



Diane Nichols Tradd
Assistant City Manager/DPD Director

MEMORANDUM

TO: Eileen M. Donohue, City Manager *EMD*

FROM: Diane N. Tradd, Assistant City Manager/DPD Director

SUBJECT: COUNCIL MOTION 3/27/18 BY COUNCILOR CIRILLO
Request City Manager Provide a Report Regarding How Many and What Types of City Vehicles are up for Renewal or Replacement and the Costs of Transferring Those and Other City Vehicles in the Future from Gas to Electric, which Would Produce an All-electric Fleet for the City of Lowell

As part of its Green Communities designation application, the City of Lowell adopted a Fuel Efficient Vehicle Policy. This policy has helped the City reduce its vehicle fuel usage by 17% since the baseline year, with an equal reduction in emissions. Exploring the possibility of strategic electrification of the City's vehicle fleet will enhance these reductions.

Lowell's Current Vehicle Fleet Replacement Needs:

The capital plan that was included with the FY19 budget includes the replacement of 98 vehicles over the next 5 years. A copy of the list of impacted vehicles is attached.

Considerations for Replacing Existing Vehicles with All-Electric Vehicles:

There are a number of considerations that go into assessing vehicle candidates for replacement with electric vehicles. The primary economic mechanism that is used to assess viability of replacing an internal combustion engine vehicle with a comparable Battery Electric Vehicle (BEV) is the Total Cost of Ownership (TOC). This calculation factors in metrics such as: initial cost, depreciation rate, years of ownership, annual fuel price, annual maintenance cost, annual insurance, and subsidies available. If the City chooses to begin to electrify its fleet, it is recommended that a TOC analysis be completed prior to procurement. In general, current market conditions favor replacement of vehicles that drive upwards of 10,000-12,000 miles annually.

There may be applications where BEVs may not be the best choice with current technology. For example, many commercially available BEVs do not retain many of their efficiency advantages at high speeds. Therefore, vehicles that require higher speeds than what is typically seen in the urban setting may not be well-suited for this application.

Additionally, if attempting to electrify the entire municipal fleet, there may be challenges in dealing with medium-duty and heavy-duty EVs since these markets are presently characterized by niche manufacturers. Even with appropriate vendors, consideration would need to be given to the limits placed on deployment of the vehicles. Since batteries on these vehicles are larger, there would need to be enough space between duty cycles to ensure sufficient charging time.

Potential Resources for Fleet Electrification:

With these considerations in mind, if the City chooses to move forward in analyzing strategic electrification of the vehicle fleet, there may be future opportunities for financial assistance to facilitate the transition. Other communities in the Commonwealth who have purchased electric vehicles and infrastructure have utilized grant incentive funding to help reduce the TOC and other barriers including:

- Massachusetts Department of Environmental Protection's Electric Vehicle Incentive Program (EVIP). This program is aimed at increasing the deployment of EVs through a first-come, first-served solicitation. Incentives range from \$3,000-\$10,000, depending on the scope and type of technology requested. The Parking Department previously received funding from Mass EVIP to cover two of their EVs and a charging station. However, for the current award cycle, MassDEP has already committed available funds.

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- Group Procurement Opportunities. In the past, the Metropolitan Area Planning Council (MAPC) has conducted a Green Mobility Group Purchasing Program, which has allowed for group procurement of various technologies to increase electrification and reduce fossil fuel usage. Although the current procurement window is closed, there may be additional opportunities to participate in future rounds.

If the City Council would like to explore moving forward for electrification of the municipal fleet, the Department of Planning and Development (DPD) will continue to monitor these programs to apply for future awards. Funding from other grant resources can help to increase the viability of strategic electrification within the municipal fleet.

Additionally, technological breakthroughs, market penetration, and manufacturer development could also increase the viability of incorporating future vehicles into an electrical fleet. For example, Ford has announced that it will invest \$11 billion into EVs in the next five years, with 24 hybrid and 16 all-electric vehicles. This announcement includes the introduction of an all-electric Explorer SUV, with a 2020 anticipated release date.

