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VEHICLE REPLACEMENT POLICY IN A PUBLIC SECTOR TRANSPORT UNDERTAKING- A CASE STUDY OF APSRTC

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ABSTRACT
Public transport undertakings like APSRTC is facing competition compelling to provide the passenger transport services to the citizens of state at competitive prices with reasonable good quality of services.

Bus replacement policy is a vital and strategic decision for any fleet owning organisations.

In a passenger public transport organisation like APSRTC economical operation of services is a part of the corporation objectives. To meet this part of the corporation objective, fleet replacement at the age /time which meets economic objective plays a vital role for not only cost, but also quality services to passengers, thereby maximising the passenger traffic revenue.

In this context, to find out the economical age of a bus, in terms of total kilometers operated from the date of its commencement, at which the bus has to be scraped/replaced with new bus, with minimum total running cost keeping the existing system of maintenance standards and operating conditions in view. The replacement study is made based on Operations research technique.

SUMMARY OF THE PAPER: The vehicle scrap and replacement age worked out utilising the vehicle wise live data pertaining to 20% of the corporation fleet of the selected category, is arrived between 9 to 10 lakhs kilometers. The exact age may be based on physical condition of the individual vehicle coupled with economy of the repairs cost. It is understood from the study that beyond that age it will be uneconomical to run the bus. This is against the existing policy of vehicle replacement at 12 lakhs kilometers age, which is based on the physical condition of certain sample number of vehicles coupled with feedback from the field managers which is prevailing in the APSRTC.The constraints such as availability of funds, interest on capital, obsolescence of technology / vehicle models are also to be considered while deciding the vehicle replacement policy.

KEYWORDS : Corporation objectives, Economical life, vehicle productivity, Present worth factor, Average annual cost, Vehicle reliability

1. ABOUT APSRTC

The origin of APSRTC dates back to June 1932, when it was first established as NSR-RTD (Nizam state Rail and Road Transport Department), as a wing of NIZAM state Railways in the erstwhile Hyderabad state with 27 buses and 166 employees.

The NSR-RTD was transformed as APSRTC w.e.f. 11-1-1958, as per the RTC Act 1950, in the form of state public sector undertaking.

Up on the division of Andhra Pradesh state wef from 2-6-2014, as Andhra Pradesh and Telangana states, APSRTC is providing its services to 13 districts of Andhra Pradesh.

The objectives of APSRTC is to provide adequate, efficient, economical and properly coordinated road transport facility for the public in the state of Andhra Pradesh and on the routes extending into other neighboring states as per need.

APSRTC is an organisation committed to the man on the road of society at large and owns a fleet of 12256 buses covering 44.49 lakhs kilometers, transporting 62.78 lakhs passengers per day.

FLEET STRENGTH AND TYPES OF BUSES IN APSRTC

In APSRTC different makes and different types of buses are available. The fleet is distributed and operated from 126 depots, across the state of Andhra Pradesh. A depot is a unit from where buses are maintained and operated. The type wise fleet strength as on 31-3 2016 is given below.

S.NO.	TYPE	CORPORATION OWN BUSES		HIRED BUSES	
		CORPORATION	KADAPA ZONE	CORPORATION	KADAPA ZONE
1	AC BUSES	228	24	NIL	NIL
2	SUPER LUXURY	1348	405	49	NIL
3	DELUX/ULTRA DELUX	629	115	49	NIL
4	EXPRESS	1478	523	797	185
5	TELUGU VELUGU (ORDINARY)	4363	1140	1397	291
6	CITY TYPE	1269	NIL	163	NIL
7	GHAT ROAD BUSES	486	NIL	NIL	NIL
	TOTAL	9801	2207	2455	476

Note: - HIRED BUSES are the Buses which are hired from private entrepreneurs, owned and maintained by the entrepreneurs. These are operated by APSRTC on the routes, with certain scheduled kilometers as mutually agreed terms and conditions.

2. VEHICLE REPLACEMENT

A vehicle can continue to be in operation, if necessary attention is paid to its maintenance. However, operating cost increases with the age and it is an accepted fact that beyond certain stage it would be uneconomical to operate a vehicle. Hence replacement of vehicle is on economic considerations.

The significant changes in the following factors influence the economic life of a vehicle.

