Clean Fleet Update

May 2024

NYC DCAS

Citywide Administrative Services

Table of Contents

Welcome Letter

May 16, 2024

New York City's fleet sustainability efforts began in the mid-1990s with the development of the first compressed natural gas dispensers to reduce fleet emissions at NYC Parks and the Department of Sanitation. We introduced hybrid electric vehicles beginning the late 1990s, the first plug in off-road units in the early 2000s, and biodiesel in 2005. All these efforts reduced tailpipe and greenhouse gas emissions and also led to a more efficiently operated fleet.

As our environmental challenges and risks accelerate, so have our efforts to tackle fleet emissions. In 2024 alone, we reached 5,000 plug-in electric vehicles; installed our 2000th electric charging port; and replaced fossil diesel fuel in the City fleet with renewable diesel.

In 2015, NYC and DCAS announced publicly in the NYC Clean Fleet Plan that we would reduce greenhouse gas emissions 50 percent by 2025 (50x25) and 80 percent by 2035 (80x35). We are proud to report that 50x25 will be achieved. In this most recent update to the NYC Clean Fleet Plan, we outline the three main strategies that got this done: electrification, biofuels, and efficiencies. We also lay out an ambitious plan to push emissions reduction even further.

I've had the honor to be part of all these efforts, starting at NYC Parks where so many of these sustainable approaches first launched, and then moving to DCAS to manage the entire City fleet including sustainability, services, and safety.

All of Fleet Management including mechanics, operators, administrators, transportation coordinators, spec writers, inspectors, and procurement staff deserve enormous credit for this sustained focused over thirty years.

The day job for DCAS is to provide City agencies with reliable, in-service, and effective fleet assets 24/7 for some of the most challenging fleet assignments imaginable. We went beyond that and made a choice to also lead the world in fleet sustainability.

Sincerely,

Keith T. Kerman, Deputy Commissioner, DCAS

Overview: Clean Fleet Update 2024

The City of New York, under the leadership of the NYC Department of Citywide Administrative Services (DCAS), operates over 28,500 on and off-road fleet units, the largest municipal fleet in the United States and among the largest fleets in the country. Fifty agencies and offices operate fleet vehicles with the Police (NYPD), Sanitation (DSNY), Parks, Transportation (DOT), Environmental Protection (DEP), and Fire (FDNY) departments having the largest fleets.

In FY23, the City spent $1.4 billion on all aspects of fleet operations including acquisitions, repair, fuel, parts, and claims. Currently, there are 1,800 full time fleet staff, including over 1,300 mechanics and technical staff, and additional agency transportation supervisors who work with fleet daily.

DCAS operates 37 dedicated repair locations and over 75 satellite or mobile repair operations and completes over 250,000 service orders annually. DCAS operates the largest EV charging network in NY State and one of the largest liquid fueling programs. DCAS plays a critical role in the provision of daily and emergency services 24/7 for New York City.

DCAS has built the most sustainable municipal vehicle fleet in the country. The City has been guided in its work by the *Clean Fleet Plan* published in 2015 and first updated in 2021. Over 21,000 fleet units now use cleaner alternative fuels including electric, hybrid electric, solar, and biofuel. In 2015, DCAS committed to 50% greenhouse gas (GHG) reduction for the City fleet by 2025 (50x25) and 80% by 2035 (80x35).

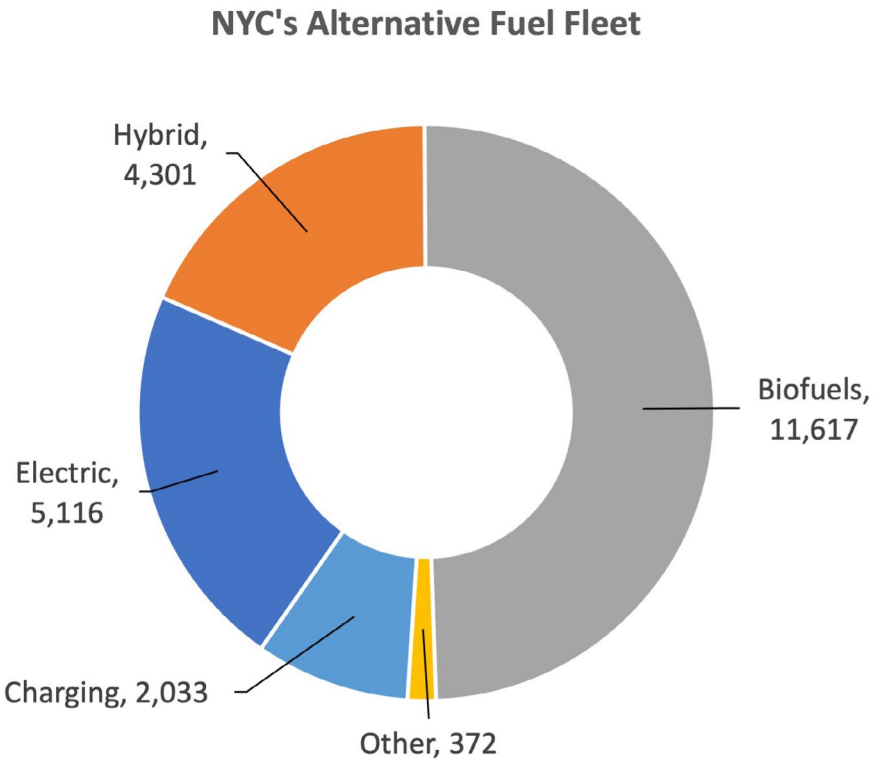
DCAS established a three-part strategy to achieve these ambitious goals:

1) **Electrification:** Electrify the fleet as quickly as technically and operationally achievable;
2) **Biofuels:** Replace diesel fossil fuel with diesel biofuels including biodiesel and renewable diesel;
3) **Efficiencies:** Implement continued efficiencies including fleet reduction, hybrids, and fleet sharing.

In 2015, the Green Fleet Plan set a goal of 2,000 electric vehicles (EVs) by 2025. Having surpassed that early, the 2021 Plan set a new goal of 4,000 by 2025. In early 2024, DCAS announced that the City had already surpassed the 5,000 mark for on and off-road EVs, PHEVs and solar units. The City will operate at least 6,000 EVs by the end of 2025, three times the original 2015 goal.

