organization in the State and in other States.
- Review the annual business/action plan of the corporation, policy hurdles hindering flexibility of operations, procedures / guidelines and examine to what extent the corporation can achieve the set targets and identify the factors hindering the target achievement by the corporation.

Operational Aspects
- Services rendered in terms of regularity, maintenance of service quality and time schedule.
- Reasons for low occupancy rates and identify trends observed across types of services and terrains and suggest measures for its improvement.
- Implications of the competition by private transport and the initiatives taken to compete with the local private road transporters effectively.
- Factors influencing preparation of transport-time schedule, criteria for bus cancellation and additional bus for a particular location.
- Gross, effective, and dead kilometre operated by bus type vary across divisions. Identify the reasons for increase in dead kilometres and suggest measures for its reduction.
- Influence of technology upgradation like advanced automation -Intelligent Transport System (ITS) in improving performance and reducing accidents.
- Measures taken by the corporation for providing modern, safe, and affordable transport services while being financially viable.
- Operational indicators to be estimated using formulas.

Financial Aspects
- The capital structure of the corporation and different categories of revenue receipts earned by the corporation at divisional and depot level.
- Mapping the traffic revenue generated by route and bus type/service type across division and depots and suggest measures for higher revenue generation.
- Present and the future earning capacity, profitability, and solvency status of the organization.

- Ways to reduce the operating and non-operating expenditures and increase revenues considering changing costs and subsidies.
- Current pricing policy and suggest affordable pricing policy considering sustainability of the corporations.
- Financial indicators to be estimated.

Labour Productivity and welfare measure

- Nature of staff- permanent- contract- and hiring practices.
- Measures taken to increase labour productivity -Training and capacity building.
- Functioning of Labour unions in the corporations- Strikes and lock outs.
- Measures taken for the welfare of staff and other contract workers.
- Wages and working conditions.
- Gender issues- safety and security.
- Staff and management relations- Review of Committees.
- Impact of Covid-l9 on contract workers and hiring services.

Other Issues

- Comparative study of an efficiently performing organization from neighbouring states.
- Best and sustainable practices adopted in different organization including e-mobility.

With the above purpose, scope and objectives of the study, an extensive literature review was conducted to identify the quantifiable indicators on transportation components in-line with the Road transport corporation's objectives.

4. THEORY OF CHANGE

The output, outcome, and impact indicators are arrived at based on the literature review and the initial interaction with the staff of the three corporations and the Karnataka Evaluation Authority (KEA). It was developed based on the broad component (activities, intended output and outcome) of the transport corporations. The outputs are measurable, while outcomes may be perceivable in the immediate and intermediate outcomes during the evaluation period. The impacts are indicative and broad. The developed theory of change was tested in the field, and it was further refined based on the field observations and it was illustrated in Figure 2:
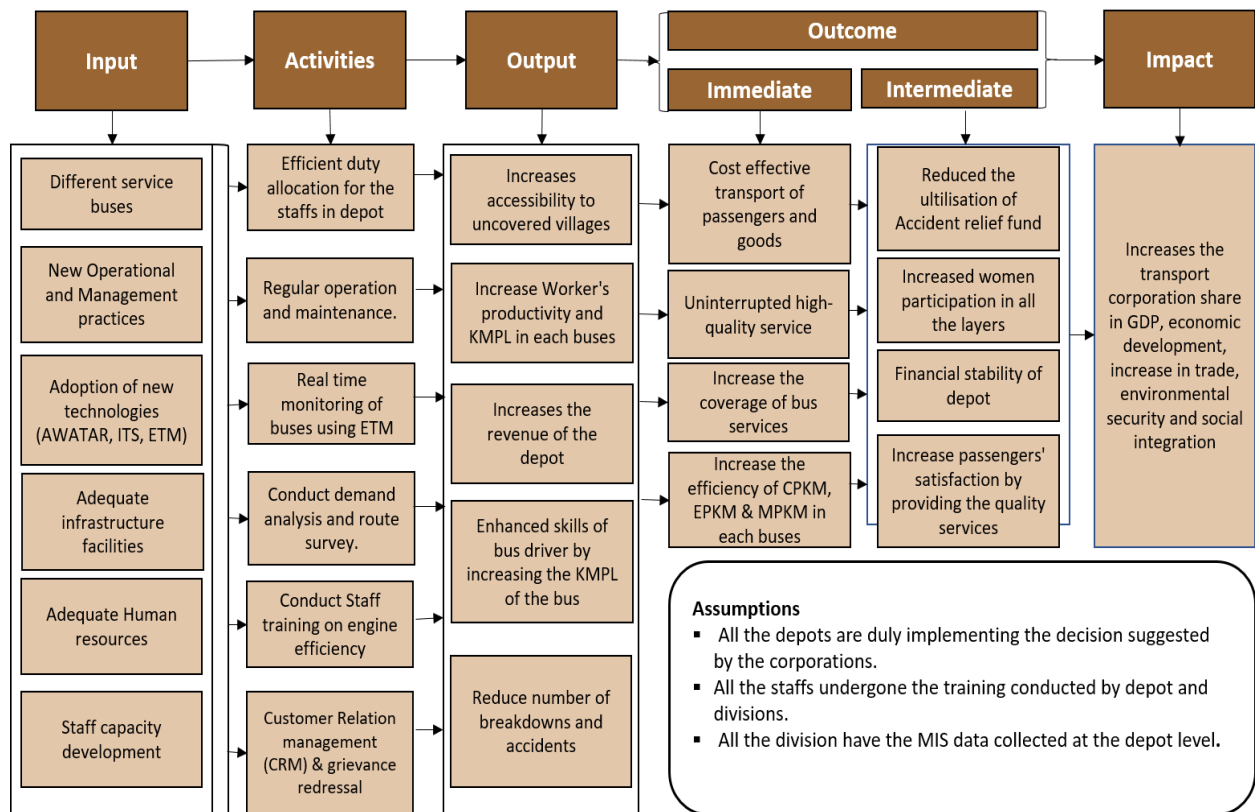
Figure 2: Theory of Change

Once the TOC was finalized, the detailed workflow for the project was developed on the basis of the TOR and its specific milestones. The workflow is illustrated in figure 3:
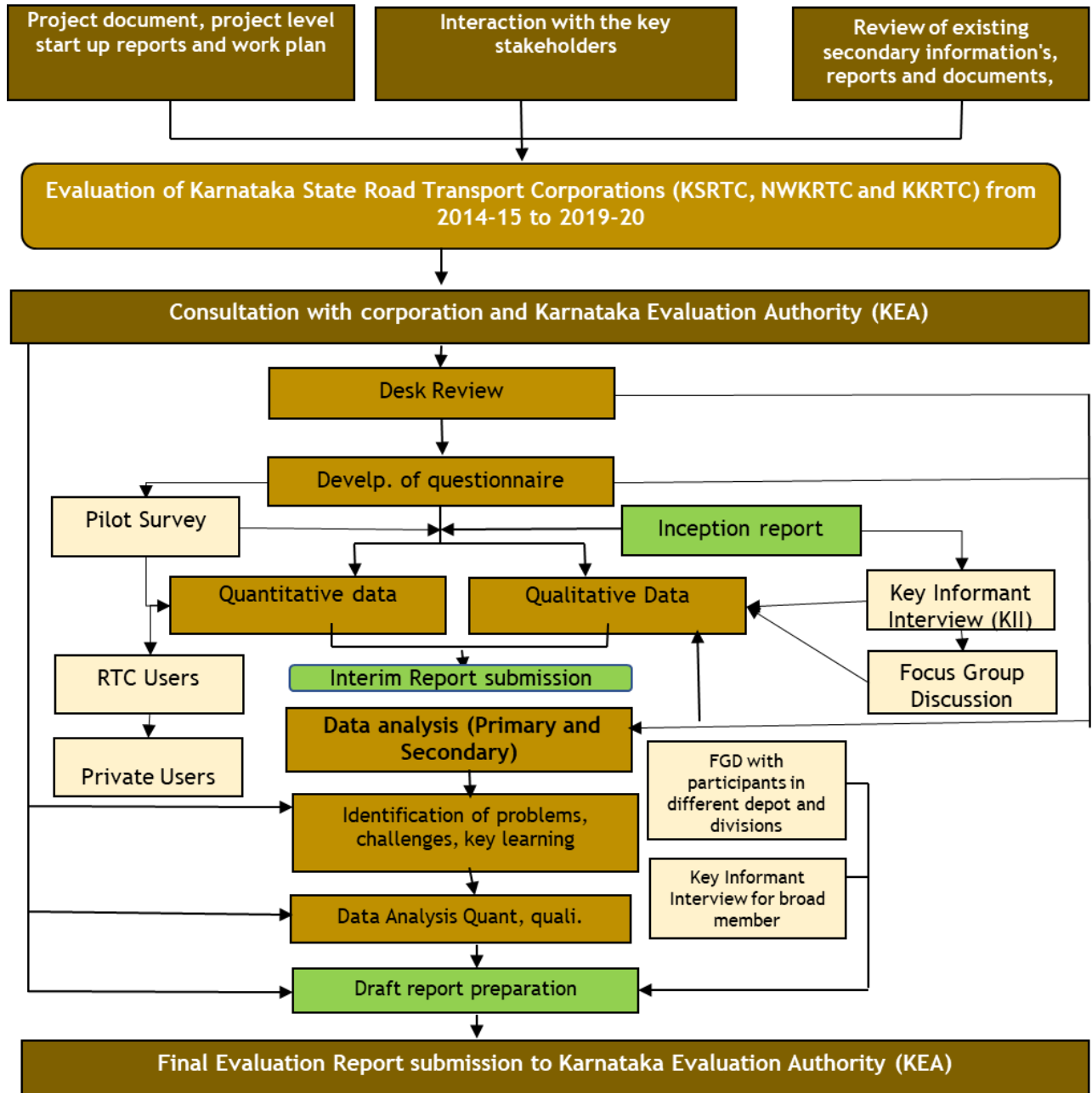
Figure 3: Schematic diagram of project management approach

5. EVALUATION FRAMEWORK

The framework was framed to evaluate various aspects of the three administrative layers of Road Transport Corporations i.e., depot, division, and Board, in terms of operational efficiency, technology adoption, managerial efficiency and delivery of services using DAC framework. The DAC framework was first laid down by 'Development Assistance Committee (DAC) to the Organisation for Economic Co-operation and Development (OECD)' in 1991 with the five evaluation criteria, relevance, effectiveness, efficiency, impact, sustainability, and equity. In recent years, one more criterion 'equity' was included by the researchers/ practitioner. The evaluation framework will look at various aspects of the corporations considering the following (Refer table 2):

Relevance: It refers to the overall consistency of the corporations towards its outcome and impact in alignment with the corporation's development strategy. This will include elements such as appropriate service to the region, suitability to targeted people by providing the good transport facilities.

Efficacy/ Effectiveness: It refers to the achievement of outcome, as compared against the goals/objectives set at the time of corporation board meetings. This will include aspects such as quality of inputs, performance against targets, infrastructural enhancement, technology adoption, etc.

Efficiency: It refers to comparing achieved outputs with inputs provided. This will include aspects such as performance of staff, use of fuel, bus operations, financial management etc.

Sustainability: This refers to the aspects of robustness of infrastructure and financial sustainability, continuation in the adoption of new technologies by the depot etc., and the likelihood that human and financial resources can support the achieved results in the long term.

Impact: It refers to the changes and effects due to the services provided to the public/passengers, both positive and negative, planned and unforeseen.

Equity: This refers to the engagement or involvement of different sub-groups including women in depot/divisional services.

Two principles were followed for better evaluation of the corporations: (i) Understanding the context in terms of stakeholder involvement, layers of corporations, specific activities/ thematic area needs to be evaluated for the respective corporation; (ii) Identifying the criteria that determine the purpose of RTC corporation's evaluation. This further helped to develop the sub evaluation questions for specific stakeholder.

The main components that were adopted to study during the study are presented in figure 4:
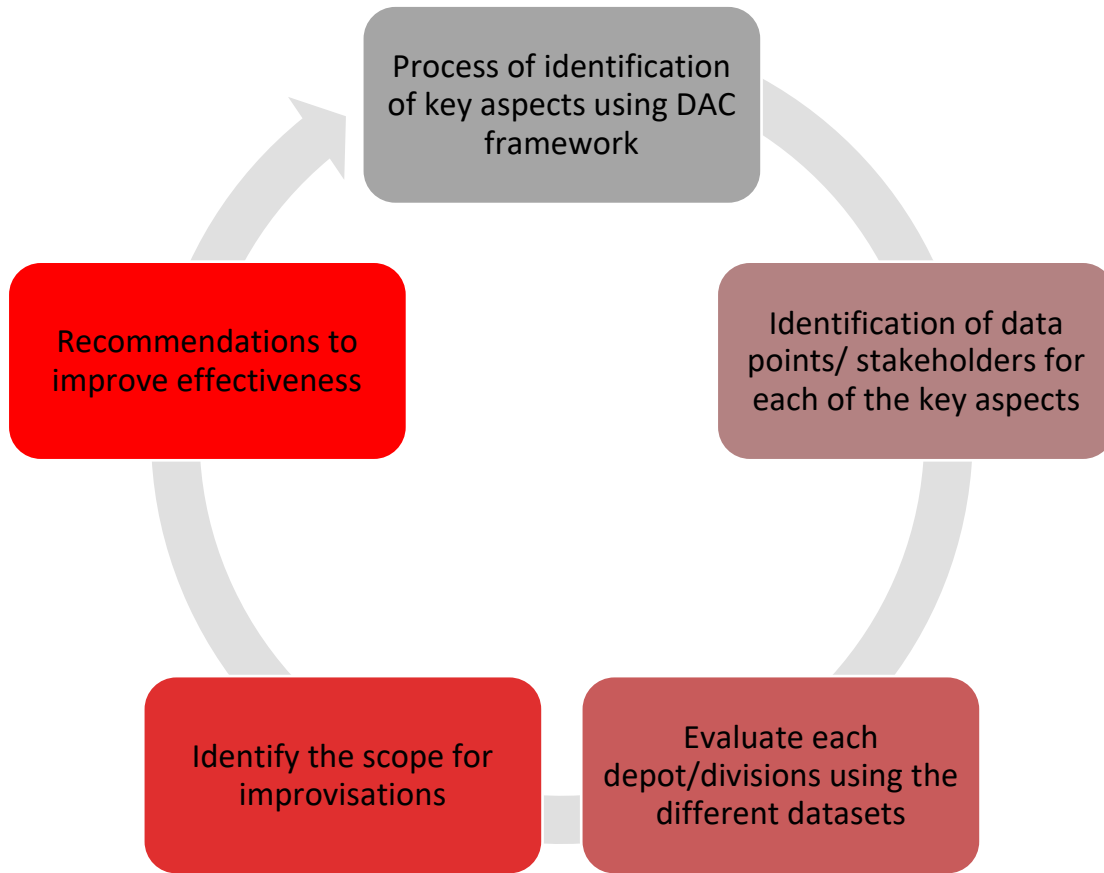
Figure 4: Components adopted during the study

With the broad understanding of theoretical background of DAC framework to evaluate the three corporations, the evaluation matrix was presented below:

Table 3: Evaluation matrix for RTC project

Evaluation Criteria	Key Evaluation question	Sub Evaluation questions	Indicators/KPI	Data Source	Data collection methods/ Analytical tools	Analytical method/ Analysis method
Relevance						
Organizational objectives & Actual requirements	Did the KSRTC, NWKRTC, KKRTC corporations have the basic infrastructure and vehicles to fulfil the public's transportation needs?	Did the corporation allocate the minimum of the bus across the division/ depot? Are the buses regularly maintained in the workshops?	*Number of technicians, engineers available in each workshop? *Number of workshops available at the division level? * Holding capacity of each workshop?	Secondary data, Primary data collection	KII, FGD and Primary data collection	DEA
		Did the corporations allocate the buses in all the services (Mofussil, Night bus, long-distance etc.) based on each division's demand?	* Percentage of buses different bus services in each division. * Number of buses covering long distance, night buses, night buses. * Number of users in each depot in terms of different terrains.	Secondary data, Primary data collection	FGD and Primary data collection	DEA
	Did the KSRTC, NWKRTC, KKRTC cover all the part of their division?	Does the corporation have adequate human resources?	* Number of employees (drivers, conductors), technicians, officials in each depot. * Number of skilled labourers in the depot. *Number of contract labourers	Secondary data, Primary data collection	KII and Primary data collection	DEA
		Are the technicians trained in the regular interval?	*Number of training conducted in each division. *Number of employees was	Secondary data, Primary data	FGD and Primary data collection	DEA

			attended and completed.	collection		
	What was different pricing structure followed by the KSRTC, NWKRTC, KKRTC corporations at the various bus services?	Did the KSRTC, NWKRTC, KKRTC generate surplus revenue at the depot level?	*Total revenue generated by each depot *Number of depots are less performance in terms of revenue generation	Secondary data	KII, FGD	DEA
		Are the users comfortable with the current pricing policy? Is there any need for revising the price slabs?	*% of passengers using he bedsheet, water bottle etc. while travel. *Pricing slabs of different division and different categories of routes	Secondary data	KII and Primary data collection	Pricing analysis-Breakeven analysis
	At what extend the RTC provide the best service to the passengers?	Did the users satisfied with the operations, maintenance and service delivery?	% of passengers satisfied in operation of RTC's, % of passengers satisfied in maintenance, % of passengers satisfied in service delivery.	Primary data	Primary data collection	Passenger satisfaction index
Effectiveness						
Inputs and process of implementation	How are the KSRTC, NWKRTC, KKRTC effective in pricing, quality of service, and comfort compared with private players?	*What is pricing mechanism followed by the corporation in different terrains and services? *Is there any feedback mechanism with the users? * How well does the corporation provide flexible services compare with other private players?	*Number of buses run in different terrain *Number of passengers given the feedback.	Secondary data	KII, FGD and Primary data collection	DEA

	Did the corporations have introduced the technology?	*Did KSRTC, NWKRTC, KKRTC introduce digital tracking systems, ticket machines etc? *Did the corporations introduce online booking facilities? *Did the corporations induce technology at the depot-level like real-time attendance, CCTV's etc?	*Number of users accessing the bus ticket using an online application. * Number of depot got access to technologies. *Number of routes are facility of access the reservation. * % of money spent for technology.	Secondary and primary data	KII, FGD and Primary data collection	DEA
	What are the best sustainable practices adopted by the KSRTC, NWKRTC, KKRTC in specific?	*What is the best practice to retain the existing users of the corporation? *what are the best practices adopted from the other states?	*Number of buses having GPS tracking and its routes. *%percentage of revenue spent on innovation.	Primary data	KII, FGD	DEA
	Are the corporations has a specific mechanism to maintain the timing, staffing and quality of services in each corporation?	*What kind of mechanism has adapted maintain the bus to be on the scheduled time? * What are the challenges to keep the service quality?	*Number of buses maintained in the depot per day. *Number of technicians engaged in each depot.	Secondary and primary data	KII, FGD	DEA
Efficiency						
Cost Benefit Analysis	How the KSRTC, NWKRTC, KKRTC are different in pricing, quality of service, and comfort compared with railways, airways and other modes of transport?	*What are the challenges used to reduce the pricing compare with other players? *How effective in terms of timing effective compare with other players?	*Annual revenue of the corporation. *Annual expenses of the corporation. *Surplus or loss per annum; *Ease of access in reaching the bus stops. *Affordability of the bus services; *Buses running regularly as per schedules; * Comfort and	Secondary data	Primary data collection	Consumer satisfaction index, Benefit to cost ratio analysis

			convenience offered by the bus services.			
			% of passengers access to the water & other materials while travel.			
			% of the passengers believe in reducing bus tickets.			
			% of passengers believe government bus service is better than Private buses. % of passengers feel that RTC ensures women safety.			
			% of passengers think RTC's buses are efficient in departure and arrival timings.			
			*Number of passengers feels the bus stands are clean.			
			*Number of passengers requested to increase RTC bus services.			
Fund Utilisation and capacity building	Did the KSRTC, NWKRTC, KKRTC utilise the fund for developing infrastructure, purchasing new buses, capacity building etc?	* What is the proportion of fund used for infrastructure, capacity building, quality assurance, staffing etc.?	*% of money spent on infrastructure, *% of money spent on capacity building, *Number of extra resources expanded during the 2014-15 to 2019-20 period?	Secondary data and primary data	KII, FGD and Primary data collection	DEA, Cost benefit analysis

Output produced	To what extent is the training for employees helpful to enhance the productivity of labour?	What is the minimum change in the KMPL after the training to enhance the KMPL efficiency?	*Number of buses that attained an increase KMPL, Number of employees attended the training in the depot.	Secondary data	KII, FGD	DEA, Benefit cost ratio
	Did the number of users increase over the year since 2014-15 to 2019-20? How did the COVID19 impact the output in terms of revenue?	*What are the operational changes, managerial changes to increase the number of users?	*% of money spent on operation and maintenance.	Secondary data	KII	DEA
Impact						
Outcomes-immediate	What is the impact of COVI9 on operations, managerial and financial status of corporations?	*What is the impact of COVID19 on bus users and the health of the passengers? What is the impact of COVID19 on the contract labourers?	*Number of contract employees that lost their jobs due to COVID19?	secondary and primary data	KII, FGD and Primary data collection	DEA
outcomes-short term	What are the steps taken to undertake to increase the passengers or users in low performing division?	How well the coordination between the corporation, division, depot, would be managed efficiently?	*Number of depots has tele communication equipment's, * Depot wise number of computer availability	Primary data	KII, FGD	DEA
outcomes-Medium term	What are the steps taken to increase the bus frequency and extent to the non-existence places?	To what extent does the number of bus services increase to the interior places and long-distance places?	*Number of villages the bus services are not covered within the jurisdiction in each depot.	Secondary and primary data	KII and Primary data collection	DEA

	What are all the measures taken by the corporations to ensure the welfare of the RTC employees?	Did the corporation have an employee grievance redressal mechanism? What was the innovation mechanism undertaken to ensure the welfare of employees?	*Number of times review meeting conducted (staff and management), *% of staffs enrolled in labour unions, *Number of labour union	Secondary data	KII, FGD and secondary data from corporations	DEA
Outcomes-Long term	How well would the depot be financially sustainable and effective use to users?	To what extent the depot would increase the revenue of the depot?	*Depot wise the revenue generated since 2014-15 to 2019-20.	Secondary data	KII	DEA
Sustainability						
Sustainability of the project in the long run	What is the percentage of corporations long run contribute to GDP growth and contribution by service sector to the GDP?	Did the bus services contribute to the economic development of the corporation?	*Profit gained by the corporation from 2014-15 to 2019-20.	Secondary data	KII and RTC annual reports	DEA, trend analysis
		Did the bus services contribute to the economic development of bus users?	*Corporation wise net revenue generated since 2014-15 to 2019-20	Secondary data	KII and RTC annual reports	DEA, trend analysis
		Did the bus services contribute the trade development and social integrity?	*Corporation wise net revenue generated on goods like luggage's etc.,	Secondary data	KII	DEA

6. METHODOLOGY

The present study uses a mixed-method approach, which includes quantitative and qualitative data collection. The quantitative data were collected from the passengers (government bus users and private bus users) at the depot level from the respective corporation. The key stakeholders were identified in qualitative data at the depot, division, corporation, and passenger's level. The present section established the geographical spread, sample size covered, sampling design was presented below:

a. Primary Data collection

i. Quantitative Data collection

In KSRTC, there are 17 divisions, along with 84 depots, 166 permanent bus stops, two regional workshops, one central training institute, four regional training institutes, one printing press, and a hospital in place. Whereas in NWKRTC, there were nine divisions, 51 depots, 158 bus stops and one regional workshop & regional training centre. In KKRTC, there were 9 divisions, 52 depots, 149 bus stands, one regional workshop and two training institutes.

The sampled division and depot were identified based on financial performance for 2014-15 to 2019-20. As a first step, 6 divisions[2] were selected from the 17 divisions in KSRTC. This was done following the criteria of low, moderate and higher profits (one in the bottom, one in middle range and top one division based on ranking on the basis of the trend of financial performance of divisions for the years 2014-15 through 2019-20). Post this, 3 depots were selected under each of the 6 divisions, following the same criteria of low, moderate and higher profits. A similar process was adopted for NWKRTC and KKRTC, out of 9 division 3 was selected in NWKRTC and KKRTC based on the financial performance (Refer Figure 5). The detailed information on division and depot was presented in figure 5 below and the detailed depot information is given in table 3.

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[2] As per these suggestions from the Statistical Officer, KSRTC, Mangalore division has been chosen in place of Kolar division, since it also exhibits Low Profit characteristics. Kolar and Chikkaballapur divisions are similar; and the Mangalore division has services such as Volvo buses and sleepers as per the request from Statistical officer KSRTC. For NWKRTC, instead of Belgavi, Hubballi-Dharawad City division was chosen as requested by the Statistical officer.
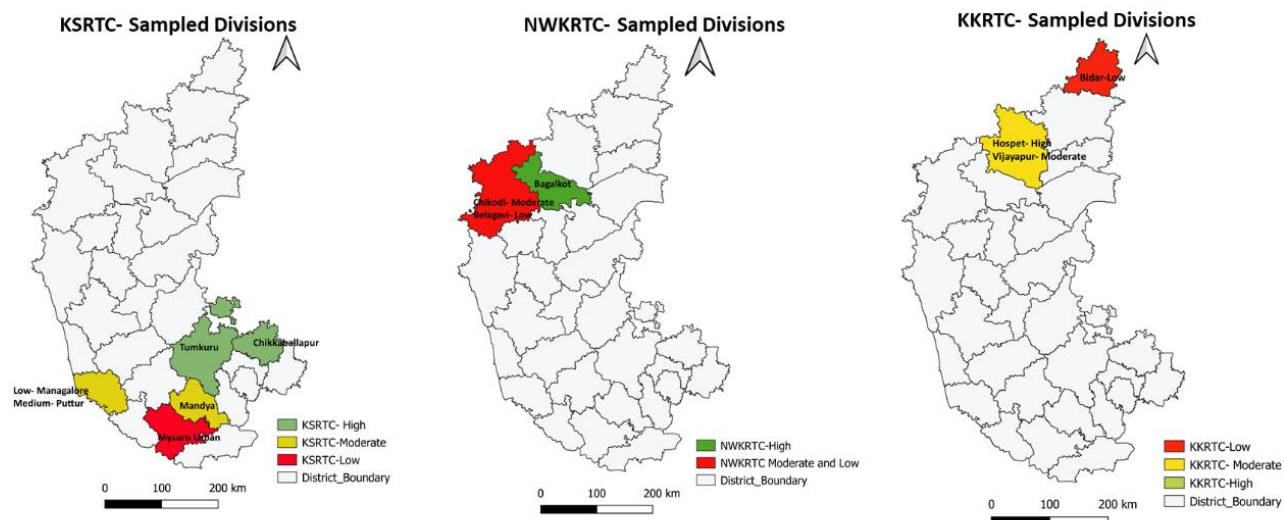
Figure 5: Sampled division selected for primary data collection

Table 4: Detailed of sample division and depot under three corporations

KSRTC		NWKRTC		KKRTC	
Division	**Depot**	**Division**	**Depot**	**Division**	**Depot**
Tumkur	Tumkur	Bagalkot	Jamakhandi	Hospet	Hadagali
Tumkur	Sira	Bagalkot	Mudal	Hospet	Sandur
Tumkur	Turuvekere	Bagalkot	Badami	Hospet	Hospet
Chikkaballapur	Gowribidanur	Chikodi	Nipani	Vijayapur	Vijayapur 2
Chikkaballapur	Chikkaballapur	Chikodi	Athoni	Vijayapur	Vijayapur 3
Chikkaballapur	Bagepalli	Chikodi	Gokak	Vijayapur	Basavana Bagewadi
Puttur	Puttur	Belgavi	Belgavi 1	Bidar	Humanabad
Puttur	Mercera	Belgavi	Belgavi 2	Bidar	Bidar 1
Puttur	Dharmasthala	Belgavi	Ramadurga	Bidar	B Kalyana
Mandya	Mandya				
Mandya	Pandavapur				
Mandya	K R pet				
Mysuru Urban	Kuvenpunagara				
Mysuru Urban	Bannimantapa				
Mysuru Urban	Vijayanagara				

Mangalore	Udupi
Mangalore	Kundapur
Mangalore	Mangalore-2

The divisions were selected, keeping in mind the geographical spread, including districts from the coastal region, northern and southern parts of the state. The depots under each division were also drawn in a representative manner to include interstate and mofussil services, long and short routes, rural and urban, day and night services, different types of bus services - ordinary, express and luxury, city, suburban, interstate, express, ordinary, Rajahamsa, sleeper and multi-axle, different terrains -hinterland, plains, hilly, coastal, monopoly, non-monopoly.

Table 5: Sample covered under three corporations

Corporation	Division	Samples Covered		Overall Sample
		RTC users	Non RTC Users	
KSRTC	Chikaballapura	136	0	136
	Mandya	125	10	135
	Mangalore	113	26	139
	Mysuru Urban	126	10	136
	Puttur	122	13	135
	Tumkur	123	12	135
NWKRTC	Bagalkot	120	16	136
	Belgavi	123	12	135
	Chikodi	119	16	135
KKRTC	Hospet	114	20	134
	Bidar	98	40	138
	Vijayapur	121	14	135
Overall		1440	189	1629

Source: Primary Survey Data

In each sampled depot, a total 40 samples were collected in different bus services like urban, rural, night service and luxury buses. If any of the depot didn't provide any one of the services, the same sample was compensated with other services. In overall, 1629 passengers were interviewed out of which 1440 Individuals were RTC buses and 189 individuals were private bus users (Refer Table 4). Simultaneously, the qualitative interviews were conducted among different stakeholders, detailed information is presented in the subsequent sections.

ii. **Qualitative data collection**

Across the three corporations, divisions, depots, and different bus routes involved multiple stakeholders in different levels to ensure the service users' efficient, safe and convenient travel. Based on the inputs given in ToR, the study team undertook systematic steps to

identify the relevant stakeholders to conduct the qualitative and quantitative data collection. There were five steps of strategies to identify the different kinds of stakeholders associated with KSRTC, NWKRTC and KKRTC, including four levels of stakeholder within the depot, division, transport board, and passengers (RTC users and Non-RTCs) was presented in figure 6.
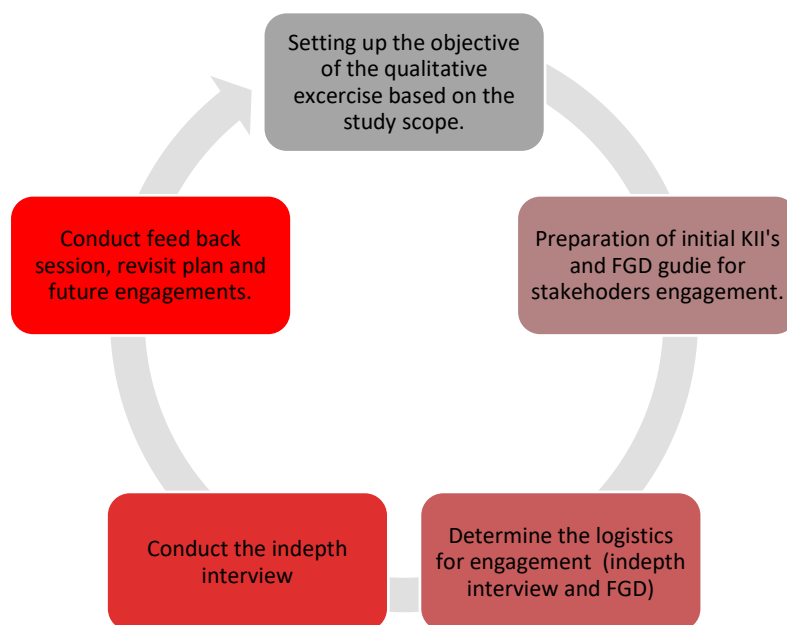
Figure 6: Systematic approach on stakeholder engagement

The objectives for the qualitative exercises were prepared following the literature review and the pilot testing with the stakeholders. Mapping across various stakeholders' categories had been done based on the consultation with the Nodal officers. The sample size for the qualitative data collection at the different layer of the corporation was presented in figure 7:
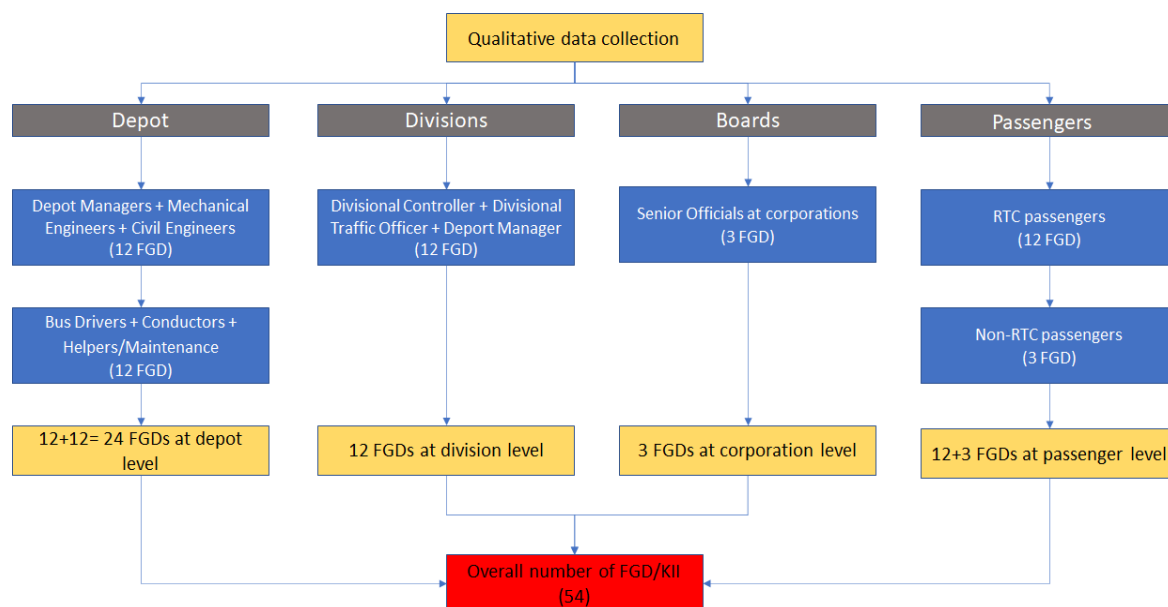
Figure 7: Sample size on qualitative data collection

At the depot level, 24 KIIs were conducted. The depot manager, mechanical engineer and civil engineer included one group, while the bus driver, conductor and helper/ maintenance crew as a second group (Details given below). Total eight interviews were conducted in the respective corporations—four KIIs at the level of managers and four at the level of workers. Total 12 KIIs were conducted at the division level officials like divisional controller, divisional traffic manager and depot manager. The Managing Directors (MD) of the transport corporation are the decision makers of the corporation. Hence, the KIIs with MD was conducted before the draft report submission. At the passenger level, two types of FGDs and KII were conducted. Public Transport users and Private Transport Users, total 15 KIIs were conducted out of which 12 KIIs at the Public Transport Users and 3 KIIs with the Private Transport Users (Refer to Table 5).

Table 6: Details of geographical coverage of qualitative data collection

Corporation	Depot Coverage – Depot KIIs for RTC officers	Depot Coverage - Passenger KIIs	Division	Board
KSRTC	Sira	Tumkur	Tumkur	Corporation Managing Director
KSRTC	Kondapur, MNG-3		Mangalore	
KSRTC	Gowribidanur, Bagepalli	Bagepalli	Chikkaballapur	
KSRTC	Mandya	Pandavpur	Mandya	
KSRTC	Mercera		Puttur	
KSRTC	Bannimantapa	Kuvenpunagara	Mysuru Urban	
NWKRTC	Belgavi I	Ramadurga	Belgavi	MD Nominated, Chief Mechanical Engineer and Traffic Manager
NWKRTC	Jamakhandi, Mudhol	Jamakhandi, Badami	Bagalkot	
NWKRTC	Chikodi	Athani	Chikodi	
KKRTC	Hospet	Hadagali	Hospet	Corporation Managing Director
KKRTC	Vijayapur	Basavana Bagewadi	Vijayapur	
KKRTC	Bidar 1	Bidar-1, B Kalyan	Bidar	

iii. Development of Survey tools

The questionnaire was developed before the inception phase and it was divided into two methods: (i) quantitative questionnaire (passengers survey) and (ii) qualitative questionnaire

(stakeholders, different layers of officials). The quantitative questionnaire for passengers using different bus services of Karnataka transport corporation buses and private services. The passengers were covered in corporation buses who use ordinary services, mofussil buses, interstate, intra-state, air conditioned, sleeper, semi sleeper bus services, non-stop, night services buses etc. Each category of buses has specific questions to be covered for all three corporations.

Covering all the indicators suggested in RFP for passenger's survey, the data collection was largely concentrated on the following:
- Basic demographic and respondent identification data required for implementing a cross-sectional survey, including information on the respondents' record of place of work, phone numbers, educational qualification, services he/she uses etc.
- Cleanliness including maintenance of buses, cleaning before the services etc.
- Specific questions on operation, technology use, service delivery which is broadly on the satisfaction of users of different services like A/C, semi-sleeper, sleeper, interstate, and intrastate services.

The qualitative questionnaire for KII and FGD for different stakeholders was developed based on the ToR and literature review. Five types of questionnaires were developed with the broad questions on the DAC framework which include operations, maintenance, challenges, innovations, COVID-19 impact, further suggestions for improvement etc.

Table 7: Details of the questionnaire used in the study

S.No	Questionnaire detail
1	Two questionnaires were developed at the depot level Depot Managers, Civil Engineer, Mechanical Engineers Bus Drivers, Conductors Helpers, Maintenance
2	One questionnaire for the division level Divisional Controller + Divisional Traffic Officer + Deport Manager
3	One questionnaire at the board level Higher officials of corporations
4	One questionnaire for Passengers Passengers using RTCs, Private transport
5	One quantitative questionnaire for passengers Passengers using RTCs, Private Transport users

iv. **Supervisor and Enumerator training**

Before Initiating the field data collection, the enumerators were recruited within 20 Kms radius from the sampled depot. The core team were highly sensitive to find the enumerators who met the qualification criteria such as educational qualification, experience in CAPI data collection and the residence at the sampled location in order to put the questions in the local language. The training was conducted virtually on 8th August 2021 (Refer to Annexure for the agenda) followed by the pilot testing which gives the familiarity to the enumerators on questionnaire. The enumerators were oriented on the methodology and the process to be followed for data collection.

An orientation training program was conducted to understand the importance of the study and its objectives to get the correct information from a suitable source. It was to ensure that all the team members follow the same protocol, i.e., all team members would adopt the same approach in collecting field information, carrying out focus group discussion, and interviewing in a similar manner. This procedure helped minimise any observer bias and avoid inconsistency in reporting. The Principal Investigator and core team members had oriented the study team on the data collection process. The Kannada translated tools were used for the training, and the training was conducted in Kannada.

b. **Secondary Data collection**

The project team undertook a detailed review of literature to scout relevant country and state specific published papers on the evaluation of transport corporations. Literature further guided the team to identify the indicators which are relevant to the study. That information/ indicators data details were requested to the corporation Nodal officers for the evaluation period. Further, the Nodal officers at each corporation provided the divisional and corporation level data. These data sets were further cleaned for analysis, Data Envelopment Analysis (DEA) was performed to rank the depot, division and corporation based on the operational, traffic revenue, expenses, maintenance, service quality and vehicle operations heads. The detailed methodology, indicators and results were discussed in the results and discussion chapter.

C. Limitation of the study

The study has the following limitations:

✓ Availability of monthly data with the corporations was limited. Hence the widely used yearly data from the corporation.
✓ Due to COVID restrictions, the total number of passengers engaged in Focus Group Discussion was reduced to five passengers.
✓ Due to the extremely long proposed timelines for compiling and sharing of granular data like depot-level route information by some corporations, the report covered only corporation and division level analysis.
✓ The study structure limited the learning from the secondary data to be incorporated into the primary data collection, given that the pilot and tool design was to be done as part of the inception stage. The ensuing suggestion would be to schedule tool development and data

collection after 50%-100% completion of the secondary data analysis. This is in turn will help minimise overlap and maximise the valuable information gained through all sources.

7. CHAPTERISATION OF FINDINGS

Based on the context, theories and methodological framework discussed in previous chapters, this study adopted the DAC framework to address the key evaluation questions and sub-evaluation questions. This was understood that the objectives were addressed in terms of relevance, effectiveness, efficiency, sustainability, impact and equity were covered in the broad categories. The following chapters discussed the critical finding of the study that was organized based on the seven major categories, namely,

(i)   Physical progress of the corporation,
(ii)   Financial progress of the corporation,
(iii)   Pricing structure of the corporation
(iv)   Passenger Survey: Service Delivery and Passenger Satisfaction, and
(v)   Efficiency of the Corporations: DEA Findings

Further detail of the chapters of the findings may provide a clear understanding of the findings and discussions.

Chapters	Description
Physical progress of the corporation	The physical progress section elaborated the corporations and division wise carrying capacity, load factor, the fleet held and utilized, accident and breakdowns, effective kms, dead kms, KMPL which was further examined at time series level. It also investigated the efficiency and effectiveness of the physical progress of the parameters as mentioned above. It also investigates the demand and supply analysis of the corporation using the secondary data provided by the corporation.
Financial progress of the corporation	The financial progress covers the overall financial position of the corporations, the capital structure, operating revenues and expenses and the efficiency parameters.
Pricing structure	It investigated the bus service wise fare structure comparing with other progressing states. It also examined the CPKM, EPKM and addresses how the corporation moves towards sustainability.
Key findings from Passenger satisfaction survey:	The passenger survey finding was divided into three broad categories namely, information of passengers, use of technology by the passengers and satisfaction of passenger (operation, maintenance and other services).
Efficiency of the corporation	The efficiency of the corporation chapter addressed using the Data Envelopment analysis using the secondary data collected from the corporations. It is a non-parametric econometric analysis to estimate the weights and rank for the divisions and corporations based on the broadheads, namely manpower, traffic revenue, expenses, maintenance, road safety and vehicle operations.

Based on the detailed, analysis in different key aspects of the corporations the recommendation was drawn in terms of operations, financial and service delivery.

8. PHYSICAL PROGRESS OF THE CORPORATION

a. Introduction

In this section we look at various indicators related to the physical progress of the corporations. We assessed the trends as well as compared the performances of the corporations and divisions for each of these indicators. The aim of this section is to understand what has changed for the corporations and divisions over the evaluation period and where they stand relative to each other. All the data analysed and visualized in this chapter has either been compiled from published sources including from the RTC administrative reports and provided offline by the Statistical Department of the corporations.

a. Passengers Carried

i. Corporation level

Given its larger size and jurisdiction, KSRTC has seen a relatively higher ridership over the evaluation period. In comparison, even though NWKRTC and KKRTC have around the same number of depots and divisions, NWKRTC carries almost double the capacity. KSRTC is also the only corporation that has clearly shown a slight increasing trend, while NWKRTC has witnessed a marginal decline, KKRTC has remained about the same.
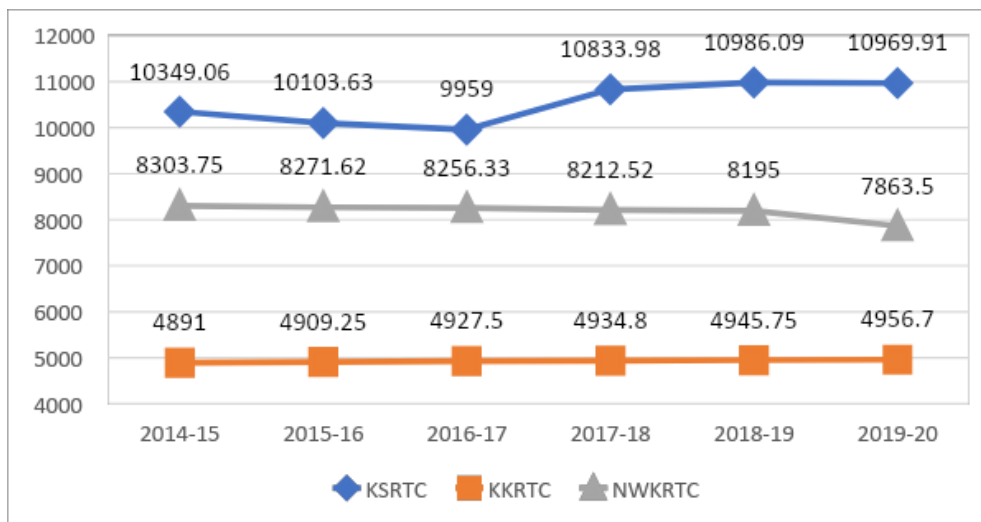
Figure 8: Corporation Level Trend for Passengers Carried (Source: Admin Report)

The six-year average for KSRTC is 10,534 lakh passengers, for NWKRTC it is 8,184 lakh passengers, and KKRTC transports 4,927 lakh passengers.

When it comes to passengers carried per bus per day, NWKRTC averaged 488 passengers per bus per day over the last 6 years, with KSRTC at 375 and KKRTC at 338. In terms of trends there is very minimal fluctuation, and the values are near constant for the period.

We also look at the passengers carried by each of the services over the evaluation period, for KSRTC. Note that while there are many service types, the four services visualised below cover around 98% of the total passengers carried in KSRTC divisions in a year. Ordinary and Express Services, which have the largest operations, both show an overall increase in the value, with a jump in the number of passengers carried in the year 2017-18. For City and

Suburban services the values show a minor increase, but are relatively close throughout. The average annual growth rate comes to 1% across all four services.
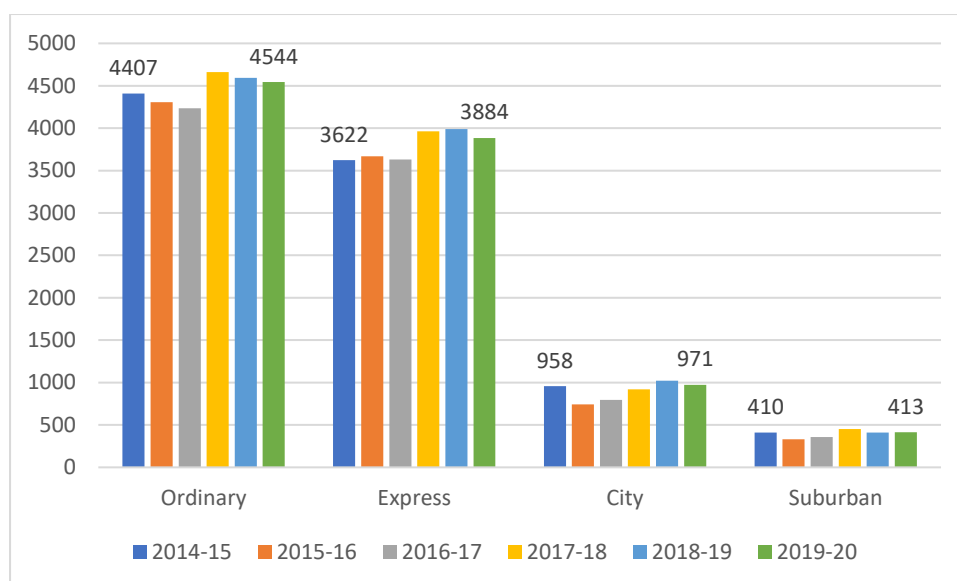
Figure N1: KSRTC Trend of Services with Highest Passengers Carried (in Lakhs) (Source: Offline Data)

For services with a smaller passenger load, the trend is a lot more variable, with fleet sizes prone to a lot more variation. As a result, we see high absolute AAGRs for almost all of these services, especially for Vaibhava (-13.6%), NAC Sleeper (11.3%), Volvo (-12.7%) and City Volvo (-10.4%). In all but a couple of cases, these values show decreasing trends, which is opposite to what was observed with the larger services.

Table 8: KSRTC Trend of Services with Lesser Passengers Carried (in Lakhs) (Source: Admin Report)

Service Type	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	AAGR
Rajahamsa	68.95	57.91	51.72	47.57	49.58	60.05	-1.9%
Vaibhava	16.57	19.16	18.43	20.69	17.14	4.27	-13.6%
NAC Sleeper	6.34	6.51	7.75	6.88	8.83	10.39	11.3%
City Volvo	75.72	53.37	39.58	40.29	42.41	40.91	-10.4%
Scania	0.09	1.71	6.95	8.51	10.23	10.31	430.0%
Volvo	25.37	22.53	15.55	18.72	13.29	11.55	-12.8%
Volvo MA	19.92	20.47	16.83	19.64	24.16	24.11	4.9%
Corona Sleeper	9.10	13.06	12.42	13.51	8.09	4.82	-6.6%

ii. Division level

At the division level, the total passengers carried (in lakh) is about constant over the five years, with no observable trend. Examining the average, we see that NWKRTC divisions have the highest ridership (in lakh passengers), with Hubballi (1506.19), Belgavi (1465.88), Chikodi (1269.43) and Dharawad - Rural (968.72) constituting 4 of the top 5 performers

among all the divisions. The only other division is Vijayapur (998) from KKRTC (table below).

Table 9: Top 5 Divisions as per Evaluation Average: Passengers Carried (in lakhs) (Source: Admin Report)

Corp	Division	Passengers Carried in lakhs (Evaluation average)
NWKRTC	Hubballi	1506.19
NWKRTC	Belgavi	1465.88
NWKRTC	Chikodi	1269.43
KKRTC	Vijayapur	997.67
NWKRTC	Dharawad (Rural)	968.72

At the bottom, we have Chitradurga (331.47), Yadgiri (343.10), Bangalore Central (353.78), Kalaburagi-1 (374.13), Shivamogga (391.68), Kalaburagi-2 (400.28) and Mangalore (408.30). Within this set, three divisions come from KKRTC and four from KSRTC, which is in line with the overall averages for the three corporations for the evaluation period.

Table 10: Bottom 5 Divisions as per Evaluation Average: Passengers Carried (in lakhs) (Source: Admin Report)

Corp	Division	Passengers Carried in lakhs (average)
KSRTC	Mangalore	408.30
KKRTC	Kalaburagi-2	400.28
KSRTC	Shivamogga	391.68
KKRTC	Kalaburagi-1	374.13
KSRTC	Bangalore Central	353.78
KKRTC	Yadgiri	343.10
KSRTC	Chitradurga	331.47

When we look at passengers carried per bus per day, the results are similar to the overall figure, with no visible trends. However, KSRTC divisions perform at a higher level when we consider the fleet values to calculate passengers per bus per day. As for passengers carried in NWKRTC, 3 of those 4 divisions are among the best in the State. However, while KSRTC does not figure into the top 5 in terms of passengers carried, two divisions are among the top 5 in this case, namely Mysuru Urban and Mandya.

Table 11: Top 5 Divisions as per Evaluation Average: Passengers Carried per bus per day (Source: Admin Report)

Corporation	Division	Passengers Carried per Bus per Day (Evaluation average)
NWKRTC	Hubballi	648.24
KSRTC	Mysuru Urban	638.39
NWKRTC	Dharawad (Rural)	626.47
NWKRTC	Belgavi	581.59
KSRTC	Mandya	566.79

The bottom of the pyramid is similar to 'Passengers carried'. The three lowest divisions are from KSRTC, namely Mangalore, Bangalore and Mysuru Rural, accompanied by the two KKRTC divisions from Kalaburagi.

Table 12: *Bottom 5 Divisions by Evaluation Average: Passengers Carried per bus per day (Source: Admin Report)*

Corp	Division	Passengers Carried per Bus per Day (Evaluation average)
KSRTC	Bangalore Central	150.44
KSRTC	Mangalore	228.70
KSRTC	Mysuru Rural	261.29
KKRTC	Kalaburagi-1	262.76
KKRTC	Kalaburagi-2	274.21

In addition to the overall values, we also examine the evaluation average values of the passengers carried across the different services, for KSRTC divisions. For Ordinary services, the Top and Bottom divisions are given in the table below. While Kolar carries the most passengers by a margin, Mysuru Urban actually does not cover any passengers through ordinary services. Shivamogga and Chitradurga, are both newly formed divisions during the evaluation period, which justifies their lower numbers in comparison to other divisions.

Table 13: Ordinary Services - Top and Bottom KSRTC Divisions by Evaluation Average (Source: Admin Report)

Division	Passengers Carried in lakhs (average)	Division	Passengers Carried in lakhs (average)
Kolar	666.87	Chikmagalur	173.73
Hassan	472.84	Bangalore Central	98.22
Puttur	466.43	Shivamogga	63.29
Chikkaballapura	458.58	Chitradurga	63.29
Ramanagara	395.83	Mysuru Urban	0.00
Tumkur	378.51		

In the case of Express Services, Chikmagalur is among the divisions with the highest passengers carried, while being among one of the lowest for Ordinary services. Chikkaballapura is the only division among the top 5 in both services. Among the bottom 5, three of the five divisions are identical to the table above, with no coverage here as well for Mysuru Urban.

Table 14: Express Services - Top and Bottom KSRTC Divisions by Evaluation Average (Source: Admin Report)

Division	Passengers Carried in lakhs (average)	Division	Passengers Carried in lakhs (average)
Chikmagalur	466.10	Mandya	167.98
Chamarajanagar	427.75	Mangalore	94.73
Chikkaballapura	409.46	Shivamogga	82.02
Hassan	340.12	Chitradurga	82.02
Mysuru Rural	308.19	Mysuru Urban	0.00

When it comes to City and Suburban services, both are led by Mysuru Urban (2601 and 1695 lakh passengers respectively), with the latter service having coverage in only one other division (Davanagere – 679 lakh passengers). For City services, we also see higher number of passengers covered in Tumkur (783.94), Hassan (687.89) and Mangalore (341.61).

Most other services are covered only in select divisions, and we will look at those in the following table. It is quite evident that while Bangalore is not among the top divisions in the services with the most operation, it is however among the top division in nearly all of the luxury and lucrative services. This is also the case for sleeper services, which justifies its high EPKM despite fewer passengers being carried overall. Other cities with luxury/sleeper operations would include Davanagere, Mangalore, Mysuru Urban and Mysuru Rural.

Table 15: Top KSRTC Divisions for Services with Lower Passengers Carried (Source: Offline Data)

Service	Top Divisions (lakh passengers covered – Avg)
Rajahamsa	Bangalore Central (11.22), Chikmagalur (9.12), Puttur (8.12), Davanagere (8.01)
Vaibhava	Davanagere (50.53), Kolar (1989), Chikmagalur (19.79)
NAC Sleeper	Bangalore Central (21.84), Mangalore (12.87)
Corona Sleeper	Davanagere (31.97), Bangalore Central (22.68)
City Volvo	Mysuru Urban (260.60), Mangalore (29.41)
Flybus	Bangalore Central (11.33)
Scania	Bangalore Central (26.39), Mysuru Rural (7.34)
Volvo	Mangalore (38.87), Mysuru Rural (35.15), Bangalore Central (27.69)
Volvo MA	Bangalore Central (59.19), Mysuru Rural (31.76), Mangalore (25.56)
Mercedes	Davanagere (19.65), Bangalore Central (5.75)
Mercedes MA	Bangalore Central (12.48)

b. Load Factor

i. Corporation Level

The Load Factor shows the average load on a bus route throughout the day. The higher the load factor, the more profitable the operation, provided that fares are set high enough: if they are too low there can be significant loss even on very full buses. The theoretical maximum of 100% is never achieved in urban services; buses are rarely full for an entire journey, and usually there are directional imbalances in demand at different times, resulting in buses operating with heavier loads in one direction than in the other.

With regards to Load Factor (%), KSRTC averages nearly 70.4%, followed by KKRTC at 66.0% and NWKRTC at 62.3%. However, when we observe the trends, we see that all corporations have improved on this indicator over the evaluation period. For KSRTC this change has been the lowest, with a 4.5 percentage point (pp) change to 74.3%, while for NWKRTC it has been the highest at 12.5 pp to 72.6%. At KKRTC the increase was 6.6 pp to 70.6%. It is also interesting to note that there was an initial drop in the values for each of the corporations: for KKRTC the increase began from 2015-16 (increased by 10.4 pp), while for the other two divisions, it began from 2016-17 (increased by 6.5 pp – KSRTC and 14.4 pp – NWKRTC). As compared to the baseline, NWKRTC has really increased from a 63% to 65% average load factor in the 5 years from 2007-2012.
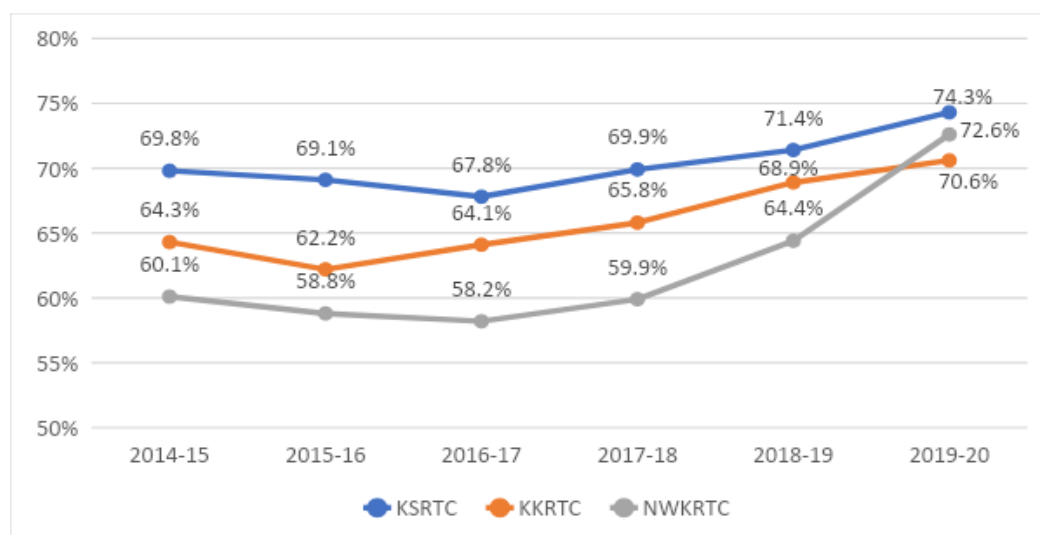
Figure 9: Corporation Level Trends for Load Factor (%)

In addition to the general values, we also examine the differences in Load Factor across services observed for each of the corporations[3]. KSRTC runs a much wider range of services as compared to NWKRTC, with many more options for AC buses (Sleepers and non-sleepers). Looking at data from the last two years (18-19 and 19-20), we first establish that for most services, especially those that use a bigger share of the fleet, there is not much variation YoY. The largest change is +4.1% for suburban services in NWKRTC, while it is -8.7% for City Volvo buses (intercity AC) in the case of KSRTC. Hence, to simplify comparisons, we look specifically at the data from 2019-20.

Table 16: Service-wise Load Factor Comparison for NWKRTC and KSRTC (Source: Offline Data)

SERVICE	NWKRTC	KSRTC
Ordinary	80.8%	70.6%
Express (Day)	Day: 74.5% Night: 72.1%	68.4%
City	83.4%	Normal: 87.6% Volvo: 62.4%
Sub Urban	73.0%	81.1%
midi	71.4%	
Semi Luxury	65.9%	
Vaibhava		60.0%
Rajahamsa	Night: 53.2%	60.1%
AC Sitting	Volvo: 40.6%	Volvo: 53.6% ; Volvo Multi-Axle: 55.8% Mercedes: 67.8%; Mercedes Multi Axle: 65.9% Scania: 59.4%; Flybus (Airport service): 35.5%
Sleeper Coach	54.9%	Non-AC: 70.2%; AC: 74.7%

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[3] Data shared only by KSRTC and NWKRTC

There is no clear pattern comparing across corporations, with either corporation performing slightly better in some services as compared to others. Only for the most used services, i.e. Ordinary and Express buses, NWKRTC has a higher load factor, with the margin being much higher for Ordinary (80.7% vs 70.6%) as compared to Express (74.5% to 68.4%). In fact, City (83.4%) and Ordinary (80.8%) buses have the highest Load Factor values for NWKRTC, while for KSRTC this is City (87.6%) and Sub-urban buses (81.1%), When it comes to Sleeper buses, KSRTC has a much higher load factors for both Non-AC (+15.3%) and AC buses (+19.8%), as compared to NWKRTC. Specifically for AC buses as well, KSRTC values across the board are much higher than for NWKRTC buses, except for the Flybus service. This can be explained because it is an Airport specific shuttle from the airport to major cities in Karnataka as well as some in neighbouring states.

An official at KSRTC provided insight into the reasons for lower load factors in semi-luxury and luxury services. In the former case (also covering Vaibhava and Rajahamsa), the demand has come down drastically for these services, due to better upgraded services in operation now. There is still some demand for Rajahamsa with senior citizens and adults who prefer pushback seats to sleepers, but the operation has been curbed to an extent as per demand. Day services are operated at a reduced frequency and night services only run with pre-booking. For AC Services, the reasons were more due to higher fares as well as the onset of COVID towards the end of the 2019-20 FY.

ii. **Division Level**

Before looking at the average performances of the divisions in terms of Load Factor, we look at the trends to understand the variation in this data YOY. There is a fair amount of variability in the load factor at division level. To look at the trends, we examine the Average Annual pp change from 2014-15 to 2019-20. For 22 of the divisions this value is within ±1 pp with 17 divisions having positive trends. Of the remaining it is between ±1 and ±2 pp for 6 divisions, and beyond ±2 pp for the last 5 divisions. We will look at the trends of 10 of these 11 divisions in the table below.

Table 17: *Top 10 Divisions with Trends in Load Factor at the Division Level (Source: Offline Data)*

Division	2015-16	2016-17	2017-18	2018-19	2019-20	Evaluation Average
Davanagere	-3.40 pp	-2.10 pp	3.20 pp	14.00 pp	0.90 pp	2.52 pp
Chikkaballapura	1.90 pp	-0.80 pp	3.40 pp	4.80 pp	2.40 pp	2.34 pp
Haveri	-0.87 pp	-0.36 pp	4.53 pp	6.24 pp	1.46 pp	2.20 pp
Dharawad (Rural)	-1.96 pp	0.71 pp	3.84 pp	5.04 pp	2.77 pp	2.08 pp
Hubballi	-1.33 pp	-0.69 pp	2.21 pp	5.77 pp	1.51 pp	1.50 pp
Belgavi	-0.19 pp	0.01 pp	1.35 pp	4.39 pp	0.91 pp	1.29 pp
Bagalkot	-1.52 pp	-0.29 pp	2.84 pp	3.91 pp	0.50 pp	1.09 pp
Gadag	-1.82 pp	-1.55 pp	1.87 pp	4.26 pp	2.50 pp	1.05 pp

Chikodi	-1.16 pp	-1.03 pp	2.17 pp	4.11 pp	1.04 pp	1.03 pp
Mysuru Urban	-2.80 pp	-13.30 pp	7.30 pp	5.20 pp	-10.40 pp	-2.80 pp

We see positive trends for all of these divisions except for Mysuru Urban, which sees a lot of fluctuation over the evaluation period. Davanagere has the highest average increase at 2.52 pp, followed by Chikkaballapura (2.34 pp) and Haveri (2.20 pp). We visualise the Top 5 divisions in the following graph. In the data as well as the graph, we see that there is a drop in the Load Factor over 2015-16 and 2016-17, apart from Dharawad, Chikkaballapura and Belgavi. We also see that for a lot of the divisions the highest increase is in 2018-19, especially for Davanagere, which saw the transfer of its depots to new divisions in 2018-19.
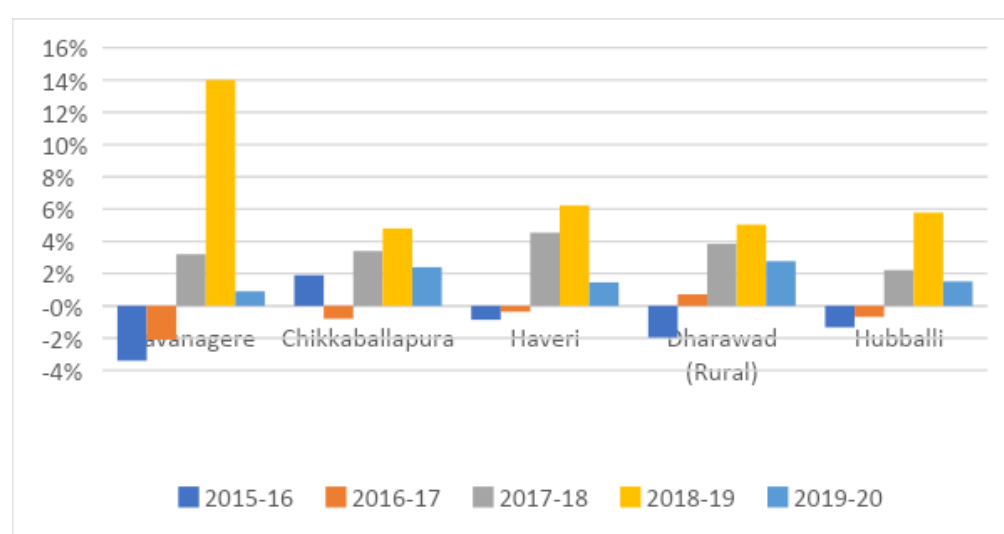
Figure 10: Top 5 divisions YOY Percentage Point (pp) Change for Load Factor (Source: Offline Data)

In terms of fluctuating values, apart from Mysuru Urban, 50% of the 22 divisions with the average annual pp variation within ±1 pp show change greater than 5 pp in at least two years of the evaluation period. The 10 divisions are given in the table below. In most cases, the large drop is over 2015-16 and the commensurate increase is over 2018-19. The only exception to this is Chamarajanagar (where the increase comes in 2017-18). We see that among these 11 divisions, all 9 divisions from NEKRTC are covered, with one division each coming from KSRTC and NWKRTC.

Table 18: *Divisions with YOY Variability but Low Overall Variation in Load Factor (Source: Offline Data)*

Row Labels	2015-16	2016-17	2017-18	2018-19	2019-20	Evaluation Average
Ballari	-6.95 pp	-0.40 pp	2.60 pp	5.48 pp	2.62 pp	0.67 pp
Bidar	-5.48 pp	-1.67 pp	2.22 pp	7.29 pp	0.52 pp	0.58 pp
Chamarajanagar	-14.10 pp	0.90 pp	9.20 pp	3.10 pp	-1.10 pp	-0.40 pp
Hospet	-6.97 pp	0.06 pp	2.16 pp	5.51 pp	3.18 pp	0.79 pp
Kalaburagi-1	-7.22 pp	0.72 pp	0.00 pp	6.99 pp	2.38 pp	0.57 pp
Kalaburagi-2	-6.05 pp	-1.10 pp	2.22 pp	6.24 pp	2.40 pp	0.74 pp
Koppal	-6.78 pp	-0.44 pp	1.49 pp	5.24 pp	2.39 pp	0.38 pp
Mangalore	-7.29 pp	2.30 pp	0.12 pp	4.22 pp	2.55 pp	0.38 pp
Raichur	-5.82 pp	0.09 pp	1.25 pp	5.04 pp	1.74 pp	0.46 pp
Vijayapur	-5.47 pp	-0.56 pp	1.88 pp	7.22 pp	1.62 pp	0.94 pp
Yadgiri	-6.86 pp	-0.91 pp	0.68 pp	5.20 pp	2.05 pp	0.03 pp

Having explored the variation, we now look at the Top and Bottom 5 divisions as per the 2019-20 values of their Load Factor values in comparison with the evaluation average. For nearly all of the divisions captured here, the Load Factor in 2019-20 is at least a few percentage points more than the evaluation average (exception being Mysuru Rural). Despite having the higher evaluation average, Mysuru Urban has the second highest load factor due to the high level of variation YOY. This indicates that the Load Factor has improved for almost all divisions, with no relation to their actual levels achieved.

Table 19: *Load Factor in 2019-20 vs Evaluation Average: Top and Bottom 5 Divisions (Source: Offline Data)*

Division	Load Factor (2019-20)	Load Factor (Evaluation Average)
Davanagere	77.50%	67.08%
Mysuru Urban	77.40%	83.85%
Dharawad (Rural)	76.44%	68.94%
Hubballi	75.33%	69.56%
Belgavi	74.72%	70.39%
Chamarajanagar	63.90%	60.20%

Chikmagalur	61.00%	57.08%
Hassan	60.10%	62.73%
Mangalore	58.73%	54.18%
Mysuru Rural	57.80%	58.57%

Finally, we group the Load Factor values based on the more accurate 2019-20 values into brackets in the following table. Given the higher Load Factor values for KSRTC and NWKRTC in 2019-20, we see more of those divisions in the upper brackets, as compared to KKRTC.

Table 20: *Load Factor Arrangement at Division Level for 2019-20 (Source: Admin Report & Offline Data)*

Load Factor (2019-20)	Divisions
75%-80%	Davanagere, Mysuru Urban, Dharawad (Rural), Hubballi, Belgavi, Ramanagara
70%-75%	Vijayapur, Kalaburagi-2, Kalaburagi-1, Bagalkot, Hospet, Ballari, Haveri, Chikkaballapura, Yadgiri
65%-70%	Bidar, Chikodi, Raichur, Tumkur, Koppal, North Kannada, Chitradurga, Mandya, Puttur, Kolar
60%-65%	Gadag, Bangalore Central, Chamarajanagar, Shivamogga, Chikmagalur, Hassan
< 60%	Mangalore, Mysuru Rural

iii. **Benchmarking of Load Factor and Analysis of Seasonality**

While there are no standards for load factor, various secondary sources provide the broad guideline for the same. City services such as DTC (Delhi) have a consistent load factor of over 85%. MTC Chennai also has a load factor of 75% to 80%. Mofussil services have a load factor of 70% to 75% with states like Tamil Nadu having a consistent load factor of 80% to 85%.

A compilation of the load factor data by the CAG for the period 2004-05 to 2008-09 shows that the load factor of Karnataka STUs has consistently declined and by 2008-09 only Goa, Arunachal Pradesh, Meghalaya and West Bengal were worse off than Karnataka [CAG study report on State Transport Undertakings - https://cag.gov.in/uploads/StudyReports/SR-StudyReports-05f68754f090388-05778944.pdf]. The desired load factor can be 85% and above for city and suburban services and 80% for the mofussil and long distance services.

NWKRTC

The month wise data received from KSRTC and NWKRTC reveal that months of July to September show a dip in the load factor in the sleeper, AC and Rajahamsa (night) services. This could be attributed to the school reopening season and the reduction in outstation travel.
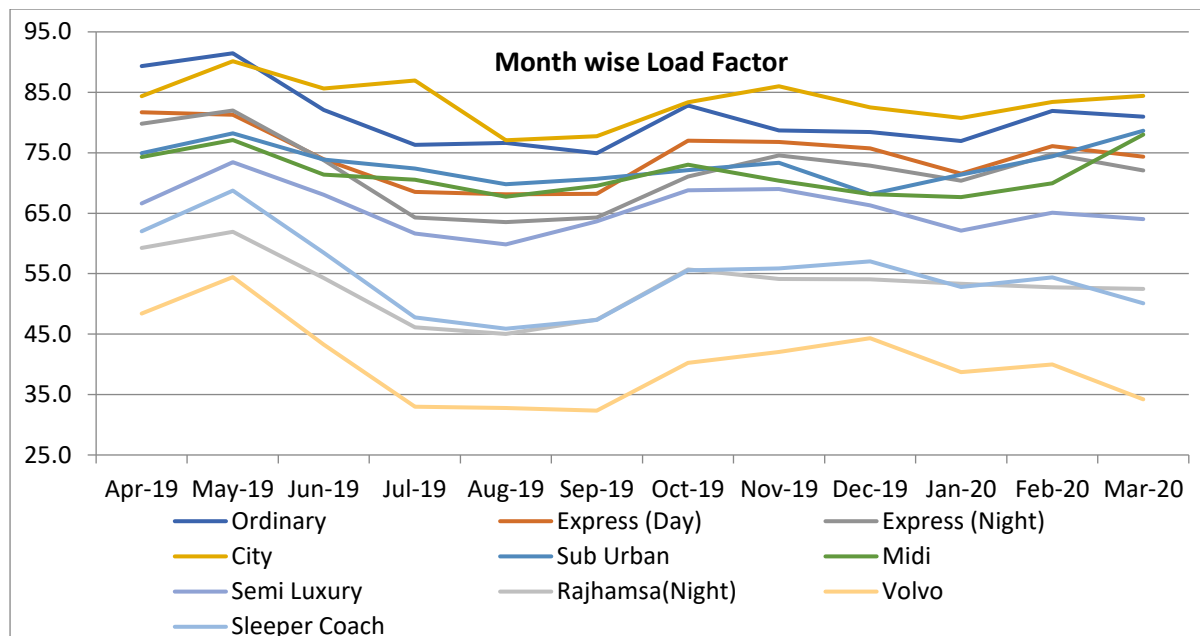
Figure N2: Month-wise Load Factor for NWKRTC 2019-20 (Source: Offline Data)

However, the issue of concern is that the premium services such as the Volvo, Sleeper and Rajahamsa have a very low load factor. A thorough demand analysis exercise needs to be conducted to understand the reasons for the low patronage of these services and route rationalization and route merger/extension exercise needs to be carried out. It may be noted that the cost recovery of the local services is typically lower than the premium services. With the premium services having a poor load factor, the cost recovery is lower in this segment as well which is contributing to the losses.

