Electrifying New York:
An Electric Vehicle Vision Plan for New York City
September 2021

Letter from the Commissioner, NYC Department of Transportation

My Fellow New Yorkers,

Climate change poses an existential threat to a coastal city like ours, and poor air quality leads to over 1,000 deaths in our metro area each year. Transportation accounts for nearly 30% of the city's emissions, meaning we have to do everything we can to encourage cleaner travel options to fight climate change and help reach Mayor de Blasio's goal of carbon neutrality by 2050.

This administration has made substantial progress to make it easier for New Yorkers to get around the city sustainably. We continue to build hundreds of miles of bike and bus lanes; improve and expand the most successful bike share program in the Western Hemisphere; and shorten crossings, widen sidewalks, and install pedestrian ramps and accessible pedestrian signals across the five boroughs to make walking safer and more convenient. As a result, more New Yorkers can leave their cars at home, or choose not to buy them at all.

But for some, driving will continue to be a part of how they navigate the city—and it is essential that we electrify as many of their cars as possible. As major auto manufacturers promise new electric vehicle models with longer ranges and lower prices, we expect EV adoption to take off. The city must do its part to help drivers make the switch by building out a public charging network. We will leverage DOT's parking facilities and the agency's management of the curb to provide convenient charging options while making sure they are distributed equitably throughout the city. By taking a strong initial role in creating publicly-accessible charging infrastructure, we can help spur the development of a comprehensive charging network and attract much greater private investment. This is a critical step in catalyzing a local EV market and fundamentally transforming how drivers get around our city.

We have already begun. We have been proud to partner with Consolidated Edison, the city's electric utility, to pilot New York City's first public curbside charging, installing 100 publicly-accessible plugs and another 20 for the city fleet. At the same time, we have worked with the New York Power Authority to open the agency's first two public fast charging stations at municipal parking garages on the Lower East Side and in Long Island City.

Scaling these efforts to meet the moment will require us to build on these partnerships, relying on an incredible degree of collaboration with our utility, state, and federal partners. We are heartened to see that they all share the goal of rapidly expanding the charging network to support our EV future. With Congress poised to enact a once-in-a-generation investment in infrastructure,

including groundbreaking dedicated funding for EV charging infrastructure, New York City will work hard to translate this opportunity into the public charging system that we need to meet our climate and clean air goals. And we will continue to work with community stakeholders across the five boroughs to make sure that these projects incorporate their feedback and meet their needs.

There is much to do and little time to do it. Thank you to all of our partners in this effort; we look forward to working with you to protect New York from the dangers of climate change over the decades to come, and to build a healthier and fairer city in the process.Henry B. Gutman

Henry B. Gutman, DOT Commissioner

Letter from the Director, Mayor's Office of Climate and Sustainability

To my fellow New Yorkers:

With intense storms, flooding, heatwaves, and the smoke from distant fires darkening our skies, we are already living with the impacts of climate change. Which is why we need to be moving aggressively to reduce our emissions and accelerate beyond fossil fuels.

New York City is committed to decarbonizing our transportation system by 2050 and improving our infrastructure so that everyone can get around the five boroughs reliably and efficiently. This will require embracing our potential as an even-more transit-oriented, walkable, and bikeable city while rapidly electrifying more than 1.5 million internal combustion engine vehicles in the next three decades.

In New York City alone, respiratory illnesses caused by traffic-related particulate matter led to 320 premature deaths and 870 emergency department visits and hospitalizations every year. Poor air quality from fossil fuel combustion — from vehicles, power plants, and boilers — disproportionately impacts the respiratory health in communities of colors and low-income communities.

Today, we are proud to release the Electrifying New York plan, in collaboration with the NYC Department of Transportation, which sets a bold vision for a fully electrified transportation system, accelerating our progress towards carbon neutrality, and significantly improving our local air quality. Electrifying the vehicles on our streets — from personal cars to for-hire vehicles, buses to trucks — will play a key role in reducing climate-changing greenhouse gases, lowering risk of respiratory illnesses, reducing noise on our streets, and ending our reliance on fossil fuels. The steps articulated in this plan will make switching to an electric vehicle more convenient, more appealing, and more economical than ever. With exciting new national leadership pointing the way, New Yorkers will be able to embrace the vehicles of the future.

