



Office of the City Manager

CONSENT CALENDAR  
November 19, 2019

To: Honorable Mayor and Members of the City Council

From: Dee Williams-Ridley, City Manager

Submitted by: Phillip L. Harrington, Director, Department of Public Works

Subject: Purchase Order: National Auto Fleet Group for Seven (7) 25 Cubic Yard Capacity Heavy Duty Rear Loading Collection Trucks

RECOMMENDATION

Adopt a Resolution satisfying requirements of City Charter Article XI Section 67.2 allowing the City to participate in Sourcewell contract bid procedures, authorizing the City Manager to execute a purchase order for seven (7) 2019 Crane Carrier 25 Cubic Yard Capacity Heavy Duty Rear Loader Collection Trucks with National Auto Fleet Group in an amount not to exceed \$2,348,732.70, and authorizing the disposal of three (3) Autocar and four (4) Volvo collection trucks by public auction.

FISCAL IMPACTS OF RECOMMENDATION

The purchase of seven (7) 2019 25 Cubic Yard Heavy Duty Rear Loader Collection Trucks will not exceed \$2,348,732.70 and includes delivery to City of Berkeley, warranties, and sales tax. Funding for this purchase is available in the FY 2020 Baseline Budget Fund for Equipment Replacement (671) and Zero Waste Fund (601). Fund amounts will be distributed as follows:

(671) Equipment Replacement	\$2,300,787.00
(601) Zero Waste Fund	\$47,945.70
<b>Total</b>	<b>\$2,348,732.70</b>

CURRENT SITUATION AND ITS EFFECTS

This purchase order will replace seven (7) existing Rear Loader Collection Trucks (Trucks) that are beyond their useful life. The existing Trucks are utilized throughout the City to collect commercial (7 days per week) and residential (5 days per week) refuse, recyclables (fiber and bottles/containers separately) and organics (green and food waste) materials. The existing trucks will be replaced with state of the art trucks with enhanced safety features, improved fuel efficiency and maneuverability to better service the community. Pending Council authorization, the City will piggyback off a Sourcewell contract with National Auto Fleet Group who will provide Crane Carrier Company Model LET2-44 Standard Cab Straight Frame Chassis with McNeilus Truck and Manufacturing

Heavy Duty 25 Cubic Yard Rear Loader Body Assembly through the local authorized dealer for Crane Carrier Company (CCC), Western Truck Center.

Once the order is submitted to Western Truck Center, the cab and chassis is manufactured at CCC’s factory. When completed, CCC will deliver the cab and chassis to McNeilus Mfg. for the installation and wiring of the 25 cubic yard body. Once completed, McNeilus Mfg. will ship the finished units to Western Truck Center, located in San Leandro, CA. Western Truck Center will prepare the trucks for delivery to the City of Berkeley. The estimated time for the manufacture of cab, chassis and body of these trucks is seven to nine months.

The vehicles being replaced include the following:

Current Vehicle #s	Year	Make / Fuel
6350	2002	Volvo / CNG
6351	2002	Volvo / CNG
6352	2002	Volvo / CNG
6353	2002	Volvo / CNG
6357	2003	Autocar / CNG
6358	2003	Autocar / CNG
6359	2003	Autocar / CNG

**Electric / Hybrid Electric Evaluation**

For every fleet purchase, Public Works staff researches the feasibility and availability of fully electric vehicles and hybrid-electric powertrains to support the City’s transition off of fossil fuels. Staff research found there are only a few all electric prototypes currently being tested in Sacramento County, Palo Alto, and Seattle as part of pilot projects. As of now, hybrid-electric collection trucks are only in early development stages. The County of Sacramento and Palo Alto are testing these collection trucks as route assist trucks only. No all electric trucks are currently available or operating in the US that can complete full collection route day of 8 to 10 hours. The City of Bloomington has also found similar lack of availability and limitations in current testing of any all electric collection trucks while researching their options for their fleet (Attachment 2).