KSRTC

The month wise load factor for KSRTC shows that there is a sharp fall in the load factor in the month of March, probably on account of the examination season when travel is not undertaken. It may also be noted that the divisions of Kolar and Chikmagalur report load factor of less than 70% consistently while Mangalore, Mysuru (R) are less than 60%. Route rationalization exercise may be conducted to ensure that the load factor is improved.
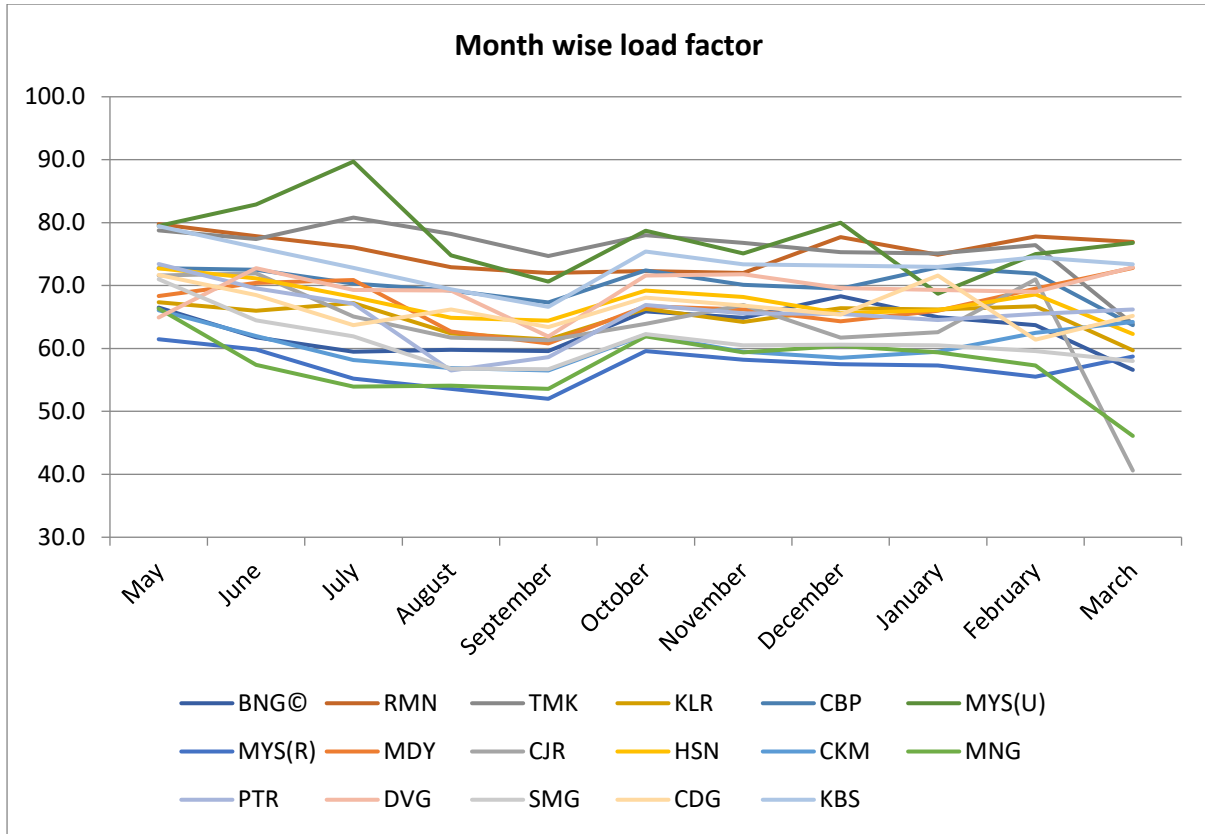
Figure N3: Month-wise Load Factor for KSRTC 2019-20 (Source: Offline Data)

c. Fleet Held and Utilised

i. Corporation level

At the corporation level, the fleet size is not prone to a lot of variation, with both KSRTC and NWKRTC having average growth rates of 0.77% and 0.84% respectively. While the values fluctuate over the years, things balance out in the long run, given the constant purchase and scrapping of vehicles over the years. KKRTC is the only corporation that shows some consistent growth, with an AAGR of 2.14%. This is primarily due to a 16.24% increase in fleet size over 2018-19, balanced out to some extent by a drop over 2019-20 of -9.73%. The trend is well captured graphically as well, where we see fairly minor jumps for KSRTC and NWKRTC, and a relatively more pronounced increase for KKRTC.
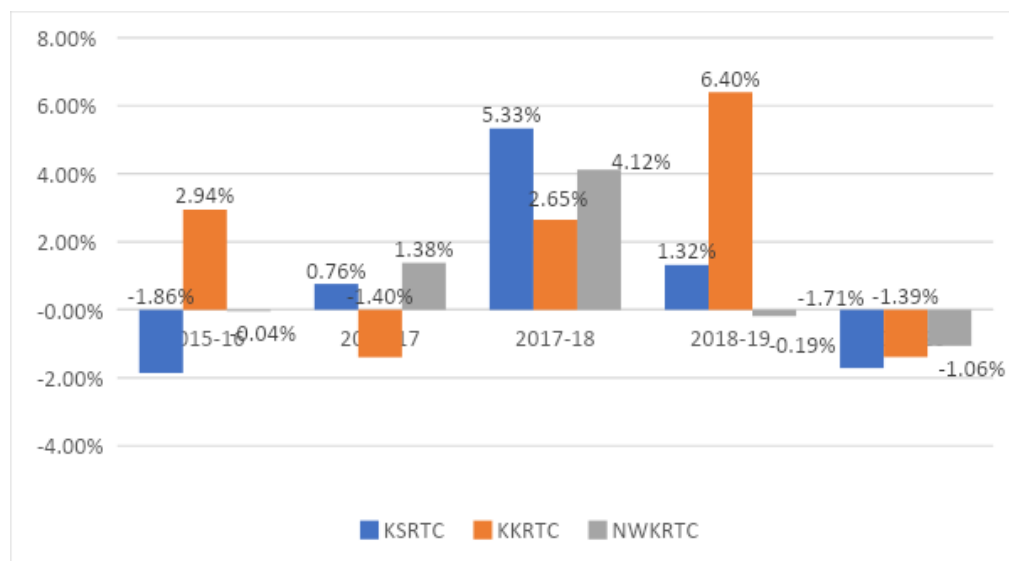
Figure N4: Corporation-wise % Change in Fleet Held Yearly 2014-20 (Source: Admin Report)

In a previous evaluation sanctioned by KEA conducted for NWKRTC in 2013 (considered a baseline study[4]), there was hardly any growth in the fleet size in the preceding half decade. In fact, compared to the peak value of 4,852 buses held in 2008-09, NWKRTC has only managed to add 85 buses in 11 years. Given that other corporations are quite similar in their trends, it indicates that the fleet is still not growing fast enough to accommodate the increasing needs and growth in traffic YoY.
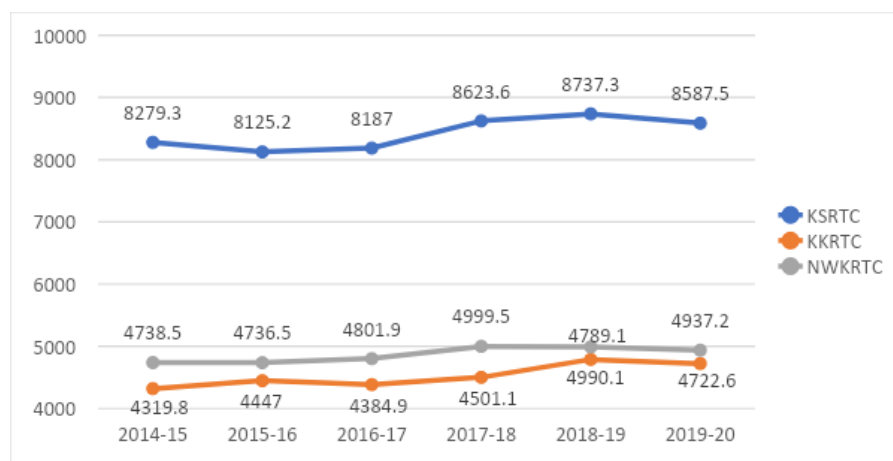
Figure 12: Trend of Fleet Held at Corporation Level (Source: Admin Report)

We also look at long distance routes run by the three corporations. We see that there are very slight increasing trends for both KSRTC and NWKRTC, while the value for NEKRTC remains about the same throughout the evaluation period. In terms of coverage, KSRTC

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[4] Reference document: https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Evaluation%20of%20the%20performance%20of%20North%20Western%20Karnataka%20Road%20Transport%20Corporation%20(NWKRTC).pdf

buses cover routes ranging from 120-1048 KM followed by NWKRTC from 200-1000 KM and KKRTC from 300-650 KM.
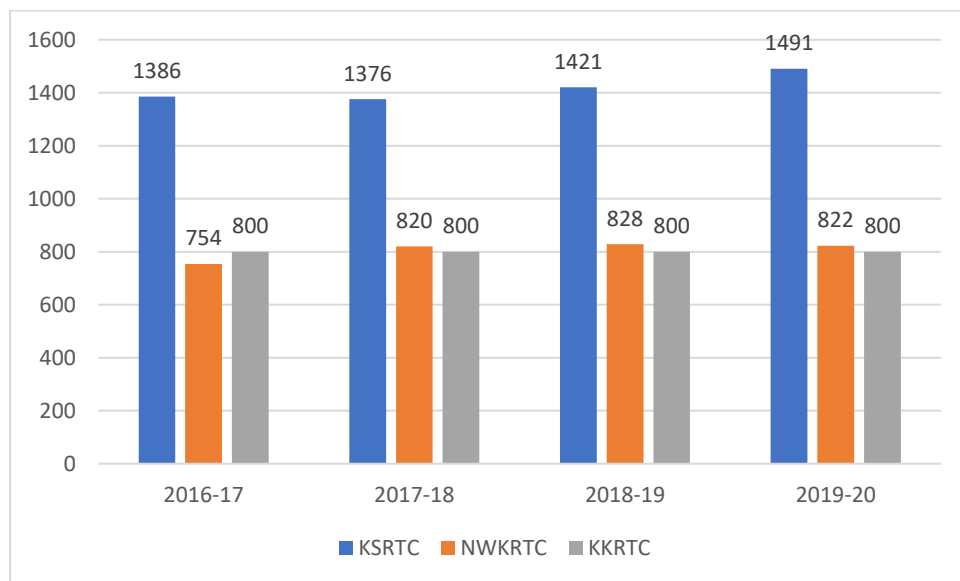
Figure N5: Long Distance Routes Trend for Corporations (Source: Offline Data)

Going slightly more in-depth, for NWKRTC[5], we also examine the fleet used for long distance day and night travel over the evaluation period. The buses used for day travel show a very slight decreasing trend, falling by 4.4% from 743 buses to 710 buses. On the other hand, for night travel, there is a slightly more pronounced increasing trend, with the value increasing from 361 to 424 buses (17%) over the evaluation period.
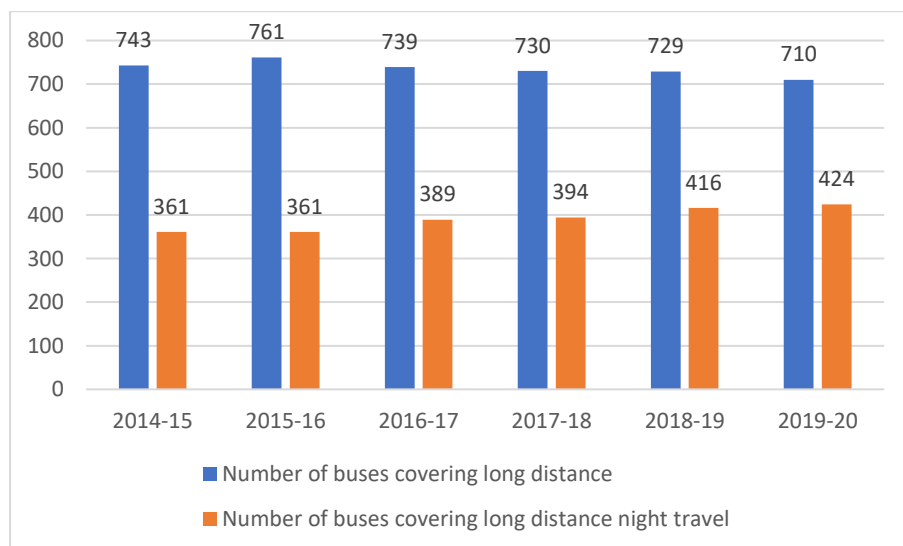
Figure N6: NWKRTC Trend of Long-Distance Day and Night Travel (Source: Admin Report)

To get more insight into the utilisation of the buses for general operations, we also look into fleet trends for each corporation, broken down by bus type. Each corporation will be analysed

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[5] Data not shared for other corporations

separately because of the difference in the bus categories maintained in the reports. The table for KSRTC is given below. Leyland and Tata are the two buses with the higher shares, but both show opposite trends, with the former increasing by 38% and the latter decreasing by 39% consistently over the evaluation period. At the same time, we also see an increase in the size of the Eicher fleet considerably, from 10 buses to nearly 1300 buses in 2019-20. Scania buses also show a quick increase from 20 buses in 2015-16 to 75 buses in 2017-18 but have remained constant thereafter. For all of the other buses, there is no clear trend, with the values fluctuating between a fixed range on account of the purchasing and scrapping practices of each year.

Table 21: KSRTC Bus Fleet Trends (Source: Admin Report)

Division/ Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Leyland	2859	2923	2836	3396	3594	3939
Tata	4794	4607	4414	3567	3235	2905
Volvo	437	402	377	384	381	417
Corona	56	59	76	82	75	55
M-Benz	10	10	10	7	9	10
M-Benz M-Ax	20	20	20	18	18	17
Scania		20	60	75	75	75
Eicher		10	498	1213	1288	1291

In the case of NWKRTC as well, while the magnitudes are different, the trends are the same for Leyland and Tata, with the former increasing by 23% and the latter decreasing by 52% continuously over the evaluation period. We also see a jump in Eicher buses from 5 to 799 from 2015-16 to 2019-20. For all other categories, the fleet size has shown a significant jump in one given year and has remained constant since. Midi buses increased from 10 to 280 from 2015-16 to 2016-17 and have stayed constant since. The Sleeper coaches also doubled from 47 in 2016-17 to 96 in 2017-18, while Volvo buses increased around 5 times from 27 in 2017-18 to 127 in 2018-19. In both cases, there are minor movements beyond this point, but no clear trends.

Table 22: NWKRTC Bus Fleet Trends (Source: Admin Report)

Division/Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Leyland	1961	2149	2122	2243	2240	2404
Tata	2720	2509	2199	1669	1414	1314
Eicher	0	5	369	697	783	799
Midi	6	10	280	280	279	280
Sleeper Coach	26	40	47	96	97	92
Volvo	25	25	25	27	127	139

As expected, for KKRTC, the Leyland fleet increased by 48% (the highest rate of increase across the 3 corporations), while the Tata fleet shrunk by 58% (the highest rate of decrease

across the 3 corporations) over the evaluation period. Of the remaining, 270 Eicher buses are introduced into the fleet in 2016-17, and this value more than doubles to 700 in 2018-19, after which it stays constant. For Corona, we see a slight drop from 35 to 26 buses over 2018-19, with the value remaining constant before and after. The Midi buses stay constant at 4-5 buses throughout, while the Mini JNNRUM buses increase from 90 in 2014-15 to 229 the next year and then 265 in 2016-17, after which they have remained the same.

Table 23: KKRTC Bus Fleet Trends (Source: Admin Report)

Division/Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Leyland	1814	2001	1950	2376	2761	2688
Tata	2424	2226	2023	1378	1122	1011
Eicher			270	700	700	704
Corona	36	34	36	35	26	26
Midi	5	5	5	5	4	4
Mini JNNRUM	90	229	265	265	265	265

ii. Division level analysis

One level lower, most divisions have fluctuating values over the years, but this evens out over the evaluation period, with all but 7 divisions having an average annual growth rate of within ±2%. The divisions that do not follow this trend are given in the table below. We see that 4 of the 7 are only slightly above this 2% threshold, with the highest being Mangalore at 3.16%. Of the remaining, Davanagere and Hubballi show clearly decreasing trends, with the AAGR values at -10.2% and -6.9% respectively, which is likely owing to the movement of depots out of these divisions and into already existing or newly created ones. There is a slight increasing trend in the case of Kalaburagi-1 (AAGR = 4.7%), but that is likely owing to the fact that in 2015 they would have upgraded their fleet (24% change approx.), after which it is been relatively constant.

Table 24: Average Growth Rate of Fleet Held at Division Level (Source: Admin Report)

Division/Growth Rate	2015-16	2016-17	2017-18	2018-19	2019-20	AAGR
Kalaburagi-1	23.91%	0.53%	1.10%	1.55%	-3.44%	4.73%
Mangalore	0.83%	4.27%	13.96%	-0.58%	-2.67%	3.16%
Chamarajanagar	0.20%	3.56%	10.04%	5.00%	-3.81%	3.00%
Hospet	9.45%	-0.93%	-1.33%	0.36%	5.61%	2.63%
Koppal	7.07%	-0.08%	5.10%	4.22%	-5.43%	2.18%
Hubballi	1.03%	-1.44%	6.70%	5.54%	-46.34%	-6.90%
Davanagere	-1.04%	3.36%	-11.96%	-38.16%	-3.42%	-10.24%

When we examine the absolute values, we see that as in the growth rate analysis Koppal, Kalaburagi-I and Hospet have the lowest values and a very minor increasing trend in the fleet held. These are followed by Chamarajanagar and Mangalore, which show a slightly more pronounced increasing trend at a higher level of fleet strength. Hubballi and Davanagere,

while having the highest fleet strength to start with, show strongly declining trends, with the drop in fleet strength synonymous with the shifting of depots out to other divisions. The new fleet strength for these two divisions in 2019-20 is just over half the fleet strength that the division had at the start of the evaluation period.
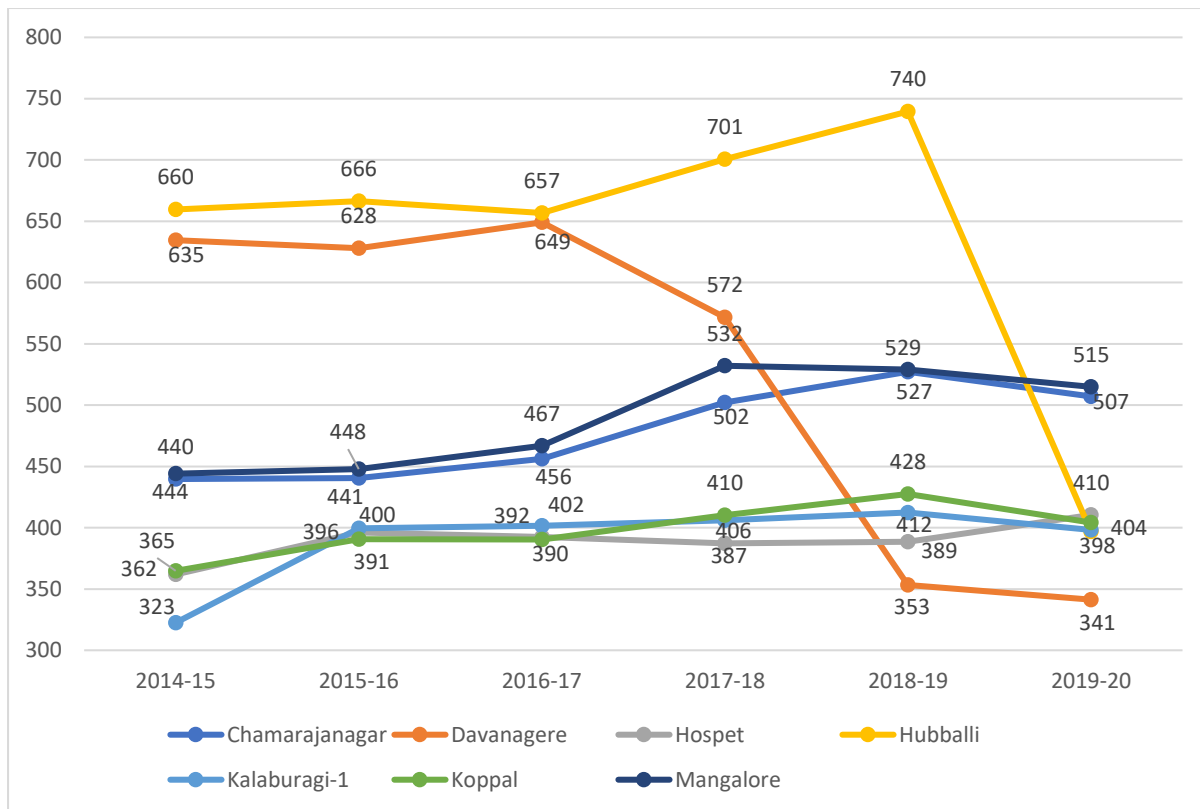
Figure 13: YOY Growth Rate for Average Fleet Held (Division Level Outliers) Level (Source: Admin Report)

In terms of overall size, while KSRTC maintains a much larger fleet than NWKRTC, the differences in passengers carried is much lesser. In addition, despite the fact that the KKRTC fleet size increased to about the same size as for NWKRTC, there is still a large gap in the passengers carried by the buses in this corporation.

The average fleet position for each division over the last five years is given below. While the ordering of this list is similar to the one we have seen in the previous section, it is clear that fleet size does not exactly correlate to passengers carried, as for the corporations. As an example, while the passengers carried over a year in Bangalore is among the lowest in the division at 353.73 lakh, the average fleet size is among the highest, at 644.

Table 25: *Division Level Fleet Held (Evaluation Average) Level (Source: Admin Report)*

Corp	Division	Fleet Size (Evaluation Average)
NWKRTC	Belgavi	691
KKRTC	Vijayapur	652
KSRTC	Bangalore Central	644
NWKRTC	Hubballi	637
NWKRTC	Bagalkot	634
KSRTC	Mysuru Rural	632
NWKRTC	Chikodi	628
KSRTC	Tumkur	590
KKRTC	Raichur	579
KSRTC	Hassan	572
KSRTC	Chikkaballapura	553
KSRTC	Kolar	552
KSRTC	Chikmagalur	550
KSRTC	Davanagere	530
NWKRTC	Gadag	530
KSRTC	Puttur	523
KKRTC	Bidar	521
NWKRTC	North Kannada	512
KSRTC	Ramanagara	497
NWKRTC	Haveri	494
KSRTC	Mangalore	489
KSRTC	Chamarajanagar	479
KSRTC	Mandya	444
NWKRTC	Dharawad (Rural)	424
KSRTC	Mysuru Urban	410
KKRTC	Kalaburagi-2	400
KKRTC	Koppal	398
KKRTC	Kalaburagi-1	390
KKRTC	Hospet	389
KKRTC	Ballari	348
KKRTC	Yadgiri	320
KSRTC	Chitradurga	289
KSRTC	Shivamogga	283
NWKRTC	Hubballi Dharawad City Division	274

Given the varying trends for the bus types in the RTC fleets for each of the corporations, we also examine the overall strength broken down by bus type, but for the latest year as opposed to the evaluation average. Given that Leyland, Tata and Eicher are common across corporations, we look at all divisions for these three figures together in the table below. What we can clearly see is that in most divisions, there is a across bus type, but no one division has

the highest number of buses from each type. Vijayapur from KKRTC has the most Leyland buses (499) with the next closest divisions coming from all three corporations in range of 350 buses. In the case of Tata, the maximum concentration is in KSRTC, led by the divisions Hassan (277), Ramanagara (243) and Mysuru Rural (241). Chikodi (151) and Puttur (109) hold the highest number of Eicher buses, with the next closest divisions holding 114 buses each (Chikmagalur and North Kannada).

Table 26: Leyland, Tata and Eicher buses held by Division for 2019-20 *Level (Source: Admin Report)*

Corporation	Division	Leyland	Tata	Eicher
KSRTC	Bangalore Central	248	145	82
KSRTC	Chamarajanagar	282	191	98
KSRTC	Chikkaballapura	331	172	101
KSRTC	Chikmagalur	254	211	114
KSRTC	Chitradurga	164	91	38
KSRTC	Davanagere	183	117	45
KSRTC	Hassan	195	277	102
KSRTC	Kolar	317	167	95
KSRTC	Mandya	243	166	68
KSRTC	Mangalore	285	150	84
KSRTC	Mysuru Rural	266	241	109
KSRTC	Mysuru Urban	212	180	20
KSRTC	Puttur	235	211	142
KSRTC	Ramanagara	221	243	69
KSRTC	Shivamogga	161	128	33
KSRTC	Tumkur	342	215	91
NWKRTC	Bagalkot	358	211	99
NWKRTC	Belgaum	327	204	99
NWKRTC	Chikodi	346	131	151
NWKRTC	Dharwad	206	145	69
NWKRTC	Gadag	290	175	107
NWKRTC	Haveri	271	134	102
NWKRTC	Hubballi	251	117	58
NWKRTC	North Kannada	314	108	114
KKRTC	Ballari	190	110	68
KKRTC	Bidar	311	146	106
KKRTC	Hospet	261	131	74
KKRTC	Kalaburagi-I	281	88	47
KKRTC	Kalaburagi-II	293	95	79
KKRTC	Koppal	274	48	84
KKRTC	Raichur	352	172	90
KKRTC	Vijayapur	499	137	108
KKRTC	Yadagiri	227	84	48

Now for the other bus types, we turn to each corporation specifically. For KSRTC, we see that in all the Luxury categories, as well as for sleeper buses, Bangalore holds the most in each category, with Mangalore and Mysuru Rural also having a fair share in Volvo as well as in Corona A/C and Scania buses. Other divisions with luxury buses are Shivamogga, Davanagere and Mysuru Urban.

Table 27: KSRTC Bus Types by Divisions Holding them for 2019-20 *Level (Source: Admin Report)*

Bus Type	Divisions Holding (Fleet strength)
Volvo	Bangalore Central (171), Mangalore (94), Mysuru Rural (72), Mysuru Urban (36), Shivamogga (25), Davanagere (19)
Corona A/C	Bangalore Central (38), Mangalore (15), Shivamogga (2)
M-Benz	Bangalore Central (10)
M-Benz M-Ax	Bangalore Central (17)
Scania	Bangalore Central (50), Mysuru Rural (14), Shivamogga (4), Mangalore (4), Davanagere (3)

Under NWKRTC, Belgavi and Hubballi are among the top holders of Sleeper coaches and Volvo luxury buses. In the case of Midi buses, Belgavi is still among the top, closely followed by Dharwad and North Kannada. Other divisions covering Sleeper coaches and Midi buses are Haveri, Chikodi and Bagalkot.

Table 28: NWKRTC Bus Types by Divisions Holding them for 2019-20 Level (Source: Admin Report)

Bus Type	Divisions Holding (Fleet strength)
Midi	Belgavi (50), Dharwad (45), North Kannada (38), Haveri (30), Chikodi (20), Bagalkot (17)
Sleeper Coach	Hubballi (24), Belgavi (20), North Kannada (12), Bagalkot (12), Chikodi (10), Dharwad (6), Haveri (6), Gadag (2)
Volvo	Belgavi (20), Hubballi (19)

For KKRTC, we see that Bidar is the only one holding Midi buses, while Kalaburagi-I holds the most Corona as well as Mini JNNURM buses, with Ballari also among the top in both these cases. All the other divisions but Kalaburagi-II hold buses under the Mini JNNURM category, with other top holders being Raichur and Vijayapur.

Table 29: KKRTC Bus Types by Divisions Holding them for 2019-20 Level (Source: Admin Report)

Bus Type	Divisions Holding (Fleet strength)
Midi	Bidar (4)
Corona	Kalaburagi-I (8), Ballari (7), Koppal (4), Raichur (4), Hospet (3)
Mini JNNURM	Kalaburagi-I (57), Raichur (45), Ballari (36), Vijayapur (35), Koppal (30), Hospet (30), Bidar (21), Yadgiri (11)

Instead of looking at Buses on Road (which is highly correlated with Fleet held), we examine the fleet Utilisation to see how efficiently these buses are being used and what the emerging trends have been over the evaluation period. At the corporation level, a clearly declining trend is seen for both NWKRTC and KKRTC, with the fleet utilization dropping from 95% to 91% and 88% to 85% respectively. While in the case of NWKRTC, a major part of the decline happens in 2019-20 (3 pp), for NEKKRTC the value actually rises up to 91%, succeeded by a drop of 5 pp in 2018-19. The utilization for KSRTC stays near constant throughout the evaluation duration, between 91% and 93%. In terms of absolute values, the NWKRTC shows a higher average utilization level, but this value drops to about the same level as KSRTC by 2020. KKRTC, while it touched a high of 91% from 2016-17 to 2017-18, is about 3 pp lower than the other two at the end of the evaluation period. Speaking to corporation officials, it was established that the reason for this consistent drop across the board was the onset of the Coronavirus pandemic in India in March 2020. At the start of the month, services were reduced in some divisions, and towards the end of the month they were completely shut down as the lockdown was established, lowering the overall utilisation, as well as the effective kilometres covered and revenue generated.
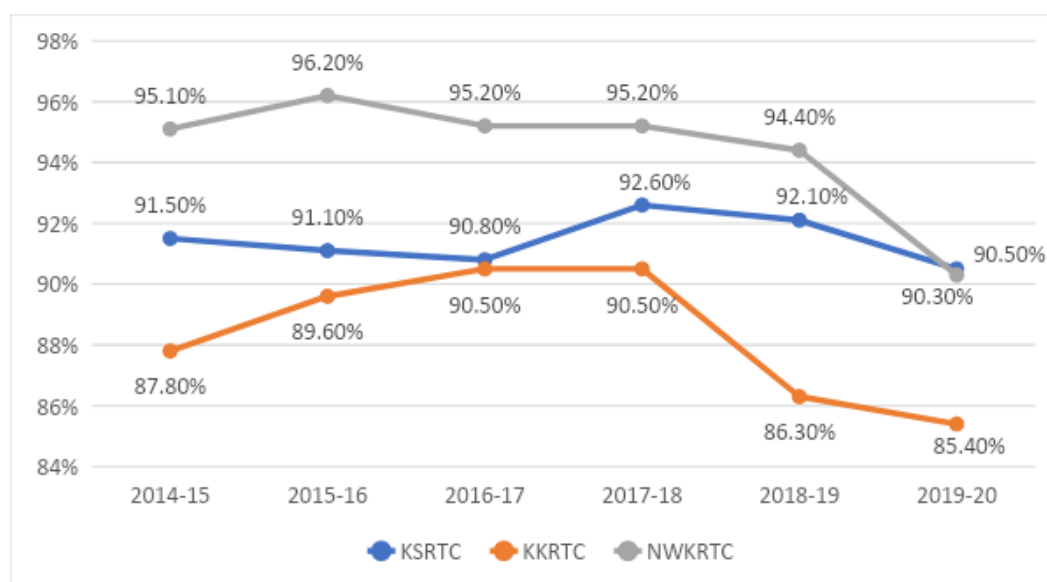
Figure 14: Fleet Utilisation Trend at Corporation Level (Source: Admin Report)

In terms of Fleet Utilisation at the division level, the values are confined between 85% and 97% across all divisions. Here, NWKRTC stands out extensively when looking at the Evaluation average, with 6 of its 9 divisions having the best fleet utilization levels in the state, namely Bagalkot (96.4%), Haveri (95%), Chikodi (95%), Gadag (94.8%), North Kannada (94.6%) and Belgavi (94.02%). The depots at KSRTC are not far behind, with 11 of the next 15 depots coming from that corporation, led by Chamarajanagar (94%), Hassan (93.8%) and Chikkaballapura (93.6%). KKRTC divisions are seen more at the lower end, with 7 of the bottom 10 coming from that division, with the lowest being Kalaburagi-1 (85.1%), Yadgiri (85.6%) and Ballari (85.82%). KSRTC divisions Bangalore Central (85.8%), Mangalore (88%) and Ramanagara (89.3%) are the other three in the bottom 10.

Looking at movement, there is an overall decreasing trend over the Evaluation period, with the overall average at -1 pp. For this reason, the rankings based on the 5-year average and based on the latest year's (2019-20) performance are different. For a majority of the divisions this value is within ±3 pp, excluding 10 divisions. Of these, the value has only increased for Yadgiri, by 3.4 pp, to 86.4%. For the remaining 9, it is an overall decrease, with the maximum decrease for Hubballi by 7.6 pp, to 87.3%. The depots with their respective trends and pp changes for the overall period are given below. Here as well, the major reason for this decrease across the board is, as previously mentioned, the COVID-19 spread in India in 2020 March and the resulting impact on Karnataka, and the entire country's public transport services.

Table 30: *Division Level Fleet Utilisation and PP Change Level (Source: Admin Report)*

Corporation	Division	5-year-Average	pp change (2014-15 to 2019-20)
NWKRTC	Hubballi	92.78	-7.6%
KKRTC	Vijayapur	87.97	-6.9%
NWKRTC	Gadag	94.80	-5.5%
KKRTC	Bidar	89.65	-5.3%
NWKRTC	Belgavi	94.02	-5.0%
NWKRTC	Dharawad (Rural)	92.77	-4.6%
NWKRTC	North Kannada	94.60	-4.5%
NWKRTC	Bagalkot	96.37	-4.1%
NWKRTC	Haveri	95.00	-3.3%
KKRTC	Yadgiri	85.73	3.4%

d. **Average Age of Fleet**

At the corporation level, KKRTC has the youngest fleet on average (5.83 lakh kms), followed by KSRTC (6.65 lakh kms) and NWKRTC (6.81 lakh kms). All the corporations have shown an increasing trend over the evaluation period, with KSRTC and NWKRTC growing consistently at similar rates, with AAGR values of 5.81% and 5.58% respectively. In the case of KKRTC, the average age was constant half of the time, with the changes only observed in 2015-16 (11.07%) and 2019-20 (14.46%), with a drop in 2016-17 (-9.38%). For this reason, the jump for KKRTC is not that high, with the AAGR coming to only 3.32%.
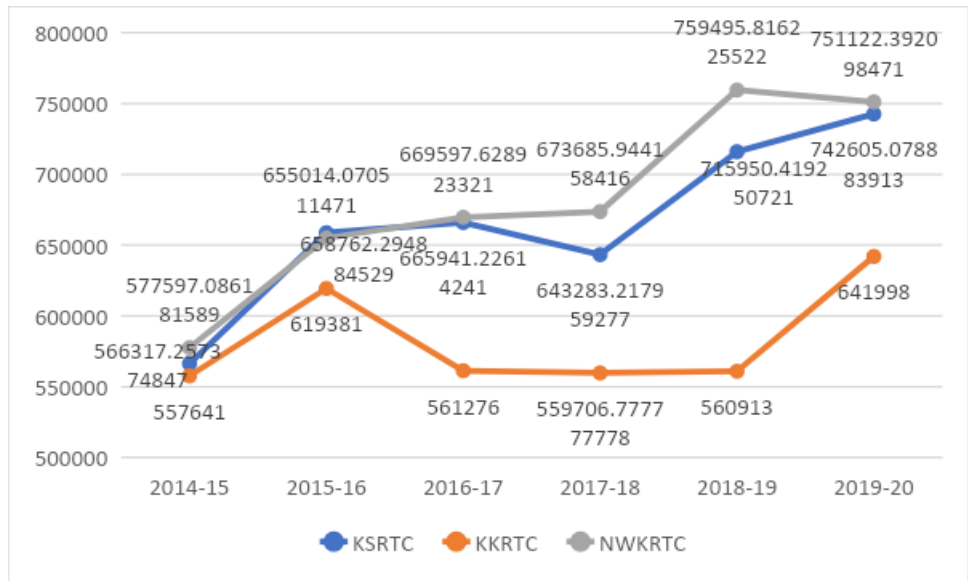
Figure 15: Average Age of Vehicles (in km) Trend at Corporation Level (Source: Admin Report)

At the division level, this statistic shows higher fluctuation than its counter parts because every year new buses are being added and scrapped from the fleet, with some years having a larger requirement than others. As a consequence, the AAGR fluctuates a lot from year to year for nearly all divisions. In a general sense however, the age is on an increasing trend, with more than half (18 divisions) showing more than 5% AAGR in the age (in lakh kms) for the evaluation period. These are those divisions where there is more positive than negative fluctuation, leading to an overall increase over the 5 years. We look at the divisions at both ends of the spectrum in the graph below.

The divisions with the highest AAGR for the evaluation period are from NWKRTC and KSRTC, namely Shivamogga (10.4%) – newly formed in 2017-18, Bagalkot (9.05%), Chikmagalur (8.7%), Hubballi (8.9%) and Mysuru Urban (8.8%). Here, we can see that while Chikmagalur and Mysuru Urban have years where there is a significant drop in the age (due to scrapping/adding new vehicles), Bagalkot and Hubballi have an increasing fleet age throughout.
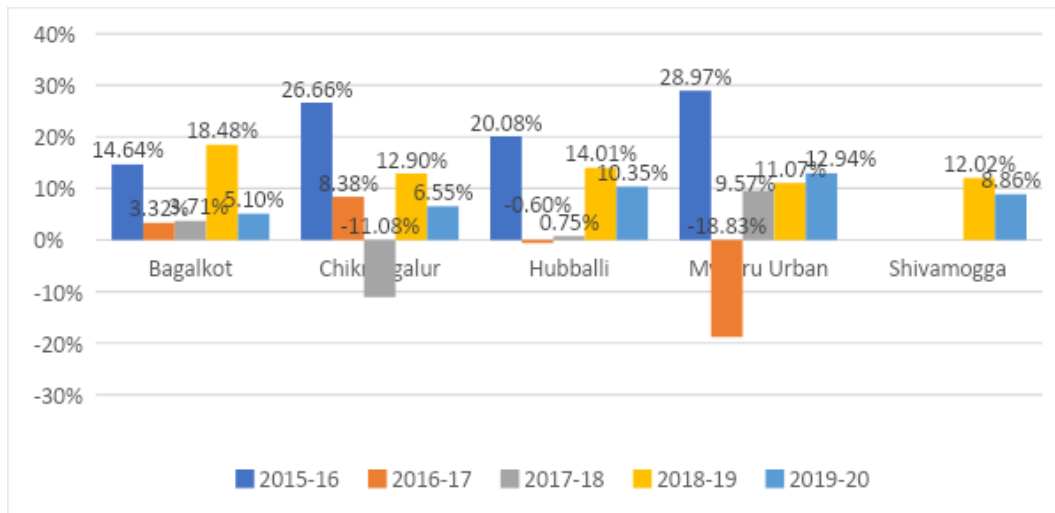
Figure 16: Positive Trend Divisions with Highest AAGR of Fleet Held Level (Source: Admin Report)

On the other end, we see divisions primarily from KKRTC, namely Raichur (-0.1%), Mangalore (0.9%), Koppal (1.5%), Hospet (1.9%) and Ballari (2.4%), with the lowest AAGR values of all the divisions. The distinction clearly visible here is that there is a balance in the increase and decrease over the 5 years, with an equilibrium being reached when looking at the AAGR as a whole.
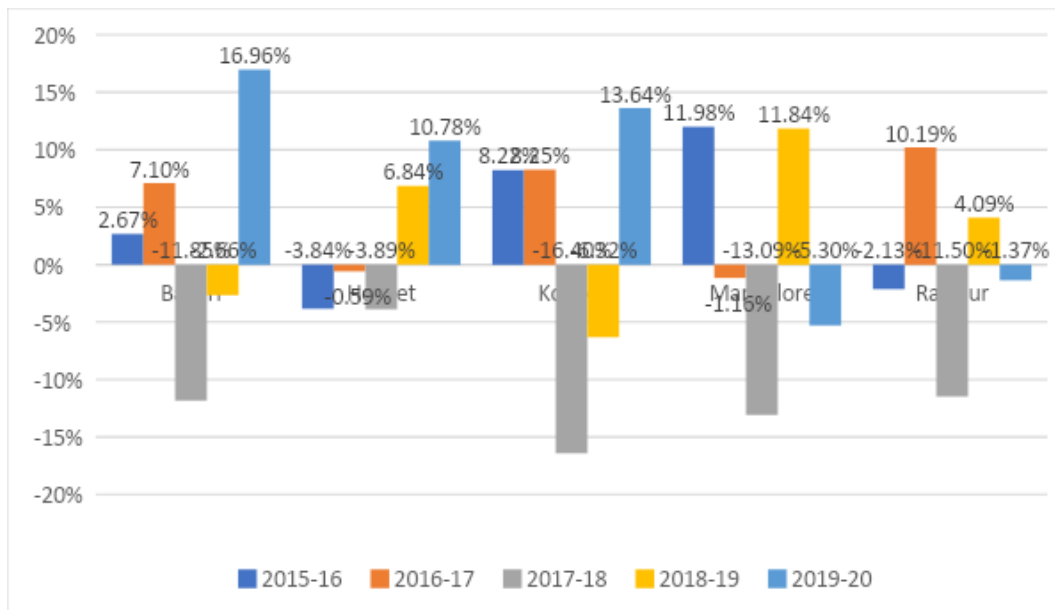
Figure 17: Negative Trend Divisions with Highest AAGR of Fleet Held Level (Source: Admin Report)

e. Accidents and Breakdowns

It is quite evident from the statistics that Accidents happen much more frequently than Breakdowns. Comparing the three corporations, KSRTC has the highest average rate of accidents per lakh kms at 0.107, followed by almost equal values for NWKRTC and KKRTC

at 0.075 and 0.073 respectively. In terms of trends, we see a slight decreasing trend for all three corporations over the three years, which is a positive indication.
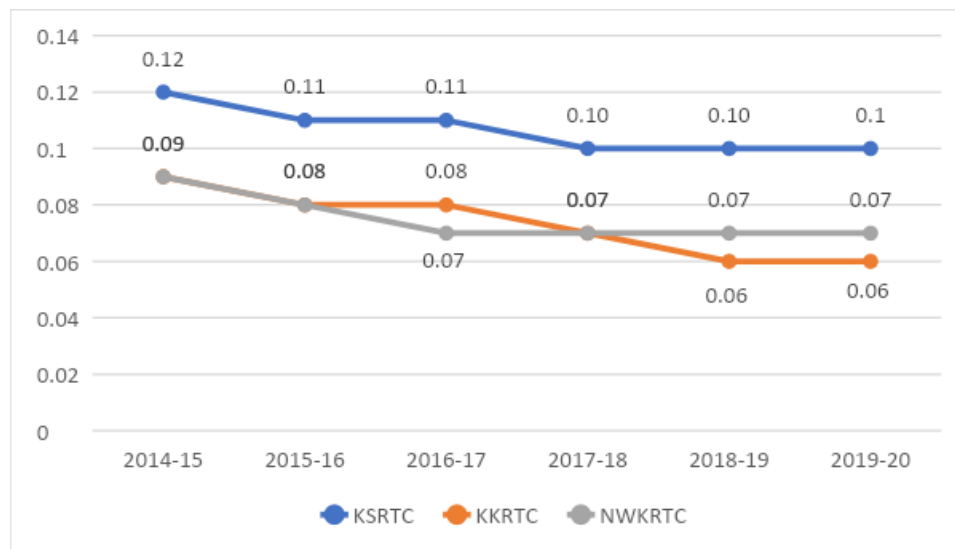
Figure 18: Corporation Level Trends for Accident Rates per lakh km Level (Source: Admin Report)

Looking at breakdowns, KSRTC actually has the lowest overall average rate of 0.027 per 10,000 kms, followed by NWKRTC at 0.033 and KKRTC 0.075 respectively, which is a complete reversal of the rate of accidents. Over the evaluation period we see the breakdown rate for KSRTC drop from 0.04 to 0.02 and the KKRTC rate drop from 0.09 to 0.06 over the evaluation period, while the NWKRTC rate stays almost constant between 0.03 and 0.04 breakdowns per 10,000 kms. Comparing to NWKRTC's performance in previous years, the rate of Accidents per lakh kms operated has come down by nearly half, while the rate of breakdowns has stayed the same.
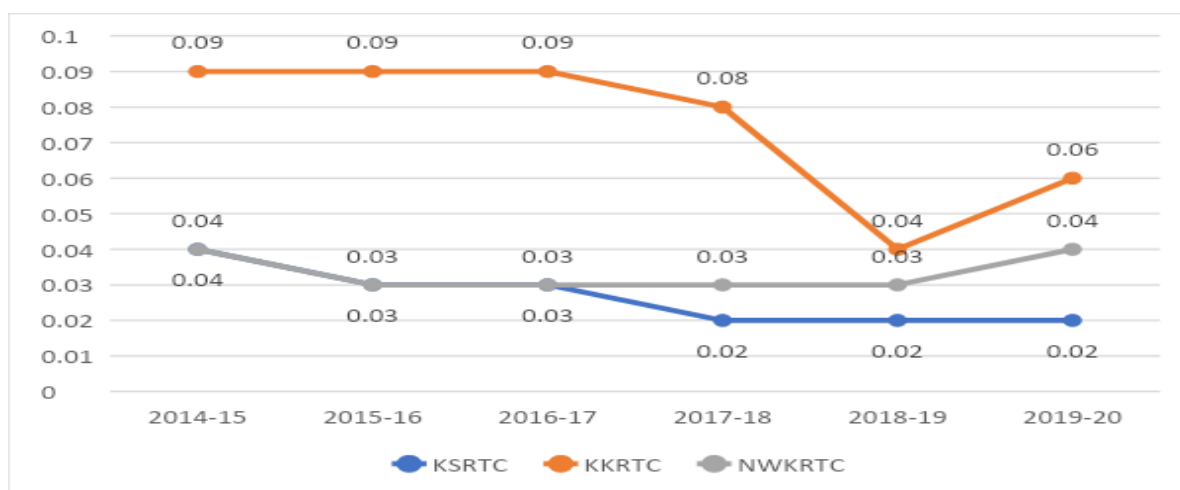
Figure 19: Corporation Level Trends for Breakdown Rates per 10000 km Level (Source: Admin Report)

At the division level as well, the evaluation average for the state is 0.09 accidents per lakh kms (9000 accidents), and 0.04 breakdowns per 10000 kms (400), which is only about 5% of the figure aforementioned. We can see the divisions arranged into brackets as per their rates of accidents in the table below. Vijayapur and Kalaburagi-2 (KKRTC) as well as Chikodi (KSRTC) and Bagalkot (NWKRTC) make up the divisions with the lowest average rate of accidents per lakh kms for the evaluation period. At the other end, Mandya, Chamarajanagar and Mangalore (all KSRTC) make up the divisions with the highest rates of accident per lakh kms on average for the evaluation period. On speaking with a corporation official from KSRTC, it was discovered that Mysuru Rural, Mandya, Chamarajanagar and Mangalore are all part of the Western Ghats area, and are prone to accidents because of the nature of the terrain. There are a lot of turnings on those routes, and it is often difficult to see oncoming vehicles. Around 80-90% of the accidents that happen here are with smaller vehicles, like bikes and scooters. Most divisions have a rate between 0.07 and 0.10 on average.

Table 31: *Brackets of Divisions based on Rate of Accidents (per lakh km) Level (Source: Admin Report)*

Rate of Accidents per lakh km (Evaluation Average): Brackets	Divisions in the Bracket
0.06-0.07	Vijayapur, Chikodi, Kalaburagi-2, Bagalkot
0.07-0.08	Raichur, Yadgiri, Gadag, Koppal, Hubballi. Dharawad City Division, Dharawad (Rural), Belgavi
0.08-0.09	Bidar, Chikkaballapura, Hubballi, Chitradurga, Kolar, Ballari
0.09-0.10	Tumkur, Bangalore Central, Kalaburagi-1, Haveri, Davanagere
0.10-0.11	Mysuru Rural, Hospet, Hassan, Chikmagalur, Mysuru Urban
0.11-0.12	Shivamogga, Puttur, Ramanagara, North Kannada
> 0.13	Mandya, Chamarajanagar, Mangalore

Similarly examining the rate of breakdowns per 10000 km, we see that all three RTCs are represented at the lowest rates, with Mysuru Rural, Kolar and Bagalkot. Most divisions have a rate between 0.02 and 0.03 on average. However, at the other end, we see that all but 1 division at the higher rates (> 0.08) are from KKRTC. Speaking to corporation officials, they have indicated that this has a lot to do with the quality of the road infrastructure in interior regions, citing poor maintenance and upkeep leading to these issues.

Table 32: *Brackets of Divisions based on Rate of Breakdowns (per 10000 km) d Level (Source: Admin Report)*

Rate of Breakdowns per 10000 km (Evaluation Average): Brackets	Divisions in the Bracket
0.01-0.02	Mysuru Rural, Kolar, Bagalkot
0.02-0.03	Hassan, Puttur, Davanagere, Bangalore Central, Chikkaballapura, Chamarajanagar, Mangalore, Ramanagara, North Kannada, Belgavi, Chikodi
0.03-0.04	Chikmagalur, Gadag, Tumkur, Chitradurga, Hubballi, Shivamogga, Mandya
0.04-0.5	Koppal, Vijayapur, Haveri, Dharawad (Rural)
0.05-0.08	Mysuru Urban, Hospet, Raichur
>0.08	Kalaburagi-2, Ballari, Hubballi Dharawad City Division, Yadgiri, Kalaburagi-1, Bidar

On average, we see an overall decreasing trend for both categories, with the overall AAGR coming to -5.5% for accidents and -5.3% for breakdowns. However, this is not commensurate across both points for each division, with most divisions performing differently in either category. We specifically look at the divisions where these values can be seen to be decreasing over the evaluation period. For accident rates, the divisions where the absolute difference was 0.05 or more for the evaluation period were looked at. All RTCs are represented among the 6 divisions that fit this criteria, with 3 from KSRTC (Davanagere, Mangalore, Mysuru Urban), 2 from NWKRTC (Belgavi, Gadag) and 1 from 2 from KKRTC (Hospet). While Mangalore saw this number fall by the largest amount (0.07), the largest percentage drop was for Belgavi (58%) and Davanagere (50%).
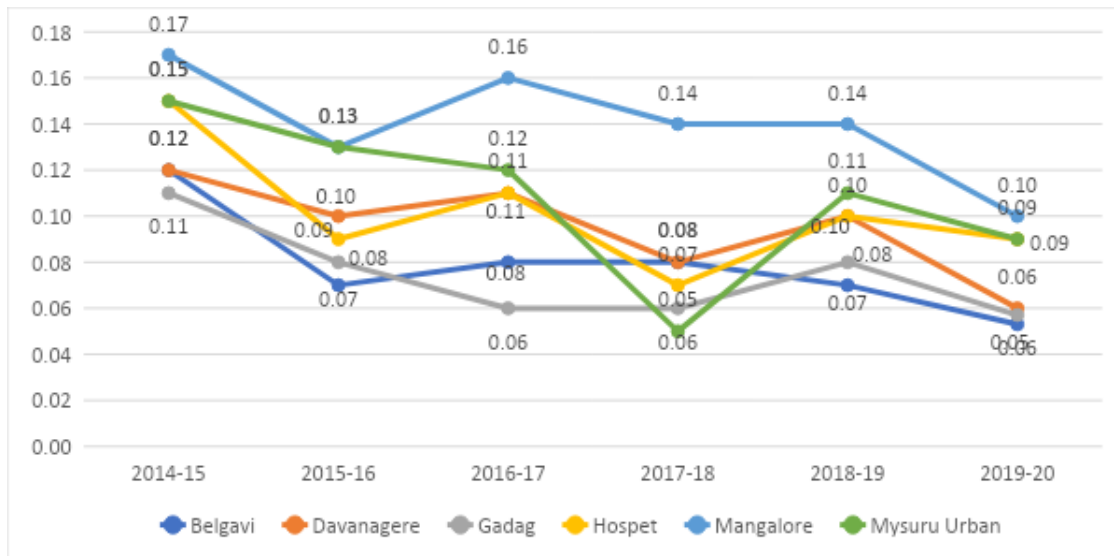
Figure 20: Divisions with Top Decreasing Trends for Rate of Accidents per lakh km Level (Source: Admin Report)

Examining the rate of breakdown, the divisions where the absolute difference was 0.04 or more for the evaluation period were looked at, given the relatively lower values for this statistic. Five 5 of the six 6 divisions here are from KKRTC, with the remaining division being from KSRTC (Chikmagalur). Raichur and Chikmagalur saw this number fall by the largest amount (0.05), and the largest percentage drop was also for the latter of the two divisions (83%).
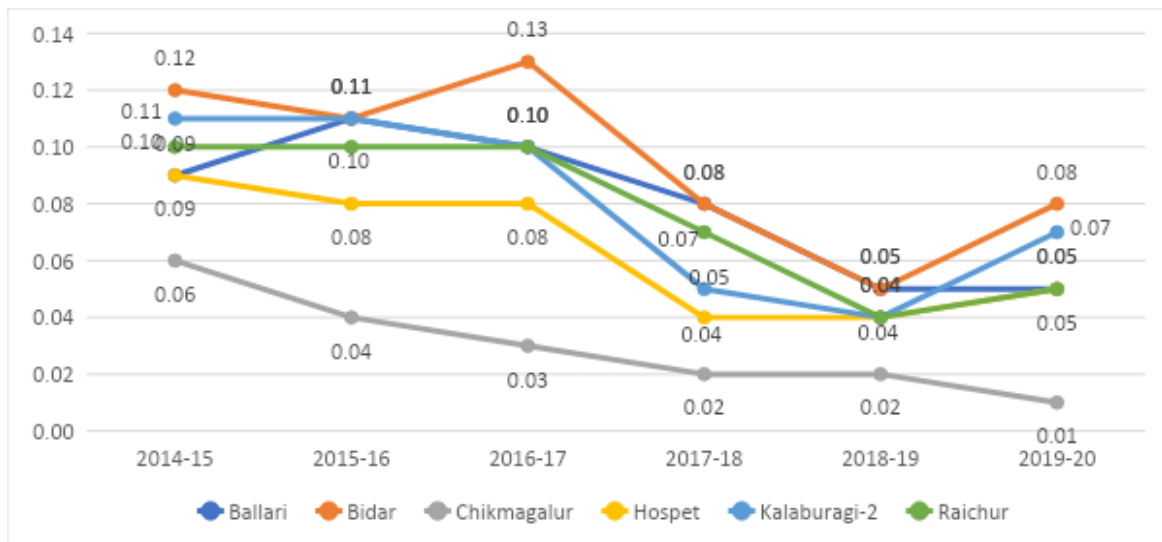
Figure 21: Corporation Level Trends for Breakdown Rates per 10000 km Level (Source: Admin Report)

f. Scheduled and Effective Kilometres

At the corporation level, in terms of absolute values, given the larger coverage of divisions, KSRTC has the highest average scheduled kilometres at 10,235 km daily, followed by NWKRTC at 5,885 km and KKRTC at 5,108 km daily respectively. We can see in the graph

below that there is an overall increasing trend when it comes to the scheduled (and hence effective kilometres) in the case of KSRTC and KKRTC. For all corporations, there is an increasing trend up until 2018-19 followed by a drop in 2019-20, but in the case of NWKRTC the drop is slightly below its figures from 2014-15. As mentioned previously, the major reason for this decrease across the board in 2019-20 is the COVID-19 spread in India in 2020 March and the resulting impact on Karnataka, and the entire country's public transport services. What we also observe is that the gap between scheduled and effective kilometres is a decreasing one for KSRTC and NWKRTC, with the values coming very close to each other towards the end of the evaluation period, while there is an almost consistent gap between in the two in the case of KKRTC. Unsurprisingly, the ratio of Effective to Scheduled kilometres is 0.99 for both KSRTC and NWKRTC, while it is 0.96 for KKRTC. Despite having a fleet of about the same size, the effective kilometres covered by NWKRTC have gone up considerably compared to the baseline, increasing by nearly 800 lakh km to 60.4 crore in 2017-18, and settling down at a surplus of 400 km in 2020, from the distance covered in 2012-13.
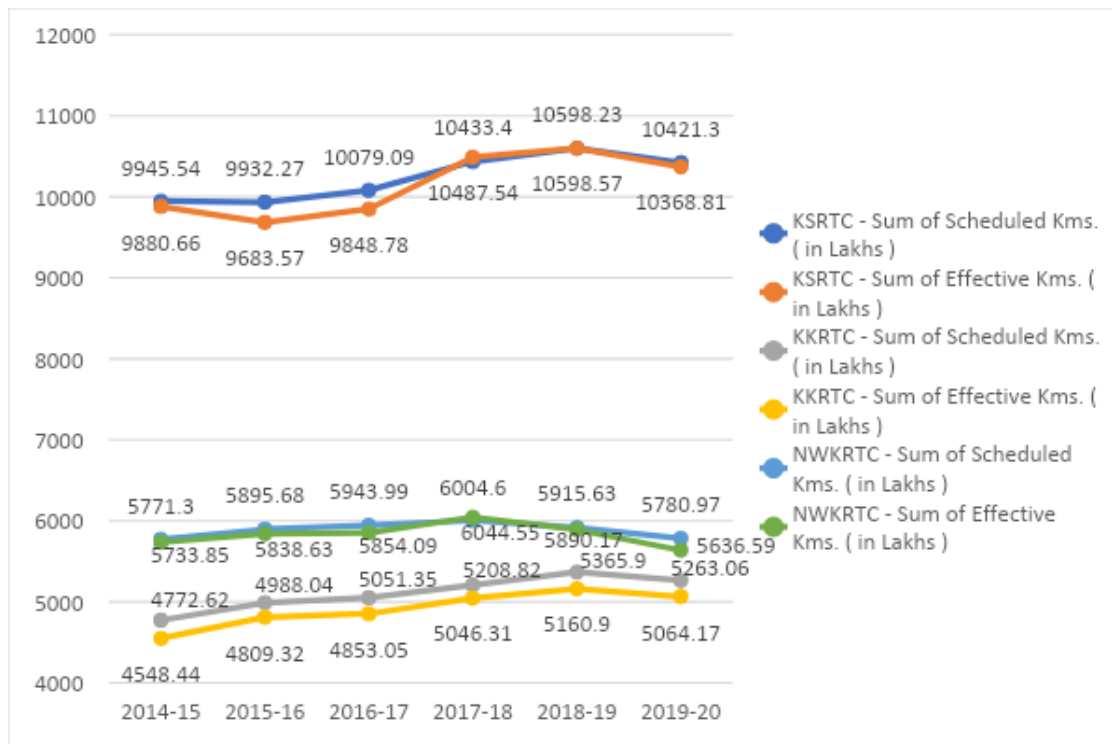
Figure 22: Corporation Level Trends for Scheduled vs Effective Kilometres Level (Source: Admin Report)

At the division level, there are no clear trends when it comes to scheduled and effective kilometres. The AAGR values are very low across the board, except for those divisions that have either reduced in size (Davanagere, Hubballi), or those that have been newly formed (Shivamogga, Chitradurga). Only a handful of divisions show a pronounced increasing trend (AAGR > 2%), with a majority of them from KKRTC (Kalaburagi-1, Kalaburagi-2, Hospet, Koppal) and one from KSRTC (Chamarajanagar). Since the trends are quite similar for both the scheduled and effective kilometres, only the latter is visualized in the graph below.
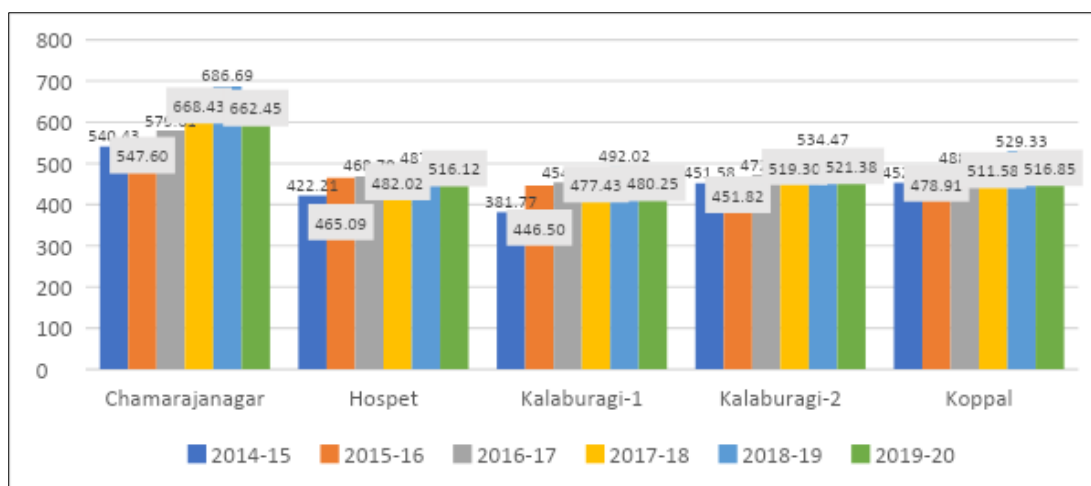
Figure 23: Divisions with Positive AAGR for Effective Kilometres Level (Source: Admin Report)

g. Cancelled, Extra & Dead Kilometers

i. Cancelled and Extra Kilometres

The variation between Scheduled and Effective kilometres is controlled by both Cancelled and Extra kilometres, while the variation between Effective and Gross kms is controlled by Dead kilometres. We will look at these two gaps individually. In the first case, cancelled kms are more responsible for the variability between scheduled and effective kilometres. The overall share of Cancelled kms is 4.2% (of Scheduled kms) and the corresponding Extra kms share is 2.6% (of Scheduled kms). When we break this down by corporation, we see that KKRTC has a relatively higher share of cancelled kms (6.2%), followed by KSRTC (3.8%) AND NWKRTC (2.9%). In terms of patterns, we see an overall increasing trend from KSRTC and NWKRTC, followed by a near constant share for KKRTC. In the latter cases, we see the values drop in 2017-18, only to rise up again past the original values by 2019-20. While in the baseline study we see cancellations fall to nearly half their 2007-08 values to 3%, we see a rising trend over this evaluation period, with the value nearly doubling from the starting point.
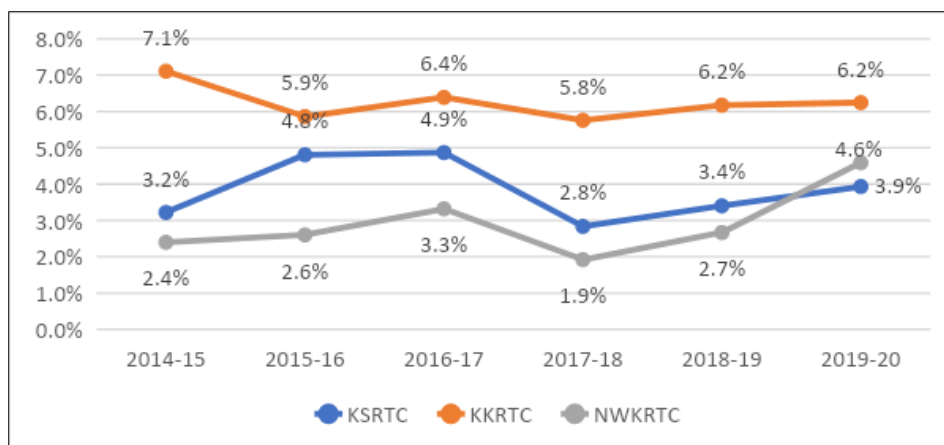
Figure 24: Trends for Cancelled Kilometres (% share of Scheduled kms) at Corp Level (Source: Admin Report)

The extra kms graph follows a pattern that can be considered the inverse of the cancelled kilometres graph, with the troughs of the former, matching the crests of the latter and vice versa in most situations. The inverse behaviour is best observed for NWKRTC, from 2017-18 to 2019-20. This makes logical sense, since the Extra kms would ideally be scheduled to make up for kilometres that were not made up as per the original schedules. Here, KSRTC has the highest average share of extra kms (3.0%), followed by KKRTC (2.4%) and NWKRTC (2.0%). The trends for extra kms generally match those for the cancelled kms, with the KSRTC and NWKRTC values increasing overall, while the KKRTC values are about constant from start to finish.
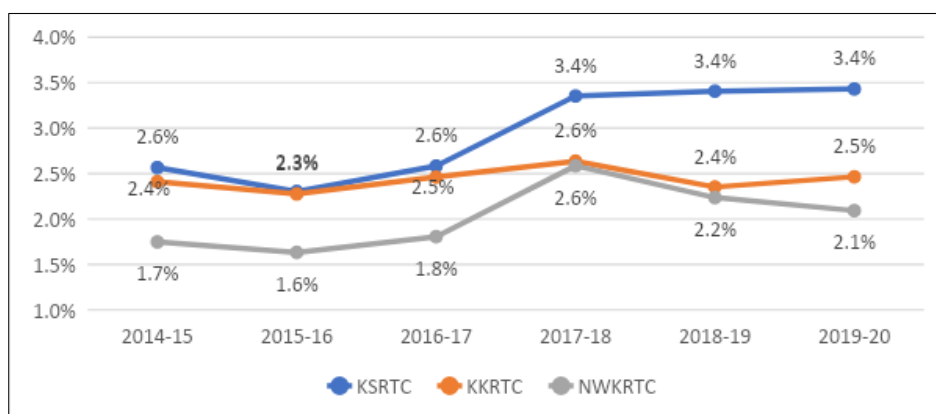
Figure 25: Trends for Extra Kilometres (% share of Scheduled kms) at Corporation Level (Source: Admin Report)

At the division level, the picture is the same. The cancelled kms are more responsible for the variability between scheduled and effective kilometres, i.e., Cancelled kilometres in most cases have a much larger share of Scheduled kilometres. Only 3 divisions violate this condition, namely Bangalore Central (6.6% extra vs 2.1% cancelled kms), Chamarajanagar (4.5% extra vs 3.1% cancelled) and Shivamogga (4.7% extra vs 3.1% cancelled). This is illustrated in the Figure 17, covering the evaluation average values for both Cancelled and Extra kms for all divisions.
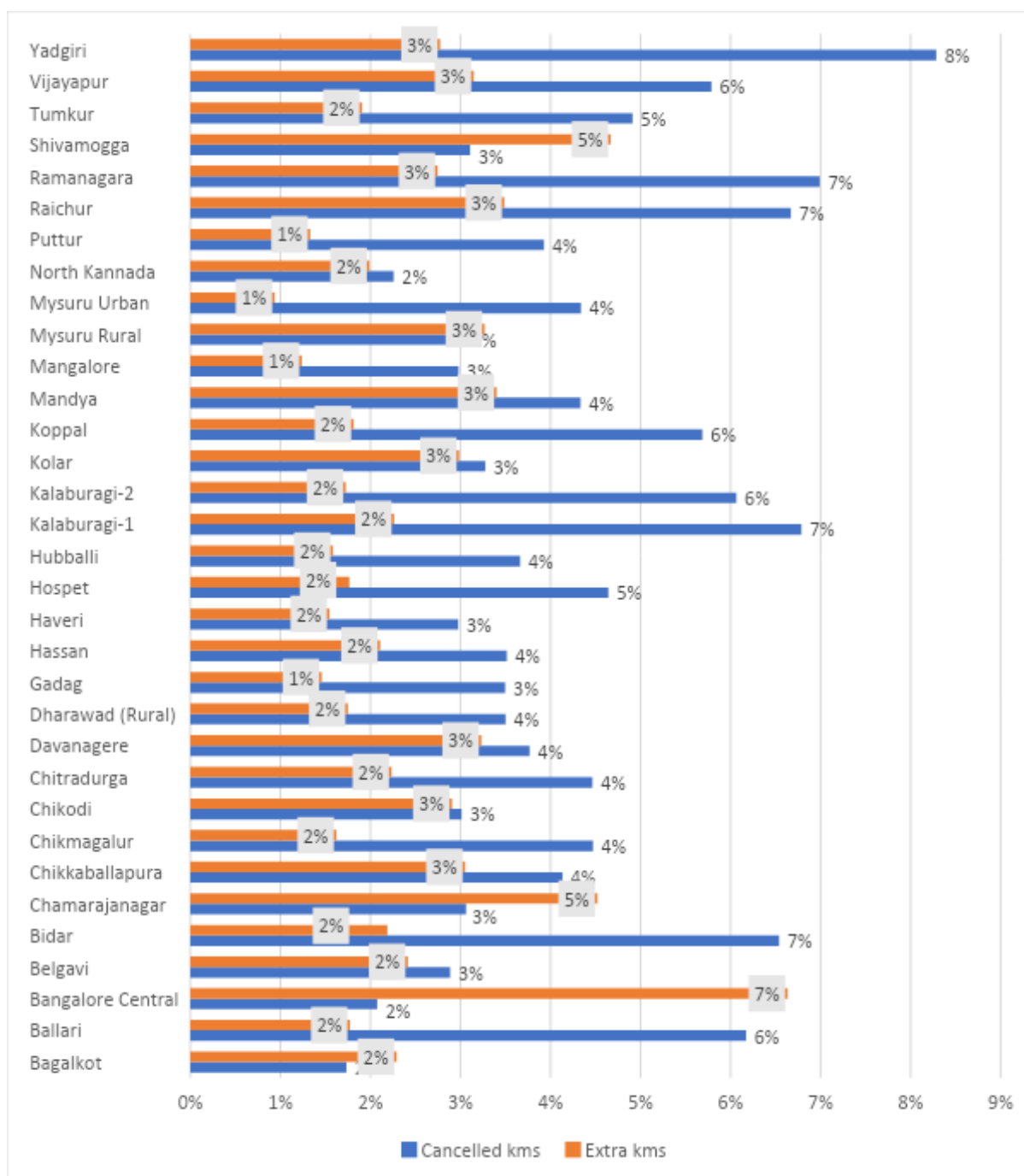
Figure 26: Cancelled kms vs Extra kms as share of Scheduled kms (Evaluation Average) at Division Level (Source: Admin Report)

Extra kms travelled by buses show little to no variation over the years, confined between 1% and 3% of scheduled kilometres for nearly all divisions averaging across the evaluation period. The same three divisions mentioned above violate this criterion. In the case of Bangalore Central, the value of Extra kms increases gradually from 5% to 8% over the evaluation period, while for Chamarajanagar it gradually increases from 3% to 6%. Shivamogga, newly formed in 2017-18, has about a constant value between 4% and 5%.

On the other hand, cancelled kms are more variable from year to year and division to division, with varying trends for different divisions. More than half of the (18) divisions have a less than 2 pp difference between the start and end of the evaluation period, while 8 divisions have a difference of between 2 pp and 3 pp (both positive and negative). The remaining (7) have a gap of 3 pp or more between the start and end of the evaluation period. The divisions in the latter two categories have been highlighted in the figures below.

In the first category, we have 4 divisions with increasing trends, and 4 with decreasing trends. Examining the pp difference for the evaluation period, in the first group we have Chikodi (2.00%), Bidar (2.03%), Dharawad (Rural) (2.64%) and Chamarajanagar (2.85%). On the other side, we have Chikmagalur (-2.02%), Davanagere (-2.62%), Koppal (-2.72%) and Kalaburagi-1 (-2.94%). NWKRTC has two depots only with increasing trends (Chikodi and Dharawad). Both KSRTC and KKRTC have one division on the increasing end (Chamrajanagara and Bidar) and two on the decreasing end. As in the figure, Chamrajanagar is the only division that fluctuates widely, with an increasing trend visible only towards the end of the period, while the others show some fluctuation but stick to their positive/negative trends overall.
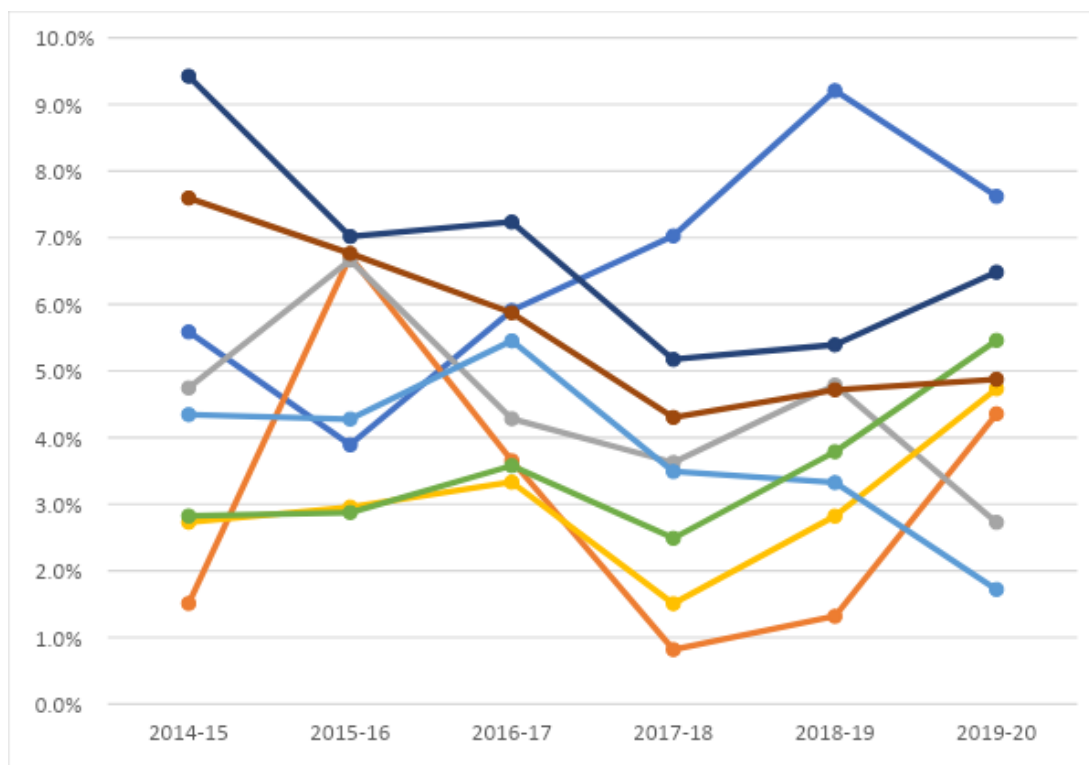
Figure 27: Divisions with Trends for Cancelled kms as a % of Scheduled kms (AAGR between ±2-3 pp) (Source: Admin Report)

In the second category, 6 Six of the seven7 divisions having increasing trends, with only one (Hospet – KKRTC) having a decreasing trend (-3.65 pp difference). For the divisions with the increasing trends, three are from NWKRTC (North Kannada – 3.08 pp, Hubballi – 3.67 pp, Belgavi – 4 pp) and KSRTC (Ramanagara – 3.02 pp, Mysuru Urban – 3.18, Bangalore Central – 3.58 pp) each. In all of these cases, the data fluctuates across the entire evaluation

period, but there is a pronounced increasing trend visible for each of the divisions. Hospet is the only division that has an almost linear trend in the downward direction. It would be interesting to understand what the reasons for these trends are and explore why they are increasing in some divisions as compared to others.
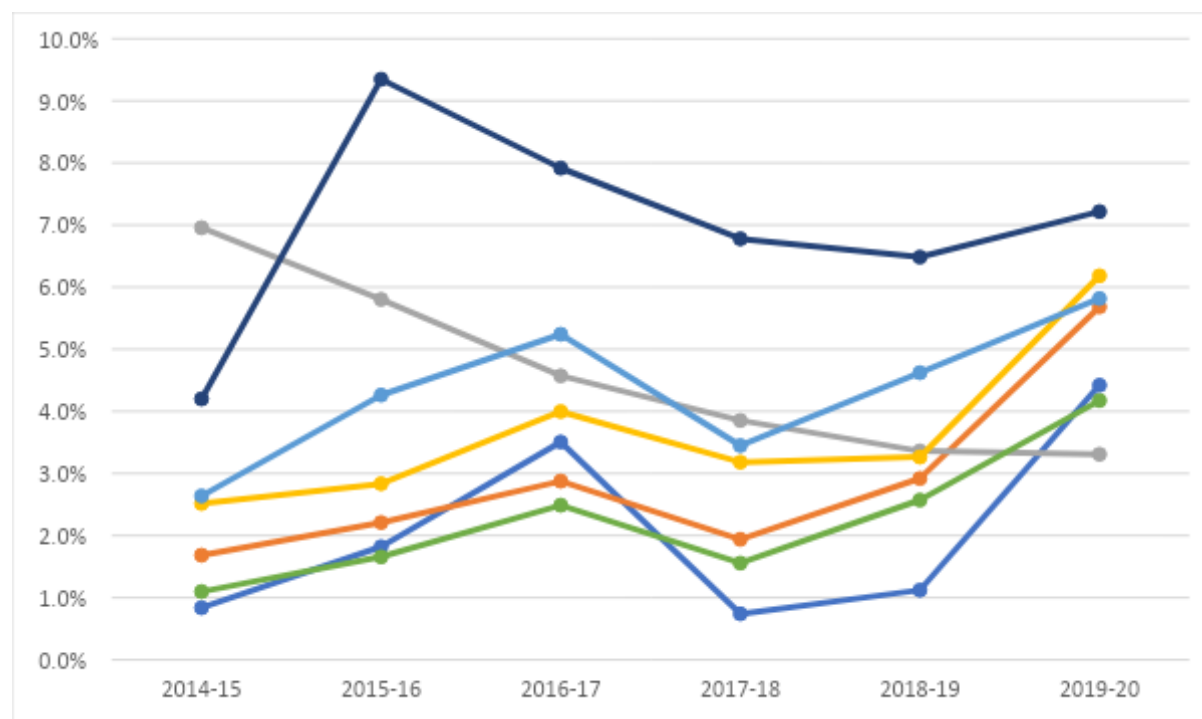
Figure 28: Divisions with Trends for Cancelled kms as a % of Scheduled kms (AAGR > 3 pp) (Source: Admin Report)

ii. Dead Kilometres

Dead kilometres are an additional 3.8% of the effective kms covered under KSRTC, followed by 3.2% for KKRTC and 2.8% for NWKRTC respectively. While KKRTC and KSRTC show clearly decreasing trends, NWKRTC shows a slight increasing trend over the evaluation period. The latter two corporations cover about 4.4% dead kilometres in 2014-15, and while the value for KSRTC only drops to 3.5% in 2016-17 and stays about constant since, at KKRTC the dead kilometre share reduces all throughout down to 2.1%. At NWKRTC the value increases from 2.4% to 3.2% in 2018-19, dropping to 2.9% in 2019-20. For NWKRTC, one of the main reasons for this increase cited by corporation officials was the three new depots that were introduced, leading to an increase in scheduled kilometres, and a subsequent increase in Dead kilometres. Furthermore, expansion work on essential highway routes (Hubballi to NH4 {Pune-Bengaluru}), as well as construction work for Smart city projects on-route have led to significant delays and deviations from the original pathing.
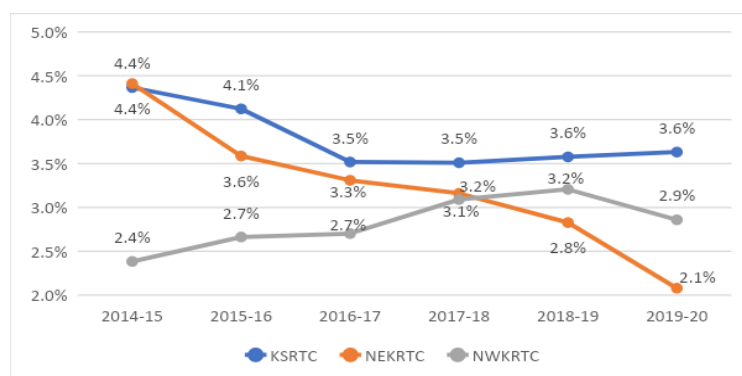
*Figure 29: Trends for Dead Kilometres (% share of Effective kms) at Corporation Level
(Source: Admin Report)*

At division level, similar to extra kilometres, dead kilometres are nearly constant for all
divisions across the evaluation period, with nearly all of the average values confined between
2% and 4% (31 of 34 divisions). The divisions with the higher average values are all from
KSRTC: Hassan (6%), Davanagere (6%) and Mysuru Urban (5%). Observing the trends, all
but 7 divisions have less than 2 pp difference between the start and end of the evaluation
period. The divisions that do not fall into this group are given in the table below, and all of
them have decreasing trends. Two of these divisions are from KSRTC (Davanagere and
Mysuru Urban), and the remaining five are from KKRTC. In each of these scenarios, it can
clearly be seen that the values are gradually reducing from year to year, which means that it is
likely some systematic move has been undertaken to try to bring down these values.

