

ELECTRIFYING FLEETS IN HUNTS POINT



CONSULTING REPORT



DEC 2020



ELECTRIFYNY

ElectrifyNY

ElectrifyNY is a statewide coalition of advocates for environmental justice, public transportation, social justice, and good jobs fighting for a clean, equitable electric transportation future for New York



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THIS REPORT IDENTIFIES AND SUGGESTS ELECTRIFICATION PATHWAYS FOR MEDIUM AND HEAVY-DUTY VEHICLES AT THE HUNTS POINT FOOD DISTRIBUTION CENTER.

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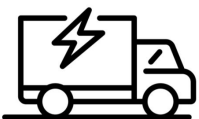
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Executive Summary

ElectrifyNY (ENY) is a consortium of twelve NGOs and transportation associations in New York State (NYS) that advocate for environmental and social justice, public transportation, and equitable employment opportunities in the electric vehicle industry. ENY supports a transition to an electric transportation future in order to reduce fossil fuel usage and see improved environmental and public health outcomes.⁴

ENY requested a policy assessment and corresponding roadmap for electrifying medium- and heavy-duty vehicles, specifically in Hunts Point, Bronx, NY, which is home to the largest food distribution center in New York City.⁵ The high volume of diesel truck traffic through the distribution center and the surrounding neighborhood contributes to Hunts Point's dangerously poor air quality when compared to the rest of New York City (NYC). By eliminating tailpipe emissions, electrification of trucks in Hunts Point is paramount to combat the health hazards associated with the air pollution that is adversely impacting Hunts Point residents and workforce. While all New Yorkers benefit from consuming the food generated by Hunts Point, only the residents there face the costs.

To consolidate the scope in order to accommodate the four-month project timeline, medium-duty diesel trucks were selected as the primary target, rather than heavy-duty trucks. Medium-duty trucks comprise most of the local traffic within Hunts Point, commute within the tri-state area, are driven by New Yorkers, and can be targeted with New York policies.⁶ Heavy-duty trucks, many of which are coming from across the country, are harder to reach by state policies. Not to mention, while neither medium- nor heavy-duty electric trucks have reached commercialized levels in U.S. markets, medium-duty trucks were understood through research to be more feasible to scale in the near future. With that in mind, existing policies for deploying medium-duty vehicles and charging infrastructure within New York State and nationally were evaluated for effectiveness and gaps.

Particular interest was paid to policies and programs instituted in food distribution centers and ports in other U.S. cities. Medium-duty electric vehicle technologies and available models were also researched. Most important, the Hunts Point neighborhood and Food Distribution Center (FDC) was researched in depth to understand the operations and importance of electrifying

⁴ <https://ENY.org/>

⁵ <https://edc.nyc/project/hunts-point-peninsula>

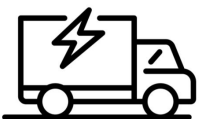
⁶ <https://www.nyserda.ny.gov/About/Newsroom/2019-Announcements/2019-04-23-Governor-Cuomo-Announces-Record-Number-of-Electric-Vehicles>



trucks. Lastly, the foundation of our methodology was conducting robust outreach. Power mapping stakeholders ensured that no instrumental group affected or necessary for policy deployment was left out of this analysis. Receiving different viewpoints ensures that policies recommended here resonate with multiple stakeholders and fall within stakeholders' power to pursue. This power mapping included Hunts Point Community-Based Organizations (CBO), Food Distribution Center Laborers, Electric Utility Companies, Electric Vehicle Companies, and City and State Level Sustainability and Energy Agencies.

As a basis for promoting medium- and heavy-duty truck policies for electrification it was calculated that if even 5% of outbound traffic is electrified (600 of the roughly 12,000 vehicles), this would reduce particulate matter 2.5 - a dangerous air pollutant - by 80kg per year. This, along with the abatement of other harmful emissions, would subsequently save \$300,000 in avoided social costs, and would result in yearly fuel and operations and maintenance cost savings of \$2.2 million across the fleets.

