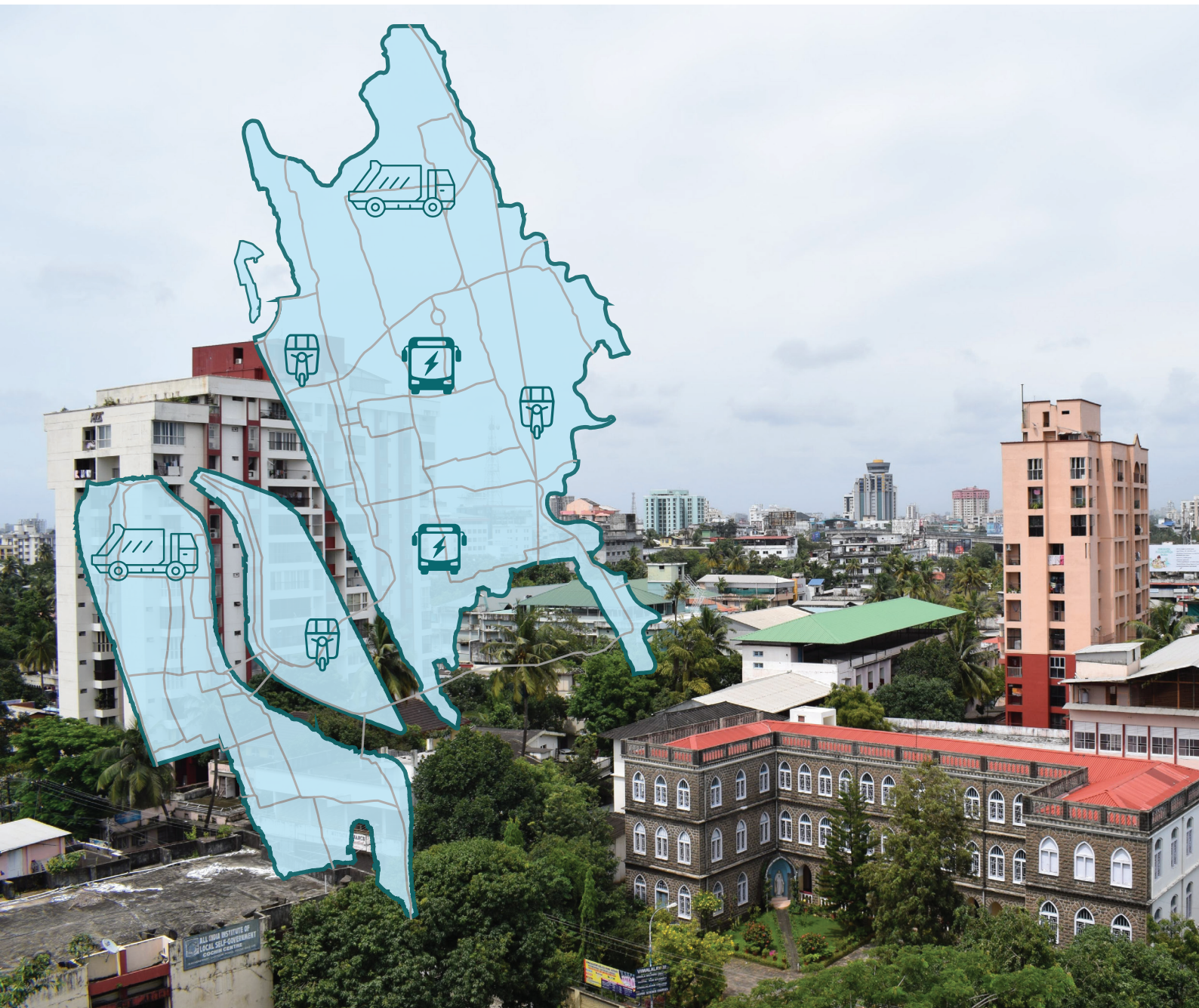




Financial strategy for Municipal fleet Electrification Kochi City



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Contents

1. Background:	4
2. Objective of engagement.....	4
3. Finances of Kochi Municipal Corporation	5
4. Future Vehicle Replacement Needs of Kochi Municipal Corporation	8
4.1. Replacement of Vehicles owned by the KMC by electric vehicles	8
4.2. Replacement of Vehicles currently hired by the KMC by electric vehicles	10
4.3. Additional vehicles required in future by the KMC and their electrification	10
5. Way Forward / Recommendations	11
6. Annexure	12
6.1. Annexure 1 – Information about age, type of vehicles owned by KMC	12
6.2. Annexure 2 – Price of E-Vehicles with Cost Escalation & amount required for replacement of vehicles	18

1. Background

Electric mobility revolution is gaining momentum in Indian cities and is being promoted by the central and the state governments through various incentives to reduce the country's reliance on fossil fuels and reduce greenhouse gas (GHG) emissions from the transport sector. Indian cities are also aiming to integrate sustainable and low emission alternatives in urban transport but long-term actions are required for mass adoption of e-mobility in Indian cities. Local governments can lead by example and set incremental goals to electrify their municipal fleets as one of the vehicle electrification steps.