In August 2023, DCAS completed a contract for hydrogenation derived renewable diesel (HDRD or just RD). DCAS began supplying agencies with RD in September 2023. Through early May 2024, over 9 million gallons – or over 56% of the City's annual diesel fleet use – had been replaced with RD. DCAS is the first entity to bring RD to the East Coast of the United States.

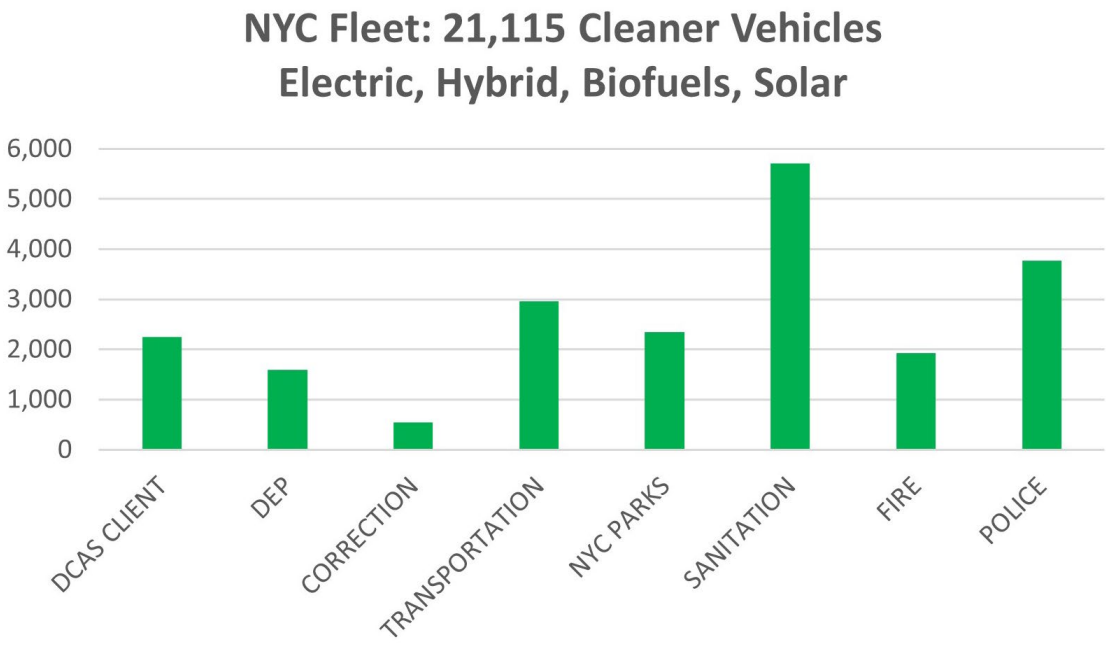
working with NYPD to test all electric patrol vehicles. DCAS has worked with FDNY to implement an auxiliary power unit (APU) battery on all City ambulances, establishing the equivalent of a plug-in hybrid unit. Through Executive Order 90 of 2021, DCAS is also working to downsize SUVs and transition executive staff to plug-in vehicles.



In April 2022, Mayor Adams announced a fleet reduction initiative of at least 855 on-road vehicles or nearly 4% of the fleet. Using telematics analysis from the DCAS Fleet Office of Real Time Tracking (FORT), DCAS implemented this reduction.
In addition, DCAS set policy that any necessary fleet increases in the future will be implemented with all-electric vehicles. DCAS also continues to invest in hybrid vehicles and the City operates 4,301 hybrids today. At NYPD, DCAS is replacing gas Interceptors with hybrid versions while

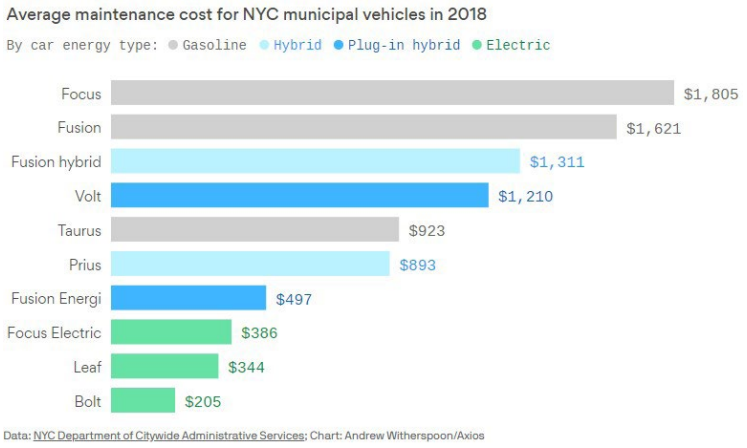
These initiatives are working, reducing total fossil fuel use from FY13 to FY23 by 21% or 6.3 million gallons. **The impact of continued electrification and the replacement of all diesel fuel use by renewable diesel will enable DCAS to achieve the 50% reduction of greenhouse gases by the 2025 goal.**

In their Climate Change 2023 Synthesis Report, the Intergovernmental Panel on Climate Change asserts the need for immediate and urgent action to reduce greenhouse gases and address the rapidly escalating global impacts of climate change. In their discussion of scaling up climate action, the IPCC discusses electric vehicles, biofuels for transport, and fuel-efficient vehicles among their recommended mitigation efforts for reducing infrastructure related emissions. NYC's Clean Fleet Plan is an example of these steps in action and implemented on a rapid timetable. NYC's on-going transformation of fleet emissions makes clear that transportation emissions can be addressed quickly, practically, and without fiscal hardship.



Progress to Date

Fleet Electrification



In April 2024, the City exceeded the 5,000 mark for plug-in on and off-road vehicles. The City operates 4,241 on-road vehicles and 875 off-road electric and solar units. As of April 2024, 59% of the City's plug in fleet was all electric (BEV) and 41% was plug-in hybrid electric (PHEV).

PHEVs were critical in the early implementation of the City's electric fleet. PHEVs will also play a continuing role for emergency services where backup power and resiliency concerns are critical.

In FY23 and FY24, 80% of new electric vehicles purchased by DCAS were BEV, representing a growing adoption of all electric options. All electric units more fully achieve the maintenance and fuel savings that help offset additional up-front costs for EV vehicles.