Table 33: *Divisions with Decreasing Trends for Dead Kilometres*

Division/ Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Average	pp Difference
Bidar	5%	4%	4%	3%	3%	3%	4%	-2.83
Davanagere	8%	8%	5%	4%	4%	4%	6%	-3.42
Hospet	5%	3%	3%	3%	2%	2%	3%	-3.26
Kalaburagi-1	5%	4%	3%	3%	3%	2%	3%	-3.35
Kalaburagi-2	5%	5%	4%	4%	3%	3%	4%	-2.57
Mysuru Urban	6%	6%	5%	4%	4%	4%	5%	-2.88
Vijayapur	5%	4%	4%	4%	3%	2%	4%	-2.41

h. Punctuality

Punctuality of the RTC services is measured in terms of both on-time departure from the starting point and timely arrival at the destination. On average, 94% of all bus services depart on time, and 95.2% arrive on time. When we look at the evaluation averages, NWKRTC has the highest on-time arrival and departure rates (96.5% and 96.9% respectively), and the one with the smallest gap between the two as well (0.4%). For KSRTC, 95.2% of the arrivals are on time, which is about 1.5% more than the on-time departures. KKRTC on the other hand, has a higher on-time departure rate of 95.2%, with a lower arrival rate of 93.6%.
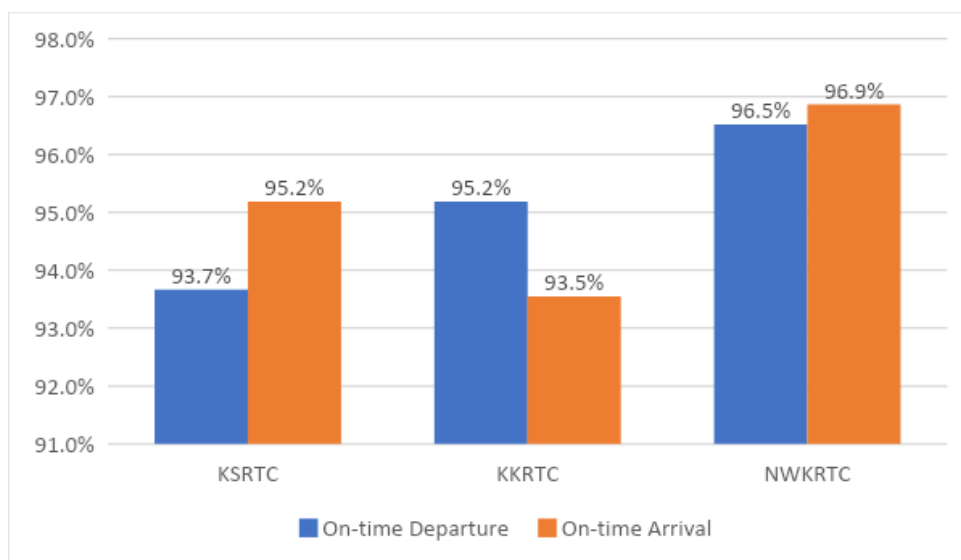
Figure 30: On-time Departure vs Arrival (Evaluation Average) at Corporation Level (Source: Admin Report)

For departure rates, we can observe slight downward trends for NWKRTC and KSRTC, dropping 1.9 pp and 3.5 pp over the evaluation period respectively. For KKRTC there is no clearly observable trend, with a 2.7 pp jump from 2014-15 to 2015-16, and a 1.7 pp drop from 2018-19 to 2019-20, with the values staying almost constant in between.
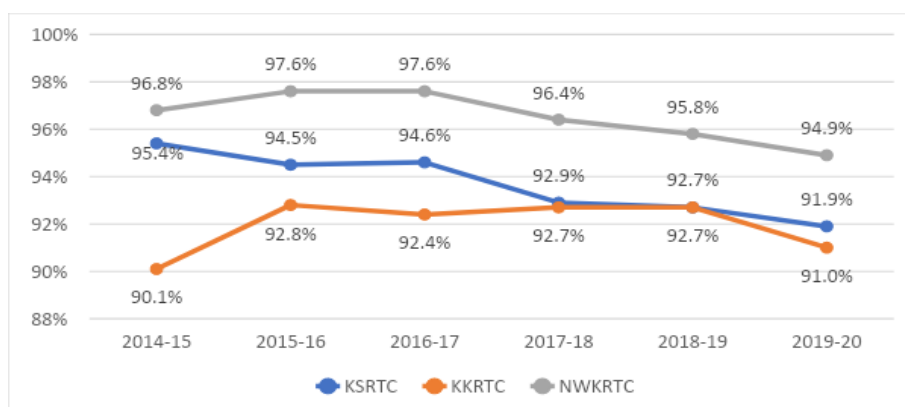
Figure 31: On-time Departure Trends at Corporation Level (Source: Admin Report)

Unlike the departure rates, on-time arrival rates for NWKRTC and KSRTC show no trend, with a 0.4 pp difference for both across the Evaluation duration. On the other hand, KKRTC

shows a slight increasing trend flattening towards the end of the evaluation period, but with a 1.4 pp increase from the rate in 2014-15.
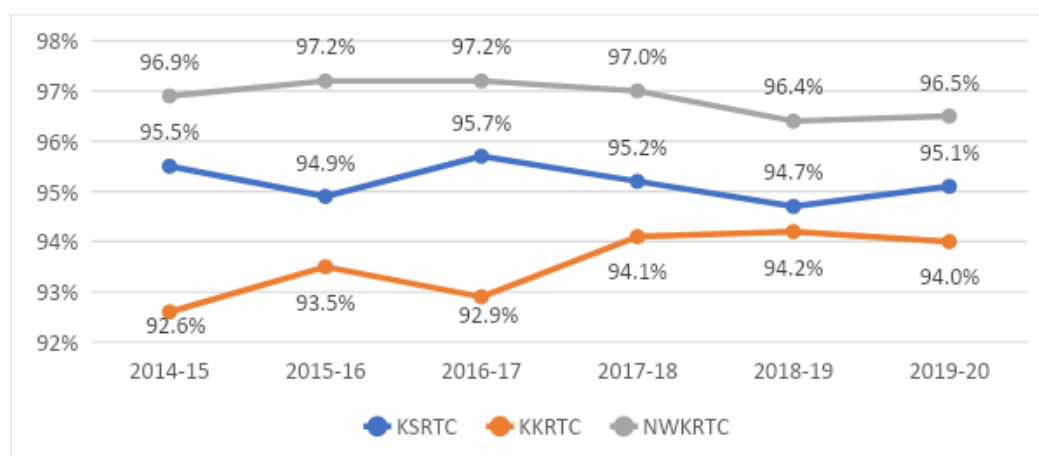
Figure 32: On-time Arrival Trends at Corporation Level (Source: Admin Report)

In general, there is little variation in the on-time departure and arrival rates for most of the divisions. For on-time departures, the average pp variation from 2014-15 to 2019-20 is -0.92, while for arrivals it comes to 0.14. For both indicators, we look at the divisions in a tabular format, arranging them into brackets based on the evaluation average percentage values (given below). Examining the figures, we see that a majority of the divisions lie between 90% and 95% for departures, and between 95% and 98% for arrivals.

In the highest bracket for departures (> 98%), fall North Kannada (NWKRTC), Tumkur (KSRTC) and Koppal (KKRTC), while in the lowest bracket (<90%), we have Kalaburagi-1 (KKRTC), Ballari (NKERTC), Mysuru Urban (KSRTC) and Vijayapur (KKRTC). Between 95% to 98%, we have a majority of KSRTC divisions (58%), with the remaining divisions falling in NWKRTC (42%). Even in the following bracket, we have nearly half the divisions from KSRTC (47%), followed by 33% from KKRTC 20% from NWKRTC.

Table 34: *On-time Departure Brackets for Divisions (Source: Admin Report)*

Average On-time Departure %: Brackets	Divisions	KSRTC	NWKRTC	KKRTC
Greater than 98%	North Kannada, Tumkur, Koppal	33%	33%	33%
Between 95% and 98%	Chikodi, Dharawad (Rural), Mandya, Mangalore, Puttur, Kolar, Belgavi, Bagalkot, Bangalore Central, Mysuru Rural, Chikkaballapura	58%	42%	0%
Between 90% and 95%	Davanagere, Haveri, Hassan, Chitradurga, Hubballi, Raichur,	47%	20%	33%

	Hospet, Chamarajanagar, Bidar, Chikmagalur, Gadag, Yadgiri, Kalaburagi-2, Shivamogga, Ramanagara			
Less than 90%	Kalaburagi-1, Ballari, Vijayapur, Mysuru Urban	25%	0%	75%

Meanwhile, on the arrivals side, we once again have Tumkur, North Kannada and Koppal in the top bracket (> 98%), now also joined by Hubballi and Dharwad (Rural), making 67% of the divisions in this bracket from NWKRTC. On the other end, we have Ballari and Vijayapur just like in departures, with Gadag also dropping down into this bracket. Similar to the performance for on-time departures, we see a majority representation of KSRTC between 95% and 98% (56%) and 90% and 95% (67%), While KKRTC has more divisions with on-time arrivals being less than 90%.

Table 35: *On-time Arrival Brackets for Divisions (Source: Admin Report)*

Average On-time Arrival %: Brackets	Divisions	KSRTC	NWKRTC	KKRTC
Greater than 98%	North Kannada, Tumkur, Koppal, Hubballi, Dharawad (Rural)	17%	67%	17%
Between 95% and 98%	Belgavi, Kolar, Chikodi, Mandya, Mangalore, Puttur, Bidar, Bagalkot, Raichur, Chitradurga, Haveri, Bangalore Central, Mysuru Rural, Hospet, Chikkaballapura, Chamarajanagar	56%	25%	19%
Between 90% and 95%	Davanagere, Hassan, Shivamogga, Mysuru Urban, Yadgiri, Kalaburagi-2, Chikmagalur, Ramanagara, Kalaburagi-1	67%	0%	33%
Less than 90%	Gadag, Ballari, Vijayapur	0%	33%	67%

When we look at the two indicators relative to each other, we see that for nearly all divisions, either the values are very close to each other, or that the on-time arrival rate is much higher than the departure rate. This makes sense logically, given the higher average at the corporation level for the overall on-time arrival rate. For 19 of the divisions, this gap is within 1%, while for 10 it is less than 2%. We see larger gaps for Mysuru Urban (6.67%), Bidar

(4.17%), Hubballi (4.29%) and Shivamogga (3.5%). The only division that does not follow this trend is Gadag, where the arrival rate is 2% lesser than the departure rate.
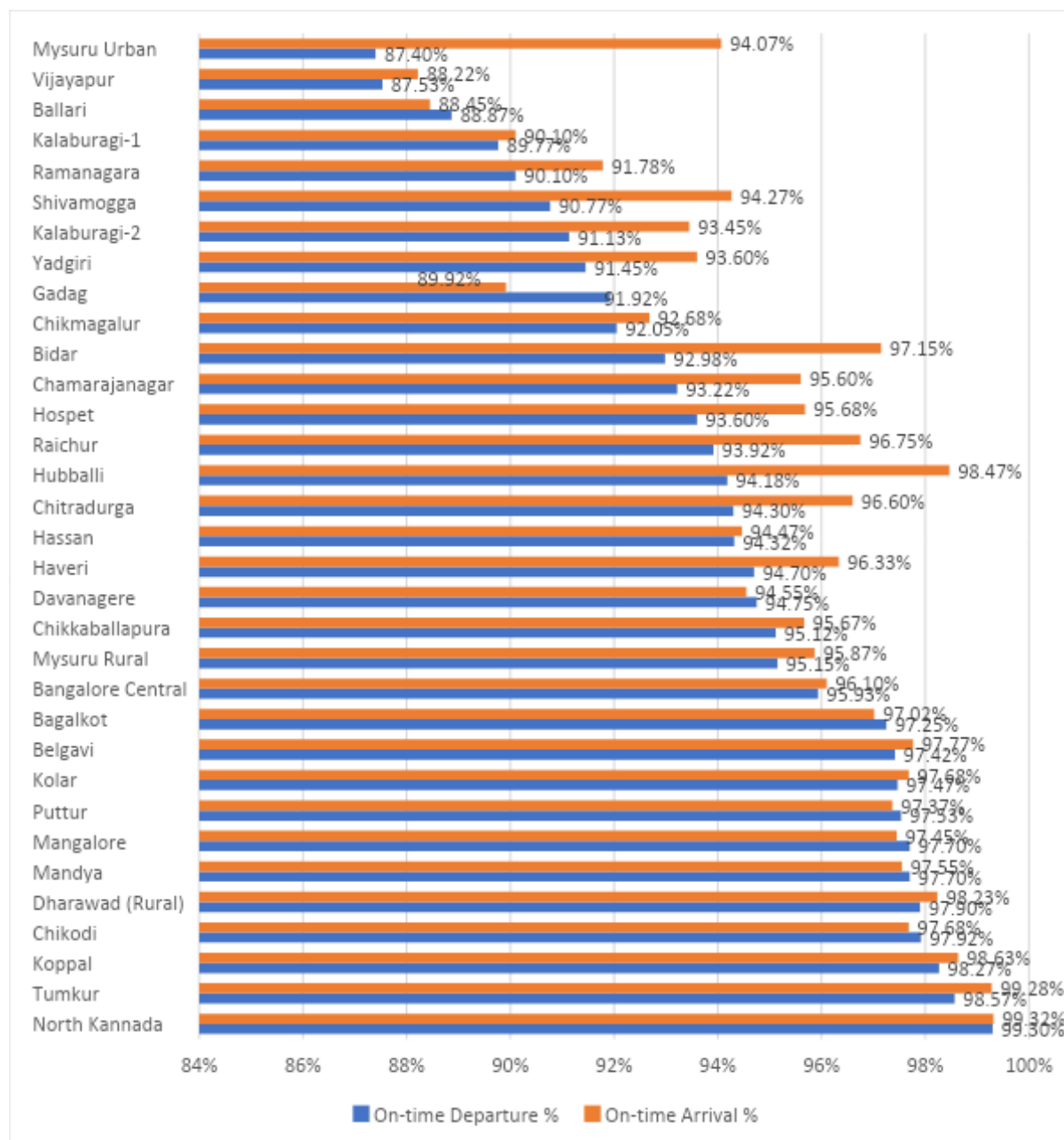
Figure 33: On-time Arrivals vs Departures (Evaluation Average) at Division Level (Source: Admin Report)

There are some divisions that show trends when it comes to on-time Departures and Arrivals. The annual average growth rate is low for most given the high values and the small magnitude of the changes, so instead we looked at divisions that moved up or down by 4 pp or more during the evaluation period. For on-time departures, there are ten divisions that meet this criterion, while there are only three such divisions when it comes to arrivals.

For departures, given that we saw decreasing trends for two of the three corporations, here 7 of the 10 divisions show movements in the negative direction, namely Mysuru Urban (-14

pp), Hubballi (-10 pp), Bidar (-6 pp), Gadag (-5 pp) and Belgavi, Chamarajanagar and Yadgiri (-4 pp). It is to be noted that the decline for Mysuru Urban, Hubballi and Bidar is near consistent throughout the period, while the others show some fluctuations in their trends. The three divisions that show positive movement are Raichur (5 pp), Hospet (7 pp) and Kalaburagi (8 pp).
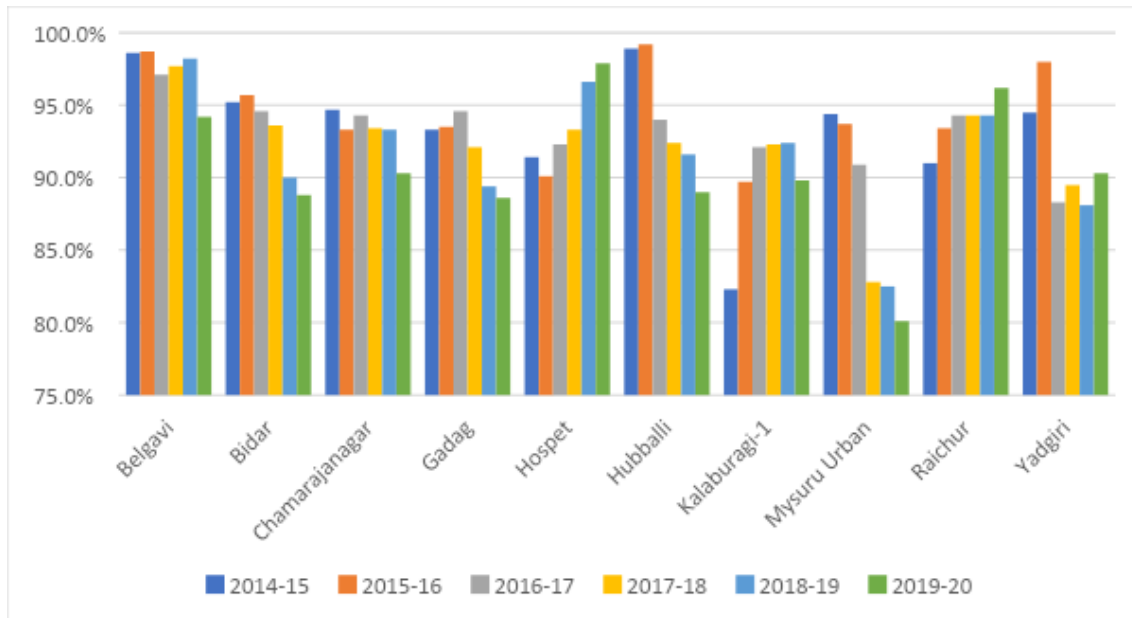
Figure 34: Divisions showing Trends for On-time Departures (Source: Admin Report)

Look at the variation for on-time arrivals, only Belgavi shows a decreasing trend (-4 pp), while Chitradurga and Hospet show increasing trends (5.4 pp and 5.7 pp respectively).
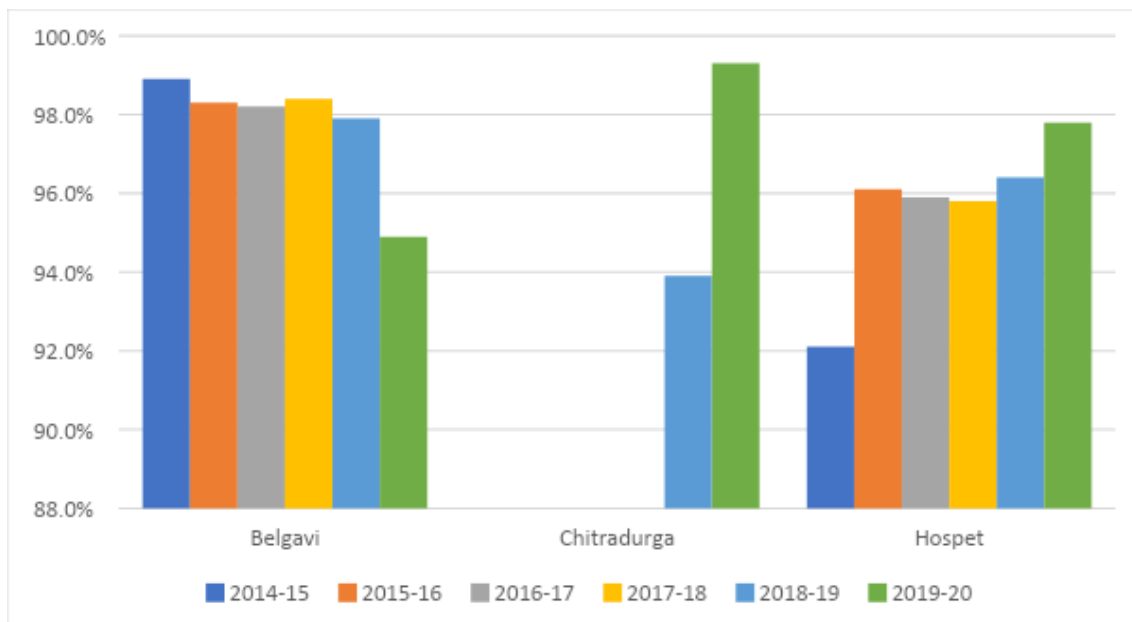
Figure 35: Divisions showing Trends for On-time Arrivals (Source: Admin Report)

i. **Vehicle Utilisation – On Road Vehicles**

On average, a KSRTC bus runs around 361 kilometres a day, followed by an NWKRTC bus at 348 kilometres a day and an KKRTC bus with 336 kilometres a day. While for NWKRTC there is no observable trend, both KSRTC and KKRTC show increasing trends from 2014-15 to 2019-20, with the latter having more growth over the duration. KSRTC vehicles increased coverage by 8 kms per day or 2.24% in 6 years, while for KKRTC this was 15 kms per day, or 4.57%.
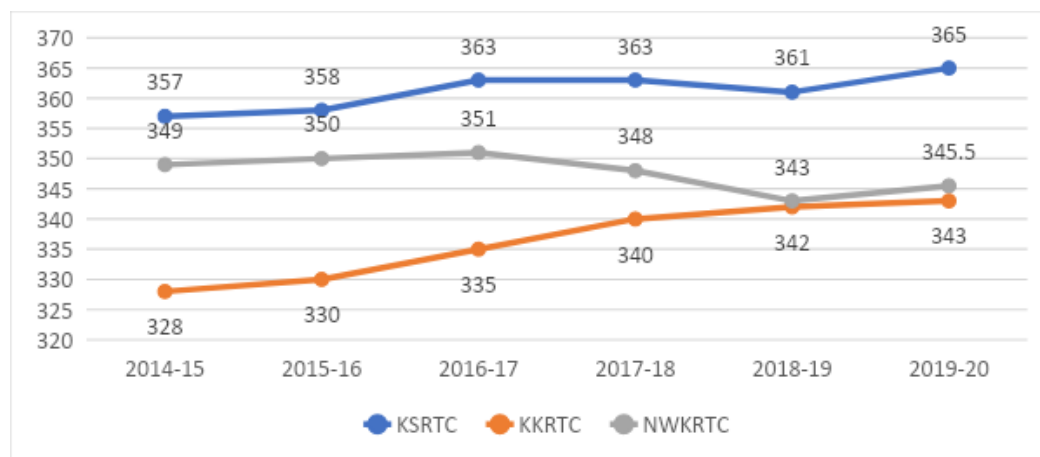
Figure 36: Vehicle Utilisation (On Road) Trend at Corporation Level (Source: Admin Report)

At division level, there is very little variation over the evaluation period, with 23 of the 33 divisions having an AAGR within ±1%. Of the remaining, 8 divisions have an AAGR within ±2%. Hence, we will look at the overall averages of the divisions to compare them with each other (graph below).
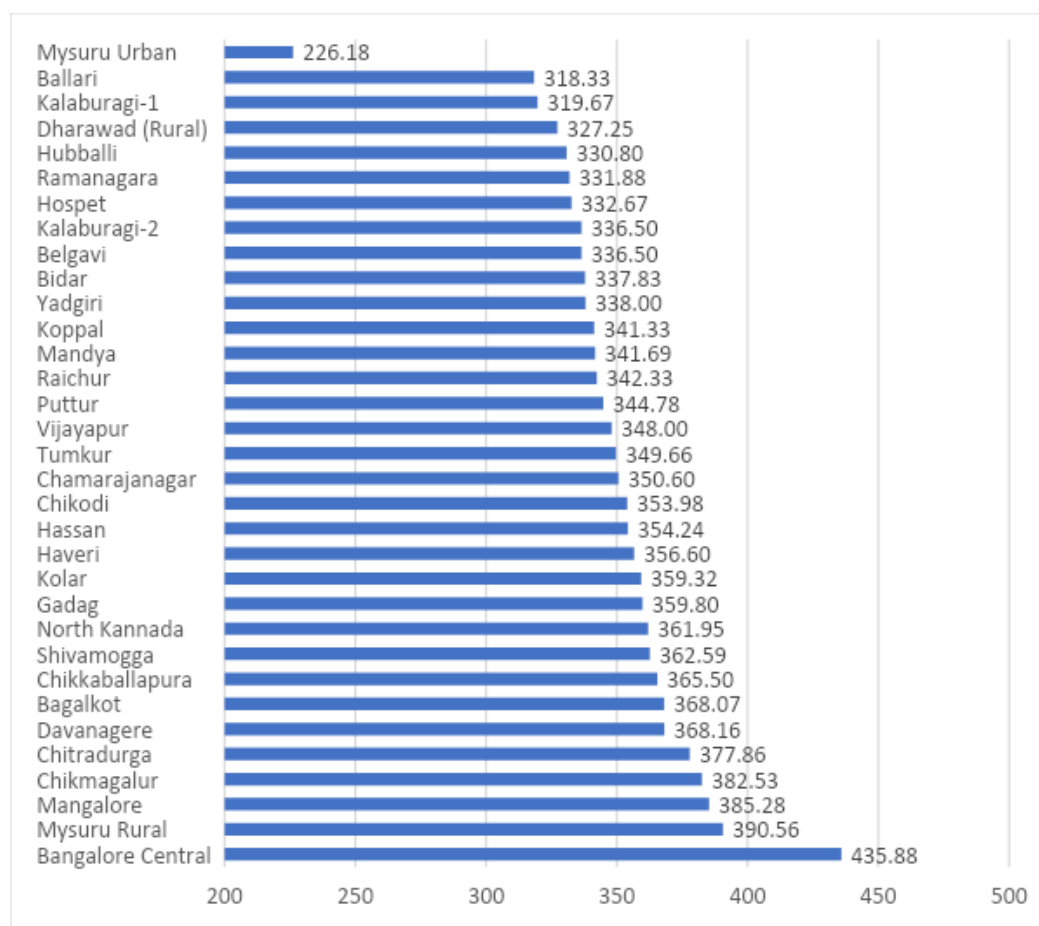
Figure 37: Vehicle Utilisation Evaluation Average at Division Level (Source: Admin Report)

We see that Bangalore Central has a very high vehicle utilisation level of 436 km, followed by Mysuru Rural (391 km) and Mangalore (385 km). In fact, 8 of the top 10 divisions in terms of utilisation are all from KSRTC. The only other divisions that feature are Bagalkot (368 km, 7th) and North Kannada (362 km, 10th), both from NWKRTC. The bottom 10 is composed of 5 divisions of KKRTC, followed by 3 divisions of NWKRTC and 2 divisions of KSRTC. Mysuru Urban from KSRTC is an outlier with a utilisation of 226 km, with the next closest divisions being Ballari and Kalaburagi-1, from NWKRTC and KKRTC at 318 km and 320 km respectively. These are followed by Dharwad (327 km) and Hubballi (331 km) from NWKRTC and Ramanagara (331 km) from KSRTC.

In terms of trends, there are 9 divisions that show slight trends, with all of them in a positive direction, barring Mangalore, where the utilisation drops from 404 km in 2014-15 to 369 km in 2019-20. Hubballi was also an outlier on the positive side, with a 3.50% AAGR, with the utilisation increasing from 328 km in 2014-15 to 377 km in 2019-20. This rate should actually be higher, but there is some fluctuation after a couple of depots were shut down/ moved to other divisions. The other divisions that showed higher growth rates are Kalaburagi-2, Ballari and Hospet.

Table 36: *Division Trends for Vehicle Utilisation (On-Road) (Source: Admin Report)*

Division/Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	AAGR
Hubballi	328.40	328.20	331.60	321.90	297.00	377.70	3.50%
Kalaburagi-2	313.00	333.00	345.00	346.00	340.00	342.00	1.83%
Ballari	304.00	315.00	319.00	319.00	325.00	328.00	1.54%
Hospet	320.00	321.00	327.00	341.00	343.00	344.00	1.47%
Mandya	331.00	334.00	340.00	344.89	346.24	354.00	1.35%
Chamarajanagar	337.00	340.00	348.00	364.73	356.86	357.00	1.19%
Chikkaballapura	354.00	354.00	369.00	370.06	370.94	375.00	1.17%
Hassan	343.00	350.00	355.00	357.23	358.23	362.00	1.09%
Yadgiri	328.00	334.00	339.00	340.00	342.00	345.00	1.02%
Mangalore	404.00	401.00	391.00	378.37	368.30	369.00	-1.79%

j. KMPL

Fuel Efficiency is an important variable in the context of today's rising rates of both diesel and petrol in the market. For KSRTC the evaluation average is the lowest at 4.84 KMPL, over 0.3 KMPL less than the other two corporations, that have efficiencies of 5.14 KMPL (KKRTC) and 5.19 KMPL (NWKRTC) respectively. In terms of trends as well, KSRTC does not show much of a change over the period, only increasing 0.03 KMPL by 2019-20, with almost no variability in between. On the other hand, both KKRTC and NWKRTC show trends, but in opposite directions, with the KKRTC fuel efficiency increasing from 5.15 to 5.24 KMPL and the NWKRTC fuel efficiency dropping from 5.17 to 5.03 KMPL in 2019-20.
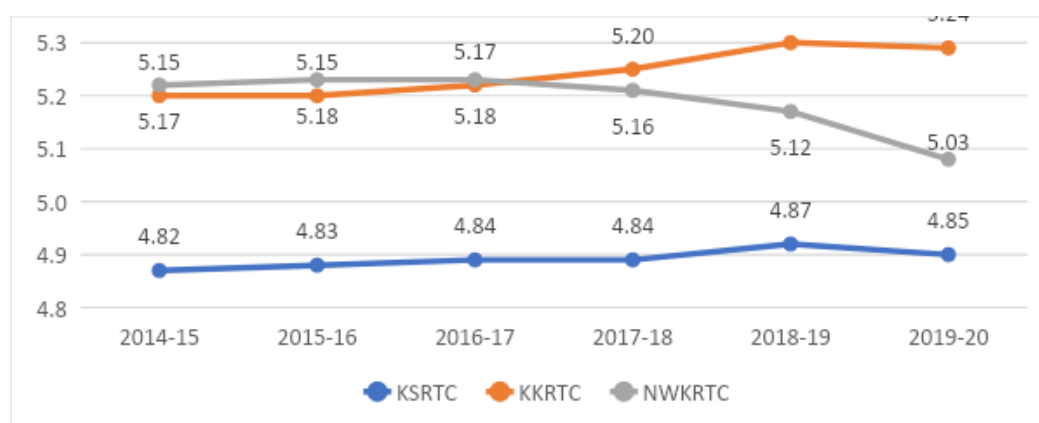
Figure 38: KMPL Trend at Corporation Level (Source: Admin Report)

At division level, there is very little variation over the evaluation period, with 31 of the 33 divisions having an AAGR within ±1%, with the remaining having an AAGR within ±2%.

Hence, here too, we will look at the overall averages of the divisions to compare them with each other (graph below).
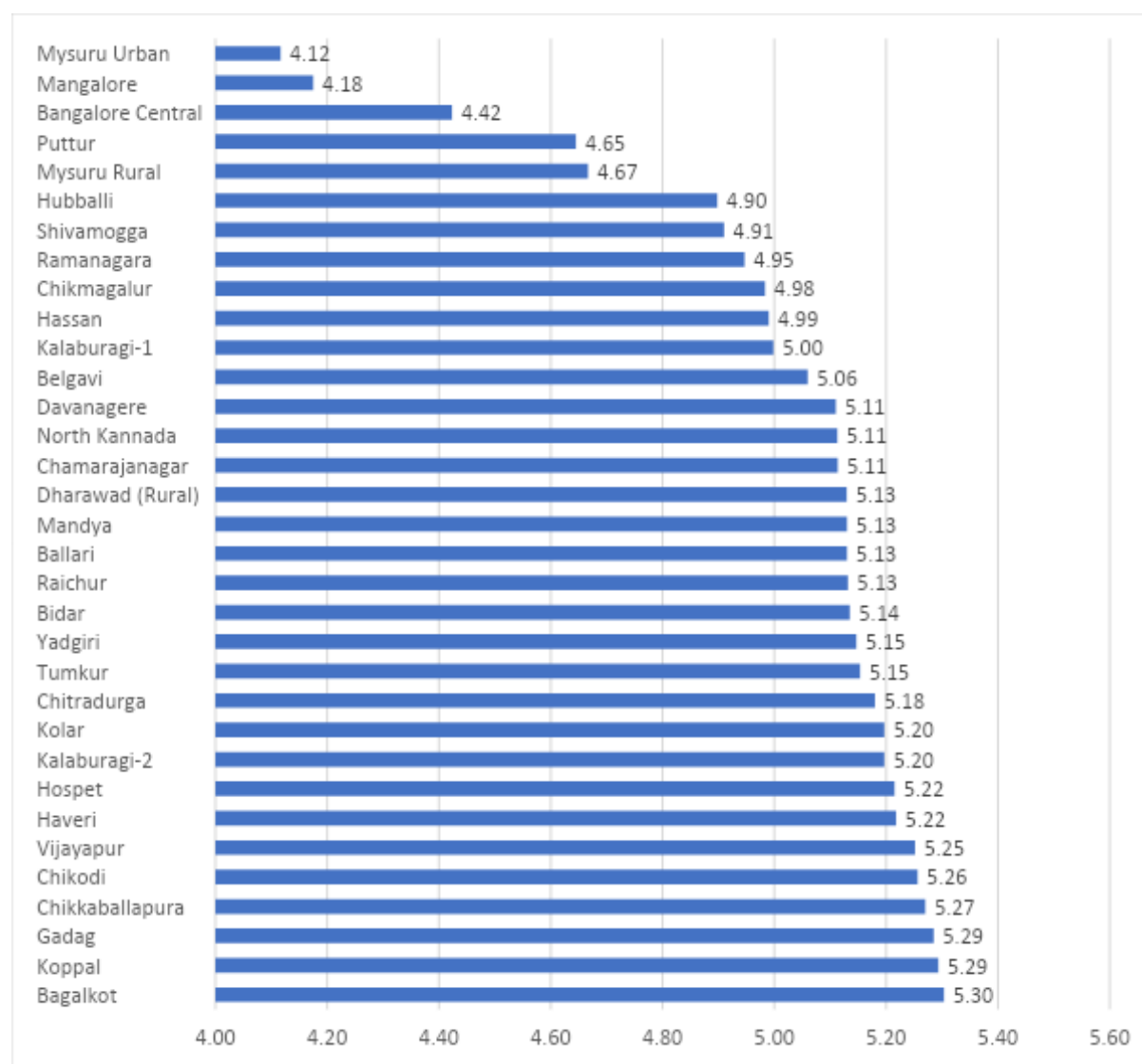
Figure 39: KMPL Evaluation Average at Division Level (Source: Admin Report)

Quite opposite to the vehicle utilisations at the division level, The bottom 10 is composed of 9 KSRTC divisions, along with Hubballi from NWKRTC (6th from the bottom). The bottom 5 divisions have very low utilisation levels as compared to the rest of the divisions, starting again with Mysuru Urban (4.12 KMPL), followed by Mangalore (4.18 KMPL), Bangalore Central (4.42 KMPL), Puttur (4.65 KMPL) and Mysuru Rural (4.67 KMPL), with the next closest division being Hubballi at 4.90 KMPL. It is interesting to note that the top three divisions in terms of vehicle utilisation, are among the bottom 5 in terms of fuel efficiency (Bangalore, Mangalore and Mysuru Rural). On the other end, the top 10 divisions are composed of 5 divisions of KKRTC, 3 divisions of NWKRTC and 2 divisions of KSRTC, with values ranging from 5.2 KMPL to 5.3 KMPL for this set. The top three divisions are Bagalkot from NWKRTC (5.3 KMPL), Koppal from KKRTC (5.29 KMPL) and Gadag from NWKRTC (5.29 KMPL).

In terms of trends, there are 4 divisions that show slight trends, with two positive and two negative trends. In the former set, Hospet stands out to a great extent, with the fuel efficiency for the division increasing consistently from 5.10 KMPL in 2014-15 to 5.51 KMPL in 2019-20, with a large share of the jump happening 2019-20 (0.29 KMPL). The other division is Chikmagalur, coming up from 4.86 KMPL to 5.12 KMPL in 2019-20. Of the other two divisions, Davanagere shows a constantly decreasing trend with the value dropping 0.20 KMPL over the 5-year period. On the other hand, the efficiency was almost constant for Koppal, with the value dropping by 0.21 KMPL only in 2019-20.
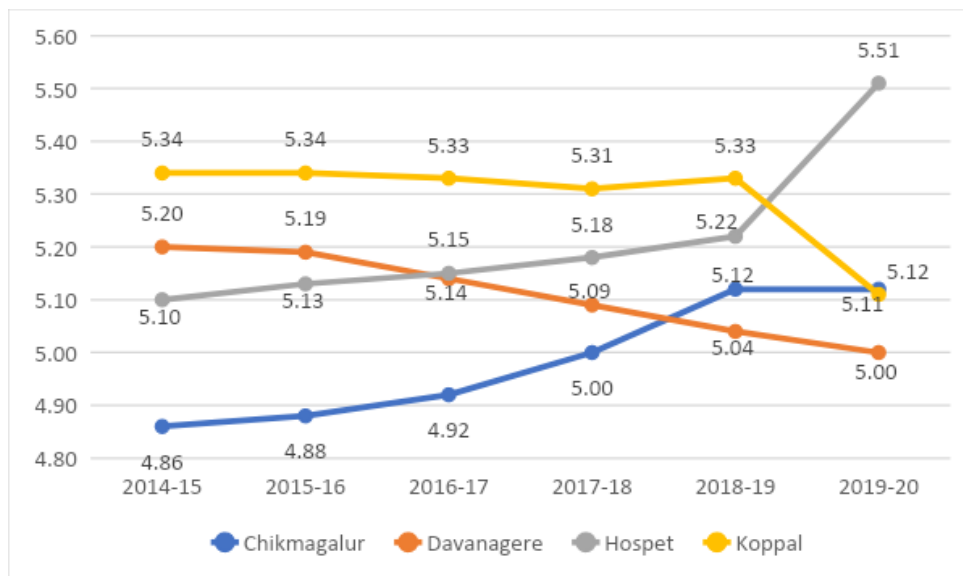
Figure 40: Division Level KMPL Trends (Source: Admin Report)

India Fuel Efficiency norms

The Ministry of Power on 16th August, 2017, by way of Gazette notification provided the fuel efficiency norms for various types of vehicles applicable from April 1, 2018. The notification also provides the norms applicable from April 1, 2021 which are as below:

> (1) On and from 1st April, 2018, diesel vehicles of category M3 and N3 with gross vehicle weight of twelve tonnes and above, complying with BS-IV emission norms, shall be tested for constant speed fuel consumption as specified by the Ministry of Road Transport and Highways, till the time Bureau of Indian Standards notify corresponding standards:

M3 refers to Heavy vehicles that are used for carrying passengers. The norms for the vehicles are as below:

Table 1(e)
For category M3- Vehicles at 40 km/h

M3 Vehicles at 40 km/h		
Gross vehicle weight range	Axle configuration	Equation for deriving target fuel consumption (l/100km)
12.0 and above	4x2 and 6x2	Y=0.509X+11.062

Table 1(f)
For category M3- Vehicles at 60 km/h

M3 Vehicles at 60 km/h		
Gross vehicle weight range	Axle configuration	Equation for deriving target fuel consumption (l/100km)
12.0 and above	4x2 and 6x2	Y=0.199X+19.342

The standard weight of a Passenger bus is 16.2 tons. Based on the above, the fuel consumption norm for buses (assuming an average speed of 40 Km/h for ordinary, express and city and suburban services) and 60 km/h for long distance buses, the fuel efficiency norms are as below:

40 km/h

16.2 x 0.509 +11.062 = 8.2458 + 11.062 = 19.3078 liters for 100 km. This translates into **5.18 Kmpl**

60 km/h

16.2 x 0.199 + 19.342 = 3.2238 + 19.342 = 22.5658 litres for 100 km. This translates into **4.43 kmpl**

The standards for fuel consumption is 4.43 kmpl to 5.18 kmpl.

The norms applicable from April 1, 20121 are as below:

Table 2(e)
For category M3– Vehicles at 40 km/h

M3 Vehicles at 40 km/h		
Gross vehicle weight range	Axle configuration	Equation for deriving target fuel consumption (l/100km)
12.0 and above	4x2 and 6x2	Y=0.659X+6.582

Table 2(f)
For category M3– Vehicles at 60 km/h

M3 Vehicles at 60 km/h		
Gross vehicle weight range	Axle configuration	Equation for deriving target fuel consumption (l/100km)
12.0 and above	4x2 and 6x2	Y=0.340X+14.300

40 km/h

16.2 x 0.659 + 6.852 = 10.6758 + 6.852 = 17.5278 litres for 100 km. This translates into **5.71 Kmpl**

60 km/h

16.2 x 0.340 + 14.300 = 5.508 + 14.300 = 19.808 litres for 100 km. This translates into **5.05 kmpl**

The standards for fuel consumption is 5.05 kmpl to 5.71 kmpl.

As per the fuel efficiency norms, 30 of the total 33 divisions find their way into the first interval of 4.43 to 5.18 KMPL, but only 11 divisions meet the standards of the April 2021 revision in the interval. It would be helpful to incentivise drivers to achieve fuel efficiency targets in this new range and adhere to the updated standards set by the Government of India.

k. **Summary**

The key findings in this section are summarised here as follows:

- While KSRTC has the highest number of passengers carried (10.53 lakh), NWKRTC has a higher number of passengers carried per bus per day (488), with KSRTC at 375 and KKRTC at 338. This is primarily due to the fact that NWKRTC has a relatively smaller fleet and higher ridership.

- Hubballi is the division with the highest number of passengers carried overall (1,506 lakhs) and per bus per day (648.24). Also among this list is Belgavi with the 2nd highest passengers carried and 4th highest in terms of carried per bus per day, and Dharawad (Rural) with the 5th highest passengers carried and 3rd highest passengers carried per bus per day (626.47).

- With regards to Load Factor (%), KSRTC averages nearly 70.4%, followed by KKRTC at 66.0% and NWKRTC at 62.3%, with all corporations showing positive trends for this indicator over the evaluation period. In 2019-20 the load factor values were 74.3% (KSRTC), 72.65% (NWKRTC) and 70.6% (KKRTC).

- Davanagere and Mysuru Urban are the divisions with the highest load factors (77.5% and 77.4%). Other values in the top 5 were Hubballi (75.3%), Dharawad (Rural) (75.4%) and Belgavi (74.72%).

- Bangalore Central has among the largest number of buses (644) held on average, and the lowest passengers carried per bus per day (150). Hubballi, Belgavi and Vijayapur are among the top 5 in terms of both fleet size held and passengers carried.

- All corporations show a declining trend for fleet utilisation, with the values in 2019-20 being 91% for NWKRTC, 90% for KSRTC and 85% for KKRTC. With large fleet sizes, Bagalkot (96.4%) and Belgavi (94.02%) show high levels of fleet utilisation.

- The Average age of the fleet has increased for all corporations from 2014-15 to 2019-20, with the AAGR values for KSRTC, NWKRTC and KKRTC being 5.81%, 5.58% and 3.32% respectively. The ages of the fleet as of 2021 are 7.51 lakh kms (NWKRTC), 7.42 lakh kms (KSRTC) and 6.41 lakh kms (KKRTC). This change has been observed for many divisions as well.

- Rate of Accidents per lakh km has decreased over the evaluation period for all corporations, dropping from 0.12 to 0.10 for KSRTC, 0.09 to 0.07 for NWKRTC and 0.09 to 0.06 for KKRTC.

- Rate of Breakdowns per 10,000 km has decreased over the evaluation period for KSRTC and KKRTC. dropping from 0.09 to 0.06 for KSRTC and 0.04 to 0.02 for KKRTC.

- Despite having among the top 5 fleets held, Vijayapur and Bagalkot have among the fewest rate of accidents on average (0.06-0.07 per lakh km). Bagalkot also has the lowest rate of breakdowns on average (0.01-0.02 per 10000 km).

- There is an overall slight increasing trend when it comes to Scheduled and Effective kilometres for KSRTC and KKRTC, while the value drops slightly for NWKRTC.
- Cancelled kilometres are more responsible as compared to Extra kilometres for the variability between scheduled and effective kilometres, having a higher share as compared to the latter. KKRTC has the highest average share of cancelled kilometres (6.2%), followed by KSRTC (3.8%) and NWKRTC (2.9%). In comparison, the 3% of scheduled kilometres on average are extra for KSRTC, while this figure is 2.4% for KKRTC and 2% for NWKRTC.
- At the division level as well, the previous condition holds through across the board, except for in the case of Shivamogga, Chamarajanagar and Bangalore Central, which have considerably higher Extra kilometres as compared to cancelled kilometres.
- Dead kilometres are an additional 3.8% of the effective kms covered under KSRTC, followed by 3.2% for KKRTC and 2.8% for NWKRTC respectively. While KKRTC and KSRTC show clearly decreasing trends, NWKRTC shows a slight increasing trend over the evaluation period.
- On average, 94% of all bus services depart on time, and 95.2% arrive on time. When we look at the evaluation averages, NWKRTC has the highest on-time arrival and departure rates (96.5% and 96.9% respectively), and the one with the smallest gap between the two as well (0.4%). For KSRTC, 95.2% of the arrivals are on time, which is about 1.5% more than the on-time departures. KKRTC on the other hand, has a higher on-time departure rate of 95.2%, with a lower arrival rate of 93.6%.
- When we look at On-Time arrivals vs departures at the division level, we see that for nearly all divisions, either the values are very close to each other, or that the on-time arrival rate is much higher than the departure rate. This makes sense logically, given the higher average at the corporation level for the overall on-time arrival rate.
- On average, a KSRTC bus runs around 361 kilometres a day, followed by an NWKRTC bus at 348 kilometres a day and an KKRTC bus with 336 kilometres a day. While for NWKRTC there is no observable trend, both KSRTC and KKRTC show increasing trends from 2014-15 to 2019-20, with the latter having more growth over the duration. KSRTC vehicles increased coverage by 8 kms per day or 2.24% in 6 years, while for KKRTC this was 15 kms per day, or 4.57%.
- For KSRTC the evaluation average for Fuel Efficiency is the lowest at 4.84 KMPL, over 0.3 KMPL less than the other two corporations, that have efficiencies of 5.14 KMPL (KKRTC) and 5.19 KMPL (NWKRTC) respectively.
- The bottom 5 divisions in terms of Fuel Utilisation with very low utilisation levels as compared to the rest of the divisions are Mysuru Urban (4.12 KMPL), followed by Mangalore (4.18 KMPL), Bangalore Central (4.42 KMPL), Puttur (4.65 KMPL) and Mysuru Rural (4.67 KMPL), with the next closest division being Hubballi at 4.90 KMPL. It is interesting to note that the top three divisions in terms of vehicle utilisation, are among the bottom 5 in terms of fuel efficiency (Bangalore, Mangalore and Mysuru Rural)

9. DEMAND AND SUPPLY ANALYSIS OF BUSES

a. Introduction

In this section we cover the replenishing demand of corporation buses based on an analysis of the average kilometres covered by buses in different age brackets. This will help us understand the position of the fleet in terms of the age and what the requirement is for newer buses to be acquired. All the data shared in this section has been taken from the following sources:

- Admin Reports of the Respective Corporations for the years 2014-15 to 2019-20.
- Offline data shared by each of the corporations for the period of 2014-15 to 2019-20.

Under each figure, we have indicated the generic source without specifying which specific reports and years, to avoid excessive repetition of the same information.

a. Analysis Description

To look at how corporations are managing their fleets, we will consider 9 lakh kilometres as the benchmark for vehicle scrapping, after discussions with relevant RTC officials. The analysis duration will be 2016-17 to 2019-20, based on available data accessed from their respective administrative reports.

b. Age of the Fleet – Corporation Level Trends

First, we go back to the average age of the fleet. As we saw previously, at the corporation level, KKRTC has the youngest fleet on average (5.83 lakh kms), followed by KSRTC (6.65 lakh kms) and NWKRTC (6.81 lakh kms). All the corporations have shown an increasing trend over the evaluation period, with KSRTC and NWKRTC growing consistently at similar rates, with AAGR values of 5.81% and 5.58% respectively. In the case of KKRTC, the average age was constant half of the time, with the changes only observed in 2015-16 (11.07%) and 2019-20 (14.46%), with a drop in 2016-17 (-9.38%). For this reason, the jump for KKRTC is not that high, with the AAGR coming to only 3.32%.

It is evident here that in terms of average age, corporation fleets have become increasingly older from 2014-15 to 2019-20. We will further explore these trends, looking at the buses for each corporation in terms of their frequencies in different age brackets, in the next section.
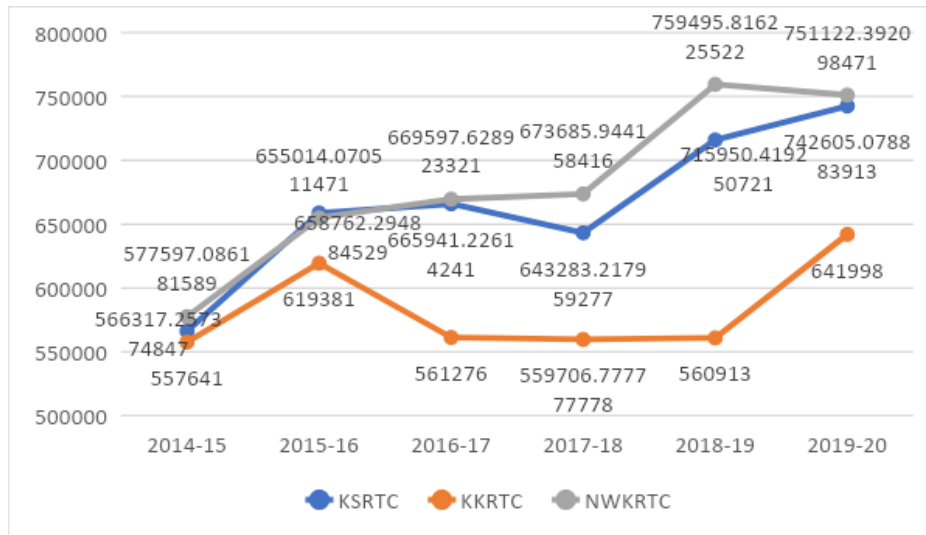
Figure 41: Average Age of Vehicles (in km) Trend at Corporation Level (Source: Admin Report)

c. **Age of the Fleet – Bus Frequency Analysis**

In this section we examine the fleet positions of the corporations over time, to understand how the composition changes in terms of age of the vehicles. First, we look at the age frequency distribution of the KSRTC buses in terms of lakh kilometres, in the graph below.
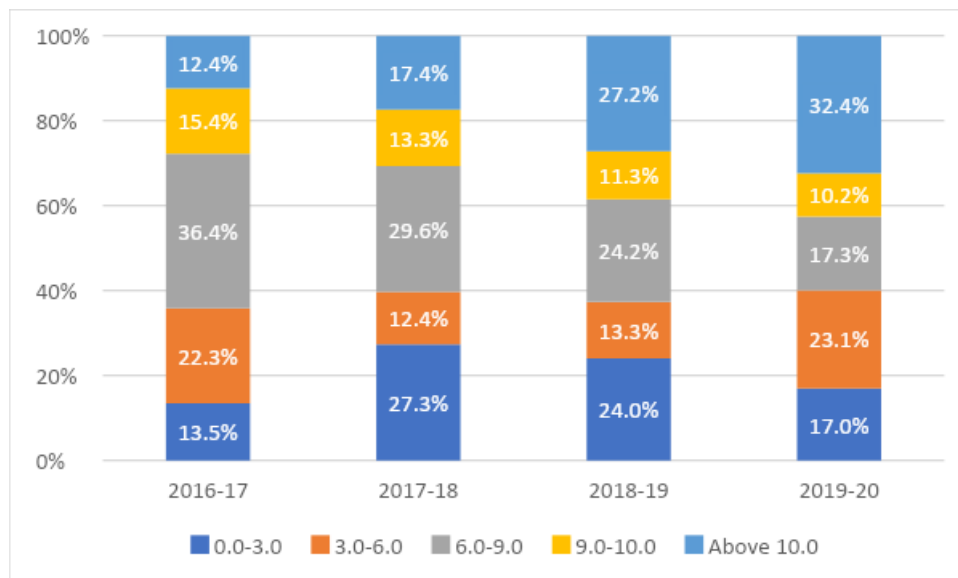
Figure 42: Frequency Distribution of Age (in Lakh Kms) of KSRTC Fleet (Source: Offline Data)

In the figure, it is quite evident that since 2016-17, the fleet age has been on the rise, despite some actions taken by the corporations. Initially, we see that the buses in the lowest 0-3 lakh kilometres do show an overall increase over this duration, due to new additions probably made in 2017-18, which effectively doubles the buses in that bracket. However, simultaneously, we see that buses above 9 lakh kilometres, our scrapping threshold, increase consistently, rising just under 15 pp from 27.8% in 2016-17 to 42.6%. While we see that

there is a small decrease of 5 pp for buses between 9-10 lakh kms over the evaluation period, the buses over 10 lakh kms increase 20 pp over the same duration. This means that effectively, as of 2019-20, 42.6% or close to half the buses in the KSRTC fleet are beyond their scrapping age.
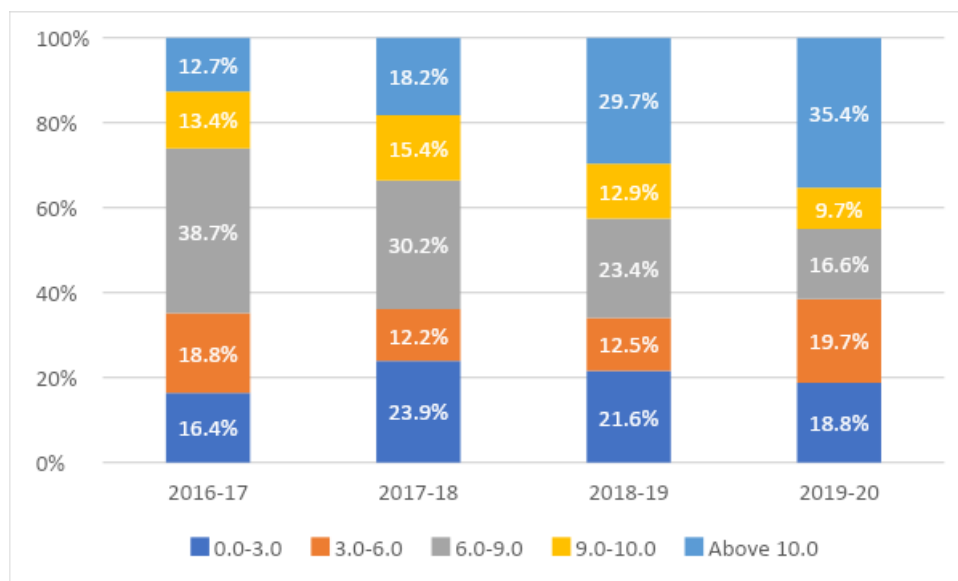
Figure 43: Frequency Distribution of Age (in Lakh Kms) of NWKRTC Fleet (Source: Offline Data)

In the case of NWKRTC, the picture is quite similar to KSRTC, with both fleets having quite a similar composition in 2016-17. At the lower end, we do see a similar increase by 7.5 pp to 23.9 per cent in the 0-3 lakh kilometre share of buses in 2017-18, but this declines to 18.8 per cent by 2019-20. At the same time, buses in the 6-9 lakh km age bracket shrink by 22 pp, while the buses with more than 9 lakh kms covered increase by 19 pp. Similar to KSRTC, in NWKRTC as well, 45.1% of the bus fleet is beyond scrapping age as of 2019-20.
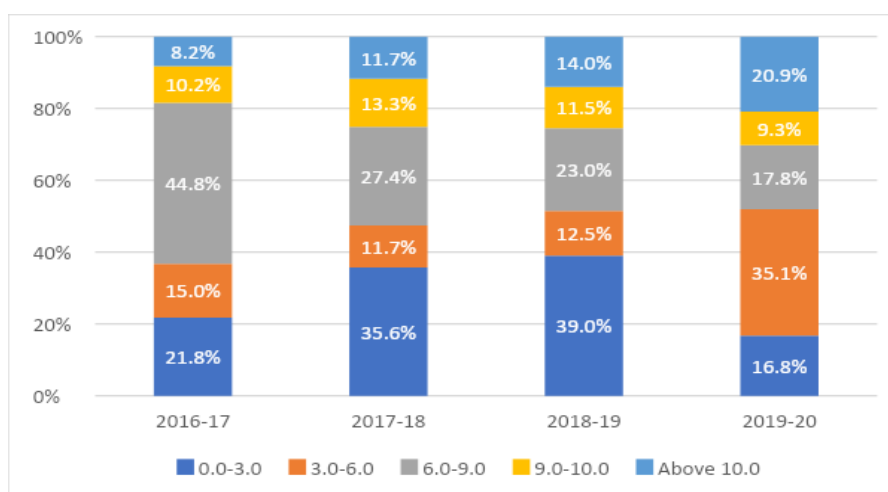
Figure 44: Frequency Distribution of Age (in Lakh Kms) of KKRTC Fleet (Source: Offline Data)

For KKRTC, the trends are similar, but the magnitudes vary as compared to the other corporations. In 2016-17, more of the KKRTC buses are within the scrapping threshold as compared to KSRTC and NWKRTC (81.6%). While this share gradually decreases to around 70 per cent in 2019-20, this is much higher than the mid 50 per cent shares held by KSRTC and KKRTC. This is primarily due to the fact that in 2017-18, buses aged 0-3 lakh kilometres increase around 14 pp to 35.6%, and instead of declining increase another 4 pp to 39% in 2019-20. This means that as compared to its counterparts, KKRTC focussed a little more on acquiring new members of its fleet given the increasing overall age. This is also the reason for the relatively low overall average age for the corporation in 2019-20 (6.42 lakh kms).

d. New Buses Added Each Year

To analyse the acquisition of new buses for each of the corporations more closely, we first look at only those buses that fall in the 0-1 lakh kilometre bracket for each year, starting from 2016-17 (figure below). When we look at the percentage share of the buses in the 0-2 lakh km bracket, all corporations have commensurate shares of 10 per cent (KSRTC), 12 per cent (KKRTC) and 13 per cent (NWKRTC) in 2016-17. For KSRTC and KKRTC, the values increase to 15 per cent and 16 per cent respectively, but for NWKRTC they fall to slightly under 12 per cent. This is interesting to note, since the buses in the 0-3 lakh km bracket increase by over 7 percentage points for the same year, indicating that some of the buses acquired may have already run a few lakh kilometres before they were bought. For all corporations in 2018-19, the buses in this bracket fall to almost a third of the strength in the previous year. In 2019-20 the buses for KSRTC and NWKRTC double to 7% and 8% respectively, but the values for KKRTC fall all the way down to 1%.
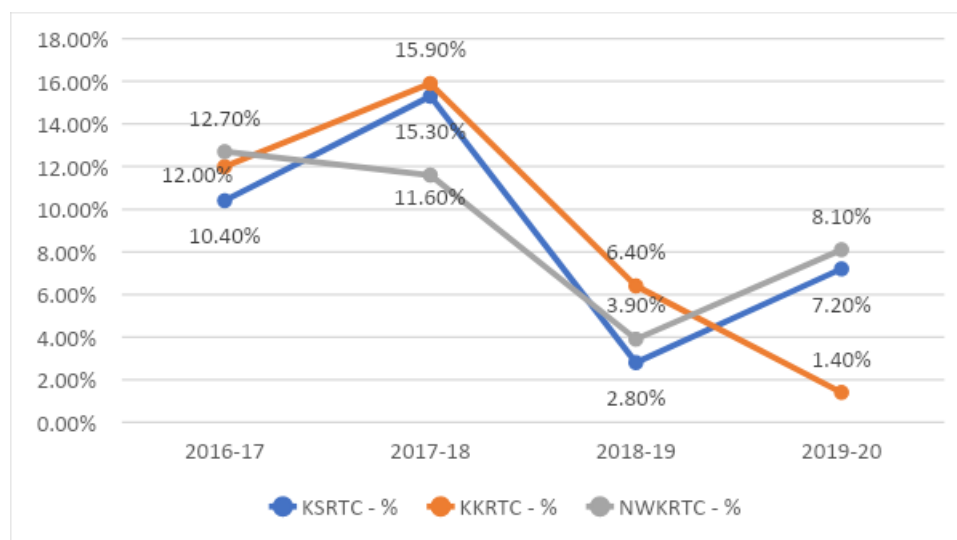
Figure 45: Percentage of Buses Aged 0-1 Lakh kms - Corporation Trends (Source: Offline Data)

We also look at new buses added each year, in comparison with the Buses aged between 0-1 lakh kilometres for each corporation. For KSRTC, the trends are almost identical, but the new buses added each year are slightly more than the buses in that age bracket for all 4 years

covered, reinforcing the fact that some new additions to the fleet may have been used previously.
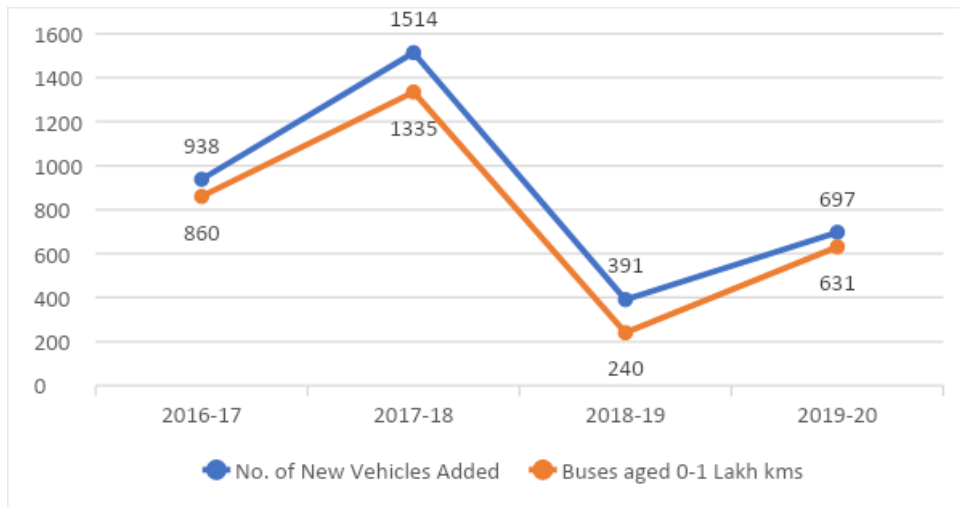
Figure 46: Trend of New Vehicles Added vs Buses Aged 0-1 Lakh kms– KSRTC (Source: Admin Report & Offline Data)

For KKRTC, we do not see the trends matching exactly, and we see that the Buses aged 0-1 lakh kms are lower than the new vehicles added in 2017-18 and 2018-19. For the outer years where the buses aged 0-1 lakh kms are more, the only explanation is that the surplus comes from buses carried forward from previous years that did not end up crossing the 1 lakh mark before the current year. For NWKRTC as well, the trends do not match exactly, but the performance is similar to KSRTC, wherein the buses aged 0-1 lakh kms are more in 2017-18 and 2018-19, with the new vehicles added being higher for the years on either side.
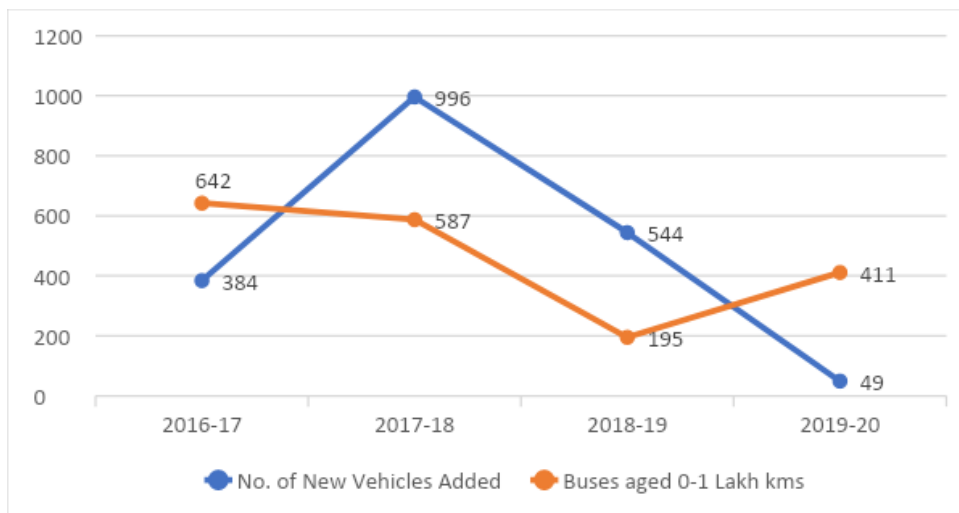
Figure 47: Trend of New Vehicles Added vs Buses Aged 0-1 Lakh km– KKRTC (Source: Admin Report & Offline Data)
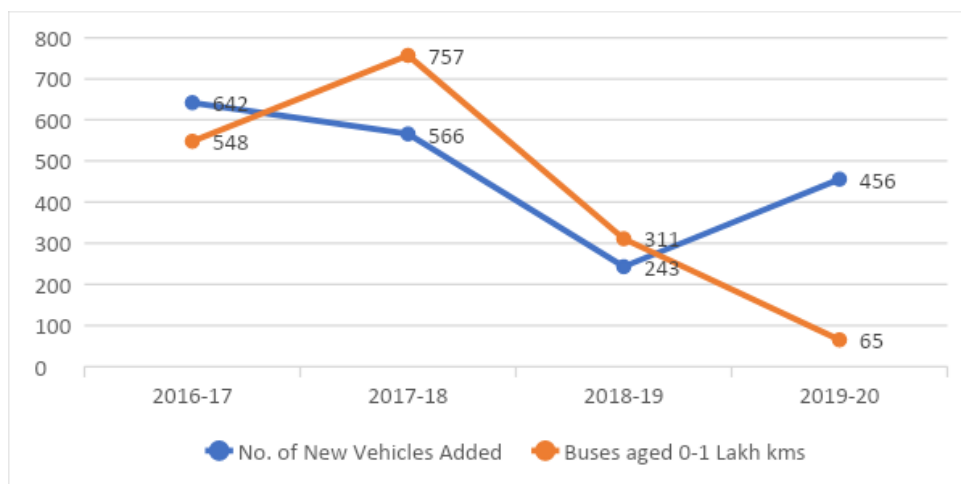
Figure 48: Trend of New Vehicles Added vs Buses Aged 0-1 Lakh kms– NWKRTC (Source: Admin Report & Offline Data)

After having looked at the purchase of new vehicles, we look at the other end of the spectrum in the next section.

e. **Expected vs Actual Scrapping of Buses**

In this section, we compare the Buses scrapped by the corporations, against the numbers that actually should have been scrapped, as per the 9-lakh km threshold. For KSRTC, there is a decreasing trend observed after the rise in 2017-18 for the vehicles scrapped, while the buses aged 9 lakh kilometres or above continue to rise (after a small drop in 2018-19). In the four years covered, the maximum % of the buses scrapped vs the buses aged > 9 lakh kms was 38.6% in 2017-18, where 1,041 buses were scrapped out of 2699 possible buses. This figure dropped to a low of 17.9% in 2019-20, where only 664 buses were scrapped of a possible 3710. Contrast this with 2016-17, where 688 buses were scrapped out of 2309 possible entities (29.8%).
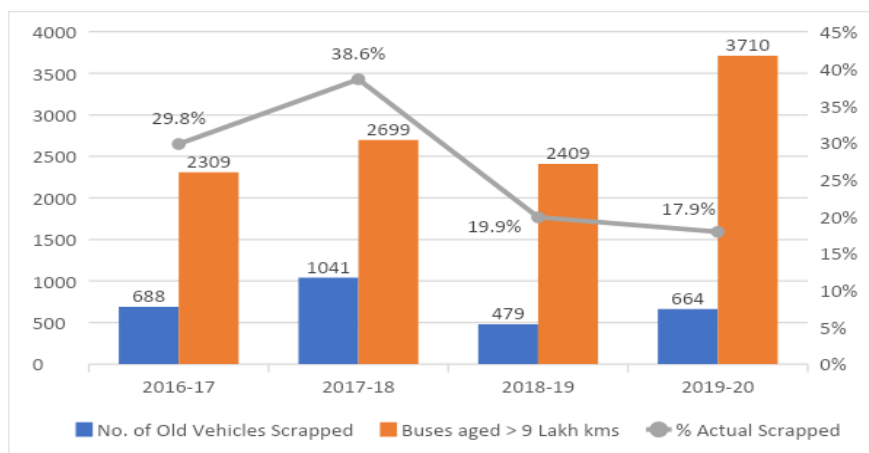
Figure 49: Vehicles Scrapped vs Vehicles that should be Scrapped – KSRTC (Source: Admin Report & Offline Data)

In the case of KKRTC, there is a decreasing trend observed after the rise in 2017-18 for the vehicles scrapped, but the Buses older than 9 lakh km increase throughout. We see a relatively better performance on the positive end, with 65.2 per cent of the eligible buses being scrapped in 2017-18. However, this figure drops to 17.4 per cent in 2019-20, an indication that the vehicles being scrapped are not directly proportional to those that should be scrapped.
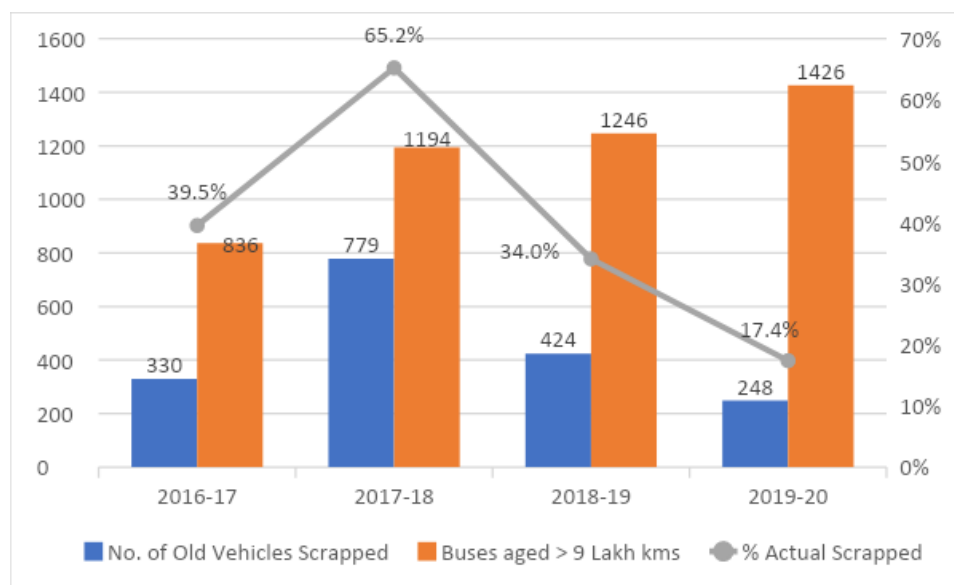
Figure 50: Vehicles Scrapped vs Vehicles that should be Scrapped – KKRTC (Source: Admin Report & Offline Data)

For NWKRTC, there is a gradual increasing trend of the scrapping % throughout the interval, unlike its counterparts. We see this value rise from 25.3 per cent to over double its original value at 57.5 per cent. While the No of vehicles scrapped sees some increase and decrease through the period, the rise in percentage is due to the drop in the Buses aged greater than 9 lakhs in 2018-19 and 2019-20.
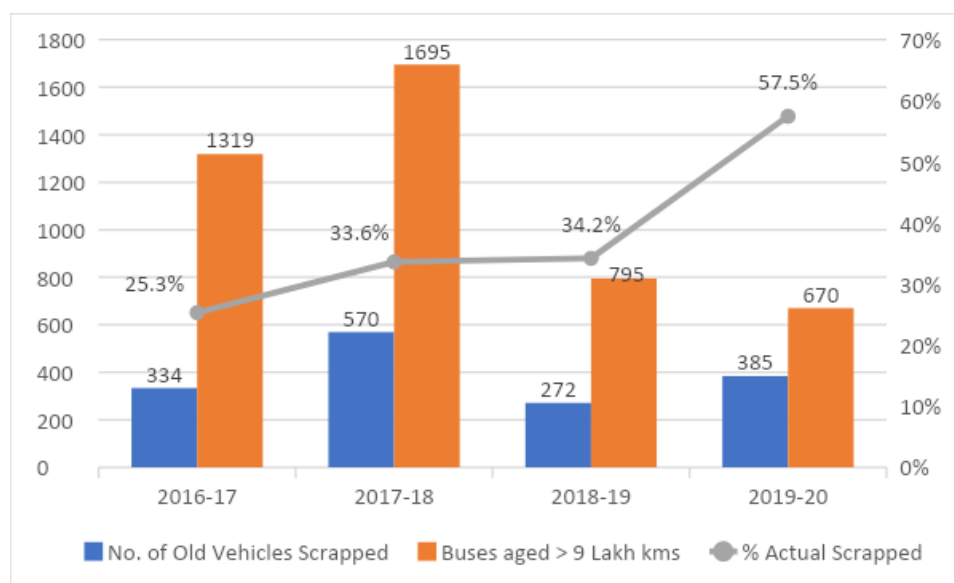
Figure 51: Vehicles Scrapped vs Vehicles that should be Scrapped – NWKRTC (Source: Admin Report & Offline Data)

On average, KKRTC has a higher scrapping rate of 39 per cent as opposed to 37.7 per cent for NWKRTC and 26.5 per cent for KSRTC, but all of these rates need to be improved upon, to keep in line with the regulations. It is quite clear that in most years scrapping is only done on a fraction of the buses that are past their decided life. This problem is further compounded by the fact that when we compare vehicles added to vehicles scrapped for the three corporations, more often than not the values are quite close to each other, big gap seen once for every corporation. For KSRTC and KKRTC it was 2017-18, when nearly 500 and 217 new vehicles were added to the fleet for each of these divisions. For NWKRTC this was 2016-17, where just over 300 new buses were added after taking into account scrapping. This points to the fact that in terms of adding new vehicles, the rate is equivalent or only a little higher/lower than the current rate at which vehicles are being scrapped, bringing into question the ability of the corporations to bring suitable and adequate replacements if actual scrapping protocol was followed.
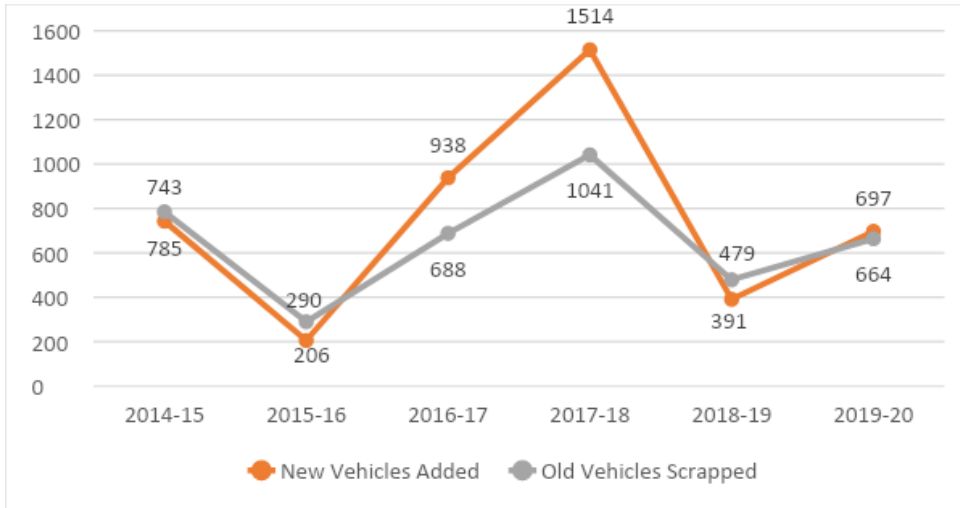
Figure 52: Trend of New Vehicles Added vs Scrapped – KSRTC (Source: Admin Report)
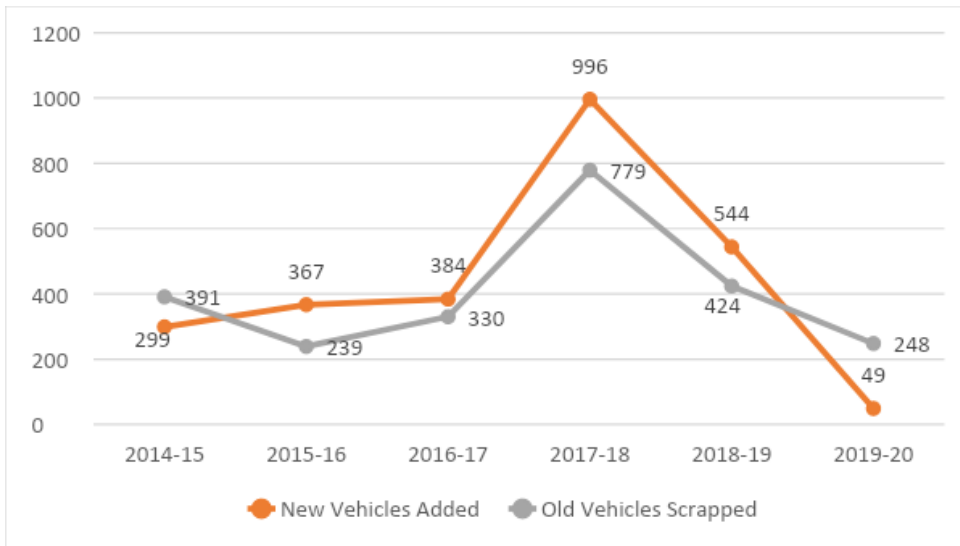
Figure 53: Trend of New Vehicles Added vs Scrapped – KKRTC (Source: Admin Report)
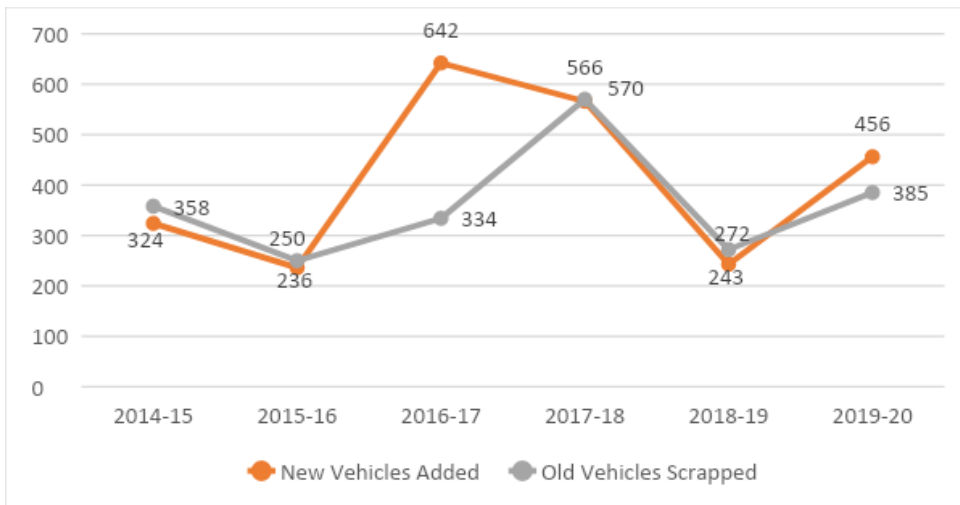
Figure 54: Trend of New Vehicles Added vs Scrapped – NWKRTC (Source: Admin Report)

It is essential that corporations understand their capability to add new vehicles to the fleet and also fix a rate of scrapping, either tied down to these new vehicles added, or the existing fleet strength, or the eligible scrapping population.

f. Breaking Down the Fleet by Bus Types in 2019-20

Just to add another layer to this, we look at the different bus types for 2019-20 for each of the corporations and see what the average age looks like when disaggregated amongst these. For each corporation, first we look at the original composition, before focusing on the buses beyond the 9-lakh km threshold. It is to be noted that, as per policy, for AC Sleeper buses, the threshold to scrap is 11 lakh km, while for luxury buses like Mercedes, Volvo, Scania, it is 13 lakh kms.

i. KSRTC

KSRTC has the largest fleet amongst all of the corporations, and a majority of its buses held are Leyland (45 per cent), Tata (33 per cent) and Eicher (15 per cent). This will be the trend observed across all other corporations as well. As was specified, Corona (Sleeper) buses constitute about 1 per cent of the total fleet, and luxury buses (Mercedes Benz, Volvo, Scania) together constitute the remaining 6 per cent of the fleet.
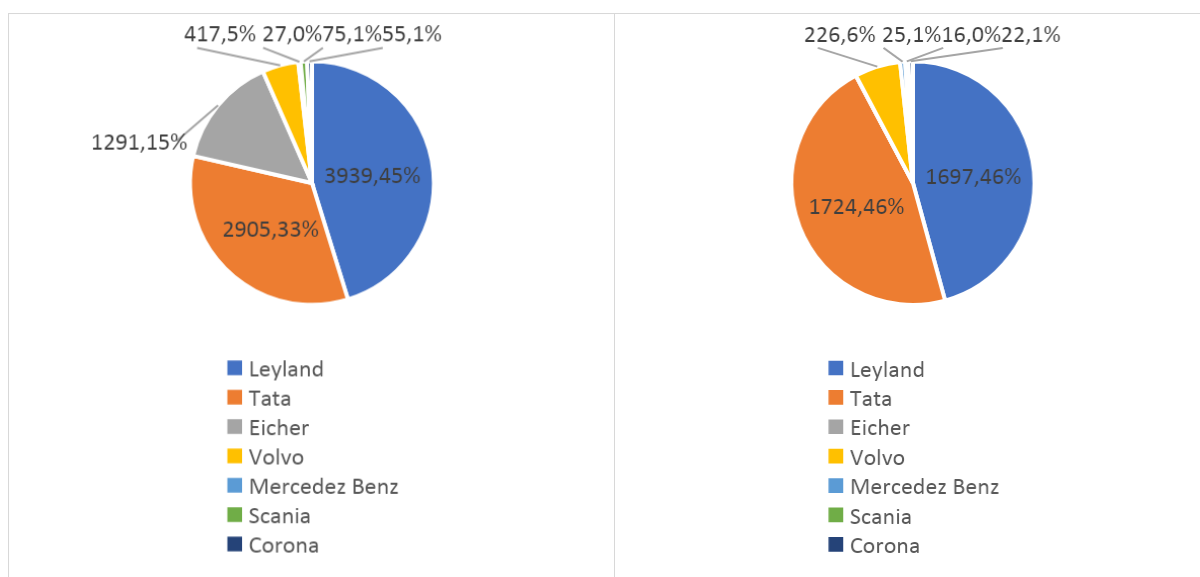
Figure 55: Distribution of KSRTC 2019-20 Fleet a. Overall by Bus Type b. > 9 lakh km by Bus Type

(Source: Offline Data)

When we look at the KSRTC fleet older than 9 lakh kms, we see that a majority of these buses are still Leyland (46 percent) and Tata (46 per cent), with the remaining 8 per cent covered by Luxury and sleeper buses. These buses represent 43 per cent and 59 per cent of the overall Leyland and Tata bus fleets, which is a considerable share.