With the same context, ICLEI South Asia embarked on an initiative to “Support Indian Cities in Taking Leadership on Electric Vehicles (EV)” to aid the cities to identify priority interventions and take necessary steps towards accelerated transition to EVs. This initiative included several interactions and discussions with the city stakeholders during visits to 10 project cities - Coimbatore, Gangtok, Kochi, Lakshadweep, Meerut, Nagpur, Panaji, Rajkot, Shimla and Surat. Consultations with the major stakeholders impacting EV transition in cities included advisory groups, industry experts including the advocacy group, charging infrastructure developers, vehicle technology/OEMs and financial institutions. As a part of the initiative, ICLEI South Asia team visited Kochi on 20th – 21st July, 2022 to interact with the stakeholders and understand the existing EV transition situation in the city, challenges, opportunities and further suggest a way forward.

The Kochi Municipal Corporation have a fleet that includes a mix of passengers as well as commercial vehicles. Many of the vehicles can be electrified in a phased manner. However, considering the technology risk and financial constraint, the transition should be planned in a phased manner to achieve long-term success as it relates to EV fleet transition. In the case of Kochi, the ability to move forward with EV purchases so quickly could only happen with the support of a comprehensive financial plan. To be prepared for the large number of EVs phased into the city fleet, a financial plan would be essential.

This document has been developed as a part of the above-mentioned initiative and aims to provide a guideline to city administration to achieve environmental sustainability by accelerated electric vehicle integration and its infrastructure development with city's existing vision. The document highlights the strategy of phased electrification of municipal fleet and support Kochi to achieve greater electric vehicle adoption.

2. Objective of engagement

The specific objectives of the assignment would be to:

- Validate and demonstrate the financial feasibility of the electrification of the current municipal fleet
- Suggest a staggered and year wise phase out plan for the existing municipal fleet
- Estimate year-wise financial plan to achieve fleet conversion for next 10 years
- Support cooperation among city governments to find out appropriate financial resources for fleet conversion.

The transition plan shall assist KMC to lead by example and set incremental goals to electrify their municipal fleets. The electrification shall include workplace charging at municipal buildings and thereby encouraging employees to drive EVs. It will help KMC to reduce both fleet emissions and operating costs while improving service to the community by replacing their fleet vehicles with EVs. The step includes:

1. Complete a Comprehensive Fleet Assessment:
 1. Collect data on current fleet usage (e.g., types and number of vehicles, common routes, fleet purchase policy).
 2. Complete a multi-year total cost of ownership analysis for each vehicle (vehicle cost, fuel, maintenance, insurance, etc).
 3. Update fleet purchasing policy to prioritize electric vehicles (if a vehicle is required).
2. Complete a multi-year total cost of ownership analysis for each vehicle (vehicle cost, fuel, maintenance, insurance, etc)

3. **Establish City Fleet Electrification targets** and replace conventional gas-powered vehicles when suitable EV options are available with equivalent operational capability.
4. Apply for electric vehicle purchase incentives and grants:
5. EV Charging Infrastructure:
 1. Evaluate charging requirements: Level 1, Level 2, DC fast charge
 2. Coordinate EV charger deployments with other departments.
 3. Partner with electric utilities to install EV charging infrastructure

3. Finances of Kochi Municipal Corporation

Finances of KMC indicate that it is not in a financial distress as out of past three years only in one year it has registered revenue deficit (see Table 1) but it is close to revenue deficit as it has very small revenue surplus (Operating Ratio of 0.97).

Finances of KMC are largely dependent on revenue and capital grants from the Gol and GoK as its own source revenue constitutes 40 % of revenue receipts and 35 % of the total receipts. Its revenue receipts constitute 77% of total income thus it receives 23 % receipts in the form of capital grants and borrowings. Similarly, its revenue expenditure constitutes more than 85 % of its total expenditure while capital expenditure constitutes less than 15 % of the total. This clearly indicates that KMC to some extent lags behind in spending its capital receipts on development.