- Increase in the cost of chassis and Bus body.
- Changes in the design of vehicles which results in changes in reliability and/or durability of vehicle.
- Increase in cost of spares
- Changes in resale value of vehicle. However big organization like APSRTC with large number of fleet resale of vehicle on road condition before its full economic life is practically not possible due to various reasons.
- Changes in the road conditions, operating conditions, greatly affect the economic life of vehicles.

3. PRESENT REPLACEMENT POLICY

The vehicle replacement policy is broadly classified into two types

- To replace special type buses i.e. Super Luxury, Deluxe/Ultra Deluxe, Express types with new ones and the replaced buses are converted as Telugu Velugu(Ordinary) buses.
- To replace the old buses which were covered the stipulated kilometers of operation as per the replacement policy, which are found not road worthy for operation and beyond economical repairs based on physical condition of buses. The replaced buses will be scrapped.

The replacement policy i.e. The stipulated kilometers to be covered to replace and scrap will be decided based on the technological advancement, improvement in maintenance standards and practices.

The procedure being followed in APSRTC is

- A committee of senior level managers from Mechanical engineering department, Operations department and Financial department is constituted.

- The committee will inspect sizeable number of buses of different types on physical condition of buses and are covered around stipulated kilometers as per the existing replacement policy.
- The committee also take views of field managers
- Then the committee will examine all the relevant data, examine / review the existing policy and submit the recommendations on the replacement policy proposed to adopt in place of the existing policy.

The present replacement policy in APSRTC is
i. Super Luxury buses to replace at -- 6.5 Lakhs kilometers
ii. Deluxe and Express type buses at – 7.5 Lakhs Kilometers
iii. Telugu velugu (Ordinary) Type buses at –12 Lakhs kilometers

MERITS OF THE PROPOSED REPLACEMENT POLICY OVER THE EXISTING POLICY

As described above, the existing policy of vehicle replacement is aiming in reviewing and revising the vehicle scrapping/ replacement age, mostly upwards and suggesting vehicle life improving strategies. The aspect of economic criteria in terms of the cost on vehicle maintenance, Operation of buses, vehicle productivity, reliability is not being taken into consideration, while recommending the vehicle replacement policy.

The proposed policy is addressed the lapses of the existing policy and is based on the proven scientific technique of Operations research.

4. PROPOSED REPLACEMENT POLICY
4.1 Objective of the proposed Replacement policy.

The objective of the study is to find out the economical age in terms of total kilometers operated from the date of its introduction, of the fleet (Buses), with minimum total cost i.e. operating, maintenance, depreciation, miscellaneous, over heads and average capital cost, at which it has to be scraped/replaced with new buses, keeping the existing system of maintenance standards and operating conditions in view.

The proposed replacement is based on Operations research technique. Replacement of assets / items whose maintenance cost increases and efficiency decreases with time, taking the time value of money into consideration, aiming to meet the corporation objectives of economic operation of bus services. and also quality services to passengers, there by maximising the passenger traffic revenue.

4.2 Methodology

As discussed above, replacement of special type buses at middle age with new bus and the old bus is translated as Telugu velugu (Ordinary) type, is to give preference to long distance travelling passengers and to earn more revenue. But the ultimate replacement of bus is after scrapping at stipulated kilometers of operation to meet the objective of economic operation. The present study is to find the age of buses at which the bus is to be scrapped and replaced with new bus.

The total vehicle running cost includes, Maintenance, Operation, Depreciation cost, miscellaneous and Overhead costs have to be computed, for each age of the vehicles, based on the cost data available in the profit and loss accounts records, worked out by financial department of the Corporation. The data of vehicle reliability i.e. number of break downs, number of garage repairs (RGs) over the different age of the vehicles is considered, in computing the cost on maintenance, work shop services.

The sampling technique adopted if non-probabilistic and convenience sampling. The sample size is 20% of the total fleet, covering vehicles of different ages

4.3 Data Collected

The nature of the Data is secondary data, taken from the performance records / computerised program out puts. The data pertaining to 2107 buses in respect of Vehicle wise age in kilometers and operated kilometers during financial year 2015-16 is collected.

Total expenditure of the three districts as per profit & loss statement worked out by accounts department is taken.

Data on chassis cost and bus body construction cost, reliability data of vehicle enroute breakdowns, Garage repairs (RGs) extracted from the records.