When approaching the electrification of Hunts Point, we recommend taking approaches that maximize the time and effort of ENY and have the greatest impact in driving progress. We recommend starting with expanding charging infrastructure as it would provide a solid foundation for electrification in NYC, and arguably the greatest impact in drawing electric trucks to Hunts Point. To that end, this report proposes 5 main recommendations to ENY which will be explained later in further detail. First, we recommend that ENY disseminate the tools prepared alongside this report to relevant stakeholders to increase general knowledge of the state of electrification in Hunts Point and some starting points for advocacy. Next, we recommend that ENY advocate for inclusion of medium and heavy duty vehicles in current policy that focuses more on light duty or personal vehicles. In addition to advocating the alteration of current policy, we recommend that new electrification policies come with their own sources of sustainable funding, to avoid the pitfalls of unfunded mandates, as well as making these policies easier to pass. Next, we recommend developing the workforce around Hunts Point to specialize in the operations and maintenance of electric vehicles, focusing particularly on equitably including members of the community in the energy transition. Finally, we recommend that ENY do what it does best, and reach out to its vast network of transportation alliances as well as relevant public agencies, private companies and prominent politicians. Electrification and de-carbonization are receiving more political attention and resources than ever before, and young progressive politicians are increasingly interested in environmental justice and ensuring that the equitable energy transition is ascendant and fair.



There is precedent for electric trucks at the Hunts Point Food Distribution Center, albeit a small and scattered offering. However, there is interest in expansion, given the social and monetary cost savings, the availability of refrigerated electric trucks that could scale in a primed market, and a fundamental need to improve the health and dignity of the community. Medium-duty truck electrification is possible in Hunts Point by adapting current New York State policies and developing related policies.



Problem Statement

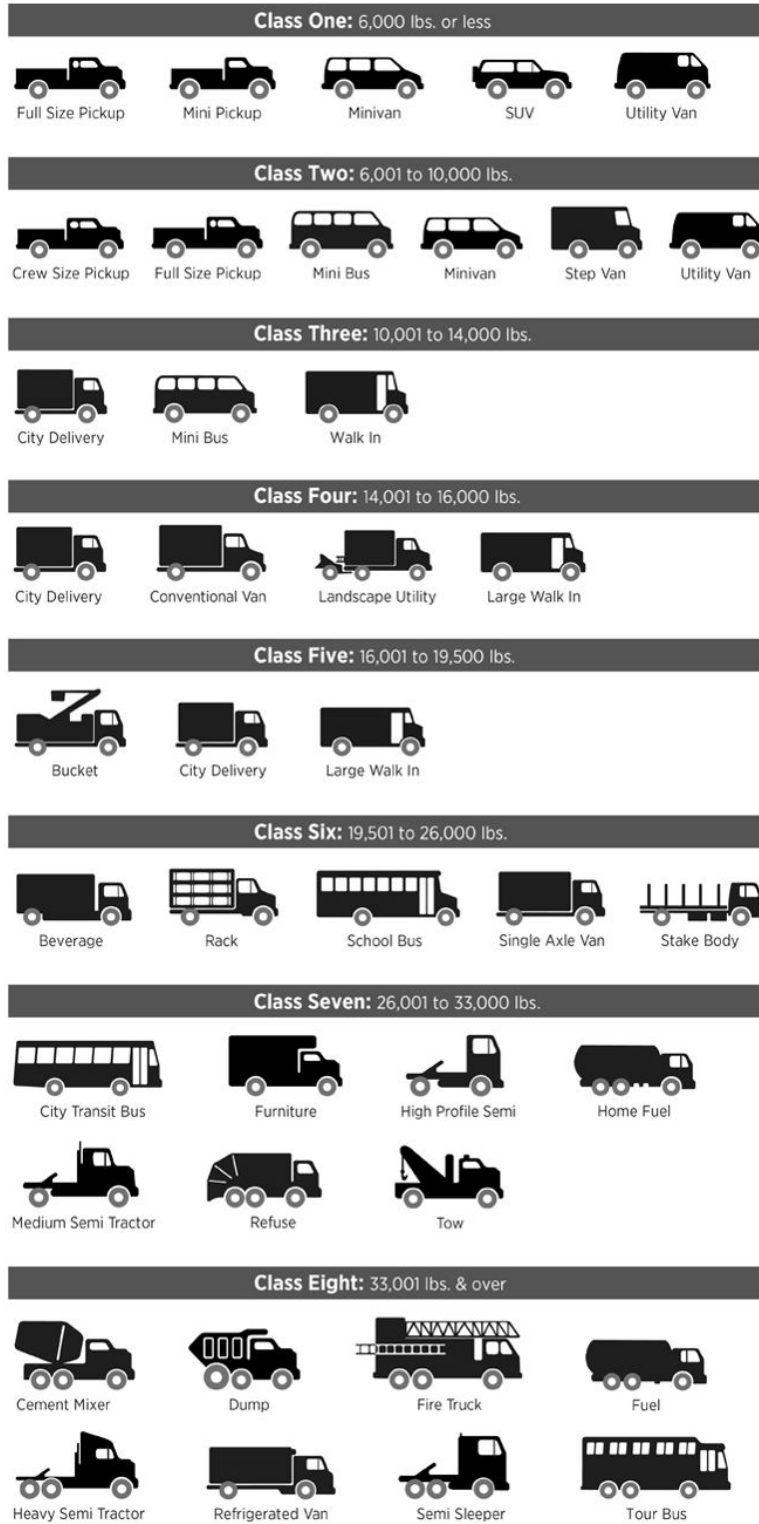
This project was tasked to us by ElectrifyNY (ENY) with the express intent of identifying opportunities and blueprinting a framework to accelerate the electrification of medium- and heavy-duty fleets operating out of the Hunts Point Food Distribution Center. A medium-duty vehicle is defined by the Federal Highway Administration as a truck between the weight of 10,000-26,000 lbs, considered class sizes 3 to 6. A heavy-duty vehicle is 26,000 lbs or greater, accounting for truck classes 7 and 8.⁷ Our goal was to understand the context of the neighborhood as it pertains to fleet electrification and to lay the groundwork for future projects to support further electrification in the neighborhood and the city.