In September 2023, DCAS published updated total cost of ownership (TCO) estimates for the City's electric fleet. In 2019, DCAS published a report on the major, 69%, maintenance savings achieved with DCAS' first generation of electric light duty vehicles. This was achieved even in comparison to very maintenance efficient hybrid sedans. EVs tend to cost more than their gas or diesel counterparts. However, for light and medium duty EV models, these up-front costs will be offset by maintenance, fuel savings, and extended vehicle life. Electric trucks and specialized equipment options are still limited and expensive. This area of the electric marketplace will need further expansion and maturation before upfront costs can be effectively offset.

The current EV fleet of the City of New York consists of 33 separate models of electric or plug-in electric fleet unit. The largest rollout is of the Chevrolet Bolt. DCAS operates 1,139 Bolts, the largest single operated fleet of Bolts in the nation. Over 20% of the City fleet are vans and pickups. In the last two years, DCAS introduced the first all-electric vans,

327 Ford E-Transits, and the first all-electric pickups with 151 Ford F-150 Lightnings. DCAS also recently established a contract for the Chevrolet Silverado EV pickup.

As part of Executive Order 90 of 2021, DCAS is transitioning senior executives throughout City government to electric vehicle assignments. As of January 2024, 107 senior executives at 31 agencies are now assigned electric vehicles with more on order in FY24.

DCAS is also working with agencies to establish truck and specialized equipment electric models. DSNY has introduced the first all-electric street sweepers with plug-in hybrid sweepers on order as well. These are among the first electric sweepers in the world. Correction recently brought in its first electric Correction bus, and also its first K-9 (canine) electric emergency response truck.

DSNY, NYC Parks, and DOT will all be procuring all-electric garbage trucks. DSNY plows with its garbage truck fleet. At this time, there are no plow trucks available in electric versions. Until those develop, DCAS will be working with DSNY, Parks, and DOT to introduce electric garbage trucks for those assignments that do not include plowing.

DCAS and fleet agencies are establishing additional EV trucks options including for fire response vehicles, 14-foot box trucks, rack trucks, passenger vans, accessible vans, 7 seat SUVs, and refrigerated box trucks. DCAS will continue to prepare specifications and bid new EV vehicle options.

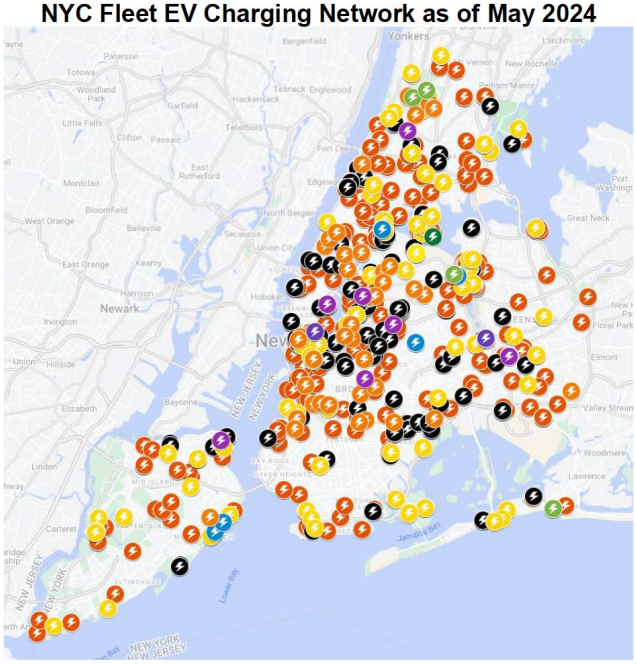
To celebrate the 5,000 EV milestone and as part of DCAS' partnership with NYC Public Schools on sustainable education, DCAS and NYC Public Schools produced an animated video titled "Batteries Included." Batteries Included promotes the various benefits of electric vehicles while showing off many of the fleet's newest electric options.

Electric Charging

As the electric fleet continues to grow, DCAS has prioritized the expansion of vehicle charging. Already, DCAS operates over 2,000 charging ports, one of the largest charging networks in the United States. DCAS has been funded to add 200 fast chargers per year through 2030, or 1,776 total fast charging ports.

- The DCAS charging network includes fast charging, solar carports, level 2 (overnight) chargers, and portable chargers. DCAS has established a new Field Services unit to maintain and repair electric vehicle chargers citywide.
- In 2023, DCAS rolled out its first battery storage fast chargers. These units dispense to vehicles as 150kW fast chargers but recharge from the

NYC Fleet EV Charging Network as of May 2024



Total 2,033 Electrical Charging Ports

- 1,375 Level 2 Charging Ports
- 153 Solar Carports + 6 Solar Public Charging = 159 Total Solar Carports
- 279 DC Fast Chargers + 15 DC Fast Public Charging = 294 Total DCFCs
- 11 DOT Municipal Level 3 Chargers
- 65 DOT Municipal Level 2 Chargers
- 118 DOT Level 2 Curbside Chargers
- 11 Mobile Chargers

grid as slow chargers. This minimizes peak period impact on the grid and offers additional resiliency in case of a power loss. DCAS also operates one of the largest networks of freestanding solar carports in the world with 159 units. These carports are completely off the grid and produce electricity to power vehicles solely from sunshine. These carports also utilize battery storage providing a resilient option in case of power losses.

- DCAS is emphasizing environmental justice (EJ) communities as it rolls out the electric vehicle program and charging network. DCAS will install 50% or more of the charging network in EJ communities. DCAS is also working to provide public access,

where possible. DCAS currently offers 22 chargers at DCAS or NYC Parks public parking lots to the general public. The public network includes 16 fast chargers and 6 solar carports and has been used over 65,000 times since January 2021. In November 2023, DCAS opened its largest publicly accessible charging hub at the World's Fair Marina in Flushing Meadows Corona Park, Queens. The new hub includes DCAS' first charging site designed for accessibility.

- DCAS has worked closely with Con Edison to develop the charging network. In 2022 and 2023, Con Edison recognized DCAS as the largest installer of fast charging in New York City. DCAS receives financial support from Con Edison through the Power Ready and Smart Charge initiatives.

Biofuels

- Biodiesel: The City began use of biodiesel in 2005 at NYC Parks through a test of 100% biodiesel (B100) in a set of Staten Island Parks garbage trucks. Biodiesel is a sustainable and renewable fuel made from waste and farm byproducts such as used cooking oil, animal fats, soybean oil, and corn oil.