When we look at the 11-lakh km mark, we see that only 1 of the 55 sleeper corona buses has crossed this mark, with the remaining buses staying in that threshold. The majority here still

are Leyland (49 per cent) and Tata (39 per cent), with a larger share of 12 per cent for the luxury buses.
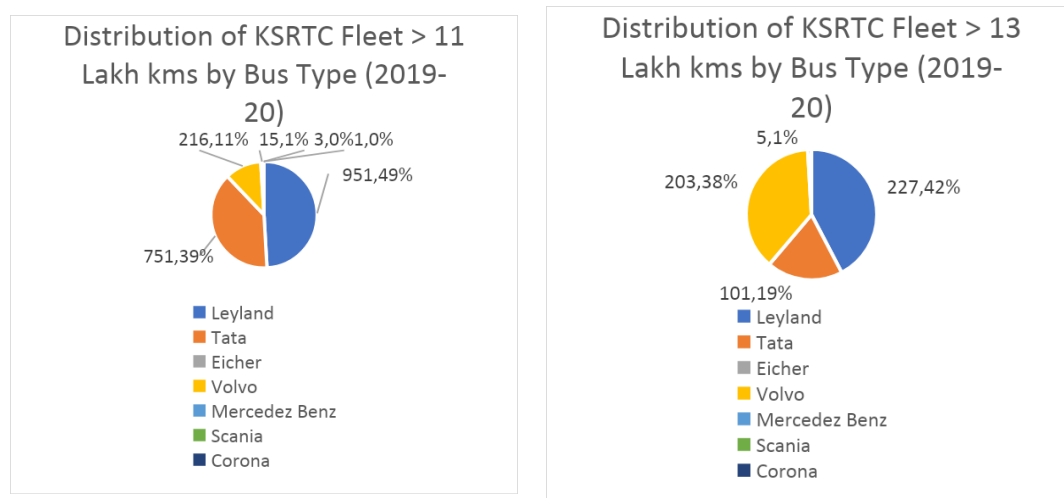
Figure 56: Distribution of KSRTC 2019-20 Fleet a. > 11 lakh km by Bus Type b. > 13 lakh km by Bus Type

(Source: Offline Data)

At 13 km, we see that a total of 208 luxury buses are still functioning, making up 39 per cent of the total buses in this age bracket. It is surprising to note that Leyland Buses still hold the largest share by a small margin (42 per cent), followed by Tata buses (19 per cent). This indicates that while there are a few luxury buses that are being used beyond their threshold of 13 lakh kms, a majority of the buses being utilized beyond the prescribed levels are Leyland and Tata, with the second having an increasingly smaller share in the older brackets.

ii. **KKRTC**

Under KKRTC, 57 per cent of the fleet is Leyland, followed by 22 per cent Tata and 15 per cent Eicher. Of the remaining around 6 per cent of the fleet consists of smaller buses (Mini/Midi), with under 1 per cent of the buses (26) being Corona Sleepers.
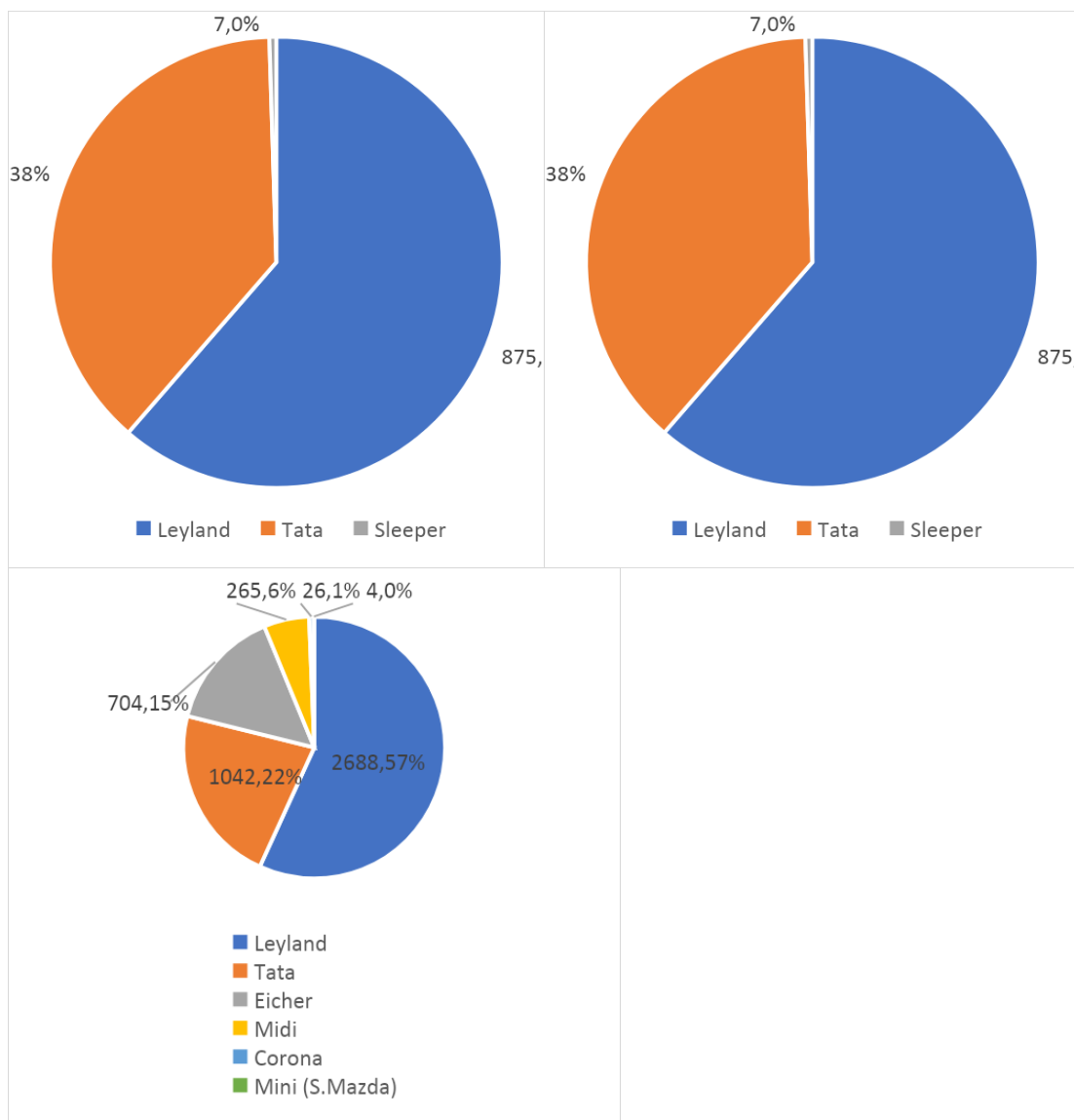
Figure 57: Distribution of KKRTC 2019-20 Fleet a. Overall by Bus Type b. > 9 lakh km by Bus Type

(Source: Offline Data)

Beyond the 9-lakh km threshold, Tata (38 per cent) and Leyland (61 per cent) make up almost the entire share, with the remaining 1 per cent buses being sleepers. In absolute terms, these Tata and Leyland buses constituted 52.2 per cent and 32.5 per cent of the overall fleet sizes of these buses for the corporation.

For the Corona buses, as per the table, 6 of the 7 buses had an average age > 10 lakh kms, with the value around 10.45 lakh, indicating that at least half of them would be within the requisite threshold.

iii. **NWKRTC**

Similar to the other corporations, the NWKRTC fleet is 48 per cent Leyland, followed by 26 per cent Tata and 16 per cent Eicher. Of the remaining around 5 per cent of the fleet consists

of smaller buses (Midi), with 3 per cent of the buses being Volvos, and 2 per cent being Corona Sleepers.

Beyond the 9 lakh km threshold, Tata (30 per cent) and Leyland (68 per cent) make up almost the entire share, with the remaining 2 per cent buses being Volvos and sleepers. In absolute terms, these Tata and Leyland buses constituted 51.8 per cent and 64.2 per cent of the overall fleet sizes of these buses for the corporation.

For the Corona buses, as per the table, 7 of the 13 buses had an average age > 10 lakh kms, with the value around 10.41 lakh, indicating that at least half of them would be within the requisite threshold. On the other hand, for the Volvo buses, 21 of the 28 buses had an average age > 10 lakh kms, and the value was around 16.45 lakh, indicating the possibility of most of them being beyond the 13 lakh km threshold that was set for those buses.
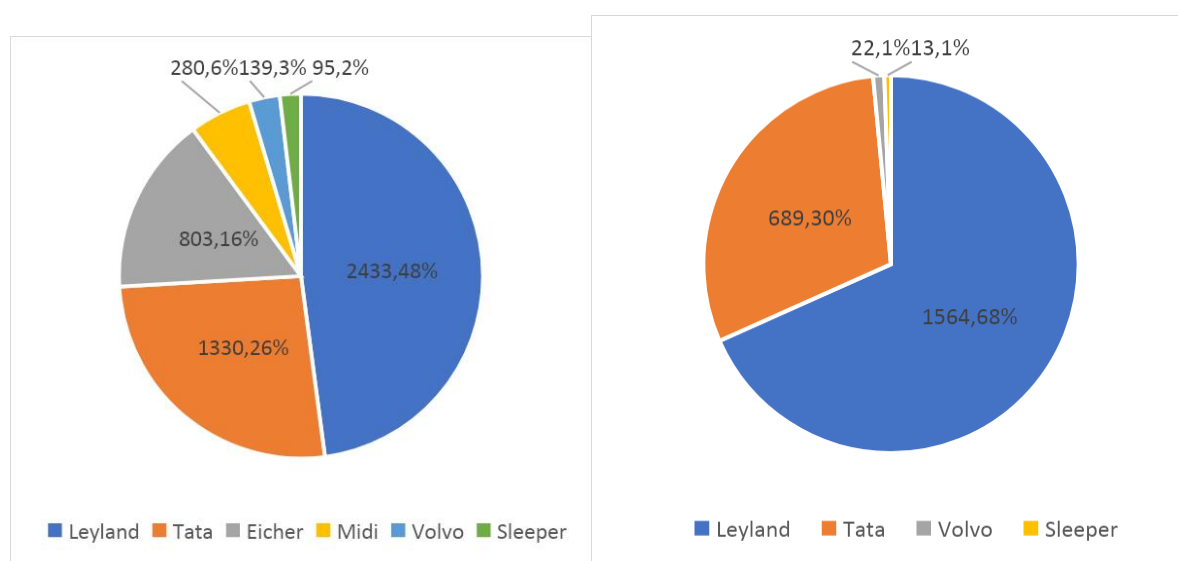
Figure 58: Distribution of NWKRTC 2019-20 Fleet a. Overall by Bus Type b. > 9 lakh km by Bus Type

(Source: Offline Data)

g. **Summary**

The average age of the buses has increased over the evaluation period, for all of the Karnataka corporations. This has primarily happened due to scrapping fewer buses as per the set thresholds, as well as buses added in most cases being close to or not much higher than the scrapped buses. Of the different bus types, Leyland is the bus with the highest numbers being utilized beyond the prescribed period, followed by Tata. The other bus types are Corona, Volvo and Mercedes, but they constitute negligible shares as compared to the former two bus types.

10.   FINANCIAL PROGRESS OF THE CORPORATION

This section analyses the financial performance of the three corporations over the five year period (2015-16 to 2019-20). The analysis is based on the Profit and Loss Account and Balance Sheet provided as part of the Administrative Reports of the corporations. The analysis covers the overall financial position of the corporations, the capital structure, operating revenues and expenses and the efficiency parameters.

a.   Earnings vs Costs per Kilometre

When we look at the overall average earnings at the corporation level for the evaluation period, we see that the CPKM has been consistently greater than the EPKM, and that the gap seems to be gradually increasing. While both values show a somewhat increasing trend, the increase of the costs seems to be at a rate quicker than the earnings, clearly visible looking at the slops and the increasing gaps in the two factors.
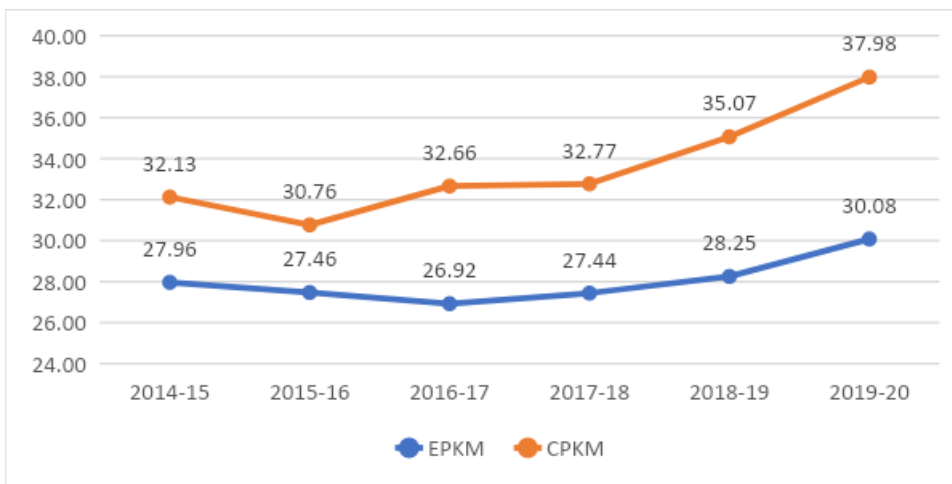
Figure 59: EPKM vs CPKM across Karnataka Corporations (Source: Offline Data)

When we look at the same values for each Corporation, we see that the exact same inferences hold here too. The other things we learn are that KSRTC and KKRTC are very close to each other in terms of their costs and earnings per kilometres for all of the years barring 2018-19 (dip in both for KKRTC). On the other hand, while the costs of NWKRTC match the trends of the other two corporations starting 2016-17, the earnings per km have been consistently lower throughout the evaluation period. These trends can also be observed when looking directly at the overall margins earned/lost by the RTCs per km.

A separate study was conducted on the financial performance of NEKRTC over a period of 10 years starting from 2005-06. The researchers observed that while the gross revenue of the corporation showed an increasing trend multiplying five-fold in 10 years (from 395 crore to 1459 crore), there was a considerable gap between the cost per kilometre (CPKM) and the earning per kilometre (EPKM), on which the health of the STU was assessed. This is not too different from the current situation, as the EPKM is lesser than the CPKM all throughout, and the gap only seems to be increasing.
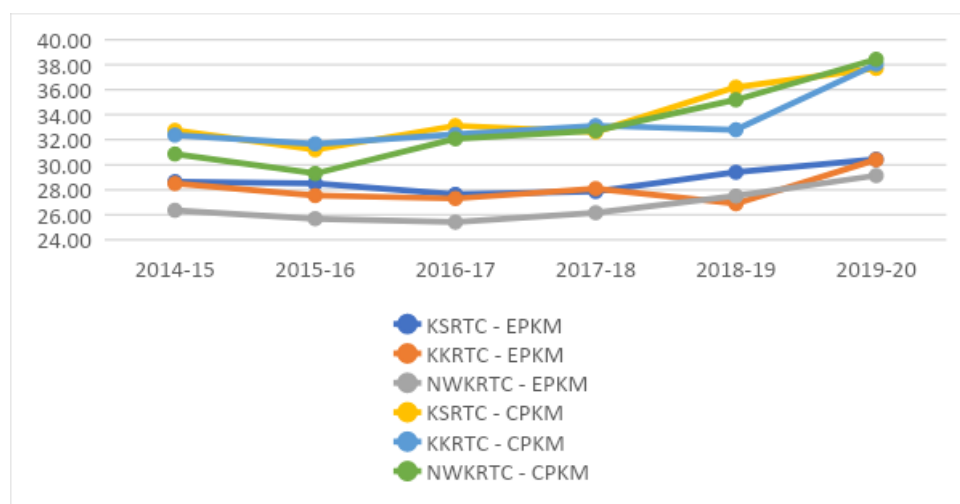
Figure 60: EPKM vs CPKM Trends at Corporation Level (Source: Offline Data)

The overall margin per km (EPKM – CPKM) is INR -5.23 and INR -5.34 for KSRTC and KKRTC respectively, given the similar behaviour of the two consisting values for both corporations. The continuously increasing gap between earnings and costs is also evident here, with a decreasing trend observed for the difference, across the board. Since this gap was larger for NWKRTC, we see that it remains lower than its counterparts for almost the entire duration.
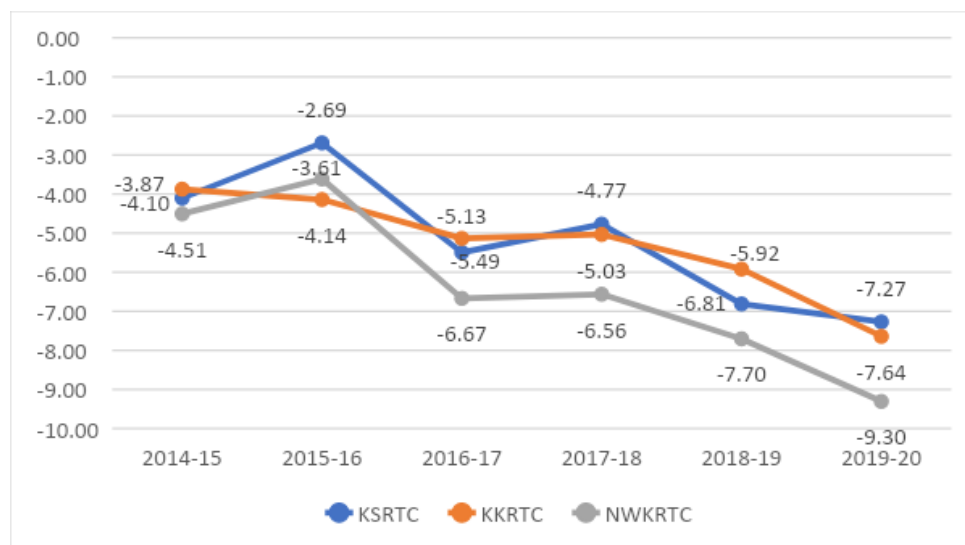
Figure 61: Margin per KM Trends at Corporation Level (Source: Offline Data)

To look at the financial performance, we divide the divisions into three categories:

- A: EPKM >= CPKM
- B: EPKM >= DCPKM
- C: EPKM < DCPKM

Where DCPKM stands for the Direct Cost per Kilometre, calculated as the Variable Cost + Staff Cost only. Based on these criteria, we have the following distribution of the divisions:

- A – NA
- B – Bangalore Central, Chamarajanagar, Chikkaballapura, Hospet, Mysuru Rural
- C – Bagalkot, Ballari, Belgavi, Bidar, Chikmagalur, Chikodi, Chitradurga, Davanagere, Dharawad (Rural), Gadag, Hassan, Haveri, Hubballi, Hubballi Dharawad City Division, Kalaburagi-1, Kalaburagi-2, Kolar, Koppal, Mandya, Mangalore, Mysuru Urban, North Kannada, Puttur, Raichur, Ramanagara, Shivamogga, Tumkur, Vijayapur, Yadgiri

On average, the Overall Margin per km (EPKM – CPKM) is INR -5.58 at the division level, indicating loss making operations across the board. The divisions at the bottom of the spectrum, with the lowest Overall Average Margins per km are Mysuru Urban (INR -18.27), Dharawad (INR -9.88), Kolar (INR -7.90), Hassan (INR -7.72) and Hubballi (INR -7.22). When we visualize the trends across the evaluation period for these depots, we do see an overall decreasing trend for all these divisions, with the decline being most pronounced in the case of Mysuru Urban.
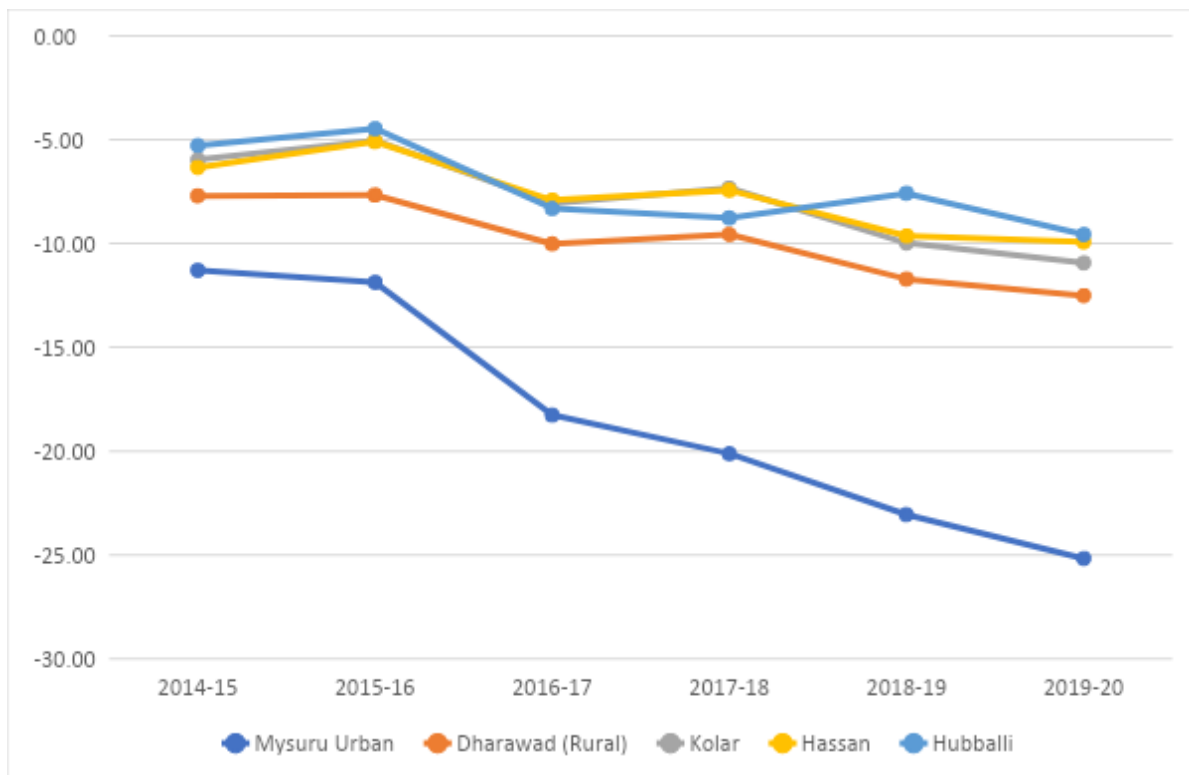
Figure 62: Trends for Divisions with the Lowest Margin per KM (Evaluation Average) (Source: Offline Data)

To look at the better performing divisions, we head to those that fall in Category B (EPKM >= DCPKM), since they will be nearly identical to those in the first set and will also give the added information of profitability against direct expenditure. Before examining division values, the Direct Cost Margin per km on average is INR -1.21, indicative of the fact that when we look at direct costs only, the losses are much lower, with the possibility of positive earnings as well in some cases. 5 divisions show positive differences for this indicator, while another 10 show very low negative margins under INR 1.00. Both sets of divisions are visualized below.
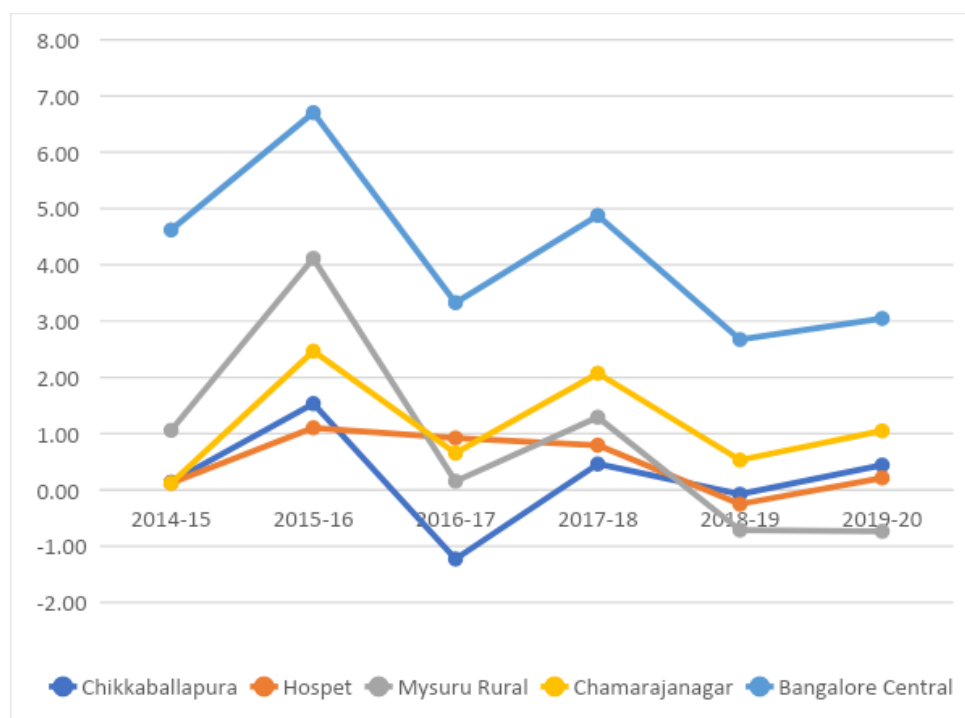
Figure 63: Trends for Divisions with the best EPKM-DCPKM Margins (Evaluation Average)
(Source: Offline Data)

For the divisions with positive differences, the decreasing trend that was observed with lower performers is not observed across the board, with three of the five, namely Chamarajanagar (INR 1.15), Chikkaballapura (INR 0.21) and Hospet (INR 0.38) either staying the same or showing increasing trends. Of the remaining two with decreasing trends, Bangalore Central still consistently remains as the best performer by a margin, with a much higher average of INR 4.21 for the evaluation period. Mysuru Rural, while having a positive average of INR 0.84, show a declining trend, with the last two years of the period spent in making losses. While Hospet here fall under KKRTC, the other four divisions are all part of KSRTC.
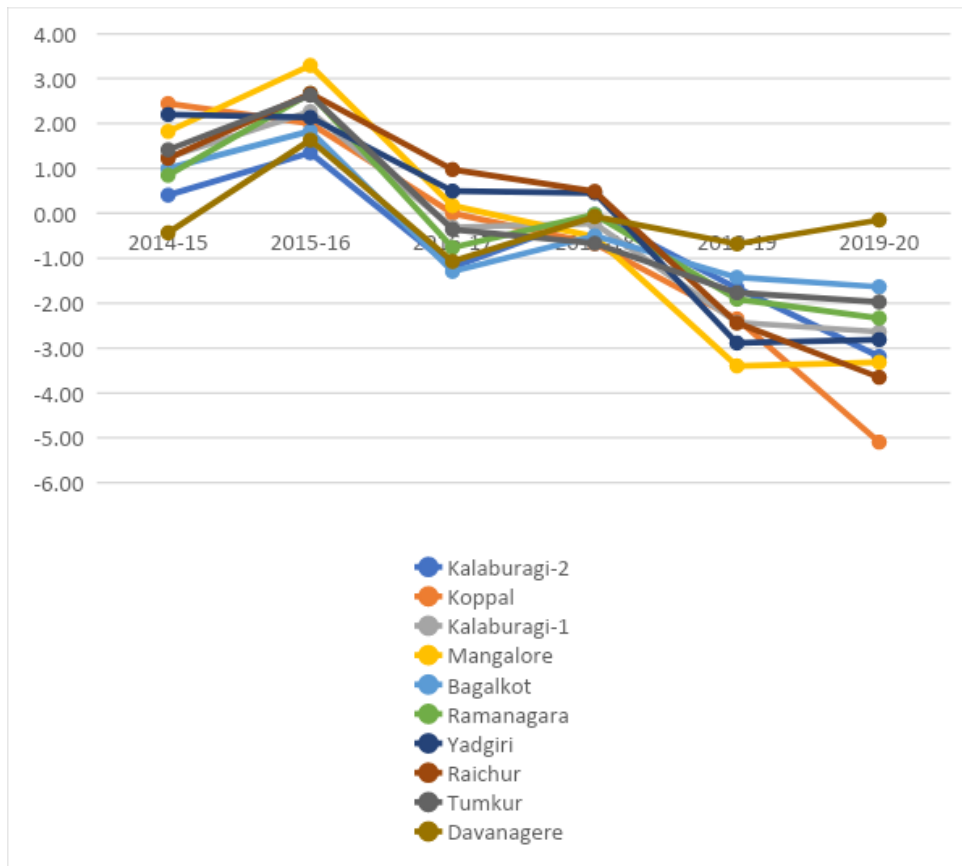
Figure 64: Trends for Divisions with >= 1 EPKM-DCPKM (Evaluation Average) (Source: Offline Data)

For the divisions with very low negative differences (>= INR -1.00), the decreasing trend that was observed with lower performers is observed here is well, with the exception of Davanagere (INR -0.09). All but one of these divisions show positive differences in 2014-15 and 2015-16, facing gradual declines into red right after. Davanagere is the only difference that starts off in red (INR -0.43 in 2014-15) and stays very close to a breakeven value in 2019-20 (INR -0.15), with all of its peers facing direct cost margins of INR -1.50 or lower for the same year. Barring the one division here from NWKRTC (Bagalkot), the remaining 9 are from either KSRTC (4: Tumkur, Ramanagara, Mangalore and Davanagere) and KKRTC (5: Kalaburagi - 1 & 2, Yadgiri, Raichur and Koppal). Of the remaining 18 divisions with higher differences (<= INR -1.00), 8 are from KSRTC, 7 are from NWKRTC and 3 are from KKRTC.

Drilling down to depot level, we examine the distribution of the overall margin in the figure below. We see that a majority of the depots have the margin falling between INR -5.00 and -6.00, with the average across the board coming to INR -5.59. There is only a single depot that has a positive overall margin (EPKM – CPKM), namely Mofussil Depot-3 in Mysuru Rural, with an average value of INR 1.31 over evaluation period. Barring this depot, all the other depots that have medium to low negative differences will be examined when looking at the Direct Cost Margin, since they will stand out further then. For this category, we put our attention towards the loss-making depots at the other end.
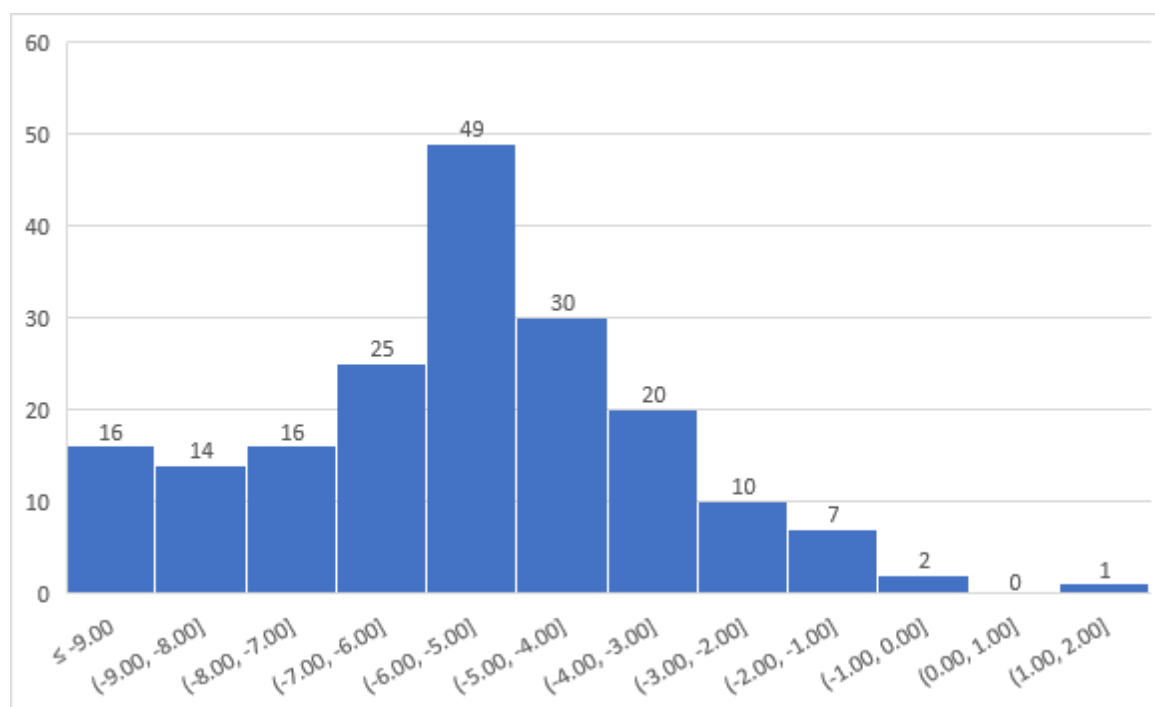
Figure 65: Distribution of EPKM vs CPKM at the Depot Level (Source: Offline Data)

The following table shows the bottom-15 depots in terms of the EPKM-CPKM average, and by coincidence, there are 5 depots from each corporation. We see that 4 of the 5 divisions that performed at the bottom (Mysuru Urban, Hubballi, Dharawad (Rural), Hassan) have depots in this list, with all of Mysuru Urban 4 depots being covered, and 1 depot each from the other three divisions. 12 of these 15 depots are at a relatively high levels of losses, with a margin of -10.00 INR or less. Ballari-3 and Vijayapur-3 (both opened in 2016-17) are at the bottom of the set, with an average overall margin of INR -23.36 and INR -24.63 respectively. To follow, the four Mysuru Urban depots all have a margin of less than INR -15, as was clear in the division level graph Kalaburagi-4 is the only other depot in that category, with an average margin of INR -18.13. The figures can be examined in more detail in the table below.

Table 37: *EPKM-CPKM Evaluation Average for Bottom 15 Depots (Source: Offline Data)*

Corporation	Division	Depot	EPKM-CPKM Evaluation Average
NWKRTC	North Kannada	Kumta	-8.97
NWKRTC	Belgavi	Ramdurga	-9.00
KKRTC	Bidar	Bidar-2	-9.23
KSRTC	Hassan	Hassan-2	-10.44
KKRTC	Ballari	Kuragoda	-11.14

NWKRTC	Dharawad (Rural)	Dharawad	-14.24
NWKRTC	Hubballi	City-1	-14.47
NWKRTC	Belgavi	Belgavi-2	-14.82
KSRTC	Mysuru Urban	Vijayanagar	-15.76
KKRTC	Kalaburagi-1	Kalaburagi-4	-18.13
KSRTC	Mysuru Urban	Kuvempunagar	-18.47
KSRTC	Mysuru Urban	Satagalli	-19.14
KSRTC	Mysuru Urban	Bannimantapa	-19.34
KKRTC	Ballari	Ballari-3	-23.36
KKRTC	Vijayapur	Vijayapur-3	-24.63

Looking at the trends for these depots, we see that the graph mirrors the division level trends, with the margin values becoming increasingly negative over the evaluation period.
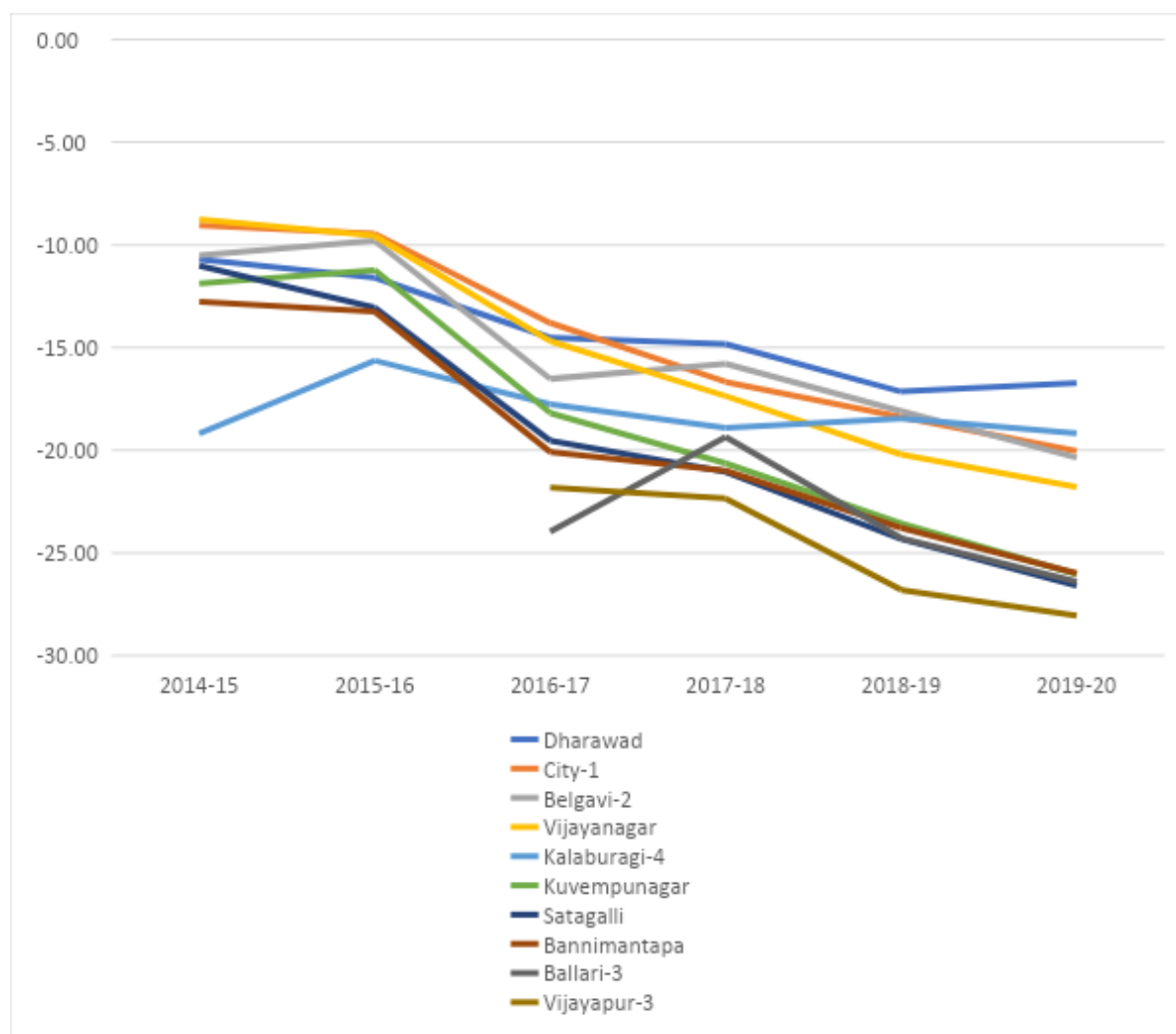
Figure 66: Trends for Depots with the Lowest Margin per KM (Evaluation Average) (Source: Offline Data)

Of the 15 depots, Kuragoda, Ballari-3 and Vijayapur-3 are all depots that were opened during the evaluation period. It is also observed that a lot of the depots like these that have been opened during the evaluation period do not fall among the top performers, and also see an increase in the margins achieved in the starting year, before following the general decreasing trend being seen among the rest of the depots.

Based on the Direct Cost Margin per km, the distribution of the difference per km for the depots is given in the histogram below. A majority of the depots (50) show a negative difference between INR -2.00 and INR -1.00. However, we see that 51 of the depots actually show positive differences, while another 26 show very low negative differences (>= INR -1.00).
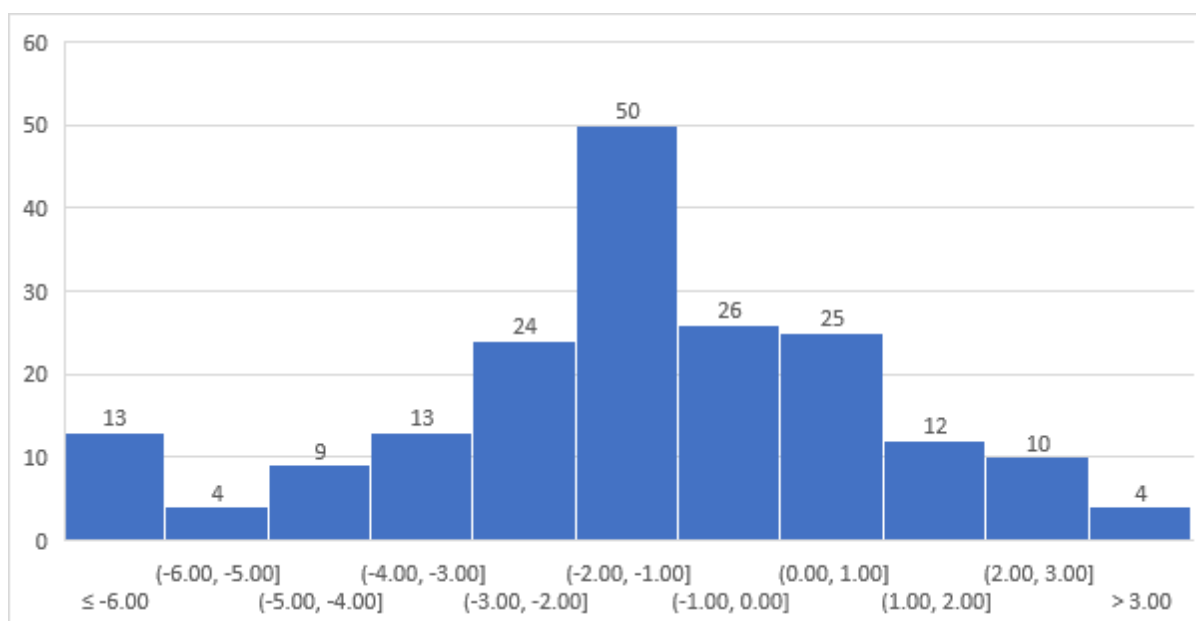
Figure 67: Distribution of the EPKM vs the DCPKM at the Depot Level (Source: Offline Data)

Focussing on the positive differences, a table for the depots with the highest average DC margin per km are given in the table below. In line with the division performance for Bangalore Central, 5 of its 6 active depots form part of this top 15, with Depot-2 and Depot-4 with the highest values by a long shot (INR 8.20 and INR 7.06 respectively). The remaining 6th depot (Depot-1) also has a positive difference of INR 1.56. Apart from Bangalore, all of the top divisions with a positive difference for the DC margin have depots here, namely Mysuru Rural, Hospet, Chikkaballapura and Chamarajanagara. The divisions that are covered here are Kalaburagi 1& 2, Ramanagara, Belgavi and Tumkur. 11 of these depots come under KSRTC, with 3 under KKRTC and a solitary depot from NWKRTC.

Table 38: *EPKM-DCPKM Evaluation Average for Top 15 Depots (Source: Offline Data)*

Corporation	Division	Depot	EPKM-DCPKM Evaluation Average
KSRTC	Bangalore Central	Depot-2	8.20
KSRTC	Bangalore Central	Depot-4	7.06
KSRTC	Mysuru Rural	Mofussil Depot-2	4.73
KSRTC	Mysuru Rural	Mofussil Depot-3	4.66
KSRTC	Bangalore	Depot-6	2.90

	Central		
NWKRTC	Belgavi	Belgavi-1	2.84
KSRTC	Tumkur	Tumkur-2	2.78
KSRTC	Chikkaballapura	Gowribidanur	2.51
KKRTC	Hospet	HOSPET	2.42
KKRTC	Kalaburagi-1	Sedum	2.40
KSRTC	Chamarajanagar	Chamarajanagara	2.28
KSRTC	Ramanagara	Harohalli	2.21
KSRTC	Bangalore Central	Nelamangala	2.09
KSRTC	Bangalore Central	Depot-5	2.07
KKRTC	Kalaburagi-2	Afzalpur	1.90

Looking at the top 5 depots graphically, we can see that the same decreasing trend for the margin is observed for the best performing depots as well, albeit by a very small amount for a couple of the depots. It is also evident that there is a fair amount of fluctuation in these values from year to year, which would mean a sizeable variation in overall traffic revenue, when multiplied with total kms travelled.
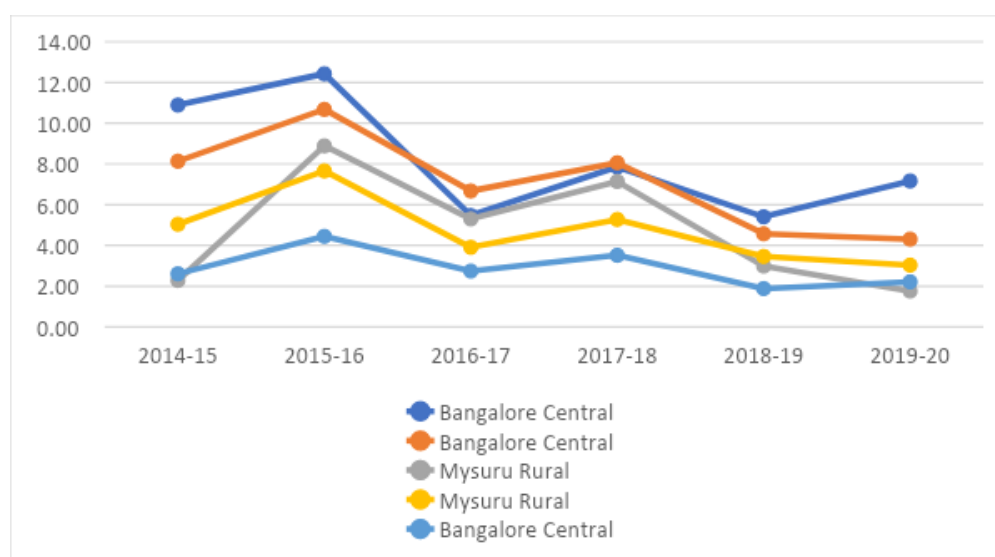
Figure 68: Trends for the Depots with the best EPKM - DCPKM values (Evaluation Average)
(Source: Offline Data)

a. **Financial Analysis of the three Corporations**

The financials of the three corporations and their analysis is provided below:

i. **KSRTC**

Table 39: Profit and Loss Account Summary of KSRTC   *in Rs. Lakh*

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Traffic Revenue	277,833	273,804	297,503	313,171	318,226
Subsidies	23,630	27,151	32,737	39,461	40,195
Total Operating Revenue	**301463**	**300955**	**330239**	**352632**	**358421**
Operating Expenses					
Staff expenses	131,416	144,630	147,574	157,978	167,336
Fuel and spares	119,049	134,164	142,521	162,024	157,953
Other operating expenses	11,819	10,779	10,767	12,470	13,070
Taxes	15,417	15,290	16,683	17,535	17,790
Depreciation on vehicles	20,199	15,565	16,046	19,475	19,690
Total Operating expenses	**297900**	**320429**	**333591**	**369482**	**375839**
Operating profit	**3562**	**(19475)**	**(3352)**	**(16850)**	**(17418)**
Interest expenses	3,233	1,669	1,752	2,218	2,346
Other expenses, Provisions, Depreciation. on other assets	11,651	12,961	13,035	14,228	16,671
Non-Operating revenue	16,416	16,396	18,590	19,804	20,679
Net profit	**5095**	**(17708)**	**450**	**(13493)**	**(15756)**

(Source: KSRTC Admin Reports from 2014-15 to 2019-20)

While the corporation was profitable at a net profit level in FY16, the subsequent years haven't been profitable with the exception of FY18 when there was a marginal profit. The reasons for losses seem to be increases in the cost of fuel and spares and employee costs. It appears that the effect of the fare increase in May 2014 has contributed to the profitable operations in 2015-16. However, the salary revision in July 2016 and increased fuel prices have contributed to losses in subsequent years.

The continuous losses have also resulted in the erosion of the net worth of the corporation. A summary of the Balance Sheet is provided below:

Table 40: Balance Sheet Summary of KSRTC   *in Rs. Lakh*

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Net worth	54,458	31,028	32,978	24,317	9,867
Capital Reserve	155,529	169,146	183,477	191,492	204,761
Loans	20,847	15,890	28,323	25,273	32,208
Current Liabilities and Provisions	61,049	77,645	84,380	85,710	107,540
Total	291883	293709	329158	326792	354375
Net Fixed Assets	246,528	258,418	294,167	295,097	314,167
Investments	5	5	5	5	5
Current Assets	21,437	23,262	25,046	22,313	26,322
Stock and Asset Adjustment	384	469	487	503	448
Cash and Bank	23,529	11,555	9,453	8,875	13,433
Total	291883	293709	329158	326792	354375

(Source: KSRTC Admin Reports from 2014-15 to 2019-20)

The corporation has maintained a positive net worth in spite of losses in three of the last 5 years. However, the same is not likely to continue given the increasing losses. It is observed that the depreciation reserve has been capitalized and the amount has been utilized for repayment of loans (shown under capital reserve in the balance sheet summary above). This gives rise to two issues:

1) Depreciation reserve is created for the purpose of meeting the requirement of asset replacement and its utilization for loan repayment results in the inability of the organization to find resources for asset replacement.

2) The assets are shown in the books at their gross value and the depreciation reserve (accumulated depreciation) is at a much lower amount as compared to the actual depreciation (as some part of it has been capitalized for loan repayment). As a result of this the asset values are inflated in the books of account.

However, the corporation has been consistent in generating operating cash flows as seen below:

Table 41: Operating Cash Flow   of KSRTC   *in Rs. Lakh*

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Net profit after tax	5,095	-17,708	450	-13,493	-15,756
Add: Depreciation	22,285	17,624	18,365	21,887	22,129
Add: Interest expenses		1,669	1,752	2,218	2,346
Gross cash accruals	**27,380**	**1,585**	**20,568**	**10,612**	**8,719**
Changes in working capital					
Change in current assets		-1,826	-1,784	2,733	-4,009
Change in current liabilities		16,596	6,735	1,331	21,829
Operating cash flow		**27380**	**16355**	**25519**	**14676**

(Source: KSRTC Admin Reports from 2014-15 to 2019-20)

The positive operating cash flow generation (after taking into account the subsidy received) indicates that the business operations are sustainable. However, the cash flows are not sufficient to address the investments in terms of purchase of buses and interest payments and repayment of loans.

The key financial ratios of the corporation are as below:

Table 42: Key financial ratios of KSRTC

Key Ratios	2015-16	2016-17	2017-18	2018-19	2019-20
Revenue Growth		-0.17%	9.92%	6.77%	1.79%
Operating profit ratio	1.18%	-6.47%	-1.02%	-4.78%	-4.86%
Net profit ratio	1.60%	-5.58%	0.13%	-3.62%	-4.16%
Asset turnover Ratio (times)	5.13	4.51	5.76	4.15	7.71
Inventory Days (stores and spares, batteries, tyres and lubricants)	68	80	91	87	106
Average collection Period (days)	5	5	6	4	8

Average Payment Period (days)	62	73	72	64	84
Inventory holding per bus (Rs)	39,015	43,349	45,480	41,353	55,015
Debt Equity Ratio	0.38	0.51	0.86	1.04	3.26
Interest coverage ratio	2.58	-9.61	1.26	-5.08	-5.72
Current Ratio	0.35	0.30	0.30	0.26	0.24

(Source: KSRTC Admin Reports from 2014-15 to 2019-20)

The revenue growth of the corporation has been volatile. It has been declining from FY18 onwards and the fall has been sharp in FY20. In line with the reduced revenue growth, the operating profit and net profit have declined. Given that a large part of the expenses (salaries, depreciation and interest) are fixed in nature, growth in revenue is key to maintaining profitability.

On the efficiency ratios, the corporation has done better in asset utilization. However, there has been an increase in the inventory holding in FY20 which is also reflected in the increased inventory per bus, which has increased by nearly 33%. The liquidity position is also strained as reflected in the increase in the average payment days and the poor current ratio.

On the solvency front, the debt equity has sharply increased in FY20 on account of the fall in net worth. Further, the interest coverage ratio has also turned negative in FY19 and FY20 after having improved in FY18.

ii. **NWKRTC**

Table 43: Profit and Loss Account Summary for NWKRTC in Rs. Lakh

	2015-16	2016-17	2017-18	2018-19	2019-20
Traffic Revenue	150,655	149,527	158,959	166,498	164,400
Subsidies	16,222	17,121	23,059	28,724	21,803
Total	**166876**	**166649**	**182018**	**195222**	**186203**
Operating Expenses					
Staff expenses					

	76,616	84,320	92,852	97,656	100,907
Fuel and spares	65,605	73,854	76,198	85,615	82,879
Other operating expenses	3,606	3,356	3,618	3,644	3,860
Taxes	7,426	7,343	7,680	8,077	8,044
Depreciation on vehicles	12,349	7,788	7,305	7,851	7,540
Total Operating expenses	**165602**	**176661**	**187653**	**202844**	**203229**
Operating profit	**1274**	**(10013)**	**(5636)**	**(7622)**	**(17026)**
Interest expenses	2,882	1,758	1,131	1,028	1,337
Other expenses, Provisions, Depreciation on other assets	8,774	7,574	6,858	7,796	9,620
Non-Operating revenue	6,503	7,389	6,427	7,538	9,338
Net profit	**(3878)**	**(11955)**	**(7198)**	**(8907)**	**(18645)**

(Source: NWKRTC Admin Reports from 2014-15 to 2019-20)

The corporation has been making losses over the last 5 years. It had a small operating profit in FY16, probably on account of the fare increase in 2015. However, the wage revision in 2016 coupled with increase in the cost of fuel and spares has resulted in increased losses. Further, traffic revenue has fallen in FY20 as compared to FY19. The losses have contributed to the net worth turning negative and continuing to be negative as seen in the Balance Sheet below.

Table 44: Balance Sheet of NWKRTC in Rs. Lakh

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Net worth	-16,588	-21,669	-25,348	-26,335	-50,011
Capital Reserve	12,194	12,194	12,194	12,194	12,149
Loans	22,144	12,454	14,831	13,354	25,093
Current Liabilities and Provisions	52,458	68,860	77,166	91,748	103,474
Total	**70208**	**71839**	**78842**	**90961**	**90705**
Net Fixed Assets	49,399	55,612	62,742	66,135	63,599
Investments	300	300	300	300	300
Current Assets	16,846	13,042	13,335	21,067	19,579
Stock and Asset Adjustment	4	72	72	72	72
Cash and Bank	3,659	2,813	2,393	3,385	7,154
Total	**70208**	**71839**	**78842**	**90961**	**90705**

(Source: NWKRTC Admin Reports from 2014-15 to 2019-20)

The negative net worth has tripled in 5 years and with traffic revenue not growing, it is likely to worsen. The negative net worth has doubled between FY19 and FY20. Further, the debt has also increased by more than 85% which is likely to impact the solvency of the corporation. As observed earlier, capitalization of depreciation reserve (shown under capital reserve in the balance sheet summary above) and utilizing the same for loan repayment results in depletion of reserves for asset replacement and inflating the value of assets in the Balance Sheet.

While the corporation has been generating operating cash flows, the same has been declining over the last five years.

Table 45: Operating Cash Flow of NWKRTC   in Rs. Lakh

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Net profit after tax	-3,878	-11,955	-7,198	-8,907	-18,645
Add: Depreciation	13,432	8,918	8,497	9,153	9,081
Add: Profit on sale of assets		-14	-328	-9	-814
Add: Interest expenses		1,758	1,131	1,028	1,337

Gross cash accruals	9553	-1294	2102	1265	-9041
Changes in working capital					
Change in current assets		3,804	-293	-7,732	1,488
Change in current liabilities		16,402	8,306	14,582	11,726
Operating cash flow		**18912**	**10115**	**8114**	**4173**

(Source: NWKRTC Admin Reports from 2014-15 to 2019-20)

The gross cash accruals have turned negative in FY20 and the increase in current liabilities signifying delayed payments to suppliers has facilitated the positive operating cash flows. However, the cash flows are not sufficient for interest payments, loan repayments and asset acquisition. The fall in traffic revenue in FY20 has also contributed to the reduction in cash from operations.

Table 46: Key financial ratios of NWKRTC

Key Ratios	2015-16	2016-17	2017-18	2018-19	2019-20
Revenue Growth		19%	9%	4%	3%
Operating profit ratio	0.76%	-6.01%	-3.10%	-3.90%	-9.14%
Net profit ratio	-2.24%	-6.87%	-3.82%	-4.39%	-9.54%
Asset turnover Ratio (times)	3.38	3.00	2.90	2.95	2.93
Inventory Days (stores and spares, batteries, tyres and lubricants)	82	90	83	82	98
Average collection Period (days)	17	14	14	28	23
Average Payment Period (days)	103	127	133	138	156
Inventory holding per bus (Rs)	45,422	46,034	37,950	38,909	53,229
Debt Equity Ratio	-1.33	-0.57	-0.59	-0.51	-0.50
Interest coverage ratio	-0.35	-5.80	-5.37	-7.67	-12.94
Current Ratio	0.32	0.19	0.17	0.23	0.19

(Source: NWKRTC Admin Reports from 2014-15 to 2019-20)

The growth in revenue has been witnessing a secular decline over the last 5 years. This has resulted in the increasing operating and net losses for the corporation. In terms of operational efficiency, the asset utilization has declined to less than 3 times in FY20 indicating that the fleet is not being utilized effectively. Further, the inventory holding has also increased to an average of 98 days in FY20, increasing by about 20% over FY19. The inventory per bus has also increased sharply in FY20. The increased payable days indicates liquidity tightening, given that the operating cash flow has fallen by nearly 30%. The current ratio is also low at 0.19.

In terms of solvency, the corporation has been having a negative net worth for the last 5 years which is showing an increasing trend. Interest coverage has deteriorated to -12.94 times. Though the interest costs are low at less than 1% of the total revenues, the lack of revenue growth has resulted in negative interest coverage. The corporation would require capital restructuring and capital infusion to be able to provide its services efficiently.

iii. KKRTC

Table 47: *Profit and Loss Account of KKRTC in Rs. Lakh*

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Traffic Revenue	132,411	132,471	141,550	152,507	153,951
Subsidies	12,877	13,492	15,551	19,288	21,529
Total	**145288**	**145962**	**157101**	**171794**	**175480**
Operating Expenses					
Staff expenses	73,716	75,187	80,905	87,187	94,302
Fuel and spares	55,465	62,073	63,302	71,970	70,042
Other operating expenses	2,573	2,278	2,631	2,905	3,260
Taxes	6,905	6,944	7,412	7,798	7,943
Depreciation on vehicles	7,188	5,408	7,132	10,422	10,574
Total Operating expenses	**145845**	**151890**	**161382**	**180282**	**186121**
Operating profit	**(558)**	**(5927)**	**(4281)**	**(8487)**	**(10642)**
Interest expenses	1,173	691	485	892	980
Other expenses, Provisions, Depreciation on other assets	5,299	4,808	5,008	4,719	5,545
Non-Operating revenue	4,838	5,980	6,444	7,275	8,239
Net profit	**(2192)**	**(5446)**	**(3331)**	**(6823)**	**(8927)**

(Source: KKRTC Admin Reports from 2014-15 to 2019-20)

The corporation has made a net loss in all the 5 years under review. The lack of growth in revenues appear to be the main reason for the losses. Fuel expenses and depreciation increased sharply in FY FY19. Revenues grew at a Compounded Annual Growth Rate (CAGR) of 5.18% between FY16 and FY20. Traffic revenue grew by 3.84% while subsidies and other non operating income grew by about 14%. Slow growth of traffic revenue is a cause for concern. In spite of having the youngest fleet among the three corporations (average age of vehicles as on March 31, 2020 being 6.42 lakh Kms), the fleet utilization is the lowest among the three corporations at 84.1%.

The increased losses in the years FY19 and FY20 has resulted in the net worth turning negative in FY20.

Table 48: *Balance Sheet Summary for KKRTC in Rs. lakh*

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Net worth	1,563	4,118	10,205	1,921	(7,212)
Capital Reserve	60,670	64,283	64,303	72,303	72,303
Loans	6,653	4,499	7,102	13,547	9,744
Current Liabilities and Provisions	59,954	66,031	76,823	84,457	93,748
Total	**128839**	**138932**	**158433**	**172227**	**168583**
Net Fixed Assets	109,638	116,270	137,170	149,420	142,799
Investments	10	10	10	10	10
Current Assets	6,988	9,298	10,469	10,673	14,963
Stock and Asset Adjustment	211	196	189	197	196
Cash and Bank	11,993	13,157	10,595	11,927	10,615
Total	**128839**	**138932**	**158433**	**172227**	**168583**

(Source: KKRTC Admin Reports from 2014-15 to 2019-20)

The corporation has maintained a positive net worth till FY19 which turned negative in FY20. As in the case of other corporations, the depreciation reserve has been capitalized (shown as capital reserve above) and the amount utilized for repayment of loans. This has resulted in non availability of reserves for asset replacement value of the assets in the balance sheet being represented at a value which is higher than their intrinsic value. There has also been a marginal reduction in the value of net fixed assets as the average number of buses in operation in the corporation has come down from 4788.90 to 4722.50. However, the corporation has managed to generate positive operating cash flows.

Table 49: *Operating Cash Flow of KKRTC in Rs. Lakh*

Particulars	2015-16	2016-17	2017-18	2018-19	2019-20
Net profit after tax	(2,192)	(5,446)	(3,331)	(6,823)	(8,927)
Depreciation	7,842	5,902	7,691	11,033	11,222
Interest expenses		691	485	892	980
Gross cash accruals	**5,650**	**1147**	**4846**	**5102**	**3275**
Changes in working capital					
Change in current assets		(2,310)	(1,171)	(204)	(4,290)
Change in current liabilities		6,078	10,791	7,634	9,291
Operating cash flow		**4914**	**14467**	**12532**	**8276**

(Source: KKRTC Admin Reports from 2014-15 to 2019-20)

The corporation has managed to generate positive operating cash flows in spite of net losses. Better management of working capital is one of the reasons of positive operating cash flows. However, as in the case of other corporations, the cash flow generation is not sufficient for capital investments.

The key ratios are as below:

Table 50: Key financial ratios of KKRTC

Key Ratios	2015-16	2016-17	2017-18	2018-19	2019-20
Revenue Growth		1%	8%	9%	3%
Operating Profit Ratio	-0.38%	-3.90%	-2.65%	-4.71%	-5.72%
Net profit ratio	-1.46%	-3.58%	-2.04%	-3.81%	-4.86%
Asset turnover Ratio (times)	1.37	1.31	1.19	1.20	1.29

Inventory Days (stores and spares, batteries, tyres and lubricants)	94	113	147	149	136
Average collection Period (days)	68	9	9	11	17
Average Payment Period (days)	140	148	160	161	171
Inventory holding per bus (Rs)	44,677	51,030	54,212	47,287	53,567
Debt Equity Ratio	4.26	1.09	0.70	7.05	-1.35
Interest coverage ratio	-0.87	-6.88	-5.86	-6.65	-8.11
Current Ratio	0.12	0.14	0.14	0.13	0.16

(Source: KKRTC Admin Reports from 2014-15 to 2019-20)

The revenue growth has declined in FY20 after showing increase in FY18 and FY19. The operating and net profit ratios are negative given the low growth in revenue. However, efficient cost management appears to have kept the losses to the minimum. The efficiency of asset utilization is low at around 1.3. Given that the corporation has a younger fleet as compared to the other corporations, asset turnover can be better. While the inventory days have not increased significantly over time, it remains at a fairly high level with more than 5 months of consumption being held in stock. The liquidity pressure is reflected in the increased payable days.

With respect to the solvency, the net worth has turned negative and the negative interest coverage has been steadily increasing. The current ratio is also very low signifying very poor financial strength. The corporation will require capital restructuring and fresh capital infusion to sustain the operations.

b. Review of the Annual Action Plans for 2019-20

After closely analysing the action plans for the three corporations there were a few aspects identified that were hindering the achievements of the targets:

1. Fuel cost is one of the key cost elements and the uncertainty and volatility makes planning difficult. The state may provide a fuel equalization subsidy as the corporations are not in a position to factor the cost increase in the fare
2. The introduction of new schedules should be done after a proper analysis of the demand and conducting route rationalization studies. Otherwise, the increase is arbitrary and may not be realistic.
3. The fuel efficiency targets are based on a standard benchmark without taking into account the age of the buses. The targets may be made more realistic based on the age of the vehicle.

4. The load factor assumed in the action plans should be based on the actuals achieved in the previous year and should then factor improvements. Making assumptions based on the EPKM is not the right approach.

5. The corporations have a larger proportion of long distance and AC routes as compared to many other State Transport Corporations. However, the load factor on the longer routes are poor and in many cases around 50%. A thorough study needs to be conducted on the demand before introducing long distance and premium services.

6. Making a realistic action plan gives a greater chance of it being achieved.

c. Impact of Economies of scale on Operations and Performance

The size and operations of the three corporations under review are different. KSRTC covers almost half the state and the other two corporations cover about 25% each. In terms of revenue, KSRTC had operating revenue of Rs. 3,594 crores in 2019-20 as compared to the revenue of Rs. 1,862 crores for NWKRTC and Rs. 1,755 crores for KKRTC. KSRTC being double the size enjoys significant economies of scale.

Table 51: Corporation wise Operating Profit Ratio trend from 2014-15 to 2019-20

Operating profit ratio	2015-16	2016-17	2017-18	2018-19	2019-20
KSRTC	1.18%	-6.47%	-1.02%	-4.78%	-4.86%
NWKRTC	0.76%	-6.01%	-3.10%	-3.90%	-9.14%
KKRTC	-0.38%	-3.90%	-2.65%	-4.71%	-5.72%

(Source: Admin Report)

It may be observed that in spite of scale benefits, at the operating level, KSTRC is not significantly better off than the other corporations. In fact, in the year 2018-19, KSRTC posted the highest operating loss percentage among the three corporations.

Further, the geographical region that KSRTC operates is more prosperous. The region has a higher share of commercial activities, and the per capita income of the population is higher. The average per capita income of the districts in which KSRTC operates is about Rs. 1,64,000, while the same for KKRTC is about Rs. 1,29,000 and for NWKRTC is Rs. 1,02,000. It is clear that the socio-economic condition of the districts covered by NWKRTC is unfavourable as compared to the other corporations but the corporation's performance has been on par with the other two till 2018-19.

It appears that KSRTC has not been able to reap the complete benefits of the economies of scale and the better economic condition of the operating environment.

d. Financial Impact of COVID-19

COVID-19 has had a devastating impact on the entire transportation sector across the world, and the Karnataka RTCs have felt the effects of it as well. In the graph below, we see that among the 4 top services run by KSRTC (by volume of passengers carried), the values drop drastically in 2020-21 across the board. For Ordinary services, the drop is by 67% from 4,544

to 1,508 lakh passengers. For Express Services the drop is slightly less steep but is still quite high at 54%. The effect is more so felt on population concentrated areas, covered by the City and Suburban services. In the former case, the passengers carried drops by 77%, while for the latter it drops by 66%.
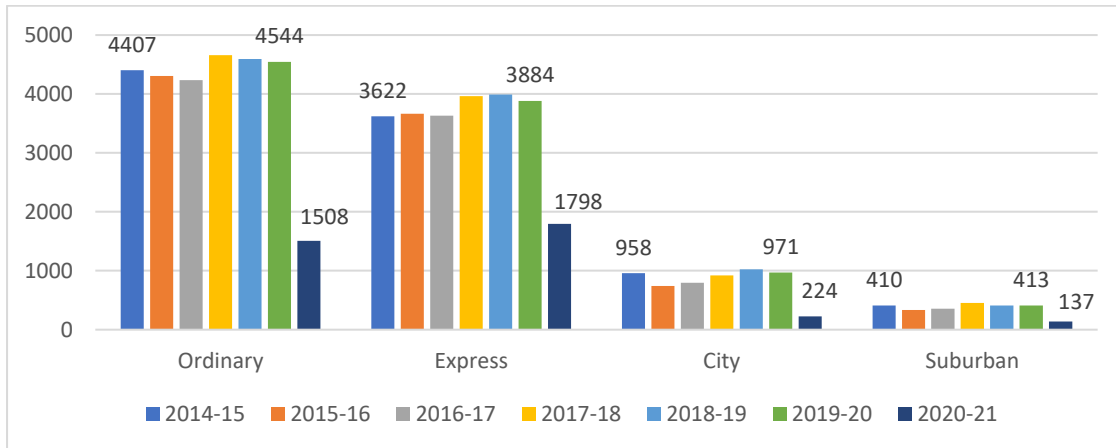
Figure N7: COVID-19 Impact on Top Services for KSRTC by Passengers Carried (in lakh) (Source: Offline Data)

When we examine actual finances as well, we see a similar situation. In the case of KSRTC, the drop in traffic revenue is 50%, falling to INR 1,56,971 lakhs from the INR 3,15,603 lakhs. For NWKRTC as well, the reaction is pretty identical, with the revenue falling by 48% from INR 1,64,205 lakhs to INR 85,625 lakhs in 2021. As reported by NWKRTC, the Man days lost due to Absenteeism (2,48,388) and Employee Sickness (1,01,164) are quite high values as well, making a further dent on the possible revenue that could have been made for the corporation.
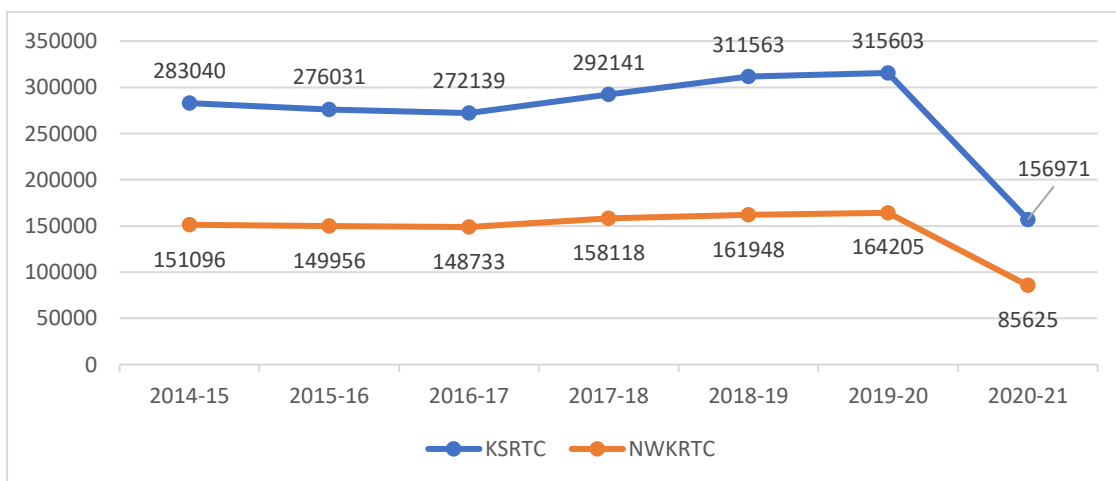
Figure N8: NWKRTC and KSRTC COVID-19 Revenue Impact (Source: Offline Data)

e. **Service-wise Financial Analysis of the three Corporations**

We have obtained information on service wise traffic revenue generated from KSRTC and KKRTC. Information obtained from NWKRTC is limited to schedule wise traffic revenue.

The details of service wise traffic revenue is not available. In all the three corporations, we have not received the route wise traffic revenue. The data in this section was provided **offline** by the three corporations.

At the corporation level, the schedule wise profitability is as below:

Table 52: Profitability of Schedules, Effective KMs Covered and Revenue for each Corporation

	KSRTC			KKRTC			NWKRTC		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
A (EPKM > CPKM)	15%	16%	22%	9%	12%	16%	10%	14%	16%
B (EPKM > DCPKM)	42%	47%	50%	40%	46%	50%	38%	44%	48%
C (EPKM < DCPKM)	43%	37%	28%	51%	42%	33%	52%	44%	36%
Margin (EPKM *less* CPKM, Paise)	338.3	-471.7	-1422.7	242.2	-588.5	-1505.6	68.0	-609.0	-1393.8

Note: The average CPKM has been used across all categories A, B and C

It can be observed that the proportion of schedules that are profitable are less than 15% and contribute to a maximum of 22% of the total revenue for KSRTC, while it is 16% for the other corporations. About 50% of the effective Kms contribute to an equal proportion of revenue in the B category, signifying that 50% of the operations are able to cover the direct cost. The loss making routes (category C) comprise 37% to 44% of the effective Kms across the three corporations.

The above indicates that some more focus on improving the load factor in the B category schedules will help in making the routes profitable. It is likely that the C category routes have poor patronage. A comprehensive route extension/route rationalisation exercise will have to be undertaken to identify the routes that can be dropped without compromising the service level. The unviable routes that are being serviced to address a social need should be identified and an appropriate compensation from the government should be sought.

The following sections provide the service wise analysis of A, B and C category routes. Please note that service wise information across the three categories is not available in the case of NWKRTC.

i. KSRTC

The division wise performance across the three categories is as below:

Table 53: KSRTC Division-wise Overall Profitability of Schedules, Effective KMS and Revenue

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Bengaluru (Central)	29%	26%	33%	**60%**	**62%**	57%	**11%**	**12%**	**10%**
Ramanagara	24%	22%	30%	35%	40%	44%	41%	38%	26%
Tumkur	18%	21%	28%	42%	46%	50%	40%	33%	22%
Kolar	5%	5%	8%	31%	37%	44%	**64%**	58%	48%
Chikkaballapura	**31%**	**36%**	**44%**	38%	37%	38%	31%	27%	18%
MCTD	**0%**	**0%**	**0%**	37%	32%	39%	63%	**68%**	**61%**
Mysuru (Rural)	15%	16%	20%	48%	53%	56%	37%	30%	24%
Mandya	13%	18%	22%	**28%**	**29%**	**33%**	59%	52%	45%
Chamarajanagar	29%	30%	37%	51%	52%	52%	20%	17%	12%
Hassan	10%	11%	16%	30%	37%	42%	60%	52%	42%
Chikmagalur	4%	4%	6%	42%	48%	54%	54%	48%	40%
Mangalore	9%	9%	14%	47%	53%	57%	44%	38%	30%
Puttur	6%	7%	9%	37%	43%	48%	57%	50%	43%
Davanagere	17%	20%	26%	53%	57%	57%	31%	23%	17%
Shivamogga	6%	7%	9%	46%	59%	**65%**	49%	34%	26%
Chitradurga	12%	16%	21%	43%	48%	53%	45%	35%	27%

Note: The highest and lowest contribution in each category is highlighted in blue and red colours respectively

In terms of revenue it can be observed that 5 of the 17 Divisions have a low proportion (single digits) of schedules that cover the costs completely. In almost all the Divisions, 45% to 50% of the revenues are generated by B category schedules where the direct cost is covered. Kolar, MCTD and Mandya are the Divisions where the majority of the revenue is from C category schedules.

The service wise analysis of Ordinary, Express and other select services are provided below:

Ordinary Services

Table 54: KSRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Ordinary Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Bengaluru (Central)	**22%**	10%	20%	30%	31%	30%	**48%**	59%	49%
Ramanagara	19%	**15%**	**26%**	12%	12%	15%	69%	73%	59%
Tumkur	1%	4%	4%	22%	27%	38%	76%	70%	58%
Kolar	3%	4%	7%	5%	5%	8%	91%	91%	85%
Chikkaballapura	9%	9%	13%	25%	25%	30%	66%	66%	57%
MCTD	**0%**	**0%**	**0%**	16%	14%	19%	84%	86%	81%
Mysuru (Rural)	2%	2%	2%	19%	20%	24%	79%	79%	74%
Mandya	4%	4%	6%	12%	13%	16%	84%	83%	79%
Chamarajanagar	10%	6%	10%	**41%**	**43%**	**49%**	49%	**51%**	**41%**
Hassan	**0%**	**0%**	**0%**	**0.4%**	**1%**	**1%**	**99.6%**	**99%**	**99%**
Chikmagalur	0%	0%	0%	11%	12%	17%	89%	88%	83%
Mangalore	6%	7%	10%	30%	31%	40%	64%	62%	55%
Puttur	0.4%	0.4%	1%	15.6%	17.8%	22%	84%	81.8%	77%
Davanagere	8%	7%	10%	27%	31%	35%	65%	62%	55%
Shivamogga	1%	1%	1%	12%	18%	26%	87%	82%	73%
Chitradurga	2%	3%	4%	23%	28%	34%	74%	69%	62%
Overall	**5%**	**4%**	**7%**	**18%**	**19%**	**25%**	**77%**	**76%**	**68%**

It can be observed that the overall performance of ordinary services is very poor from a cost recovery perspective with more than 75% of the schedules not covering even the Direct cost (variable cost *plus* employee cost). With the exception of Bengaluru, Ramanagar and Chamrajnagar, all other division have negligible profitable schedules under the Ordinary service. With 37% of the schedules of KSRTC being Ordinary services (3,042 out of 8,172 schedules) this is the biggest contributor to the losses of the corporation. There is a need to rationalise the number of schedules by rationalising the routes that are served by the Ordinary service. While it is unlikely that the Ordinary service will be profitable in areas other than urban centres, the focus should be on increasing the number of schedules in B category. A year wise target should be set to bring at least 50% of the schedules into the B category.