The importance of the Hunts Point neighborhood to New York City can not be understated. As the FDC is the main supplier of fresh food and vegetables to the city, it is an integral part of the cultural fabric of the city, supporting tourism and trade. However, the residential section of Hunts Point has ironically been described as a food desert situated next to the biggest food distribution center in the world. To make matters worse, the FDC contributes to the extreme volume of truck traffic in the area, which has led to high rates of respiratory health issues. Through our research, we have found large gaps between the stated sustainability and health goals of the city and the realities of the policies and incentives meant to drive progress towards those goals. This report is meant to go a small way in closing those gaps, and to provide stakeholders with the means to continue to do so.

⁷ <https://afdc.energy.gov/data/10380>



Figure 1. Types of Vehicles by Weight Class



Source: <https://afdc.energy.gov/data/10381>



Methodology

There have been many past efforts to reduce traffic in Hunts Point and to begin the process of electrifying some of the vehicles within the FDC - so much so that one interviewee called electrifying the neighborhood the “Holy Grail”. Likewise, there are a lot of isolated efforts both in NY and the US as a whole to electrify trucking, and the best practices and policies are similarly scattered. This project represents ENY’s first efforts to tackle this problem at this scale, and much of the project and its deliverables are focused upon aggregating existing information for ease of use. To that end, we hope to enhance ENY’s understanding of this issue, and to provide pathways to achieve the goal of truck electrification.

The ascribed scope to look at electrifying medium- and heavy-duty vehicles was mostly narrowed to medium-duty vehicles to be able to execute a full analysis and recommendation within the four month project period. Medium-duty trucks are prominent in Hunts Point and while many heavy-duty trucks pass through the community, these are mostly trucks coming from other states as compared to the medium-duty trucks that are making regular ‘one stop,’ ‘last mile’ trips to the FDC. These local trucks can be targeted best by state and city policies especially when eligibility for rebates and other incentives may require NYS registration.

The beginning stages of this work started with an extensive and comprehensive literature and policy reviews of:

- ❑ Hunts Point community health;
- ❑ Hunts Point FDC operations;
- ❑ Availability of electric truck and relevant electric vehicle (EV) models and electric vehicle supply equipment (EVSE or ‘chargers’);
- ❑ Federal, NYS, NYC, and other states’ and cities’ policies and programs relevant to electrifying trucks;
 - ❑ Those that were found in other distribution centers and ports around the country we presented as ‘case studies.’ This warranted in depth research on how the policies developed and whether they are effective, in order to assess applicability to the FDC.

This review, in turn, informed our stakeholder outreach process. The stakeholder outreach component ultimately validated and supplemented the findings from our policy and literature



research. In order to make sure every perspective relevant to electrifying trucks in Hunts Point was captured, power mapping, otherwise known as stakeholder mapping, was executed to make sure no stakeholder however big or small was left out. By hearing different perspectives we are able to recommend policies that resonate with stakeholders as feasible and fall within stakeholders' power to execute. This stakeholder mapping steered us to reach out to Environmental Justice Organizations, Hunts Point CBOs, Union Workers at the FDC, Con Edison, Electric Vehicle Companies, New York City Department of Transportation (DOT), and the NYC Mayor's Office of Sustainability.