In addition to the lack of readily available and tested electric trucks, there is no current infrastructure at the City’s Transfer Station to support charging of electric vehicles. As part of the Solid Waste & Recycling Transfer Station Feasibility Study presented at the November 5, 2019 City Council Work Session, electric charging infrastructure and capacity will be included in the new design. Public Works is also applying for assistance from Pacific Gas and Electric to provide electric charging infrastructure for future medium and heavy duty vehicles.

Public Works staff is working closely with the East Bay Community Energy's consultant to complete a fleet assessment to evaluate overall fleet needs, vehicle options and right-sizing.

### ***Renewable Fuel***

The trucks being replaced were powered by Compressed Natural Gas which is non-renewable, and Renewable Natural Gas is unavailable in Berkeley at this time. The new trucks will run on 100% renewable diesel<sup>1</sup> which complies with the City's Fossil Free recommendations<sup>2</sup>.

This purchase will support the City's Strategic Plan Goal of Create a resilient, safe, connected, and prepared City.

### **BACKGROUND**

Throughout the year, Department of Public Works purchases vehicles and equipment for City's operating departments that are paid through the Equipment Replacement fund. City departments that use fleet vehicles pay into the equipment replacement fund, which funds vehicle replacement as they reach the end of their life. If a purchase request exceeds \$25,000, the Department of Finance, General Services Division, solicits bids or "piggybacks" off competitively bid contracts to ensure the City's departments receive the best pricing.

The City of Berkeley has been a no cost member of Sourcewell,<sup>3</sup> formerly the National Joint Powers Alliance (NJPA), and a municipal contracting agency operating under the legislative authority of Minnesota Statute 123A.21. The original 1978 statute was revised in 1995 to allow government clients to better meet their specific needs through participation in a service cooperative, rather than paying the higher cost associated with individual procurement. Sourcewell allows participating municipal agencies to leverage the benefits of cooperative purchasing and reduces procurement costs.

All Sourcewell contracts have been competitively solicited nationwide. On June 21, 2016, Sourcewell released Request for Proposal No. 081716 for Class 6, 7, and 8 Chassis with Related Equipment, Accessories and Services. The solicitation was released for approximately fifty-eight days and fourteen proposals were submitted. Upon their review Sourcewell selected National Auto Fleet Group as the best most responsive proposer to meet the specifications thusly awarding Contract No. 081716-NAF.

---

<sup>1</sup> [https://www.cityofberkeley.info/Clerk/City\\_Council/2016/10\\_Oct/Documents/2016-10-18\\_Item\\_44\\_Use\\_of\\_Renewable\\_Diesel.aspx](https://www.cityofberkeley.info/Clerk/City_Council/2016/10_Oct/Documents/2016-10-18_Item_44_Use_of_Renewable_Diesel.aspx)

<sup>2</sup> <https://www.cityofberkeley.info/uploadedFiles/Clerk/2019-10-03%20Agenda%20Packet%20-%20Facilities.pdf>

<sup>3</sup> <https://sourcewell-mn.gov/>

For all contracts Sourcewell charges an administrative fee based upon the percentage of the sale, and that fee is paid by the Contractor directly to Sourcewell. For this purchase the fee will be paid by National Auto Fleet Group and will be not be passed onto the City.

ENVIRONMENTAL SUSTAINABILITY

Public Works Equipment Maintenance works to procure the most fuel-efficient vehicles and equipment that are suitable for the required tasks. Hybrid heavy duty collection trucks are undergoing development and pilot testing and are not yet available to meet full service requirements of the Zero Waste Division.

The replacement equipment will be powered by 100% renewable diesel that will meet 2018 EPA and California Air Resources Board (CARB) requirements.

RATIONALE FOR RECOMMENDATION

All City vehicles are due for replacement at the end of their recognized economic lives. In addition, the newer collection trucks ensure that maintenance costs are controlled and meet current fuel efficiency and air emission standards.

