

emissions



NYC Parks leads the charge

Author

Keith Kerman, Chief Fleet Officer and DCAS Deputy Commissioner, NYC

How NYC Parks Department has transformed its fleet of vehicles and equipment to ensure that New Yorkers and tourists enjoying the city's parks can also enjoy their clean air.

Above: NYC Parks embraced hybrid technology when it first emerged in 2000. Hybrids reduce fuel use and maintenance and can be used in tandem with other cleaner approaches such as biofuels.

NYC operates some of the world's most famous parks. Central Park in Manhattan, Prospect Park in Brooklyn, Flushing Meadows Corona Park, home to the US Open, Van Cortlandt Park in the Bronx, and Fresh Kills, NYC's park of the future in Staten Island.

New Yorkers and tourists come to these parks and thousands of neighbourhood parks, playgrounds, beaches, and gardens for many reasons. To relax, play with their kids,

exercise, read, date, get close to nature, walk their dog. Of the countless reasons to take in the parks, there is one that is on no one's list. Seeing more vehicles and breathing more exhaust fumes. New Yorkers would prefer that cars and trucks had no place in the parks, and for the most part, they don't. The NYC Parks Department, however, is charged with cleaning, repairing, and safeguarding the parks. Vehicles and equipment are critical to that mission.

emissions



The challenge

Parks operates 2,808 fleet items, including 377 trucks and 1,132 off-road units like tractors, tree chippers, and surf rakes for the beach. This equipment is used to clean the parks, prune the City's street trees, clean the beach sand each night, and empty the rubbish bins. Parks operates 72 types of vehicles – the City's most diverse fleet. In addition, Parks uses more than 5,000 pieces of horticultural equipment such as lawnmowers, weed-whackers, blowers, chainsaws, and snowblowers.

Parks can't avoid using equipment. Parks can and has, however, led the charge to green this fleet, limiting harmful emissions and reducing the fleet's impact on New Yorkers' enjoyment of the parks. Many NYC agencies have environmental missions. No agency has done more to match its fleet to its commitments.

I first started at Parks in 1994. I recall a weekend morning inspection in Prospect Park. A big Parks garbage truck picked up baskets along the baseball fields, spewing the dirtiest, smelliest exhaust. Kids were running away from the truck so they could breathe. That is not why they came to the park.

From those earliest days, Parks began the effort to reduce vehicle emissions. It began with natural gas. In 1994 and 1995, Parks implemented the City's earliest efforts at clean emissions, installing two natural gas fuelling sites, first in Flushing Meadows Corona Park, and later in Central Park. Parks procured natural gas sedans, vans, and sweepers.

The NYC Department of Sanitation also installed a natural gas site, the only three owned by the City. Natural gas was cleaner at the tailpipe and started the ball rolling in looking for alternatives to gas and diesel. While not the long-term future, natural gas

was critical to launching Parks' greener vehicle effort.

Next came hybrids. Parks embraced the technology when it first emerged in 2000, implementing hybrid sedans and SUVs. After 9/11, Parks received a donation of two hybrid Prius units from Toyota and soon made hybrid technology standard for its light-duty units. Then it was expanded to pickups and vans, rack and dump trucks, forestry bucket trucks, and most recently, to smaller six-yard garbage trucks called mini-packers. Hybrids reduce fuel use and maintenance and can be used in tandem with other cleaner approaches such as biofuels.

Parks also retrofitted its trucks with diesel particulate filters (DPFs) to reduce tailpipe emissions as part of a citywide programme and in response to Local Law 39 of 2005. While new trucks are required to have these devices by federal law, existing trucks can operate for 12 or more years. By retrofitting the trucks, Parks further reduced tailpipe emissions, enhancing the benefits of hybrids.

Biofuels and renewable diesel

Parks went further. In 2005, a vendor demonstrated biodiesel at the Parks Annual Fleet Show. They later donated B100, pure biodiesel, for use in Park's garbage trucks in Staten Island. Biodiesel is a domestic fuel alternative, produced using excess soybean oil or recycled grease. It has lower greenhouse gas and air quality emissions than regular diesel. Biodiesel does operate differently than regular fuel, but it is generally seamless at blends of 5% to 20%.

Parks embraced biofuels, becoming one of the leading adopters in the nation. Starting with B5 and going to B20 year-round, Parks used biodiesel for all fleet equipment, including its large off-road fleet, then for all its heating oil systems. Parks pushed the

Above left: Parks has many hybrid trucks, retrofitted with diesel particulate filters, that operate on biodiesel.

Above right: BMW donated 20 BMW i3 electric vehicles to NYC Parks.