The financial data analysis also indicates that own source tax and non-tax revenue has registered low annual growth rate this may be due to Covid 19 Pandemic. Even if it is so KMC need to work hard on its revenue front to achieve annual growth rate of at least 10 to 12 % that is in tune with national and state economy growth rate. Looking at the broad picture it seems that KMC will not have problem in funding replacement of its vehicles in future by electrical variants. Detailed analysis is as follows -

Table 1 - Financial Statement of KMC (Rs. in lacs)

Sr. No.	Heads / Particulars	Actual 2019-20	Actual 2020-21	Actual 2021-22	Average Growth Rate
1	Revenue Fund Opening Balance				
2	Capital Fund (Capital Grants / Loans unspent) Op. Bal				
3	Opening Balance (1+2)	4054.32	5751.29	9805.21	
	Revenue Receipts				
4	Property Tax Receipts	11487.44	11545.25	11579.59	
5	Other Tax / Fees Receipts	2599.80	3485.77	3717.53	
6	Municipal Own Tax Income (4+5)	14087.24	15031.02	15297.12	
7	Water & Sewerage User Charge	0	0	0	
8	Solid Waste Management Charge	80.00	12.78	10.76	
9	Other User Charges / Rent /interest/ sale revenue etc.	5089.21			
10	Municipal Own Non-tax income (7+8+9)	5169.21	3631.60	3284.15	
11	Municipal Own Total Income (6+10)	19256.45	18662.62	18581.27	

	Municipal Own Source Revenue as % of Revenue Income	40.3	34.4	43.2	
	Municipal Own Revenue as % of Total Income	35.8	30.4	38.1	
	Revenue Grants				
12	Central Finance Commission Grant	535.09	3718.80	737.72	
13	Any other revenue grant from Central Government				
14	Total Central Government Revenue Transfers (12+13)				
15	Assignments & devolutions/compensatory grants				
16	State Finance Commission Grant				
17	Total State Transfers (15+16)				
18	Total Revenue Grants (14+17)	26211.61	35589.08	24418.48	
	State Transfers % of Revenue Receipts				
	Central Transfers % of Revenue Receipts				
	Total Revenue Grants / Transfers as % of Revenue Receipts	54.9	65.6	56.8	
19	Total Revenue Receipts (11+18)	47732.25	54251.70	42999.75	
	Total Revenue Receipts as % of Total Receipts	88.7	88.4	75.0	
	Capital Receipts (use additional rows to provide details)				
20	Own Source Capital Receipts (Development Charge, Sale of FSI, Sale or Lease of Land etc.)				
21	Capital Grants Receipts under Central Schemes				
22	Capital Grants Receipts under State Schemes				
23	Borrowings	457.33	1000.00	583.84	
24	Capital Receipts (20+21+22+23)	6098.70	7121.23	14312.78	
	Total Capital Receipts as % of Total Receipts	11.3	11.6	25.0	
25	Total Municipal Receipts (19+24)	53830.95	61372.93	57312.53	
	Municipal Expenditure				
26	Salary Establishment Expenditure	10581.42	10327.50	12877.83	
27	Administrative Expenditure	1232.33	683.23	925.22	
28	Operation & Maintenance Expenditure	8549.99	7943.97	9946.41	
29	Loan interest and other finance charges paid		0		
	Revenue Expenditure Decentralised Plan Fund		21401.28	13708.92	
	Revenue Expenditure – State Sponsored Schemes		9177.97	4468.96	

30	Depreciation		0		
	Other expenditure				
31	Revenue Expenditure (26+27+28+29+30)	48550.78	49549.67	41968.15	
	Total Revenue Expenditure as % of Total Expenditure	93.1	86.4	78.0	
32	Capital Expenditure under Central Schemes				
33	Capital Expenditure under State Schemes				
34	Capital Expenditure from own funds				
	Capital Expenditure Total	3270.60		11853.65	
35	Loan Repayment	312.59	138.35		
36	Capital Expenditure (32+33+34+35)	3583.19	7759.35	11853.65	
	Total Capital Expenditure as % of Total Expenditure	6.9	13.6	22.0	
37	Total Municipal Expenditure (31+36)	52133.97	57319.02	53821.80	
38	Revenue fund Closing Balance (1+19 – 31)				
39	Capital Fund Unspent Closing Bal (2+24 – 36)				
40	Year End Closing Balance (3+25 – 37)	5751.29	9805.21	11824.14	
	Operating ratio	1.02	0.91	0.98	
	Revenue Surplus/Deficit (19-31)	-818.53	+4702.03	+1031.60	
	Capital Account surplus /Deficit (24 – 36)	+2515.51	-638.12	+2459.13	
	Fiscal Surplus/Deficit (25 – 37)	+1696.98	+4053.91	+3490.73	

4. Future Vehicle Replacement Needs of Kochi Municipal Corporation

Future vehicle replacement needs have been worked out under three heads 1. Replacement of Vehicles owned by the KMC; 2. Replacement of Vehicles hired by the KMC and 3. Additional Vehicles needed in future by KMC in the light of population, area and service quality improvement.