New Yorkers live in the most transit-oriented city in America — from walking down the sidewalk, riding in a bike lane, or hopping on the subway — we have many options for getting around that do not rely on a fossil-fuel vehicle. As the Director of the Mayor's Office of Climate and

Sustainability, I proudly make most trips on New York's oldest and longest-running all-electric transportation system: the subway. For shorter trips, I can be found riding my electric bike around the five boroughs.

New York City's goal is that by 2050, 80 percent of trips taken within the five boroughs will be done by walking, biking, or mass transit. We are working to achieve this goal by securing new sources of funding for our transit system, building out a high-quality network of protected bike lanes, expanding bike share, prioritizing buses on our streets, and making sidewalks and streets safer and more accessible for pedestrians. In the future, we'll drive less, and when we drive, we'll drive electric.

If our goals are realized, by the middle of the 21st century, our streetscape will be transformed, with ample and accessible space for walking, biking, and high-quality transit, and with silent and clean vehicles served by advanced charging infrastructure across our city. New Yorkers in every neighborhood will benefit from a city that is quieter, cleaner, healthier, safer, and far more livable.

Onwards!

Ben Furnas, Director, Mayor's Office of Climate and Sustainability

Executive Summary

Electrifying New York: An Electric Vehicle Vision Plan for New York City lays out the city's goals for the adoption of electric vehicles (EVs) and the steps it is taking over the next decade to catalyze the dramatic expansion of the city's local EV charging network.

New York City is committed to reaching carbon neutrality by 2050 and making sure all New Yorkers can breathe clean air. Transportation is a major source of greenhouse gas emissions and air pollution: the two million light-duty vehicles registered in the city are responsible for the vast majority, approximately 80%, of the city's transportation emissions.

Electric vehicles are a critical part of the path to carbon neutrality, and the New York City Department of Transportation (NYC DOT) is setting ambitious goals for their adoption. The EV market is moving in the right direction, but not fast enough: local EV sales still lag far behind California and our European peers, and the existing public charging network is too small and over-concentrated in Manhattan. The lack of charging options suppresses demand for EVs, which in turn discourages private sector investment in EV charging.With a host of new and more versatile EV models coming to market and the potential for significant federal investment, the next few years represent a critical opportunity to accelerate EV adoption. The lack of charging infrastructure remains one of the most significant barriers. In the near-term, with the help of federal and state partners, New York City can fill this need by providing and incentivizing EV charging infrastructure, seeding the market that the private sector will then take over.

NYC DOT has mapped out the following steps to spur investment in and equitable distribution of charging infrastructure throughout the five boroughs:

1. Grow the city-operated fast charging network to over 80 plugs by 2025.

2. Equip 20% of all spaces in municipal public parking lots and garages with level 2 chargers by 2025, increasing to 40% by 2030.

3. Create a network of 1,000 curbside charge points across the five boroughs by 2025, increasing to 10,000 by 2030.

4. Develop a level 2 and level 1 user-supplied cord charging system that integrates with existing street infrastructure.

5. Advocate for funding and supportive policies from the federal government.

6. Work with utilities and regulators to make it easier and cheaper to install EV chargers.

7. Engage with EV stakeholders to better understand evolving EV market, technology, and charging needs through an industry day.

8. Increase public awareness of EVs and charging opportunities through the PlugNYC marketing program.

Together, these actions represent a significant commitment to the city's EV future. NYC DOT will work with community, governmental, and private sector stakeholders to maximize the impact of these investments and continues to refine its strategy as new technologies and best practices emerge.

New York City is committed to reaching carbon neutrality by 2050 and making sure all New Yorkers can breathe clean air.

The climate crisis threatens New York City's health, economy, and, with 520 miles of shoreline, its very existence. In the coming decades, New York City will face rising sea levels, increasing temperatures and precipitation, and the likelihood of more frequent and intense storms, endangering our neighborhoods and infrastructure while worsening social inequities. Air pollution also continues to harm New Yorkers, particularly lower-income communities of color that live next to truck routes, highways, and industrial areas. Residents of these communities struggle with asthma and other respiratory and cardiovascular diseases at far higher rates than the rest of the city, with severe consequences: fine particulate matter (PM2.5) and ozone are estimated to kill 1,400 residents of the New York City metropolitan area each year.[1]

As the climate continue to change, the magnitude and frequency of these challenges will continue to increase without swift action to drastically cut greenhouse gas (GHG) emissions and local air pollution from all sources. Consistent with the U.S. commitment to the Paris Climate Accord,

New York City has set the goal of reaching carbon neutrality by 2050, and providing dramatically cleaner air in the process.