Express Services

Table 55: KSRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Express Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Bengaluru (Central)	25%	23%	27%	**73%**	75%	71%	**3%**	**3%**	**2%**
Ramanagara	32%	29%	33%	62%	64%	61%	6%	7%	5%
Tumkur	35%	33%	40%	60%	60%	57%	4%	7%	3%
Kolar	7%	7%	9%	63%	62%	64%	30%	31%	27%
Chikkaballapura	**48%**	**51%**	**57%**	48%	44%	40%	4%	4%	3%
MCTD	-	-	-	-	-	-	-	-	-
Mysuru (Rural)	19%	19%	22%	63%	68%	68%	17%	13%	11%
Mandya	24%	30%	33%	**47%**	**43%**	**44%**	30%	27%	24%
Chamarajanagar	41%	42%	46%	57%	57%	53%	2%	2%	1%
Hassan	15%	16%	21%	54%	55%	54%	30%	29%	25%
Chikmagalur	7%	6%	7%	63%	62%	65%	31%	32%	28%
Mangalore	**5%**	**6%**	**7%**	70%	74%	**76%**	25%	10%	17%
Puttur	11%	10%	12%	57%	59%	61%	**32%**	**31%**	**27%**
Davanagere	23%	23%	26%	71%	73%	70%	6%	5%	4%
Shivamogga	9%	10%	12%	68%	**76%**	77%	23%	13%	11%
Chitradurga	26%	19%	32%	64%	64%	62%	10%	7%	6%
Overall	**23%**	**23%**	**27%**	**60%**	**62%**	**60%**	**17%**	**16%**	**13%**

A significant proportion of the Express services are able to cover the variable cost and employee expenses. With the exception of 5 Divisions, the share of revenue from A category schedules is more than 20%. For nearly half of the Divisions, the loss making schedules are less than 20%. In the case of the better performing Divisions (those with less than 20% schedules in category C) the focus has to be on identifying schedules that can be moved from category B to category A by rationalising routes, timings and route extensions and merging routes. In the case of other Divisions, the focus should be on bringing down the C category routes to less than 20% of the total schedules. From the above it is clear that the break even fare structure is closer to the Express fare which is about 1.5 times the basic fare.

Rajahamsa

Table 56: KSRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Rajahamsa Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Bengaluru (Central)	22%	9%	11%	73%	**86%**	**85%**	**4%**	**6%**	**5%**
Tumkur	**57%**	**51%**	**54%**	43%	**49%**	**46%**	0%	0%	0%
Kolar	0%	0%	0%	**88%**	81%	83%	13%	19%	17%
Chikkaballapura@	0%	0%	0%	100%	100%	100%	0%	0%	0%
Mysuru (Rural)	27%	44%	43%	57%	56%	57%	17%	0%	0%
Chikmagalur	0%	0%	0%	72%	69%	72%	29%	31%	28%
Mangalore	7%	9%	11%	85%	85%	84%	7%	6%	5%
Puttur	22%	16%	19%	59%	68%	66%	19%	17%	15%
Davanagere	**5%**	**7%**	**8%**	85%	83%	84%	10%	10%	8%
Shivamogga@	0%	0%	0%	50%	53%	58%	50%	**47%**	**42%**
Chitradurga	0%	0%	0%	**33%**	74%	70%	**67%**	26%	20%
Overall	**17%**	**14%**	**15%**	**68%**	**76%**	**77%**	**10%**	**10%**	**8%**

@ Only 2 Schedules

It can be observed that most of the services cover only the Direct cost and the proportion of schedules recovering full cost is less than 20%. It may be noted that Divisions such as Bengaluru (Central) which is a top performer in Ordinary and Express services has a significant proportion of schedules that do not cover the total cost. Interestingly, Mysuru and Puttur Divisions which do not recover the full cost in the Ordinary and Express services perform well in the Rajahamsa category. In the case of Chitradurga Division, it appears that a large proportion of schedules contribute to a lesser distance and there may be a case for reviewing the short haul schedules. It appears that the segment is sensitive to competition and selection of routes and a comprehensive review of the routes is required. At an aggregate level, the proportion of C category routes is not significant. However, the large proportion of routes in the B category, particularly in the Divisions which are better performing in the other service segments.

Volvo (Including Volvo MA)

The performance of Volvo service is as below:

Table 57: KSRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Volvo Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Bengaluru (Central)	45%	36%	44%	45%	46%	43%	10%	18%	13%
Mysuru (Rural)	26%	25%	32%	38%	40%	39%	35%	35%	29%
Mangalore	22%	18%	23%	42%	38%	43%	**37%**	**44%**	**34%**
Davanagere	**65%**	**64%**	**67%**	**29%**	**34%**	**31%**	**6%**	**2%**	**2%**
Shivamogga	**10%**	**7%**	**8%**	**60%**	**59%**	**61%**	30%	34%	31%
Overall	**34%**	**28%**	**35%**	**43%**	**43%**	**43%**	**23%**	**29%**	**22%**

The corporation is able to recover full costs only in about 35% of the schedules, while 43% of the schedules cover the Direct cost (variable cost *plus employee cost).* 23% of the schedules do not recover even the Direct cost. Given that even in the Rajahamsa service the category C schedules are only 10%, non-recovery of even Direct cost in 23% of the schedules requires to be closely reviewed. Three out of the 5 Divisions have 30% or more schedules in the C category. Being a premium service the focus should be to have at least 50% of the schedules in A category and less than 10% in C category.

ii. **KKRTC**

The division wise performance across the three categories is as below:

Table 58: KKRTC Overall Division-wise Profitability of Schedules, Effective KMS and Revenue

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	12%	15%	20%	38%	46%	48%	50%	39%	32%
Kalaburagi -2	10%	12%	17%	46%	55%	59%	44%	33%	24%
Yadagiri	11%	13%	19%	42%	48%	53%	47%	39%	28%
Raichuru	**5%**	**6%**	**8%**	**29%**	**36%**	42%	**66%**	**58%**	**50%**
Bidar	**5%**	**6%**	**8%**	36%	42%	49%	59%	52%	42%
Koppal	7%	9%	12%	40%	45%	51%	53%	46%	37%
Ballari	8%	9%	12%	45%	53%	58%	48%	38%	30%
Vijayapur	11%	18%	26%	34%	38%	**41%**	55%	44%	33%
Hospet	**15%**	**17%**	**23%**	**60%**	**62%**	**63%**	**25%**	**20%**	**14%**
Overall	**9%**	**12%**	**16%**	**40%**	**46%**	**50%**	**51%**	**42%**	**33%**

Note: The highest and lowest contribution in each category is highlighted in blue and red colours respectively

It can be observed from the proportion of schedules that recover the full cost is less than20%. 51%% of the schedules contributing to 33% of the revenues are in category C. The socio economic characteristics of the operating geography and the need to provide connectivity are possible reasons for the low recovery. The focus should be to try and achieve full cost recovery in at least 20% of the schedules and reduce the C category schedules to less than one third to start with. A comprehensive route rationalisation exercise needs to be carried out to assess the routes that can be extended/merged. It is also essential to find out the impact of the social obligation of connecting villages and request the government to appropriately compensate the corporation.

The service wise analysis is provided below:
Regular Service

Table 59: KKRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Regnular Services

Divisions	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	**7%**	**8%**	**12%**	29%	31%	36%	63%	61%	52%
Kalaburagi -2	1%	1%	2%	27%	30%	37%	72%	69%	61%
Yadagiri	1%	1%	2%	22%	23%	31%	77%	75%	67%
Raichuru	**0%**	**0%**	**0%**	**7%**	**9%**	**13%**	**93%**	**91%**	**87%**
Bidar	**0%**	**0%**	**0%**	12%	11%	15%	88%	89%	85%
Koppal	1%	0.4%	1%	10%	11%	15%	89%	88%	84%
Ballari	1%	3%	5%	15%	15%	19%	84%	825	75%
Vijayapur	1%	4%	6%	13%	21%	28%	86%	76%	66%
Hospet	5%	4%	6%	**34%**	**36%**	**43%**	**61%**	**60%**	**52%**
Overall	**2%**	**2%**	**4%**	**18%**	**20%**	**26%**	**80%**	**77%**	**70%**

In line with the general trend, the share of schedules that recover full cost is negligible. Even the proportion of schedules that recover Direct cost (variable cost *plus* employee cost) is less than 20%. Rationalisation of routes and improvement of cost recovery in the C category needs to be undertaken. As mentioned earlier, routes that are served to address the social requirements need to be identified and the corporation should request the government to compensate wherever the load factor is low.

Vegaduta Service

Table 60: KKRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Vegaduta Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	17%	19%	22%	61%	63%	62%	22%	19%	15%
Kalaburagi -2	22%	22%	26%	73%	76%	73%	4%	2%	1%
Yadagiri	**23%**	23%	28%	70%	73%	69%	7%	4%	3%
Raichuru	**7%**	**8%**	**10%**	**45%**	**49%**	52%	**49%**	**44%**	**38%**
Bidar	11%	11%	14%	68%	69%	70%	20%	19%	16%
Koppal	12%	13%	15%	65%	67%	67%	24%	21%	17%
Ballari	12%	10%	13%	75%	**77%**	**77%**	13%	12%	10%
Vijayapur	22%	**30%**	**36%**	62%	52%	**50%**	16%	18%	14%
Hospet	22%	23%	29%	**78%**	76%	71%	**1%**	**1%**	**0.4%**
Overall	**16%**	**18%**	**22%**	**65%**	**65%**	**64%**	**19%**	**18%**	**14%**

The Express service recovers the Direct cost in a significant proportion of the schedules. However, the full cost recovery is made by about 20% of the schedules. Route wise analysis is required to identify the potential routes where the service can be improved.

Rajahamsa Service

Table 61: KKRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Rajahamsa Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	14%	14%	16%	64%	69%	70%	21%	17%	24%
Yadagiri[@]	**100%**	**100%**	**100%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Raichuru	**0%**	**0%**	**0%**	40%	38%	44%	60%	62%	56%
Bidar	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**100%**	**100%**	**100%**
Ballari	**0%**	**0%**	**0%**	**100%**	**100%**	**100%**	**0%**	**0%**	**0%**
Vijayapur[@]	0%	5%	6%	50%	57%	61%	50%	38%	33%
Hospet	0%	0%	0%	**100%**	**100%**	**100%**	0%	0%	0%
Overall	**8%**	**7%**	**9%**	**49%**	**44%**	**48%**	**43%**	**49%**	**43%**

@ These Divisions have only 2 schedules

The total number of schedules is only 49 with 50% of the schedules covering Direct cost and about 9% covering the full cost. Being a specialised service, the focus should be to at least cover the Direct Cost and the unviable schedules may be merged with other Divisions or dropped. Further maintain a small fleet of buses in the Division may also lead to inefficiencies in maintenance.

A/C Sleeper

Table 62: KKRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for AC Sleeper Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	25%	16%	22%	**25%**	**36%**	**39%**	**50%**	**48%**	**39%**
Raichuru	25%	22%	23%	50%	50%	51%	25%	28%	26%
Ballari	**33%**	**26%**	**31%**	67%	74%	69%	**0%**	**0%**	**0%**
Hospet@	**0%**	**0%**	**0%**	**100%**	**100%**	**100%**	**0%**	**0%**	**0%**
Overall	**26%**	**19%**	**24%**	**53%**	**56%**	**57%**	**21%**	**24%**	**20%**

@ The Division has only 2 schedules

Being a premium service, the endeavour should be to recover at least the Direct cost. However, in 25% of the schedules the direct cost is not recovered. The merging of schedules of Ballari and Hospet Divisions may be evaluated.

Non A/C Sleeper

Table 63: KKRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for Non-AC Sleeper Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	53%	47%	55%	32%	34%	31%	16%	19%	14%
Kalaburagi -2@	**0%**	**0%**	**0%**	**100%**	**100%**	**100%**	**0%**	**0%**	**0%**
Yadagiri@	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**100%**	**100%**	**100%**
Raichuru	14%	16%	21%	50%	49%	52%	36%	35%	27%
Bidar	**0%**	**0%**	**0%**	100%	100%	100%	0%	0%	0%
Koppal	27%	30%	36%	47%	48%	47%	27%	22%	17%
Ballari	29%	30%	35%	71%	70%	65%	0%	0%	0%
Vijayapur@	25%	32%	42%	38%	33%	34%	38%	35%	24%
Hospet	**56%**	**55%**	**61%**	33%	40%	36%	11%	5%	3%
Overall	**33%**	**32%**	**39%**	**46%**	**48%**	**47%**	**21%**	**20%**	**14%**

The Non A/C sleeper segment appears to be the best performing service in terms of cost recovery. More than one third of the schedules recover the full cost and the proportion of schedules not recovering the Direct cost is ales than 15% (in revenue terms). Expanding the service may be evaluated and shifting some of the Rajahamsa schedules to the sleeper segment may also be evaluated.

City Services

Table 64: KKRTC Division-wise Profitability of Schedules, Effective KMS and Revenue for City Services

	A (EPKM>CPKM)			B (EPKM>DCPKM)			C (EPKM<DCPKM)		
	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue	Schedules	Effective KMs	Revenue
Kalaburagi -1	0%	0%	0%	4%	4%	5%	96%	96%	95%
Yadagiri	0%	0%	0%	8%	2%	3%	92%	98%	97%
Raichuru	15%	1%	2%	11%	2%	4%	74%	97%	95%
Bidar	0%	0%	0%	0%	0%	0%	100%	100%	100%
Koppal	0%	0%	0%	8%	10%	13%	92%	90%	87%
Ballari	0%	0%	0%	0%	0%	0%	100%	100%	100%
Vijayapur	5%	0%	0%	2%	1%	1%	93%	99%	98%
Hospet	0%	0%	0%	75%	71%	75%	25%	29%	25%
Overall	3%	0%	0%	10%	10%	13%	87%	90%	87%

With the exception of Hospet Division, the performance of city services is poor across all Divisions. Given the nature of service, it is inevitable that these services will not cover the costs. The transport corporations should request the government to provide assistance for these services.

f. Summary of financial analysis

The key issues to be addressed are:

✔ Increase in Revenue by way of increase in fares

✔ Identify assets that can be monetized

✔ Work out a compensation from the Government for:

a. Diesel price increase

b. Operations of unviable routes

✔ Capital restructuring by way of writing off of losses and infusion of capital for sustained operations. However, any capital infusion has to be supplemented with a plan for ensuring profitable operations. Otherwise, the net worth will be eroded after a few years. The amount of capital to be infused will depend on the plan for fleet expansion, quantum of existing losses to be written off and working capital requirements

✔ Ensure that the depreciation fund is utilized only for replacement of operating assets and purchase of new buses

✓ Ensure better inventory management and at least reach the inventory days maintained in FY16, which is an improvement 20% to 50% in the various corporations

11.   PRICING STRUCTURE

The comparable fare structures of the Southern states are as below:

Table 65: State-wise Pricing Structure for Southern States

State	Date of last revision	Ordinary	Express	Super Deluxe	Ultra Deluxe	A/C	A/C Volvo
Karnataka	26.02.2020	66	101	123	145	240 (Corona Services)	214
Tamil Nadu	29.01.2018	58	75	85	100	130	170
Kerala	01.03.2018	75	78	85	100	120	145
Andhra Pradesh	10.12.2019	73	107	118	136	156	192

(Source: Admin Reports)

It can be observed that except in the case of the Ordinary and Express services the fare structure of the Karnataka Corporations are higher than the other Southern States. In certain categories such as Sleeper buses Tamil Nadu has a flexi policy where the fare during the weekends are higher by 20% as compared to the fare on weekdays. Similarly, the Kerala State Transport Corporation provides up to 15% discount on inter-state and other superclass services. Similarly, a premium of 10% is charged during the peak season for these services.

Table 66: Karnataka Corporations: EPKM vs CPKM Trend from 2014-15 to 2019-20

EPKM	2015-16	2016-17	2017-18	2018-19	2019-20	CPKM	2015-16	2016-17	2017-18	2018-19	2019-20
KSRTC	28.51	27.63	27.86	29.40	30.44	KSRTC	31.20	33.1	32.63	36.2	37.71
KKRTC	27.53	27.30	28.09	26.88	30.40	KKRTC	31.67	32.4	33.13	32.8	38.04
NWKRTC	25.68	25.41	26.16	27.49	29.13	NWKRTC	29.30	32.1	32.72	35.2	38.44

(Source: Offline Data)

All the three corporations are not in a position to recover the costs resulting in losses. The Cost Per KM (CPKM) and Earnings Per KM (EPKM) of the three corporations over the last years are depicted below:

Table 67: Shortfall in EPKM vs CPKM Trend from 2014-15 to 2019-20

CPKM	2015-16	2016-17	2017-18	2018-19	2019-20
KSRTC	-2.69	-5.49	-4.77	-6.81	-7.27
KKRTC	-3.87	-5.13	-5.03	-5.92	-7.64
NWKRTC	-3.61	-6.67	-6.56	-7.70	-9.30

(Source: Offline Data)

It can be observed that the earnings are not sufficient to cover the costs. The earning do not cover even the Variable cost *plus* Staff expenses as can be seen below:

Table 68: EPKM vs DCPKM Trend from 2014-15 to 2019-20

EPKM	2015-16	2016-17	2017-18	2018-19	2019-20	DCPKM@	2015-16	2016-17	2017-18	2018-19	2019-20
KSRTC	28.51	27.63	27.86	29.40	30.44	KSRTC	26.53	28.78	28.42	31.79	32.75
KKRTC	27.53	27.30	28.09	26.88	30.40	KKRTC	26.04	27.88	28.49	29.34	33.81
NWKRTC	25.68	25.41	26.16	27.49	29.13	NWKRTC	25.19	28.14	28.92	31.24	33.88

@DCKPM – Direct Cost per KM - includes Variable Cost and Staff expenses
(Source: Offline Data)

Table 69: Shortfall in EPKM VS DCPKM Trend from 2014-15 to 2019-20

Corporation	2015-16	2016-17	2017-18	2018-19	2019-20
KSRTC	1.97	-1.14	-0.56	-2.39	-2.32
KKRTC	-1.49	-0.59	-0.40	-2.46	-3.41
NWKRTC	0.49	-2.45	-2.76	-3.75	-4.75

(Source: Offline Data)

It can be observed that except for the year 2015-16, and for two corporations the earnings have not been sufficient to cover even the direct costs. It appears that the direct costs were

covered for KSRTC and NWKRTC for the year 2015-16 on account of the fare increase in February 2015. Further the surplus eroded in FY17 and the shortfall has increased significantly by FY20.

We also compare fare structures of Karnataka to other Southern states in the table below:

Table 70: Fare Structure of Karnataka vs Other Southern States

State	Date of last revision	Ordinary	Express	Super Deluxe	Ultra Deluxe	A/C	A/C Volvo
Karnataka	26.02.2020	66	101	123	145	240 (Corona Services)	214
Tamil Nadu	29.01.2018	58	75	85	100	130	170
Kerala	01.03.2018	75	78	85	100	120	145
Andhra Pradesh	10.12.2019	73	107	118	136	156	192

(Source: Admin Reports)

The fare structure comparison before the revision of fares by Karnataka is as below. It may be observed that the fare before revision was higher than the Tamil Nadu fare structure and with the exception of the ordinary service was higher than the fare structure of Kerala.

Table 71: Fare Structure of Karnataka vs Other Southern States (before fare revision)

State	Date of last revision	Ordinary	Express	Super Deluxe	Ultra Deluxe	A/C	A/C Volvo
Karnataka	10.01.2015	59	90	112	131	171	190
Tamil Nadu	29.01.2018	58	75	85	100	130	170
Kerala	01.03.2018	75	78	85	100	120	145
Andhra Pradesh	10.12.2019	73	107	118	136	156	192

(Source: Admin Reports)

In order to have a sustainable organization, it is essential that the revenues are adequate to cover the costs. Any Organization that is not profitable cannot sustain itself in the long run. While public transport is a 'Public Good' and may have to be subsidized to the poorer

sections of the society, it is important that the transport corporations are compensated adequately for the service so that they stay sustainable financially.

In order to be financially sustainable, the corporations should be able to cover the costs and generate surplus for making fresh investments and repaying its loans. Traffic revenue which is the main source of revenue should be able to cover the substantial part of the costs. **A robust pricing structure should be arrived at based on the following**:

1. Arrive at the normative CPKM
   a. This should be based on fleet utilization of 95% with a load factor of 80%.
   b. Norms for fuel, repairs and other operating costs should be fixed in consultation with the corporations
   c. Staff cost should be arrived at based on the norms for number of employees per bus
   d. Interest cost should be arrived at based on the optimum Debt-Equity ratio
   e. Depreciation cost should be based on the existing fleet
   f. Non operating expenses will be fixed as a percentage of operating expenses
2. CPKM should be arrived at year-wise for a five year period, projecting the expenses, factoring inflation and increase in employee expenses
3. Once the CPKM is arrived at the required EPKM should be arrived at based on the expected return
4. The share of non-traffic revenue should be deducted from the EPKM. Ideally non-traffic revenue should constitute about 30% of the total revenue
5. Based on the existing fare structure and the fleet utilization and load factor the EPKM should be arrived at
6. The gap between the current EPKM and the required EPKM from traffic is arrived at and the fare structure is adjusted to reach the required EPKM
7. Given that the costs increase every year, but the fares cannot be increased annually, a levelized tariff should be arrived at which will factor in the cost increased identified under point 2 above
8. Where the load factor is not supportive and the routes have to be maintained even though they are unprofitable, the gap in revenues should be compensated by the Government through grants
9. Fuel prices are not predictable and are susceptible to volatility. The base price of diesel should be fixed (based on the price of diesel on the date of fare revision) and the government shall reimburse increase in diesel price
10. It is also recommended that the concessions given to various categories of passengers should be paid directly by the Government through Direct Benefit Transfer (DBT) and the transport corporations be allowed to charge the full fare from the beneficiaries. This will ensure that the transport corporations are not saddled with receivables on account of subsidies.
11. **Note on Variable Pricing:**
    The Transport corporations may resort to variable pricing in the case of long-distance services, namely, Rajahamsa (night), Sleeper service and Volvo services.

It is observed that the load factor is low in the month of March - April on account of the examination season and it increases in May. Similarly the load factor increases in October around Dussera. A 10% discount may be provided in the month of March to attract passengers. Similarly a 10% premium may be charged during the months of May and October.

In addition to the above, in other months, a 10% discount may be offered on Tuesdays to Thursdays to attract additional traffic. It may not be viable to charge a premium during weekends as the long-distance fares of the Karnataka corporations are already higher than that of the neighboring states and any increase may result in fall in Load Factor.

12. PASSENGER SURVEY: SERVICE DELIVERY AND PASSENGER SATISFACTION

The passenger survey was conducted among RTC bus users and Private passengers. Overall, three corporations were covered, out of which, 12 divisions and 36 depots were sampled to conduct the passenger interviews. Total 1629 passengers were interviewed of which includes 1440 RTC users and 189 Private passengers (Refer Figure below). The present chapter was broadly discussed about the general information of passengers, use of technology, status of service delivery and passenger satisfaction. All charts covered in this chapter are generated from the Primary Data collection exercise conducted in Karnataka by the Athena team.

KSRTC Passangers-745; Private Passenger-71
NWKRTC Passengers- 362; Private Passenger-44
KKRTC Passengers-333; Private Passenger-74

RTC Passenger- 1440
Private Passenger- 189

Total sample- 1629

* KKRTC Passenger
* KSRTC Passenger
* NWKRTC Passenger
* Private Passenger
☐ Karnataka District

0   100   200 km
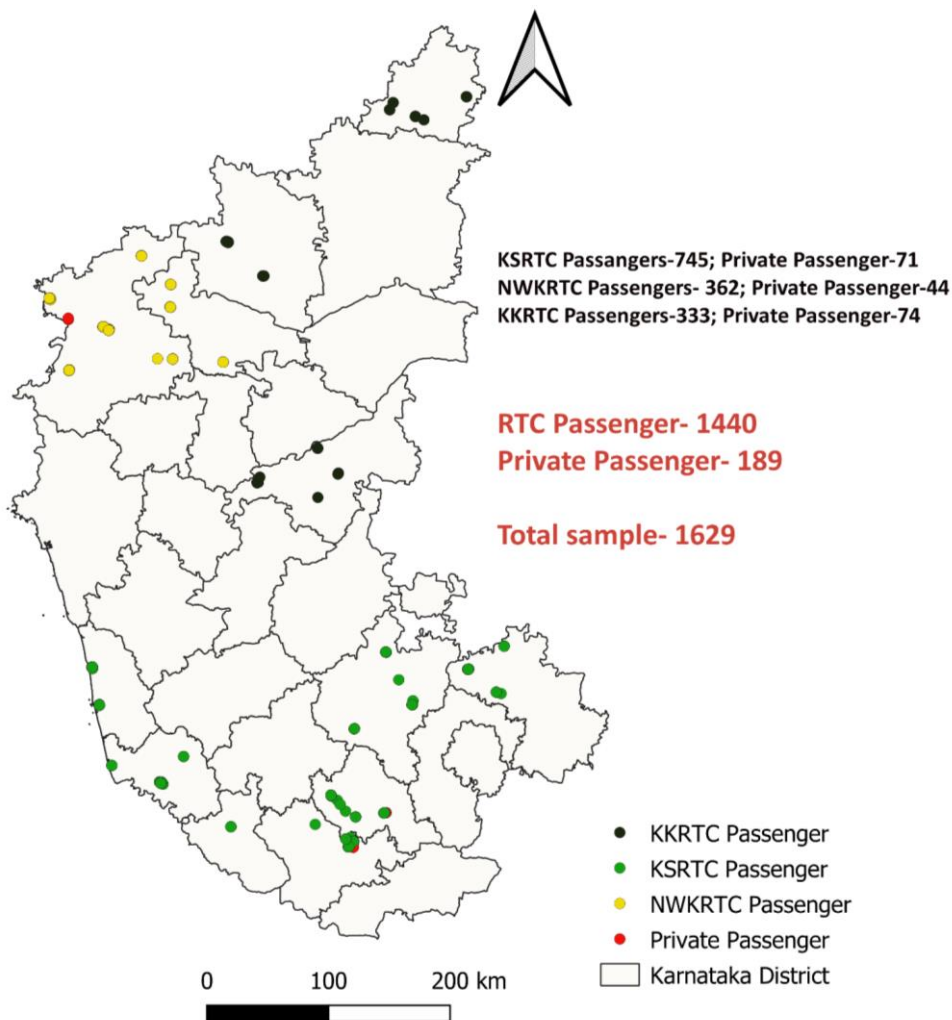
Figure 69: Geographical Spread: Passenger Survey

Source: Author's own computation, Athena Infonomics, 2021

a. Passengers Profile

In the overall sample, KSRTC was covered maximum of 46% of passengers, NWKRTC, KKRTC and private operators covered 22%, 20% and 12% of passengers respectively (Refer below figure).
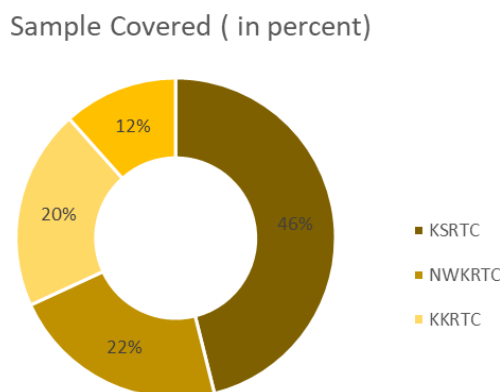
Figure 70: Sample Covered (Source: Primary data, 2021)

The analysis was conducted with the comparison of RTC users and private bus users. The female passengers were counted a maximum of 36.04% in KKRTC, 33.56% in KSRTC and 18.23% in NWKRTC in RTC passengers. In the KSRTC area, female passengers who used the private bus accounted was 45%, KKRTC 36.49% and 20.45% in NWKRTC, whereas; in NWKRTC, the male passengers accounted for 81.77%, and more than 60% of passengers accounted in KSRTC and KKRTC (Refer below table)

Table 72: Description of Respondents

Gender	Passenger	Description	KSRTC	NWKRTC	KKRTC
Female	RTC	Number	250	66	120
		%	33.56	18.23	36.04
	Private	Number	32	9	27
		%	45.07	20.45	36.49
Male	RTC	Number	494	296	213
		%	66.31	81.77	63.96
	Private	Number	38	35	47
		%	53.52	79.55	63.51
Others	RTC	Number	1	0	0
		%	0.13	0.00	0.00
	Private	Number	1	0	0
		%	1.41	0.00	0.00
Overall	RTC	Number	745	362	333
		%	91.30	89.16	81.82
	Private	Number	71	44	74
		%	8.70	10.84	18.18

(Source: Primary data, 2021)

The average age of the passenger who used the RTC bus and private passenger was 36 years whereas; NWKRTC passenger average age is 35 years. The KKRTC passengers who uses RTC passenger was 36 years and private bus users was 35 years (Refer Below figure)
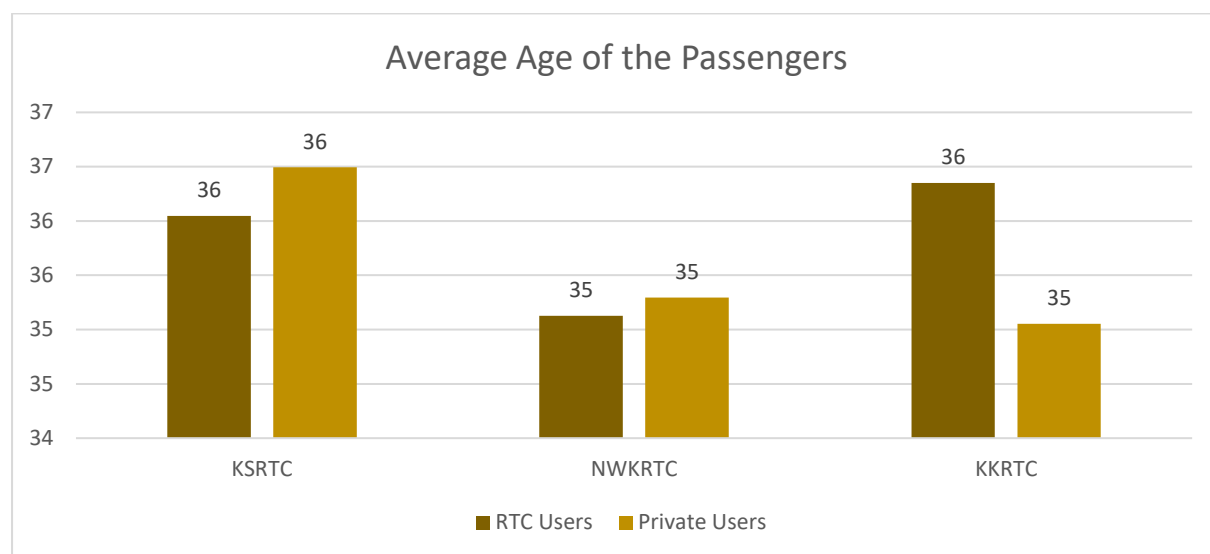
Figure 71: Average Age of Passengers (Source: Primary data, 2021)

The occupation of the passenger is more important, it directly depends on the nature of work and its affordability to travel from one place to another. Table 27 explained that the KSRTC passengers who uses the maximum was the private employees (92.6%) followed by self-employed (91.1%) and students (91.8%) where as in NWKRTC, private employees (84.5%) followed by self-employed (88.2%) and students (95.8%). In KKRTC, the majority of RTC users were self-employed (72.5%) followed by private employees (97%) and students (68%).

Table 73: *Respondent Occupation*

Occupation of the respondent across the corporation	KSRTC					NWKRTC					KKRTC				
	RTC User		Private		Overall	RTC User		Private		Overall	RTC User		Private		Overall
	N	%	N	%	N	N	%	N	%	N	N	%	N	%	N
Employed in Govt.	39	92.9	3	7.1	42	23	92.0	2	8.0	25	34	87.2	5	12.8	39
Housewife	33	80.5	8	19.5	41	13	92.9	1	7.1	14	21	91.3	2	8.7	23
Informal Worker	13	92.9	1	7.1	14	3	100.0	0	0.0	3	4	66.7	2	33.3	6
Private employee	189	92.6	15	7.4	204	101	83.5	20	16.5	121	50	72.5	19	27.5	69
Retired	17	100.0	0	0.0	17	10	100.0	0	0.0	10	20	90.9	2	9.1	22
Self-employed	215	91.1	21	8.9	236	112	88.2	15	11.8	127	97	80.2	24	19.8	121
Student	135	91.8	12	8.2	147	46	95.8	2	4.2	48	68	88.3	9	11.7	77
Unemployed	104	90.4	11	9.6	115	54	93.1	4	6.9	58	39	78.0	11	22.0	50

| Total | 74 5 | 91.3 | 71 | 8.7 | 816 | 36 2 | 89.2 | 4 4 | 10. 8 | 406 | 33 3 | 81. 8 | 7 4 | 18. 2 | 407 |

(Source: Primary data, 2021)

The passengers travelled using RTC bus and Private bus for different purposes like business, education, family trip, personal work, religious trip and vacation. In KSRTC depots, Nearly, 90% of the passengers travelled for business purposes, 98% of the passengers for personal work, 91% for family trips and vacations. But in NWKRTC, nearly 89% of the passengers travelled as vacation, 96% of passengers as family trip and education and 89% of the passengers travelled as personal work. In KKRTC, nearly 89.5% of passenger travelled for educational purpose, 84.3% for business purpose, 84.6% for vacation and 82.5% for religious purpose (Refer table below)

Table 74: *Purpose of Travel*

Purpose of Travel	KSRTC					NWKRTC					KKRTC				
	RTC User		Private		Overall	RTC User		Private		Overall	RTC User		Private		Overall
	N	%	N	%	N	N	%	N	%	N	N	%	N	%	N
Business	181	90.0	20	10.0	201	61	80.3	15	19.7	76	59	84.3	11	15.7	70
Education	96	88.9	12	11.1	108	30	96.8	1	3.2	31	51	89.5	6	10.5	57
Family Trip	158	91.3	15	8.7	173	75	96.2	3	3.8	78	91	78.4	25	21.6	116
Personal Work	135	98.5	2	1.5	137	74	89.2	9	10.8	83	41	74.5	14	25.5	55
Religious Trip	99	86.8	15	13.2	114	30	93.8	2	6.3	32	47	82.5	10	17.5	57
Vacation	76	91.6	7	8.4	83	89	86.4	14	13.6	103	44	84.6	8	15.4	52
Others	0	0.0	0	0.0	0	3	100.0	0	0.0	3	0	0.0	0	0.0	0
Total	745	91.3	71	8.7	816	362	89.2	44	10.8	406	333	81.8	74	18.2	407

(Source: Primary data, 2021)

Distance from home to the bus stand was the primary factor that decided the mode of transport. Figure 54 refers to the average distance travelled to board the bus, in KSRTC, the RTC passengers travelled to board the bus is 2.78Km and 2.92 kms for private bus. Whereas NWKRTC passenger and private passengers travelled more than 2.70 kms and in KKRTC, RTC users travelled 2.80 Km and 3.38 Km for private passenger. In general, the government buses had better connectivity comparing with the private bus operators.
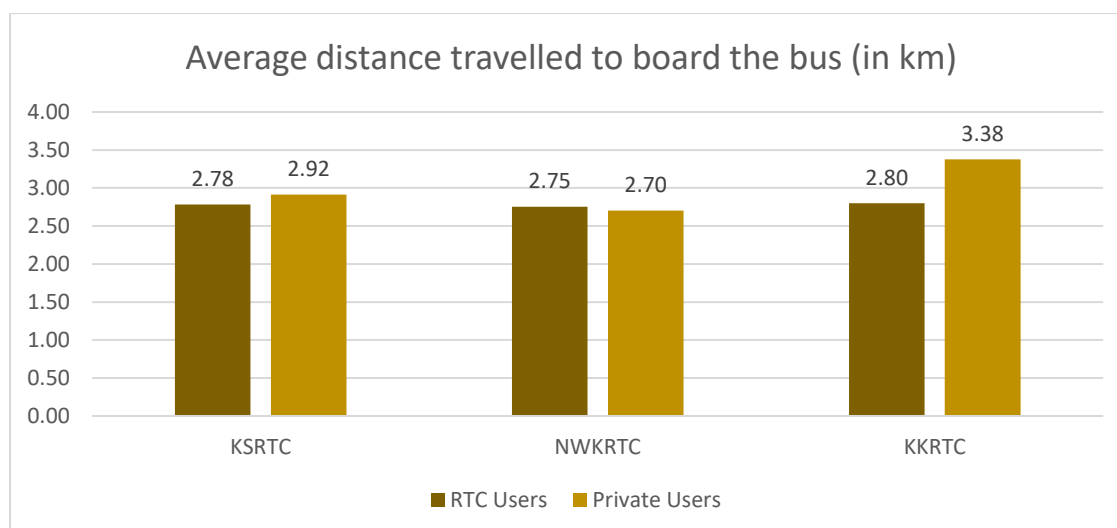
Figure 72: Average Distance Travelled to Board the Bus (Source: Primary data, 2021)

There are different types of bus services provided by the corporation namely, AC sleeper, Express, Ordinary, Semi-Sleeper and Sleeper and which was operated in Inter State, Intra State and Suburban. In KSRTC, of all services in the intra state, the passenger highly preferred to use ordinary (9%) buses followed by express (24%) and semi sleeper (45%). For interstate service, express services were predominantly preferred by the passengers (80%) followed by ordinary (12.5%) and semi sleeper (54.9%).

Table 75: Cross Tabulation of Journey Type vs Service Type for each RTC

Corporation	Service	Status	AC Semi sleeper	AC Sleeper	Express	Ordinary	Semi-Sleeper	Sleeper	Total
KSRTC	Intra State	N	21	6	34	38	32	18	149
		%	75.0	42.9	20.0	9.0	45.1	46.2	20.0
	Inter State	N	7	8	136	53	39	21	264
		%	25.0	57.1	80.0	12.5	54.9	53.8	35.4
	Suburban	N	0	0	0	332	0	0	332
		%	0.0	0.0	0.0	78.5	0.0	0.0	44.6
	Overall	N	28	14	170	423	71	39	745
NWKRTC	Intra State	N	2	0	63	28	9	3	105
		%	14.3	0.0	55.3	16.1	18.8	33.3	29.0
	Inter State	N	12	3	51	30	39	6	141
		%	85.7	100.0	44.7	17.2	81.3	66.7	39.0
	Suburban	N	0	0	0	116	0	0	116
		%	0.0	0.0	0.0	66.7	0.0	0.0	32.0
	Overall	N	14	3	114	174	48	9	362
KKRTC	Intra State	N	2	0	19	1	2	9	33
		%	15.4	0.0	19.2	0.5	16.7	45.0	9.9
	Inter State	N	11	3	80	18	10	11	133
		%	84.6	100.0	80.8	9.7	83.3	55.0	39.9
	Suburban	N	0	0	0	167	0	0	167
		%	0.0	0.0	0.0	89.8	0.0	0.0	50.2
	Overall	N	13	3	99	186	12	20	333

(Source: Primary data, 2021)

In NWKRTC, within intra state services, the express (55.3%) services were preferred by the passenger followed by ordinary services (16.1%). Whereas the interstate service, the express services (44.7%) of the passenger used. Within KKRTC, nearly 45% of the passengers used sleeper services and 19.2% of the passengers used express services. Nearly 80% of the passengers use express in the interstate and 9.7% of passenger ordinary services. In KKRTC, 89.8% of the passengers used ordinary services. In general, across all the corporations, the ordinary and express services were highly preferred and used by the passengers.
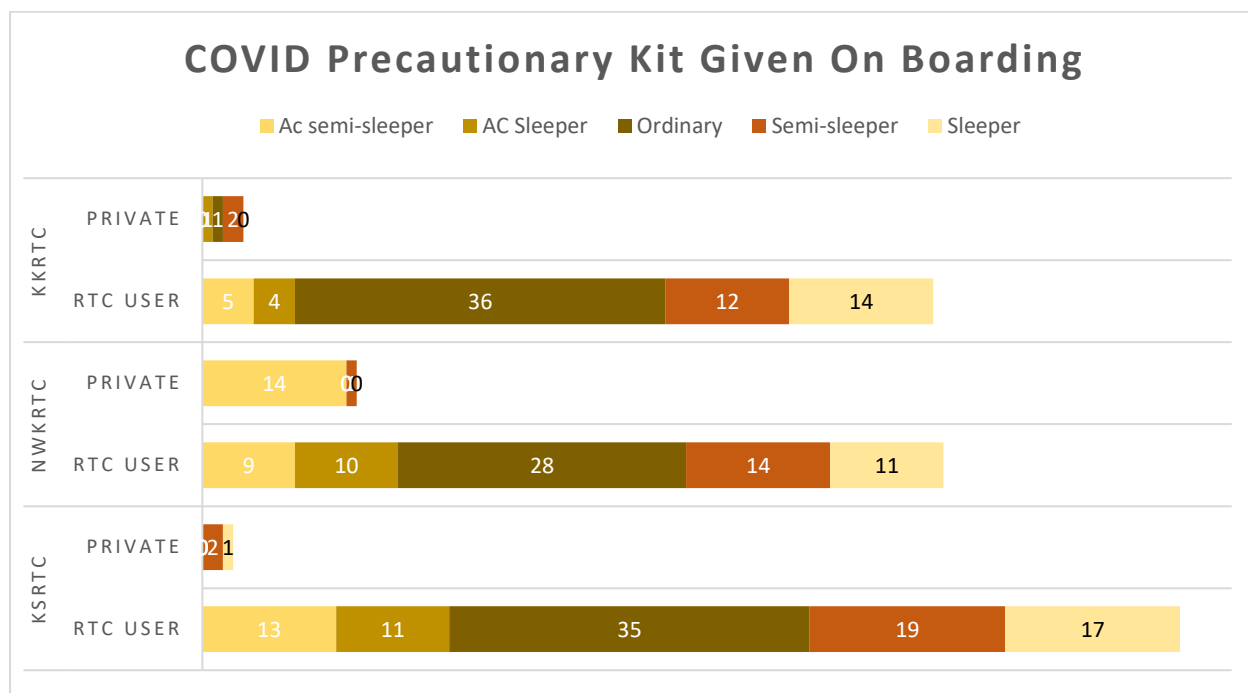
Figure 73: Disbursal of COVID Precautionary Kit (Source: Primary data, 2021)

COVID-19 precautionary kit was provided extensively to RTC users as compared to private buses. The percentage of this provision was found to be high in ordinary buses in all three corporations. However, only sanitizers were disbursed as a part of the kit.

a. Use of Technology by the Passengers
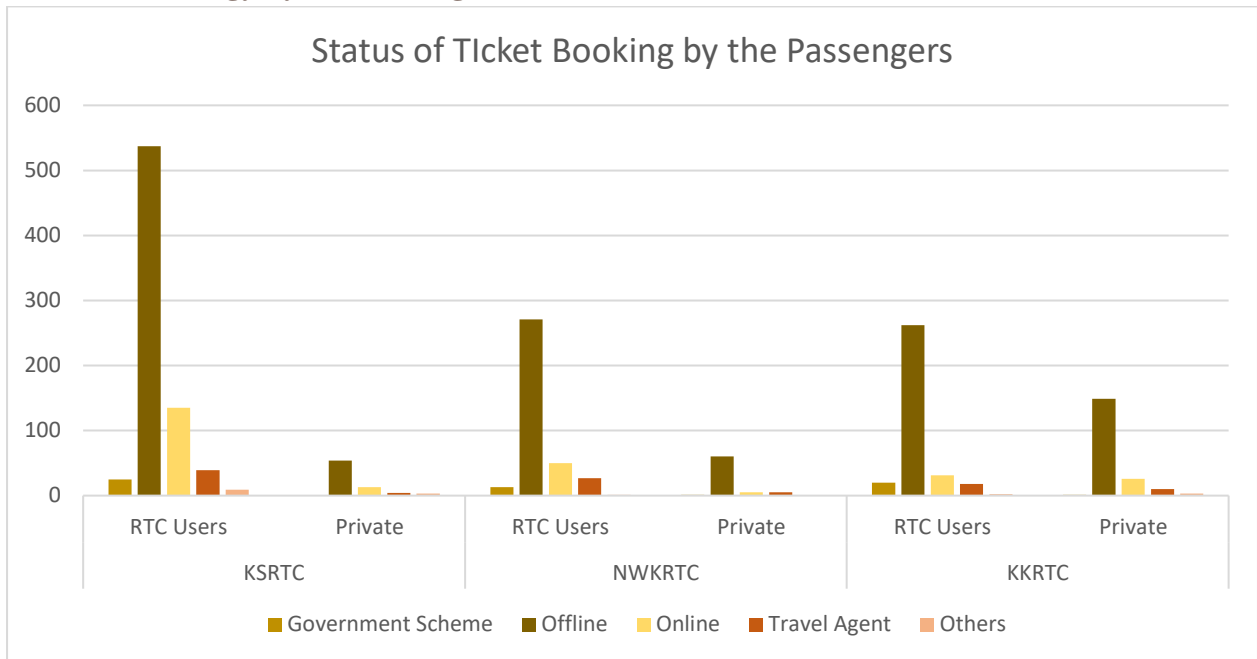
Figure 74: Status of Ticket-Booking by Passengers (Source: Primary data, 2021)

The most preferred method for purchasing tickets was offline. This result was consistent across all corporations and even within the private sector. A negligible amount of passengers used other methods such as online booking, booking through a travel agent or through government schemes.
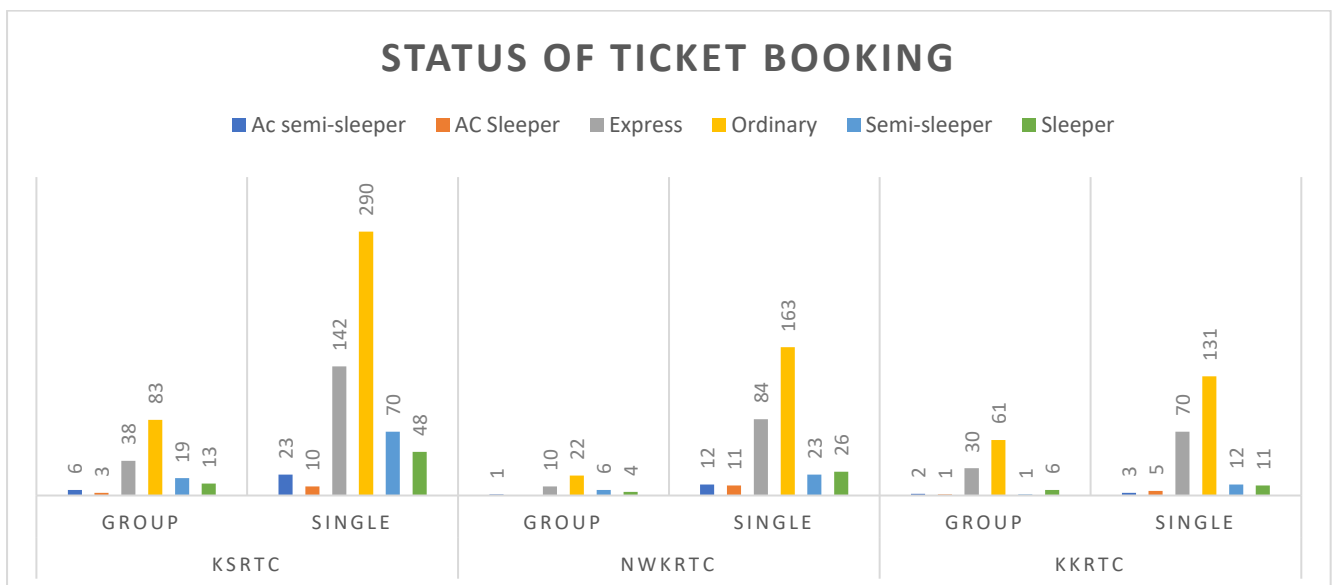
Figure 75: Status of Ticket Booking (Source: Primary data, 2021)

Through our preliminary analysis on ticket booking by passengers, we found that ordinary buses were most commonly used by passengers across all corporations. This was followed by express buses, with the bookings mainly for single passengers. Group travel bookings were found to be limited.

b. Status of Passenger Satisfaction

Reason for Choosing the Bus Transport
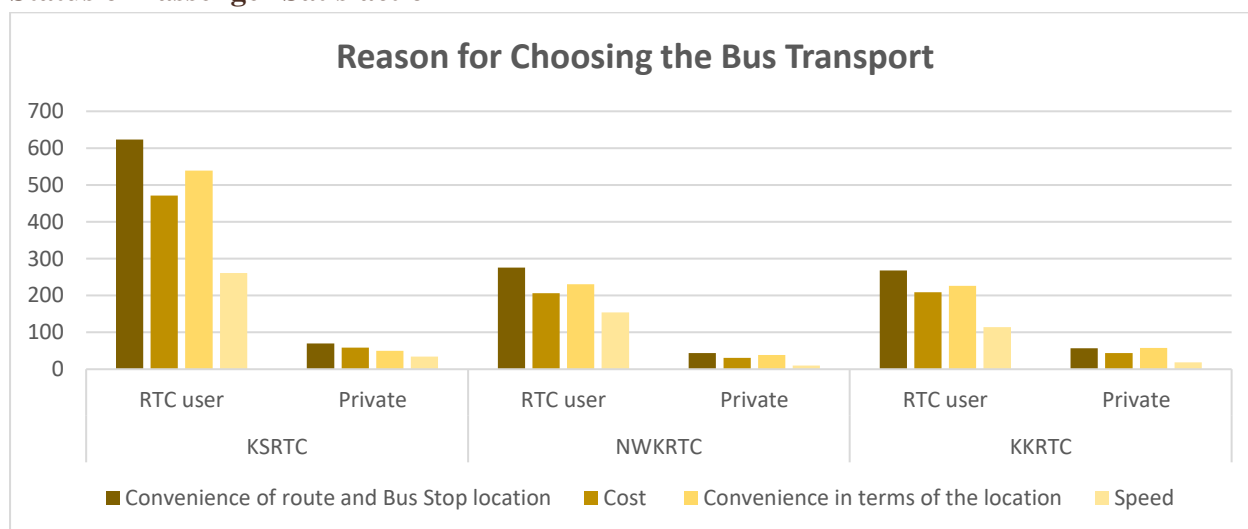
Figure 76: Reason for Choosing Bus Transport (Source: Primary data, 2021)

Passenger satisfaction with respect to convenience of route and bus stop location was found to be high amongst users of KSRTC corporations. This satisfaction was also one of their biggest reasons for choosing the type of bus transport. Other reasons for their choice were cost and convenience in terms of location.

Table 76: *Level of Comfort*

Corporation	Users	Status	Status of travel comfortability				
			Comfortable travelling in RTC Bus	Comfortable travelling in Private Bus	Comfortable in travelling RTC bus and Private bus	Not comfortable in travelling both the buses	Total
KSRTC	**RTC user**	N	559	134	15	37	745
		%	90.9	93.7	100.0	86.0	91.3
	Non RTC	N	56	9	0	6	71
		%	9.1	6.3	0.0	14.0	8.7
	Overall	N	615	143	15	43	816
NWKRTC	**RTC user**	N	285	69	4	4	362
		%	89.6	93.2	40.0	100.0	89.2

	Non RTC	N	33	5	6	0	44
		%	10.4	6.8	60.0	0.0	10.8
NWKRTC	Overall	N	318	74	10	4	406
	RTC user	N	278	48	5	2	333
		%	84.5	73.8	100.0	25.0	81.8
	Non RTC	N	51	17	0	6	74
		%	15.5	26.2	0.0	75.0	18.2
KKRTC	**Overall**	N	329	65	5	8	407

(Source: Primary data, 2021)

The aforementioned table denotes the level of comfort passengers feel with travelling in RTC and private buses. Highest number of passengers who reported that they are comfortable in traveling in RTC buses were found to be in the KSRTC division (90.9%), this was followed by NWRTC (89.6%) and KKRTC (84.25%). Comfort while traveling in private buses across KSRTC and NWRTC were found to be higher than KSRTC (93.7% and 93.2%, respectively).

Table 77: *Passengers' willingness to travel in the same bus again*

Corporation	Users	Willingness to travel in the same bus service again				Total
		Yes		No		
		N	%	N	%	
KSRTC	RTC User	584	91.8	161	89.4	745
	Private user	52	8.2	19	10.6	71
	Overall	636	100.0	180	100.0	816
NWKRTC	RTC User	285	87.2	77	97.5	362
	Private user	42	12.8	2	2.5	44
	Overall	327	100.0	79	100.0	406
KKRTC	RTC User	259	77.8	56	75.7	333
	Private user	74	22.2	18	24.3	74
	Overall	333	100.0	74	100.0	407

(Source: Primary data, 2021)

Following the trend from the previous table, passengers willing to travel again in RTC buses were found to be highest in KSRTC (91.8%). This was followed by NWRTC (87.2%) and KKRTC (77.8%).
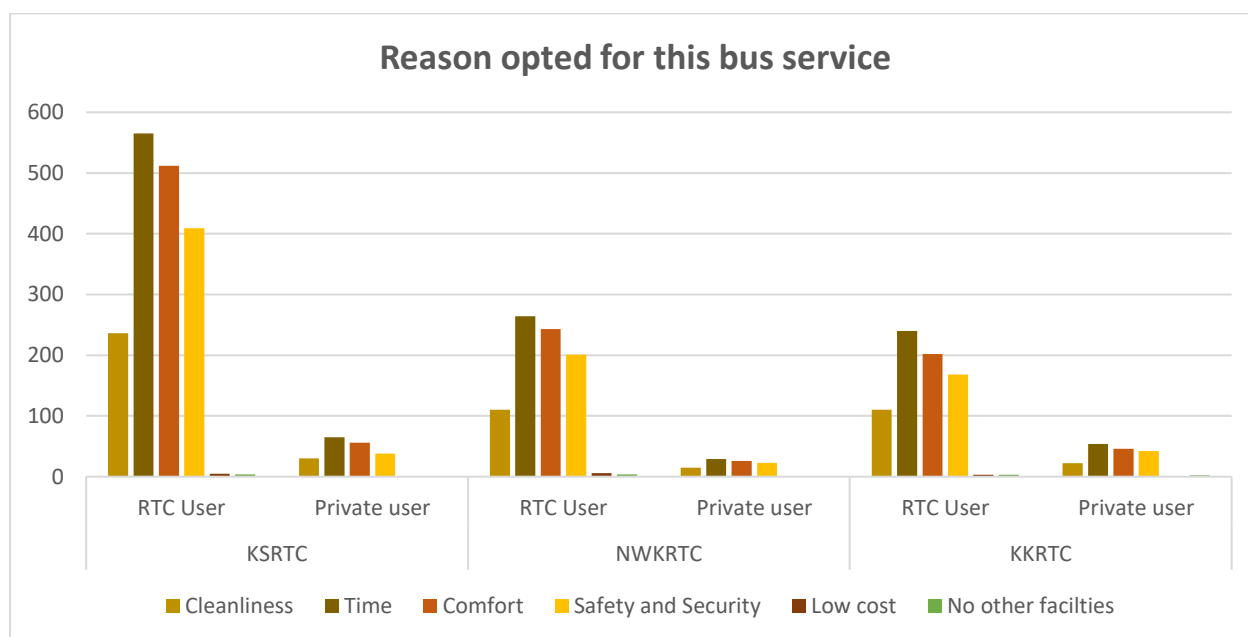
Figure 77: Reason for opting the bus service (Source: Primary data, 2021)

Preferred timings, comfort and safety and security were the biggest reasons for passengers to opt for the bus services. The results were consistent across all corporations. Cleanliness and cost were not found to be prominent reasons for the selection of their bus choice.

Table 78: *Access to other facilities*

Access to other facilities available near to bus stand	KSRTC		NWKRTC		KKRTC		Overall	
	RTC User	Private user	RTC User	Private user	RTC User	Private user	RTC User	Private e
Personal vehicle	515	70	226	41	203	54	944	165
Auto	215	24	96	20	89	22	400	66
Taxi	267	10	148	28	133	11	548	49
Local Buses	2	0	3	0	2	1	7	1
Trains	17	1	11	0	17	1	45	2

(Source: Primary data, 2021)

A majority of RTC bus users reported having a personal vehicle, autos and taxis as an alternate available transport facility. Only a negligible number of respondents preferred local buses and trains.
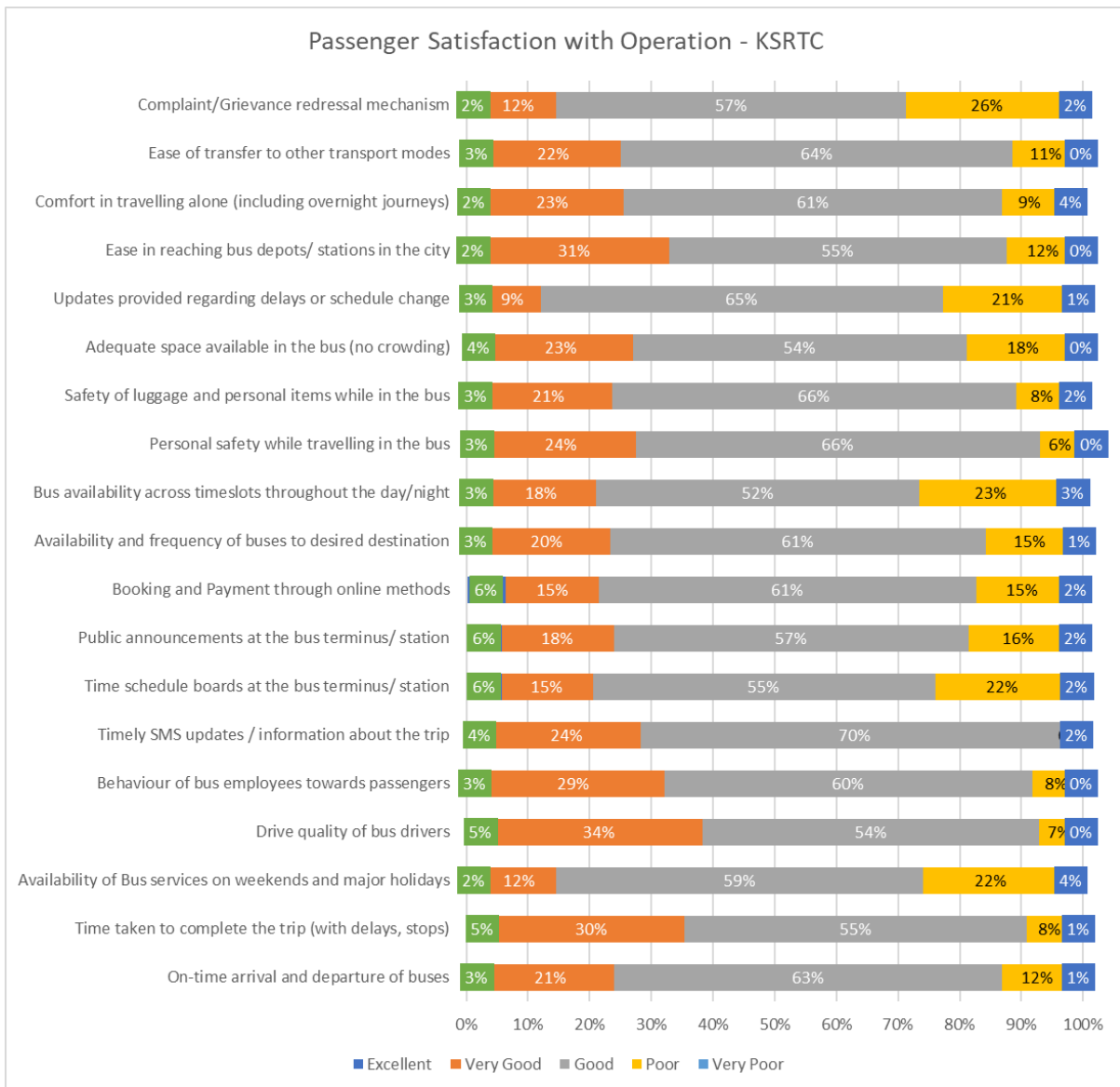
Figure 78: Passenger Satisfaction with Operation (KSRTC) (Source: Primary data, 2021)

With more than 50% of passengers reporting satisfaction on all components, passenger satisfaction for KSRTC. However, 34% of passengers found the driving quality of bus drivers to be very good. Further, 30% of the surveyed passengers reported that the ease in reaching bus stations/ depots was poor.
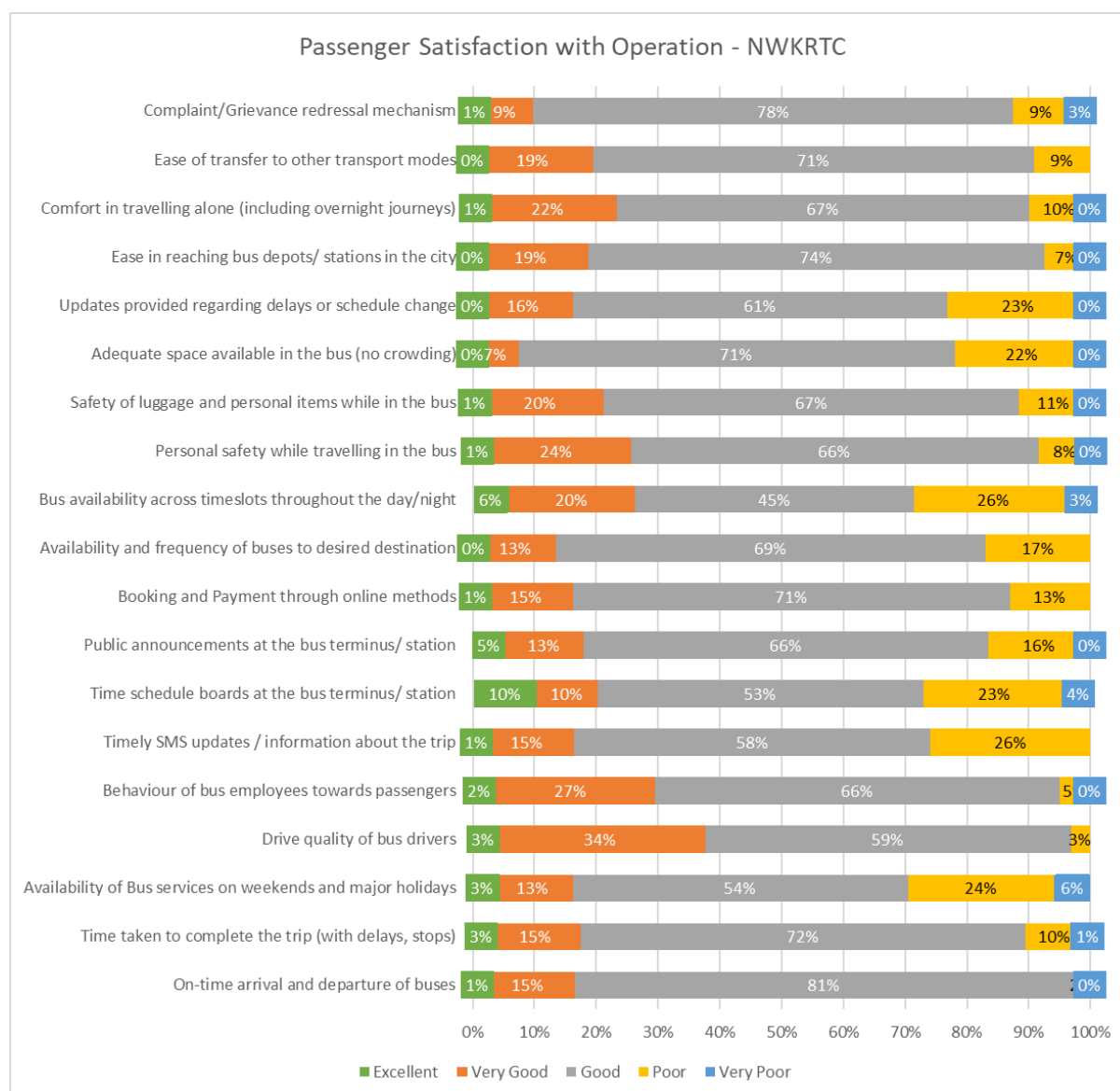
Figure 79: Passenger Satisfaction with Operation (NWKRTC) (Source: Primary data, 2021)

With more than 60% of passengers reporting satisfaction on most components, passenger satisfaction for NWKRTC. However, 34% of passengers for this corporation also reported that the driving quality of bus drivers was very good. A high proportion (78%) of the passengers found the current grievance redressal system in place to be good.
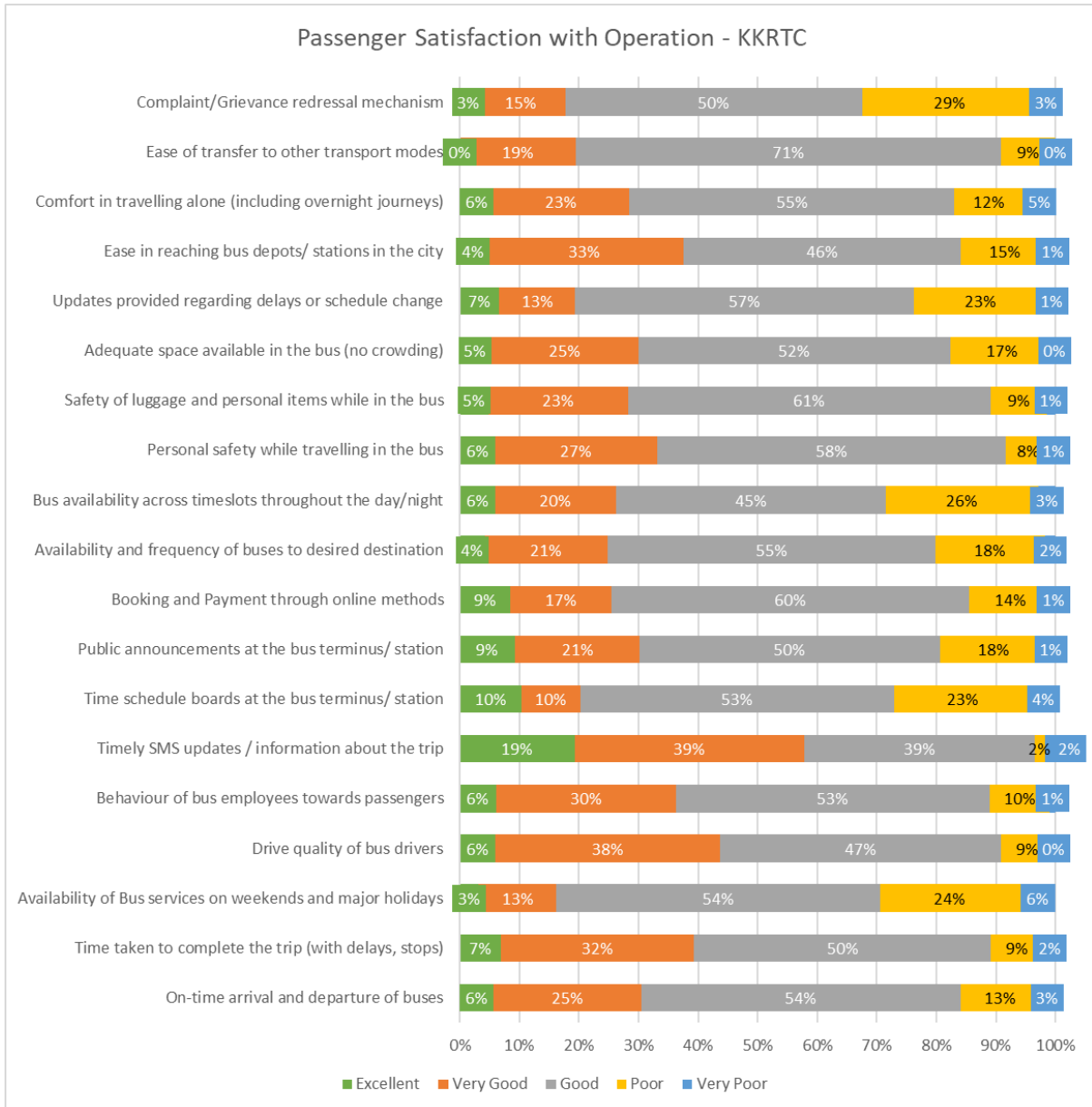
Figure 80: Passenger Satisfaction with Operation (KKRTC) (Source: Primary data, 2021)

With more than 50% of passengers reporting satisfaction on most components, passenger satisfaction for KKKRTC. However, 29% of passengers reported that the grievance redressal method in place was poor. About 39% and 19% passengers found the timely SMS updates and information about their trip to be very good and excellent, respectively.
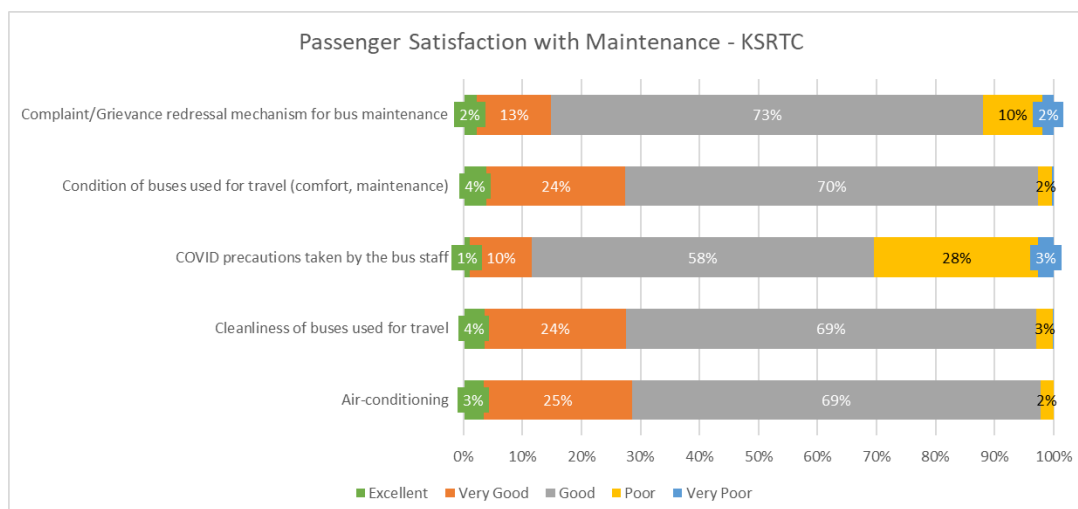
Figure 81: Passenger Satisfaction on Maintenance (KSRTC) (Source: Primary data, 2021)

Passenger satisfaction with maintenance for KSRTC was found to be good (higher than 60%) for most components. However, 28% respondents reported that the COVID precautions taken by the staff were poor.
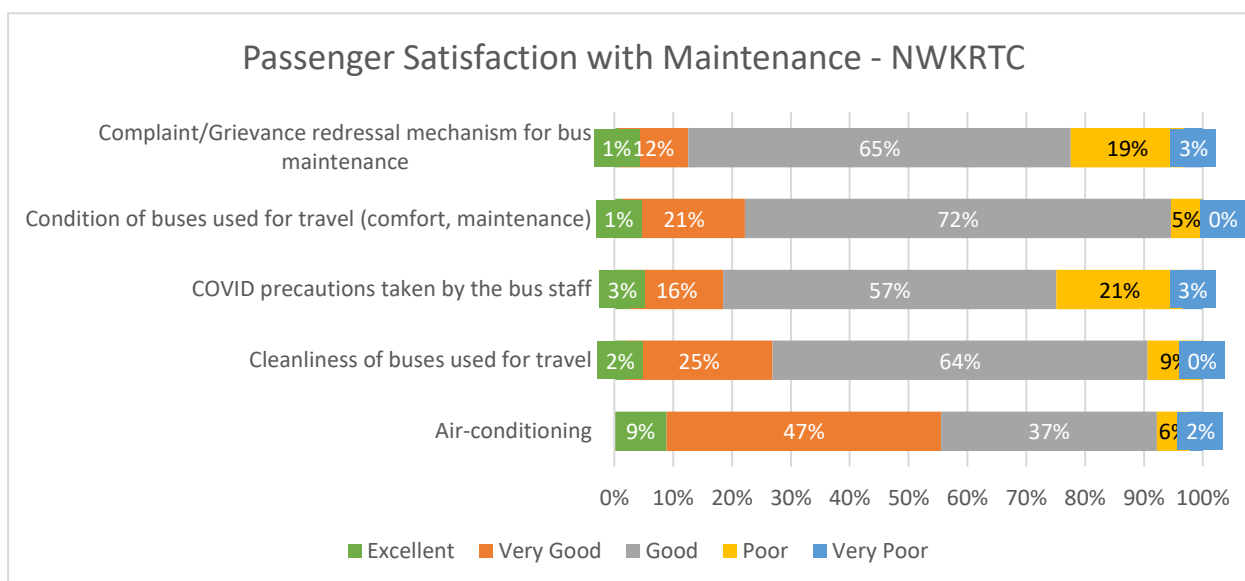
Figure 82: Passenger Satisfaction on Maintenance (NWKRTC) (Source: Primary data, 2021)

Passenger satisfaction with maintenance for NWKRTC was found to be good (higher than 60%) for most components. However, 21% respondents reported that the COVID precautions taken by the staff were poor.
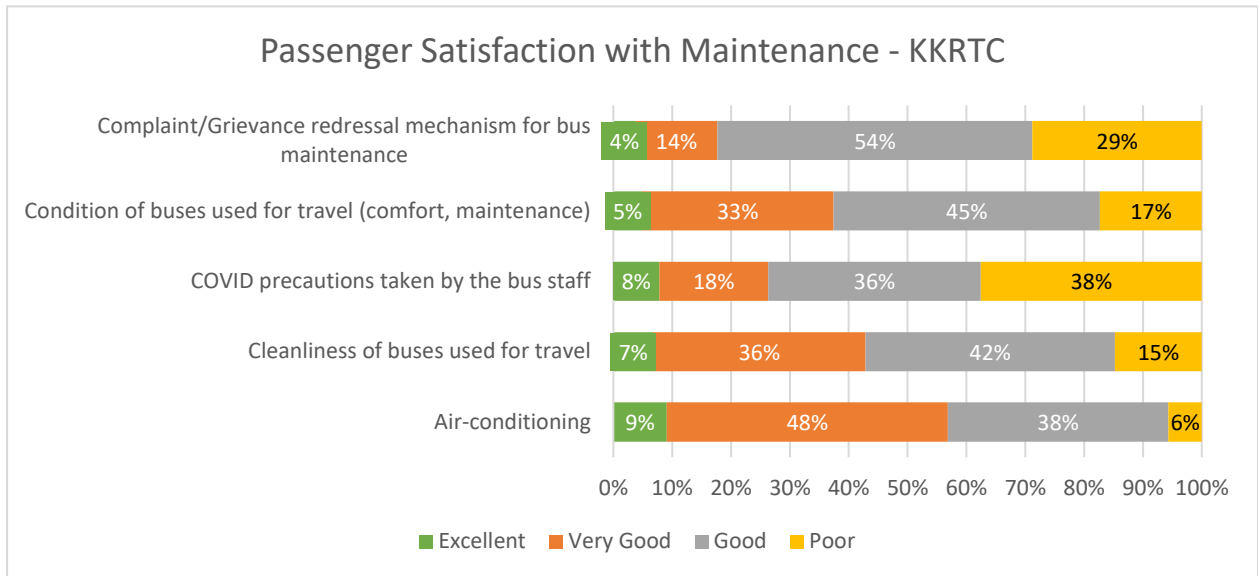
Figure 83: Passenger Satisfaction on Maintenance (KKRTC) (Source: Primary data, 2021)

Passenger satisfaction with maintenance for KKRTC was perceived to be very good for most components. However, 38% respondents reported that the COVID precautions taken by the staff were poor.
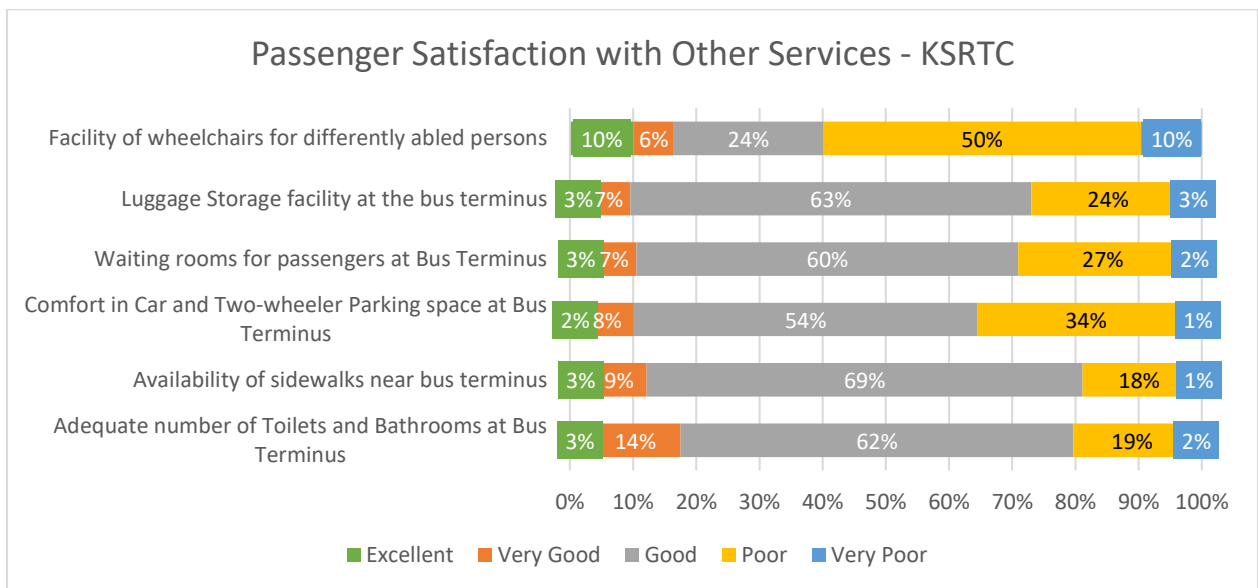
Figure 84: Passenger Satisfaction with other services (KSRTC) (Source: Primary data, 2021)

Passenger satisfaction with other services for KSRTC was found to be good (higher than 50%) for most components. However, the facility of wheelchairs for differently abled persons was found to be poor by respondents.
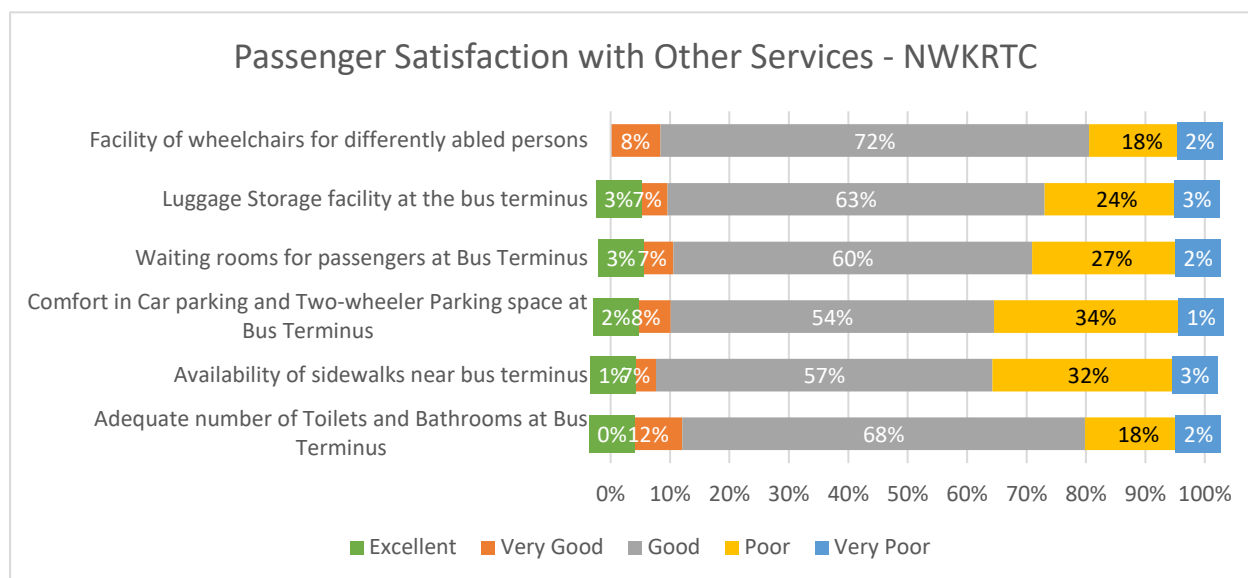
Figure 85: Passenger Satisfaction with other services (NWKRTC) (Source: Primary data, 2021)

Passenger satisfaction with other services for NWRTC was found to be good (higher than 50%) for most components. Comfort in parking cars and two wheelers, and availability of sidewalks near bus terminus were reported to be poor by 34% and 32% respondents, respectively.
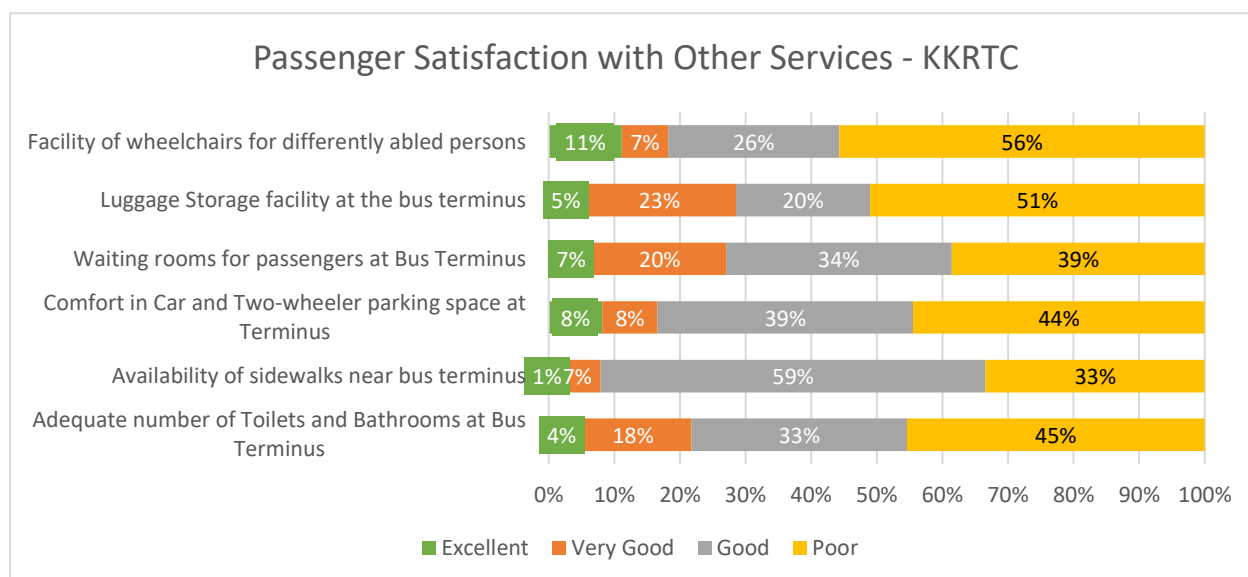
Figure 86: Passenger Satisfaction with other services (KKRTC) (Source: Primary data, 2021)

Passenger satisfaction with other services for KKRTC was found to be poor (more than 50%) for most components. Satisfaction of availability of sidewalks near bus terminus was found to be high (by 59% respondents).

c. Public vs Private Transport Operators

In this section, we compare the RTCs and Private Transport Operators across some of the relevant questions asked in the survey, in order to establish a comparison between the two.