4.4 Data Processing & Analysis

The data of vehicle wise operated kilometers for a period of one year is sorted out and classified According to the vehicle age in lakh kilometers in the range of one lakh kilometers. All the vehicles(Buses) irrespective of type are grouped according to the age in kilometers, in the range of one Lakh kilometers. The average vehicle utilisation (AVU) is computed for each group of vehicles.

It is a known fact that new vehicles will be operated on long distance routes, with more vehicle kilometers per day. The down time of vehicles in new stage is negligible. hence vehicle productivity (AVU)i.e., Average vehicle utilisation per day is on high side.

As the vehicle age is progressing, the vehicle becomes older and Average vehicle utilisation(AVU) will come down, owing to the more down time, more maintenance time.

The statement showing number of buses, average age in terms of kilometers operated, and average operated kilometers, AVU of each age group is shown below.

VEHICLE SAMPLE DATA-SUMMARY

S.NO.	AGE GROUP(Lakh KMs)	NO.OF BUSES	AVG. AGE(KMs)	AVG OPTD.KMs	AVU (KMs)	TYPE WISE NO. OF BUSES			
						SLX	DELUXE	EXP	TVG
1	Below 1	20	0.64	63965	474	5	0	15	0
2	Ab.1 upto 2	267	1.73	158778	459	59	0	128	80
3	Ab.2 upto 3	371	2.35	163076	447	125	0	218	28
4	Ab.3 upto 4	125	3.48	157774	435	43	2	78	2
5	Ab.4 upto 5	64	4.45	152992	419	56	5	3	0
6	Ab.5 upto 6	44	5.64	147746	405	13	23	5	3
7	Ab.6 upto 7	162	6.60	143965	394	46	43	25	48
8	Ab.7 upto 8	204	7.51	141849	389	19	21	29	135
9	Ab.8 upto 9	212	8.52	140696	385	0	13	2	197
10	Ab.9 upto 10	211	9.46	138863	380	0	2	2	207
11	Ab.10 upto 11	110	10.48	115790	317	0	0	0	110
12	Ab.11 upto 12	139	11.51	99055	271	0	0	0	139
13	Ab.12 upto 13	104	12.47	94740	260	0	0	0	104
14	Ab.13 upto 14	54	13.40	91029	249	0	0	0	54
15	Ab.14	20	14.85	88015	241	0	0	0	20
	TOTAL	2107				366	109	505	1127
	AVERAGE		7.54	126556	368				

NOTE:-

(1) AVG AGE is Average number of kilometers operated by a bus from the date of its commencement
(2) AVG .OPTD.KMs is Average number of kilometers run by a bus FOR a period of one year
(3) AVU (KMs) is average number of kilometers operated by a bus in a day of 24 hours during A year
(4) SLX is Super Luxury type Bus
(5) DLX is DELUX/ULTRA DELUX Type Bus
(6) EXP is Express type of bus

5. EXPENDITURE ANALYSIS

The expenditure to run the bus is broadly classified as follows

(1) Operating cost
(a) Personnel cost of operating staff
(b) Fuel cost
(c) Tyres cost

(2) Maintenance cost
(a) personnel cost on maintenance staff
(b) Spares & Lubricants cost
(c) Work shop cost

(3) Miscellaneous costs like electricity & water charges, sweeping& cleaning charges, buildings maintenance, telephone Charges, legal expenses, etc.

(4) **Overhead cost** i.e. Regional overhead cost, Zonal overhead cost, Head office overhead cost

(5) Depreciation cost
Cost on Motor vehicle tax, Interest on capital are not taken for computation of annual average cost of vehicle, as these are not relevant on either age, operating as well as maintenance costs of vehicles. Out of the above costs except Fuel, and Tyres all other costs are incurred per vehicle over a period and little relevance on vehicle productivity (AVU), i.e. fixed nature. Hence cost per kilometer (CPK) is lower side if AVU is high, obviously for new or less aged vehicles. As the AVU is falling down due to progress in vehicle age in terms of kilometers, the unit cost i.e., cost per kilometer (CPK) will increase.

In case of cost on fuel (HSD OIL) and tyres the age of the vehicle is little relevance and more depends upon Road condition, operating conditions, driving habits and quality of vehicle maintenance. As the vehicle sub-units like Engine. Fuel injection equipment, injectors, Axles, Gear box, propeller shafts, self-starter, Alternator are replaced with overhauled units, the fuel performance in terms of number of kilometers operated per liter of HSD oil consumption and tyre life in term of kilometers run by a tyre may get better performance irrespective of age of the vehicle.