Transportation is a major source of greenhouse gas emissions and air pollution.

New York is known for its sustainable transportation system, and for good reason: before the coronavirus pandemic, two thirds of all trips were made on foot, by transit, or by bike.[2] However, the transportation sector is still the city's second largest source of GHG emissions, after buildings. Vehicles emit nearly 30% of the city's greenhouse pollution, of which the roughly two million light-duty vehicles registered in the city generate 80%.[3] Tailpipe emissions from these vehicles react to create ozone and smog, and wear on tires and the diesel burned by trucks and buses emit PM2.5, both of which are significant contributors to respiratory and cardiovascular illness.

Chart: A pie chart of the city's greenhouse gas emissions by sector. Buildings emit 68% of the total, transportation 28%, and waste 3%

Slashing transportation emissions requires immediate, bold action.

The results of "Pathways to Carbon-Neutral NYC: Modernize, Reimagine, Reach," a 2021 study commissioned by the NYC Mayor's Office of Climate and Sustainability and the city's two major electric and gas utilities, Con Edison and National Grid, indicate that the city's existing initiatives and targets for decarbonizing the transportation sector—such as 20% of new vehicles being electric by 2025—along with expected advances in fuel economy and electric vehicle (EV) adoption, would produce a 47% reduction in citywide transportation emissions.[4]

The study models a multi-pronged strategy for deep reductions in emissions, and its results offer a framework to guide the city's strategy through 2050:

1. Shift: support the shift from cars to sustainable options like walking, transit, and biking, so that their share of total trips increases from 66% to 80%.[5]

2. Reduce: encourage more efficient trip-making for those that continue to drive to decrease the total mileage driven by at least 17%.

3. Electrify: accelerate the adoption of battery electric vehicles and plug-in hybrids to electrify 74% of light-duty vehicles and 78% of medium- and heavy-duty vehicles.[6]

The study results show that adopting these strategies by 2050 could cut GHG emissions from the sector by up to 85%, putting the city on track to achieving carbon neutrality, and reduce PM2.5 emissions from vehicles by up to 50%.

New York City is setting ambitious goals for vehicle electrification.

Achieving carbon neutrality will require a revolutionary change to the vehicle mix and EV charging infrastructure network in New York. Informed by the results modeled in the Pathways report, the New York City Department of Transportation has set ambitious targets for electrification: by the end of the decade the city will need nearly 400,000 vehicles to switch to EVs, up from just 15,000 today. To serve these EVs, the city will need over 40,000 publicly-accessible level 2 (L2) charger plugs and 6,000 fast charger plugs. The number of EVs and public L2 chargers will need to quadruple, and the number of fast chargers must increase tenfold, by 2050.

Chart: A pyramid illustrating how EV chargers should use different types of charging infrastructure. At-home Level 2 or Level 1 charging, at the bottom, should provide the majority of a vehicle's charge.

Sidebar: The Basics of EV Charging

There are three levels of EV charging, categorized by how quickly they recharge EV batteries:

Level 1 (L1)
L1 charging cords using a standard 120V outlet can power about 4–5 miles of driving for each hour of charging. They are most suitable for at-home charging where L2 is not available. Plug-in hybrid electric vehicles (PHEVs) often have an electric range of 20-50 miles, so a depleted battery can be recharged in 8 hours. L1 cords can provide a full charge to BEVs with smaller battery capacities in 12 hours.

Level 2 (L2)
L2 units can provide a full charge for most EVs in 4-8 hours. These chargers require 240V (residential) or 208V (commercial) outlets, the same as standard clothes dryers. They are suitable for home, work, and public destination charging. Public L2 chargers can generally be used by all EVs, but may require an adapter.

Level 3, or Direct Current Fast Charging (DCFC)
These units can provide 80% charge for a car in 30 to 60 minutes, depending on the vehicle model and the exact power of the charger. They require connection to a 480V DC electrical connection, and are typically only available at commercial locations. PHEVs usually cannot use L3 chargers, while battery electric vehicles (BEVs) can at varying power levels. Tesla's fast chargers cannot currently be used by other EVs.