4.1. Replacement of Vehicles owned by the KMC by electric vehicles

Future vehicle replacement needs of vehicles owned by KMC has been worked out by collecting data about number, type and age of vehicles it has at present. For office vehicles 15 years age and for public works vehicles 20 years age has been assumed. It can be observed from the Table 2 (for details see Annexure 1) that in all KMC has 128 vehicles which mainly of three categories – office vehicles (Cars, Jeeps, SUVs), Health and Sanitation related (open and close tippers, refuse compactor, 3 and 4 wheelers, JCB and Ambulance). Barring three vehicles which were purchased in 1998 and have gone out of service, rest of the vehicles are purchased during belong to 2005 to 2018 period, so real vehicle replacement need is going to arise from 2026 onwards. It can be observed from the Table 2 that KMC will be required to replace only 16 vehicles in 2027 and 21 vehicles in 2028. The really large replacement of 68 vehicles is slated in 2033-34, thus there is some time for planning available for finding right kind of electric vehicles to replace existing vehicles and for arranging finances for the replacement.

Funding requirement for replacement of vehicles with electric variant has been worked out by taking present price and increasing it by 5 % per annum. It is possible that in future prices of electric vehicles as they get mainstreamed, they may go down and may not increase at assumed 5% growth per annum; but at the same time, it is also a fact that though with mainstreaming of technological innovation, price go down market brings in higher version of technology to maintain growth in pricing. So, prices of electric vehicle of present make and capacity may go down as it gets mainstreamed but then higher capacity e-vehicles will also become available with slight increase in prices and KMC being public body will require e-vehicles with higher capacity and of higher version so 5 % annual growth assumed is justified.

It can be observed from the Table 2 that KMC will require funds for replacement of vehicles as follows -

- 2023 - 24 Rs. 74 lacs (for replacement of three vehicles purchased in 1998)
- 2024 – 25 Rs. 13 lacs
- 2025 - 26 Rs. 241 lacs
- 2026 - 27 Rs. 1004 lacs
- 2027 – 28 Rs. 783 lacs

The funding requirement for replacement of existing vehicles by electric vehicles is very small/miniscule. Even if we compare future funding requirement with existing (not the future) revenue receipts of KMC then also it is less than 1 % thus there should not be any problem in future to fund replacement of vehicles owned by the KMC.

Table 2 - Existing Fleet of Vehicles and its future phasing out (Replacement need / requirements) and requirement of funds

Existing Fleet of Vehicles			Nos. Vehicles going out of operation due to age, usage kms and would require replacement and funds for it (Rs. in lakhs)															
Type of Vehicle	Nos.	Year of purchase	2023-24	Rs in lacs	2024-25	Rs in lacs	2025-26	Rs in lacs	2026-27	Rs in lacs	2027-28	Rs in lacs	2028-29	Rs in lacs	2029-30	Rs in lacs	2030-35	2035-40
Car	7	2009-10-11-14-18			1	13	1	14			1	15			1	17	3	
Scorpio, Jeep, Bollero, Sumo	16	1998-2010-11-12-	3	48			5	87	3	55	2	38					3	
Refuse Compactor	13	2014&17															10	3
Covered Tipper	22	2005-08			1	NA	1+1	140	13	949	7	462						
Open Tipper	2	2008									2	102						
APE 3 Wheeler	9	2008-14-17									2	10					4	3
APE 4 Wheeler	46	2008-14									2	24					44	
Jeep	1	2009											1	20				
Crew Van	5	2008-13-16									2	102					2	1
JCB	2	2007									1	NA					1	
Maruti van	4	2001-08-13	2	26							2	30						
Ambulance	1	2019															1	
Total	128		5	74	2	13	7	241	16	1004	21	783	1	20	1	17	68	7

4.2. Replacement of Vehicles currently hired by the KMC by electric vehicles

KMC spends around Rs. 200 lacs per year for fuel and O&M of the vehicles owned by it. While it spends around Rs. 900 lacs per year. In the light of such a high expenditure it is necessary that these vehicles should also be replaced in future by electric vehicles to achieve twin objective of climate protection and cost economy. It can be observed from the Table 3 that on average per day KMC hires 58 vehicles of 16 tones capacity, 5 Hitachi vehicles and JCBs for 16 hours a day.

Table 3 - Information about Vehicle hired by the KMC for service delivery

Vehicles hired during the month on per day basis (on an average 58 vehicles per day during the year)			On contract for whole year for the waste management facility and beach cleaning		Rented as per need for payment on hourly basis in a month		
Trucks (16 tones GVW)			Hitachi	5 vehicles	JCB	4 vehicles	
Month	Number	Cost (Rs.)	Month	Cost (Rs.)	Month	Number	Cost (Rs.)
Jan-22	1713	6071400	Jan-22	276277	Jan-22	396.30	1187348
Feb-22	1595	5662520	Feb-22	266935	Feb-22	382.90	1010654
Mar-22	1692	6012480	Mar-22	305487	Mar-22	438.20	1035452
Apr-22	1708	6065680	Apr-22	235354	Apr-22	337.60	634603
May-22	1797	6381480	May-22	368961	May-22	529.25	694419
Jun-22	1855	6583480	Jun-22	432366	Jun-22	627.80	635314
Jul-22	1931	6844040	Jul-22	437665	Jul-22	620.20	643669
Aug-22	1868	6622880	Aug-22	318035	Aug-22	456.20	618338
Sep-22	1704	6058320	Sep-22	289731	Sep-22	415.60	494973
Oct-22	1806	6418080	Oct-22		Oct-22	429.20	621360
Nov-22	1829	6502520	Nov-22		Nov-22	493.30	575320
Dec-22	1863	6606600	Dec-22		Dec-22	641.30	
Total	21361	75829480		2930811			8151451