The Y-Axis of the powermap organizes stakeholders by influence. This means the capacity of organizations to directly create policies, incentives, and programs (e.g., governmental agencies), as well as stakeholders who can offer support to these agencies (e.g., CBOs, Utilities, Unions). The X-Axis documents how supportive entities would be to electrification, which categorizes based on the ethos of agencies and alignment with city and state goals. For example, the NYCEDC is a quasi-public agency so it aligns with Mayoral agendas.⁸ Currently electrifying transport through EV charger installation is a City priority, so the NYCEDC accordingly would be very supportive.⁹ The NYCEDC is also extremely influential as the leaseholder of the property and of a multitude of properties around the city, totalling 66 million square feet. Figure 2. shows the NYCEDC's strong support and influence by placing it in the top right corner of the map.

The combination of research and interviewee responses allow us to critically discuss existing policies, suggest changes, and provide necessary considerations for new policy development. 'Fact Sheets,' were also developed for each policy to be utilized by ENY when explaining and advocating for policies and programs with stakeholders (see the Appendix).

Lastly, we were able to estimate the cost savings and social benefits of fleet electrification by using the results of the NY Voucher Incentive Program's 2018 Final Report¹⁰ on its first round of funding, prepared for NYSERDA by CALSTART. In this report, operations & maintenance and fuel costs were based on participant surveys of cost savings, and PM 2.5 abatement and other avoided social costs were based on coefficients from Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) tool.

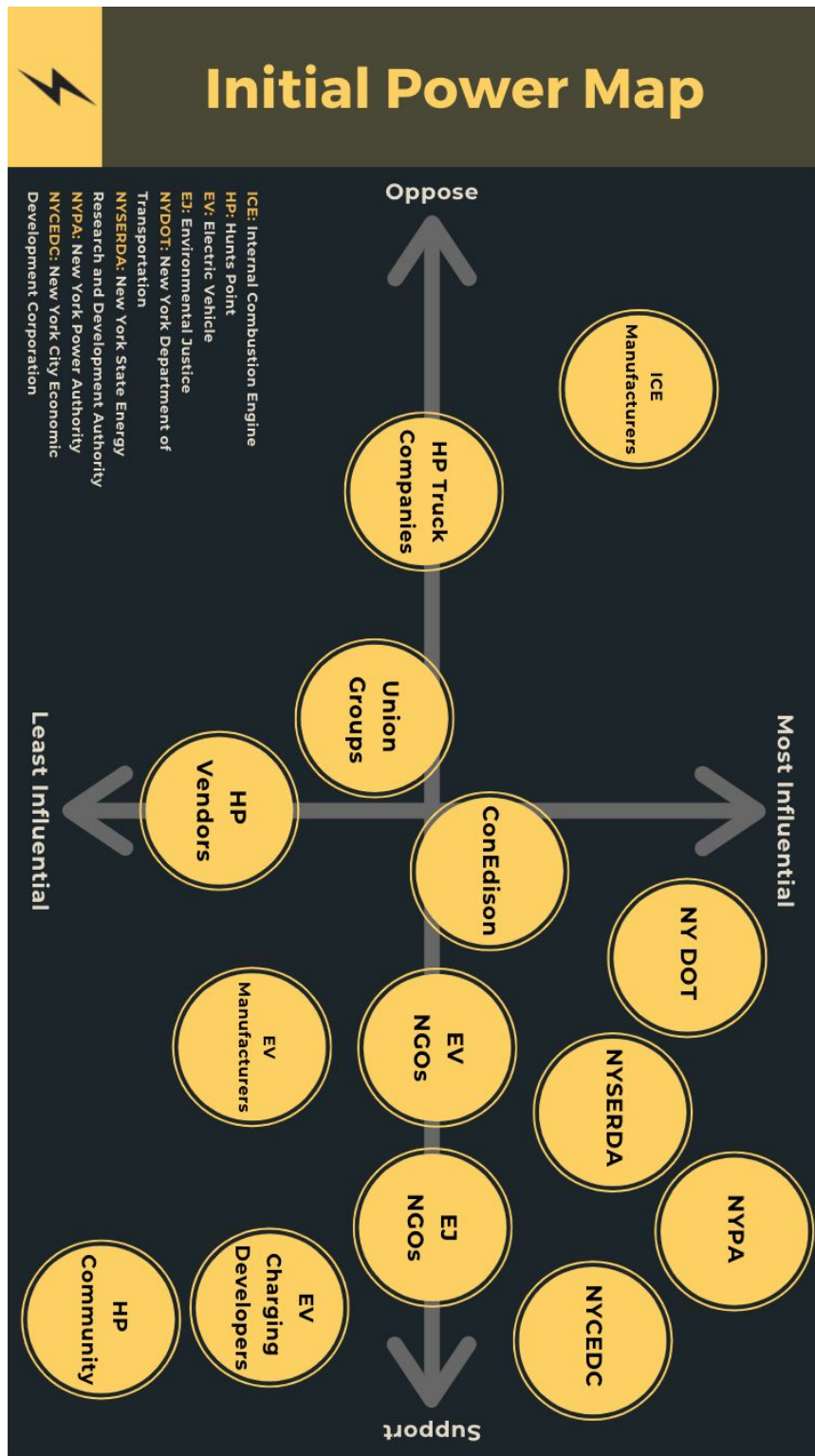
⁸ <https://2os2f877tn1dvtmc3wy0aq1-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/Hunts-Point-TAP-Report-Final-Web.pdf>