New York City is moving in the right direction, but not fast enough.

There are now almost 15,000 EVs registered in the city, over 5,000 of which were sold in 2020. 2020 saw 38% more battery electric vehicles (BEVs) sold than 2019, and if current trends hold, 2021 will surpass 2020 sales. As of June 2021, the taxi and for-hire vehicle fleet includes almost 400 EVs.

New York's EV charging ecosystem, while small compared to that of peer cities, continues to grow apace. There are now over 1,400 publicly-accessible level 2 plugs, and 117 publicly-accessible fast charging plugs. As discussed later in the document, the city is taking a range of actions to expand EV charging and accelerate the adoption of electric cars, trucks, and school buses.

Graph: A line chart of EV adoption in New York City. The numbers of new EVs (including plug-in hybrids) registered each year has grown from virtually 0 in 2011 to approximately 5,000 in 2020.

Alone, though, this progress will not be nearly enough: New York State trails California in EV adoption and charging infrastructure, and both trail peer countries like Norway, the Netherlands, and the United Kingdom. The vast majority of New York City's publicly-accessible charging stations are located in Manhattan. Tesla has led investment in fast charging, but uses a proprietary charging system incompatible with other EVs. And the scale of infrastructure installation and EV sales pale in comparison to what the Pathways study predicts the city will need. The charging network is simply not growing fast enough; without it, New Yorkers will not adopt EVs at the rate necessary to achieve carbon neutrality by 2050.

The next few years represent a critical opportunity to accelerate EV adoption.

The stars are aligning for a radical acceleration of EV adoption in New York City.

Automakers have announced many new EV models, increasing their affordability, range, and overall appeal. Batteries, one of the key technological barriers, are improving and becoming more affordable. Signals from the EV market provide some cause for optimism: 2019 saw 331,000 EVs sold nationwide[8]; in 2020, through the coronavirus pandemic, sales dropped by just 11%.[9] In California, where nearly half of the nation's EV sales occur, over 8% of new vehicles are EVs.

The federal government has identified EVs as central to its strategy for stopping catastrophic climate change. The Biden Administration has set the goal of 50% of new vehicles being electric by 2030, and is working with Congress to invest billions of dollars into EV purchase incentives and charging infrastructure.

New York State is moving, too: following the 2019 passage of the Climate Leadership and Community Protection Act (CLCPA), the state is mobilizing to drive EV uptake by subsidizing vehicles and charging infrastructure, and the legislature passed a complete phase-out of light-duty internal combustion engine vehicles (ICEVs) by 2035 and medium- and heavy-duty vehicles by 2045.[10] Its target of 100% clean energy will make sure that electricity fueling the vehicles is truly cleaner than fossil fuels.

Other countries and cities have proven that the right combination of incentives, charging infrastructure, regulations, and messaging shift consumer preferences and spur significant EV adoption in a short time. Last year in Europe, EVs made up 11% of new vehicle sales[11], with Norway becoming the first country worldwide to sell more EVs than ICEVs.[12]

New York City can drive EV adoption by providing and incentivizing the installation of EV charging infrastructure.

Publicly-accessible EV charging infrastructure is a major missing piece in New York, especially in a city where about 50% of private cars are parked on the street.[13] Prospective vehicle buyers report that convenient access to charging is a major barrier to purchasing EVs. This creates a chicken and egg problem: vehicle buyers are wary of purchasing EVs without convenient charging, while the private sector is slow to invest in charging networks for fear that there will not be enough demand. To date, charging companies have made few investments in L2 charging in the outer boroughs, where 90% of the city's registered vehicles live.[14]

To break this cycle, the city must step in to kick-start the development of a robust, resilient publicly-accessible charging network. By installing level 2 chargers at the curb and in its facilities, and building out the fast charging network, the city can help seed enough of an EV ecosystem to assuage New Yorkers' range anxiety and support the private EV market. Unlike much of the private sector, the city can make these investments to steer the market, before there is enough demand for the chargers to be profitable. Early on, this will be critical to ensuring that chargers are distributed equitably around the city, rather than concentrated in high-income areas. The city will also set the standard for a resilient EV network by incorporating forward- looking climate data in the siting and design of charging stations. As the number of EVs rises and the private sector makes use of the multiplying public incentives for installation of charging infrastructure, the need for continued city spending on chargers will diminish.