ALTERNATIVE ACTIONS CONSIDERED

None. Listed vehicles have reached the end of their useful service life and replacement vehicles are urgently needed to ensure timely residential and commercial collection of refuse, recyclables and organics

CONTACT PERSON

Greg Ellington, Superintendent, Public Works Maintenance, (510) 981-6469

Attachments:

- 1: Resolution
2. City of Bloomington Illinois - Hybrid-Electric and Electric Garbage Trucks Could be the Future, but they're Not Ready

RESOLUTION NO. ##,###-N.S.

PURCHASE ORDER WITH NATIONAL AUTO FLEET GROUP FOR SEVEN (7) 25  
CUBIC YARD CAPACITY HEAVY DUTY REAR LOADER COLLECTION TRUCKS

WHEREAS, seven (7) 25 Cubic Yard Capacity Heavy Duty Rear Loader collection trucks are needed by the City of Berkeley Public Works Division for the commercial and residential collection of refuse, recyclables, and organics; and

WHEREAS, the vehicles to be replaced have reached the end of their useful life; and

WHEREAS, vehicles must be replaced based upon a reasonable schedule that allows City employees to efficiently, safely and effectively carry out their duties; and

WHEREAS, surplus rolling stock valued at more than \$25,000 must be sent to public auction; and

WHEREAS, City Charter XI Section 67.2 allows the City to purchase goods without undergoing a competitive bid process if the City uses pricing obtained by another entity through competitive bid process; and

WHEREAS, on June 21, 2016 Sourcewell released Request for Proposal No. 081716 for Class 6, 7, and 8 Chassis with Related Equipment, Accessories, and Services. The solicitation was released for approximately fifty-eight days and fourteen proposals were submitted. Upon their review Sourcewell selected National Auto Fleet Group as the best most responsive proposer to meet the specifications, thusly awarding Contract No. 081716-NAF; and

WHEREAS, Sourcewell contract bid procedures satisfy the procurement requirement of the City of Berkeley; and

WHEREAS, funds in the amount of \$2,300,787.00 are available in the FY 2020 Equipment Replacement Fund (671) and Zero Waste Fund (601) in the amount of \$47,945.70.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the City Manager is authorized to execute a purchase order for seven (7) 25 Cubic Yard Capacity Heavy Duty Rear Loader collection trucks with National Auto Fleet Group in an amount not to exceed \$ 2,348,732.70 and is authorized to dispose of three (3) Autocar and four (4) Volvo collection trucks by public auction.

# Hybrid-Electric and Electric Garbage Trucks Could be the Future, but they're Not Ready

August 2019

## *at a glance*

Hybrid-electric powertrains for existing garbage trucks and fully-electric garbage trucks are technologies that are in development and are not fully utilized by any U.S. garbage collection providers. Staff research shows that neither option is in production at this time. Wrightspeed is not testing or selling its technology at this time. Manufacturers such as Peterbilt and Kenworth are testing hybrid-electric technology internally while also testing over 50 electric trucks in multiple, large cities such as Los Angeles and Seattle. Staff recommends reviewing this research each year, as the technologies develop. In the meantime, staff recommends continuing its commitment to a green fleet by continuing to use 20 percent biodiesel fuel for the City's diesel fleet vehicles.

## Scope

---

City Council and Administration directed Public Works to research the possibility of using hybrid-electric garbage trucks, based on research provided by Professor Emeritus William Rau, and both hybrid-electric and electric garbage trucks, based on previous research performed by Public Works staff. Staff has prepared this document to examine several aspects of hybrid-electric or electric garbage trucks, including the merits, effectiveness, availability, and price of each technology.