⁹ <https://onenyc.cityofnewyork.us/wp-content/uploads/2019/11/OneNYC-2050-A-Livable-Climate-11.7.pdf>

¹⁰ <https://www.nysesda.ny.gov/-/media/Files/Publications/Research/Transportation/18-33-NYS-Truck-VIP.pdf>



Figure 2. Stakeholder Power Map



Created by the authors



Hunts Point Context

Background

Hunts Point is a neighborhood in the South Bronx that sits on the Hunts Point Peninsula. The community is predominantly Black, Indigenous, and People of Color (BIPOC), with 68% of residents hispanic and 27% black. The neighborhood experiences a significantly lower wealth distribution as compared to other parts of the city. The median Hunts Point household income in 2018 was \$26,150, which is about 60% less than citywide median household income at \$64,850. Additionally, 43% of residents live below the federal poverty line.¹¹ Income inequality is just one of the stressors the community faces. Hunts Point also lies in a flood plain and is inflicted with hazardous air quality levels, which contribute to Hunts Point's designation as an environmental justice community.¹²

Food Distribution Center

Hunts Point is an Industrial Business Zone, a city designation that protects against rezoning.^{13 14} This prevents the existing businesses from being pushed out of the community. Figure 3 shows land use designations in Hunts Point. The Hunts Point Food Distribution Center (FDC) is situated at the edge of the Peninsula in the southeast outside of the 'study area' in Figure 3 below, which was being evaluated by the city for roadway improvements that lead into the FDC. Other warehousing and manufacturing industries lie above the FDC (pink). Besides manufacturing, there are few other commercial zones (red). Meanwhile the FDC covers almost half of the entire peninsula (Figure 4), important for economic growth. However, this growth must be equitable and sustainable to mitigate the social vulnerability and environmental racism in the community. Figure 3 shows that the industry zones have pushed multifamily residential areas (yellow) and institutions like schools (purple) close to main highways that produce a lot of pollution. If dirty fossil fuel tailpipe emissions from trucks were reduced with the use of electric trucks, these residents would see lower levels of air pollution in their community.