This strategy will require a transformative public investment over a short period of time. Current initiatives of NYC DOT, the New York City Department of Citywide Administrative Services (NYC DCAS), and the New York City Economic Development Corporation (NYC EDC) have laid the groundwork, but must be scaled up consid-erably. This report lays out eight steps that New York will pursue during this decade, with the help of our federal, state, and utility partners, to spur the development of the public charging network that the city needs to meet its climate and air quality goals.

New York City will need nearly 160,000 public level 2 EV charging plugs and 60,000 fast charging plugs to reach carbon neutrality by 2050.

Research on the ratio of EVs to public charging plug in Europe and China supports a target of one public charging plug for every 10 EVs.[15] Applying this ratio to the EV adoption targets in the Pathways study provides a rough timeline for EV charging investment targets.

By 2050, most of this infrastructure must be installed by the private sector: by major employers, gas stations, grocery stores and shopping centers, developers building or refurbishing parking facilities, and in homes with off-street parking. However, between now and 2030, the city will play a critical role, installing over 11,000 public L2 plugs and over 80 public fast chargers.

Graph: A line chart showing the EV and charging infrastructure targets

Sidebar: The City is Already Preparing for EVs

NYC Department of Transportation (NYC DOT)

Fast charging: Through a contract with the New York Power Authority (NYPA), NYC DOT is installing up to 28 fast charging plugs at seven city parking garages and lots, with at least one location in each borough.

L2 chargers at city lots and garages: NYC DOT operates 38 L2 chargers at its municipal parking lots and garages.

Curbside L2 pilot: Con Edison, in partnership with NYC DOT, is installing 120 L2 curbside charging ports across the five boroughs. One hundred will be available to the public, while the remaining 20 will be dedicated for city fleet use. The pilot will evaluate the operations and performance of curbside charging in New York City.

NYC Department of Citywide Administrative Services (NYC DCAS)

City fleet: NYC DCAS, which manages the city's fleet of vehicles, has purchased over 2,300 on-road EVs. These vehicles are supported by over 1,000 dedicated L2 charge ports, including 89 solar L2 chargers solar L2 chargers and 74 fast charging plugs.

Publicly-accessible DC fast chargers: NYC DCAS is piloting public access to eight fast charging stations at four locations in Manhattan, Queens, and Staten Island.

NYC Taxi and Limousine Commission (NYC TLC)

Electric taxis and FHVs: There are currently approximately 400 electric taxis and FHVs in NYC. In May 2021, the Commission approved a one-year pilot program to allow a wider range of EV models to operate as taxis.

NYC Department of Education (NYC DOE)

Electric school buses: NYC DOE has committed to electrifying its entire school bus fleet by 2035, beginning with 75 school buses over the next two years.[16]

New York Metropolitan Transportation Authority (NY MTA)

Electric transit buses: NY MTA has committed to purchasing only electric buses by 2028[17], with the goal of all but eliminating gasoline from its fuel mix by 2040.[18]

DC Fast Charging

For EVs to be attractive, prospective buyers must feel that they have access to a convenient charging network that provides level 1, level 2, and fast charging options. Most of the time, EV owners should rely on level 1 or level 2 chargers while they park at home or at work—this approach is the cheapest for users, has the least impact on the electric grid, and is convenient, eliminating extra trips to fueling locations. Sometimes, however, EV owners will need a quick way to charge, such as during long trips or after forgetting to charge overnight. This is where fast charging comes in. By enabling EV owners to almost completely fill the battery in 30-60 minutes, fast chargers provide more of the gas station experience. Fast chargers are particularly important for drivers of fleet vehicles, like taxis and FHVs, who are more likely to exhaust their batteries over the course of a single day. They provide flexibility, and therefore peace of mind.

Map: Map of existing fast chargers in New York City. The chargers are primarily in Manhattan, Brooklyn, and Queens.

Initiative 1: Grow the city fast charging network to over 80 plugs by 2025.

DOT is executing a multi-phase program to create a network of fast charging stations across the five boroughs. The agency has completed the first two installations at the Delancey-Essex and Court Square municipal garages, with five more scheduled to be completed by mid-2022, for a total of 28 plugs. In a third phase, DOT hopes to partner with the New York Power Authority (NYPA) to build at least five more stations with 20 plugs. Combined with NYC DCAS's four public fast charging sites with eight plugs, this would grow the city's fast charging network to 56 plugs.