## Background

---

The Fleet Management Section of the Public Works Department has continued to explore ways to "green" the fleet in responsible and practical manners, which is consistent with Strategic Plan and Comprehensive Plan goals. The Section uses 20 percent bio-diesel in all units that fill up at the Public Works fueling site. This includes all Solid Waste trucks. Bio-diesel is an alternative, renewable fuel. The city uses biodiesel derived from soybean oil. In total, the city has 191 vehicles that run on this alternative fuel. The city also has many cars and trucks that are compatible with E85 fuel. However, the City does not have an available fuel tank for this type of fuel, and off-site E85 fuel is not cost-effective at this time.

In February 2018, William Rau, Professor Emeritus of Sociology at Illinois State University, brought the issue of using hybrid-electric garbage trucks to union leadership by reaching out to the media. As a result, staff performed an internal, preliminary review of the information, but found it was not something that should be considered at that time.

In August 2019, Rau contacted Council prior to their consideration of purchasing three new diesel solid waste trucks. As a result, Council tabled the consideration of the purchase until September 2019 in order to generate this report, which discusses hybrid-electric and electric garbage trucks and whether they are feasible alternatives to the staff-recommended diesel solid waste trucks that would run on 20 percent biodiesel.

## Findings

---

### Hybrid-Electric Garbage Trucks

#### Wrightspeed

Hybrid-electric powertrains, theorized by Wrightspeed, are installed on an existing truck. Once the conversion is completed, the truck would run on an electric powertrain until the batteries run low and then uses a biodiesel turbine generator to charge the batteries (Wrightspeed Powertrains, n.d.). Unfortunately, the company found that biodiesel turbine generators are not compliant with 2020 vehicle emissions standards based on information Wrightspeed provided to staff.

The information provided by Peter Kelly-Detweiler in an article in Forbes (Kelly-Detweiler, 2015), that makes claims about brakes only lasting three months and powertrains lasting five years or less, is based on quotes from Founder and CEO of Wrightspeed, Ian Wright, and does not have supporting data. Unfortunately, this technology is not well-tested for garbage trucks and buses and has failed to come to fruition in multiple communities, including Santa Rosa, California (McCallum, 2018), and Wellington, New Zealand (George, 2019). While FedEx tested Wrightspeed's technology on 2 delivery vehicles, and subsequently ordered 25 delivery vehicles for an additional test (Golson, 2014), staff could not find that FedEx has implemented the technology beyond those 25 test units. FedEx has more than 47,000 vehicles in its fleet, so the 27 vehicles would be under 0.06 percent of their fleet (Golson, 2014).

The company who manufactures the hybrid-electric powertrains appears to have gone dormant (Gitlin, 2019). Staff found that the company has had no press releases since 2016 and no consistent social media presence on Facebook, Twitter, or LinkedIn since 2017. However, staff was able to call Wrightspeed, and a representative estimated it would cost \$200,000 per truck to install their drivetrain, assuming it could go into production with the 2020 vehicle emissions standards. The representative said the company installed the unit on two garbage trucks, but none of them are in operation at this time. In addition, the representative said the company does not have service centers in Illinois, and they would only install units on a few vehicles at a time to test before installing on the entire fleet.

#### Other Manufacturers

Based on staff conversations with vendors, Peterbilt, Kenworth, and other companies are internally testing other forms of hybrid-electric garbage trucks. These include electric/biodiesel hybrids that use a traditional generator when the batteries run low and electric/compressed natural gas (CNG) hybrids that use a generator powered by CNG. However, none of these options are available on the market at this time.

### Electric Garbage Trucks

Electric garbage trucks are fully electric and use no other fuel. When the batteries run low, the vehicle must return and recharge or recharge on the road, which requires charging infrastructure and room for charging at either the domicile of the vehicle or on the road. This technology is in the testing phase for garbage trucks. Staff contacted distributors for Peterbilt and Volvo (owner of Mack) via e-mail to inquire about pricing for electric vehicles. Peterbilt is testing over 50 units across the country but has not announced a production launch date due to a lack of demand. Volvo (Mack) will start testing next year, but they estimate that production will not start for a couple of years.