¹¹ <https://thrivingearthexchange.org/project/bronx-ny/>

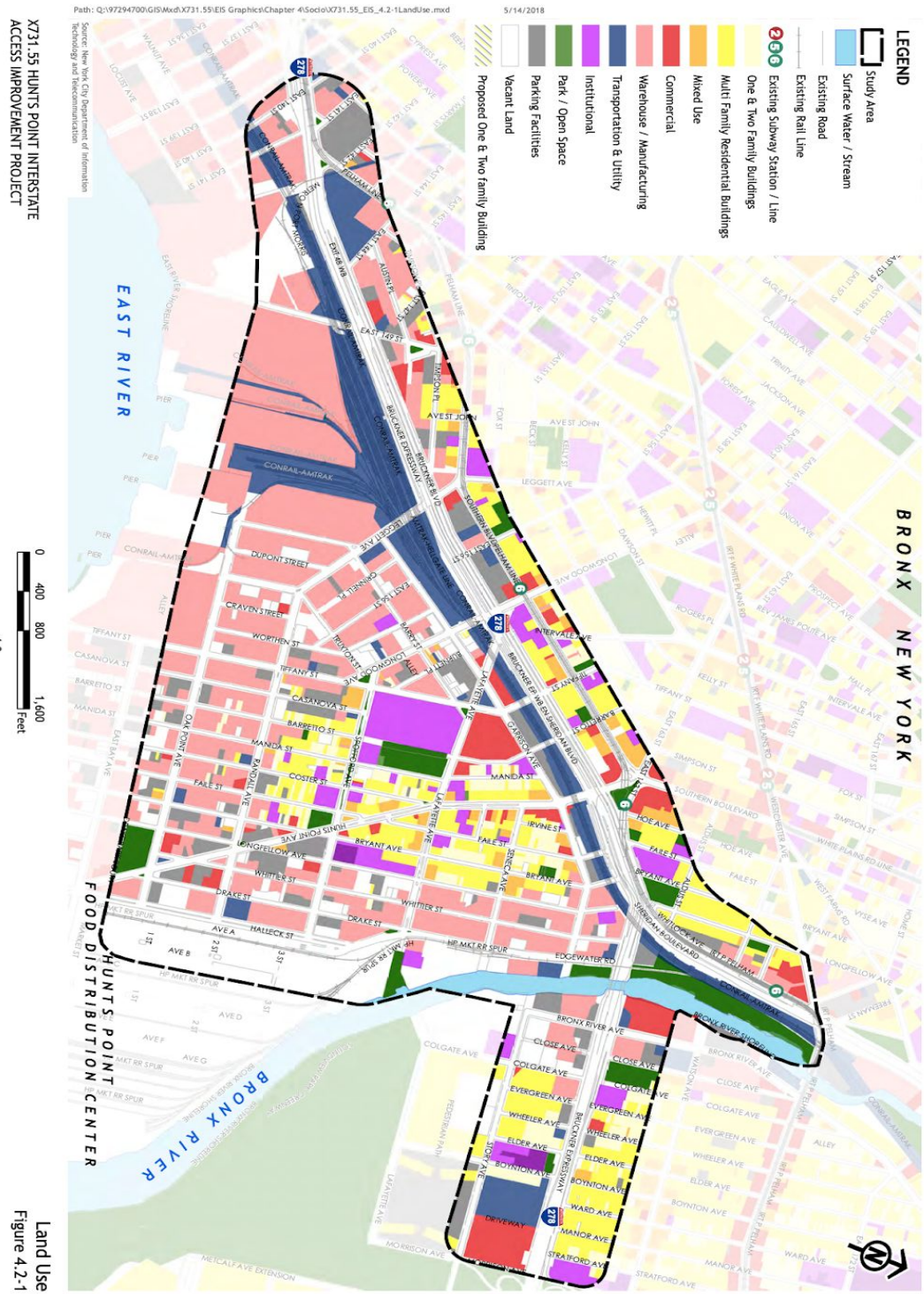
¹² <https://www1.nyc.gov/site/planning/data-maps/flood-hazard-mapper.page>

¹³ <https://edc.nyc/project/hunts-point-peninsula>

¹⁴ <https://edc.nyc/industry/industrial-and-manufacturing#:~:text=Industrial%20Business%20Zones%20%28IBZs%29%20are%20geographic%20areas%20that,the%20rezoning%20of%20properties%20to%20allow%20residential%20uses>.