To continue to expand fast charging options, NYC DOT will issue a competitive procurement for a fourth phase, installing chargers at up to seven additional locations. This would bring the city-owned fast charging network to 23 stations with at least 84 fast charging units. Crucially, 22 of the 23 charging stations will be sited outside of Manhattan, many conveniently located close to major thoroughfares, dramatically expanding the number of New Yorkers who live with 1.5 miles of a fast-charging station.

The Infrastructure Investment and Jobs Act negotiated by Congress and the Biden Administration includes $7.5 billion for electric vehicle charging infrastructure across the country. If Congress passes the infrastructure bill, NYC DOT hopes to secure federal funding for this project.

Level 2 Charging

Level 2 (L2) chargers are the backbone of public EV charging networks. These chargers provide more affordable power than fast chargers, and should provide the vast majority of the power consumed by light-duty EVs. A network of publicly-accessible L2 chargers, widely available in convenient locations throughout the five boroughs, will be critical to providing charging options to

the roughly 50% of private car owners who park on-street. EVs in this category currently have few good charging options: owners get to choose between running extension cords from apartment windows and relying entirely on more expensive fast charging stations. The city is well poised to help these New Yorkers by bringing L2 chargers closer to home.

Map: Map of existing L2 fast chargers in New York City. The majority of chargers are concentrated in Manhattan.

Initiative 2: Equip 20% of all spaces in municipal public parking lots and garages with L2 chargers by 2025, increasing to 40% by 2030.

NYC DOT operates 36 municipal parking facilities spread across the five boroughs, which collectively have over 5,500 parking spaces. Some of these facilities already contain a handful of L2 chargers. This initiative would turn DOT's facilities into neighborhood charging hubs, equipping over 1,100 spaces with L2 charging plugs. At each lot or garage, at least 20% of spaces would be equipped with an EV charger.

Map: Map of NYC DOT municipal parking facilities. They are geographically distributed around the five boroughs.

Because NYC DOT controls these facilities and the projects are relatively straightforward, this initiative is the fastest way to expand public L2 charging. The geographic diversity of the locations of the facilities will also help to seed charger networks across the city. As more New Yorkers buy EVs and demand exceeds supply at the facilities, the agency will continue to install additional chargers, with the goal of bringing the electrified share to 40% of all spaces by the end of the decade.

Initiative 3: Create a network of 1,000 curbside charge points across the five boroughs by 2025, increasing to 10,000 by 2030.

While NYC DOT can deploy L2 chargers quickly in the parking facilities it operates, many New Yorkers do not live close to a DOT lot or garage. To ensure all communities have convenient access to public L2 charging, the agency must also deploy curbside chargers across the five boroughs. NYC DOT's annual Citywide Mobility Survey finds that approximately 50% of private vehicles are parked primarily on-street.19 For many of these drivers, reliable access to curbside L2 charging near their home or workplace will be a non-negotiable prerequisite to purchasing an EV. To address this need, NYC DOT will install 1,000 curbside L2 plugs by 2025, and 10,000 plugs by 2030.

Curbside charging is a key focus for the agency, because NYC DOT has the jurisdiction to site and authorize the installation of chargers in the public right of way. The agency will seek to partner with one or more charging network companies in this effort, with project costs and revenues shared

between the city and the private partner. Packaging such a large number of chargers into one or a small number of procurements will also allow the agency to require deployments in communities the private sector has overlooked, ensuring charging infrastructure is distributed equitably across the city.

Such a transformative process will take time to execute: the proposal for the curbside L2 network will require extensive planning and community engagement. DOT will build the network in two phases, directly procuring 1,000 chargers in the frst phase. In the second phase, the agency will consider a range of options, including a citywide franchise, to grow the curbside network to 10,000 plugs. DOT will coordinate curbside L2 charger deployment with the agency's efforts to improve traffic safety, expand the bike and bus lane networks, and support initiatives like outdoor dining and Open Streets.

As a first step, NYC DOT will conduct a planning study to further develop the program. NYC DOT will seek federal funding to support this program and calls on the Biden Administration and Congress to provide a per-charger subsidy for publically-installed L2 chargers. State and local governments should have a role in directing this funding, to ensure that chargers are equitably distributed across communities. As discussed in more detail in Initiative 6, NYC DOT will also continue to advocate that the New York State Public Service Commission implement policies and funding programs to make it easier and cheaper on the utility side to install EV chargers.