The vehicles which are hired are large and at present electric options are not available to replace them but in future i.e. by the year 2025 it is possible that if not 16 ton vehicles but 8 ton capacity electric vehicles may becomes available, in such circumstances if it viable KMC should go for smaller capacity electric vehicles. If such vision and policy is adopted then it will not be difficult as investment in the vehicle fleet will be done by private player and even if private player is not ready then KMC should go for owning such electric vehicles.

4.3. Additional vehicles required in future by the KMC and their electrification

Inquiry with the KMC indicated that in coming five to seven years KMC will not be required to own or hire additional vehicles compare to existing vehicles it is owning or hiring. In support of this it provided a baseline study report for solid waste management prepared by International Urban Cooperation (IUC). In the light of this future requirement of vehicles for KMC and their electric replacement has not been worked out.

5. Way Forward / Recommendations

In the light of foregone analysis, it can be said that KMC has financial capacity to fund its future vehicles requirements whether they are conventional or electrical. Following are the recommendations to achieve optimum electrification of vehicles owned or hired by the KMC –

1. Out of 128 vehicles at present owned by KMC 51 vehicles will require replacement in next five years 2023 – 2027 as per present rules regarding age and scraping of the vehicles. KMC will be able to replace all these vehicles with electric variant and has necessary funds available for the same. So KMC should go with 100 % replacement of 51 vehicles (retiring in coming five years) by electric version.
2. There are 77 vehicles which will be falling due for replacement as present rules during the period 2030 to 2037 as these vehicles have been purchased during the period 2014 – 2017. KMC need to take real policy decision with regard to these 77 vehicles. If KMC decides to replace these vehicles with electric version when they become due for replacement in 2030 onwards then KMC will be able to achieve 100 % electrification of its vehicles only by 2035 / 2037. If KMC wish to achieve 100 % electrification of vehicles (owned or hired) by the KMC then KMC should auction its 77 vehicles in coming two to three years and should replace them with electric version. Auctioning these 77 vehicles which were purchased during 2014-2017 when they are in good condition is likely to achieve good price and will get replaced with electric version.
3. VMC at present hires on an average 58 vehicles of 16 tons capacity for solid waste management. Replacement of these vehicles by electric version should be carried out in next two to three years by giving appropriate time period to private sector to procure electric vehicles to supply it to KMC for operations. It is possible that 16 tones capacity electric version of vehicle may not be available at present but if 8 tones electric vehicles are available then such electric vehicles should be hired to achieve vision of 100 % electrification of KMC vehicles. While doing this private player who are supplying vehicles on rent to KMC should be given appropriate time to procure electric vehicles and to supply them on rent to KMC. It is recommended that while hiring electric vehicles to replace existing conventional vehicles a proper analysis of hiring cost/ rates should be done.

6. Annexure

6.1. Annexure 1 – Information about age, type of vehicles owned by KMC

HEALTH - WASTE DISPOSAL Vehicles					
Sr. No.		Reg. No.	Vehicle Type	Make	For Auction
COMPACTOR					
1	1	KL-07-CA-6145	Refuse Compactor	Eicher 2016 2014 model	2034
2	2	KL-07-CA-6601	Refuse Compactor	Eicher 2016 2014 model	2034
3	3	KL-07-CA-6619	Refuse Compactor	Eicher 2016 2014 model	2034
4	4	KL-07-CA-6662	Refuse Compactor	Eicher 2016 2014 model	2034
5	5	KL-07-CA-7491	Refuse Compactor	Eicher 2016 2014 model	2034
6	6	KL-07-CA-7503	Refuse Compactor	Eicher 2016 2014 model	2034
7	7	KL-07-CA-7527	Refuse Compactor	Eicher 2016 2014 model	2034
8	8	KL-07-CA-7534	Refuse Compactor	Eicher 2016 2014 model	2034
9	9	KL-07-CA-7537	Refuse Compactor	Eicher 2016 2014 model	2034
10	10	KL-07-CA-7571	Refuse Compactor	Eicher 2016 2014 model	2034
11	11	KL-07-CN-5350	Refuse Compactor	Asok Leyland 2017 model	2037
12	12	KL-07-CN-5396	Refuse Compactor	ASOK LEYLAND 2017 Model	2037
13	13	KL-07-CN-6028	Refuse Compactor	ASOK LEYLAND 2017 Model	2037
COVERED TIPPER					
14	1	KL-07-BA-6628	COVERED TIPPER	TATA1613 2005 model	2025
15	2	KL-07-BF-8601	COVERED TIPPER	EICHER 2007 model	2027
16	3	KL-07-BF-8604	COVERED TIPPER	EICHER 2007 model	2027
17	4	KL-07-BG-5552	COVERED TIPPER	TATA1613 2006 model	2026
18	5	KL-07-BG-5605	COVERED TIPPER	TATA1613 2007 model	2027
19	6	KL-07-BH-2086	COVERED TIPPER	EICHER 2007 model	2027
20	7	KL-07-BH-2104	COVERED TIPPER	EICHER 2007 model	2027