DNT/ns

07/03/18

Attachment

cc: Philip Ferreira, Housing and Energy Programs Manager
Katherine Moses, Energy Manager

VEHICLE NUMBER	VEHICLE	MODEL YEAR	DEPARTMENT	2019	2020	2021	2022	2023
82	Ford F-350 Pickup/Sander	2001	DPW - STREETS	\$80,000				
P-35	Skid Loader 320 G	2018	DPW - PARKS	\$46,162				
E7	Fire Truck - Engine 7	2019	FIRE DEPARTMENT		\$550,000			
E-2	Int'l Aerial Lift	2002	DPW - ELECTRICIAN		\$165,000			
E-11	Ford F-150	2003	DPW - ELECTRICIAN		\$32,000			
205	Ford Explorer	1999	DPW - STREETS		\$32,000			
91	Ford E-150 Van	1999	DPW - STREETS		\$35,000			
206	Ford Ranger 4x4 Pickup	1997	DPW - STREETS		\$35,000			
46	Chevy GMT400 Pickup	1998	DPW - STREETS		\$40,000			
84	Ford F-250 Pickup	2000	DPW - STREETS		\$35,000			
86	Ford F-150	2003	DPW - STREETS		\$40,000			
129	Bandit Chipper	1999	DPW - STREETS		\$50,000			
72	Caterpillar	2002	DPW - STREETS		\$80,000			
66	Ford F-550 Sander/Dump	1999	DPW - STREETS		\$90,000			
55	Int'l Trash Truck	1987	DPW - STREETS		\$150,000			
30	Sander/Dump	2006	DPW - STREETS		\$150,000			
127	Int'l Skyworker	1987	DPW - STREETS		\$180,000			
49	Volvo Loader	2005	DPW - STREETS		\$220,000			
77	Int'l 4700 Sander/Dump	2006	DPW - STREETS		\$230,000			
78	Int'l 4701 Sander/Dump	2006	DPW - STREETS		\$230,000			
79	Int'l 4702 Sander/Dump	2006	DPW - STREETS		\$230,000			
37	Elgin Sweeper	2002	DPW - STREETS		\$235,000			
LB-8	Ford F-250	2000	DPW - L&B		\$35,000			
LB-5	Ford F-250	2003	DPW - L&B		\$35,000			
LB- 102	Ford F-350	2000	DPW - L&B		\$45,000			
LB-119	Ford F-350	2000	DPW - L&B		\$45,000			
LB-25	Ford F-350	2001	DPW - L&B		\$75,000			
TR3	Flatbed Trailer	1993	DPW - GENERAL		\$75,000			
N/A	Generator	N/A	DPW - GENERAL		\$85,000			
TR4	Big Tex Trailer	2001	DPW - GENERAL		\$20,000			
P-23	Ford F-650 Medium Dump Truck	2018	DPW - PARKS		\$121,963			
P-24	Ford F-650 Medium Dump Truck	2018	DPW - PARKS		\$121,963			
E1	Fire Truck - Engine 1	2020	FIRE DEPARTMENT			\$550,000		
N/A	Hustler Super 2 HD Mower 36 Vang	2018	DPW-PARKS			\$11,330		
N/A	Tennant Vacuum ATL	2018	DPW- PARKS			\$47,852		
N/A	Kaswasaki Mule SX 4x 4 610 Hard Cab	2018	DPW - PARKS			\$15,598		
ASL-300	Terex Track Loader	2018	DPW-PARKS			\$38,540		
LB-17	Ford E-250	2011	DPW - L&B			\$38,000		
LB-18	Ford E-250	2011	DPW - L&B			\$38,000		
LB-28	Ford E-250	2011	DPW - L&B			\$38,000		
LB- 2	Ford F-150	2013	DPW - L&B			\$40,000		
LB-19	Ford E-250	2013	DPW - L&B			\$40,000		
LB-85	Ford F-350	2011	DPW - L&B			\$45,000		
42	Ford Transit	2012	DPW - STREETS			\$35,000		
N/A	Smith Air Compressor	1986	DPW - STREETS			\$85,000		
74	Int'l 4900 Hotbox/Sander	2002	DPW - STREETS			\$180,000		
75	Int'l 4900 Sander/Dump	2002	DPW - STREETS			\$180,000		
56	Int'l Sander/Dump	2012	DPW - STREETS			\$230,000		
57	Int'l Sander/Dump	2012	DPW - STREETS			\$230,000		
58	Int'l Sander/Dump	2012	DPW - STREETS			\$230,000		
60	Int'l Sander/Dump	2012	DPW - STREETS			\$230,000		
61	Int'l 4x4 Sander/Dump	2012	DPW - STREETS			\$230,000		
62	Sander	2012	DPW - STREETS			\$230,000		
33	Elgin Sweeper	2013	DPW - STREETS			\$240,000		
59	Int'l Sander/Dump	2012	DPW - STREETS			\$245,000		
N/A	Power Wash Trailer	N/A	DPW - GENERAL			\$45,000		
TR2	Trailer	2011	DPW - GENERAL			\$90,000		
L3	Fire Truck - Ladder 3	2021	FIRE DEPARTMENT				\$850,000	
LB-88	Logan Lift	1996	DPW - L&B				\$180,000	