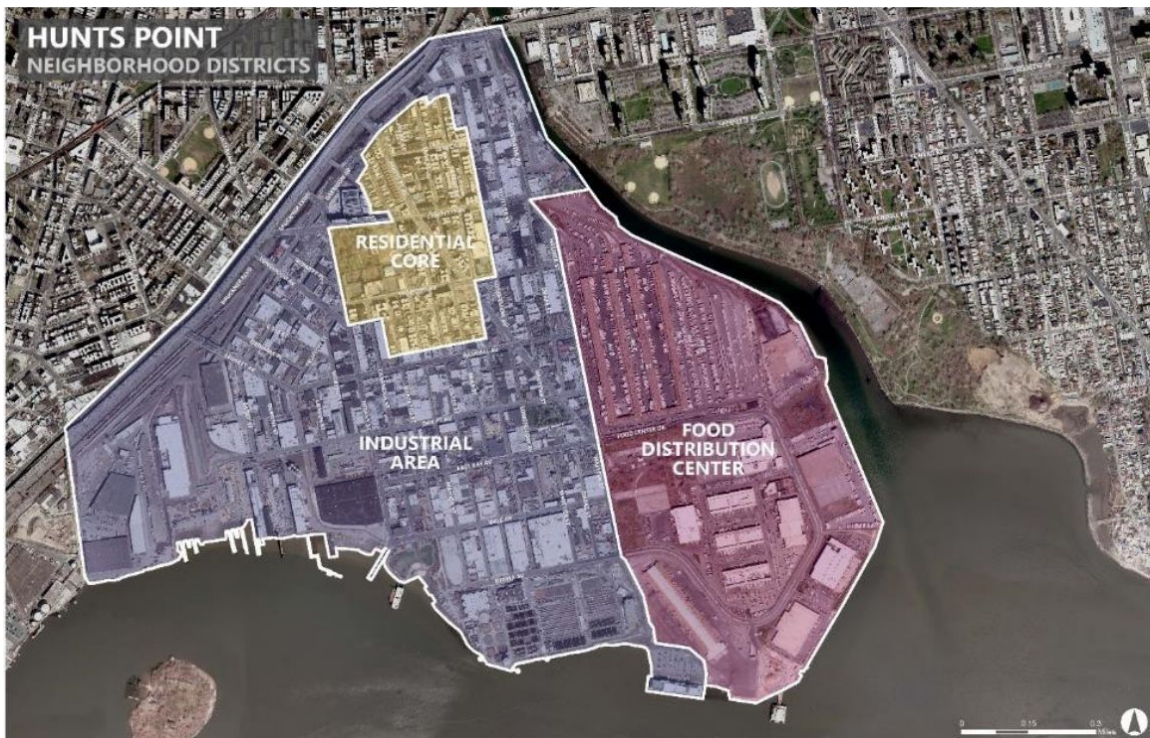
Figure 3. Hunts Point Land Use



Source: https://www.dot.ny.gov/southbronx/repository/X731.55_FEIS_Chapters_1-6.pdf



Figure 4. Designated areas in Hunts Point



Source: <https://2os2f877tnl1dvtmc3wy0aq1-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/Hunts-Point-TAP-Report-Final-Web.pdf>

The New York City Economic Development Corporation (NYCEDC) is the leaseholder of the FDC, overseeing the maintenance and operations, capital improvements, and leasing of the space to its wholesaler tenants.^{15 16} The NYCEDC is vested in the success of the FDC and the community at large, many of whom are employed within the FDC.¹⁷ To tackle the remaining high unemployment rates in Hunts Point, the NYCEDC has partnered with some of the large tenants at the FDC. The large tenants are national firms including those shown in Figures 5 and 6: Dairyland, Krasdale, Baldor, and Anheuser-Busch. In 2019, the NYCEDC partnered with Baldor on its 132,000 square foot expansion of new office and refrigeration spaces. Through this public private partnership, Baldor was able to add 450 jobs instead of the original 300 it projected before the NYCEDC's involvement.¹⁸ Many other tenants at Hunts Point are more regional and New York focused, family-owned businesses including D'Arrigo and Katzman Produce that have created local jobs in the community for generations.^{19 20 21}

¹⁵ https://edc.nyc/sites/default/files/2020-07/20_hunts_point_vision_plan_spring_2019.pdf

¹⁶ <https://2os2f877tnl1dvtmc3wy0aq1-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/Hunts-Point-TAP-Report-Final-Web.pdf>

¹⁷ <https://edc.nyc/project/hunts-point-peninsula>

¹⁸ https://edc.nyc/sites/default/files/2020-07/20_hunts_point_vision_plan_spring_2019.pdf

¹⁹ <https://thrivingearthexchange.org/project/bronx-ny/>

²⁰ <https://www.darrigony.com/about/history/>

²¹ <https://www.katzmanproduce.com/>



The land was originally a Con Edison coal gasification plant. Due to the environmental degradation from the operation of the gasification plant, remediation efforts have been ongoing since the market was built in the 1960's.²² While nearly 71 acres as of Spring 2019 were remediated, approximately 110 acres remain, an example of the environmental justice concerns in the community (Figure 6). Nevertheless, from the 1960's to today, the FDC has undeniably been a central part of Hunts Point's (and NYC's) identity and economy. The FDC houses three large wholesale markets: produce, meat, and fish that generate \$3 billion dollars in annual revenue (Figure 5).²³

Figure 5. Satellite view of FDC showing locations of produce, meat, and fish markets



Source: https://edc.nyc/sites/default/files/2020-07/20_hunts_point_vision_plan_spring_2019.pdf

²² https://edc.nyc/sites/default/files/filemanager/Projects/Hunts_Point_Peninsula/2004_Hunts_Point_Vision_Plan_combined.compressed.pdf
²³ <https://edc.nyc/project/hunts-point-peninsula>



Figure 6. Satellite view of remediation sites in Hunts Point



Source: https://edc.nyc/sites/default/files/2020-07/20_hunts_point_vision_plan_spring_2019.pdf