  As reported by the Department of Energy's Alternative Fuels Data Center, Biodiesel (B100) can reduce greenhouse gas emissions as much as 74%. As reported by the California Air Resources Board, biodiesel can reduce harmful tailpipe emissions from trucks for hydrocarbons, particulate matter, and carbon monoxide. At very high blends, biodiesel can slightly increase NOx. However, biodiesel is generally used in lower blends of 20% or less.

NYC Government Use of Biodiesel Blends			
FY	Blended Gallons for Government Buildings (1)	Blended Gallons for Government Fleet	Total
13	31,736,530	11,925,594	43,662,124
14	35,457,127	14,080,534	49,537,661
15	35,554,585	15,597,826	51,152,411
16	22,669,030	15,281,204	37,950,234
17	23,792,071	15,780,318	39,572,389
18	27,412,541	15,698,806	43,111,347
19	25,955,047	14,596,581	40,551,628
20	20,354,876	13,305,898	33,660,774
21	23,145,725	13,792,271	36,937,996
22	25,699,426	14,219,288	39,918,714
23	21,256,343	13,848,141	35,104,484
Total	293,033,300	158,126,461	451,159,761

(1) Total fuel use determined by winter temperatures; Prepared by DCAS Fleet

In the last 18 years, biodiesel has become standard in blends of 5, 10 or 20% in DCAS' fleet truck fuel and in heating oil for public and private buildings. Local Law 73 of 2013 requires City fleet trucks to use biodiesel 5% in cold weather months and 20% in warm weather months. Emergency service agencies were exempted but have in fact adopted biodiesel for their fleet units including FDNY ambulances and NYPD Emergency Service Unit trucks.

In FY23, 93% of the 15 million gallons of diesel dispensed at City owned fuel sites was blended with biodiesel. New York State and City law require biodiesel in heating oil as well. Since FY13, City governmental operations have blended over 450 million gallons of diesel fuel with biodiesel.

Biodiesel has been effective in achieving some level of GHG and tailpipe emissions reduction for fleet. However, biodiesel (B20) is produced to a different technical standard than regular diesel. The ASTM standard for B20 is ASTM 7467. Biodiesel can cloud up at higher temperatures than regular diesel, making it less reliable for colder weather events. Biodiesel will degrade more quickly

than regular diesel. Biodiesel may also react with vehicle components and plastics. In general, biodiesel is used in 20% or less blends, limiting its application.

- Hydrogenation Derived Renewable Diesel (HDRD or RD for short): RD is produced from the same waste feedstocks as biodiesel. The first 9 million gallons of RD procured by DCAS in FY24 were made from used cooking oil and waste animal fats. However, renewable diesel is manufactured through hydro-treating in the same manner that crude oil is manufactured to final product. The end result is a renewable biofuel that meets the same technical specifications as regular diesel (ASTM 975). There are no compatibility issues with trucks, off-road equipment, or underground storage tanks with renewable diesel. DCAS worked closely with FDNY to assess the fuel and tested nearly 1 million gallons in 2018.

  In August 2023, DCAS completed its first long term contract for renewable diesel. This was a landmark contract as DCAS is the first organization east of the Rocky Mountains in the United States to procure RD in scale. Almost all RD in the United States is sold in California, Oregon, and Washington State. These states have adopted versions of Low Carbon Fuel Standards (LCFS) to create a carbon market and structure low carbon fuel sales including electric vehicles and biofuels. DCAS has partnered with the Clean Fuels NY Coalition and the League of Conservation Voters to prepare a case study regarding possible LCFS adoption in NY State.

  From September 2023 through April 2024, DCAS supplied over 9 million gallons of RD for use in City fleet agencies. All agencies except FDNY are now fully using RD for in-house diesel fuel. FDNY has adopted RD at more than fifty percent of sites to date through April 2024. In November 2023, Mayor Adams announced that all agencies would complete the use of RD for all trucks and off-road equipment by June 30, 2024.

  Renewable diesel will achieve 60% or more greenhouse gas reduction for the City diesel fleet. As per the State of California EPA, RD will achieve a 12% to 33% reduction in tailpipe emissions including particulate matter, carbon monoxide, hydrocarbons and NOx. DCAS is also the first large scale implementer in the nation of what is referred to as the “artic blend” renewable diesel. This is RD that meets the cold weather requirements of DCAS. DSNY and other agencies successfully used the artic blend for

	THC g/bhp-hr	ΔTHC %	CO g/bhp-hr	ΔCO %	NOx g/bhp-hr	ΔNOx %	PM g/bhp-hr	ΔPM %
CARB	0.769	*0.0%*	2.091	*0.0%*	5.891	*0.0%*	0.063	*0.0%*
R20	0.744	*-3.3%*	1.753	*-16.2%*	5.603	*-4.9%*	0.06	*-4.8%*
R50	0.726	*-5.6%*	1.612	*-22.9%*	5.289	*-10.2%*	0.055	*-12.7%*
R100	0.677	***-12.0%***	1.392	***-33.4%***	4.825	***-18.1%***	0.045	***-28.6%***

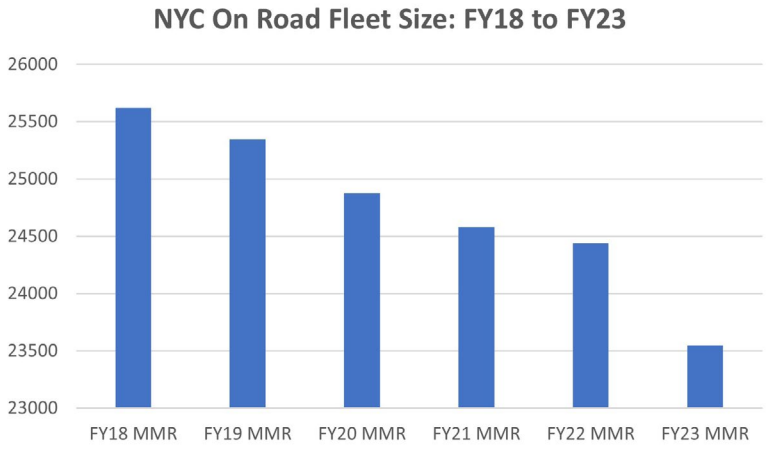
the complete winter of 2023 to 2024. Among many benefits, RD does not have the strong and distasteful smell associated with regular diesel, thus greatly improving workplace conditions for garage and field staff and mechanics.

Fleet Efficiency

Efficient use of existing resources is a critical aspect of the NYC Clean Fleet Strategy. Efficiency initiatives have taken many forms.