"Parks can't avoid using equipment. Parks can and has, however, led the charge to green this fleet, limiting harmful emissions and reducing the fleet's impact on New Yorkers' enjoyment of the parks. Many NYC agencies have environmental missions. No agency has done more to match their fleet to their commitments."

emissions

Right: NYC Parks is working towards a zero-emissions fleet and is the city's leading adopter of electric vehicles.

NYC Parks Alternative Fuel Fleet	
Fuel	Count
All Electric BEV	209
Plug-in Electric PHEV	48
Electric Gas Hybrid	227
Diesel Electric Hybrid	16
On-road fleet using biodiesel blends	806
Off-road BEV	152
Off-road Solar Electric	82
Off-road equipment using biodiesel blends	593
Compressed Natural Gas (CNG)	56
Chargers	209
Solar Carport	50
Total	2448

“You would think that a government entity would be resistant to change and a late adopter of new technologies. However, Parks has been an innovator when it comes to the adoption of new sustainability ideas and technologies.”

limits of biodiesel use, showing that it was suitable for the full range of vehicle and heating oil systems.

Parks is working to expand biofuel use even further. Parks and the Department of Citywide Administrative Services’s (DCAS) NYC Fleet division have launched an effort to test B50 use in Staten Island with support from the National Biodiesel Board. Parks also participated in a citywide demonstration project to use renewable diesel (RD), a next-stage biofuel. RD is made with the same feedstocks as biodiesel.

Unlike biodiesel, RD meets the same specification as regular diesel and can potentially replace all diesel fuel use. Parks is even using some tyres made from soybeans. In 2011, Parks was recognised nationally for its biodiesel leadership by the National Biodiesel Board. Farmers from across the nation regularly visit Parks to learn about their biodiesel efforts.

As mentioned, these approaches can work in tandem. Parks has many hybrid trucks, retrofitted with diesel particulate filters, that operate on biodiesel.

Electrification

The best-case scenario is zero emissions and NYC Parks is on its way there. Park’s leadership in the plug-in electrification of the fleet began with a series of donations of RAV4 electric SUVs, over 200 all-electric GEM carts, and early Navistar electric vans.

These donations provided vital early experience with operating and maintaining electric equipment and establishing a charging infrastructure. There was certainly a learning curve. At Orchard Beach, a Park worker charged more than 10 electric carts on a single outlet, leading to a major fire.

Another Parks worker, discovering how fast electric vehicles can go, crashed one of the RAV4s.

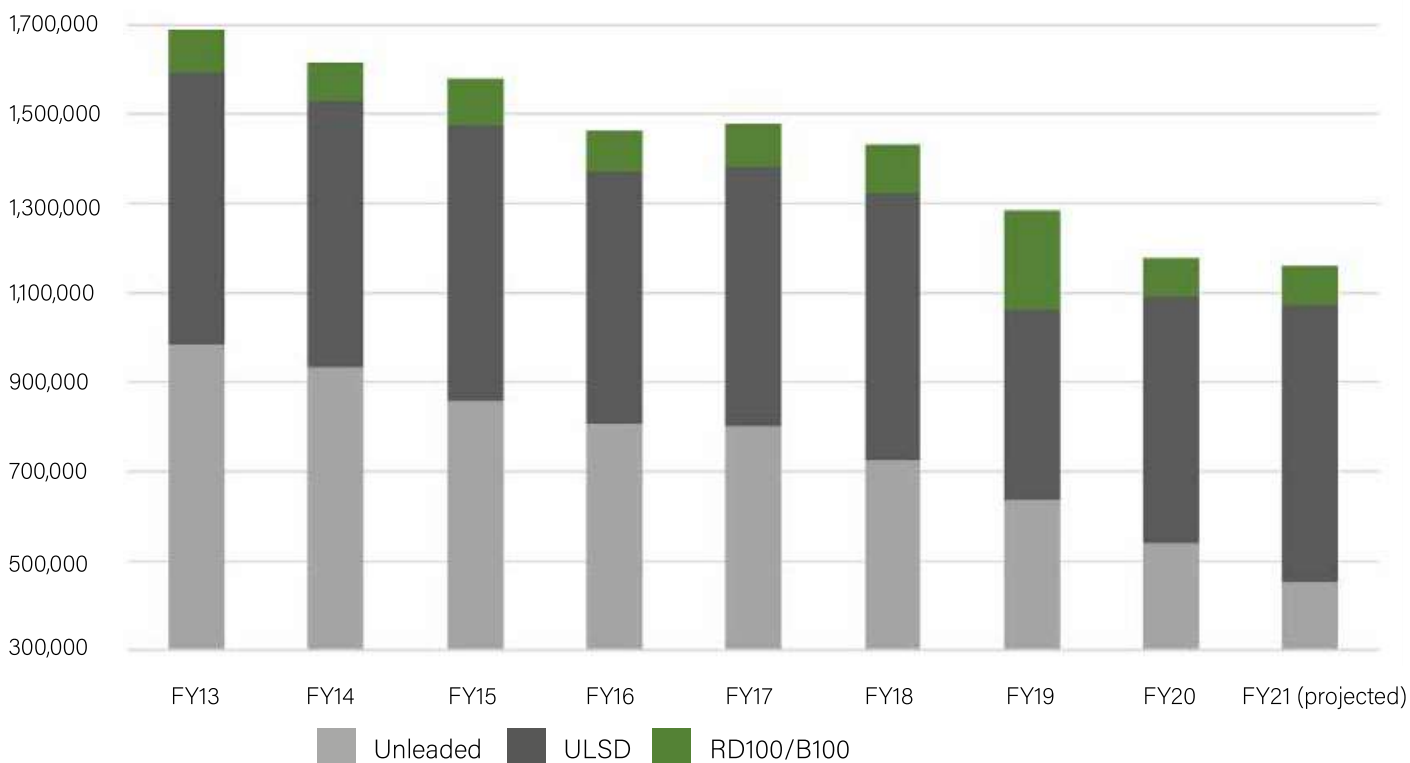
Parks soon moved beyond these early challenges and is now New York City’s leading adopter of electric vehicles. Parks operates 361 all-electric BEV units and 48 plug-in hybrids and has 259 EV charging stations. These stations include 50 free-standing solar carports that are not connected to the grid. Working with DCAS, Parks has made eight of these stations open to both City vehicles and the general public, supporting efforts to expand EV adoption more widely in NYC. DCAS and Parks are planning to expand these public charging efforts in the next year.