- First, we look at Reasons for choosing the particular service. We can see that about the same share of respondents consider comfort to be a reason for choosing Private or RTC buses. A larger share of RTC respondents cite Time (76%) and Safety and Security (56%) as reasons for choosing the service. More respondents using private buses cite Cleanliness (43%) as the reason for opting for the service. Low cost is not considered a reason by only 1% of the respondents on either end.
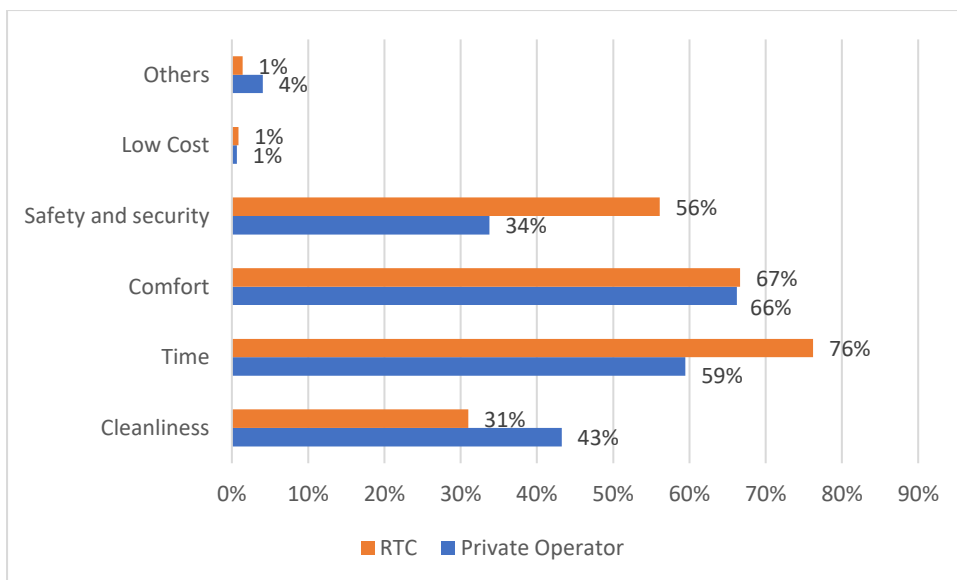
Figure N9: Reason for Choosing the Service: Private Operator vs RTC, (Source: Primary data, 2021)

- When we look at the opinion of the respondents on the professional behaviour of the driver and conductor, we find that 97% of the respondents travelling via RTC buses considered the behaviour of the driver/conductor to be professional, while this figure is slightly lower for Private Operators (85%).
- Next, we compare the satisfaction of respondents with different aspects of the service for both RTCs and Private Operators. Initially, the aim was to look at the level of positive responses (Excellent/Very Good/Good) and use those to strike up comparisons. However, in most cases, the level of positive responses across both services were quite close to each other (within 2-3 percentage points). The exceptions to this favouring the RTCs were availability of Bus services on weekends and major holidays, Availability and frequency of buses to desired destination, Comfort in travelling alone (including overnight journeys), Air-conditioning, while Booking and Payment through online methods favoured the Private Operators.

Table 79: Satisfaction with Operations Related Areas: Private Operator vs RTCs

Satisfaction Area	Private Operator	RTC
On-time arrival and departure of buses at the terminus (waiting time)	91.22%	93.59%
Time taken to complete the trip (with delays, stops)	89.19%	92.64%
Availability of Bus services on weekends and major holidays	75.68%	82.65%
Behaviour of bus employees towards passengers	91.22%	95.14%
Drive quality of bus drivers	95.27%	95.95%
Booking and Payment through online methods	88.51%	82.58%
Availability and frequency of buses to desired destination	79.73%	89.40%
Bus services available across varied timeslots throughout the day/night	80.41%	84.27%
Personal safety while travelling in the bus	93.24%	94.53%
Safety of luggage and personal items while in the bus	92.57%	92.78%
Adequate space available in the bus for the route travelled (no crowding)	79.05%	79.20%
Ease in reaching bus depots/ stations in the city	91.22%	92.91%
Comfort in travelling alone (including overnight journeys)	84.46%	90.21%
Connectivity of bus terminus/stations to other modes of transport (ease of transfer)	91.22%	92.98%
Complaint/Grievance redressal mechanism for the Operation of services	79.05%	77.85%

(Source: Primary data, 2021)

Table 80: Satisfaction with Maintenance Related Areas: Private Operator vs RTCs

Satisfaction Area	Private Operator	RTC
Air-conditioning	84.16%	93.28%
Cleanliness of buses used for travel	91.89%	92.10%
COVID precautions taken by the bus staff	66.89%	66.85%
Condition of buses used for travel (comfort, maintenance)	91.22%	92.44%
Complaint/Grievance redressal mechanism for maintenance of buses	82.43%	80.55%

(Source: Primary data, 2021)

- When we look at the same areas of satisfaction across the entire spectrum, we see that while the positive response share is about the same for RTCs and Private Operators, the latter have more responses in the 'Excellent' and 'Very Good' categories as compared to RTCs, which

have a relatively much higher share of responses in the 'Good' category. This high share of 'Good' responses is also partly responsible for increases the overall set of positive responses, leading to a larger relative share than the Private Operators, albeit with fewer responses in the Top 'Excellent' and 'Very Good' categories. For example, availability of bus services on weekends and major holidays has about the same

- From the other end of the spectrum, when we look at the areas with clear differences in the table above, it is also because of more Poor/Very Poor responses received by the corporation with a lower performance in the said category. For example, when we look at the Availability and Frequency of buses to a desired destination, about 20% of the respondents state that the fulfilment is poor, while in the case of RTCs, this is chosen by 10% of the respondents. Similarly, while the Poor/Very Poor responses are 11% for Private Operators for 'Booking and Payment Through Online Methods', this value is 18% for RTCs.

- These findings hold true both for Satisfaction of Operations as well as Maintenance related points that have been asked. The overall understanding is that Private Services are preferred nearly across the board, but by marginal differences in the level of positive or not so positive response, as opposed to the nature of the response itself.
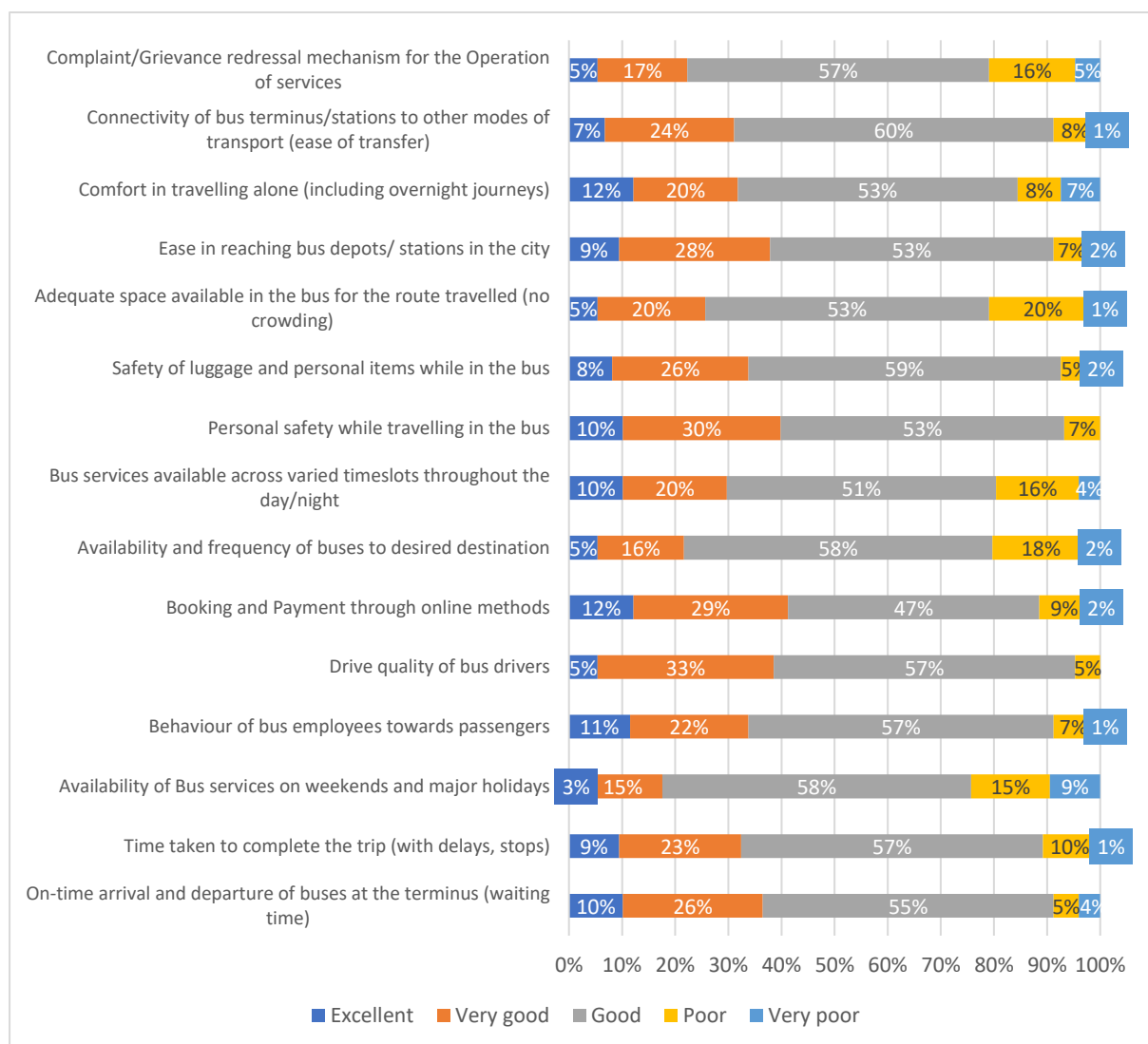
Figure N10: Satisfaction Level with Operations for Private Operated Buses
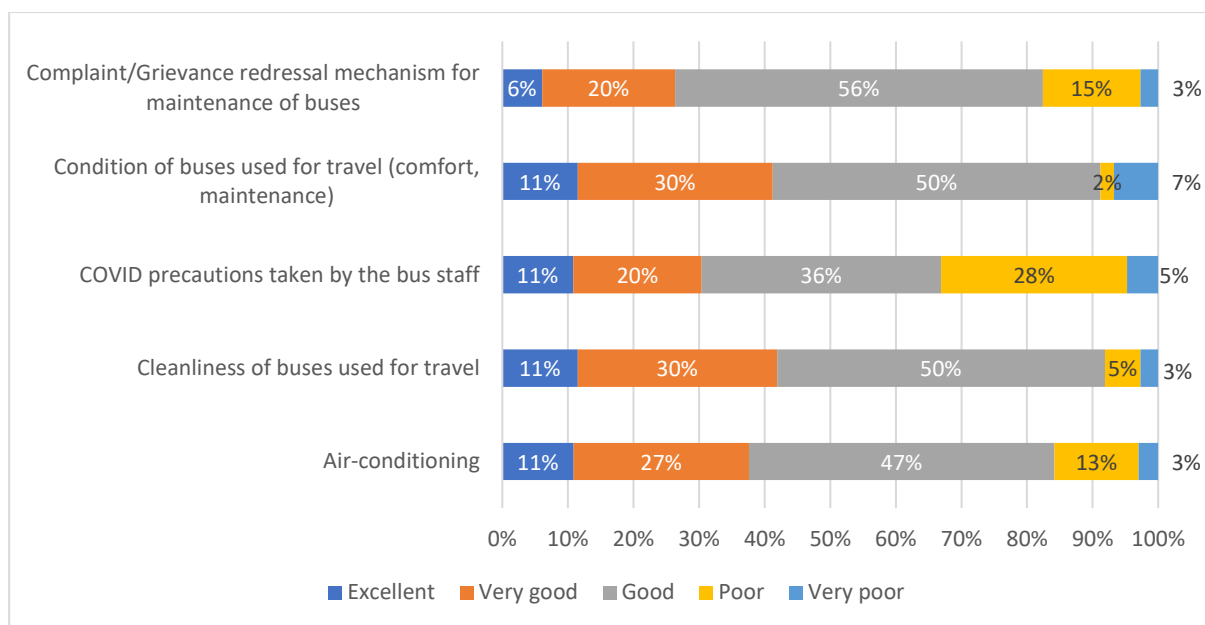
Figure N11: Satisfaction Level for Maintenance for Private Operated Buses (Source: Primary data, 2021)
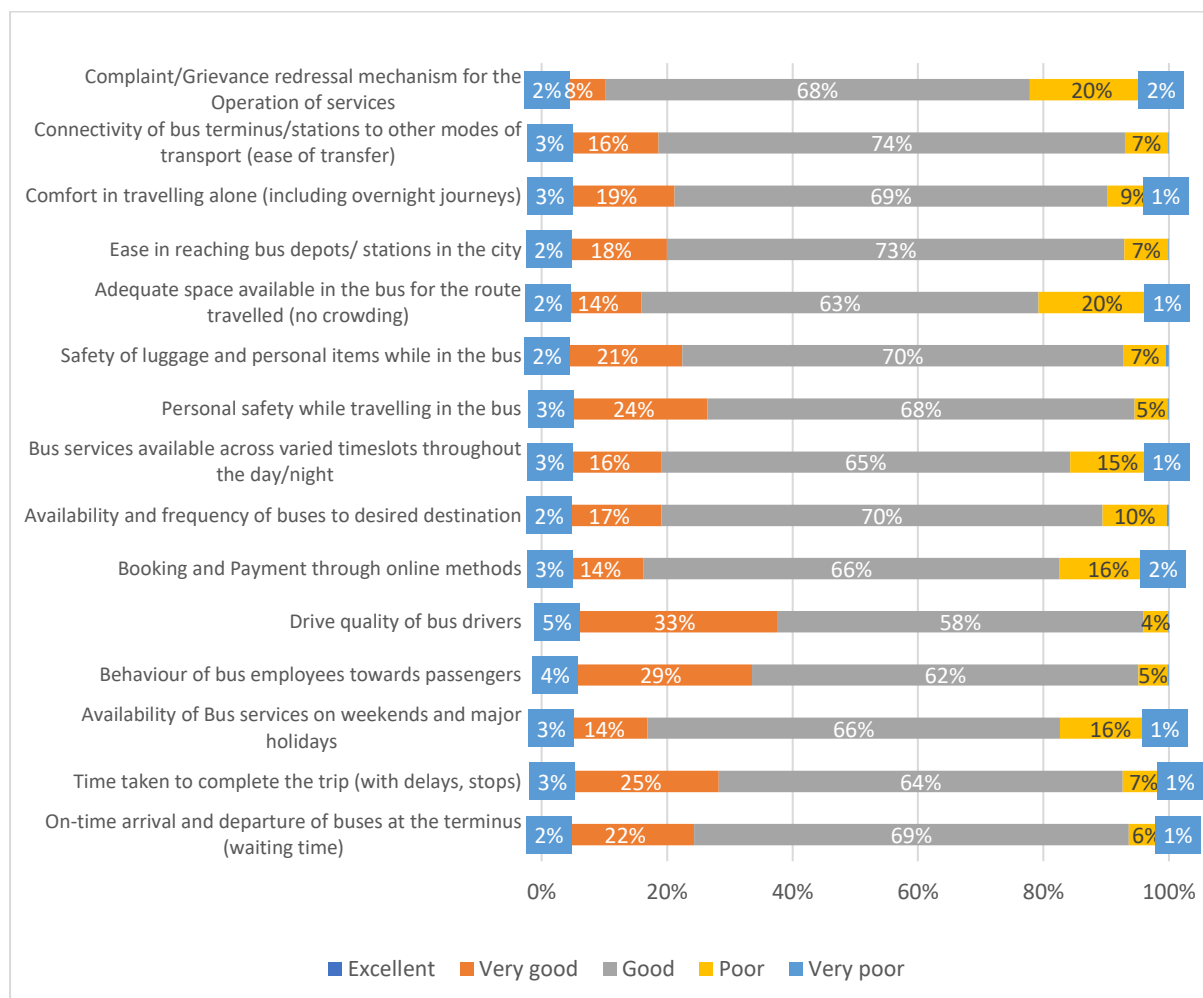
Figure N12: Satisfaction Level with Operations for RTC Buses (Source: Primary data, 2021)
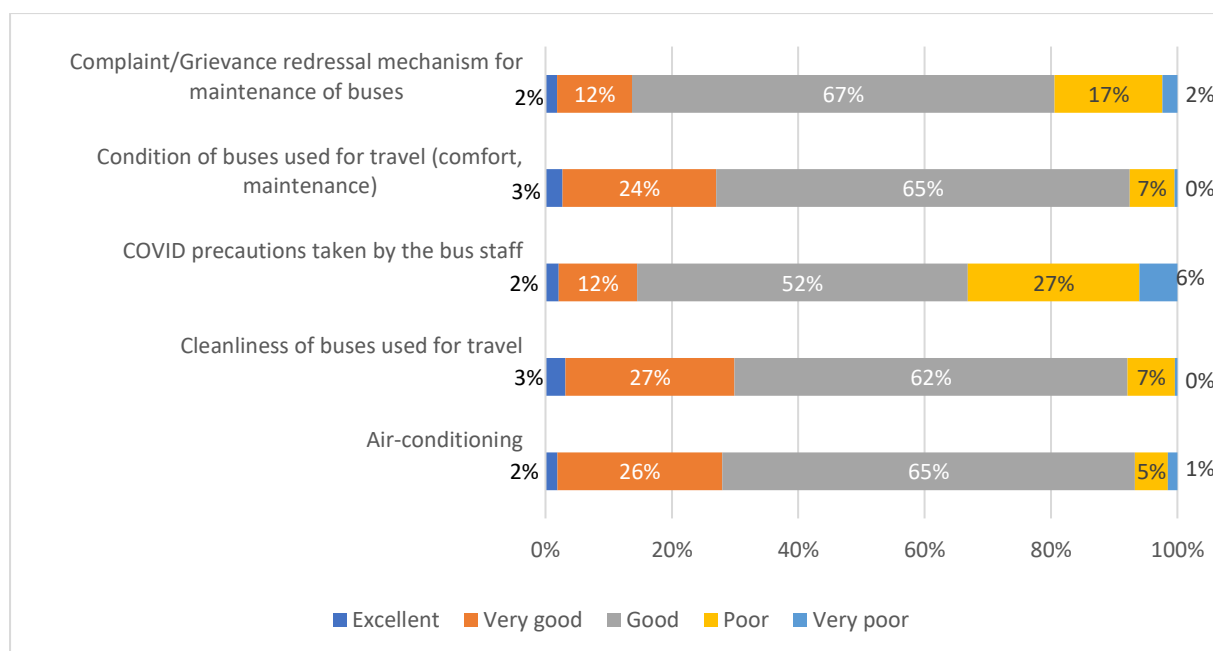
Figure N13: Maintenance Level Satisfaction for RTC Buses (Source: Primary data, 2021)

d. Qualitative Findings from the Passenger Survey

Passengers were found to be satisfied with the quality of services provided by the KSRTC. The overall challenges faced by passengers were due to overcrowded buses, frequent buses for heavy routes was provided as a suggestion to counter the same. Cleanliness of buses and bus stations was also raised as an area of concern by the passengers. Availability of car parking, time-schedule digital boards were a few of the suggestions made by the passenger to improve their experience with KSRTC.

Further, the divisions reported that social media (such as Twitter handles) and complaint registers at the bus stations were the two most common ways of registering complaints made by passengers. This was also echoed by higher officials in KSRTC. An NWKRTC official also stated an increase in the registration of grievances through email communication, handled by a grievance cell in the government as well as in the corporation. Bagalkot division also used an app for registering complaints called "My Haq". Passenger feedback forms were not uniformly distributed across all corporations and were mostly used in express buses. The most common complaints that the divisions received were regarding:

i.   Driver's negligence
ii.   Attitude of drivers and conductors
iii. Maintenance and cleanliness of bus stations and buses
iv.   Need/ Demand for intermediate bus stops
v.   Cancellation of buses due to low number of passengers

The time to resolution of these disputes/issues was cited as situational, depending on the nature of the complaint. For example, if a passenger requested the incorporation of a new route, a due procedure would have to be followed internally, involving a survey to check the

viability and demand for the said route, which might be a slightly lengthy procedure. On the other hand, an issue like 'Shortage of staff' would be dealt with much quickly, as people would be reassigned instantly to fill the gaps.

Cancellation of buses was reported to happen if the number of passengers was low, however, Chikodi division reported that the buses run despite low number of passengers and are cancelled only when there's shortage of staff. Bus frequency was reported to be maintained at 15 minutes and decreased at the time of lowered demand (early morning and late nights). The frequency has also decreased with the onset of COVID-19 due to fewer services and passengers.

13.   CORPORATION EFFICIENCY: A COMPARISON USING DATA ENVELOPMENT ANALYSIS

a. Introduction

In this section, we assess the efficiencies of SRTUs in comparison to the Karnataka corporations to understand their national standing. We will also look at the performance in-state, going over the various divisions across KSRTC, KKRTC and NEKRTC to see which divisions show a higher efficiency level as compared to others. The methodology used in this chapter is called Data Envelopment Analysis, which helps calculate a value of efficiency based on a given set of inputs and outputs. The models that have been built are based on data availability and secondary research of the literature. The aim of this section is to implement this complex mathematical technique and understand its approach towards efficiency estimation, delving into the reasons for non-efficient performance. This approach is solely used as a ranking and comparison tool at the state and division level.

a. Data Envelopment Analysis – A Summary of the Approach

Data Envelopment Analysis (DEA) is a method first put forward by Charnes, Cooper and Rhodes in 1978. It is a performance measurement technique which can be used for evaluating the relative efficiency of homogenous bodies, referred to as decision-making units (DMUs). These decision-making units can be institutional structures (like Banks, Schools, etc) or courses of action to achieve a common objective (like different routes leading to the same destination). The efficiency in DEA is calculated by defining the inputs and outputs of the DMUs and looking at the ratio of total weighted outputs to total weighted inputs (i.e., the efficiency). In addition, DEA also provides information that enables the comparison of each inefficient unit with its "peer group", that is, a group of efficient units that are identical with the units under analysis. These role-model units can then be studied in order to identify the success factors which other comparable units can attempt to follow.

The efficiency of DMUs in DEA is measured relative to an efficiency frontier that is composed of the best performing DMUs. The best performing/ efficient DMUs are allocated an efficiency score of 1 (100%) and lie on the frontier. Other DMUs whose efficiency score is less than 1 lie inside the frontier. None of the DMUs lie out of the frontier since the efficiency score of greater than 1 is not feasible. This implies that in a DEA model, performance is a relative concept, dependent on the DMUs within the model. The 'most efficient' DMU(s) is/are hence the best performing DMUs, only in the context of the model in question. More detailed theory about DEA is given in the Appendix.

b. DEA: Application in the RTC Evaluation

In the context of the KSRTC Evaluation, we will be utilising DEA at two levels:

- For the main part of our analysis, we will focus on the State of Karnataka and look at the relative efficiency of all the divisions in the state, across the three RTC. This will tell us which divisions handle their resources more efficiently. We will also see how each of the corporations perform based on the values of the containing divisions. The data for this

analysis has been taken from Administrative Reports as well as Offline data shared by the three corporations and over the period April 2019 to March 2020

● Second, we will also take Road Transport Corporations/Undertakings/etc. across the country and look at the performance of the Karnataka RTCs in relation to their peers across different state borders. This will help us shed light on where Karnataka stands in the national picture. The data for this analysis has been taken from the MoRTH Report 'Review of The Performance of State Road Transport Undertakings' for April 2016 – March 2017, published in July 2020. This is the latest published edition of the report and is the most detailed record of compiled nation-wide corporation related statistics. Note that some of the RTCs were excluded due to lack of information available and issues in the analysis model. This analysis still holds validity in 2019-20, since most of the key physical indicators have shown little or no trends over the evaluation period.

This two-tiered approach aims to first give Karnataka's national position when it comes to corporation efficiency as well as the internal relative performance of the divisions in each of these RTCs.

c. **Indicators and Model Structures**

In order to appropriately cover the different aspects associated with running a road transport corporation, six areas called 'functional heads' have been covered in the analysis, namely:

● Manpower
● Traffic Revenue
● Expenses
● Maintenance
● Road Safety
● Vehicle Operations

The set of indicators used across these models for the analyses is given below. The indicators are slightly different at State and Division due to the varying availability of information, as well a higher level of contextualization of the models to the Karnataka context.

Table 81: *List of Indicators to be Used for DEA Analysis*

Indicator	Code	State Level	Division Level
Avg fleet held	AFH	Y	Y
Avg no. of buses on road	ABR	Y	Y
Avg age of fleet (in kms)	AAF		Y
Avg age of fleet (in years)	AAF	Y	
Fleet Utilisation (in %)	FUT		Y
Fuel efficiency (KMPL)	FEF		Y

Staff strength	STR	Y	Y
Staff Ratio / Bus held	SRB	Y	Y
Staff productivity (kms per staff per day)	STP	Y	Y
Passengers carried (lakhs)	PAC	Y	Y
Passengers carried per bus/day	PACBD	Y	Y
Vehicle productivity: (kms per bus per day)	VHP	Y	Y
Passenger kilometres offered (lakh kms)	PKMO	Y	Y
Passenger kilometres performed (lakh kms)	PKMP	Y	Y
Traffic revenue (in Rs. Lakhs)	TRR	Y	Y
Staff cost (in lakhs)	STC	Y	Y
Cost of Fuel (in Rs Lakhs)	FUC		Y
Cost of Fuel and Lubricants (in Rs Lakhs)	FLC	Y	
Cost of Other consumables (in Rs Lakhs)	OTC		Y
Cost of Battery & Ele. items (In Rs Lakhs)	BEC		Y
Cost of tyres, tubes and spares (in Rs Lakhs)	TSC		Y
Cost of tyres and tubes (in Rs Lakhs)	TTC	Y	
Cost of spares (in Rs Lakhs)	SPC	Y	
Motor Vehicle Tax (in Rs Lakhs)	MVT	Y	Y
Rate of Accidents (per lakh km)	RAC		Y
No. of Accidents	NAC	Y	
No. of Fatal Accidents	NFAC	Y	
Accident Compensation (in Rs Lakh)	ACC	Y	Y
Per Capita Income (in Rs. at current prices)	PCI	Y	Y
Population Density (people per sq km)	PDN		Y

Population	POP	Y	
Area (sq km)	AR	Y	

All Functional heads also relate to the overarching head of Managerial (Manpower), Financial (Revenue and Expenses) and Operational (Maintenance, Road Safety, Vehicle Operations), as specified by KEA. The functional heads have been chosen looking at the requirements of the KSRTC (Quality of Service, Expenses, Costs) and the basic areas that are essential to measuring the efficiency of a service (Vehicle Ops, Manpower, Maintenance). The overall efficiency (OE) score of a decision-making unit will be calculated as a weighted sum of the individual efficiency scores of each of these functional heads. The weights that will be used to combine the functional heads are standard mean weights ($1/6 \approx 0.17$ for each functional head). These weights can be revised if required using the Analytical Hierarchical Process (AHP) approach after consultation with the higher board level officials of the three corporations. Through AHP we will be able to incorporate the preferences of the RTC officials in the calculation of the functional head weights to give the overall efficiency score. The overall model structures for each of the heads at the state and division level are given below, with data pre-processing steps covered in the appendix. Before we go over to the model structures, we list the assumptions that go behind the variable selection for these models:

- The main assumption in the DEA models being utilised is that there are **Constant Returns to Scale**, which means that an increase in input results in a proportional increase in output.
- All per day variables assume operation on all days of year, which is how they are calculated. This is in line with the RTC methods of calculating them as well.
- 'Staff Cost (in Rs. Lakhs)' is used as a proxy for Maintenance Staff cost, with the assumption that the latter would be directly proportional to the former for any division.
- The use of Per Capita Income in multiple models assumes that areas with higher per capita income would have higher taxation levels, and the people living in these areas there would expect a higher level and quality of service.

The quantitative findings and analysis produced by these models at the division level will be supplemented by insights from field interviews, as well as other data and statistics analyzed over the course of this study.

d. Analysis of the Efficiency of Karnataka Divisions

The efficiency under each of the functional heads, as well as the overall efficiency for each of the divisions is given below. What we observe here is that efficiency values are tightly grouped together, due to lesser variation in the data. In fact, all 33 divisions in the model are actually efficient in at least one functional head, with all but 6 divisions having an OE value > 0.9. Some divisions, like Mysuru Urban and Hubballi are at 21st and 29th ranks respectively, while being efficient in 2 and 3 functional heads respectively, owing to relatively low values in the non-efficient functional heads.

Table 82: *Efficiency Scores Overall and for each Functional Head at the Division Level (2019-20)*

Weight	0.17	0.17	0.17	0.17	0.17	0.17		
Division	Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations	Overall	Ranking
Vijayapur	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
Chitradurga	1.000	0.988	1.000	1.000	1.000	1.000	0.998	2
Davanagere	0.938	1.000	1.000	1.000	1.000	1.000	0.990	3
Kalaburagi-1	0.931	0.991	1.000	1.000	1.000	1.000	0.987	4
Koppal	0.961	0.976	0.969	1.000	1.000	1.000	0.984	5
Chamarajanagar	1.000	1.000	1.000	1.000	0.892	1.000	0.982	6
Kalaburagi-2	0.920	0.950	1.000	1.000	1.000	1.000	0.978	7
Chikkaballapura	1.000	1.000	1.000	1.000	0.869	1.000	0.978	8
North Kannada	1.000	1.000	0.940	0.919	1.000	1.000	0.977	9
Chikodi	1.000	1.000	0.996	1.000	0.857	1.000	0.976	10
Yadgiri	0.903	0.930	1.000	1.000	1.000	1.000	0.972	11
Chikmagalur	0.983	1.000	0.926	0.902	1.000	1.000	0.969	12
Bidar	0.862	0.946	1.000	1.000	1.000	1.000	0.968	13
Belgavi	1.000	1.000	0.976	0.909	0.921	1.000	0.968	14
Shivamogga	1.000	1.000	0.926	0.872	0.983	1.000	0.964	15
Ballari	0.816	0.949	1.000	1.000	1.000	1.000	0.961	16
Raichur	0.938	0.987	0.952	0.855	0.998	1.000	0.955	17
Puttur	0.828	1.000	0.991	1.000	0.835	0.999	0.942	18
Hospet	0.797	0.939	1.000	1.000	0.884	0.984	0.934	19
Tumkur	0.893	1.000	1.000	0.974	0.736	0.984	0.931	20
Mysuru Urban	0.859	1.000	1.000	0.820	0.891	1.000	0.928	21
Mandya	0.974	1.000	0.978	0.853	0.760	0.999	0.927	22
Gadag	0.868	0.985	0.988	0.789	0.909	0.997	0.923	23
Mangalore	0.934	1.000	0.878	0.875	0.887	0.951	0.921	24
Ramanagara	0.795	0.964	1.000	1.000	0.714	0.991	0.911	25
Bagalkot	0.793	1.000	0.932	0.821	0.864	1.000	0.902	26
Hassan	0.916	1.000	0.904	0.848	0.736	1.000	0.901	27

Kolar	0.865	0.989	0.999	0.822	0.730	0.987	0.899	28
Hubballi	1.000	1.000	0.932	0.844	0.553	1.000	0.888	29
Haveri	0.828	0.990	1.000	0.909	0.572	0.996	0.883	30
Mysuru Rural	0.835	1.000	0.848	0.772	0.652	0.971	0.846	31
Dharawad (Rural)	0.809	0.978	1.000	0.775	0.488	0.998	0.841	32
Bangalore Central	0.801	1.000	0.734	0.606	0.682	0.909	0.789	33

Vijayapur in KKRTC is the most efficient division, with efficiency achieved across all functional heads, closely followed by Chitradurga in KSRTC, which is efficient in five of the six functional heads. Davanagere (KSRTC), Kalaburagi-1 (NEKRTC) and Koppal (NEKRTC) also figure into the top 5, with efficiency in 5, 4 and 3 functional heads, respectively (see the table below). Further examining the top 10 divisions for efficiency levels, we see that Chamarajanagar and Chikkaballapura are not among the top 5, even though they are only inefficient in one functional head, namely Road Safety. Indeed, Manpower and Road Safety are the main causes of the performance rankings, with only 9 and 11 efficient divisions respectively, followed by Maintenance and Expenses with 15 and 16 efficient divisions. Traffic Revenue and Vehicle Operations are the functional heads with the maximum number of efficient divisions, at 19 and 21 respectively. In terms of corporation performance, we see that 40% of the top 10 divisions come from KSRTC and KKRTC each, with 20% coming from NWKRTC.

Table 83: *Functional Head Efficiency of Top 10 Divisions*

Corp	Division	Man-power	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations
KKRTC	Vijayapur	Y	Y	Y	Y	Y	Y
KSRTC	Chitradurga	Y	X	Y	Y	Y	Y
KSRTC	Davanagere	X	Y	Y	Y	Y	Y
KKRTC	Kalaburagi-1	X	X	Y	Y	Y	Y
KKRTC	Koppal	X	X	X	Y	Y	Y
KSRTC	Chamarajanagar	Y	Y	Y	Y	X	Y
KKRTC	Kalaburagi-2	X	X	Y	Y	Y	Y
KSRTC	Chikkaballapura	Y	Y	Y	Y	X	Y

NWKRTC	North Kannada	Y	Y	X	X	Y	Y
NWKRTC	Chikodi	Y	Y	X	Y	X	Y

In DEA, we also have a concept of 'peers' for inefficient DMUs, which are efficient DMUs that most closely resemble the inefficient DMU in terms of its outputs/inputs (depending on maximization or minimization). In addition, DEA assigns to each of the efficient peers a weighting which indicates just how the inefficient DMU should emulate its peers. Thus, a peer which is assigned a high weight (relative to the weights of the other efficient peers) is one which the inefficient DMU should most closely emulate. The peers for each of the divisions as per the model have been arranged, but the table is in the Appendix, due to its larger size. In the table below, you can see under each functional head the top three efficient divisions that are most considered peers.

Table 84: *Top Peers for each of the Functional Heads*

Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations
Chamarajanagar (16) Chitradurga (16) Hubballi (12)	Chamarajanagar (10) Bagalkot (8) Davanagere (7)	Haveri (13) Mysuru Urban (9) Ballari, Hospet (8)	Ballari (16), Chamarajanagar (10) Chikkaballapura (9)	Koppal (16) Vijayapur (8) Chitradurga (6)	Davanagere (16) North Kannada (6) Bagalkot (6)

Let us examine the results in the context of the available secondary data and qualitative findings. Along with having the highest no of efficient divisions (19 and 21 out of 33 respectively), the average efficiencies for Traffic Revenue and Vehicle Operations are very high (0.987 and 0.993). This implies that non-efficient divisions also have high performance levels, leaving little room for comparison and differentiation between the divisions in these two areas. Instead, we will focus on the other four functional heads when making comparisons and cross-referencing secondary data.

i. **Manpower**

Manpower is the area with the lowest number of efficient divisions, and it looks at the general inputs of the divisions against the strength and efficiency of the staff that runs them. 14 of the divisions under this functional head have an OE value < 0.9, and an additional 7 have values < 0.95, leaving 9 efficient and 3 near-efficient divisions. We will focus on the first category to understand why their rankings are on the lower end, comparing them to efficient division Chikodi.

The first thing we observe here is that 50% of these divisions are from KSRTC, with the remaining coming from the other two corporations. It is interesting to note that six of the top

ten corporations in terms of staff strength fall into this list of inefficient divisions. Of the other four, three are efficient (Vijayapur, Chikodi and Belgavi), and one has a decent OE of 0.938 (Raichur). By contrast, only three of these divisions are among the top 10 when it comes to staff productivity, namely Bengaluru, Mysuru Rural and Tumkur.

Table 85: *Manpower Division-wise Efficiency*

Corp	Division	Manpower (Efficiency Score)
NWKRTC	Bagalkot	0.793
KSRTC	Ramanagara	0.795
NEKRTC	Hospet	0.797
KSRTC	Bangalore Central	0.801
NWKRTC	Dharawad (Rural)	0.809
NEKRTC	Ballari	0.816
KSRTC	Puttur	0.828
NWKRTC	Haveri	0.828
KSRTC	Mysuru Rural	0.835
KSRTC	Mysuru Urban	0.859
NEKRTC	Bidar	0.862
KSRTC	Kolar	0.865
NWKRTC	Gadag	0.868
KSRTC	Tumkur	0.893

Instead of looking at all 14 divisions, we pick three divisions from the top, middle and bottom of the list, to look at the varying performance and comparison across efficiency levels. The divisions to look at are Bagalkot, Mysuru Rural and Tumkur. It is already quite evident why Chikodi is more efficient in this model, looking at the Passengers Carried and the Passengers Carried per bus per day. All other divisions achieve only fractions of these values, while having comparable staff and fleet strengths, as well as Staff to Bus ratios (Tumkur values are slightly lesser). Staff Productivity, which is also an important output, is actually the lowest for Chikodi, by a small margin (it is ranked 19th overall for that statistic), but the other outputs more than make up for this value, owing to the higher efficiency level

Table 86: *Manpower Division Level Model Comparison*

Nature	Variable	Bagalkot	Mysuru Rural	Tumkur	Chikodi
Input	Avg no. of buses on road	617	631.3	567.7	605
Input	Staff strength	3096	3110	2604	2964
Input	Staff Ratio / Bus held	4.44	4.43	4.02	4.50
Input	Per Capita Income (in Rs. at current prices)	151030	129016	157923	105133
Input	Population Density (people per sq km)	288	476	253	356
Output	Staff productivity (kms per staff per day)	73.86	79.7	77.3	71.18
Output	Passengers carried (lakhs)	796.01	591.9	797.64	1219.74
Output	Passengers carried per bus/day	353.40	256.87	384.94	552.63

Qualitative Findings on Manpower

Staff Hiring and Shortage

In a status quo scenario, hiring across corporations is driven to fill the need in a given area. With the increase in schedules, it is bus crew as well as new mechanics will be recruited as first priority. As per the administrative reports, overall, for KSRTC, NEKRTC and NWKRTC, the divisional staff per bus ratio was 4.265, 4.41 and 4.9 respectively. However, when looked through different levels, it was reported that the number of current supervising staff is low for the crew and depot staff appointed. In addition to this, depot crew reported having a shortage of human resources working on-ground. Based on NWKRTC data, the gap between staff working vs the number sanctioned has been increasing over the evaluation period, with the vacancies nearly tripling from 603 to 1727.

Since COVID-19 struck the situation has worsened, as recruitment was halted by the government, and has not been allowed to resume, despite a dearth of people available to work. Currently, the staff is still able to continue efficient services to some extent, with the shortage due to a reduced number of schedules owing to the prevalence of COVID-19. The depot crew is currently operating on a rotational basis on routes and schedules, due to this shortage of staff.

Gender Equity

The gender ratio in the depots and divisions across all corporations was found to be skewed. However, essential infrastructure such as separate toilets, baby feeding room, changing room etc. for women were offered both at the division and the depots. In addition to this, labour welfare officers at the depot were also responsible to facilitate menstrual health management within the depots for female employees. Female conductors are allowed to choose their own routes and schedules based on their convenience and are usually assigned duties during the day to ensure their safety.

Training and Capacity Building

The corporations undertake uniform and regular capacity building exercises for the depot staff. Training for drivers and conductors takes place at the central training centres of all corporations at the time of their joining. As reported by the stakeholders in corroboration with the administrative reports, the induction training by PCRA for drivers is inclusive of road safety guidelines, increasing KMPL (kilometre per litre) and general administrative information. The training for conductors is not uniformly spread across all divisions, as only a limited number of divisions reported undergoing it. The training for conductors covered aspects pertinent for their functioning, which included interaction with passengers, women's safety and increasing EPK (earnings per kilometre). Refresher trainings are also conducted for defaulting drivers and conductors. Reportedly, the learnings of the training at the Depot are also consistently disseminated through depot staff and management. These training and capacity building are also followed by incentives and awards which act as motivational factors to deliver enhanced performances.

Technical training for repair and maintenance of works are conducted by automobile companies such as TATA and Leyland, based on the buses in-use at the depots. The mechanical staff in some divisions recommended a thorough hands-on training. It was informed that the information provided to them on newer technologies such as electric buses was limited to the theoretics of the functioning of newer buses and did not provide them with the opportunity to have a practical understanding.

In addition to this, divisional staff reported having occasional managerial training organised by All India Traffic Education System on stress management, machine and man management, attitude towards public, crisis management etc. Mangalore division reported having accident analysis training to identify systematic reasons for accidents.

Staff Welfare Measures

At NWKRTC, there is dispensary at Hubballi providing outpatient treatment facilities to the Employees and their family members. A total of 20,558 persons were treated in all the dispensaries in 2019-20. Health check-up and eye check-up camps were also organised very regularly throughout the year. Across corporations, employees are also eligible for Medical Reimbursement on these check-ups and visits, along with their family members and dependent parents. In terms of other means of support, KSRTC also has a Rs. 1260

monthly childcare (creche) allowance for women with children below the age of 3. There is also a 40 bed de-addiction treatment center is established at KSRTC Hospital, Jayanagar, Bangalore. The Corporation spend about Rs.8000/- to each addicted employee towards the residential/In-House treatment.

Employees are also eligible to availing loans to purchase a house/flat or construction without any limitation of amount. The subsidy of 4% on interest availed housing loan maximum up to Rs. 5.00 lakhs will be granted by the Corporation. The interest amount is limited to Rs. 1.00 lakh only.

Along with financial and healthcare support, an Education Assistance Fund for the children of the employees of the Karnataka RTCs is available to provide monetary support for them to undertake ITI, Diploma, Graduate Courses, MBBS/BHMS/BAMS, and other post graduate courses.

Feedback Mechanisms

Across all corporations, feedback is collected regularly from the depot, division and corporation level employees, and is a part of the decision making for the upper management in the management and board meetings. This is done in hierarchical manner, with the Depot Manager passing suggestions/ideas up to the divisions, and Division level officers and Department HoDs passing them upward to the Central office, and so on. In KSRTC, there is Committee out in place to assess idea of all the staff for the improvement of the corporation and deliberates on these ideas to see whether they are viable and can be implemented.

ii. **Expenses**

Chikkaballapura, Chamarajanagar are two of the five profit-making divisions in Karnataka (when considering only Direct Costs) and here too, they are among the Top 10 divisions in terms of overall efficiency. By contrast, Bangalore Central and Mysuru Rural are two more profit-making divisions in Karnataka (when considering only Direct Costs) but are among the bottom divisions in the DEA model, with efficiency only achieved under Traffic Revenue. The remaining division Hospet is ranked in the middle of the table.

To explore the reasons for these contrasting results, we compare the model of Expenses for Bangalore, Mysuru Rural and Mangalore (three lowest performers) with Vijayapur (most efficient division). It is quite clear that when we look at the cost inputs, Bangalore stands out with the highest costs, followed by Mysuru Rural, Vijayapur and Mangalore. However, Vijayapur maintains the largest fleet, both held and operated, and also runs the maximum number of passenger kilometers performed. In contrast, Bangalore and Mysuru, which run on higher or about equal costs both maintain smaller and less utilized fleets, that are older and have covered less passenger kilometres. Vijayapur also has about the same number of employees as these two divisions. The only place it falls behind is the Vehicle Productivity, which is quite high for both other divisions, but is outweighed by all the other gaps in inputs vs outputs. Mangalore is the smallest corporation of the four, in terms of costs, fleet held, buses on road, staff strength and passenger kilometers performed. It is also younger and has a

higher vehicle productivity than Vijayapur. However, the expenditure as well as the fleet held/operated and the passenger kilometres performed are relatively low compared to the magnitude of the costs incurred, resulting in the inefficiency in the performance.

Table 87: *Expenses Division Level Model Comparison*

Nature	Variable	Bangalore Central	Mysuru Rural	Mangalore	Vijayapur
Input	Staff cost (in lakhs)	15304.13	12398.9	9078.42	15431.07
Input	Cost of fuel (in Rs Lakhs)	15087.03	12376.16	10648.04	9898.15
Input	Motor Vehicle Tax (in Rs Lakhs)	2369.45	1614.31	1252.04	1137.31
Input	Cost of tyres, tubes and spares (in Rs Lakhs)	1864.33	1088.14	1460.45	964.25
Output	Avg fleet held	740.3	701.3	594.3	790.4
Output	Avg no. of buses on road	631.2	631.3	514.9	654.7
Output	Avg age of fleet (in kms)	767000	819000	626000	687155
Output	Staff strength	3354	3110	2361	3264
Output	Vehicle productivity (kms per bus per day)	437.65	393.69	370.20	349.34
Output	Passenger kilometres performed (lakh kms)	30036.05	28104.23	17405.54	30684.44

Qualitative Findings on Revenue and Expenses

Impact of COVID-19 on Revenue Generation

Due to a limited number of schedules with the onset of COVID-19, and a higher number of subsidised passengers all divisions generated limited revenue during 2019-20. To cater to the costs of operation within the corporations, divisions are still currently recovering from the impact of the pandemic.

Expenditure on Technology Upgradation

As per a corporation official in KSRTC, the amount spent does not match up to the expectations held towards the functioning of the corporations. The expenditure yearly is about 1-2 crores, spent on hardware and development of applications in-house. It is less

than a fraction of a percent of the overall expense of any given year, and is currently only used to fulfil ad-hoc requirements to satisfy day to day requests. However, what is actually required is an upgradation of the system in place, by adding a new ERP system or database management software in place. The problem is of perspective, as having this facility is considered a luxury rather than a necessity, and the government has been unwilling raise the contribution to an amount more fitting to make these upgrades.

Since COVID-19 has struck, technology upgradation has been put on hold over the last two years. As per an NWKRTC official, there has been difficulty managing basic payments including salary over this period, making the upgrade out of question at the moment. He stated that their shift to ETMs as well as buying the buses with the latest technology have been beneficial in saving resources and making the dealings in buses more efficient, he still feels there is room for more upgrades like GPS tracking of buses, smart bus stands with a regularly updating timetable, to increase the uptake of these transport modes by the general public.

iii. Maintenance

15 divisions have achieved full efficiency under maintenance, with 1 near-efficient division. Of the remaining, 4 have scores < 0.95 and 13 have OE scores less than 0.9 (in the table below). 61% of these 13 are KSRTC divisions, while 31% are NWKRTC divisions, with the remaining 1 division (8%) coming from NEKRTC. Bangalore Central has the lowest value by a long margin (0.606), with the next closest division being Mysuru Rural (0.772) more than 0.162 units away, followed by Dharawad (Rural) (0.775) and Gadag (0.789). The remaining divisions are confined between 0.820 and 0.875.

We also look at the efficiency scores in relation to the performance of these divisions in the main contributing indicators of the Maintenance model. Here, some divisions clearly justify their efficiency ranking, starting with Bangalore and Mysuru Rural. Both divisions are in the top 10 in the top 2 input cost indicators (staff as well as tyres and tubes) but are among the lowest ranked indicators in all indicators except vehicle productivity. Hubballi and Raichur are also similar, with higher input costs, and relatively lower performance indicators to match up to them, with Hubballi doing well only in Vehicle productivity (6th), and Raichur doing well only in terms of age of fleet (4th youngest). We compare efficient divisions with the remaining divisions to shed more light on why they have been ranked this low.

Table 88: *Maintenance Division-wise Efficiency and Indicator Ranking*

Corp	Division	Maintenance	Rank: Fleet Utilisation (in %)	Rank: Avg age of fleet (in km)	Rank: KMPL	Rank: Vehicle prod (kms per bus per day)	Rank: Staff cost (in lakhs)	Rank: Tyre and tube Cost (Rs Lakhs)
KSRTC	Bangalore Central	0.606	29	21	31	1	2	3
KSRTC	Mysuru Rural	0.772	17	32	29	3	5	9
NWKRTC	Dharawad (Rural)	0.775	21	10	17	32	17	27
NWKRTC	Gadag	0.789	14	31	5	14	13	14
KSRTC	Mysuru Urban	0.820	20	8	33	33	14	31
NWKRTC	Bagalkot	0.821	2	30	2	8	4	7
KSRTC	Kolar	0.822	10	19	6	12	9	20
NWKRTC	Hubballi	0.844	24	29	27	6	18	16
KSRTC	Hassan	0.848	4	27	24	10	10	8
KSRTC	Mandya	0.853	8	25	12	17	26	22
KKRTC	Raichur	0.855	28	4	18	19	8	5
KSRTC	Shivamogga	0.872	18	14	28	2	31	30
KSRTC	Mangalore	0.875	26	6	32	9	19	2

We compare the divisions in two sets owing to the high numbers, comparing the first set with Chamarajanagar and the second set with Ballari. For the first set, we see that while Chamarajanagar has the 3rd smallest fleet in terms of average fleet among the divisions below, the smaller divisions are spending a lot more money on their staff and maintenance related expenses. Kolar, Gadag and Bagalkot which have slightly larger fleet sizes are paying a lot more, primarily by way of staff costs. In all output areas, Chamarajanagar is 3rd or 4th in

terms of performance (2nd only for Fleet Utilisation %), but this is outweighed by the relatively low expenditures incurred towards this functional head.

Table 89: *Maintenance Division Level Model Comparison – Lower Efficiency*

Nature	Variable	Kolar	Mysuru Urban	Dharawad (Rural)	Bagalkot	Gadag	Chamarajanagar
Input	Staff cost (in lakhs)	11187.15	10045.22	9392.98	13042.86	10196.6	6878.5
Input	Cost of Battery & Ele. items (In Rs Lakhs)	32.64	40.24	34.09	41.24	41.89	26.59
Input	Cost of Reconditioning (in Rs Lakhs)	99.31	244.71	369.6	102.24	138.39	153.11
Input	Cost of Other consumbles (in Rs Lakhs)	33.86	63.93	9.7	14.77	44.95	34.7
Input	Cost of tyres, tubes and spares (in Rs Lakhs)	652.22	512.74	581.22	853.75	713.04	630.78
Output	Avg fleet held	590.5	446.5	471.6	661.4	561.9	553.7
Output	Avg age of fleet (in kms)	739000	646000	672216	808480	810402	728000
Output	Vehicle productivity : (kms per bus per day)	361.63	231.37	325.54	370.54	359.47	357.90

Output	Fleet utilisation (in %)	91.40	89.30	88.40	93.30	90.40	91.60	
Output	Fuel efficiency (KMPL)	5.21	4.09	5.06	5.32	5.27	5.10	

Ballari also shows similar behaviour to Chamarajanagar. With the lowest costs in relation to the buses held, and with the 2nd best fuel efficiency and youngest fleet of the set, the average performance in the other areas does not weigh in as much in deciding the efficiency levels. By contrast, Hassan Mangalore and Mandya all have larger fleets, but have a much higher increase in the costs expended, primarily towards the staff.

Table 90: *Maintenance Division Level Model Comparison - Higher Efficiency*

Nature	Variable	Mandya	Hassan	Mangalore	Shivamogga	Ballari
Input	Staff cost (in lakhs)	7860.54	11069.30	9078.42	6161.33	6361.19
Input	Cost of Battery & Ele. items (In Rs Lakhs)	33.09	30.64	45.29	38.35	24.50
Input	Cost of Reconditioning (in Rs Lakhs)	105.80	85.30	399.46	73.44	17.81
Input	Cost of Other consumbles (in Rs Lakhs)	37.12	71.17	34.72	88.02	4.03
Input	Cost of tyres, tubes and spares (in Rs Lakhs)	611.33	801.01	1460.45	591.23	392.82
Output	Avg fleet held	487.50	588.30	594.30	328.70	409.70
Output	Avg age of fleet (in kms)	775000	790000	626000	700000	624076
Output	Vehicle productivity: (kms per bus per day)	355.15	362.99	370.20	400.02	328.76
Output	Fleet utilisation (in %)	91.80	92.90	86.60	89.90	83.40
Output	Fuel efficiency (KMPL)	5.12	4.99	4.19	4.87	5.11

Qualitative Findings on Maintenance

Routine Maintenance Plans

Depots have a well-laid out plan for maintenance of vehicles on daily, weekly and monthly maintenance. Drivers fill out log sheets and report mechanical defects of buses, if any. Mechanical staff further is responsible for the maintenance. Belgaum reported challenges with respect to newer electronic buses with respect to space for operation and dissemination of toolkit for problem-identification.

Impact of COVID-19 on Maintenance

Availability of spare parts caused initial challenges to fulfil day-to-day maintenance and service needs. Further, due to constant sanitisation of buses is also resulting in an accelerated degradation and rusting of the external body of the buses.

Introduction of Newer Technology

Electronic buses have been introduced in Belgaum as it is also a part of the Smart Cities Mission; these buses have been efficiently running ever since they have been introduced. Electronic buses come with an automated error-identifying toolkit; however, the dissemination of the toolkit was not completed, reportedly and training on repair of these buses was found to be not satisfactory. In addition, mechanical staff also raised challenges to maintain these buses as the physical space to operate on these buses was found to be limited.

Bus Repair Duration at Regional Workshop and Revenue Loss

After reviewing data shared by KSRTC for the evaluation period, it was established that on average buses take around 35-45 days to be repaired at the regional workshop. The traffic revenue per bus per day came out to be between around INR 10,375 on average and showed little variation, sticking between 10,000 and 11,200 from 2014-15 to 2019-20. However, the consequent revenue lost, being dependent on the number of buses repaired, is much more prone to variation, given the variation of the former statistic. In 2014-15 this value was estimated to be INR 1,165 lakhs for 237 buses (48 days avg repair time), while in 2016-17 it was calculated to be INR 758 lakhs for 184 buses (41 days avg repair time). In 2019-20 both the repair time (35 days) and no of buses covered (122) were lower, leading to a much lower estimated loss of INR 476 lakhs. It is quite clear here that if the efficiency of the Workshops is increased, they will be able to save money, or even handle a higher quantam of repairs in a shorter period of time.

iv. **Road Safety**

Road Safety, along with Manpower, is the most decisive functional head in calculating the efficiency, with only 11 efficient divisions, and 2 near efficient (> 0.95) divisions. As many as 18 divisions have efficiency values below 0.9, with values going down to as low as 0.488

for Dharawad (Rural). 67% of these are from KSRTC, 22% are from NWKRTC and the remaining 1 (11%) is from KKRTC.

When we look at the outputs, the rankings for most of these divisions are not very surprising. All but three of them fall in the 10 worst performing divisions, either in terms of the Rate of Accidents (per lakh km), Accident Compensations (in Rs lakh), or both (Dharawad Rural and Haveri, specifically). The only three divisions here that violate this condition are Bangalore Central, Chikkaballapura and Hospet, and these will be compared with Koppal, one of the efficient divisions under this functional head.

Table 91: *Road Safety Division-wise Efficiency and Indicator Ranking*

Corp Higher Efficiency	Division	Road Safety	Rank: Avg fleet held	Rank: Average of fleet (in kms)	Rank: Population Density (people per sq km)	Rank: Per Capita Income (in Rs.)	Rank: Rate of accidents (per lakh kms)	Rank: Accident Compensation (in Rs Lakh)
NWKRTC	Dharawad (Rural)	0.488	24	24	4	10	5	7
NWKRTC	Hubballi	0.55	26	5	4	10	16	2
NWKRTC	Haveri	0.572	20	12	12	22	10	5
KSRTC	Mysuru Rural	0.652	4	2	2	16	6	12
KSRTC	Bangalore Central	0.682	2	13	1	1	17	11
KSRTC	Ramanagara	0.714	19	8	15	6	6	14
KSRTC	Kolar	0.73	12	15	6	21	17	10
KSRTC	Hassan	0.736	13	7	20	12	4	13
KSRTC	Tumkur	0.736	8	11	21	8	17	9
KSRTC	Mandya	0.76	21	9	9	7	1	23
KSRTC	Puttur	0.835	15	25	16	3	1	21
NWKRTC	Chikodi	0.857	7	17	10	24	23	4
NWKRTC	Bagalkot	0.864	5	4	17	9	30	3

KSRTC	Chikkaballa pura	0.869	10	6	13	27	22	17
KKRTC	Hospet	0.884	25	27	18	14	11	20
KSRTC	Mangalore	0.887	11	28	7	2	6	18
KSRTC	Mysuru Urban	0.891	28	26	2	16	11	25
KSRTC	Chamarajan agar	0.892	18	16	31	18	1	15

Koppal has the 24th lowest Accident Rate, and also the Second lowest compensation paid, along with the youngest fleet, lowest population density and lowest per capita income, which is why it does much better than all the three other divisions in comparison. Hospet is of comparable size but has a higher accident rate and more than double the compensation paid. Chikkaballapura's fleet has almost 150 more buses but has a slightly higher accident rate and also pays nearly three times the compensation. Given that Bangalore Central has one of the largest fleets in the state (and among the oldest), its accident rate is not very high, but its accident compensation is over 3.5 times that of Koppal. Moreover, it has the highest population density and per capita income, increasing the expected standard of performance, which it does not meet, as per the DEA model.

Table 92: *Road Safety Division Level Model Comparison*

Nature	Variable	Bangalore Central	Chikkaballap ura	Hospe t	Kopp al
Input	Avg no. of buses on road	631.2	552.8	410.4	404.3
Input	Avg Fleet held	740	598	470	451
Input	Avg age of fleet (in kms)	767000	795000	64205 5	59241 2
Input	Per Capita Income (in Rs. at current prices)	3541273	101952	13398 2	96380
Input	Population Density (people per sq km)	3640	327	278	250

Output	Rate of accidents (per lakh kms)	0.08	0.07	0.09	0.06
Output	Accident Compensation (in Rs Lakh)	430.92	323.03	276.44	115.40

e. Corporation Level Rankings for 2019-20

Based on the DEA scores at the division level, we calculated the scores for the corporations for each of the functional heads, as well as the overall efficiency at that level. The values were aggregated using the weighted sum method, giving equal weightage to each of the divisions in a particular corporation. The efficiency values of the three corporations as per the study are given below. The values for Manpower and Vehicle Operations do not show much differentiation between the three corporations. When we look at Traffic Revenue as well, NEKRTC falls a little short of the other two corporations, while for Expenses, we see KSRTC and NWKRTC having lower values than NEKRTC, but not by great margins. The main difference makers are Maintenance and Road Safety, where NEKRTC has near-efficient values, while KSRTC and NWKRTC averages are far behind. In both cases, KSRTC averages a value higher than NWKRTC, but the gap is much greater when it comes to Road Safety. Resultantly, we see that KKRTC's OE value comes up to 0.971, followed by KSRTC at 0.930 and NWKRTC at 0.920. It is to be noted that in practice, these scores are actually quite close to each other, and do not signal a major difference between the performance of the three corporations, from an efficiency perspective.

Table 93: *Corporation Efficiency based on Division Ranking*

Corp Level	Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations	Overall
KSRTC	0.914	0.996	0.949	0.897	0.835	0.987	**0.930**
NWKRTC	0.912	0.994	0.971	0.871	0.771	0.999	**0.920**
KKRTC	0.903	0.963	0.991	0.984	0.987	0.998	**0.971**

We also go ahead and look at the divisions and how each of them contributes to each corporation's overall scores. In the case of KKRTC, it is quite evident that either the corporation almost as a whole achieves a high efficiency level, or almost none of its divisions achieve that target. Koppal and Vijayapur are the only divisions that consistently stay above 0.95 OE across all functional heads, and among the others Kalaburagi-1 & 2, as well as Yadgiri are efficient across three functional heads each, and perform well on the remaining ones (> 0.90 OE). Hence, 5 of the 9 NE divisions are consistently good performers (4 of them are in the top 10, while the 5th is 11th). Of the remaining, Ballari and Bidar have relatively lower efficiency values for manpower, while Raichuru has lower values in Maintenance and Hospet's efficiency level is low in both Manpower as well as Road Safety.

For KSRTC, in the case of Traffic Revenue, almost the entire division is efficient, with the non-efficient places coming really close to the maximum value. Vehicle operations are also similar, although there are a lot more such divisions that are near-efficient but do not achieve the value of 1. Davanagere and Chitradurga are the only divisions that show consistency, which is the reason for their 2nd and 3rd ranks as per overall efficiency. Chikkaballapura and Chamarajanagar are the only two divisions that come close (fully efficient in 5 functional heads each), but both have lower efficiency levels under Road Safety. The entire remaining divisions perform at a lower level in atleast two, three or even all four remaining functional heads. In the last category, we have Bangalore Central, Mysuru Rural, Hassan and Mangalore among the bottom 10 divisions, with Ramanagara and Kolar also achieving similar rankings, on the back of lower efficiencies in only 3 of the 6 functional heads.

Finally, for NWKRTC, the performance is similar to KSRTC, with Vehicle Operations and Traffic Revenue being efficient or near efficient for all divisions. For the remaining 4 functional heads, all divisions have low efficiency levels 2, 3 or 4 functional heads, barring Chikodi, which has a low OE level only under Road Safety. Northern Kannada and Belgavi with two efficient/near efficient functional heads also perform at relatively higher levels than their remaining counterparts. This leaves the lower performers to be Dharawad, Hubballi, Haveri, Bagalkot and Gadag.

Table 94: *Division Efficiency Level for each Corporation*

Corporation	Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations
KSRTC	25%	81%	44%	38%	19%	50%
KKRTC	11%	11%	78%	89%	78%	89%
NWKRTC	50%	63%	25%	13%	13%	63%

f. **State Level Analysis of the Efficiency of Karnataka RTCs**
The aggregated stage of our DEA analysis looks at the relative performance of 18 out of 56 State Road Transport Undertakings (SRTUs) in India, specifically those pertaining to the southern part of the country. The efficiency table looking at the performance of these SRTUs under each functional head, as well as the overall score is given below. The SRTUs have been arranged in ascending order in terms of ranking, for ease of comparison.

It is important to note that the State level and Division level models will not necessarily correlate with each other, since they are built using data from different financial years, and indicators like Costs and Revenues are prone to a lot of variation YoY.

Table 95: *Efficiency Scores Overall and by Functional for the SRTUs (2016-17)*

Weight	0.17	0.17	0.17	0.17	0.17	0.17		
Corporation	Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations	Overall	Ranking
Andhra Pradesh SRTC	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
Navi Mumbai MT	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
TN STC (Kumbakonam) Ltd.	1.000	1.000	1.000	0.997	1.000	1.000	1.000	3
TN STC (Madurai) Ltd.	1.000	1.000	1.000	0.913	0.938	1.000	0.975	4
TN STC (Villupuram) Ltd.	1.000	1.000	1.000	0.830	1.000	1.000	0.972	5
TN STC (Salem) Ltd.	1.000	1.000	1.000	0.773	1.000	1.000	0.962	6
TN STC (Coimbatore) Ltd.	1.000	1.000	1.000	0.985	0.786	1.000	0.962	7
State Exp.TC TN Ltd.	1.000	1.000	1.000	0.688	0.956	1.000	0.941	8
Thane MT	0.629	1.000	1.000	1.000	1.000	0.992	0.937	9
Telangana SRTC	1.000	1.000	1.000	1.000	0.600	1.000	0.933	10
Kalyan Karnataka RTC	1.000	0.989	1.000	1.000	0.737	0.832	0.926	11

Bangalore Metropolitan TC	1.000	1.000	1.000	1.000	0.607	0.903	0.918	12
Metro TC (Chennai) Limited	1.000	1.000	1.000	0.844	0.662	1.000	0.918	13
North Western Karnataka RTC	0.981	1.000	1.000	1.000	0.719	0.782	0.914	14
BEST Undertaking	0.814	1.000	1.000	1.000	0.489	1.000	0.884	15
Karnataka SRTC	0.842	0.954	1.000	0.958	0.620	0.896	0.878	16
Kerala SRTC	0.468	1.000	1.000	1.000	0.591	1.000	0.843	17
Maharashtra SRTC(P)	0.716	1.000	1.000	1.000	0.282	1.000	0.833	18

Based on the rankings, three corporations, Andhra Pradesh SRTC, Navi Mumbai MT and Tamil Nadu STC (Kumbakonam) Ltd. are among the best performers, achieving efficiency in all six functional heads. The other undertakings that make up the top 5 are Tamil Nadu STC (Madurai) Ltd. and Tamil Nadu STC (Villupuram) Ltd., efficient in 4 and 5 functional heads respectively. In fact, of the Top 10 corporations in terms of efficiency, positions 3 through 8 are all Tamil Nadu corporations, followed by Thane MT and Telangana SRTC. When we observe all the RTCs, the major area of inefficiency is Road Safety across the board (6 efficient SRTUs), followed by Maintenance (10 efficient SRTUs). Of the others, Manpower and Vehicle Operations have 12 and 13 efficient SRTUs, while all corporations show high efficiency under Traffic Revenue and Expenses (16 and 18 efficient SRTUs respectively).

Notably, in line with the analysis, Andhra Pradesh SRTC was among only seven (of 56) profit-making SRTUs in 2016-17, along with Uttar Pradesh SRTC, Odisha SRTC, PUNBUS, Bihar SRTC, Sikkim NT and Kanpur City Transport (not included in this DEA). Andhra Pradesh SRTC also received numerous awards over the years, from organisations like the Association of State Road Transport Undertakings (ASRTU), in areas like High vehicle productivity and highest KMPL. They have also been recognised at the Technology Sabha and India Bus Awards for their pursuits and improvements in digital technology and their

mobile app. We further look at the corporations in the table with performance brackets based on the ranking values given below.

Table 96: Performance Bracket Based on Efficiency Scores of SRTUs

Performance Bracket	Corporation	Overall Efficiency	Ranking
Very good performer (OE >= 0.95)	Andhra Pradesh SRTC	1.00	1
	Navi Mumbai MT	1.00	1
	TN STC (Kumbakonam) Ltd.	1.00	3
	TN STC (Madurai) Ltd.	0.98	4
	TN STC (Villupuram) Ltd.	0.97	5
	TN STC (Salem) Ltd.	0.96	6
	TN STC (Coimbatore) Ltd.	0.96	7
Good performer (0.9 <= OE < 0.95)	State Exp.TC TN Ltd.	0.94	8
	Thane MT	0.94	9
	Telangana SRTC	0.93	10
	Kalyan Karnataka RTC	0.93	11
	Bangalore Metropolitan TC	0.92	12
	Metro TC (Chennai) Limited	0.92	13
	North Western Karnataka RTC	0.91	14
Average performer (0.85 <= OE < 0.9)	BEST Undertaking	0.88	15
	Karnataka SRTC	0.88	16
Modest performer (0.8 <= OE < 0.85)	Kerala SRTC	0.84	17
	Maharashtra SRTC(P)	0.83	18

Looking at Karnataka's performance, NWKRTC, KKRTC and KSRTC are in Good performer and Average performer (KSRTC only) categories respectively. NWKRTC and KKRTC are efficient in three of the six functional heads (Traffic Revenue, Expenses and Maintenance), while KSRTC is efficient in only one of these functional heads (Expenses). If we look at performance in terms of functional heads efficient or close to efficiency (> 0.9.5), both NWKRTC and KKRTC have four such functional heads. The difference in the efficiency of KSRTC from the other two is seen across the heads, with notable gaps in Manpower and Road Safety. The relevant peers of the Karnataka corporations are given in the Appendix.

g. Limitations of the DEA Analysis
The main limitations of the study are listed here:

● DEA is a relative analysis procedure that tells us about performance among the DMUs within the model setting. The efficiency score calculated also pertains to that particular model only,

with exactly those Decision-Making Units and the same composition of inputs and outputs. We tried to overcome this limitation by first looking at the Karnataka corporations at the state level to get a sense of the national standing, followed by a review of the division level performance, of all the divisions and corporations within Karnataka.

- The state level DEA and city level DEA are conducted over two different years due to the latest available data being from 2016-17 at the national level. The difference in variation in the data sets themselves also warranted the use of two slightly different models. In essence, the national and internal standings are not meant to be compared to each other, but rather serve different purposes. As earlier described, the first gives a view of how the RTCs from Karnataka are doing from an all-India point of view (based on the latest available data), while the second approach tells us how Karnataka divisions have performed relative to each other (based on the latest available data here as well).

- A few qualitative/quantitative criteria like use of online services, cleanliness, staff behavior to customer, punctuality, on-board security, and on-time arrival/departure have not been considered in the evaluation of the performance, due to lack of availability of data on nearly all of these areas. To compensate for this, all of these areas have been covered as part of the primary survey analysis, which has a number of passenger related questions about different aspects of the journey, as well as the satisfaction levels for the same.

- These models only cover the physical and financial statistics as presented by the Karnataka corporations, and does not take into account the social obligations and welfare routes that are undertaken with low profit-making opportunities.

- The models created as part of these analyses primarily serve to offer comparison and are not suitable to make exact recommendations, because of the multiple functional head structure used to come up with the efficiency scores. Efficiency for each functional head would suggest different optimal values for its input and output indicators, and due to common repeating indicators across models, one would be unable to prioritise which functional head's recommendation to follow for efficiency.

h. Summary

At the division level we find that there are some divisions that perform better than others, and we look at which divisions those are and how they compare to their counterparts that are labelled inefficient by the model. These comparisons are also supplemented with qualitative findings from the field research. For the corporation averages, it is to be noted that in practice, these scores are actually quite close to each other, and do not signal a major difference between the performance of the three corporations, from an efficiency perspective. At the state level, accuracy of the model aside, it is quite evident that there is room for improvement for the Karnataka Corporations in relation to other national SRTU

14. KEY RECOMMENDATIONS

The recommendations were brought in based on the qualitative (interaction with multiple stakeholders) and quantitative information (data collected from corporations and primary data collected among bus users) collected during the study period. The detailed key recommendations on operational and financial efficiency and, service delivery are highlighted below.

a. Operational Efficiency

i. Short Term Recommendations

o Given the high levels of loss making across the board, it is essential to improve route planning and rationalisation by digitizing the depot wise route maps and its integration at division and corporation level. This would help the decision makers at the various depot, division and corporation level to identify the unviable routes and restructure the system in a timely manner. This could be carried out using a software such as CUBE, by covering the following steps:

▪ Prepare integrated route maps, land use map: Point data on depot, division, workshops, training institutes.

▪ Tagging of buses, services it operates and routes they regularly run.

▪ Software: cube or other similar software to model routes, route rationalisation, identify overlapping routes.

CUBE Software for Public Transport Modelling

CUBE is a software product Bentley Systems Inc., a software development company that provides software products and solutions for the infrastructure sector, including transportation, industrial and power plants, as well as utility networks.

The product 'CUBE Voyager' provides information on the current transportation system, predicts the status for the next generation, and guides towards system optimization.

CUBE Voyager has a Public Transportation model (PT Model) that will help in identifying the routes based on Origin Destination (OD) surveys, rationalization of routes, extension of routes, identification of bus stops, etc.

The PY module provides multi-user-class, multi-routing transit algorithm which represents all the complexities of the public transport system. It uses efficient techniques to determine what different travellers would consider as reasonable public transport routes and allocates the demand between the various routes in a way similar to how travellers actually chose their routes

The PT Model adopts a two-step process of 'Enumeration' and 'Evaluation'. The Enumeration process identifies all available routes between two points based on the following:

• The route should move progressively from the origin to the destination

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- Travellers tend to select journeys that are simpler – that are direct or involve few interchanges
- Travellers are unwilling to walk very long distances

Once the routes are enumerated, they are 'Evaluated' based on a number of parameters which include the preferred route based on traffic, fare structure (flat, linear, telescopic etc.), cost etc. and arrives at the 'Route Choice Probability'.

The software also facilitates upgrades and rationalization based on changes to network (new roads, new destinations etc.) and changes in demand at various Origins and Destinations.