- **Fleet Reduction**

In 2019 and 2022, Mayoral initiatives were launched to reduce the size of the City fleet. DCAS has implemented the nation's largest live tracking initiative for City fleet vehicles, called the Fleet Office of Real Time Tracking (FORT).

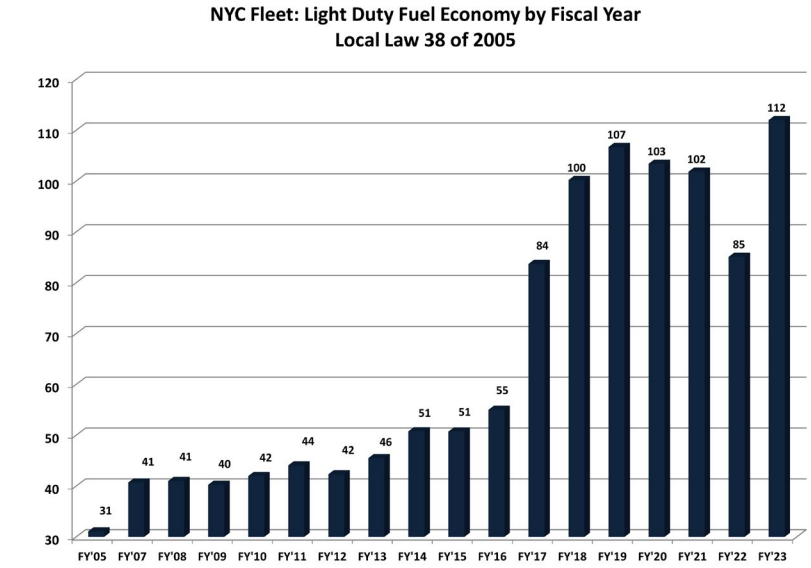


DCAS tracks over 28,500 City fleet units and contracted school buses. Usage data from the FORT was analyzed to identify the best opportunities to reduce fleet size including low use vehicles and employee commuting that was not operationally necessary. Over 6 years, the City's fleet has been reduced by over 2,000 units. Commuting by City employees was reduced 33%, nearly 1,000 staff.

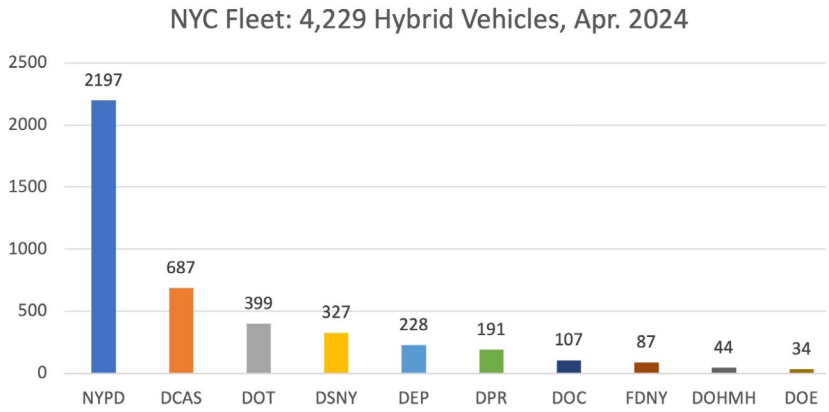
- **Improving EPA Fuel Economy**

Local Law 38 of 2005 requires DEP and DCAS to report on the Environmental Protection Agency (EPA) fuel economy for new City owned non-emergency light duty vehicles. This reporting is the equivalent of the Federal Corporate Average Fuel Economy (CAFE) standard. The law governs procurement of sedans, SUVs, crossovers, mini-vans, and small pickups. These vehicle types represent the vast majority of vehicles on the road in the United States.

In FY23, DCAS achieved an average fuel economy for these units of a record 112 miles per gallon (MPG) across 1,071 units. For 5 of the last 6 years, the average fuel economy has been over 100 MPG. For purposes of comparison, the 2023 EPA Automotive Trends Report shows a national average fuel economy of 26 MPG in 2022, a new record. DCAS procures vehicles from major manufacturers such



as Ford, Chevrolet, and Toyota. The vehicles that DCAS procures are available to all consumers. The DCAS fuel economy achievements demonstrates clearly that major improvements to fuel economy are achievable today for light duty vehicles.



- **Continued Investment in Hybrids**

DCAS is committed to transitioning the City fleet to electric plug-in models. However, plug-in options are not yet available in many areas. In these cases, DCAS continues to invest in hybrid electric units, reducing both fuel use and maintenance costs. The NYPD alone operates nearly 2,200 hybrid units. DCAS and NYPD will replace all gas patrol units with hybrids while continuing development of electric options.

In 2020, DCAS produced a report using telematics data that showed hybrid vehicles in operation in the City fleet performed better against gas options than projected through EPA fuel economy ratings.

- **SUV Reduction and Downsizing**

Through Executive Orders 41 of 2019, and 53 of 2020, DCAS is reviewing and working to reduce sports utility vehicle (SUV) purchases. SUVs, especially with 4x4 traction, are operationally necessary for many assignments including DSNY snow emergencies, NYC Parks off-road and beach operations, and DEP off-road site management. In addition, 7 seat SUVs are used in specialty assignments in law enforcement.

Since 2020, DCAS has reduced total SUVs, outside the NYPD, by 121 (or 8%) and moved to sedan models. Additional reductions are built into the FY24 procurement plan. Currently, there are no longer viable sedan models for policing. Both Ford and General Motors have transitioned away from supplying sedan models of police cars. As a result, NYPD is transitioning to hybrid SUVs, mostly the Ford Hybrid Interceptor. DCAS has also reduced purchasing of 7-seat large SUVs by 80% since 2019. DCAS implemented the first all-electric 7-seat utility contract with the Kia EV9.

- **Fleet and Car Share**

DCAS continues to adopt fleet and car sharing to more efficiently allocate fleet assets focused on non-emergency light duty units. Local Law 41 of 2015 marked the kickoff of a car sharing system for City fleet vehicles. DCAS has offered City agencies a car share contract with Zipcar since 2012. In 2023, 22 agencies and offices made use of car share services with a total of 35,825 reservations.