21	8	KL-07-BH-2814	COVERED TIPPER	EICHER 2008 Model	2028
22	9	KL-07-BH-2822	COVERED TIPPER	EICHER 2007 model	2027
23	10	KL-07-BH-5117	COVERED TIPPER	EICHER 2007 model	2027
24	11	KL-07-BH-5119	COVERED TIPPER	EICHER 2007 model	2027
25	12	KL-07-BH-5146	COVERED TIPPER	EICHER 2007 model	2027
26	13	KL-07-BH-5708	COVERED TIPPER	EICHER 2007 model	2027
27	14	KL-07-BH-5734	COVERED TIPPER	EICHER 2007 model	2027
28	15	KL-07-BH-9633	COVERED TIPPER	EICHER 2008 Model	2028
29	16	KL-07-BH-9635	COVERED TIPPER	EICHER 2008 Model	2028
30	17	KL-07-BH-9726	COVERED TIPPER	EICHER 2007 model	2027
31	18	KL-07-BH-9746	COVERED TIPPER	EICHER 2007 model	2027
32	19	KL-07-BJ-298	OPEN TIPPER	TATA 2008 model	2028
33	20	KL-07-BJ-445	OPEN TIPPER	TATA 2008 model	2028
34	21	KL-07-BJ-1561	COVERED TIPPER	TATA1613 2008 model	2028
35	22	KL-07-BJ-1582	COVERED TIPPER	TATA1613 2008 model	2028
36	23	KL-07-BJ-7375	COVERED TIPPER	TATA1613 2008 model	2028
37	24	KL-07-BJ-7417	COVERED TIPPER	TATA1613 2008 model	2028
APE 3-WHEELER					
38	1	KL-07-BJ-1297	3 Wheeler auto	PIAGGIO APE 2008 model	2028
39	2	KL-07-BJ-1345	3 Wheeler auto	PIAGGIO APE 2008 model	2028
40	3	KL-07-BZ-9798	3 Wheeler auto	PIAGGIO APE 2014 model	2034
41	4	KL-07-BZ-9863	3 Wheeler auto	PIAGGIO APE 2014 model	2034
42	5	KL-07-BZ-9876	3 Wheeler auto	PIAGGIO APE 2014 model	2034
43	6	KL-07-BZ-9983	3 Wheeler auto	PIAGGIO APE 2014 model	2034
44	7	KL-07-CK-9576	3 Wheeler auto	MAHINDRA ALFA 2017	2037
45	8	KL-07-CK-9591	3 Wheeler auto	MAHINDRA ALFA 2017model	2037
46	9	KL-07-CK-9622	3 Wheeler auto	MAHINDRA ALFA 2017 model	2037

APE 4 WHEELER					
47	1	KL-07-CA-8890	4 Wheeler auto	PIAGGIO APE 2014 model	2034
48	2	KL-07-CA-8906	4 Wheeler auto	PIAGGIO APE 2014 model	2034
49	3	KL-07-CA-8947	4 Wheeler auto	PIAGGIO APE 2014 model	2034
50	4	KL-07-CA-8969	4 Wheeler auto	PIAGGIO APE 2014 model	2034
51	5	KL-07-CA-9062	4 Wheeler auto	PIAGGIO APE 2014 model	2034
52	6	KL-07-CA-9089	4 Wheeler auto	PIAGGIO APE 2014 model	2034
53	7	KL-07-CA-9128	4 Wheeler auto	PIAGGIO APE 2014 model	2034
54	8	KL-07-CA-9134	4 Wheeler auto	PIAGGIO APE 2014 model	2034
55	9	KL-07-CA-9137	4 Wheeler auto	PIAGGIO APE 2014 model	2034
56	10	KL-07-CA-9198	4 Wheeler auto	PIAGGIO APE 2014 model	2034
57	11	KL-07-CA-9200	4 Wheeler auto	PIAGGIO APE 2014 model	2034
58	12	KL-07-CA-9268	4 Wheeler auto	PIAGGIO APE 2014 model	2034
59	13	KL-07-CA-9286	4 Wheeler auto	PIAGGIO APE 2014 model	2034
60	14	KL-07-CA-9330	4 Wheeler auto	PIAGGIO APE 2014 model	2034
61	15	KL-07-CA-9632	4 Wheeler auto	PIAGGIO APE 2014 model	2034
62	16	KL-07-CA-9853	4 Wheeler auto	PIAGGIO APE 2014 model	2034
63	17	KL-07-CA-9869	4 Wheeler auto	PIAGGIO APE 2014 model	2034
64	18	KL-07-CB-57	4 Wheeler auto	PIAGGIO APE 2014 model	2034
65	19	KL-07-CB-115	4 Wheeler auto	PIAGGIO APE 2014 model	2034
66	20	KL-07-CB-126	4 Wheeler auto	PIAGGIO APE 2014 model	2034
67	21	KL-07-CB-132	4 Wheeler auto	PIAGGIO APE 2014 model	2034
68	22	KL-07-CB-244	4 Wheeler auto	PIAGGIO APE 2014 model	2034
69	23	KL-07-CB-337	4 Wheeler auto	PIAGGIO APE 2014 model	2034
70	24	KL-07-CB-436	4 Wheeler auto	PIAGGIO APE 2014 model	2034
71	25	KL-07-CB-650	4 Wheeler auto	PIAGGIO APE 2014 model	2034
72	26	KL-07-CB-1382	4 Wheeler auto	PIAGGIO APE 2014 model	2034