✓ In order to incentivize people to increase their utilization of public transport, an effective approach would be to improve the linkages of bus stations or terminals to other modes of long or short distance transport. One effective measure would be to introduce small feeder fleets for improved connectivity to and from the most utilized bus terminals to the nearest or most Centrally located railway stations. The same could also be done for Airports, wherever applicable. Future planning of bus routes and addition of bus stops could also be done keeping this particular requirement in mind.

✓ Some issues were faced with conducting the data analysis exercise for the Karnataka corporations, given different data structures being used and offline modes of collection. It is essential that the Karnataka corporations maintain their data in a set standard manner across the board, and also re-think and restructure a few tables and data points being currently showcased. Important issues to highlight in this regard are:

o There is no clear and consistent mapping of Bus Services to Bus Fleet utilised, and it is difficult to attribute one to the other directly without making some assumptions.

o This also makes it tough to estimate other service-related statistics like Passengers carried, Fleet Utilisation, etc, which could provide essential insight into what is working well and what is not, for each of the services.

o The definition of a service is also not clear, as multiple AC buses are considered separate services because of their different makes and models.

It is hence important to rethink how this information should be grouped and presented, and how exactly a 'service' is defined.

✓ The corporations must ensure that better inventory management practices are adopted and at least reach the inventory levels (in terms of days of consumption) maintained in FY16, which will be an improvement of 20% to 50% for the various corporations.

✓ Given lower KMPL values than the FE benchmark for some divisions, the crew may be incentivised to reach the Fuel Efficiency Benchmarks stated in the Norms published by the Government of India. This would encourage more drivers to improve their KMPL averages overtime and lead to more efficient consumption of fuel.

ii. Long Term Recommendations

✓ In order to improve the load factor, regular and consistent monitoring is required for luxury services so that there is constant adjustment and readjustment of planned routes and schedules based on prevailing circumstances, to ensure that the corporation is able to generate maximum value with the available resources.

✓ Digitizing the permit for travel (eg. QR code): Corporation could execute these through the RTOs. Permits to be given to all private and government operators to make sure Private operators do not work on routes that they have not been given permit to ensure that there is healthy competition and enough supply in all routes. This should be periodically examined by the RTOs on request of the corporation.

✓ In conjunction with the previous point, it would be beneficial to conduct Joint planning of routes by government and private bus operators, aiming at cost effectiveness and last mile connectivity. This regulation would help the government factor in profitability along with effective service delivery in collaboration with private operators, while also keeping them in-check using the permits issued.

✓ The corporations can also look into the Introduction of IT solutions for reducing cost and improving the efficiency of their services. One such alternative could be the setting of an Enterprise Resource Planning or ERP Software for one or more areas of operation, like Human Resource Management, Financial Accounting, as well as Planning of Work. The corporations could also invest in setting up a uniform MIS database with a pre-decided structure of relevant indicators to increase the ease of accessing and analysing this information. The relevant depot and division officials would be trained to utilize the platform, to make it easier for them to update all relevant information on a regular basis.

✓ Fixing up of vehicle cameras for effective dispute resolution in the event of accidents. Different kinds of equipment could be installed in the bus, depending on the main focus of the intervention. For example, one could set up a camera in the bus towards the passengers, one at the back capturing the view from the rear end and one covering the view at the front end. This would lead to a higher degree of safety and a stronger chance of dispute resolution of any arising issues due to availability of physical evidence. However, it would definitely add to the costs of operation. The corporations could go in for a PPP approach to set up this equipment, negotiating monetary terms and a payment schedule to make the deal more amenable for themselves. However, it is essential that corporations explore this option to reduce disputes within the current privacy laws.

✓ One could also look at installing digital equipment in the buses to track the locations to improve day to day scheduling and fleet utilisation on the corporation's end, with better visibility and travel experience for the passengers. As for the previous point, the corporations

could go in for a PPP approach in order to make the deal more viable for themselves, and to ensure the use of the latest available technology in the market.

✓ KSRTC has implemented Intelligent Transport System (ITS) in Mysuru City Transport Division. ITS is disseminating the bus arrival and departure information in real time through 167 passenger information system boards, 20 small screens and 16 big screens. The same is also provided through SMS, IVRS and Commuter Portal for public usage. Based on the consumer satisfaction results, there is a merit in scaling up this system.

✓ All the corporations are operating luxury buses like Volvo, sleeper, semi-sleeper, AC buses. In recent days, the operational & maintenance cost of those increased tremendously. In order to increase the operational efficiency, it would be beneficial to integrate the luxury services of all divisions through technology, like a single point of booking for instance.

✓ All three corporations were expending nearly 100 crores every year to compensate the accidents' victims. It is appropriate to study that the reason for accidents is the maintenance of the vehicle, carelessness of the driver, carelessness of the other vehicle, and poor road structure in the particular area. The corporation shall conduct road safety awareness programmes at the depot level for the passengers.

i. **Financial Analysis**

i. **Short Term Recommendations**

✓ Enhancement of Revenue through increase in fares. The financial analysis clearly points to a low-cost recovery across all corporations. Even in KSRTC which is financially better performing among all the corporations only 15% of the schedules were making a net margin (EPKM > CPKM) and contributed to 22% of the total traffic revenues in FY20. Another 42% of the schedules covered the direct costs (variable costs *plus* employee expenses) while 43% of the schedules accounting for 28% of the revenues were loss making. In the case of NWKRTC and KKRTC, the profitable schedules are 10% and 9% respectively contributing to 16% of the revenues. It is therefore essential to ensure that the fare structure is able to absorb the costs.

The Transport corporations may resort to variable pricing in the case of long-distance services, namely, Rajahamsa (night), Sleeper service and Volvo services. It is observed that the load factor is low in the month of March - April on account of the examination season and it increases in May. Similarly, the load factor increases in October around Dussera. A 10% discount may be provided in the month of March to attract passengers. Similarly a 10% premium may be charged during the months of May and October. In addition to the above, in other months, a 10% discount may be offered on Tuesdays to Thursdays to attract additional traffic. It may not be viable to charge a premium during weekends as the long-distance fares of the Karnataka corporations are already higher than that of the neighboring states and any increase may result in fall in Load Factor.

✓ Work out a compensation from the Government for:
o Diesel price increase
o Operation of unviable routes

Two important reasons that are not related to operational efficiency and contributing to losses are increasing diesel prices and operation of unviable routes. Frequent increase in diesel prices has led to the state transport undertakings incurring additional expenditure without commensurate increase in income. It is therefore essential for the government to compensate the transport corporations for increased diesel prices. The base price of diesel as on the date of fare revision should be fixed and any increase in diesel prices should be compensated by the government.

Similarly, the operations of certain rural routes where the load factor is poor also contributes to the losses. In routes where the patronage is poor but are required to be operated for social reasons, an appropriate mechanism needs to be worked out for the government to provide compensation for the shortfall.

ii. Long Term Recommendations

✓ Capital restructuring by way of writing off of losses and infusion of capital for sustained operations. However, any capital infusion has to be supplemented with a plan for ensuring profitable operations. Otherwise, the net worth will be eroded after a few years. The amount of capital to be infused should be arrived at based on the fleet expansion plan, quantum of existing losses to be written off and working capital requirements.

✓ The scrapping rate of buses is much lower than it should be, with a number of older buses than should be currently in operation. It must be ensured that the depreciation fund is utilized only for replacement of operating assets and purchase of new buses and not capitalized and used for other purposes. As mentioned earlier, this results in non-availability of funds for asset replacement and the assets are at an inflated value in the books of accounts.

✓ Identify assets that can be monetized: The corporations should identify the surplus and non-operating assets and monetize the same. Provision of parking facilities, commercial complexes, food courts, logistic hubs (where space is available), multi storey buildings etc., may be explored depending on local demand. In the urban areas, the unutilised land may be converted into dormitories, shopping complexes, food courts, car/ bike parking. This may applicable only to urban and two-tier towns.

Monetization of assets

Asset monetization is the process of creating new revenue streams by unlocking the value of unutilized or underutilized assets of an entity.

Land and Building: The real estate assets of the transport corporations can be monetized.

The bus depots, workshops and some of the other assets can be monetized.

Bus depots: The land available at bus depots can be used for commercial development in association with a private player on PPP mode. The land can be leased to a private bidder who will ensure availability of space for the buses, amenities for staff and passengers and utilize the additional space for developing commercial real estate. The bus depots that are not at very prominent locations may be used for warehousing and other such uses by the private partner.

The Corporations can request the Government to allow additional FSI for these projects (Maharashtra government has allowed additional FSI for commercial development at bus depots and bus stations of MSRTC).

The Ministry of Road Transport and Highways has issued guidelines (No. RT-16011 /4/2017-T, dated September 7, 2018) for development of bus ports on BOT basis. While this project is being funded by MoRTH and one bus port will be selected in each state on a pilot basis, the state can follow these guidelines and develop its bus depots.

Workshops: The vehicle workshops can also be leased out as mentioned above. The maintenance schedule for the buses can be worked out in advance and the private player shall do the maintenance in lieu of the workshop lease. The private player should be mandated to install state of the art equipment. The private player can be allowed to use the workshop to earn revenue from servicing other vehicles. Whether any revenue share should be given from the servicing of outside vehicles will depend upon the value of the land, the number of buses serviced for the corporation, quality of equipment used etc.

Sale and Lease back of Buses: It is clear that the transport corporations are not in a position to invest in new buses as the capital infusion has been low. Further, the depreciation reserve has been used for loan repayment and enough finances are not available for replacement of buses. As a onetime measure, the corporations may resort to Sale and Lease back buses. Under this, the buses (that are in good condition – particularly the high values ones such as Volve/Scania) can be sold and leased back. The effect of the transaction is that the buses remain with the corporation, but the ownership is transferred. They buyer provides a lump sum to the corporation and charge lease rentals for the leased buses. The corporation gets an upfront payment which can be used for capital expenditure and the outflow will be in terms of lease rentals. However, it must be ensured that the fare structure is designed to take care of the lease rentals (this will be in lieu of the interest cost). The lump sum funding will help in adding new buses which will increase the revenue.

✓ The government may explore the option of making Direct Benefit Transfers (DBT) to the segments of passengers who are provided with concessions. The beneficiaries will pay the full fare to the corporation and receive the subsidy directly from the government. This will help in reducing the administrative cost of managing the same by the corporation, avoid delays in obtaining the reimbursement of subsidies from the government, prevent misuse of

the facility by unscrupulous elements and ensure that the corporation's finances are not impaired. This may start with the student segment as it is easier to identify the beneficiaries through the educational institutions and seamlessly make the benefit transfer to them.

j. Service Delivery
i. Short Term Recommendations

✓ It would be helpful to conduct trainings for the depot manager and traffic manager on methods to conduct the demand assessment for each route, in order to better plan schedules and for the corporations to work more efficiently. Conducting a periodic (monthly) demand assessment for each route in the depot would also help to target those routes with a higher density of passengers.

✓ Extend the safety measure to sub-urban and rural buses by providing sanitizers which eventually increases confidence among the passengers to travel in public transport.

✓ Stringent attention should be paid while addressing grievances from passengers. Passengers using the luxury buses are mostly aware of the procedures and it is accessible for them to reach division officials and corporation officials (if required). However, passengers using the ordinary buses are not generally aware of the complaint filing procedures. All the corporations, divisions have appointed Public Relation officers (PRA's) who monitor the complaint redressal closely. If corporations also provide the explicit contact number for complaint through WhatsApp or text message, the redressals could be faster.

✓ Establish breast feeding rooms for the mother passengers. KSRTC and BMTC has already implemented in few of the bus stands. It could be extended to rest of the depot as well.

✓ Given the reduced ridership in most buses owing to the spread of COVID-19, the RTCs could hire an onboard guard for late buses or routes with lower load factors to ensure that women passengers feel safer using public transport services.

✓ To restore the faith that riders have in public transport, operators could develop protocols and procure protective equipment to maintain higher hygiene standards and protect staff and passengers. The Karnataka RTCs could create a COVID-19 Green Label, comprising of a set of safety and hygiene related criteria showing that they are meeting set standards, to encourage users to return. Some of these set criteria could be regular wiping off contact points, as well as dispensing sanitizer or giving wet napkins to all passengers to reduce surface transmissions of the viral load.

15. ANNEXURE 1: BEST PRACTICES IN NEIGHBOURING STATES

Here is a collection of Best practices from neighbouring states to highlight improved methods of performing tasks taking into account valid experience in the field.

a. Andhra Pradesh SRTC: Introduction of a New Brand – Ultra Deluxe

The main aim of introducing a more luxury bus service was to increase revenues, but also to provide a higher level of comfort to the passengers. Based on the inputs of the relevant supervisors and mechanical staff that were part of the initiative, the type of seat was changed in some buses from 'fixed' to 'reclining', thus upgrading the bus from 'Deluxe' to 'Ultra-Deluxe', thus allowing the corporation to charge a higher fare as well. This change led to an increase in the EPKM, as well as an increase in the passenger comfort levels as well.

b. Bangalore MTC: Decreasing Frequency of Accidents

As of 2015-16, The BMTC operates 6158 buses as on date covering 1.3 million daily bus km by serving 5.2 million passenger trips constituting roughly 40% of the mode share in Bangalore. However, increasing vehicle ownership in the city has led to increase in congestion and number of accidents. The economic impact of accidents is also great, with loses across vehicle damage, manpower, legal feels, and more. As accidents are random, multi-factor events, the organization can only work towards mitigating it from their end. Constant effort and active implementation of ideas have helped BMTC to reduce their fatalities and number of accidents:

- The ITS system has enabled BMTC to track vehicle and driver performance and has cautioned the drivers about them being monitored at every step.

- BMTC has been working with their drivers to reduce the human error and are also improving on the upkeep of their buses to reduce breakdowns. This has also resulted in reducing their compensation pay-outs and improve efficiency amongst their staff.

- BMTC has also begun use of a more comprehensive accident data collection form prepared by JP Research and WRI, being used by the BMTC officials. The officials were trained to collect crash data that can be used to do scientific analysis.

- Accident-free drivers are encouraged by providing special allowance, awards and medals (drivers who render accident-free service for 3 years will be awarded with Silver medal of 30 grams and Rs. 2000/- cash prize and for 7 years, will be awarded with Gold medal of 8 grams and Rs. 5000/- cash prize).

- A "Committee to Review fatal accidents" was formed under the chairmanship of the Managing Director, BMTC to review fatal accidents, wherein the Managing Director in person counseled drivers involved in the accidents and provide necessary instructions/ suggestions. The aim was to drive home the message that such incidents are taken seriously and drivers are answerable for their conduct to the highest authorities.

- A number of measures were also taken to improve infrastructure being used by the corporations:

o Ensuring safe and cautious access of buses to the terminal from adjoining roads by constructing traffic cameras and sign boards.

o Seamless multi-modal integration with other mass transit modes of transport like the metro and suburban train stations, airport etc. to reduce conflict of access.

o Redesigning the terminal structure to provide adequate resting facilities for drivers, conductors, etc. The resting facilities have helped the drivers to take breaks and remain relaxed.

o In all the big bus terminals pedestrian guard rails have been mounted to prevent pedestrians for straying on to the bus bay area.

c. Telangana RTC: Self-Imposed Feedback Mechanism

In order to proactively take inputs from passengers about their journeys in the RTC buses, a call centre with 5 operators was established in the corporate office. The procedure followed was:

- The contact numbers of the passengers who have travelled are distributed to the operators by the system itself without giving scope for any discretion in choosing the phone numbers

- The passengers are called over phone by trained female operators and feedback on the quality of service and the problems faced by them are obtained

- The feedback obtained is recorded in the system. Voice recording of the conversation is also maintained

- The feedback obtained from the passengers is entered into the system by the operators and reports (service-wise, Depot-wise, date-wise, region-wise etc.) are generated

- The negative feedback given by the passengers is communicated to the respective Depot Managers for improvement

The impact of this approach was that the overall revenue increased from 151 to 200 Cr per annum after implementation. As per the monthly trend, the passengers carried per annum were also expected to increase from 32.98 lakhs to about 35 lakhs. This approach stood out because passengers were contacted first instead of corporations waiting to hear about the deficiency in the services. This in turn led to the passengers feeling more important and cared for when called to give his/ her/their inputs.

d. Maharashtra SRTC: Geographical Information Technology   based MIS

Before the implementation of GIS based MIS system in MSRTC, Statistical data was received from divisional office to region office in the physical format. At Regional office, consolidation of data of all divisions under them was done & then sent to Central office by mail. At central level, consolidation of region-wise data was done in MS-Excel. After data consolidation, analyzed data used to be circulated by way of hard copies to concerned Managers. The old system was time consuming & MIS data was not made available at all levels. In order to provide fast, up-to-date paperless MIS data at every level, a GIS-based MIS system was started in the state.

GIS is a computer system that allows to map, model, query, and analyze large quantities of data. The corporation had to encourage & train field officers / clerical staff for collection of

latitude & longitude data of 1073 establishments of MSRTC. To minimize the time between the data capture & data delivery, the system was developed wherein data is captured from division level directly bypassed regional level consolidation, with the analysis able to be done online. The benefits of the implementation were manifold:

- Allowed for effective monitoring of performance at every level.
- Sped up the upload of data by the divisions in the stipulated time, with the availability of fast and accurate transmissions at every level, leading to more prompt corrective actions by field officers without loss of time.
- More efficient presentation of the data through maps is more effective than the traditional tabular format.
- Allowed access information anytime and anywhere. An official could point to a spot on a map to find information stored in the GIS about that location.

16. ANNEXURE 2: PASSENGER SURVEY QUESTIONNAIRE

Passenger Survey- Questionnaire
ಪ್ರಯಾಣಿಕರ ಸಮೀಕ್ಷೆ- ಪ್ರಶ್ನಾವಳಿ

Read out: Hello, my name is [NAME]. I come from an agency called Athena Infonomics. We are conducting an evaluation study on behalf of the Karnataka State Government. We would request for 10 minutes of your time to collect some responses to our survey. Any information you provide us with will not be revealed to anyone. Participating is voluntary, there is no right or wrong answer.

ನಮಸ್ಕಾರ, ನನ್ನ ಹೆಸರು [NAME]. ನಾನು ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಎಂಬ ಏಜೆನ್ಸಿಯಿಂದ ಬಂದಿದ್ದೇನೆ. ನಾವು ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸರ್ಕಾರದ ಪರವಾಗಿ ಮೌಲ್ಯಮಾಪನ ಅಧ್ಯಯನವನ್ನು ನಡೆಸುತ್ತಿದ್ದೇವೆ. ನಮ್ಮ ಸಮೀಕ್ಷೆಗೆ ಕೆಲವು ಪ್ರತಿಕ್ರಿಯೆಗಳನ್ನು ಸಂಗ್ರಹಿಸಲು ನಿಮ್ಮ ಸಮಯದ 10 ನಿಮಿಷಗಳ ಕಾಲ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ.

ನೀವು ನಮಗೆ ಒದಗಿಸುವ ಯಾವುದೇ ಮಾಹಿತಿ ಯಾರಿಗೂ ಬಹಿರಂಗವಾಗುವುದಿಲ್ಲ. ಭಾಗವಹಿಸುವುದು ಸ್ವಯಂಪ್ರೇರಿತವಾಗಿದೆ, ಸರಿಯಾದ ಅಥವಾ ತಪ್ಪು ಉತ್ತರವಿಲ್ಲ.

A. General Information (ಸಾಮಾನ್ಯ ಮಾಹಿತಿ)

S.No ಕ್ರ. ಸಂ.	Questions ಪ್ರಶ್ನೆಗಳು	Options ಆಯ್ಕೆಗಳು	Response ಪ್ರತಿಕ್ರಿಯೆ
A.1	Select state road transport corporation. ರಾಜ್ಯ ರಸ್ತೆ ಸಾರಿಗೆ ನಿಗಮವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ.	01- KSRTC (ಕೆ.ಎಸ್.ಆರ್.ಟಿ.ಸಿ.) 02- NWKRTC (ಎನ್ಡಬ್ಲ್ಯೂ ಕೆಆರ್ಟಿಸಿ) 03- NEKRTC (ಎನ್ಇಕೆಆರ್ಟಿಸಿ) 04- PRIVATE OPERATOR (ಖಾಸಗಿ ಆಪರೇಟರ್)	
A.2	Select the nearest depot. ಹತ್ತಿರದ ಡಿಪೋ ಆಯ್ಕೆಮಾಡಿ.	Select from drop down list ಡ್ರಾಪ್ ಡೌನ್ ಪಟ್ಟಿಯಿಂದ ಆಯ್ಕೆಮಾಡಿ	

A.3	Geotag survey location ಸಮೀಕ್ಷೆಯ ಸ್ಥಳವನ್ನು ಜಿಯೋಟ್ಯಾಗ್ ಮಾಡಿ		
A.4	Mobile number ಮೊಬೈಲ್ ನಂಬರ		Numeric
A.5	Age of the respondent ಪ್ರಯಾಣಿಕರ ವಯಸ್ಸು		Numeric
A.6	Sex of the respondent ಪ್ರಯಾಣಿಕರ ಲಿಂಗ	01-Male (ಪುರುಷ) 02- Female (ಹೆಣ್ಣು) 03 - Third gender/Prefer not to say (ಮೂರನೇ ಲಿಂಗ / ಹೇಳದಿರಲು ಆದ್ಯತೆ)	
A.7	Occupation of the respondent ಪ್ರಯಾಣಿಕರ ಉದ್ಯೋಗ	01-Self Employed (ಸ್ವಯಂ ಉದ್ಯೋಗಿ) 02- Employed in Government Services (ಸರ್ಕಾರಿ ಸೇವೆಗಳಲ್ಲಿ ಉದ್ಯೋಗ) 03- Private Service Personnel (ಖಾಸಗಿ ಸೇವಾ ಸಿಬ್ಬಂದಿ) 04-Student (ವಿದ್ಯಾರ್ಥಿ) 05- Retired (ನಿವೃತ್ತ) 06- Unemployed (ನಿರುದ್ಯೋಗಿ) 999- Others Specify (ಇತರೆ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	

A.8	Purpose of travel ಪ್ರಯಾಣದ ಉದ್ದೇಶ	01- Business (ವ್ಯವಹಾರ ಪ್ರವಾಸ) 02- Family trip (ಕುಟುಂಬ ಪ್ರವಾಸ) 03- Vocational trip (ವೃತ್ತಿಪರ ಪ್ರವಾಸ) 04- Religious trip (ಧಾರ್ಮಿಕ ಪ್ರವಾಸ) 05- Other specify (ಇತರೆ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
A.9	Type of booking ಬುಕಿಂಗ್ ವಿಧಾನ	01- Single (ಒಂಟಿ) 02- Group (ಗುಂಪು) 03- Other (ಇತರೆ)	
A.10	Are you making a round trip on the same service? ನೀವು ಒಂದೇ ಸೇವೆಯಲ್ಲಿ ಒಂದು ಸುತ್ತಿನ ಪ್ರವಾಸ ಮಾಡುತ್ತಿದ್ದೀರಾ?	01- Yes (ಹೌದು) 02- No (ಇಲ್ಲ)	
A.11	Type of journey ಪ್ರಯಾಣದ ವಿಧಾನ	01- Within the state (ಅಂತರ ರಾಜ್ಯ) 02- Outside the state (ಅಂತರ ಜಿಲ್ಲೆ) 03- Suburban (ಉಪ ನಗರ)	

B. Passenger Service Usage Related Questions

This section of the questionnaire focuses on various aspects of the bus service availed by the passengers. It is to be noted that questions have to be answered specific to the passengers' experience with respect to his/her latest trip. This applies to both the experience of RTC and non-RTC passengers.

ಪ್ರಶ್ನಾವಳಿಯ ಈ ವಿಭಾಗವು ಪ್ರಯಾಣಿಕರು ಪಡೆಯುವ ಬಸ್ ಸೇವೆಯ ವಿವಿಧ ಅಂಶಗಳನ್ನು ಕೇಂದ್ರೀಕರಿಸುತ್ತದೆ. ಪ್ರಯಾಣಿಕರ ಇತ್ತೀಚಿನ ಪ್ರವಾಸಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ನಿರ್ದಿಷ್ಟವಾಗಿ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಬೇಕಾಗಿದೆ. ಇದು ಆರ್ಟಿಸಿ ಮತ್ತು ಆರ್ಟಿಸಿ ಅಲ್ಲದ ಪ್ರಯಾಣಿಕರ ಅನುಭವ, ಎರಡಕ್ಕೂ ಅನ್ವಯಿಸುತ್ತದೆ.

S.No ಕ್ರ. ಸಂ.	Questions ಪ್ರಶ್ನೆಗಳು	Options ಆಯ್ಕೆಗಳು	Response ಪ್ರತಿಕ್ರಿಯೆ
B.1.	Please specify the type of bus service availed in your latest trip ನಿಮ್ಮ ಇತ್ತೀಚಿನ ಪ್ರವಾಸದ ಬಸ್ ಸೇವೆಯ ವಿಧಾನವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ	01- Ordinary (ಸಾಮಾನ್ಯ) 02- Express (ಎಕ್ಸ್‌ಪ್ರೆಸ್) 03- Semi-sleeper (ಸೆಮಿ ಸ್ಲೀಪರ್) 04- Ac-Semi-sleeper (ಎಸಿ-ಸೆಮಿ-ಸ್ಲೀಪರ್) 05- Sleeper (ಸ್ಲೀಪರ್) 06- Ac- Sleeper (ಎಸಿ- ಸ್ಲೀಪರ್) 99- Others Specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	To be asked to respondents that selected 01 – Within the state or 02 - Outside the State in A.11.
B1.1.	Please specify the type of bus service availed in your latest trip ನಿಮ್ಮ ಇತ್ತೀಚಿನ ಪ್ರವಾಸದ ಬಸ್ ಸೇವೆಯ ಪ್ರಕಾರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ	01- Ordinary (ಸಾಮಾನ್ಯ) 02- Express (ಎಕ್ಸ್‌ಪ್ರೆಸ್) 03- Semi-sleeper (ಸೆಮಿ ಸ್ಲೀಪರ್) 99- Others Specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	To be asked to respondents that selected 03 - Suburban in A.11
B.2	How did you book your ticket? ನಿಮ್ಮ ಟಿಕೆಟ್ ಅನ್ನು ನೀವು ಹೇಗೆ ಖರೀದಿಸಿದ್ದೀರಿ?	1- Online (ಆನ್‌ಲೈನ್) 2- Offline (ಆಫ್‌ಲೈನ್) 3- Travel Agent (ಟ್ರಾವೆಲ್ ಏಜೆಂಟ್) 4- Government Scheme (ಸರ್ಕಾರಿ	If 1 go to B3 and B4

		ಯೋಜನೆ) 88- Don't know (ಗೊತ್ತಿಲ್ಲ) 99- Any other (specify) (ಇತರ	
B.3	If **online,** are you aware about Any Where Any Time Advance Reservation (AWATAR) ಆನ್‌ಲೈನ್‌ನಲ್ಲಿದ್ದರೆ, ಎನಿ ವೇರ್ ಎನಿ ಟೈಮ್ ಅಡ್ವಾನ್ಸ್ ರಿಸರ್ವೇಶನ್ (ಅವತಾರ್) ಬಗ್ಗೆ ನಿಮಗೆ ತಿಳಿದಿದೆಯೇ?	1- Yes (ಹೌದು) 2- No (ಇಲ್ಲ)	
B.4	Did you face any difficulty while booking the ticket online? ಆನ್‌ಲೈನ್‌ನಲ್ಲಿ ಟಿಕೆಟ್ ಕಾಯ್ದಿರಿಸುವಾಗ ನೀವು ಯಾವುದೇ ತೊಂದರೆಗಳನ್ನು ಎದುರಿಸಿದ್ದೀರಾ? ದಯವಿಟ್ಟು ನಿರ್ದಿಷ್ಟಪಡಿಸಿ.	1- Yes (ಹೌದು) 2- No (ಇಲ್ಲ)	If 1, go to next B.5, else go to B.6.
B.5	What difficulty did you face while booking the ticket online? ಆನ್‌ಲೈನ್‌ನಲ್ಲಿ ಟಿಕೆಟ್ ಕಾಯ್ದಿರಿಸುವಾಗ ನೀವು ಯಾವುದೇ ತೊಂದರೆಗಳನ್ನು ಎದುರಿಸಿದ್ದೀರಾ? ದಯವಿಟ್ಟು ನಿರ್ದಿಷ್ಟಪಡಿಸಿ.	01-Accessing the website (ವೆಬ್‌ಸೈಟ್ ಪ್ರವೇಶಿಸಲು ಅಸಾಧ್ಯತೆ) 02-Selection of preferred seats (ಆದ್ಯತೆಯ ಆಸನಗಳ ಆಯ್ಕೆ) 03- Online payment (ಆನ್‌ಲೈನ್ ಪಾವತಿ) 04-Pre/Postponement of journey (ಪ್ರಯಾಣದ ಹಿಂದೂಡಿಕೆ / ಮುಂದೂಡಿಕೆ) 05-Cancellation of journey (ಪ್ರಯಾಣ	

		ರದ್ದತಿ) 06-Unavailability of buses to desired destination/at desired timings (ಅಪೇಕ್ಷಿತ ಗಮ್ಯಸ್ಥಾನಕ್ಕೆ / ಅಪೇಕ್ಷಿತ ಸಮಯಕ್ಕೆ ಬಸ್ಸುಗಳ ಅಲಭ್ಯತೆ) 99- Any other (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.6.	What was the source of information about the arrival/ departure of your bus? ನಿಮ್ಮ ಬಸ್ ಆಗಮನ ಮತ್ತು ನಿರ್ಗಮನದ ಬಗ್ಗೆ ಮಾಹಿತಿಯನ್ನು ಹೇಗೆ ಪಡೆಯುತ್ತೀರಿ?	01- Through the public announcement system at the terminal/station (ನಿಲ್ದಾಣದಲ್ಲಿ ಸಾರ್ವಜನಿಕ ಘೋಷಣೆ ವ್ಯವಸ್ಥೆಯ ಮೂಲಕ) 02- Through electronic information boards at the terminal/station (ನಿಲ್ದಾಣದಲ್ಲಿ ಎಲೆಕ್ಟ್ರಾನಿಕ್ ಮಾಹಿತಿ ಫಲಕಗಳು) 03- Through SMS by the bus service provider (ಸೇವಾ ಪೂರೈಕೆದಾರರಿಂದ SMS ಮೂಲಕ) 04-The Booking website/Online RTC Portal (ಸಾರ್ವಜನಿಕ ಬಳಕೆಗಾಗಿ ಪ್ರಯಾಣಿಕರ ಪೋರ್ಟಲ್) 05-Whatsapp (ವಾಟ್ಸಪ್) 06- Did not receive any information (ಯಾವುದೇ ಮಾಹಿತಿ ಸಿಗಲಿಲ್ಲ) 88- Not Applicable (ಅನ್ವಯಿಸುವುದಿಲ್ಲ) 99- Any other (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.7	Are you using night service	1- Yes (ಹೌದು)	

	bus? ನೀವು ರಾತ್ರಿ ಸೇವಾ ಬಸ್ ಬಳಸುತ್ತೀರಾ?	2- No (ಇಲ್ಲ)	
B.8.	What was/will be the journey time in hours to your destination? ನಿಮ್ಮ ಗಮ್ಯಸ್ಥಾನವನ್ನು ತಲುಪಲು ಎಷ್ಟು ಗಂಟೆಗಳ ಪ್ರಯಾಣ ಬೇಕಾಗುತ್ತದೆ?		Numeric
B.9	Do you think the bus fare is reasonable for the services provided? ಒದಗಿಸಿದ ಸೇವೆಗಳಿಗೆ ಬಸ್ ಶುಲ್ಕ ಸಮಂಜಸವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ?	1- Yes (ಹೌದು) 2- No (ಇಲ್ಲ)	
B.10	Are you comfortable in travelling in public/private bus transport? ಸಾರ್ವಜನಿಕ/ಖಾಸಗಿ ಬಸ್ ಸಾರಿಗೆಯೊಂದಿಗೆ ಪ್ರಯಾಣಿಸಲು ನಿಮಗೆ ಆರಾಮದಾಯಕವಾಗಿದೆಯೇ?	1-Yes, 2-No 01- ಹೌದು 02- ಇಲ್ಲ	
B.10.1	Did you get a bus pass from the transport corporation? ಸಾರಿಗೆ ನಿಗಮದಿಂದ ನಿಮಗೆ ಬಸ್ ಪಾಸ್ ಸಿಕ್ಕಿದೆಯೇ?	1- Student Concessional Pass (ವಿದ್ಯಾರ್ಥಿ ರಿಯಾಯಿತಿ ಪಾಸ್) 2- Old age pass (ವೃದ್ಧಾಪ್ಯ ಪಾಸ್) 3- Ex-service man (ಮಾಜಿ ಸೇವಾ ವ್ಯಕ್ತಿ) 4- Uniformed services pass	Only to be asked to respondents that answered 03 – Suburban in A11.

		(ಏಕರೂಪದ ಸೇವೆಗಳು ಪಾಸ್) 5- None of the above (ಮೇಲಿನ ಯಾವುದೂ ಅಲ್ಲ) 99- Others specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.11	Did you get COVID precautionary kit while onboarding? ಬಸ್ ಹತ್ತುವ ವೇಳೆ ನೀವು COVID ಮುನ್ನೆಚ್ಚರಿಕೆ ಕಿಟ್ ಪಡೆದಿದ್ದೀರಾ?	1-Yes (ಹೌದು) 2-No (ಇಲ್ಲ)	If 1, go to B.12 If 2, go to B.12.1
B.12	If yes, what kind of kits you were provided with? ಹೌದು ಅಂದರೆ, ನಿಮಗೆ ಯಾವ ರೀತಿಯ ಕಿಟ್‌ಗಳನ್ನು ಒದಗಿಸಲಾಗಿದೆ?	1- Sanitizer (ಸ್ಯಾನಿಟೈಜರ್) 2- Mask (ಫೇಸ್ ಮಾಸ್ಕ್) 3- face shield (ಮುಖದ ಕವಚ) 99- Others specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.12.1	If No, what is the reason? (do not read options out loud) ಇಲ್ಲದಿದ್ದರೆ, ಕಾರಣವೇನು? (ಆಯ್ಕೆಗಳನ್ನು ಜೋರಾಗಿ ಓದಬೇಡಿ)	1-The bus staff did not have any kits to distribute (ಬಸ್ ಸಿಬ್ಬಂದಿಯ ಬಳಿ ವಿತರಿಸಲು ಯಾವುದೇ ಕಿಟ್‌ಗಳಿರಲಿಲ್ಲ) 99- Others specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.13	Are you willing to travel in the same bus service again? ಮತ್ತೆ ಅದೇ ಬಸ್ ಸೇವೆಯಲ್ಲಿ	1- Yes (ಹೌದು) 2- No (ಇಲ್ಲ)	

	ಪ್ರಯಾಣಿಸಲು ನೀವು ಸಿದ್ಧರಿದ್ದೀರಾ?		
B.14	What made you opt for this bus service? ಈ ಬಸ್ ಸೇವೆಯನ್ನು ನೀವು ಆರಿಸಿಕೊಳ್ಳಲು ಕಾರಣಗಳು ಯಾವುವು?	1- Cleanliness (ಸ್ವಚ್ಛತೆ) 2- Time (ಸಮಯ) 3- Comfort (ಆರಾಮ) 4- Safety and security (ಸುರಕ್ಷತೆ) 99- Others specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.15	Did you feel that the bus driver/conductor behaved with you in a professional manner? ಬಸ್ ಚಾಲಕ / ಕಂಡಕ್ಟರ್ ನಿಮ್ಮೊಂದಿಗೆ ವೃತ್ತಿಪರ ರೀತಿಯಲ್ಲಿ ವರ್ತಿಸಿದ್ದಾರೆ ಎಂದು ನಿಮಗೆ ಅನಿಸಿದೆಯಾ?	1- Yes (ಹೌದು) 2- No (ಇಲ್ಲ)	If 2, go to B16, else go to B17.
B.16	If no, what may be the reason? ಇಲ್ಲದಿದ್ದರೆ, ಕಾರಣವೇನು?	1-The bus driver/ conductor was talking very rudely 1-ಬಸ್ ಚಾಲಕ/ಕಂಡಕ್ಟರ್ ತುಂಬಾ ಅಸಭ್ಯವಾಗಿ ಮಾತನಾಡುತ್ತಿದ್ದರು 2-The conductor did not help load/unload the luggage 2-ಸಾಮಾನುಗಳನ್ನು ಲೋಡ್ ಮಾಡಲು/ಇಳಿಸಲು ಕಂಡಕ್ಟರ್ ಸಹಾಯ ಮಾಡಲಿಲ್ಲ 3- The driver/conductor were intoxicated 3- ಚಾಲಕ / ಕಂಡಕ್ಟರ್ ಮಾದಕ	Multiple Choice

		ವ್ಯಸನಿಯಾಗಿದ್ದರು	
		4- The driver was driving in a very unsafe and reckless manner	
		4- ಚಾಲಕ ತುಂಬಾ ಅಸುರಕ್ಷಿತ ಮತ್ತು ಅಜಾಗರೂಕತೆಯಿಂದ ಚಾಲನೆ ಮಾಡುತ್ತಿದ್ದರು	
		5- The driver/conductor was asking for a higher fare than the actual ticket price	
		5- ಚಾಲಕ / ಕಂಡಕ್ಟರ್ ನಿಜವಾದ ಟಿಕೆಟ್ ಬೆಲೆಗಿಂತ ಹೆಚ್ಚಿನ ಶುಲ್ಕವನ್ನು ಕೇಳುತ್ತಿದ್ದರು	
		6- The driver refused to stop at the designated station/endpoint as part of the route plan	
		6- ಮಾರ್ಗ ಯೋಜನೆಯಲ್ಲಿ ಗೊತ್ತುಪಡಿಸಿದ ನಿಲ್ದಾಣ / ಎಂಡ್‌ಪೋಯಿಂಟ್‌ನಲ್ಲಿ ನಿಲ್ಲಿಸಲು ಚಾಲಕ ನಿರಾಕರಿಸಿದರು	
		99- Others specify (ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ)	
B.17	In the depot/bus stand, do you get access to other means of transportations like? ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ, ನೀವು ಇತರ ಸಾರಿಗೆ ಪ್ರಕಾರಗಳನ್ನು ಸುಲಭವಾಗಿ ತಲುಪಬಹುದೇ?	1. Personal vehicle (ಸ್ವಂತ ವಾಹನ) 2. Auto (ಆಟೋ) 3. Taxi (ಟ್ಯಾಕ್ಸಿ) 4. Local buses (ಸ್ಥಳೀಯ ಬಸ್ಸುಗಳು) 5. Any other (ಇತರೆ)	

C. Passenger satisfaction on operations (ಕಾರ್ಯಾಚರಣೆಗಳಲ್ಲಿ ಪ್ರಯಾಣಿಕರ ತೃಪ್ತಿ)

This section of the questionnaire asks passengers about the satisfaction with bus service operations. It is to be noted that questions have to be answered specific to the passengers' experience with respect to his/her latest trip. This applies to both the experience of RTC and non-RTC passengers.

ಪ್ರಶ್ನಾವಳಿಯ ಈ ವಿಭಾಗವು ಪ್ರಯಾಣಿಕರಿಗೆ ಬಸ್ ಸೇವಾ ಕಾರ್ಯಾಚರಣೆಯ ತೃಪ್ತಿಯ ಬಗ್ಗೆ ಕುರಿತಾಗಿದೆ. ಪ್ರಯಾಣಿಕರ ಇತ್ತೀಚಿನ ಪ್ರವಾಸಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ನಿರ್ದಿಷ್ಟವಾಗಿ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಬೇಕಾಗಿದೆ. ಇದು ಆರ್ಟಿಸಿ ಮತ್ತು ಆರ್ಟಿಸಿ ಅಲ್ಲದ ಪ್ರಯಾಣಿಕರ ಅನುಭವ, ಎರಡಕ್ಕೂ ಅನ್ವಯಿಸುತ್ತದೆ.

S.No ಕ್ರ. ಸಂ.	Type of Services ಸೇವೆಗಳ ಪ್ರಕಾರ	Very poor ತುಂಬಾ ಕಳಪೆ	Poor ಕಳಪೆ	Good ಒಳ್ಳೆಯದು	Very good ತುಂಬಾ ಒಳ್ಳೆಯದು	Excellent ಅತ್ಯುತ್ತಮ
	On-time arrival and departure of buses at the terminus (waiting time) ನಿಲ್ದಾಣದಲ್ಲಿ ಬಸ್‌ಗಳ ಸಮಯಕ್ಕೆ ಸರಿಯಾಗಿ ಆಗಮನ ಮತ್ತು ನಿರ್ಗಮನ (ಕಾಯುವ ಸಮಯ)					
	Time taken to complete the trip (with delays, stops) ಪ್ರವಾಸವನ್ನು ಪೂರ್ಣಗೊಳಿಸಲು ತೆಗೆದುಕೊಂಡ ಸಮಯ (ವಿಳಂಬ, ನಿಲ್ದಾಣಗಳೊಂದಿಗೆ)					
	Availability of Bus services on weekends and major holidays ವಾರಾಂತ್ಯ ಮತ್ತು ಪ್ರಮುಖ ರಜಾದಿನಗಳಲ್ಲಿ ಬಸ್ ಸೇವೆಗಳ ಲಭ್ಯತೆ					
	Drive quality of bus drivers ಬಸ್ ಚಾಲಕರ ಚಾಲನಾ ಶೈಲಿ					

	Behaviour of bus employees towards passengers ಪ್ರಯಾಣಿಕರೊಂದಿಗೆ ಬಸ್ ಸಿಬ್ಬಂದಿಗಳ ವರ್ತನೆ					
	SMS updates / information provided about the trip in a timely fashion ಎಸ್ಎಂಎಸ್ ಮೂಲಕ ಪ್ರವಾಸದ ಬಗ್ಗೆ ಮಾಹಿತಿಯನ್ನು ಸಮಯೋಚಿತವಾಗಿ ಒದಗಿಸಲಾಗಿದೆ					
	Time schedule boards present at the bus terminus/ station ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಸಮಯದ ವೇಳಾಪಟ್ಟಿ ಫಲಕಗಳು ಇವೆ					
	Public announcements carried out at the bus terminus/ station ಸಾರ್ವಜನಿಕ ಪ್ರಕಟಣೆಗಳ ಲಭ್ಯತೆ					
	Booking and Payment through online methods ಆನ್ಲೈನ್ ವಿಧಾನಗಳ ಮೂಲಕ ಬುಕ್ಕಿಂಗ್ ಮತ್ತು ಪಾವತಿ					
).	Availability and frequency of buses to desired destination ಅಪೇಕ್ಷಿತ ಗಮ್ಯಸ್ಥಾನಕ್ಕೆ ಬಸ್ಗಳ ಲಭ್ಯತೆ ಮತ್ತು ಆವರ್ತನ					

.	Bus services available across varied timeslots throughout the day/night ರಾತ್ರಿ/ಹಗಲುಗಳಲ್ಲಿ ವಿವಿಧ ಸಮಯಾವಧಿಗಳಲ್ಲಿ ಬಸ್ ಸೇವೆಗಳು ಲಭ್ಯವಿದೆ					
.	Personal safety while travelling in the bus ಬಸ್‌ನಲ್ಲಿ ಪ್ರಯಾಣಿಸುವಾಗ ವೈಯಕ್ತಿಕ ಸುರಕ್ಷತೆ					
.	Safety of luggage and personal items while in the bus ಬಸ್‌ನಲ್ಲಿರುವಾಗ ಸಾಮಾನು ಮತ್ತು ಸ್ವಂತ ವಸ್ತುಗಳ ಸುರಕ್ಷತೆ					
.	Adequate space available in the bus for the route travelled (no crowding) ಬಸ್ಸಿನಲ್ಲಿ ಸಾಕಷ್ಟು ಸ್ಥಳಾವಕಾಶ					
.	Updates provided regarding delays or change in schedule ವಿಳಂಬ ಅಥವಾ ವೇಳಾಪಟ್ಟಿಯಲ್ಲಿನ ಬದಲಾವಣೆಯ ಬಗ್ಗೆ ಇಂದೀಕರಣ					
.	Ease in reaching bus depots/ stations in the city ನಗರದ ಬಸ್ ಡಿಪೋಗಳು / ನಿಲ್ದಾಣಗಳಿಗೆ ಸುಲಭವಾಗಿ					

	ತಲುಪಬಹುದು					
7.	Comfort in travelling alone (including overnight journeys) ಒಬ್ಬಂಟಿಯಾಗಿ ಪ್ರಯಾಣಿಸಲು ಹಿತಕರವಾಗಿದೆ (ರಾತ್ರಿಯ ಪ್ರಯಾಣ ಸೇರಿದಂತೆ)					
8.	Connectivity of bus terminus/stations to other modes of transport (ease of transfer) ಬಸ್ ನಿಲ್ದಾಣಗಳ ಇತರ ಸಾರಿಗೆ ವಿಧಾನಗಳಿಗೆ ಸಂಪರ್ಕ (ವರ್ಗಾವಣೆ ಸುಲಭ)					
9.	Complaint/Grievance redressal mechanism for the Operation of services ದೂರು / ಕುಂದುಕೊರತೆ ನಿವಾರಣಾ ಕಾರ್ಯವಿಧಾನ					

D. Passenger satisfaction on maintenance
ನಿರ್ವಹಣೆ ಬಗ್ಗೆ ಪ್ರಯಾಣಿಕರ ತೃಪ್ತಿ

This section of the questionnaire asks passengers about the satisfaction with maintenance related to the bus services. It is to be noted that questions have to be answered specific to the passengers' experience with respect to his/her latest trip. This applies to both the experience of RTC and non-RTC passengers.

ಪ್ರಶ್ನಾವಳಿಯ ಈ ವಿಭಾಗವು ಪ್ರಯಾಣಿಕರ ಬಸ್ ಸೇವೆಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ನಿರ್ವಹಣೆಯ ತೃಪ್ತಿಯ ಬಗ್ಗೆ

ಕುರಿತಾಗಿದೆ. ಪ್ರಯಾಣಿಕರ ಇತ್ತೀಚಿನ ಪ್ರವಾಸಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ನಿರ್ದಿಷ್ಟವಾಗಿ ಪ್ರಶ್ನೆಗಳಿಗೆ

ಉತ್ತರಿಸಬೇಕಾಗಿದೆ. ಇದು ಆರ್ಟಿಸಿ ಮತ್ತು ಆರ್ಟಿಸಿ ಅಲ್ಲದ ಪ್ರಯಾಣಿಕರ ಅನುಭವ, ಎರಡಕ್ಕೂ ಅನ್ವಯಿಸುತ್ತದೆ.

S.No ಕ್ರ. ಸಂ.	Type of Services ಸೇವೆಗಳ ಪ್ರಕಾರ	Very poor ತುಂಬಾ ಕಳಪೆ	Poor ಕಳಪೆ	Good ಒಳ್ಳೆಯದು	Very good ತುಂಬಾ ಒಳ್ಳೆಯದು	Excellent ಅತ್ಯುತ್ತಮ
1.	Air-conditioning ಹವಾನಿಯಂತ್ರಣ (ಎಸಿ)					
2.	Cleanliness of buses used for travel ಬಸ್‌ಗಳ ಸ್ವಚ್ಛತೆ					
3.	COVID precautions taken by the bus staff ಬಸ್ಸು ಸಿಬ್ಬಂದಿ ತೆಗೆದುಕೊಂಡ COVID ಮುನ್ನೆಚ್ಚರಿಕೆಗಳು					
4.	Condition of buses used for travel (comfort, maintenance) ಬಸ್‌ಗಳ ಸ್ಥಿತಿ (ಸೌಕರ್ಯ, ನಿರ್ವಹಣೆ)					
5.	Complaint/Grievance redressal mechanism for maintenance of buses ಬಸ್ಸುಗಳ ನಿರ್ವಹಣೆಗಾಗಿ ದೂರು / ಕುಂದುಕೊರತೆ ನಿವಾರಣಾ ಕಾರ್ಯವಿಧಾನ					

E. Passenger Satisfaction on other services
ಇತರ ಸೇವೆಗಳಲ್ಲಿ ಪ್ರಯಾಣಿಕರ ತೃಪ್ತಿ

This section of the questionnaire asks passengers about the satisfaction with other aspects related to bus services. It is to be noted that questions have to be answered specific to the passengers' experience with respect to his/her latest trip. This applies to both the experience of RTC and non-RTC passengers.

ಪ್ರಶ್ನಾವಳಿಯ ಈ ವಿಭಾಗವು ಪ್ರಯಾಣಿಕರಿಗೆ ಬಸ್ ಸೇವೆಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಇತರ ಅಂಶಗಳ ತೃಪ್ತಿಯ ಬಗ್ಗೆ ಕುರಿತಾಗಿದೆ. ಪ್ರಯಾಣಿಕರ ಇತ್ತೀಚಿನ ಪ್ರವಾಸಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ನಿರ್ದಿಷ್ಟವಾಗಿ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಬೇಕಾಗಿದೆ. ಇದು ಆರ್‌ಟಿಸಿ ಮತ್ತು ಆರ್‌ಟಿಸಿ ಅಲ್ಲದ ಪ್ರಯಾಣಿಕರ ಅನುಭವ, ಎರಡಕ್ಕೂ ಅನ್ವಯಿಸುತ್ತದೆ.

S.No ಕ್ರ. ಸಂ.	Type of Services ಸೇವೆಗಳ ಪ್ರಕಾರ	Very poor ತುಂಬಾ ಕಳಪೆ	Poor ಕಳಪೆ	Good ಒಳ್ಳೆಯದು	Very good ತುಂಬಾ ಒಳ್ಳೆಯದು	Excellent ಅತ್ಯುತ್ತಮ
1.	Adequate number of Toilets and Bathrooms at Bus Terminus ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಸಾಕಷ್ಟು ಸಂಖ್ಯೆಯ ಶೌಚಾಲಯಗಳ ಮತ್ತು ಸ್ನಾನಗೃಹಗಳ ಲಭ್ಯತೆ					
2.	Availability of sidewalks near bus terminus ಬಸ್ ನಿಲ್ದಾಣದ ಬಳಿ ಸೈಡ್ ವಾಕ್‌ಗಳ ಲಭ್ಯತೆ					
3	Comfort in Car parking and Two-wheeler Parking space at Bus Terminus ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಕಾರ್ ಪಾರ್ಕಿಂಗ್ ಮತ್ತು ದ್ವಿಚಕ್ರ ವಾಹನ ನಿಲುಗಡೆಗೆ ಸೌಕರ್ಯ					

5.	Waiting rooms for passengers at Bus Terminus ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಪ್ರಯಾಣಿಕರಿಗಾಗಿ ಕಾಯುವ ಕೊಠಡಿಗಳ ಲಭ್ಯತೆ					
6.	Luggage Storage facility at the bus terminus ಸಾಮಾನು ಶೇಖರಣಾ ಸೌಲಭ್ಯದ ಲಭ್ಯತೆ					
7.	Facility of wheelchairs for differently abled persons ವಿಭಿನ್ನ ಸಾಮರ್ಥ್ಯ ಹೊಂದಿರುವ ವ್ಯಕ್ತಿಗಳಿಗೆ ಗಾಲಿಕುರ್ಚಿಗಳ ಸೌಲಭ್ಯ					

F. Passenger Suggestions for Improvement

B.18	In your opinion, what are the improvements that can be made to the bus services? (do not read the options out loud) ನಿಮ್ಮ ಅಭಿಪ್ರಾಯದಲ್ಲಿ, ಬಸ್ ಸೇವೆಗಳಿಗೆ ಯಾವುದೇ ಸುಧಾರಣೆಗಳ ಅವಶ್ಯಕತೆ ಇದೆಯೇ? (ಆಯ್ಕೆಗಳನ್ನು	1- Timings and frequency of the buses 1- ಬಸ್ಸುಗಳ ಸಮಯ ಮತ್ತು ಆವರ್ತನ 2- On-time arrival/departure of the buses 2- ಬಸ್ಸುಗಳ ಸಮಯಕ್ಕೆ ಆಗಮನ / ನಿರ್ಗಮನ 3- Increase the frequency of services during weekends and major holidays 3- ವಾರಾಂತ್ಯ ಮತ್ತು ಪ್ರಮುಖ ರಜಾದಿನಗಳಲ್ಲಿ	Multiple choice

ಜೋರಾಗಿ ಓಡಬೇಡಿ)	ಸೇವೆಗಳ ಆವರ್ತನವನ್ನು ಹೆಚ್ಚಿಸಿ	
	4- Better training of the drivers and the bus staff	
	4- ಚಾಲಕರು ಮತ್ತು ಬಸ್ ಸಿಬ್ಬಂದಿಗೆ ಉತ್ತಮ ತರಬೇತಿಯ ಅವಶ್ಯಕತೆ	
	5- Change in bus schedule, timings to be communicated well in advance	
	5- ಬಸ್ ವೇಳಾಪಟ್ಟಿಯಲ್ಲಿ ಬದಲಾವಣೆ ಇದ್ದಲ್ಲಿ, ಮುಂಚಿತವಾಗಿ ಸಂವಹನ ಮಾಡಬೇಕಾದ ಅವಶ್ಯಕತೆ	
	6- Infrastructure available at terminus/station to inform about delays/ change in schedule (public announcement, display boards)	
	6- ವೇಳಾಪಟ್ಟಿಯಲ್ಲಿನ ಬದಲಾವಣೆಯ ಬಗ್ಗೆ ತಿಳಿಸಲು ನಿಲ್ದಾಣದಲ್ಲಿ ಮೂಲಸೌಕರ್ಯ ಲಭ್ಯವಿದೆ (ಸಾರ್ವಜನಿಕ ಪ್ರಕಟಣೆ, ಪ್ರದರ್ಶನ ಫಲಕಗಳು)	
	7- Improvement of online portal for booking of tickets	
	7- ಟಿಕೆಟ್ ಕಾಯ್ದಿರಿಸಲು ಆನ್ಲೈನ್ ಪೋರ್ಟಲ್ ಸುಧಾರಣೆ	
	8- Pay more attention to the safety of passengers and luggage on the bus	
	8- ಬಸ್ನಲ್ಲಿ ಪ್ರಯಾಣಿಕರು ಮತ್ತು ಸಾಮಾನು ಬಗ್ಗೆ ಹೆಚ್ಚಿನ ಗಮನ ಹರಿಸಬೇಕಾದ ಅವಶ್ಯಕತೆ	
	9- Management of overcrowding in buses	
	9- ಬಸ್ಗಳಲ್ಲಿ ಜನದಟ್ಟಣೆಯ ನಿರ್ವಹಣೆ	
	10- Ease in reaching bus depots/stations in the city	
	10- ನಗರದ ಬಸ್ ಡಿಪೋಗಳು / ನಿಲ್ದಾಣಗಳನ್ನು	

		ತಲುಪಲು ಸೌಲಭ್ಯತೆ	
		11- Easy connectivity of bus stations to other modes of transport	
		11- ಇತರ ಸಾರಿಗೆ ವಿಧಾನಗಳಿಗೆ ಬಸ್ ನಿಲ್ದಾಣಗಳ ಸುಲಭ ಸಂಪರ್ಕ	
		12- Complaints are acknowledged and addressed promptly	
		12- ದೂರುಗಳ ಸ್ವೀಕೃತಿ ಮತ್ತು ತ್ವರಿತ ಪರಿಹಾರದ ಅವಶ್ಯಕತೆ	
		13- Make Air conditioning service available	
		13- ಹವಾನಿಯಂತ್ರಣ ಸೇವೆಯನ್ನು ಲಭ್ಯವಾಗುವಂತೆ ಮಾಡಿ	
		14- Take appropriate precautions to tackle the spread of COVID-19 (distribute masks, face shields, sanitizer and assign passenger seating keeping in mind social distancing)	
		14- COVID-19 ಹರಡುವುದನ್ನು ನಿಭಾಯಿಸಲು ಸೂಕ್ತ ಮುನ್ನೆಚ್ಚರಿಕೆಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳಿ (ಮುಖವಾಡಗಳನ್ನು ವಿತರಿಸಿ, ಮುಖದ ಕವಚಗಳು, ಸ್ಯಾನಿಟ್ಯೆಜರ್ ಮತ್ತು ಸಾಮಾಜಿಕ ದೂರವನ್ನು ಗಮನದಲ್ಲಿಟ್ಟುಕೊಂಡು ಪ್ರಯಾಣಿಕರ ಆಸನಗಳನ್ನು ನಿಯೋಜಿಸಿ)	
		15 – Improve cleanliness and comfort of buses used for travel	
		15 - ಪ್ರಯಾಣಕ್ಕೆ ಬಳಸುವ ಬಸ್‌ಗಳ ಸ್ವಚ್ಛತೆ ಮತ್ತು ಸೌಕರ್ಯವನ್ನು ಸುಧಾರಿಸಿ	
		16- Improve infrastructure available at the terminus for waiting and storage of facilities	
		16- ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಪ್ರಯಾಣಿಕರಿಗಾಗಿ ಕಾಯುವ ಕೊಠಡಿಗಳ ಮೂಲಸೌಕರ್ಯಗಳನ್ನು ಸುಧಾರಿಸಿ	

		17- Safe car/ vehicle parking facility should be present at the bus terminus	
		17- ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಸುರಕ್ಷಿತ ವಾಹನ ನಿಲುಗಡೆ ಸೌಲಭ್ಯ ಇರಬೇಕು	
		18- Adequate number of well-maintained toilets should be available at the bus terminus	
		18- ಬಸ್ ನಿಲ್ದಾಣದಲ್ಲಿ ಉತ್ತಮವಾಗಿ ನಿರ್ವಹಿಸಲ್ಪಟ್ಟ ಶೌಚಾಲಯಗಳು ಲಭ್ಯವಿರಬೇಕು	
		19- Make bus stations/ terminals more disabled-friendly	
		19- ಬಸ್ ನಿಲ್ದಾಣಗಳನ್ನು ಹೆಚ್ಚು ವಿಭಿನ್ನ ಸಾಮರ್ಥ್ಯ ಸ್ನೇಹಿಯಾಗಿ ಮಾಡಬೇಕು	
		99- Any other	
		99 - ಇತರ ನಿರ್ದಿಷ್ಟಪಡಿಸಿ	

17. ANNEXURE 3: QUESTIONNAIRE FOR DIVISION OFFICIALS

ವಿಭಾಗ ಅಧಿಕಾರಿಗಳಿಗೆ ಪ್ರಶ್ನಾವಳಿ

Date:
ದಿನಾಂಕ:

Name of the officials and designation
ಅಧಿಕಾರಿಗಳ ಹೆಸರು ಮತ್ತು ಹುದ್ದೆ

Division controller	
Division traffic officer	
Depot Manager	

Name of the Corporation (ಕಾರ್ಪೋರೇಶನ್ ಹೆಸರು)   :

Name of the Division (ವಿಭಾಗದ ಹೆಸರು)   :

Starting Time (ಆರಂಭದ ಸಮಯ)   :

Ending Time (ಮುಕ್ತಾಯದ ಸಮಯ)   :

Consent

Hello,

I am [Name] [designation]. I come from an agency called Athena Infonomics. We are currently evaluating the Karnataka State Transport Corporations (KSRTC, NWKRTC and NEKRTC) on behalf of Karnataka Evaluation Authority for the period between 2014-15 and 2019-20. Athena Infonomics will be conducting this study in 12 divisions across Karnataka (6 from KSRTC, 3 from NWKRTC and 3 from NEKRTC). We request you to provide us information on issues related to efficiency, effectiveness and sustainability of the transport services in your division. We will collate the information collected from you and present the overall picture of the road transport system to KEA. We are committed to protecting your personal details and identity and will not reveal this confidential information. This survey will take about 20 to 25 minutes. We request for your permission and cooperation to conduct this survey. You can choose to stop at any point during the survey.

ನಮಸ್ಕಾರ,

ನಾನು [ಹೆಸರು] [ಹುದ್ದೆ]. ನಾನು ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಎಂಬ ಏಜೆನ್ಸಿಯಿಂದ ಬಂದಿದ್ದೇನೆ. ನಾವು ಪ್ರಸ್ತುತ ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸಾರಿಗೆ ನಿಗಮಗಳನ್ನು (KSRTC, NEKRTC and NWKRTC) ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರದ (KEA) ಪರವಾಗಿ 2014-15 ಮತ್ತು 2019-20ರ ನಡುವಿನ ಅವಧಿಗೆ ಮೌಲ್ಯಮಾಪನ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಈ ಅಧ್ಯಯನವನ್ನು ಕರ್ನಾಟಕದಾದ್ಯಂತ 12 ವಿಭಾಗಗಳಲ್ಲಿ ನಡೆಸಲಿದೆ (ಕೆಎಸ್‌ಆರ್‌ಟಿಸಿಯಿಂದ 6, ಎನ್‌ಡಬ್ಲ್ಯೂ ಕೆಆರ್‌ಟಿಸಿಯಿಂದ 3 ಮತ್ತು ಎನ್‌ಇಕೆಆರ್‌ಟಿಸಿಯಿಂದ 3). ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿನ ಸಾರಿಗೆ ಸೇವೆಗಳ ದಕ್ಷತೆ, ಪರಿಣಾಮಕಾರಿತ್ವ ಮತ್ತು ಸುಸ್ಥಿರತೆಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳ ಕುರಿತು ನಮಗೆ ಮಾಹಿತಿ ನೀಡುವಂತೆ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ. ನಿಮ್ಮಿಂದ ಸಿಕ್ಕ ಮಾಹಿತಿಯನ್ನು ನಾವು ಸಂಗ್ರಹಿಸುತ್ತೇವೆ ಮತ್ತು ರಸ್ತೆ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆಯ ಒಟ್ಟಾರೆ ಚಿತ್ರವನ್ನು ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಕ್ಕೆ ಪ್ರಸ್ತುತಪಡಿಸುತ್ತೇವೆ. ನಿಮ್ಮ ವೈಯಕ್ತಿಕ ವಿವರಗಳು ಮತ್ತು ಗುರುತನ್ನು ರಕ್ಷಿಸಲು ನಾವು ಬದ್ಧರಾಗಿದ್ದೇವೆ ಮತ್ತು ಈ ಮಾಹಿತಿಯನ್ನು ಬಹಿರಂಗಪಡಿಸುವುದಿಲ್ಲ. ಈ ಸಮೀಕ್ಷೆಯು ಸುಮಾರು 20 ರಿಂದ 25 ನಿಮಿಷಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳುತ್ತದೆ. ಈ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಲು ನಿಮ್ಮ ಅನುಮತಿ ಮತ್ತು ಸಹಕಾರಕ್ಕಾಗಿ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ.

Would you like to participate in the interview?   Yes/ No

ಸಮೀಕ್ಷೆಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ನೀವು ಬಯಸುವಿರಾ? ಹೌದು /ಇಲ್ಲ

Topic ವಿಷಯ	Questions ಪ್ರಶ್ನೆಗಳು
Introduction ಪರಿಚಯ	Introduction, ice-breaking and ethical declaration ಪರಿಚಯ ಮತ್ತು ನೈತಿಕ ಘೋಷಣೆ
Relevance ಪ್ರಸ್ತುತತೆ	. Have you adapted any new technology into your depot during the period 2014-15 to 2019-20? 2014-15 ರಿಂದ 2019-20ರ ಅವಧಿಯಲ್ಲಿ ನೀವು ಯಾವುದೇ ಹೊಸ ತಂತ್ರಜ್ಞಾನವನ್ನು ನಿಮ್ಮ ಡಿಪೋಗೆ ಅಳವಡಿಸಿಕೊಂಡಿದ್ದೀರಾ? 2. If yes, have there been any changes in operation of the division level because of the adaptation? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಅಳವಡಿಸಿಕೊಂಡ ನಂತರ ವಿಭಾಗ ಮಟ್ಟದ ಕಾರ್ಯಾಚರಣೆಯಲ್ಲಿ ಏನಾದರೂ ಬದಲಾವಣೆಗಳಾಗಿವೆಯೇ? Did your corporation upgrade any of the buses (new purchase/retrofitting)

in your division?

ನಿಮ್ಮ ನಿಗಮವು ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಯಾವುದೇ ಬಸ್‌ಗಳನ್ನು (ಹೊಸ ಖರೀದಿ / ರೆಟ್ರೊಫಿಟಿಂಗ್) ನವೀಕರಿಸಿದೆಯೇ?

4. Are there any plans for upgrading in the near future?

ಮುಂದಿನ ದಿನಗಳಲ್ಲಿ ಬಸ್‌ಗಳನ್ನು ನವೀಕರಿಸಲು ಯಾವುದೇ ಯೋಜನೆಗಳಿವೆಯೇ?

5. According to you, is there a gap in staffing?

ನಿಮ್ಮ ಪ್ರಕಾರ, ಸಿಬ್ಬಂದಿಗಳ ಸಂಖ್ಯೆಯಲ್ಲಿ ಕೊರತೆ ಇದೆಯೇ?

6. If yes, which positions must be hired/deployed for better depot functioning?

ಹೌದು ಎಂದಾದಲ್ಲಿ, ಉತ್ತಮ ಡಿಪೋ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ಯಾವ ಸ್ಥಾನಗಳನ್ನು ನೇಮಿಸಿಕೊಳ್ಳಬೇಕು / ನಿಯೋಜಿಸಬೇಕು?

7. Does your division promote the depot to offer facilities such as
i. Digital Display and Intelligent Transport System?

ii. Tourist Information System?

iii. Two Wheelers and Four Wheelers Parking Facility?

iv. Public Addressing System?

v. Prepaid auto rickshaw and taxi?

ಡಿಪೋನಲ್ಲಿ ಈ ಕೆಳಕಂಡ ಸೌಲಭ್ಯಗಳನ್ನು ನೀಡಲು ನಿಮ್ಮ ವಿಭಾಗವು ಉತ್ತೇಜಿಸುತ್ತದೆಯೇ?

i. ಡಿಜಿಟಲ್ ಪ್ರದರ್ಶನ ಮತ್ತು ಸ್ಮಾರ್ಟ್ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆ?

ii. ಪ್ರವಾಸೋದ್ಯಮ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆ?

iii. ದ್ವಿಚಕ್ರ ಮತ್ತು ನಾಲ್ಕುಚಕ್ರ ವಾಹನಗಳ ಪಾರ್ಕಿಂಗ್ ಸೌಲಭ್ಯ?

iv. ಸಾರ್ವಜನಿಕ ಪ್ರಕಟಣೆ ವ್ಯವಸ್ಥೆ?

v. ಪ್ರಿಪೇಯ್ಡ್ ಆಟೋ ರಿಕ್ಷಾ ಮತ್ತು ಟ್ಯಾಕ್ಸಿ?

	Have you conducted any passenger satisfaction survey in the past 5 years? ಕಳೆದ 5 ವರ್ಷಗಳಲ್ಲಿ ನೀವು ಯಾವುದೇ ಪ್ರಯಾಣಿಕರ ತೃಪ್ತಿ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಿದ್ದೀರಾ? 9. According to you, do you think the passengers are satisfied with the service? ನಿಮ್ಮ ಪ್ರಕಾರ, ಪ್ರಯಾಣಿಕರು ಸೇವೆಯಲ್ಲಿ ತೃಪ್ತರಾಗಿದ್ದಾರೆಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? 10. What are all the steps you have taken to increase the number of routes and increase the frequency of buses in your division? ಮಾರ್ಗಗಳ ಸಂಖ್ಯೆಯನ್ನು ಹೆಚ್ಚಿಸಲು ಮತ್ತು ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್‌ಗಳ ಆವರ್ತನವನ್ನು ಹೆಚ್ಚಿಸಲು ನೀವು ತೆಗೆದುಕೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು? 11. How will you ensure the buses are in good condition in your division and is there any monitoring mechanism in place already? ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್ಸುಗಳು ಉತ್ತಮ ಸ್ಥಿತಿಯಲ್ಲಿವೆ ಎಂದು ನೀವು ಹೇಗೆ ಖಚಿತಪಡಿಸಿಕೊಳ್ಳುತ್ತೀರಿ? ಈಗಾಗಲೇ ಯಾವುದೇ ಉಸ್ತುವಾರಿ ವ್ಯವಸ್ಥೆ ಇದೆಯೇ? 12. What are the types of bus services in your division? ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್ ಸೇವೆಗಳ ಪ್ರಕಾರಗಳು ಯಾವುವು?
Effectiveness ಪರಿಣಾಮಕಾರಿತ್ವ	13. What resources do you use for the functioning of this division? ಈ ವಿಭಾಗದ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ನೀವು ಯಾವ ಸಂಪನ್ಮೂಲಗಳನ್ನು ಬಳಸುತ್ತೀರಿ? 14. What mechanisms do you follow to use those resources effectively? ಆ ಸಂಪನ್ಮೂಲಗಳನ್ನು ಪರಿಣಾಮಕಾರಿಯಾಗಿ ಬಳಸಲು ನೀವು ಯಾವ ಕಾರ್ಯವಿಧಾನಗಳನ್ನು ಅನುಸರಿಸುತ್ತೀರಿ? 15. Is there a monitoring mechanism for measuring the effectiveness of the buses (carrying capacity/effective kms/lifespan etc.)? ಬಸ್ಸುಗಳ ಪರಿಣಾಮಕಾರಿತ್ವವನ್ನು ಅಳೆಯುವ ಉಸ್ತುವಾರಿ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? 16. If yes, how is it done?

	ಹೌದು ಎಂದಾದಲ್ಲಿ, ಅದನ್ನು ಹೇಗೆ ಮಾಡಲಾಗುತ್ತದೆ? 17. How many schedules does your depot operate currently? *(we have this information already, repeating for triangulation)* ನಿಮ್ಮ ಡಿಪೋ ಪ್ರಸ್ತುತ ಎಷ್ಟು ವೇಳಾಪಟ್ಟಿಗಳನ್ನು ನಿರ್ವಹಿಸುತ್ತದೆ?
Efficiency ದಕ್ಷತೆ	Are there any specific challenges that you encounter related to buses which harm the efficiency.? Please elaborate ಬಸ್ಸುಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ Are there any specific challenges that you encounter related to staff which harm the efficiency.? Please elaborate ಸಿಬ್ಬಂದಿಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ 3. Are there any specific challenges that you encounter related to infrastructure which harm the efficiency.? Please elaborate ಮೂಲಸೌಕರ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ 4. How are the buses maintained for better engine efficiency or lifespan? Please elaborate. ಉತ್ತಮ ಎಂಜಿನ್ ದಕ್ಷತೆಗಾಗಿ ಅಥವಾ ಜೀವಿತಾವಧಿಯನ್ನು ಹೆಚ್ಚಿಸಲು ಬಸ್ಸುಗಳನ್ನು ಹೇಗೆ ನಿರ್ವಹಿಸಲಾಗುತ್ತದೆ? ವಿವರಿಸಿ Do you offer any training for the division staff in your corporation? If yes, how frequently? ನಿಮ್ಮ ನಿಗಮದಲ್ಲಿ ವಿಭಾಗದ ಸಿಬ್ಬಂದಿಗೆ ನೀವು ಯಾವುದೇ ತರಬೇತಿಯನ್ನು ನೀಡುತ್ತೀರಾ?

	ಹೌದು ಎಂದಾದಲ್ಲಿ, ಎಷ್ಟು ಬಾರಿ?
	6. What does the training cover? ತರಬೇತಿಯಲ್ಲಿ ಏನು ತಿಳಿಸಿಕೊಡಲಾಗುತ್ತದೆ? 7. Who conducts the training? ತರಬೇತಿಯನ್ನು ಯಾರು ನಡೆಸುತ್ತಾರೆ? 8. Is there a specified budget to cover these expenses? ತರಬೇತಿಯ ವೆಚ್ಚಕ್ಕೆ ನಿಗದಿತ ಹಣವಿದೆಯೇ?
Impact ಪರಿಣಾಮ	How has COVID-19 impacted the depot in terms of number of passengers, number of schedules (trips), staff availability, changes in revenue etc.? Please elaborate COVID-19 ಸಂಬಂಧಿಸಿದಂತೆ ಪ್ರಯಾಣಿಕರ ಸಂಖ್ಯೆ, ವೇಳಾಪಟ್ಟಿಗಳ ಸಂಖ್ಯೆ (ಪ್ರವಾಸಗಳು), ಸಿಬ್ಬಂದಿ ಲಭ್ಯತೆ, ಆದಾಯದಲ್ಲಿನ ಬದಲಾವಣೆಗಳು ಇತ್ಯಾದಿಗಳ ವಿಷಯದಲ್ಲಿ ಡಿಪೋ ಮೇಲೆ ಹೇಗೆ ಪ್ರಭಾವ ಬೀರಿದೆ? ವಿವರಿಸಿ Do you think the adoption of new technology in the depot has been useful in real time monitoring of buses? ಬಸ್ಸುಗಳ ನೈಜ ಸಮಯದ ಮೇಲ್ವಿಚಾರಣೆಯಲ್ಲಿ ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನದ ಅಳವಡಿಕೆ ಉಪಯುಕ್ತವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? Do you think the adoption of new technology in the depot has been useful in managing human resources in an effective way? ಮಾನವ ಸಂಪನ್ಮೂಲವನ್ನು ಪರಿಣಾಮಕಾರಿ ರೀತಿಯಲ್ಲಿ ನಿರ್ವಹಿಸಲು ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನದ ಅಳವಡಿಕೆ ಉಪಯುಕ್ತವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ?
Sustainability ಸುಸ್ಥಿರತೆ	1. Is there any mechanism in place to use the resources (fuel, manpower, machineries) in a sustainable way? ಸಂಪನ್ಮೂಲಗಳನ್ನು (ಇಂಧನ, ಮಾನವಶಕ್ತಿ, ಯಂತ್ರೋಪಕರಣಗಳು) ಸುಸ್ಥಿರ ರೀತಿಯಲ್ಲಿ ಬಳಸಲು ಯಾವುದೇ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ?

	2. Do you think the division is financially sustainable? ವಿಭಾಗವು ಆರ್ಥಿಕವಾಗಿ ಸುಸ್ಥಿರವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? 3. If so, what are the steps taken to achieve that? ಹಾಗಿದ್ದರೆ, ಆರ್ಥಿಕ ಸುಸ್ಥಿರವನ್ನು ಕಾಪಾಡಲು ಕೈಗೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು?
Equity ಸಂದರ್ಭಾನುಸಾರ ಸಮಾನತೆ	1. What is the ratio of female and male staff in your division level? *(The figures are to be validated using the physical attendance registers)* ನಿಮ್ಮ ವಿಭಾಗ ಮಟ್ಟದಲ್ಲಿ ಮಹಿಳಾ ಮತ್ತು ಪುರುಷ ಸಿಬ್ಬಂದಿಗಳ ಅನುಪಾತ ಎಷ್ಟು? 2. Are there facilities such as separate toilets for men and women, canteen, lockers etc. for the division staff? ಸಿಬ್ಬಂದಿಗಳಿಗಾಗಿ ಕ್ಯಾಂಟೀನ್, ಲಾಕರ್, ಪುರುಷರು ಮತ್ತು ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಶೌಚಾಲಯ, ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳಿವೆಯೇ? Does your depot undertake any gender-specific initiative (such as reserving a leadership position for women, deploying facilities such as separate changing/feeding rooms for women, menstrual hygiene management etc.)? ನಿಮ್ಮ ಡಿಪೋ ಯಾವುದೇ ಲಿಂಗ-ನಿರ್ದಿಷ್ಟ ಉಪಕ್ರಮವನ್ನು ಕೈಗೊಳ್ಳುತ್ತದೆಯೇ (ಉದಾಹರಣೆಗೆ ಮಹಿಳೆಯರಿಗೆ ನಾಯಕತ್ವದ ಸ್ಥಾನವನ್ನು ಕಾಯ್ದಿರಿಸುವುದು, ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಕೊಠಡಿಗಳು, ಮುಟ್ಟಿನ ನೈರ್ಮಲ್ಯ ನಿರ್ವಹಣೆ ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳನ್ನು ನಿಯೋಜಿಸುವುದು)? 4. What measures have you taken to ensure safety of women passengers travelling within your division buses? ನಿಮ್ಮ ವಿಭಾಗದ ಬಸ್‌ಗಳಲ್ಲಿ ಮಹಿಳಾ ಪ್ರಯಾಣಿಕರ ಸುರಕ್ಷತೆಯನ್ನು ಖಚಿತಪಡಿಸಿಕೊಳ್ಳಲು ನೀವು ಕೈಗೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು?

18. ANNEXURE 4: QUESTIONNAIRE FOR BOARD MEMBERS

ಫಲಕಗಳ ಸದಸ್ಯರಿಗೆ ಪ್ರಶ್ನಾವಳಿ

Date:
ದಿನಾಂಕ:

Name of the officials and designation
ಅಧಿಕಾರಿಗಳ ಹೆಸರು ಮತ್ತು ಹುದ್ದೆ

Name of the Corporation (ಕಾರ್ಪೋರೇಶನ್ ಹೆಸರು)   :

Name of the Division (ವಿಭಾಗದ ಹೆಸರು)   :

Starting Time (ಆರಂಭದ ಸಮಯ)   :

Ending Time (ಮುಕ್ತಾಯದ ಸಮಯ)   :

Consent

Hello,

I am [Name] [designation]. I come from an agency called Athena Infonomics. We are currently evaluating the Karnataka State Transport Corporations (KSRTC, NWKRTC and NEKRTC) on behalf of Karnataka Evaluation Authority for the period between 2014-15 and 2019-20. Athena Infonomics will be conducting this study in 12 divisions across Karnataka (6 from KSRTC, 3 from NWKRTC and 3 from NEKRTC). We request you to provide us information on issues related to efficiency, effectiveness and sustainability of the transport services in your division. We will collate the information collected from you and present the overall picture of the road transport system to KEA. We are committed to protecting your personal details and identity and will not reveal this confidential information. This survey will take about 20 to 25 minutes. We request for your permission and cooperation to conduct this survey. You can choose to stop at any point during the survey.