DCAS' Fleet Management also continues to share City owned fleet units through Fleet Share. In 2022, DCAS utilized a new supplier of fleet share technology, called Ridecell. Currently 214 vehicles from DCAS, NYC Parks, DEP, DOC, DOT, and ACS share fleet units across staff using the fleet share technology. DCAS offers a citywide share program of 94 vehicles including 78 all-electric Chevrolet Bolts that are available to all agencies. Over 3,500 employees from 14 agencies and offices have access to the DCAS shared fleet. In 2023, these shared units were used nearly 18,000 times.

In January 2024, DCAS completed a series of contracts to electrify car share, rideshare, and other short term vehicle rental options. Fleet and car share, rideshare, and short-term rentals all offer opportunities to meet agency transportation needs without increasing City owned fleet units.

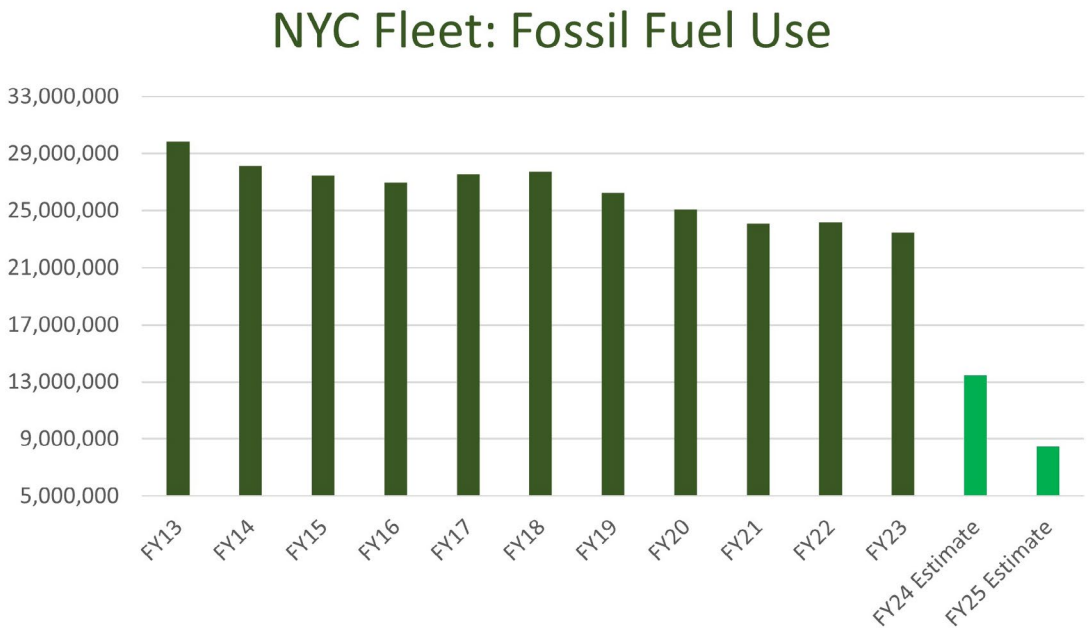
Fuel Use and GHG Reduction

The three strategies of electrification, biofuels, and efficiencies are all aimed at reducing fossil fuel use and greenhouse gas emissions (GHG) from the fleet. DCAS reports on fuel use performance in the Fleet Section of the Mayor's Management Report (MMR).

From FY13 through FY23, total fuel use in the City fleet decreased by 5.4 million gallons annually or 18%. The reduction in fossil fuel use, when adding in biodiesel and renewable diesel efforts, is greater at 6.3 million gallons annually or 21%.

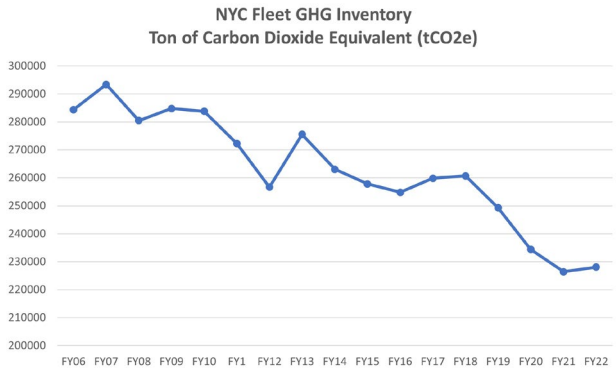
DCAS expects further reduction in total fuel use as we approach the FY25 target date. DCAS will achieve dramatic reductions starting FY24 in fossil fuel reduction with the implementation of renewable diesel. By the end of FY24, DCAS expects to have reduced total fossil fuel use by over 50% as compared to FY13 and by nearly 70% by FY25.

The Mayor's Office of Climate and Environmental Justice (MOCEJ) publishes the City's Greenhouse Gas Inventory. This report includes City's fleet emissions. The inventory includes fleet use of gasoline, ethanol which is 10% of gasoline by law, diesel, biodiesel and renewable diesel, and electricity. The current GHG inventory shows a 20% reduction in GHG from the City fleet from FY05, the baseline reporting year, to FY22, the last public year of reporting. This reporting closely mirrors DCAS reporting of reduction in fossil fuel use. ***Based on the rollout of renewable diesel to all fleet units and continuing electrification and efficiency, the FY25 GHG inventory will show a 50% or greater reduction in GHG from the City fleet.***



Moving Forward

The next major benchmarks for the New York City fleet sustainability program will be 80x35 and the Local Law 140 of 2023 targets of an all-electric light and medium duty fleet by 2035 and full electric on-road fleet by 2038. Local Law 140 includes exemptions in cases where vehicle models or sufficient charging and backup power is not available. DCAS will be working on a series of initiatives to achieve those goals that include:



- **Electric Options for Policing:** NYPD and other law enforcement vehicles are the largest single component of the City fleet, with over 9,000 units. Fleet has worked with NYPD, Sheriff, Correction, DCAS, and NYC Parks to introduce the Ford Mustang Mach-E for law enforcement use. DCAS will work with manufacturers to develop a plug-in hybrid (PHEV) option for police and law enforcement vehicles and additional all electric (BEV) options for law enforcement. Due to the extensive charging and emergency back-up power requirements for electrifying law enforcement vehicles, a PHEV option(s) will be essential. The Ford Interceptor SUV, based on the Ford Explorer, is the main NYPD patrol unit today. Ford offers a version of the Ford Explorer in Europe currently that is both PHEV and BEV. However, there is no PHEV or BEV Interceptor. Chevrolet has introduced an all-electric Chevrolet Blazer for police use. DCAS has initiated efforts to contract for that unit. DCAS will continue to replace gas law enforcement vehicles with hybrids until additional plug-in options develop here in the United States. NYPD and DCAS will also investigate electric options for NYPD's 130 patrol motorcycles.