Many of these EVs are deployed as shared vehicles. Working with DCAS, Parks is the lead adopter of the electric shared fleet initiative, which uses sharing technology to reserve and assign units. Shared, all-electric cars, many powered by solar carports, is a vision of the future that is very much the present at Parks.

While DCAS offers many light-duty plug-in options and also hybrid plug-in ambulances, this is the first long-term requirement contract for an all-electric replacement truck for the City fleet. This contract will serve as the model for future electrification as the City pursues an all-electric fleet by 2040.

Paris Apollon, Chief of the Parks Fleet, says that Parks has bucked the trend when it comes to government bodies and change. ‘You would think that a government entity would be resistant to change and a late adopter of new technologies. However, Parks has been an innovator when it comes to the adoption of new sustainability ideas and technologies.’

emissions



NYC Parks Electric Equipment	
Type	Count
Pressure washer	18
Sprayer	1
Scrubber	3
Handheld blower	167
Backpack blower	20
Saw	15
Mower	67
Trimmer	348
Hedge trimmer	27
Brush cutter	4
Total	670

online, and the expansion of biofuel efforts, Parks is well positioned to keep this trend line steadily decreasing until fossil fuels are a thing of the past.

Horticultural equipment also uses fuels and produces noise and harmful emissions. Parks has more than 5,000 pieces of two and four-cycle equipment that are used to keep parks clean and safe. These include weed trimmers, chainsaws, leaf and snow blowers, and lawn mowers.

In the last five years, Parks has been leading an effort to research, test, and implement cleaner alternatives for this type of equipment, which has heavy use, especially in summer. While the industry still has a way to go, electric options are now coming onto the market with improved operational capacity. Parks is committed to finding equipment units that are zero noise and emissions but that can also handle the gruelling operational demands placed on them, and currently has 670 electric horticultural equipment pieces in operation, the largest such programme in NY State.

Over 25 years and in every sphere of endeavour, Parks has pushed the envelope and led the way for a greener fleet. In recognition of these efforts, Parks Fleet Chief Paris Apollon received recognition at the Future Fleet Forum Awards in January 2020. Through Executive Order 53 of 2020, Mayor de Blasio committed NYC to achieving an all-electric fleet by 2040. Parks is well on its way to being the first large NYC agency to get there.

Top: Fuel use by Parks vehicles from 2013 to 2021 (unleaded, ULSD, and RD100/B100).

Above: Parks has more than 5,000 pieces of two and four-cycle horticultural equipment, 670 of which are electric, the largest such programme in NY State.

Even all-electric can be improved upon, however. Parks is also leading on implementing solar-electric equipment options, operating 81 programmable solar light towers. These eliminate emissions, costly maintenance, and time-consuming operations for diesel light towers. The towers also produce improved LED lighting.

The goal of all these efforts is to reduce fossil fuel use. In the last five years, Parks has reduced its fossil fuel use by 500,000 gallons annually, over 31%, despite increasing demands on park services. With more and more all-electric fleet options about to come