Initiative 4: Develop an L2 and L1 user-supplied cord charging system that integrates with existing street infrastructure.

In 2018, the Mayor's Office of the Chief Technology Officer ran the Climate Moonshot Challenge, soliciting bold ideas that could help the city meet its emission reduction goals. One of the winners offered a new type of vehicle charging solution: a charging cord with a smart meter, which EV owners would keep with them and plug into electrified street furniture, such as streetlights, to charge. Such a system is currently in use in London.

By eliminating the need to site and install dedicated charging infrastructure, the user-supplied cord approach has the potential to rapidly increase the number of EV charging locations. NYC DOT maintains over 250,000 streetlights; if even a fraction of these could be retrofitted or replaced with charging-compatible streetlights at the end of their useful life, the city could dramatically increase the number of curbside charging ports. While most streetlights do not have the electrical configuration necessary to provide L2 charging, allowing vehicles that are kept on the street to charge at streetlights using L1 chargers would still provide a considerable benefit: 30–50 miles of charge overnight, and a full battery over a few days.

Technical and regulatory hurdles to making this approach work in New York City remain, and the solution will need to be tested. DOT will design and develop a prototype charging-compatible streetlight by 2022, and pilot test of 200 such streetlights, beginning in 2023. If the pilot is

successful, the agency will incorporate the specifications for the streetlight into its larger replacement contracts.

Advocacy and Engagement

Initiative 5: Advocate for funding and supportive policies from the federal government.

The Biden Administration has put climate justice at the center of its transportation priorities and identified the rapid adoption of electric vehicles as critical to achieving it. It has proposed historic investments in transportation infrastructure and conveyed the urgency of acting to prevent catastrophic climate change. The city supports the passage of the American Jobs Plan and other legislative proposals that help cities, states, and the private sector rapidly deploy charging infrastructure and encourage consumers to purchase EVs. In particular, funding should be available for the following uses:

• Supporting the extensive planning/coordination of these projects

• Building fast charging stations or make-ready sites, with local input on site prioritization

• Subsidizing publicly-accessible L2 chargers, flowing through or guided by cities to ensure strategic and equitable distribution

• Supporting on-going operations and maintenance during the initial period when the systems will operate at a loss

Federal funding should be made as user-friendly as possible, allowing cities to use in-house labor and flexible contracting mechanisms. Funding mechanisms should also enable partnerships between government and private companies. NYC DOT will seek substantial funding support from the federal government to support a large, equitable deployment of public charging infrastructure.

Sidebar: EV Readiness in Private Parking Facilities

In 2013, the New York City Council passed Local Law 130, mandating that all new parking facilities and major rehabilitations make 20% of their parking spaces “EV ready.” To comply, facilities must make the electrical upgrades and provide the conduit to support the future installation of L2 chargers. Working with the Mayor, the Council is currently considering legislation that would strengthen this rule to require the installation of L2 chargers at 20% of spaces in new or substantially renovated facilities.

Initiative 6: Work with utilities and regulators to make it easier and cheaper to install EV chargers.

Utilities are key partners in managing the city’s transition to a fully-electrified transportation

system. Most of New York City's electricity is distributed to customers by Consolidated Edison (Con Edison), an investor-owned utility regulated by the New York State Public Service Commission (PSC).

Most recently, the PSC approved a $701 million statewide "Make-Ready Program" that will provide incentives for the infrastructure necessary to equip parking spots with EV chargers. Approximately $233 million dollars of this infrastructure funding is allocated to Con Edison's service territory in New York City and Westchester. The program will fund more than 50,000 L2 plugs and 1,500 DCFC plugs by the end of 2025 across New York State. The program will also provide $85 million dollars in mobility electrification incentives through various prizes administered by the New York State Energy Research and Development Authority. NYC DOT will seek to leverage this funding to develop its curbside charging program and continue to expand fast-charging offerings in municipal parking lots and garages.

The Mayor's Office of Climate and Sustainability (NYC MOC&S) leads regulatory affairs for matters related to energy before the PSC, including representing the city's policy goals of vehicle electrification as well as the broader goals of reducing energy cost burden, adapting to the impacts of climate change on the grid, decarbonizing, and reducing overall dependence on fossil fuels. NYC MOC&S advocates for policies that remove barriers to EV adoption through incentives and rate design that offset the high cost of providing EV charging at this early stage in the market.