73	27	KL-07-CB-1398	4 Wheeler auto	PIAGGIO APE 2014 model	2034
74	28	KL-07-CB-1437	4 Wheeler auto	PIAGGIO APE 2014 model	2034
75	29	KL-07-CB-1472	4 Wheeler auto	PIAGGIO APE 2014 model	2034
76	30	KL-07-CB-1480	4 Wheeler auto	PIAGGIO APE 2014 model	2034
77	31	KL-07-CB-1713	4 Wheeler auto	PIAGGIO APE 2014 model	2034
78	32	KL-07-CB-1725	4 Wheeler auto	PIAGGIO APE 2014 model	2034
79	33	KL-07-CB-1750	4 Wheeler auto	PIAGGIO APE 2014 model	2034
80	34	KL-07-CB-1864	4 Wheeler auto	PIAGGIO APE 2014 model	2034
81	35	KL-07-CB-1895	4 Wheeler auto	PIAGGIO APE 2014 model	2034
82	36	KL-07-CB-2081	4 Wheeler auto	PIAGGIO APE 2014 model	2034
83	37	KL-07-CB-2206	4 Wheeler auto	PIAGGIO APE 2014 model	2034
84	38	KL-07-CB-2594	4 Wheeler auto	PIAGGIO APE 2014 model	2034
85	39	KL-07-CB-2643	4 Wheeler auto	PIAGGIO APE 2014 model	2034
86	40	KL-07-CB-2789	4 Wheeler auto	PIAGGIO APE 2014 model	2034
87	41	KL-07-CC-1757	4 Wheeler auto	PIAGGIO APE 2014 model	2034
88	42	KL-07-CC-1759	4 Wheeler auto	PIAGGIO APE 2014 model	2034
89	43	KL-07-CC-1867	4 Wheeler auto	PIAGGIO APE 2014 model	2034
90	44	KL-07-CC-1877	4 Wheeler auto	PIAGGIO APE 2014 model	2034
91	45	KL-07-BJ-245	4 Wheeler auto	PIAGGIO APE 2008 model	2028
92	46	KL-07-BJ-304	4 Wheeler auto	PIAGGIO APE 2008 model	2028
JEEP					
93	1	KL-07-BM-4632	MAHINDRA	JEEP 2009 model	2029
CREW VAN					
94	1	KL-07-BH-9763	CREW CAB	TATA 2008 model	2028
95	2	KL-07-BH-9788	CREW CAB	TATA 2008 model	2028
96	3	KL-07-BY-7556	CREW CAB	MAHINDRA 2013 model	2033
97	4	KL-07-BY-7621	CREW CAB	MAHINDRA 2013 model	2033

