

# electric



## New York plugs in

In February 2020, New York City Mayor Bill de Blasio committed to an all-electric municipal vehicle fleet by 2040. The City of New York has the largest municipal fleet in the US, and putting in place 30,000 electric and plug-in cars and trucks poses many challenges. First and foremost, where is everyone going to charge up?

### Words

Keith Kerman, Chief Fleet Officer, Deputy Commissioner, NYC Department of Citywide Administrative Services

**T**he City of New York's fleet is managed by the NYC Department of Citywide Administrative Services (DCAS). It includes the New York Police Department (NYPD), New York City Fire Department (FDNY), the NYC Department of Sanitation (DSNY), NYC Department of Transportation (DOT) and the NYC Parks Department. These are the largest municipal agencies of their type in the world and must operate fleet units 24/7. An electric vehicle charging network will need to be extensive, robust, and varied to support these agencies.

The City's fleet agencies are already well-versed in large-scale fuelling programmes. Under the oversight of DCAS, NYC operates the largest number of fuel stations in New York

State, with 420 liquid fuelling sites supporting both on and off-road fleet units. NYC also operates 63 mobile fuelling trucks, many purchased as part of a significant resiliency investment after Superstorm Sandy in 2012. DCAS also provides access to agencies to fuel at hundreds of private stations. In an average year, City fleet vehicles may use over 26 million gallons of liquid fuel.

We plan to transition this entire fuelling infrastructure to electric and solar, and we are already off to a great start. DCAS has installed more than 1,000 charging ports, the largest network of its type in the state. The early chargers were level two slow chargers. Vehicles would park overnight at these chargers, charge through the night, and be ready for use the next day. In our early days of electric vehicle

DCAS Commissioner Lisette Camilo and NYC Chief Fleet Officer Keith Kerman using the EV Charger at NY's City Hall.

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adoption, this model was effective.

Early electric vehicles in our fleet were restricted to non-emergency assignments and focused on units travelling a maximum of 40 miles per day. This doesn't sound like a lot, but in crowded city streets, it is. At that time, our early electric vehicles achieved, at most, 80 miles per battery charge. Newer electric vehicles achieve over 200 miles.

These early chargers were purchased through general fleet auto parts budgets and installed by City electricians in most cases. DCAS has conducted training sessions on electric vehicle installation with both fleet mechanics and electricians, recognising the merging of these two trades in fleet operations. The City's fleet also employs plug-in hybrid units (PHEVs) – electric cars with small gas engines – as backup.

Slow chargers are adequate for non-emergency, one shift, overnight vehicle fuelling and for plug-in hybrids. NYC, however, operates more than 12,000 medium and heavy-duty on-road trucks and over 11,000 police, fire, and emergency response units. The expansion of electrification to this larger fleet will require the type of same-day, same-shift, quick fuelling that we can now access through fuel stations.

To prepare the fleet for large-scale electrification, DCAS developed a \$14 million (£10.2 million) project to install at least 100 fast chargers throughout the City. These fast chargers would charge up to seven times faster than slow, level-two chargers.

Making a case for this funding, DCAS stressed that these fast chargers would also enable broader use of all-electric vehicles (BEVs) instead of the plug-in hybrid electric vehicles (PHEVs). In the City's experience, all-electric BEV vehicles achieve complete liquid fuel savings and also major savings in fleet repair and maintenance of up to 60% or more. PHEVs require more substantial management of the charging versus fuelling process and achieve fewer maintenance savings. While PHEVs are great electric cars, especially for motivated individual owners, ensuring PHEVs are charged rather than fuelled is a real challenge in a large, diverse fleet operation. The City offset the cost of the fast-charging project through planned maintenance and fuel savings in future years.

DCAS has now made progress in rolling out the fast-charging network. In January 2021, [DCAS announced the completion of the first 58 fast chargers](#), including two offered for general public access. These are among NYC's first public charging hubs. The chargers are located at 11 different agencies and in all five NYC boroughs. Since then, we have added four more fast chargers, including an additional public unit, and installations continue.

Fast charging is critical to our plans to expand electric vehicle adoption to trucking and emergency services. It is fun to debate whether the chicken or the egg comes first, but the charging needs to come first for electric vehicles.