Staff was not able to locate a U.S. solid waste collection provider that has a fleet of electric garbage trucks in service. Notably, Chicago, Sacramento, Los Angeles, and Seattle each have an electric garbage truck to use as a pilot. However, Chicago is currently suing the company that produced the truck they received in 2015 due to its inability to be in service. Sacramento and Los Angeles received their trucks in 2018 (Greenwalt, 2018), and Seattle received a truck in 2019 (Gitlin, 2019). Staff could not find resources that show that these cities have reported back about how the trucks are performing. New York City will pilot an electric garbage truck in 2020 (Dzikiy, 2019).

Some cities in the United States have purchased electric buses, but they are not widely utilized. The United States has 300 electric buses total, which is small, compared to China, which has 421,000 (Eckhouse, 2019). This is partially due to the fact that U.S. municipalities replace buses at the end of their useful lives, which averages to about 12 years, and electric buses, while cheaper to maintain than diesel models, are more expensive up-front (Eckhouse, 2019).

Connect Transit in Bloomington received discretionary grants from the FAST Act and the Federal Transit Administration's Buses and Bus Facilities Competitive Grant Program to replace 12 out of 42 diesel buses with electric buses and install charging infrastructure (Denham, 2018) (Denham & Schlenker, 2017). Since the technology is not available for garbage trucks, grants are also not available. Connect Transit has not purchased electric buses at this time. Staff met with Connect Transit Chief Operating Officer Martin Glaze and Safety and Training Director Dave White, who said that the organization advertised a Request for Proposals for the buses they want to purchase, which they estimate will cost about \$1 million per bus, including parts and labor for a charging station for each bus.

Interestingly, in Bloomberg New Energy Finance (NEF) (2019) reports buses and heavy commercial vehicles, such as garbage trucks, in different segments of the global fleet, which shows that they are quite different when it comes to adoption of fully-electric vehicles. Figure 1 forecasts that less than one percent of heavy commercial vehicles will be fully electric by 2026, and eleven percent will be fully electric by 2040. However, the Figure 1 also forecasts that 37 percent of buses will be fully electric by 2026, and 67 percent of buses will be fully electric by 2040. Figure 2 shows that, among heavy commercial vehicles, natural gas will outpace electricity as the main fuel each year until 2040. These figures demonstrate that heavy commercial vehicles have a long way to go before adoption by garbage truck fleets and other, similar fleets, whereas bus fleets will see a much larger increase in adoption of fully-electric vehicles.

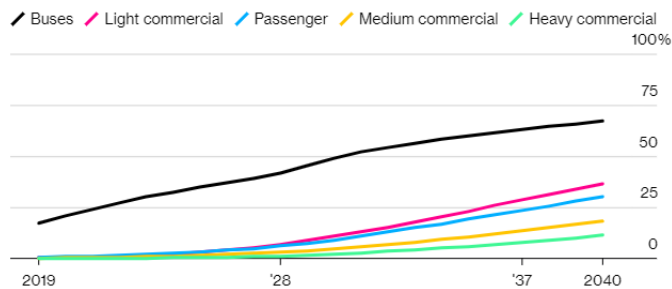


Figure 1: Percentage of electric vehicles in each segment of the global fleet (Bloomberg New Energy Finance, 2019)

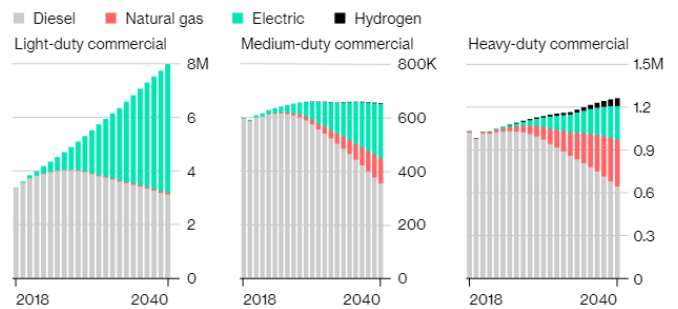


Figure 2: Commercial vehicle sales forecast by segment in the U.S., China and Europe (Bloomberg New Energy Finance, 2019)