- **Electric Options for Emergency Trucks and Specialized On-Road and Off-Road Equipment:** Electric vehicles are developing successfully for most non-emergency light and medium duty vehicle types. Electric models are currently effective when the primary vehicle use is to transport individuals from one location to another. DCAS has

regularly expanded contract options in these areas and is confident these models will pay for themselves over time, with savings in fuel, maintenance, and extended life offsetting upfront vehicle costs and charging costs. However, the demands of the city fleet go beyond transport and emphasize the performance of specialized tasks once arriving at a destination.

- These tasks include:
  - Snow plowing
  - Salt spreading
  - Firefighting
  - Ambulance rescue and patient support
  - Towing
  - Construction
  - Sweeping
  - On-sand beach operations
  - Off-road difficult terrain operations
  - Bucket truck operations for skilled trades and forestry
  - Log loading and other boom arm applications
  - Chipping
  - Asphalt paving
  - Snow melting
  - Tractors
  - Front end loaders
  - And more

The City has made some progress in specialized areas including the leading work DSNY has done developing all-electric and soon plug-in hybrid electric street sweepers. At this time, however, there are still few viable electric options in many of these work and functional areas. DCAS will continue working with the marketplace and City fleet agencies to advocate for further electric vehicle development in these areas and to test early market offerings. As with law enforcement and ambulances, plug-in hybrid or auxiliary power unit options could play a role in early electrification of these models. DCAS discussed these issues in its Clean Fleet Transition Plan, published with the US DOT Volpe Center in October 2022.

- **Efficient Use of Plug-in Hybrids and Charging Infrastructure:** As discussed above, PHEVs have a vital role to play in fleet electrification especially for emergency service applications and in other fleet areas where charging may not be readily available. Fleet managers must work to ensure that PHEVs are charged as

much as possible. The environmental and maintenance benefits depend on electricity and not gasoline being used to power the vehicles to the maximum extent. DCAS will use tracking from telematics to identify PHEVs not sufficiently charging and will work with agencies to improve charging performance. Some specialty units also have unique challenges to plugging in. Most city ambulances today have a plug tied to their auxiliary power unit (APU) battery. A major challenge remains to plug those units in without interrupting emergency medical technician (EMT) operations. In FY25, FDNY will be piloting use of solar panels on the roofs of new ambulances to recharge the battery and further displace liquid fuel use.

DCAS will assess the use of its chargers and solar carports to maximize usage of available charging time. For practical implementation, DCAS looks to implement charging to serve agencies before electric vehicles arrive. This can lead to some downtime in usage of the chargers. DCAS will work to maximize interagency sharing of the charging ports and improve charger use. The new DCAS Field Services team will continue its efforts to improve charger maintenance, repair, and availability.

- **Improving Charging Resiliency:** DCAS operates one of the largest charging networks in the nation with over 2,000 charging ports including fast, overnight, solar, and portable charging. As DCAS continues to expand charging, it will be critical to both increase charging speeds and improve resiliency and failsafe protections. DCAS currently installs mostly 50kW fast charging. DCAS is bidding contracts now to increase charging speed to 150kW with options to go higher. A 50kW charger can require 45 minutes to an hour to charge a vehicle from 20 to 80 percent. A 150kW charger can reduce this time to 15 minutes.

  DCAS is also working to establish access to commercial charging. For liquid fuels, DCAS both manages a large internal fueling capacity and has access to all commercial sites through a NY State contract. DCAS will want the same for EV chargers.

Resiliency and backup power are also critical issues as the EV fleet expands and plays a role in a growing number of essential City services that cannot be disrupted at any time. DCAS will work with vendors to improve IT security and safety and ensure charging systems offer failsafe ways to continue use in case of network disruption where the unit and electric source are otherwise undamaged. DCAS has also set a goal of 25% non-networked chargers to protect against the impacts of network disruption.

Power losses are also major concerns. The current DCAS network of solar carports and battery storage chargers is one protection against power loss events. DCAS will also look at trailer based portable charging units, additional modes of backup battery power, and how diesel generation would support EVs in the case of power losses. New DCAS fast charging hubs are currently being designed with the capacity to transition to diesel generator power in emergencies.

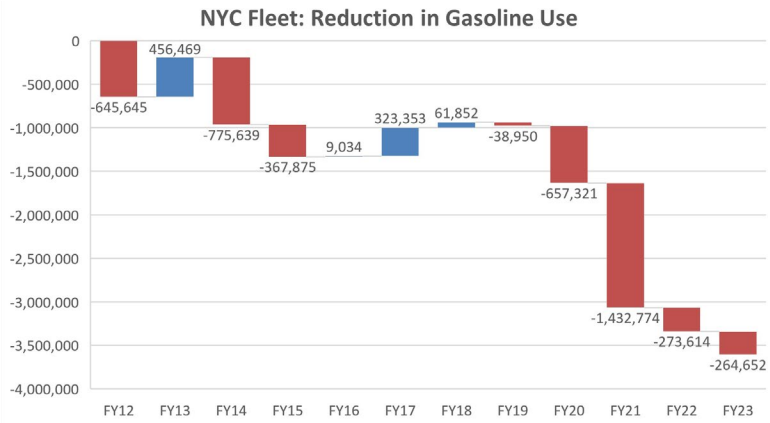
Finally, electric charging is an area of extensive investment currently in the fleet industry. Alternatives to cord charging such as wireless charging or battery swapping could offer additional charging solutions.

- **EV Education and Battery Safety:** Local Law 140 requires DCAS to provide training on EVs to mechanics and fleet operators. DCAS will build on its existing mechanics EV training and its "Let's Talk About EV" initiatives. DCAS will also continue to work with the FDNY to assess fire safety as it relates to EV vehicles, batteries, and charging systems and to educate employees on these issues. DCAS has also partnered extensively with NYC Public Schools to introduce electric vehicles to students including donating 15 EVs to the automotive high schools and 7 Nissan Leaf EVs for use in driver's education. DCAS and NYC Public Schools also launched the "Batteries Included" educational video campaign to promote electric vehicles, and DCAS supported the Hertz Electrifies educational initiative for NYC Public Schools.