In addition to fast charging, the capital project for electric vehicle charging included an expansion of the City's solar carport programme. DCAS implemented an equipment resiliency programme after Superstorm Sandy, procuring hundreds of generators, light towers, forklifts, fuel trucks, and pumps to ensure the City could respond to future storms. DCAS procured the liquid fuel trucks to support mobile fuelling of gas and diesel fleet units. DCAS also faced the question of how to power its growing fleet of electric vehicles, now at over 2,800, if electric power was lost.

The City's first solution was to implement mobile solar carports. The carport includes solar panels, a 25 to 30 KW storage battery, and a level two charger. These units are free-standing and mobile. There is no requirement to attach them to the grid or permanently affix them. They are 'tow and use'. DCAS now operates 87 of these carports, the largest such project in the world. We plan to order two more this year.

While purchased as an emergency asset, these solar carports power fleet vehicles on a daily basis unlike traditional emergency diesel generators, which are only used during crises. This is also the first example of the fleet generating its own power supply, providing the cleanest and most sustainable possible energy source. Day to day, these carports charge one to three fleet units. The mobile solar carports are also a unique and important emergency power reserve, operating as a new emergency generator asset. Zero-emission vehicles powered solely by the sun through free-standing carports are already our reality and an exciting future.

To support and manage this charging, DCAS uses the network management system of its main charging supplier. This system enables DCAS to track usage at each charging location and issue cards for site access. DCAS is also working with its liquid fuel card supplier to add electric charging to its services. Ten years ago, DCAS merged in-house and commercial fuelling into one fuel card. DCAS is now working on adding in-house and commercial charging into that same card. Ideally, DCAS will offer staff one card for seamless fleet powering.

In a partnership with our main electricity supplier, ConEdison, the City is also being provided with financial incentives to charge, expand charging sites, and implement peak-load management programmes where charging



With 1,000 electric charge points and counting, the DCAS charging network is the largest of its type in the state of New York.

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DCAS currently operates 87 mobile solar carports, the largest such project in the world, and plans to add more to its network.

is directed to late-night, low-use times, and away from peak energy usage periods. DCAS has already earned hundreds of thousands of dollars through this programme.

As with any large infrastructure programme, the electric vehicle charging network will come with growing maintenance needs. DCAS has developed a weekly outage reporting programme and will be developing new tools, training, and resources to maintain and repair the charging network. We will also need to decide which staff will own the maintenance. Electric vehicle charging is as much an issue for buildings and electricians as it is fleets and mechanics.

Slow, fast, and solar charging are the backbone of our charging network to date. DCAS recognises that even these may not be enough as the expansion of our electric fleet continues. Working with our partner agencies, we are also looking at additional charging options.

One of these is mobile charging. Working with the NYC Department of Correction, DCAS procured its first mobile charger. A battery on wheels that fits on a pick-up truck, this mobile charger avoids the costly and time-consuming installation process. It is a charger that can be easily transported to different parking areas. Portable chargers could be a solution at facilities where fixed charging can't be established, including leased facilities or facilities with power limitations. We are even looking at mobile power trucks, big batteries on wheels to serve as the new fuel truck.

DCAS is also working with the NYC Department of Transportation on the development of curbside and light-pole

charging. Thousands of City vehicles are parked on the curb, and for these vehicles, curbside charging would be the most convenient way to power up. The City will be introducing its first curbside chargers in 2021, supporting City fleet and electric vehicle adoption among the general public.

In 2018, NYC launched the [NYCx Climate Challenge](#), which offered cash incentive awards to innovative charging suppliers. Ubitricity won with its light-pole charging system. DCAS is now working on our first projects to test this system in NYC applications.

Wireless charging and solar canopies are other technologies DCAS is assessing to expand our charging capacity. We will also need to look at more extensive backup emergency power options once electric vehicles are implemented in large scale, especially with emergency service and sanitation trucks. In a citywide power loss, these units must remain functional. Our sanitation, fire, and police garages will need extensive electric upgrades to accommodate the future's charging needs.

NYC operates more than 160 types of fleet units. For over 100 years, liquid petroleum fuelling has supported our fleet operations. The internal combustion engine and fossil fuels helped build the modern world, but their time has come. Zero emissions and electric options are here today and offer a cleaner and more sustainable future. Retiring the internal combustion engine starts with rolling out charging options far and wide.

The City of New York has started along this journey, with thousands, maybe tens of thousands of additional chargers to go as we pursue an all-electric and zero-emissions fleet.

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