Through regulatory proceedings at the PSC, MOC&S successfully advocated for operating cost support to EV chargers through a moderated EV charging rate by ensuring that EV fast charging equipment is eligible for Con Edison's Business Incentive Rate, which provides up to a 39% discount on the delivery portion of an electric bill, offsetting the impacts of high demand charges while EV adoption remains low. Con Edison also offers financial rewards to customers that charge entirely off-peak, when electricity demand is low, through its SmartCharge program. Charging vehicles overnight or generally during non-peak hours lowers grid impacts and helps enable the cost-effective development of infrastructure needed to support the city's goals. Additionally, MOC&S has advocated for the creation of a public map showing where electrical capacity can handle EV chargers on the electric grid, and for rate design that responds to the unique load profiles of EVs and promotes grid resiliency through off-peak charging incentives and through vehicle-to-grid innovation.

Initiative 7: Engage with EV stakeholders to better understand evolving EV market, technology, and charging needs through an industry day.

NYC DOT, in partnership with other interested agencies, will host an EV industry day in fall 2021 to learn about the latest developments and best practices from automakers, charging providers, and other industry stakeholders. This engagement will help the city ensure its EV charging strategy will address the needs of current and planned vehicles. The agency will seek information on the following topics:

• Vehicles: range, charging compatibility, charging duration

• Electric vehicle supply equipment: Power, cost, electrical requirements, customer interface, operations and maintenance, innovative charging methods (e.g., user-supplied cord systems)

• Innovative charging infrastructure delivery: partnerships and operational models that expedite the delivery of publicly-accessible charging infrastructure

• Public communications: effective strategies for highlighting the availability of public charging infrastructure, encouraging EV adoption

Initiative 8: Increase public awareness of EVs and charging opportunities through the PlugNYC marketing program.

To combat range anxiety, the city will need to draw attention to the growing network of publicly-accessible chargers and the increasing capabilities and decreasing cost of EVs. PlugNYC, the brand for the NYC DOT's charging infrastructure program, will promote city charging opportunities, off-peak charging, and information about EVs to the public through physical and digital communications.

Conclusion

New York City is committed to reducing its greenhouse gas emissions from transportation by 80% and cutting harmful air pollutants by 2050 while enhancing equitable access to mobility and building a stronger and fairer city. The city's EV charging infrastructure targets, which require immediate and significant action, are a critical step in meeting these goals.

NYC DOT believes the strategies outlined in this vision plan represent a strong first step toward encouraging stronger citywide adoption of EVs. Leading with groundbreaking investments in on-street L2 and fast charging infrastructure, the agency will catalyze the development of a network robust enough to give New Yorkers and businesses the confidence they need to choose EVs.

But this is just the first step. With this plan in hand, the agency will seek the partnership of the federal and state governments, the NYS PSC, and Con Edison, and input from community members and groups, elected officials, and the private sector. As it moves forward, NYC DOT will continue to refine its strategies and remain open to new opportunities and technologies. The agency looks forward to working with all stakeholders to protect New York City against the pressing challenges of climate change and air pollution, and to create a transportation system that is sustainable, safe, equitable, healthy, and available to all New Yorkers

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5. The target of 80% of trips being completed using sustainable modes (walking, biking, and transit) comes from the city’s 80 x 50 modeling. While this modeling served as an input to the Pathways report, the report did not specify a mode shift threshold necessary to achieve carbon neutrality.

6. The Pathways study also modeled a low-carbon fuels pathway, which relied on much lower levels of electrification in the medium- and heavy-duty vehicle fleets.

7. The Pathways report does not distinguish between publicly-accessible and private L2 or fast charging plugs. To inform this plan’s goal for the number of publicly-accessible L2 plugs, NYC DOT used a ratio of 10 EVs per publicly-accessible L2 charging plug, attributed to the European Parliament, as recorded in Dale Hale & Nic Lutsey. “Emerging Best Practices for Electric Vehicle Charging Infrastructure,” The International Council on Clean Transportation, October 2017: https://theicct.org/sites/default/files/publications/EV-charging-best-practices_ICCT-white-paper_04102017_vF.pdf

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