E-7	Aerial Lift	2011	DPW - ELECTRICIAN			\$170,000	
43	Ford Transit	2013	DPW - STREETS			\$35,000	
44	Ford Transit	2012	DPW - STREETS			\$35,000	
1	Ford Escape	2011	DPW - STREETS			\$40,000	
89	Ford F-150	2013	DPW - STREETS			\$40,000	
87	Ford F-350	2011	DPW - STREETS			\$45,000	
88	Ford F-350	2012	DPW - STREETS			\$50,000	
64	Leroi Compressor	N/A	DPW - STREETS			\$70,000	
128	Int'l Skyworker	2012	DPW - STREETS			\$175,000	
50	Volvo Loader	2011	DPW - STREETS			\$230,000	
65	Int'l Sander/Dump	2012	DPW - STREETS			\$250,000	
TR5	Trailer	2012	DPW - GENERAL			\$20,000	
TR1	Trailer	N/A	DPW - GENERAL			\$80,000	
E4	Fire Truck - Engine 4	2022	FIRE DEPARTMENT				\$550,000
E3	Fire Truck - Engine 3	2022	FIRE DEPARTMENT				\$550,000
LB-3	Ford Transit	2016	DPW - L&B				\$40,000
LB-4	Ford Transit	2016	DPW - L&B				\$40,000
LB-7	Ford F-250	2016	DPW - L&B				\$48,000
131	Bandit Chipper	2015	DPW - STREETS				\$90,000
47	John Deere Excavator	2014	DPW - STREETS				\$130,000
76	Int'l 4700 Trash Truck	2001	DPW - STREETS				\$185,000
51	Deere 624K Loader	2016	DPW - STREETS				\$225,000
32	Elgin Sweeper	2014	DPW - STREETS				\$245,000
63	Freightliner Sander	2017	DPW - STREETS				\$250,000
67	Freightliner Sander/Dump	2014	DPW - STREETS				\$250,000
68	Freightliner Sander/Dump	2014	DPW - STREETS				\$250,000
69	Freightliner Sander/Dump	2014	DPW - STREETS				\$250,000
E-4	Ford Escape	2016	DPW - ELECTRICIAN				\$40,000
E-9	Ford Transit	2016	DPW - ELECTRICIAN				\$40,000
E-8	Ford F-450 Crane Truck	2014	DPW - ELECTRICIAN				\$90,000
E-1	Int'l Aerial Lift	2013	DPW - ELECTRICIAN				\$185,000
N/A	Utility Trailer	2001	DPW - GENERAL				\$30,000
N/A	Mixer	N/A	DPW - GENERAL				\$30,000
N/A	Mixer	N/A	DPW - GENERAL				\$30,000
N/A	Light Tower	N/A	DPW - GENERAL				\$30,000
TR6	Trailer	2014	DPW - GENERAL				\$50,000
N/A	Ditch Witch	1999	DPW - GENERAL				\$75,000
N/A	Plunkett Paver	N/A	DPW - GENERAL				\$80,000
N/A	Snogo Snowblower	2011	DPW - GENERAL				\$105,000