## Recommendations

---

At this time, staff recommends continuing to purchase diesel vehicles that run on 20 percent bio-diesel fuel until one or more of the technologies are proven and available on the market. Wrightspeed's technology is unproven and unavailable, but Peterbilt, Kenworth, and others companies are testing alternative hybrid-electric options internally. Electric garbage trucks are also in the testing stage, with more than 50 units spread across multiple, larger cities in the United States. Staff also recommends researching these technologies each year, prior to budget preparation, to determine whether they have developed enough to consider for garbage trucks.

## References

---

- Bloomberg New Energy Finance. (2019). *Electric Vehicle Outlook 2019*. New York, NY.
- Denham, R. (2018, September 20). *Connect Transit Gets \$6 Million Grant For Electric Buses, Transfer Center*. Retrieved from WGLT: <https://www.wglt.org/post/connect-transit-gets-6-million-grant-electric-buses-transfer-center#stream/0>
- Denham, R., & Schlenker, C. (2017, September 19). *Connect Transit Gets \$1.5M Grant For Electric Buses, Solar Panels*. Retrieved from WGLT: <https://www.wglt.org/post/connect-transit-gets-15m-grant-electric-buses-solar-panels#stream/0>
- Dzikiy, P. (2019, May 8). *Mack Trucks debuts electric garbage truck, will test on NYC streets next year*. Retrieved from Electrek: <https://electrek.co/2019/05/08/mack-electric-garbage-truck/>
- Eckhouse, B. (2019, May 15). *The U.S. Has a Fleet of 300 Electric Buses. China Has 421,000*. Retrieved from Bloomberg: <https://www.bloomberg.com/news/articles/2019-05-15/in-shift-to-electric-bus-it-s-china-ahead-of-u-s-421-000-to-300>
- George, D. (2019, April 24). *Wellington's trolley buses gathering dust 18 months after they were expected to be running again*. Retrieved from Stuff: <https://www.stuff.co.nz/national/112233348/wellingtons-trolley-buses-gathering-dust-18-months-after-they-were-expected-to-be-running-again>
- Gitlin, J. M. (2019, May 22). *Seattle makes history with electric garbage truck*. Retrieved from Ars Technica: <https://arstechnica.com/cars/2019/05/seattle-makes-history-with-electric-garbage-truck/>
- Golson, J. (2014, September 30). *FedEx's New Electric Trucks Get a Boost from Diesel Turbines*. Retrieved from Wired: <https://www.wired.com/2014/09/fedex-wrightspeed-diesel-ev-trucks/>
- Greenwalt, M. (2018, January 3). *Pilot to Benefit ERVs Released in Two California Cities*. Retrieved from Waste 360: <https://www.waste360.com/trucks/pilot-benefit-ervs-released-two-california-cities>
- Kelly-Detwiler, P. (2015, Mar 4). *Electric Garbage Trucks: Huge Energy Savings And They Won't Wake* . Retrieved from Forbes: <https://www.forbes.com/sites/peterdetwiler/2015/03/04/electric-garbage-trucks-huge-energy-savings-and-they-wont-wake-you-up-in-the-morning/#2b363adf6368>
- McCallum, K. (2018, January 4). *New year, new garbage services for Santa Rosa*. Retrieved from The Press Democrat: <https://www.pressdemocrat.com/news/7827823-181/new-year-new-garbage-services>
- Wrightspeed Powertrains. (n.d.). *Introducing the Wrightspeed Route Powertrain*. Retrieved from Wrightspeed Powertrains: <https://www.wrightspeed.com/the-route-powertrain>