98	5	KL-07-CG-1363	ABC PROGRAMME	MAHINDRA BOLERO CAMPER PS 2 WD 2016 model	2036
JCB					
99	1	KL-07-BZ-1758	EARTH MOVER	JCB 2DX BACK HOU LOADER 2013 model	2033
100	2	KL-07-BH-4378	MAHINDRA	TRACTOR 2008 model	2028
Corporation – Office Vehicles					
101	1	KL-07-CN-8369	Car	TOTOTA INNOVA 2018 model	2033
102	2	KL-07-BQ-2109	Car	HYUNDAI Verna 2010 model	2025
103	3	KL-07-CN-7565	Car	MARUTHI DEZIRE 2018 model	2033
104	4	KL-07-AD-4750	Car	MARUTI 2001 model	2016
105	5	KL-07-BV-6583	Car	TOYOTA ETIYOS 2012 model	2027
106	6	KL-07-BM-6436	Car	MARUTHI DEZIRE 2009 model	2024
107	7	KL-07-CB-1516	Car	MARUTHI DEZIRE 2014 model	2029
108	8	KL-07-CN-7586	Car	MARUTHI DEZIRE 2018 model	2033
109	9	KL-07-BR-4444	MAHINDRA SCORPIO	2011 model	2026
110	10	KL-07-BU-5464	MAHINDRA SCORPIO	2012 model	2027
111	11	KL-07-BU-7173	MAHINDRA SCORPIO	2012 model	2027
112	12	KL-07-BQ-7777	MAHINDRA SCORPIO	2011 model	2026
113	13	KL-07-BS-6778	MAHINDRA	2011 model	2026
114	14	KL-07-CJ-3042	MAHINDRA	2016 model	2031
115	15	KL-07-CK-8424	MAHINDRA	2017 model	2032
116	16	KL-07-CN-3574	MAHINDRA	2018 model	2033
117	17	KL-07-BN-4164	MAHINDRA 550	2010 model	2025
118	18	KL-07-BN-4136	MAHINDRA 550	2010 model	2025
119	19	KL-07-BN-4191	MAHINDRA 550	2010 model	2025
120	20	KL-07-BN-4180	MAHINDRA 550	2010 model	2025
121	21	KL-07-BN-4119	MAHINDRA 550	2010 model	2025

122	22	KL-07-V-5791	MAHINDRA	1998 model	2013
123	23	KL-07-W-6973	TATA SUMO	1998 model	2013
124	24	KL-07-BY-6230	Ambulance	Maruti OMINI 2013 model	2028
125	25	KL-07-BZ-3828	Ambulance	Maruti OMINI 2013 model	2028
126	26	KL-07-BJ-5632	Ambulance	Maruti OMINI 2008 model	2023
127	27	KL 07 CT 3743	Ambulance	Focus 2019	2034
128	28	KL-07-W-6967	JEEP	Marshal 1998	2013

6.2. Annexure 2 – Price of E-Vehicles with Cost Escalation & amount required for replacement of vehicles

Type of Vehicle	Electric variant to be replaced	Cost of Electric alternative 2022-23 Rs. in lacs	Price escalation assumed	2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30	
				Price Rs. in lakhs	No. of vehicles & Amount	Price Rs. in lakhs	No. of vehicles & Amount	Price Rs. in lakhs	No. of vehicles & Amount	Price Rs. in lakhs	No. of vehicles & Amount	Price Rs. in lakhs	No. of vehicles & Amount	Price Rs. in lakhs	No. of vehicles & Amount	Price Rs. in lakhs	No. of vehicles & Amount
Car	Tata Tigor- EV	12	5%	12.6		13.2	1 (13 lacs)	13.9	1 (14 lacs)	14.6		15.3	1 (15 lacs)	16.1		16.9	1 (17 lacs)
Scorpio, Jeep, Bolero, Sumo	Tata Nexon	15	5%	15.8	3 (48 lacs)	16.5		17.4	5 (87 lacs)	18.2	3 (55 lacs)	19.1	2 (38 lacs)	20.1		21.1	
Refuse Compactor (10 Tons)	Alternative not yet available	40	5%	42.0		44.1		46.3		48.6		51.1		53.6		56.3	
Covered Tipper- 16 tonnes	Multiple prototypes under development. Commercial launch expected in 2024. Replacement can be assumed since 2025.	60	5%	63.0		66.2	1 not to be purchased	69.5	1 + 1 = 2 (140 lacs)	72.9	13 (949 lacs)	76.6	7 (462 lacs)	80.4		84.4	

Open Tipper	Alternative shall be available since 2025	40	5%	42.0		44.1		46.3		48.6		51.1	2 (102 lacs)	53.6		56.3	
APE 3- Wheeler	Piaggio Ape	4	5%	4.2		4.4		4.6		4.9		5.1	2 (10 lacs)	5.4		5.6	
APE 4- Wheeler	Tata ACE	9.5	5%	10.0		10.5		11.0		11.5		12.1	2 (24 lacs)	12.7		13.4	
Jeep	Tata NExon	15	5%	15.8		16.5		17.4		18.2		19.1		20.1	1 (20 lacs)	21.1	
Crew Van	Tata open tipper	40	5%	42.0		44.1		46.3		48.6		51.1	2 (102 lacs)	53.6		56.3	
JCB	Not available		5%										1.0				
Maruti van	Omni E- version may be launched in 2024	12	5%	12.6	2 (26 lacs)	13.2		13.9		14.6		15.3	2 (30 lacs)	16.1		16.9	
Ambulance	Not available	NA	5%														
1004.0	Total				74.0		13.0		241.0		1004.0		783.0		20.0		17.0



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