The depreciation cost is taken as per the corporation policy using the formula for arriving the total cost in the replacement model.

Depreciation cost = (Cost of the vehicle/ assumed life as approved by the state Government (6.5 lakh KMs)) multiplied by the operated kilometers for the year under consideration.

The expenditure data is shown below

EXPENDITURE STATEMENT OF KADAPA ZONE : 2015-16

S.NO.	PARTICULARS	UOM	AMOUNT	CPK(Rs)	CPB(Rs)
1	FLEETHELD	NO	2204		
2	KMs OPERATED	Lakhs	2777.41		
3	A V U	KMs	368		
4	OPERATING COST				
4.1	PERSONNEL	Rs.Lakhs	35095.30	12.64	4650
4.2	POWER	Rs.Lakhs	28247.80	10.17	3743
4.3	TYRES	Rs.Lakhs	2049.71	0.74	272
	TOTAL OPERATING COST		65392.81	23.54	8664
5	MAINTENANCE COST				
5.1	PERSONNEL	Rs.Lakhs	10031.74	3.61	1329
5.2	WORK SHOP	Rs.Lakhs	1408.07	0.51	187
5.3	SPARES & LUBRICANTS	Rs.Lakhs	2476.32	0.89	328
	TOTAL MAINTENANCE COST		13916.13	5.01	1844
6	DEPRECIATION	Rs.Lakhs	3606.33	1.30	478
7	MISCELLANEOUS	Rs.Lakhs	3576.09	1.29	474
8	OVER HEADS				
8.1	REIONAL OFFICE	Rs.Lakhs	1434.23	0.52	190
8.2	ZONAL OFFICE	Rs.Lakhs	1393.30	0.50	185
8.3	HEAD OFFICE	Rs.Lakhs	1014.60	0.37	134
	TOTAL OVE HEADS		3842.13	1.38	509
	TOTAL		90333.49	32.52	11969
Note:-	(1) CPK is cost per kilometer operation of bus				
	(1) CPB is cost per bus per day				

6. COMPUTATION OF AVERAGE TOTAL COST PER BUS FOR OPERATING ONE LAKH KILOMETERS

As stated above the CPK on operation, maintenance, Depreciation, miscellaneous and overheads is worked out for each age group of vehicles, shown at Annexure -1 to 4

Annexure-1
AGE WISE OPERATING COST

Anexure-2 (Operating cost table)

S.NO.	AGE (Lakh KMs)	AVU	PERSONNEL CPB	PERSONNEL CPK	POWER CPB	POWER CPK	TYRES CPB	TYRES CPK	TOTAL CPB	TOTAL CPK
1	< 1	474	4650	9.81	4821	10.17	351	0.74	9821	20.72
2	1 to 2	459	4650	10.13	4668	10.17	340	0.74	9658	21.04
3	2 to 3	447	4650	10.40	4546	10.17	331	0.74	9527	21.31
4	3 to 4	435	4650	10.69	4424	10.17	322	0.74	9396	21.60
5	4 to 5	419	4650	11.10	4261	10.17	310	0.74	9221	22.01
6	5 to 6	405	4650	11.48	4119	10.17	300	0.74	9069	22.39
7	6 to 7	394	4650	11.80	4007	10.17	292	0.74	8949	22.71
8	7 to 8	389	4650	11.95	3956	10.17	288	0.74	8894	22.86
9	8 to 9	385	4650	12.08	3915	10.17	285	0.74	8850	22.99
10	9 to 10	380	4650	12.24	3865	10.17	281	0.74	8796	23.15
11	10 to 11	317	4650	14.67	3224	10.17	235	0.74	8108	25.58
12	11 to 12	271	4650	17.16	2756	10.17	201	0.74	7607	28.07
13	12 to 13	260	4650	17.88	2644	10.17	192	0.74	7487	28.79
14	13 to 14	249	4650	18.67	2532	10.17	184	0.74	7367	29.58
15	> 14	241	4650	19.29	2451	10.17	178	0.74	7279	30.20
TOTAL		368	4650	12.62	3743	10.17	272	0.74	8665	23.52

MAINTENANCE COST (Anexure-2)