- **Sustainability Includes Traffic Safety:** The DCAS fleet approach to sustainability emphasizes the importance of both emission reduction and safety. DCAS is implementing a comprehensive Safe Fleet Transition Plan to improve safety and has partnered on this effort with the US DOT Volpe Center. As DCAS rolls out further emission reduction and safety measures,

DCAS will further develop the direct connections between emissions reduction and improved safety. For example, DCAS has implemented telematics and a nation leading Intelligent Speed Assistance (ISA) initiative to control vehicle speeds. The US Department of Energy estimates that reducing speed can improve fuel economy 7 - 14%. Chevrolet electric Bolts are one of the primary units for the initial ISA safety rollout. DCAS has also announced its intention to invest in high vision truck models to address visual impairments for truck operators. Electric trucks offer a great opportunity to implement high vision models. Electric units are also heavier than liquid fuel models which can be a safety risk. DCAS will explore further areas of vehicle down-sizing, especially for SUVs to crossovers and sedans and reducing the size of pickups to help offset these impacts.

- **Renewable Gasoline:** DCAS has successfully replaced fossil diesel fuel with renewable diesel. The City's fleet continues to utilize over 9 million gallons of gasoline per year. Gasoline use has gone down 28% since FY11 and we expect continued reductions through 2035. However, some level of gasoline use is expected to continue through use of plug-in hybrids especially in emergency services and models without electric options. Renewable gasoline is in early development and a potential alternative to fossil gas where gasoline remains in use. DCAS will explore opportunities to implement renewable gasoline.



- **Repowering:** Repowering, or retrofitting, is a potential approach to electrifying older trucks and buses including school type buses. The Logan School Bus Company serving NYC public schools has announced an initial repowering effort. City school buses are expected to electrify by 2035 through Local Law 120 of 2021. DCAS continues to explore initial pilots of repowering for older diesel trucks to determine the cost and operational effectiveness of this approach.

- **Renewable Diesel for Marine Vessels and Heating Oil:** In September 2024, DCAS began the rollout of renewable diesel fuel for City fleet trucks and off-road equipment. Renewable diesel is also a potential alternative for boating vessels including the DOT Ferry, DEP sludge boat, NYC Ferry, and NYPD and FDNY harbor and marine units. DCAS and DOT have begun

initial testing of renewable diesel fuel in vessels and this fuel is used for vessel applications in California. Renewable diesel is also a potential alternative for heating oil. DCAS published a report on this potential in 2019. In any given year, the City can use up to double as much heating oil as fleet fuel. Renewable diesel has not been used yet in the United States as an alternative heating oil though biodiesel is extensively used for heating oil in blends of 5 to 20 percent including by law in NY State. DCAS will work with industry and City agencies to explore expansion of renewable diesel to both marine vessels and heating oil.

- **Hydrogen:** Hydrogen fuel cells offer the potential of zero emission vehicles using scalable fuel cell technology that could be applied to all sizes and types of both on and off-road fleet equipment. Hydrogen fuel cell technology has the potential to solve the challenge of implementing zero emissions technology for specialized equipment. While the emissions and the scalability are very attractive, hydrogen comes with many limitations including nearly no current supply of hydrogen powered vehicles, the need to source hydrogen through renewables like solar or wind to achieve GHG reduction, comprehensive upgrades to vehicle repair shops to maintain hydrogen equipment safely, fire risk concerns and fire regulation, and the need to build new fueling infrastructure while maintaining existing fuel infrastructure in transition. DCAS is not currently pursuing hydrogen approaches. Hydrogen is however receiving continued investment in the United States and DCAS will remain open to viable hydrogen proposals.
- **Non-Tailpipe Vehicle Emissions:** The focus of the NYC Clean Fleet Plan is tailpipe emissions. Vehicles also emit from tires and brakes. In 2023, DCAS partnered with Emissions Analytics to look at tire emissions and assess the potential of soy based tires to reduce both petroleum use and particle emissions from tires. DCAS and fleet agencies have invested in over 2,300 soy-based tires through 2023. DCAS will continue efforts to reduce tire emissions and will also assess additional aspects of vehicle emissions including in-cab air quality.

NYC Fleet Biotire Purchases 2018 to 2023	
NYPD	1738
DOT	359
DSNY	83
Parks	62
DOC	52
FDNY	36
Total	2330

Conclusion

In 2015, New York City announced its intention to lead the nation and the world in cleaning its fleet emissions and reducing greenhouse gas emissions from fleet. DCAS operates the largest municipal fleet in the United States and one of the most complex with 160 types of on and off-road fleet unit, focusing on the provision of essential and emergency public services. The City committed to 50% greenhouse gas (GHG) reduction by 2025 (50x25) and 80% by 2035 (80x35). The City, led by DCAS, embarked on a three-part strategy to reduce fleet emissions:

1) Electrify the fleet as quickly as technically and operationally achievable;
2) Replace diesel fossil fuel with diesel biofuels including biodiesel and renewable diesel;
3) Implement continued efficiencies including fleet reduction, hybrids, and fleet sharing.

Nine years later, DCAS has maintained a relentless focus on each of these three initiative areas and will achieve the first major benchmark of 50x25 for reducing GHG emissions from fleet. Many governments and organizations throughout the world have announced aggressive and ambitious GHG reduction targets and programs. Few have delivered on time. DCAS has now done so and has established a model of fleet sustainability that can guide fleets public, private, and non-profit throughout the nation.

Acknowledgements

Clean Fleet Update 2024 Prepared by NYC Chief Fleet Officer and DCAS Deputy Commissioner Keith Kerman

Thanks to:

DCAS Commissioner Dawn Pinnock
DCAS Executive Deputy Commissioner Beatrice Thuo
Assistant Fleet Commissioner Brent Taylor
Deputy Chief Fleet Officer Eric Richardson
Fleet Chief of Staff Sherry Lee
Deputy Chief Fleet Officer Tamika Johnson
Executive Director of Fleet Operations Harris Kaplan
Sustainability Coordinators Julia Marchetti and Fiona Crisp
Fleet Sustainability Director Javier Nieves Negron
Director of Field Services Marcin Gubernat
Deputy Assistant Commissioner / Deputy ACCO Masha Rudina
DCAS Communications

May 2024

DCAS

nyc.gov/dcas

NYC Citywide Administrative Services