ನಮಸ್ಕಾರ,

ನಾನು [ಹೆಸರು] [ಹುದ್ದೆ]. ನಾನು ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಎಂಬ ಏಜೆನ್ಸಿಯಿಂದ ಬಂದಿದ್ದೇನೆ. ನಾವು ಪ್ರಸ್ತುತ ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸಾರಿಗೆ ನಿಗಮಗಳನ್ನು (KSRTC, NEKRTC and NWKRTC) ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರದ (KEA) ಪರವಾಗಿ 2014-15 ಮತ್ತು 2019-20ರ ನಡುವಿನ ಅವಧಿಗೆ ಮೌಲ್ಯಮಾಪನ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಈ ಅಧ್ಯಯನವನ್ನು ಕರ್ನಾಟಕದಾದ್ಯಂತ 12 ವಿಭಾಗಗಳಲ್ಲಿ ನಡೆಸಲಿದೆ (ಕೆಎಸ್ಆರ್ಟಿಸಿಯಿಂದ 6, ಎನ್ಡಬ್ಲ್ಯೂಕೆಆರ್ಟಿಸಿಯಿಂದ 3 ಮತ್ತು

ಎನ್ಇಕೆಆರ್ಟಿಸಿಯಿಂದ 3). ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿನ ಸಾರಿಗೆ ಸೇವೆಗಳ ದಕ್ಷತೆ, ಪರಿಣಾಮಕಾರಿತ್ವ ಮತ್ತು ಸುಸ್ಥಿರತೆಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳ ಕುರಿತು ನಮಗೆ ಮಾಹಿತಿ ನೀಡುವಂತೆ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ. ನಿಮ್ಮಿಂದ ಸಿಕ್ಕ ಮಾಹಿತಿಯನ್ನು ನಾವು ಸಂಗ್ರಹಿಸುತ್ತೇವೆ ಮತ್ತು ರಸ್ತೆ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆಯ ಒಟ್ಟಾರೆ ಚಿತ್ರವನ್ನು ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಕ್ಕೆ ಪ್ರಸ್ತುತಪಡಿಸುತ್ತೇವೆ. ನಿಮ್ಮ ವೈಯಕ್ತಿಕ ವಿವರಗಳು ಮತ್ತು ಗುರುತನ್ನು ರಕ್ಷಿಸಲು ನಾವು ಬದ್ಧರಾಗಿದ್ದೇವೆ ಮತ್ತು ಈ ಮಾಹಿತಿಯನ್ನು ಬಹಿರಂಗಪಡಿಸುವುದಿಲ್ಲ. ಈ ಸಮೀಕ್ಷೆಯು ಸುಮಾರು 20 ರಿಂದ 25 ನಿಮಿಷಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳುತ್ತದೆ. ಈ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಲು ನಿಮ್ಮ ಅನುಮತಿ ಮತ್ತು ಸಹಕಾರಕ್ಕಾಗಿ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ.

Would you like to participate in the interview?   Yes/ No

ಸಮೀಕ್ಷೆಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ನೀವು ಬಯಸುವಿರಾ? ಹೌದು /ಇಲ್ಲ

Topic ವಿಷಯ	Questions ಪ್ರಶ್ನೆಗಳು
Introduction ಪರಿಚಯ	Introduction, ice-breaking and ethical declaration ಪರಿಚಯ ಮತ್ತು ನೈತಿಕ ಘೋಷಣೆ
Relevance ಪ್ರಸ್ತುತತೆ	What is the process of adopting the new technologies in your corporation? ನಿಮ್ಮ ನಿಗಮದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನಗಳನ್ನು ಅಳವಡಿಸಿಕೊಳ್ಳುವ ಪ್ರಕ್ರಿಯೆ ಏನು? What are major challenges you face in terms of operations? ಕಾರ್ಯಾಚರಣೆಗಳ ವಿಷಯದಲ್ಲಿ ನೀವು ಎದುರಿಸುತ್ತಿರುವ ಪ್ರಮುಖ ಸವಾಲುಗಳು ಯಾವುವು? How are you solving these issues? ಈ ಸವಾಲುಗಳನ್ನು ನೀವು ಹೇಗೆ ಪರಿಹರಿಸುತ್ತಿದ್ದೀರಿ? During your tenure, what are some major reforms you have taken in terms of operation, management, and quality of services? ನಿಮ್ಮ ಅಧಿಕಾರಾವಧಿಯಲ್ಲಿ, ಕಾರ್ಯಾಚರಣೆ, ನಿರ್ವಹಣೆ ಮತ್ತು ಸೇವೆಗಳ ಗುಣಮಟ್ಟದ ವಿಷಯದಲ್ಲಿ ನೀವು ತೆಗೆದುಕೊಂಡ ಕೆಲವು ಪ್ರಮುಖ ಸುಧಾರಣೆಗಳು ಯಾವುವು? How will you plan for upgradation?

	ನವೀಕರಣಕ್ಕಾಗಿ ನೀವು ಹೇಗೆ ಯೋಜಿಸುತ್ತೀರಿ?
	What is the process involved in it? ನವೀಕರಣದ ಪ್ರಕ್ರಿಯೆ ಏನು?
	According to you, is there a gap in staffing? ನಿಮ್ಮ ಪ್ರಕಾರ, ಸಿಬ್ಬಂದಿಗಳ ಸಂಖ್ಯೆಯಲ್ಲಿ ಕೊರತೆ ಇದೆಯೇ?
	If yes, which positions must be hired/deployed for better depot functioning? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಉತ್ತಮ ಡಿಪೋ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ಯಾವ ಸ್ಥಾನಗಳನ್ನು ನೇಮಿಸಿಕೊಳ್ಳಬೇಕು / ನಿಯೋಜಿಸಬೇಕು?
	Have you conducted any passenger satisfaction survey in the past 5 years? ಗಿದ 5 ವರ್ಷಗಳಲ್ಲಿ ನೀವು ಯಾವುದೇ ಪ್ರಯಾಣಿಕರ ತೃಪ್ತಿ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಿದ್ದೀರಾ?
	According to you, do you think the passengers are satisfied with the service? ಮ್ಮ ಪ್ರಕಾರ, ಪ್ರಯಾಣಿಕರು ಸೇವೆಯಲ್ಲಿ ತೃಪ್ತರಾಗಿದ್ದಾರೆಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ?
	What are all the steps you have taken to increase the number of routes and increase the frequency of buses in your division? ಾರ್ಗಗಳ ಸಂಖ್ಯೆಯನ್ನು ಹೆಚ್ಚಿಸಲು ಮತ್ತು ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್‌ಗಳ ಆವರ್ತನವನ್ನು ಹೆಚ್ಚಿಸಲು ನೀವು ತೆಗೆದುಕೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು?
	How will you ensure the buses are in good condition in your division and is there any monitoring mechanism in place already? ಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್ಸುಗಳು ಉತ್ತಮ ಸ್ಥಿತಿಯಲ್ಲಿವೆ ಎಂದು ನೀವು ಹೇಗೆ ಖಚಿತಪಡಿಸಿಕೊಳ್ಳುತ್ತೀರಿ? ಈಗಾಗಲೇ ಯಾವುದೇ ಉಸ್ತುವಾರಿ ವ್ಯವಸ್ಥೆ ಇದೆಯೇ?
Effectiveness ಪರಿಣಾಮಕಾರಿತ್ವ	What resources do you use for the functioning of this division? ವಿಭಾಗದ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ನೀವು ಯಾವ ಸಂಪನ್ಮೂಲಗಳನ್ನು ಬಳಸುತ್ತೀರಿ?

	What mechanisms do you follow to use those resources effectively? ಸಂಪನ್ಮೂಲಗಳನ್ನು ಪರಿಣಾಮಕಾರಿಯಾಗಿ ಬಳಸಲು ನೀವು ಯಾವ ಕಾರ್ಯವಿಧಾನಗಳನ್ನು ಅನುಸರಿಸುತ್ತೀರಿ? Is there a monitoring mechanism for measuring the effectiveness of the buses (carrying capacity/effective kms/lifespan etc.)? ಸ್ಗಳ ಪರಿಣಾಮಕಾರಿತ್ವವನ್ನು ಅಳೆಯುವ ಉಸ್ತುವಾರಿ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? If yes, how is it done? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಅದನ್ನು ಹೇಗೆ ಮಾಡಲಾಗುತ್ತದೆ?
Efficiency ದಕ್ಷತೆ	How do you monitor and use the resources efficiently in your corporation? ನಿಮ್ಮ ನಿಗಮದಲ್ಲಿ ಸಂಪನ್ಮೂಲಗಳನ್ನು ನೀವು ಹೇಗೆ ಉಸ್ತುವಾರಿ ಮಾಡುತ್ತೀರಿ ಮತ್ತು ಬಳಸುತ್ತೀರಿ? Is there any specific mechanism in place? ಉಸ್ತುವಾರಿಗೆ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? Are there any specific challenges that you encounter related to buses which harm the efficiency.? Please elaborate ಸ್ಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ Are there any specific challenges that you encounter related to staff which harm the efficiency.? Please elaborate ಂದಿಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ Are there any specific challenges that you encounter related to infrastructure which harm the efficiency.? Please elaborate ಲಸೌಕರ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು

	ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ Do you offer any training for the division staff in your corporation? If yes, how frequently? ನಿಮ್ಮ ನಿಗಮದಲ್ಲಿ ವಿಭಾಗದ ಸಿಬ್ಬಂದಿಗೆ ನೀವು ಯಾವುದೇ ತರಬೇತಿಯನ್ನು ನೀಡುತ್ತೀರಾ? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಎಷ್ಟು ಬಾರಿ? What does the training cover? ಬೇತಿಯಲ್ಲಿ ಏನು ತಿಳಿಸಿಕೊಡಲಾಗುತ್ತದೆ? Who conducts the training? ಬೇತಿಯನ್ನು ಯಾರು ನಡೆಸುತ್ತಾರೆ? Is there a specified budget to cover these expenses? ಬೇತಿಯ ವೆಚ್ಚಕ್ಕೆ ನಿಗದಿತ ಹಣವಿದೆಯೇ?
Impact ಪರಿಣಾಮ	How has COVID-19 impacted the depot in terms of number of passengers, number of schedules (trips), staff availability, changes in revenue etc.? Please elaborate COVID-19 ಸಂಬಂಧಿಸಿದಂತೆ ಪ್ರಯಾಣಿಕರ ಸಂಖ್ಯೆ, ವೇಳಾಪಟ್ಟಿಗಳ ಸಂಖ್ಯೆ (ಪ್ರವಾಸಗಳು), ಸಿಬ್ಬಂದಿ ಲಭ್ಯತೆ, ಆದಾಯದಲ್ಲಿನ ಬದಲಾವಣೆಗಳು ಇತ್ಯಾದಿಗಳ ವಿಷಯದಲ್ಲಿ ಡಿಪೋ ಮೇಲೆ ಹೇಗೆ ಪ್ರಭಾವ ಬೀರಿದೆ? ವಿವರಿಸಿ Do you think the adoption of new technology in the depot has been useful in real time monitoring of buses? ಬಸ್ಸುಗಳ ನೈಜ ಸಮಯದ ಮೇಲ್ವಿಚಾರಣೆಯಲ್ಲಿ ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನದ ಅಳವಡಿಕೆ ಉಪಯುಕ್ತವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? Do you think the adoption of new technology in the depot has been useful in managing human resources in an effective way? ಮಾನವ ಸಂಪನ್ಮೂಲವನ್ನು ಪರಿಣಾಮಕಾರಿ ರೀತಿಯಲ್ಲಿ ನಿರ್ವಹಿಸಲು ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನದ ಅಳವಡಿಕೆ ಉಪಯುಕ್ತವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ?

Sustainability ಸುಸ್ಥಿರತೆ	Is there any mechanism in place to use the resources (fuel, manpower, machineries) in a sustainable way? ಪನ್ಮೂಲಗಳನ್ನು (ಇಂಧನ, ಮಾನವಶಕ್ತಿ, ಯಂತ್ರೋಪಕರಣಗಳು) ಸುಸ್ಥಿರ ರೀತಿಯಲ್ಲಿ ಬಳಸಲು ಯಾವುದೇ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? Do you think the division is financially sustainable? ಾಗವು ಆರ್ಥಿಕವಾಗಿ ಸುಸ್ಥಿರವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? If so, what are the steps taken to achieve that? ಗಿದ್ದರೆ, ಆರ್ಥಿಕ ಸುಸ್ಥಿರವನ್ನು ಕಾಪಾಡಲು ಕೈಗೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು? Were there any steps taken to ensure staff welfare? ಂದಿ ಕಲ್ಯಾಣಕ್ಕಾಗಿ ಯಾವುದೇ ಕ್ರಮಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳಲಾಗಿದೆಯೇ?
Equity ಸಂದರ್ಭಾನುಸಾ ರ ಸಮಾನತೆ	What is the ratio of female and male staff in your corporation level? ನಿಮ್ಮ ವಿಭಾಗ ಮಟ್ಟದಲ್ಲಿ ಮಹಿಳಾ ಮತ್ತು ಪುರುಷ ಸಿಬ್ಬಂದಿಗಳ ಅನುಪಾತ ಎಷ್ಟು? Does your depot undertake any gender-specific initiative (such as reserving a leadership position for women, deploying facilities such as separate changing/feeding rooms for women, menstrual hygiene management etc.)? ನಿಮ್ಮ ಡಿಪೋ ಯಾವುದೇ ಲಿಂಗ-ನಿರ್ದಿಷ್ಟ ಉಪಕ್ರಮವನ್ನು ಕೈಗೊಳ್ಳುತ್ತದೆಯೇ (ಉದಾಹರಣೆಗೆ ಮಹಿಳೆಯರಿಗೆ ನಾಯಕತ್ವದ ಸ್ಥಾನವನ್ನು ಕಾಯ್ದಿರಿಸುವುದು, ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಕೊರಡಿಗಳು, ಮುಟ್ಟಿನ ನೈರ್ಮಲ್ಯ ನಿರ್ವಹಣೆ ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳನ್ನು ನಿಯೋಜಿಸುವುದು)? What measures have you taken to ensure safety of women passengers travelling within your division buses? ನಿಮ್ಮ ವಿಭಾಗದ ಬಸ್‌ಗಳಲ್ಲಿ ಮಹಿಳಾ ಪ್ರಯಾಣಿಕರ ಸುರಕ್ಷತೆಯನ್ನು ಖಚಿತಪಡಿಸಿಕೊಳ್ಳಲು ನೀವು ಕೈಗೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು?

19. ANNEXURE 5: QUESTIONNAIRE FOR DEPOT STAFF

ಡಿಪೋ ಸಿಬ್ಬಂದಿಗೆ ಪ್ರಶ್ನಾವಳಿ

Date:
ದಿನಾಂಕ:

Name of the officials and designation
ಅಧಿಕಾರಿಗಳ ಹೆಸರು ಮತ್ತು ಹುದ್ದೆ

Depot Manager	
Civil Engineer	
Mechanical Engineer	

Name of the Corporation (ಕಾರ್ಪೋರೇಶನ್ ಹೆಸರು)   :

Name of the Division (ವಿಭಾಗದ ಹೆಸರು)   :

Starting Time (ಆರಂಭದ ಸಮಯ)   :

Ending Time (ಮುಕ್ತಾಯದ ಸಮಯ)   :

Consent

Hello,

I am [Name] [designation]. I come from an agency called Athena Infonomics. We are currently evaluating the Karnataka State Transport Corporations (KSRTC, NWKRTC and NEKRTC) on behalf of Karnataka Evaluation Authority for the period between 2014-15 and 2019-20. Athena Infonomics will be conducting this study in 12 divisions across Karnataka (6 from KSRTC, 3 from NWKRTC and 3 from NEKRTC). We request you to provide us information on issues related to efficiency, effectiveness and sustainability of the transport services in your division. We will collate the information collected from you and present the overall picture of the road transport system to KEA. We are committed to protecting your personal details and identity and will not reveal this confidential information. This survey will take about 20 to 25 minutes. We request for your permission and cooperation to conduct this survey. You can choose to stop at any point during the survey.

ನಮಸ್ಕಾರ,

ನಾನು [ಹೆಸರು] [ಹುದ್ದೆ]. ನಾನು ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಎಂಬ ಏಜೆನ್ಸಿಯಿಂದ ಬಂದಿದ್ದೇನೆ. ನಾವು ಪ್ರಸ್ತುತ ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸಾರಿಗೆ ನಿಗಮಗಳನ್ನು (KSRTC, NEKRTC and NWKRTC) ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರದ (KEA) ಪರವಾಗಿ 2014-15 ಮತ್ತು 2019-20ರ ನಡುವಿನ ಅವಧಿಗೆ ಮೌಲ್ಯಮಾಪನ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಈ ಅಧ್ಯಯನವನ್ನು ಕರ್ನಾಟಕದಾದ್ಯಂತ 12 ವಿಭಾಗಗಳಲ್ಲಿ ನಡೆಸಲಿದೆ (ಕೆಎಸ್‌ಆರ್‌ಟಿಸಿಯಿಂದ 6, ಎನ್‌ಡಬ್ಲ್ಯೂ ಕೆಆರ್‌ಟಿಸಿಯಿಂದ 3 ಮತ್ತು ಎನ್‌ಇಕೆಆರ್‌ಟಿಸಿಯಿಂದ 3). ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿನ ಸಾರಿಗೆ ಸೇವೆಗಳ ದಕ್ಷತೆ, ಪರಿಣಾಮಕಾರಿತ್ವ ಮತ್ತು ಸುಸ್ಥಿರತೆಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳ ಕುರಿತು ನಮಗೆ ಮಾಹಿತಿ ನೀಡುವಂತೆ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ. ನಿಮ್ಮಿಂದ ಸಿಕ್ಕ ಮಾಹಿತಿಯನ್ನು ನಾವು ಸಂಗ್ರಹಿಸುತ್ತೇವೆ ಮತ್ತು ರಸ್ತೆ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆಯ ಒಟ್ಟಾರೆ ಚಿತ್ರವನ್ನು ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಕ್ಕೆ ಪ್ರಸ್ತುತಪಡಿಸುತ್ತೇವೆ. ನಿಮ್ಮ ವೈಯಕ್ತಿಕ ವಿವರಗಳು ಮತ್ತು ಗುರುತನ್ನು ರಕ್ಷಿಸಲು ನಾವು ಬದ್ಧರಾಗಿದ್ದೇವೆ ಮತ್ತು ಈ ಮಾಹಿತಿಯನ್ನು ಬಹಿರಂಗಪಡಿಸುವುದಿಲ್ಲ. ಈ ಸಮೀಕ್ಷೆಯು ಸುಮಾರು 20 ರಿಂದ 25 ನಿಮಿಷಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳುತ್ತದೆ. ಈ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಲು ನಿಮ್ಮ ಅನುಮತಿ ಮತ್ತು ಸಹಕಾರಕ್ಕಾಗಿ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ.

Would you like to participate in the interview?   Yes/ No

ಸಮೀಕ್ಷೆಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ನೀವು ಬಯಸುವಿರಾ? ಹೌದು /ಇಲ್ಲ

Topic	Questions
ವಿಷಯ	ಪ್ರಶ್ನೆಗಳು
Introduction	Introduction, ice-breaking and ethical declaration
ಪರಿಚಯ	ಪರಿಚಯ ಮತ್ತು ನೈತಿಕ ಘೋಷಣೆ
Relevance ಪ್ರಸ್ತುತತೆ	Have you adapted any new technology into your depot during the period 2014-15 to 2019-20? 14-15 ರಿಂದ 2019-20ರ ಅವಧಿಯಲ್ಲಿ ನೀವು ಯಾವುದೇ ಹೊಸ ತಂತ್ರಜ್ಞಾನವನ್ನು ನಿಮ್ಮ ಡಿಪೋಗೆ ಅಳವಡಿಸಿಕೊಂಡಿದ್ದೀರಾ? If yes, have there been any changes in operation of the division level because of the adaptation? ದು ಎಂದಾದಲ್ಲಿ, ಅಳವಡಿಸಿಕೊಂಡ ನಂತರ ವಿಭಾಗ ಮಟ್ಟದ ಕಾರ್ಯಾಚರಣೆಯಲ್ಲಿ ಏನಾದರೂ ಬದಲಾವಣೆಗಳಾಗಿವೆ? Did your corporation upgrade any of the buses (new purchase/retrofitting) in

your division?

ಮ್ಮ ನಿಗಮವು ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಯಾವುದೇ ಬಸ್‌ಗಳನ್ನು (ಹೊಸ ಖರೀದಿ / ರೆಟ್ರೊಫಿಟಿಂಗ್) ನವೀಕರಿಸಿದೆಯೇ?

Are there any plans for upgrading in the near future?

ಂದಿನ ದಿನಗಳಲ್ಲಿ ಬಸ್‌ಗಳನ್ನು ನವೀಕರಿಸಲು ಯಾವುದೇ ಯೋಜನೆಗಳಿವೆಯೇ?

According to you, is there a gap in staffing?

ಮ್ಮ ಪ್ರಕಾರ, ಸಿಬ್ಬಂದಿಗಳ ಸಂಖ್ಯೆಯಲ್ಲಿ ಕೊರತೆ ಇದೆಯೇ?

If yes, which positions must be hired/deployed for better depot functioning?

ದು ಎಂದಾದಲ್ಲಿ, ಉತ್ತಮ ಡಿಪೋ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ಯಾವ ಸ್ಥಾನಗಳನ್ನು ನೇಮಿಸಿಕೊಳ್ಳಬೇಕು / ನಿಯೋಜಿಸಬೇಕು?

Does your division promote the depot to offer facilities such as
Digital Display and Intelligent Transport System?

Tourist Information System?

Two Wheelers and Four Wheelers Parking Facility?

Public Addressing System?

Prepaid auto rickshaw and taxi?

ಪೋವಿನಲ್ಲಿ ಈ ಕೆಳಕಂಡ ಸೌಲಭ್ಯಗಳನ್ನು ನೀಡಲು ನಿಮ್ಮ ವಿಭಾಗವು ಉತ್ತೇಜಿಸುತ್ತದೆಯೇ?

ಡಿಜಿಟಲ್ ಪ್ರದರ್ಶನ ಮತ್ತು ಸ್ಮಾರ್ಟ್ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆ?

ಪ್ರವಾಸೋದ್ಯಮ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆ?

ದ್ವಿಚಕ್ರ ಮತ್ತು ನಾಲ್ಕುಚಕ್ರ ವಾಹನಗಳ ಪಾರ್ಕಿಂಗ್ ಸೌಲಭ್ಯ?

ಸಾರ್ವಜನಿಕ ಪ್ರಕಟಣೆ ವ್ಯವಸ್ಥೆ?

ಪ್ರಿಪೇಯ್ಡ್ ಆಟೋ ರಿಕ್ಷಾ ಮತ್ತು ಟ್ಯಾಕ್ಸಿ?

Have you conducted any passenger satisfaction survey in the past 5 years?

	ಗಿದ 5 ವರ್ಷಗಳಲ್ಲಿ ನೀವು ಯಾವುದೇ ಪ್ರಯಾಣಿಕರ ತೃಪ್ತಿ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಿದ್ದೀರಾ? According to you, do you think the passengers are satisfied with the service? ಮ್ಮ ಪ್ರಕಾರ, ಪ್ರಯಾಣಿಕರು ಸೇವೆಯಲ್ಲಿ ತೃಪ್ತರಾಗಿದ್ದಾರೆಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? Do the passengers prefer government buses or private buses? ಪ್ರಯಾಣಿಕರು ಸರ್ಕಾರಿ ಬಸ್ಸುಗಳಿಗೆ ಆದ್ಯತೆ ನೀಡುತ್ತಾರೆಯೇ ಅಥವಾ ಖಾಸಗಿ ಬಸ್ಸುಗಳಿಗೆ ಆದ್ಯತೆ ನೀಡುತ್ತಾರೆಯೇ? Why do you think this might be the case (irrespective of the preference)? ಈ ರೀತಿಯಾಗಿರಬಹುದು ಎಂದು ನೀವು ಏಕೆ ಭಾವಿಸುತ್ತೀರಿ (ಆದ್ಯತೆಯ ಹೊರತಾಗಿಯೂ)?
Effectiveness ಪರಿಣಾಮಕಾರಿತ್ವ	What resources do you use for the functioning of this division? ವಿಭಾಗದ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ನೀವು ಯಾವ ಸಂಪನ್ಮೂಲಗಳನ್ನು ಬಳಸುತ್ತೀರಿ? What mechanisms do you follow to use those resources effectively? ಸಂಪನ್ಮೂಲಗಳನ್ನು ಪರಿಣಾಮಕಾರಿಯಾಗಿ ಬಳಸಲು ನೀವು ಯಾವ ಕಾರ್ಯವಿಧಾನಗಳನ್ನು ಅನುಸರಿಸುತ್ತೀರಿ? Is there a monitoring mechanism for measuring the effectiveness of the buses (carrying capacity/effective kms/lifespan etc.)? ಸ್ಸುಗಳ ಪರಿಣಾಮಕಾರಿತ್ವವನ್ನು ಅಳೆಯುವ ಉಸ್ತುವಾರಿ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? If yes, how is it done? ದು ಎಂದಾದಲ್ಲಿ, ಅದನ್ನು ಹೇಗೆ ಮಾಡಲಾಗುತ್ತದೆ? How many schedules does your depot operate currently? *(we have this information already, repeating for triangulation)* ಮ್ಮ ಡಿಪೋ ಪ್ರಸ್ತುತ ಎಷ್ಟು ವೇಳಾಪಟ್ಟಿಗಳನ್ನು ನಿರ್ವಹಿಸುತ್ತದೆ?
Efficiency	Are there any specific challenges that you encounter related to buses which harm the efficiency.? Please elaborate

ದಕ್ಷತೆ	...ಸ್ಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ
	Are there any specific challenges that you encounter related to staff which harm the efficiency.? Please elaborate
	...ಬಂದಿಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ
	Are there any specific challenges that you encounter related to infrastructure which harm the efficiency.? Please elaborate
	...ಾಲಸೌಕರ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ
	How are the buses maintained for better engine efficiency or lifespan? Please elaborate.
	...ತ್ತಮ ಎಂಜಿನ್ ದಕ್ಷತೆಗಾಗಿ ಅಥವಾ ಜೀವಿತಾವಧಿಯನ್ನು ಹೆಚ್ಚಿಸಲು ಬಸ್ಸುಗಳನ್ನು ಹೇಗೆ ನಿರ್ವಹಿಸಲಾಗುತ್ತದೆ? ವಿವರಿಸಿ
	Do you offer any training for the division staff in your corporation? If yes, how frequently?
	...ಮ್ಮ ನಿಗಮದಲ್ಲಿ ವಿಭಾಗದ ಸಿಬ್ಬಂದಿಗೆ ನೀವು ಯಾವುದೇ ತರಬೇತಿಯನ್ನು ನೀಡುತ್ತೀರಾ? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಎಷ್ಟು ಬಾರಿ?
	What does the training cover?
	...ರಬೇತಿಯಲ್ಲಿ ಏನು ತಿಳಿಸಿಕೊಡಲಾಗುತ್ತದೆ?
	Who conducts the training?
	...ರಬೇತಿಯನ್ನು ಯಾರು ನಡೆಸುತ್ತಾರೆ?
	Is there a specified budget to cover these expenses?

	ಬೇತಿಯ ವೆಚ್ಚಕ್ಕೆ ನಿಗದಿತ ಹಣವಿದೆಯೇ?
Impact ಪರಿಣಾಮ	How has COVID-19 impacted the depot in terms of number of passengers, number of schedules (trips), staff availability, changes in revenue etc.? Please elaborate OVID-19 ಸಂಬಂಧಿಸಿದಂತೆ ಪ್ರಯಾಣಿಕರ ಸಂಖ್ಯೆ, ವೇಳಾಪಟ್ಟಿಗಳ ಸಂಖ್ಯೆ (ಪ್ರವಾಸಗಳು), ಸಿಬ್ಬಂದಿ ಲಭ್ಯತೆ, ಆದಾಯದಲ್ಲಿನ ಬದಲಾವಣೆಗಳು ಇತ್ಯಾದಿಗಳ ವಿಷಯದಲ್ಲಿ ಡಿಪೋ ಮೇಲೆ ಹೇಗೆ ಪ್ರಭಾವ ಬೀರಿದೆ? ವಿವರಿಸಿ Do you think the adoption of new technology in the depot has been useful in real time monitoring of buses? ಸ್ಸುಗಳ ನೈಜ ಸಮಯದ ಮೇಲ್ವಿಚಾರಣೆಯಲ್ಲಿ ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನದ ಅಳವಡಿಕೆ ಉಪಯುಕ್ತವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? Do you think the adoption of new technology in the depot has been useful in managing human resources in an effective way? ಾನವ ಸಂಪನ್ಮೂಲವನ್ನು ಪರಿಣಾಮಕಾರಿ ರೀತಿಯಲ್ಲಿ ನಿರ್ವಹಿಸಲು ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನದ ಅಳವಡಿಕೆ ಉಪಯುಕ್ತವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ?
Sustainability ಸುಸ್ಥಿರತೆ	Is there any mechanism in place to use the resources (fuel, manpower, machineries) in a sustainable way? ಸಂಪನ್ಮೂಲಗಳನ್ನು (ಇಂಧನ, ಮಾನವಶಕ್ತಿ, ಯಂತ್ರೋಪಕರಣಗಳು) ಸುಸ್ಥಿರ ರೀತಿಯಲ್ಲಿ ಬಳಸಲು ಯಾವುದೇ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? Do you think the division is financially sustainable? ಾಗವು ಆರ್ಥಿಕವಾಗಿ ಸುಸ್ಥಿರವಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? If so, what are the steps taken to achieve that? ಗಿದ್ದರೆ, ಆರ್ಥಿಕ ಸುಸ್ಥಿರವನ್ನು ಕಾಪಾಡಲು ಕೈಗೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು?
Equity ಸಂದರ್ಭಾನುಸಾ ರ ಸಮಾನತೆ	What is the ratio of female and male staff in your division level? *(The figures are to be validated using the physical attendance registers)* ಕ್ತ ವಿಭಾಗ ಮಟ್ಟದಲ್ಲಿ ಮಹಿಳಾ ಮತ್ತು ಪುರುಷ ಸಿಬ್ಬಂದಿಗಳ ಅನುಪಾತ ಎಷ್ಟು?

| | Are there facilities such as separate toilets for men and women, canteen, lockers etc. for the division staff?

ುಂದಿಗಳಿಗಾಗಿ ಕ್ಯಾಂಟೀನ್, ಲಾಕರ್, ಪುರುಷರು ಮತ್ತು ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಶೌಚಾಲಯ, ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳಿವೆಯೇ?

Does your depot undertake any gender-specific initiative (such as reserving a leadership position for women, deploying facilities such as separate changing/feeding rooms for women, menstrual hygiene management etc.)?

ುಮ್ಮ ಡಿಪೋ ಯಾವುದೇ ಲಿಂಗ-ನಿರ್ದಿಷ್ಟ ಉಪಕ್ರಮವನ್ನು ಕೈಗೊಳ್ಳುತ್ತದೆಯೇ (ಉದಾಹರಣೆಗೆ ಮಹಿಳೆಯರಿಗೆ ನಾಯಕತ್ವದ ಸ್ಥಾನವನ್ನು ಕಾಯ್ದಿರಿಸುವುದು, ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಕೊಠಡಿಗಳು, ಮುಟ್ಟಿನ ನೈರ್ಮಲ್ಯ ನಿರ್ವಹಣೆ ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳನ್ನು ನಿಯೋಜಿಸುವುದು)? |

20. ANNEXURE 6: QUESTIONNAIRE FOR DEPOT SUPPORT STAFF

ಡಿಪೋ ಬೆಂಬಲ ಸಿಬ್ಬಂದಿಗೆ ಪ್ರಶ್ನಾವಳಿ

Date:
ದಿನಾಂಕ:

Name of the officials and designation
ಅಧಿಕಾರಿಗಳ ಹೆಸರು ಮತ್ತು ಹುದ್ದೆ

Bus Driver	
Conductors	
Helpers/Maintenance	

Name of the Corporation (ಕಾರ್ಪೋರೇಶನ್ ಹೆಸರು)   :

Name of the Division (ವಿಭಾಗದ ಹೆಸರು)   :

Starting Time (ಆರಂಭದ ಸಮಯ)   :

Ending Time (ಮುಕ್ತಾಯದ ಸಮಯ)   :

Consent

Hello,

I am [Name] [designation]. I come from an agency called Athena Infonomics. We are currently evaluating the Karnataka State Transport Corporations (KSRTC, NWKRTC and NEKRTC) on behalf of Karnataka Evaluation Authority for the period between 2014-15 and 2019-20. Athena Infonomics will be conducting this study in 12 divisions across Karnataka (6 from KSRTC, 3 from NWKRTC and 3 from NEKRTC). We request you to provide us information on issues related to efficiency, effectiveness and sustainability of the transport services in your division. We will collate the information collected from you and present the overall picture of the road transport system to KEA. We are committed to protecting your personal details and identity and will not reveal this confidential information. This survey will take about 20 to 25 minutes. We request for your permission and cooperation to conduct this survey. You can choose to stop at any point during the survey.

ನಮಸ್ಕಾರ,

ನಾನು [ಹೆಸರು] [ಹುದ್ದೆ]. ನಾನು ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಎಂಬ ಏಜೆನ್ಸಿಯಿಂದ ಬಂದಿದ್ದೇನೆ. ನಾವು ಪ್ರಸ್ತುತ ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸಾರಿಗೆ ನಿಗಮಗಳನ್ನು (KSRTC, NEKRTC and NWKRTC) ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರದ (KEA) ಪರವಾಗಿ 2014-15 ಮತ್ತು 2019-20ರ ನಡುವಿನ ಅವಧಿಗೆ ಮೌಲ್ಯಮಾಪನ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಈ ಅಧ್ಯಯನವನ್ನು ಕರ್ನಾಟಕದಾದ್ಯಂತ 12 ವಿಭಾಗಗಳಲ್ಲಿ ನಡೆಸಲಿದೆ (ಕೆಎಸ್ಆರ್ಟಿಸಿಯಿಂದ 6, ಎನ್ಡಬ್ಲ್ಯೂಕೆಆರ್ಟಿಸಿಯಿಂದ 3 ಮತ್ತು ಎನ್ಇಕೆಆರ್ಟಿಸಿಯಿಂದ 3). ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿನ ಸಾರಿಗೆ ಸೇವೆಗಳ ದಕ್ಷತೆ, ಪರಿಣಾಮಕಾರಿತ್ವ ಮತ್ತು ಸುಸ್ಥಿರತೆಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳ ಕುರಿತು ನಮಗೆ ಮಾಹಿತಿ ನೀಡುವಂತೆ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ. ನಿಮ್ಮಿಂದ ಸಿಕ್ಕ ಮಾಹಿತಿಯನ್ನು ನಾವು ಸಂಗ್ರಹಿಸುತ್ತೇವೆ ಮತ್ತು ರಸ್ತೆ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆಯ ಒಟ್ಟಾರೆ ಚಿತ್ರವನ್ನು ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಕ್ಕೆ ಪ್ರಸ್ತುತಪಡಿಸುತ್ತೇವೆ. ನಿಮ್ಮ ವೈಯಕ್ತಿಕ ವಿವರಗಳು ಮತ್ತು ಗುರುತನ್ನು ರಕ್ಷಿಸಲು ನಾವು ಬದ್ಧರಾಗಿದ್ದೇವೆ ಮತ್ತು ಈ ಮಾಹಿತಿಯನ್ನು ಬಹಿರಂಗಪಡಿಸುವುದಿಲ್ಲ. ಈ ಸಮೀಕ್ಷೆಯು ಸುಮಾರು 20 ರಿಂದ 25 ನಿಮಿಷಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳುತ್ತದೆ. ಈ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಲು ನಿಮ್ಮ ಅನುಮತಿ ಮತ್ತು ಸಹಕಾರಕ್ಕಾಗಿ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ.

Would you like to participate in the interview? Yes/ No

ಸಮೀಕ್ಷೆಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ನೀವು ಬಯಸುವಿರಾ? ಹೌದು /ಇಲ್ಲ

Topic ವಿಷಯ	Questions ಪ್ರಶ್ನೆಗಳು
Introduction ಪರಿಚಯ	Introduction, ice-breaking and ethical declaration ಪರಿಚಯ ಮತ್ತು ನೈತಿಕ ಘೋಷಣೆ
Relevance ಪ್ರಸ್ತುತತೆ	How many years of experience do you have of working in this depot? ಈ ಡಿಪೋದಲ್ಲಿ ನಿಮಗೆ ಎಷ್ಟು ವರ್ಷಗಳ ಅನುಭವವಿದೆ? Which kind of service do you usually go to? ನೀವು ಸಾಮಾನ್ಯವಾಗಿ ಯಾವ ರೀತಿಯ ಸೇವೆಯಲ್ಲಿ ಒಳಗೊಂಡಿರುತ್ತೀರಾ? Did your corporation upgrade any of the buses (new purchase/retrofitting) in your depot? ನಿಮ್ಮ ನಿಗಮವು ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಯಾವುದೇ ಬಸ್‌ಗಳನ್ನು (ಹೊಸ ಖರೀದಿ / ರೆಟ್ರೋಫಿಟಿಂಗ್) ನವೀಕರಿಸಿದೆಯೇ?

	According to you, is there a staff/technician deficiency? If yes, when did the hiring take place last? ನಿಮ್ಮ ಪ್ರಕಾರ, ಸಿಬ್ಬಂದಿಗಳ ಸಂಖ್ಯೆಯಲ್ಲಿ ಕೊರತೆ ಇದೆಯೇ? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಈ ಹಿಂದೆ ನೇಮಕ ಯಾವಾಗ ನಡೆಯಿತು? Did your depot provide you the training on how to approach/ behave with your passengers? ಪ್ರಯಾಣಿಕರೊಂದಿಗೆ ಹೇಗೆ ವರ್ತಿಸಬೇಕು ಎಂಬುದರ ಕುರಿತು ನಿಮ್ಮ ಡಿಪೋ ನಿಮಗೆ ತರಬೇತಿ ನೀಡಿದೆಯೇ? Did you undergo any training on technical/ mechanical aspects for your work? Was this supported by your depot? ನಿಮ್ಮ ಕೆಲಸಕ್ಕಾಗಿ ತಾಂತ್ರಿಕ / ಯಾಂತ್ರಿಕ ಅಂಶಗಳ ಕುರಿತು ನೀವು ಯಾವುದೇ ತರಬೇತಿ ಪಡೆದಿದ್ದೀರಾ? ತರಬೇತಿಗೆ ನಿಮ್ಮ ಡಿಪೋ ಬೆಂಬಲ ನೀಡಿತೇ? How will you ensure the buses are in good condition in your division? ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್ಸುಗಳು ಉತ್ತಮ ಸ್ಥಿತಿಯಲ್ಲಿವೆ ಎಂದು ನೀವು ಹೇಗೆ ಖಚಿತಪಡಿಸಿಕೊಳ್ಳುತ್ತೀರಿ? Is there any monitoring mechanism in place already? ಈಗಾಗಲೇ ಯಾವುದೇ ಉಸ್ತುವಾರಿ ವ್ಯವಸ್ಥೆ ಇದೆಯೇ? What are the types of bus services in your division? ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿ ಬಸ್ ಸೇವೆಗಳ ಪ್ರಕಾರಗಳು ಯಾವುವು?
Effectiveness ಪರಿಣಾಮಕಾರಿ ತ್ವ	What resources do you use for the functioning of this division? ವಿಭಾಗದ ಕಾರ್ಯನಿರ್ವಹಣೆಗೆ ನೀವು ಯಾವ ಸಂಪನ್ಮೂಲಗಳನ್ನು ಬಳಸುತ್ತೀರಿ? What mechanisms do you follow to use those resources effectively? ಸಂಪನ್ಮೂಲಗಳನ್ನು ಪರಿಣಾಮಕಾರಿಯಾಗಿ ಬಳಸಲು ನೀವು ಯಾವ ಕಾರ್ಯವಿಧಾನಗಳನ್ನು ಅನುಸರಿಸುತ್ತೀರಿ?

	Does the depot management monitor you? If yes, how does this happen? ಡಿಪೋ ನಿರ್ವಹಣೆ ನಿಮ್ಮ ಉಸ್ತುವಾರಿ ಮಾಡುತ್ತದೆಯೇ? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಇದು ಹೇಗೆ ನಡೆಯುತ್ತದೆ? Is there a monitoring mechanism for measuring the effectiveness of the buses (carrying capacity/effective kms/lifespan etc.)? ಸ್ಗಳ ಪರಿಣಾಮಕಾರಿತ್ವವನ್ನು ಅಳೆಯುವ ಉಸ್ತುವಾರಿ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? If yes, how is it done? ದು ಎಂದಾದಲ್ಲಿ, ಅದನ್ನು ಹೇಗೆ ಮಾಡಲಾಗುತ್ತದೆ? How many schedules does your depot operate currently? *(we have this information already, repeating for triangulation)* ಮ್ಮ ಡಿಪೋ ಪ್ರಸ್ತುತ ಎಷ್ಟು ವೇಳಾಪಟ್ಟಿಗಳನ್ನು ನಿರ್ವಹಿಸುತ್ತದೆ?
Efficiency ದಕ್ಷತೆ	Are there any specific challenges that you encounter related to buses which harm the efficiency.? Please elaborate ಬಸ್ಸುಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ Are there any specific challenges that you encounter related to staff which harm the efficiency.? Please elaborate ಸಿಬ್ಬಂದಿಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ Are there any specific challenges that you encounter related to infrastructure which harm the efficiency.? Please elaborate ಮೂಲಸೌಕರ್ಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸವಾಲುಗಳು ದಕ್ಷತೆಯನ್ನು ಕಡಿಮೆಯಾಗಿಸುತ್ತದೆಯೇ? ವಿವರಿಸಿ How are the buses maintained for better engine efficiency or lifespan? Please

	elaborate. ಉತ್ತಮ ಎಂಜಿನ್ ದಕ್ಷತೆಗಾಗಿ ಅಥವಾ ಜೀವಿತಾವಧಿಯನ್ನು ಹೆಚ್ಚಿಸಲು ಬಸ್ಸುಗಳನ್ನು ಹೇಗೆ ನಿರ್ವಹಿಸಲಾಗುತ್ತದೆ? ವಿವರಿಸಿ
Impact ಪರಿಣಾಮ	How has COVID-19 impacted the depot in terms of number of passengers, number of schedules (trips), number of days of work, maintenance of buses etc.? Please elaborate COVID-19 ಸಂಬಂಧಿಸಿದಂತೆ ಪ್ರಯಾಣಿಕರ ಸಂಖ್ಯೆ, ವೇಳಾಪಟ್ಟಿಗಳ ಸಂಖ್ಯೆ (ಪ್ರವಾಸಗಳು), ಸಿಬ್ಬಂದಿ ಲಭ್ಯತೆ, ಆದಾಯದಲ್ಲಿನ ಬದಲಾವಣೆಗಳು ಇತ್ಯಾದಿಗಳ ವಿಷಯದಲ್ಲಿ ಡಿಪೋ ಮೇಲೆ ಹೇಗೆ ಪ್ರಭಾವ ಬೀರಿದೆ? ವಿವರಿಸಿ Do you think the adoption of new technology in the depot reduces your work burden in any way? ಡಿಪೋದಲ್ಲಿ ಹೊಸ ತಂತ್ರಜ್ಞಾನವನ್ನು ಅಳವಡಿಸಿಕೊಳ್ಳುವುದರಿಂದ ನಿಮ್ಮ ಕೆಲಸದ ಹೊರೆ ಯಾವುದೇ ರೀತಿಯಲ್ಲಿ ಕಡಿಮೆಯಾಗಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ?
Sustainability ಸುಸ್ಥಿರತೆ	Is there any mechanism in place to use the resources (fuel, manpower, machineries) in a sustainable way? ಸಂಪನ್ಮೂಲಗಳನ್ನು (ಇಂಧನ, ಮಾನವಶಕ್ತಿ, ಯಂತ್ರೋಪಕರಣಗಳು) ಸುಸ್ಥಿರ ರೀತಿಯಲ್ಲಿ ಬಳಸಲು ಯಾವುದೇ ಕಾರ್ಯವಿಧಾನವಿದೆಯೇ? From the mechanic point of view, do you think the buses need more upgradation? ಮೆಕ್ಯಾನಿಕ್ ದೃಷ್ಟಿಕೋನದಿಂದ, ಬಸ್ಸುಗಳಿಗೆ ಹೆಚ್ಚಿನ ನವೀಕರಣದ ಅಗತ್ಯವಿದೆ ಎಂದು ನೀವು ಭಾವಿಸುತ್ತೀರಾ? If yes, how sustainable is it in terms of fuel consumption, maintenance? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಇಂಧನ ಬಳಕೆ, ನಿರ್ವಹಣೆ ವಿಷಯದಲ್ಲಿ ಅದು ಎಷ್ಟು ಸುಸ್ಥಿರವಾಗಿದೆ?
Equity ಸಂದರ್ಭಾನುಸಾರ ಸಮಾನತೆ	What is the ratio of female and male staff in your division level? *(The figures are to be validated using the physical attendance registers)* ನಿಮ್ಮ ವಿಭಾಗ ಮಟ್ಟದಲ್ಲಿ ಮಹಿಳಾ ಮತ್ತು ಪುರುಷ ಸಿಬ್ಬಂದಿಗಳ ಅನುಪಾತ ಎಷ್ಟು? Are there facilities such as separate toilets for men and women, canteen, lockers

| | etc. for the division staff?
ಸಿಬ್ಬಂದಿಗಳಿಗಾಗಿ ಕ್ಯಾಂಟೀನ್, ಲಾಕರ್, ಪುರುಷರು ಮತ್ತು ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಶೌಚಾಲಯ, ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳಿವೆಯೇ?

Does your depot undertake any gender-specific initiative (such as reserving a leadership position for women, deploying facilities such as separate changing/feeding rooms for women, menstrual hygiene management etc.)?
ನಿಮ್ಮ ಡಿಪೋ ಯಾವುದೇ ಲಿಂಗ-ನಿರ್ದಿಷ್ಟ ಉಪಕ್ರಮವನ್ನು ಕೈಗೊಳ್ಳುತ್ತದೆಯೋ (ಉದಾಹರಣೆಗೆ ಮಹಿಳೆಯರಿಗೆ ನಾಯಕತ್ವದ ಸ್ಥಾನವನ್ನು ಕಾಯ್ದಿರಿಸುವುದು, ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕ ಕೊಠಡಿಗಳು, ಮುಟ್ಟಿನ ನೈರ್ಮಲ್ಯ ನಿರ್ವಹಣೆ ಇತ್ಯಾದಿ ಸೌಲಭ್ಯಗಳನ್ನು ನಿಯೋಜಿಸುವುದು)?

What measures have you taken to ensure safety of women passengers travelling within your division buses?
ನಿಮ್ಮ ವಿಭಾಗದ ಬಸ್‌ಗಳಲ್ಲಿ ಮಹಿಳಾ ಪ್ರಯಾಣಿಕರ ಸುರಕ್ಷತೆಯನ್ನು ಖಚಿತಪಡಿಸಿಕೊಳ್ಳಲು ನೀವು ಕೈಗೊಂಡ ಕ್ರಮಗಳು ಯಾವುವು? |

21. ANNEXURE 7: QUESTIONNAIRE FOR RTC /NON-RTC PASSENGERS

ಆರ್‌ಟಿಸಿ ಪ್ರಯಾಣಿಕರು / ಆರ್‌ಟಿಸಿ ಅಲ್ಲದ ಪ್ರಯಾಣಿಕರಿಗೆ ಪ್ರಶ್ನಾವಳಿ

Date: (RTC/ Non-RTC)
ದಿನಾಂಕ: ಆರ್‌ಟಿಸಿ / ಆರ್‌ಟಿಸಿ

ಅಲ್ಲದ ಪ್ರಯಾಣಿಕ

Name of the passengers

S.No	Name of the passenger ಪ್ರಯಾಣಿಕರ ಹೆಸರು	Age ವಯಸ್ಸು	Occupation ಉದ್ಯೋಗ
1			
2			
3			
4			
5			
6			

Name of the Depot   (ಡಿಪೋ ಹೆಸರು)

Starting Time (ಆರಂಭದ ಸಮಯ)   :

Ending Time (ಮುಕ್ತಾಯದ ಸಮಯ)   :

Consent

Hello,

I am [Name] [designation]. I come from an agency called Athena Infonomics. We are currently evaluating the Karnataka State Transport Corporations (KSRTC, NWKRTC and NEKRTC) on behalf of Karnataka Evaluation Authority for the period between 2014-15 and 2019-20. Athena Infonomics will be conducting this study in 12 divisions across Karnataka (6 from KSRTC, 3 from NWKRTC and 3 from NEKRTC). We request you to provide us information on issues related to efficiency, effectiveness and sustainability of the transport services in your division. We will collate the information collected from you and present the

overall picture of the road transport system to KEA. We are committed to protecting your personal details and identity and will not reveal this confidential information. This survey will take about 20 to 25 minutes. We request for your permission and cooperation to conduct this survey. You can choose to stop at any point during the survey.

ನಮಸ್ಕಾರ,

ನಾನು [ಹೆಸರು] [ಹುದ್ದೆ]. ನಾನು ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಎಂಬ ಏಜೆನ್ಸಿಯಿಂದ ಬಂದಿದ್ದೇನೆ. ನಾವು ಪ್ರಸ್ತುತ ಕರ್ನಾಟಕ ರಾಜ್ಯ ಸಾರಿಗೆ ನಿಗಮಗಳನ್ನು (KSRTC, NEKRTC and NWKRTC) ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರದ (KEA) ಪರವಾಗಿ 2014-15 ಮತ್ತು 2019-20ರ ನಡುವಿನ ಅವಧಿಗೆ ಮೌಲ್ಯಮಾಪನ ಮಾಡುತ್ತಿದ್ದೇವೆ. ಅಥೇನಾ ಇನ್ಫೋನಾಮಿಕ್ಸ್ ಈ ಅಧ್ಯಯನವನ್ನು ಕರ್ನಾಟಕದಾದ್ಯಂತ 12 ವಿಭಾಗಗಳಲ್ಲಿ ನಡೆಸಲಿದೆ (ಕೆಎಸ್ಆರ್ಟಿಸಿಯಿಂದ 6, ಎನ್ಡಬ್ಲ್ಯೂಕೆಆರ್ಟಿಸಿಯಿಂದ 3 ಮತ್ತು ಎನ್ಇಕೆಆರ್ಟಿಸಿಯಿಂದ 3). ನಿಮ್ಮ ವಿಭಾಗದಲ್ಲಿನ ಸಾರಿಗೆ ಸೇವೆಗಳ ದಕ್ಷತೆ, ಪರಿಣಾಮಕಾರಿತ್ವ ಮತ್ತು ಸುಸ್ಥಿರತೆಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳ ಕುರಿತು ನಮಗೆ ಮಾಹಿತಿ ನೀಡುವಂತೆ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ. ನಿಮ್ಮಿಂದ ಸಿಕ್ಕ ಮಾಹಿತಿಯನ್ನು ನಾವು ಸಂಗ್ರಹಿಸುತ್ತೇವೆ ಮತ್ತು ರಸ್ತೆ ಸಾರಿಗೆ ವ್ಯವಸ್ಥೆಯ ಒಟ್ಟಾರೆ ಚಿತ್ರವನ್ನು ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಕ್ಕೆ ಪ್ರಸ್ತುತಪಡಿಸುತ್ತೇವೆ. ನಿಮ್ಮ ವೈಯಕ್ತಿಕ ವಿವರಗಳು ಮತ್ತು ಗುರುತನ್ನು ರಕ್ಷಿಸಲು ನಾವು ಬದ್ಧರಾಗಿದ್ದೇವೆ ಮತ್ತು ಈ ಮಾಹಿತಿಯನ್ನು ಬಹಿರಂಗಪಡಿಸುವುದಿಲ್ಲ. ಈ ಸಮೀಕ್ಷೆಯು ಸುಮಾರು 20 ರಿಂದ 25 ನಿಮಿಷಗಳನ್ನು ತೆಗೆದುಕೊಳ್ಳುತ್ತದೆ. ಈ ಸಮೀಕ್ಷೆಯನ್ನು ನಡೆಸಲು ನಿಮ್ಮ ಅನುಮತಿ ಮತ್ತು ಸಹಕಾರಕ್ಕಾಗಿ ನಾವು ವಿನಂತಿಸುತ್ತೇವೆ.

Would you like to participate in the interview?   Yes/ No

ಸಮೀಕ್ಷೆಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ನೀವು ಬಯಸುವಿರಾ? ಹೌದು /ಇಲ್ಲ

1. Introduction, ice-breaking and ethical declaration
ಪರಿಚಯ ಮತ್ತು ನೈತಿಕ ಘೋಷಣೆ

2. How often do you travel in RTC/private buses?
ನೀವು ಆರ್ಟಿಸಿ / ಖಾಸಗಿ ಬಸ್‌ಗಳಲ್ಲಿ ಎಷ್ಟು ಬಾರಿ ಪ್ರಯಾಣಿಸುತ್ತೀರಿ?

3. Did you face any challenges during your last trip? If yes, what were they?
ನಿಮ್ಮ ಕೊನೆಯ ಪ್ರವಾಸದ ಸಮಯದಲ್ಲಿ ನೀವು ಯಾವುದೇ ಸವಾಲುಗಳನ್ನು ಎದುರಿಸಿದ್ದೀರಾ? ಹೌದು ಎಂದಾದಲ್ಲಿ, ಅವು ಯಾವುವು?

4. How did you overcome those challenges?
ಆ ಸವಾಲುಗಳನ್ನು ನೀವು ಹೇಗೆ ಜಯಿಸಿದ್ದೀರಿ?

5. How effective are the RTC buses transport services in terms of timings?
    ನಿಮ್ಮ ಪ್ರಕಾರ, ಸಮಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಆರ್‌ಟಿಸಿ ಬಸ್‌ಗಳ ಸಾರಿಗೆ ಸೇವೆಗಳು ಎಷ್ಟು ಪರಿಣಾಮಕಾರಿಯಾಗಿವೆ?

6. How effective are the RTC buses transport services in terms of cleanliness?
    ನಿಮ್ಮ ಪ್ರಕಾರ, ಆರ್‌ಟಿಸಿ ಬಸ್‌ಗಳ ಸ್ವಚ್ಛತೆಯ ದೃಷ್ಟಿಯಿಂದ ಸಾರಿಗೆ ಸೇವೆಗಳು ಎಷ್ಟು ಪರಿಣಾಮಕಾರಿಯಾಗಿವೆ?

7. How effective are the RTC buses transport services in terms of safety?
    ನಿಮ್ಮ ಪ್ರಕಾರ, ಆರ್‌ಟಿಸಿ ಬಸ್‌ಗಳ ಸುರಕ್ಷತೆಯ ದೃಷ್ಟಿಯಿಂದ ಸಾರಿಗೆ ಸೇವೆಗಳು ಎಷ್ಟು ಪರಿಣಾಮಕಾರಿಯಾಗಿವೆ?

8. Do you have any particular suggestion to improve the service quality of the RTC buses? If yes, please elaborate.
    ಆರ್‌ಟಿಸಿ ಬಸ್‌ಗಳ ಸೇವೆಯ ಗುಣಮಟ್ಟವನ್ನು ಸುಧಾರಿಸಲು ನಿಮಗೆ ಯಾವುದೇ ನಿರ್ದಿಷ್ಟ ಸಲಹೆ ಇದೆಯೇ? ಹೌದು ಎಂದಾದಲ್ಲಿ, ದಯವಿಟ್ಟು ವಿಸ್ತಾರವಾಗಿ ತಿಳಿಸಿ.

22. ANNEXURE 8: CONSENT FORM

ATHENA
INFONOMICS

Consent to be participating in the interview

ಸಂದರ್ಶನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ಒಪ್ಪಿಗೆ

I, _____, consent to be interviewed on _____
by (insert date) by _____ (name of investigator) as part of the
evaluation of Karnataka road transport corporations (KSRTC,NWKRTC, NEKRTC) from
2014-15 to 2019-20, supported by Karnataka Evaluation Authority (KEA), Government of
Karnataka. .

I further authorize that this information can be published as part of the reports (presenting
project findings) that shall be published as a part of the KEA publications.

ನಾನು, _____, ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಬೆಂಬಲಿತವಾದ
ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಯ (ಕೆಇಎ) 'ಕರ್ನಾಟಕದ ರಸ್ತೆ ಸಾರಿಗೆ ಸಂಸ್ಥೆಗಳ (ಕೆಎಸ್ಆರ್ಟಿಸಿ,
ಎನ್ಡಬ್ಲ್ಯೂ ಕೆಆರ್ಟಿಸಿ, ಎನ್ಇಕೆಆರ್ಟಿಸಿ) ಮೌಲ್ಯಮಾಪನ'ದ ಭಾಗವಾಗಿ
_____(ತನಿಖಾಧಿಕಾರಿಯ ಹೆಸರಿನಿಂದ) ಸಂದರ್ಶನ ಮಾಡಲು ಒಪ್ಪಿಗೆ
ನೀಡುತ್ತೇನೆ. ಈ ಮಾಹಿತಿಯನ್ನು ವರದಿಗಳ ಭಾಗವಾಗಿ (ಪ್ರಾಜೆಕ್ಟ್ ಆವಿಷ್ಕಾರಗಳನ್ನು ಪ್ರಸ್ತುತಪಡಿಸುವುದು)
ಪ್ರಕಟಿಸಬಹುದೆಂದು ನಾನು ಮತ್ತಷ್ಟು ಅಧಿಕಾರ ನೀಡುತ್ತೇನೆ.

_____ _____ _____
____   ____   ____
Signature   *Name*   *Date*

_____ _____
____   _____
Mobile no.   *Email ID (if available)*

●●

ATHENA
INFONOMICS

Consent to be Photographed and Voice recording

<u>ಛಾಯಾಚಿತ್ರ ತೆಗೆಯಲು ಮತ್ತು ಧ್ವನಿ ರೆಕಾರ್ಡಿಂಗ್ ಮಾಡಲು ಒಪ್ಪಿಗೆ</u>

I, _____, consent to be photographed by _____ (name of investigator) while being interviewed as [part of the evaluation of Karnataka road transport corporations (KSRTC,NWKRTC, NEKRTC) from 2014-15 to 2019-20, supported by Karnataka Evaluation Authority (KEA), Government of Karnataka.

I further authorize that these photographs may be published as part of the reports (presenting project findings) that shall be published as a part of the KEA publications.

ನಾನು, _____, ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಬೆಂಬಲಿತವಾದ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರಯ (ಕೆಇಎ) 'ಕರ್ನಾಟಕದ ರಸ್ತೆ ಸಾರಿಗೆ ಸಂಸ್ಥೆಗಳ (ಕೆಎಸ್ಆರ್ಟಿಸಿ, ಎನ್ಡಬ್ಲ್ಯೂಕೆಆರ್ಟಿಸಿ, ಎನ್ಇಕೆಆರ್ಟಿಸಿ) ಮೌಲ್ಯಮಾಪನ'ದ ಭಾಗವಾಗಿ _____(ತನಿಖಾಧಿಕಾರಿಯ ಹೆಸರಿನಿಂದ) ಸಂದರ್ಶನದ ನಡುವಿನಲ್ಲಿ, ನನ್ನ ಛಾಯಾಚಿತ್ರ ತೆಗೆಯಲು ಒಪ್ಪಿಗೆ ನೀಡುತ್ತೇನೆ. ತೆಗೆದ ಚಿತ್ರಗಳನ್ನು ವರದಿಗಳ ಭಾಗವಾಗಿ (ಪ್ರಾಜೆಕ್ಟ್ ಆವಿಷ್ಕಾರಗಳನ್ನು ಪ್ರಸ್ತುತಪಡಿಸುವುದು) ಪ್ರಕಟಿಸಬಹುದೆಂದು ನಾನು ಮತ್ತಷ್ಟು ಅಧಿಕಾರ ನೀಡುತ್ತೇನೆ.

_____ _____ _____
____   ____   ____

Signature   *Name*   *Date*

_____ _____
____   _____

Mobile no.   *Email ID*

****
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23. ANNEXURE 9: DETAILS OF THE KICKOFF MEETING WITH KEA

Date of Meeting: 08th February 2021

Time of Meeting: 2:30 PM

Place of Meeting: Office of Karnataka Evaluation Authority, Government of Karnataka,

People present in the meeting

- Officials from KEA
- Officials from KSRTC
- Official from NEKRTC
- Official from NWKRTC
- Athena Team

Points were discussed during the meeting:

- KEA and the corporations expressed the expected quality of work from Athena team.
- It was mentioned that the Pre and Post COVID impact is to be captured in the report.
- An elaborate theory of change to be submitted along with the inception report.
- Official communication will be sent to concerned corporations from the side of KEA on data requirements.
- Pilot survey needs to be completed before submission of inception report.
- Athena team also shared the first list of data requirement during the meeting.

24. ANNEXURE 10: DEA AT STATE LEVEL

b. Data Preprocessing

Data cleaning exercises carried out prior to modelling and analysis are given below:

- RTCs that were missing one or more indicators to be used in the analysis were removed, except in cases where these values could be imputing from other existing information. This was the case for Tamil Nadu STC (Salem) Ltd., where MV taxes were imputed using the total taxes, because for most corporations it is over 90% of the total taxation incurred. The RTCs that were removed for missing data are:
  - Himachal RTC
  - North Bengal STC
  - Arunachal Pradesh ST
  - Puducherry Road Transport corp
  - West Bengal Surface Transport Corp.
  - Kolhapur MTU
  - Sholapur MT
  - Kalyan Dombivali MT
  - Himachal Pradesh TDCL
  - DELHI INTEGRATED MTS
  - MEERUT CITY TSL
  - KANPUR CITY TSL
- Pune Mahamandal, Delhi Transport Corporation and Nagaland State Transport were removed as outliers, with their inclusion making it very difficult to compare all the other RTCs.
- DEA requires that output variables are greater the better type and input variables are lesser the better type. For this reason, in some models that had lesser the better type variables as outputs, a large scalar β was added to the negatives of all the values in those columns to make all of them positive. In this way, the impact of the variable is revered, making it a 'greater the better type. The formula for this transformation is:

  aij*=- aij+ j

  where aij* is the transformed variable, aij is the original variable and j is the weight for the values in column j. This was done for 'Rate of Accidents per lakh km', 'Accident Compensation (in Lakhs)' and 'Age of fleet (in years)' (wherever utilised as an output).
- Due to some bugs in the analysis software, 0 values for 'Cost of Spares (in Lakhs)' and 'Motor Vehicle Tax (in Lakhs)' for some states were replaced by very low values of 0.01 (i.e. Rs. 1000) because model was throwing up an error.

l. Model Structure for State Level DEA

The combined table with the model structures at the state level is given below.

Table 34: DEA Model Structures (State Level)

Functional Head	Variable	Code	Nature (Input/Output)
Manpower	Average fleet operated: Average number of buses operated across the year	ABR	Input
	Staff strength: Average number of staff employed across the year	STR	Input
	Staff Ratio to Buses Held	SRB	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input
	Staff productivity: Average kms performed per staff per day	STP	Output
	Passenger carried: Number of passengers carried across the year (in Lakh)	PAC	Output
	Passenger carried per bus/day: Average number of passengers carried in a single bus per day	PAC BD	Output
Traffic Revenue	Average fleet held: Average number of buses held across the year	AFH	Input
	Staff strength: Average number of staff employed across the year	STR	Input
	Staff productivity: Average km performed per staff per day	STP	Input
	Vehicle productivity: Average km performed per bus per day	VHP	Input
	Passenger kilometres offered: Average number of seats times km performed (in Lakh)	PKM O	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input

	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Passenger carried per bus/day: Average number of passengers carried in a single bus per day	PAC BD	Output
	Traffic revenue: Revenue generated by running buses (in Rs. Lakh)	TRR	Output
Expenses	Staff cost: Total expenditure on staff (in Rs. Lakh)	STC	Input
	Fuel and lubricant cost: Total expenditure on fuel (in Rs. Lakh)	FUC	Input
	Cost of tyres and tubes and spares: Total expenditure on tyres and tubes (in Rs. Lakh)	TTC	Input
	Cost of spares: Total expenditure on spare parts (in Rs. Lakh)	SPC	Input
	Motor Vehicle Tax	MVT	Input
	Average fleet held: Average number of buses held across the year	AFH	Output
	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Staff strength: Average number of staff employed across the year	STR	Output
	Vehicle productivity: Average km performed per bus per day	VHP	Output
	Passenger kilometres performed: Number of passenger times km performed (in Lakh)	PKM P	Output
Maintenance	Staff cost: Total expenditure on staff (in Rs. Lakh)	STC	Input
	Cost of tyres and tubes and spares: Total expenditure on tyres and tubes (in Rs. Lakh)	TTC	Input
	Cost of spares: Total expenditure on spare parts (in Rs. Lakh)	SPC	Input
	Average fleet held: Average number of buses held across the year	AFH	Output

	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Average age of fleet: Average age of buses (in years)	AAF	Output
Road Safety	Average fleet held: Average number of buses held across the year	AFH	Input
	Average fleet operated: Average number of buses operated across the year	ABR	Input
	Average age of fleet: Average age of buses (in years)	AAF	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input
	Number of Accidents	NAC	Output
	Number of Fatal Accidents	NFAC	Output
	Accident Compensation	ACC	Output
Vehicle Operations	Average fleet held: Average number of buses held across the year	AFH	Input
	Passenger kilometres offered: Average number of seats times km performed (in Lakh)	PKMO	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input
	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Average age of fleet: Average age of buses (in years)	AAF	Output
	Vehicle productivity: Average km performed per bus per day	VHP	Output
	Passenger kilometres performed: Number of	PKM	Output

passengers times km performed (in Lakh)	P	
Passenger carried per bus/day: Average number of passengers carried in a single bus per day	PAC BD	Output

m. Peers of the Karnataka RTCs

In DEA, we also have a concept of 'peers' for inefficient DMUs, which are efficient DMUs that most closely resemble the inefficient DMU in terms of its outputs/inputs (depending on maximization or minimization). In addition, DEA assigns to each of the efficient peers a weighting which indicates just how the inefficient DMU should emulate its peers. Thus, a peer which is assigned a high weight (relative to the weights of the other efficient peers) is one which the inefficient DMU should most closely emulate. In the table below, we have the peers of the Karnataka corporations for each of the functional heads, arranged in the ascending order of their weights. Andhra Pradesh SRTC AND Navi Mumbai MT are among the most commonly appearing top-most peers for all the corporations, along with some of the Tamil Nadu corporations.

Table 55: Peers of Karnatak Corporations for each Functional Head

Corp	Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations
KSRTC	State Exp.TC TN Ltd., Andhra Pradesh SRTC	Bangalore MTC, Navi Mumbai MT, Andhra Pradesh SRTC		Thane MT, Kalyan Karnataka RTC, North Western Karnataka RTC	Navi Mumbai MT	TN STC (Villupuram) Ltd., Maharashtra SRTC
KKRTC		North Western Karnataka RTC, Navi Mumbai MT, Bangalore MTC, Andhra Pradesh SRTC			TN STC (Salem) Ltd., Navi Mumbai MT	TN STC (Salem) Ltd., TN STC (Villupuram) Ltd., Metro TC (Chennai) Limited, Kerala SRTC

| NWKRTC | TN STC (Madurai) Ltd., NEKRTC, Andhra Pradesh SRTC | | | | Navi Mumbai MT | TN STC (Salem) Ltd., TN STC (Villupuram) Ltd., Metro TC (Chennai) Limited, Kerala SRTC |

25. Annexure 11: DEA at Division Level

c. **Data Pre-processing**

Data cleaning exercises carried out prior to modelling and analysis are given below:

- Per Capita Income: Since it is available by district, we have assumed that people living in divisions within the same district will have equal per-capita income values.
- Area and Population: Since this data was available by district, it would be difficult to estimate what part of the area and population falls under multiple divisions in the same district. To avoid this setback, the value for population density has been used instead, combining both these indicators into one. An issue initially faced with this approach was that there were some divisions that covered multiple districts. This was solved by taking the average of the population densities of each of the districts to estimate the overall value for the division.
- All statistics calculated per day: calculated assuming operation on all days of the year.
- DEA requires that output variables are greater the better type and input variables are lesser the better type. For this reason, in some models that had lesser the better type variables as outputs, a large scalar β was added to the negatives of all the values in those columns to make all of them positive. In this way, the impact of the variable is revered, making it a 'greater the better type. The formula for this transformation is:

aij*=- aij+ j

where aij* is the transformed variable, aij is the original variable and j is the weight for the values in column j. This was done for 'Rate of Accidents per lakh km', 'Accident Compensation (in Lakhs)' and 'Age of fleet (in kms)' (wherever utilised as an output).

n. **Division Level Model Structure**

The combined table with the model structures at the division level is given below.

Table 33: DEA Model Structures (Division Level)

Functional Head	Variable	Code	Nature (Input/Output)
Manpower	Average fleet operated: Average number of buses operated across the year	ABR	Input
	Staff strength: Average number of staff employed across the year	STR	Input
	Staff Ratio to Buses Held	SRB	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input

	Staff productivity: Average kms performed per staff per day	STP	Output
	Passenger carried: Number of passengers carried across the year (in Lakh)	PAC	Output
	Passenger carried per bus/day: Average number of passengers carried in a single bus per day	PACBD	Output
Traffic Revenue	Average fleet held: Average number of buses held across the year	AFH	Input
	Staff strength: Average number of staff employed across the year	STR	Input
	Staff productivity: Average km performed per staff per day	STP	Input
	Vehicle productivity: Average km performed per bus per day	VHP	Input
	Passenger kilometres offered: Average number of seats times km performed (in Lakh)	PKMO	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input
	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Passenger carried per bus/day: Average number of passengers carried in a single bus per day	PACBD	Output
	Traffic revenue: Revenue generated by running buses (in Rs. Lakh)	TRR	Output
Expenses	Staff cost: Total expenditure on staff (in Rs. Lakh)	STC	Input
	Fuel cost: Total expenditure on fuel (in Rs. Lakh)	FUC	Input
	Cost of tyres, tubes and spares: Total expenditure on tyres and tubes (in Rs. Lakh)	TTC	Input

	Motor Vehicle Tax	MVT	Input
	Average fleet held: Average number of buses held across the year	AFH	Output
	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Staff strength: Average number of staff employed across the year	STR	Output
	Vehicle productivity: Average km performed per bus per day	VHP	Output
	Passenger kilometres performed: Number of passenger times km performed (in Lakh)	PKMP	Output
Maintenance	Staff cost: Total expenditure on staff (in Rs. Lakh)	STC	Input
	Cost of tyres, tubes and spares: Total expenditure on tyres and tubes (in Rs. Lakh)	TTC	Input
	Cost of battery and electrical items: Total expenditure on battery and electrical items (in Rs. Lakh)	BEC	Input
	Other consumbles	OTC	Input
	Cost of reconditioning (check for correlation)	REC	Input
	Average fleet held: Average number of buses held across the year	AFH	Output
	Average age of fleet: Average age of buses (in kms)	AAF	Output
	Vehicle productivity: Average km performed per bus per day	VHP	Output
	Fuel efficiency: KMPL for Diesel	FEF	Output
	Fleet Utilisation %	FUT	Output
Road Safety	Average fleet held: Average number of buses held across the year	AFH	Input
	Average fleet operated: Average number of buses operated across the year	ABR	Input

	Average age of fleet: Average age of buses (in years)	AAF	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input
	Rate of Accidents (per lakh km)	RAC	Output
	Accident Compensation	ACC	Output
Vehicle Operations	Average fleet held: Average number of buses held across the year	AFH	Input
	Passenger kilometres offered: Average number of seats times km performed (in Lakh)	PKMO	Input
	Population Density of Region Served (people per sq km)	PDN	Input
	Per Capita Income: Per capita income of the population residing in the region (in Rs.)	PCI	Input
	Average fleet operated: Average number of buses operated across the year	ABR	Output
	Average age of fleet: Average age of buses (in kms)	AAF	Output
	Vehicle productivity: Average km performed per bus per day	VHP	Output
	Passenger kilometres performed: Number of passengers times km performed (in Lakh)	PKMP	Output
	Passenger carried per bus/day: Average number of passengers carried in a single bus per day	PACBD	Output

o. **Division Level Peers as per Data Envelopment Analysis**

In DEA, we also have a concept of 'peers' for inefficient DMUs, which are efficient DMUs that most closely resemble the inefficient DMU in terms of its outputs/inputs (depending on maximization or minimization). In addition, DEA assigns to each of the efficient peers a weighting which indicates just how the inefficient DMU should emulate its peers. Thus, a peer which is assigned a high weight (relative to the weights of the other efficient peers) is one which the inefficient DMU should most closely emulate. In the following table, we have

the peer divisions, which are the reference divisions for efficient performance, for each of the inefficient divisions. If a particular division is efficient in a functional head, it will not have a peer and hence that box will be blank.

Table 56: Peers for each of the Karnataka Divisions

Corporation	Division	Div Code	Manpower	Traffic Revenue	Expenses	Maintenance	Road Safety	Vehicle Operations
KSRTC	Bangalore Central	BCT	CHM		HSP CHM	CHM HSP	KPL	DVG
KSRTC	Ramanagara	RMN	HUB CHM CHD	PTR BGK MNG MYU CHM BLV			BLL KPL CHD	BGK DVG VJP KB1 BLV
KSRTC	Tumkur	TMK	CHM BLV			CHB BLL KB1	KPL CHD VJP NKD	DVG NKD CHK HAS BGK
KSRTC	Kolar	KLR	HUB CHB BLV	DVG CID HAS BGK	BLL DWD KB2 MYU	CHB CHM BLL	KB2 KPL KB1 VJP	CID CHB DVG BGK
KSRTC	Chikkaballapura	CHB					KB1 KB2 VJP	
KSRTC	Mysuru Urban	MYU	HUB BLV			BLL CHB KB1 CHD	KPL DVG	
KSRTC	Mysuru Rural	MYR	CHB CHM		HSP CHD CHM	HSP RMN CHM	KPL KB1	CHB BGK
KSRTC	Mandya	MND	HUB CHM CHD		YDG BLL MYU DVG HVR KB2 CHD	BLL CHM CHD HSP	CHD KPL DVG	CHK HUB HAS DVG
KSRTC	Chamarajanagar	CHM					NKD CHD KB1	
KSRTC	Hassan	HAS	NKD CHM BLV HUB		DVG MYU RMN HVR CHM	CHB BDR BLL RMN	CHD NKD KPL	
KSRTC	Chikmagalur	CHK	NKD CHD CHM		HVR CHD BDR RMN CHM	CHD CHM CHB BLL		
KSRTC	Mangalore	MNG	CHM		HVR CHM	CHM BLL DVG	KPL	NKD MYU BGK

								DVG
KSRTC	Puttur	PTR	HUB CHM CHD		HVR CHM		KPL	NKD BGK MYU DVG
KSRTC	Davanagere	DVG	HUB CHB CHD CHM					
KSRTC	Shivamogga	SHG			BLL HSP CHD HVR	HSP BLL CHD	KPL NKD CHD KB1	
KSRTC	Chitradurga	CHD		CHM HAS DVG MND HUB				
NWKRTC	Belgavi	BLV			DWD KB2 HSP HVR BLL MYU	BLL	BDR VJP	
NWKRTC	Hubballi	HUB			CHD HSP DWD KB2 HVR	CHD BLL CHB	DVG YDG	
NWKRTC	Dharawad (Rural)	DWD	CHM HUB CHD	HUB MYU DVG BGK HAS		CHM CHB BLL PTR	DVG	HUB DVG MYU BLV
NWKRTC	North Kannada	NKD			MYU BDR CHD HVR RMN	BLL CID		
NWKRTC	Bagalkot	BGK	CHM BLV		KB2 HVR BLL MYU DVG HSP	CHB BLL CID	KPL YDG VJP	
NWKRTC	Gadag	GDG	HUB CHM CHB CHD VJP	CHM BGK CID NKD BLV	BLL DWD HVR HSP	BLL CHB CHM CHD	VJP YDG	KPL RCR CHB BLV NKD
NWKRTC	Chikodi	CID			MYU VJP YDG KB2 HVR		BDR KPL VJP	
NWKRTC	Haveri	HVR	CHB CHD CHM	DVG BGK CID CHM MYU		CHM BLL	YDG KPL KB2	CHD MYU DVG BLV CID NKD
NEKRTC	Kalaburagi-1	KB1	CHD CHB	MYU VJP MNG CHM				

NEKRTC	Kalaburagi-2	KB2	CHD CHB	CHB CID BGK				
NEKRTC	Yadgiri	YDG	CHD CHB	CHK CHM CHB DVG				
NEKRTC	Raichur	RCR	VJP CHD CHB	CHM VJP BLV	VJP HVR MYU DWD BLL HSP	CHM BLL HSP	KPL VJP	
NEKRTC	Bidar	BDR	HUB CHB CHD	CHM CHB VJP CID BLV				
NEKRTC	Koppal	KPL	CHD CHB	DVG CHM MYU BGK CID	BLL CHD DVG KB2 MYU			
NEKRTC	Ballari	BLL	HUB CHM CHD	MNG NKD CHM HUB MYU				
NEKRTC	Vijayapur	VJP						
NEKRTC	Hospet	HSP	HUB CHM CHD	CHB BGK DVG PTR CHK			BLL KPL DVG	KPL NKD SHG KB2 DVG

Most frequent Peers	CHM 16, CHD 16, HUB 12	CHM 10, BGK 8, DVG 7	HVR 13, MYU 9, BLL 8, HSP 8	BLL 16, CHM 10, CHB 9	KPL 16, VJP 8, CHD 6	DVG 16, NKD 6, BGK 6

EVALUATION OF KARNATAKA STATE ROAD TRANSPORT CORPORATIONS (KSRTC, NWKRTC AND KKRTC) FROM 2014-15 TO 2019-20