S.NO.	AGE GROUP (Lakh KMs)	AVU	PERSONNEL CPB	PERSONNEL CPK	WORK SHOP CPB	WORK SHOP CPK	SPARES&LUB CPB	SPARES&LUB CPK	TOTAL CPB	TOTAL CPK
1	< 1	474	863	1.82	0	0.00	213	0.45	1076	2.27
2	1 to 2	459	914	1.99	62	0.14	226	0.49	1202	2.62
3	2 to 3	447	1026	2.30	62	0.14	253	0.57	1341	3.00
4	3 to 4	435	1080	2.48	62	0.14	266	0.61	1408	3.24
5	4 to 5	419	1219	2.91	80	0.19	301	0.72	1600	3.82
6	5 to 6	405	1272	3.14	100	0.25	314	0.78	1686	4.16
7	6 to 7	394	1300	3.30	216	0.55	321	0.81	1837	4.66
8	7 to 8	389	1306	3.36	247	0.63	322	0.83	1875	4.82
9	8 to 9	385	1295	3.36	247	0.64	320	0.83	1862	4.84
10	9 to 10	380	1290	3.39	266	0.70	318	0.84	1874	4.93
11	10 to 11	317	1464	4.62	292	0.92	361	1.14	2117	6.68
12	11 to 12	271	1604	5.92	292	1.08	396	1.46	2292	8.46
13	12 to 13	260	1598	6.15	292	1.12	394	1.52	2284	8.78
14	13 to 14	249	1812	7.28	292	1.17	447	1.80	2551	10.24
15	> 14	241	1891	7.85	292	1.21	467	1.94	2650	11.00
TOTAL		368	1329	3.61	187	0.51	328	0.89	1844	5.01

Anexure-3
DEPRECIATION COST

S.NO.	AGE (Lakh KMs)	AVU	DEPRECIATION CPB(Rs)	DEPRECIATION CPK(RS)
1	< 1	474	1498	4.07
2	1 to 2	459	1451	3.94
3	2 to 3	447	1413	3.84
4	3 to 4	435	1375	3.74
5	4 to 5	419	1325	3.60
6	5 to 6	405	1280	3.48
7	6 to 7	394	1246	3.38
8	7 to 8	389	1230	3.34
9	8 to 9	385	1217	3.31
10	9 to 10	380	1201	3.26
11	10 to 11	317	1002	2.72
12	11 to 12	271	857	2.33
13	12 to 13	260	822	2.23
14	13 to 14	249	787	2.14
15	> 14	241	762	2.07
TOTAL		368	1164	3.16

TABLE-4

MISCELLANEOUS & OVER HEAD COSTS

S.NO.	AGE LakhKMs	AVU	MISCELLANEOUS CPB(Rs)	MISCELLANEOUS CPK(RS)	OVERHEADS CPB(Rs)	OVERHEADS CPK(RS)
1	< 1	474	474	1.00	509	1.07
2	1 to 2	459	474	1.03	509	1.11
3	2 to 3	447	474	1.06	509	1.14
4	3 to 4	435	474	1.09	509	1.17
5	4 to 5	419	474	1.13	509	1.21
6	5 to 6	405	474	1.17	509	1.26
7	6 to 7	394	474	1.20	509	1.29
8	7 to 8	389	474	1.22	509	1.31
9	8 to 9	385	474	1.23	509	1.32
10	9 to 10	380	474	1.25	509	1.34
11	10 to 11	317	474	1.50	509	1.61
12	11 to 12	271	474	1.75	509	1.88
13	12 to 13	260	474	1.82	509	1.96
14	13 to 14	249	474	1.90	509	2.04
15	> 14	241	474	1.97	509	2.11
	TOTAL	368	474	1.29	509	1.38

Based on the CPK, so arrived, for each age group, total cost to operate one lakh kilometers is worked out

ANNEXURE-5

TOTAL COST (Rs)

S.NO.	AGE GROUP (Lac KMs)	AVU (KMs)	OPERATING CPK	MAINTENANCE CPK	MISCELLANEOUS CPK	OVER HEADS CPK	DEPRECIATION CPK	TOTAL CPK
1	< 1	474	20.72	2.27	1.00	1.07	4.07	29.13
2	1 to 2	459	21.04	2.62	1.03	1.11	3.94	29.74
3	2 to 3	447	21.31	3.00	1.06	1.14	3.84	30.35
4	3 to 4	435	21.60	3.24	1.09	1.17	3.74	30.84
5	4 to 5	419	22.01	3.82	1.13	1.21	3.60	31.77
6	5 to 6	405	22.39	4.16	1.17	1.26	3.48	32.46
7	6 to 7	394	22.71	4.66	1.20	1.29	3.38	33.24
8	7 to 8	389	22.86	4.82	1.22	1.31	3.34	33.55
9	8 to 9	385	22.99	4.84	1.23	1.32	3.31	33.69
10	9 to 10	380	23.15	4.93	1.25	1.34	3.26	33.93
11	10 to 11	317	25.58	6.68	1.50	1.61	2.72	38.09
12	11 to 12	271	28.07	8.46	1.75	1.88	2.33	42.49
13	12 to 13	260	28.80	8.78	1.82	1.96	2.23	43.59
14	13 to 14	249	29.59	10.24	1.90	2.04	2.14	45.91
15	> 14	241	30.20	11.00	1.97	2.11	2.07	47.35
	TOTAL	368	23.53	5.01	1.29	1.38	3.16	34.37

The new vehicle cost i.e., chassis cost and bus body building cost is added to the cost arrived as above.

The data is tabled in the replacement model problem.

Present worth of future costs on maintenance, operation and other costs is also taken into account with interest rate of 10% per annum The Average Annual total cost i.e., operation, maintenance, depreciation, overheads, miscellaneous together with initial vehicle cost per one lakh kilometers operation is worked out for each age group of vehicles at and shown below:

Anexure-6

AVERAGE ANNUAL TOTAL COST FOR RUNNING 1 Lakh KMs

S.NO.	AGE (Lac KMs)	AVU (KMs)	CPK (Rs)	AMT. Rs.Lakhs	PWF	DISCOUNTED COST (Rs.Lacs)	CUMULATIVE	VEH. COST (Rs.Lacs)	TOTAL COST (Rs.Lacs)	CUM. PWF	AVG. COST (RS.Lacs)
1	< 1	474	29.13	29.14	1.0000	29.14	29.14	20.55	49.69	1.0000	49.69
2	1 to 2	459	29.74	29.74	0.9091	27.04	56.18	20.55	76.73	1.9091	40.19
3	2 to 3	447	30.35	30.35	0.8264	25.08	81.26	20.55	101.81	2.7355	37.22
4	3 to 4	435	30.84	30.83	0.7513	23.16	104.42	20.55	124.97	3.4868	35.84
5	4 to 5	419	31.77	31.77	0.6830	21.70	126.12	20.55	146.67	4.1698	35.17
6	5 to 6	405	32.46	32.46	0.6209	20.15	146.27	20.55	166.82	4.7907	34.82
7	6 to 7	394	33.25	33.25	0.5645	18.77	165.04	20.55	185.59	5.3552	34.66
8	7 to 8	389	33.55	33.55	0.5132	17.22	182.26	20.55	202.81	5.8684	34.56
9	8 to 9	385	33.69	33.68	0.4665	15.71	197.97	20.55	218.52	6.3349	34.50
10	9 to 10	380	33.93	33.93	0.4241	14.39	212.36	20.55	232.91	6.7590	34.46
11	10 to 11	317	38.08	38.08	0.3855	14.68	227.04	20.55	247.59	7.1445	34.65
12	11 to 12	271	42.48	42.48	0.3505	14.89	241.93	20.55	262.48	7.4950	35.02
13	12 to 13	260	43.59	43.60	0.3186	13.89	255.82	20.55	276.37	7.8136	35.37
14	13 to 14	249	45.92	45.92	0.2896	13.30	269.12	20.55	289.67	8.1032	35.75
15	> 14	241	47.35	47.35	0.2633	12.47	281.59	20.55	302.14	8.3665	36.11

Note: - PWF is present Factor at 10% interest rate

As per this, the Average total cost is decreasing with age till 9-10 lakh kilometers age. After 9-10 lakhs KMs age the total cost is increasing.

Hence at 9-10 lakhs KMs age of vehicle, the total cost is minimum, which is the age at which vehicle has to be replaced.

In light of the above, it is evident that in APSRTC with present standards of maintenance and other costs, bus has to replace at 9 to 10 Lakhs KMs of service to run the organization with economy and also to optimize revenue earning capacity of bus. It pertinent to mention that the scraping / Replacement of individual bus is based on physical condition and cost of repairs.

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