Hunts Point FDC was born by its roadways. In the 1950's and 1960's New York State received federal funding to construct the major highways that now cut across the borough: the Major Deegan Expressway, the Cross Bronx Expressway and the Bruckner Expressway. These highways facilitated the growing food industry in Hunts Point and incentivized the opening of the first Terminal Produce Market in 1967.²⁴ Afterwards, the Cooperative Meat Market was built out in the 1970's, and the New Fulton Fish Market, originally housed in lower Manhattan, was moved to Hunts Point in 2005.^{25 26}

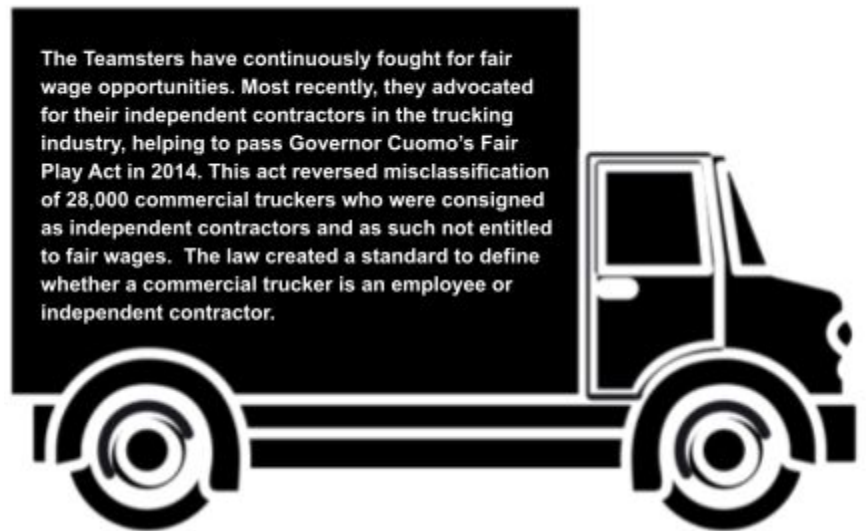
²⁴ <https://thepoint.org/community/local-history/>

²⁵ https://edc.nyc/sites/default/files/filemanager/Projects/Hunts_Point_Peninsula/2004_Hunts_Point_Vision_Plan_combined.compressed.pdf

²⁶ <http://www.newfultonfishmarket.com/history.html>



From the early 1800's to the late 20th century, Hunts Point's workforce was mostly immigrants to the US, but as generations of immigrants have come to call Hunts Point home, a majority of the workforce now live and work in Hunts Point. For example, approximately half of the Teamsters Local 202 Union live in the South Bronx and the other half are largely from the surrounding tristate area.²⁷



The Teamsters are one of the largest unions at Hunts Point working in the produce market, but are just one example of the many laborers at the FDC.²⁸ The FDC provides 8,500 direct jobs, and these jobs are not only abundant, but also come with competitive pay, healthcare, and pension benefits, especially with organized laborers like the Teamsters.²⁹ Besides truckers, other jobs in food distribution at Hunts Point include warehouse positions such as loading dock workers and forklift operators, as well as salesmen, foremen, and buyers.

There are over 155 wholesalers, distributors, and manufacturers in the FDC. The FDC's three wholesale markets sell approximately 4.5 billion pounds of food every year. With this incredible volume, only 50% is needed to serve the FDC's entire NYC base of restaurants, cafes, bodegas, and supermarkets. The other 50% of food exits the city into the tri-state area. The biggest market is the produce market covering 112 acres, which is 18% of the entire 629 acre peninsula.³⁰ The produce market alone generates over \$2 billion of the revenue and employs 3,000 people across three large firms and 28 small firms.³¹ Similarly, the fish market has 37 smaller wholesalers maintaining approximately 600 permanent jobs.³² ³³ The FDC is so successful in NYC because tourists want to eat at local restaurants that source fresh food and residents want the variety of being able to buy fresh food from their neighboring bodega or at

²⁷ <http://teamsters.nyc/locals/local-202/>

²⁸ http://teamsters.nyc/locals/local-202/#~:text=L_LOCAL_%20202.%20Teamsters%20Local%20202%20represents%20workers%20in%20Bronx%20and%20represents%20members%20throughout%20the%20tristate%20area.

²⁹ <https://edc.nyc/project/hunts-point-peninsula>

³⁰ <https://thrivingearthexchange.org/project/bronx-ny/>

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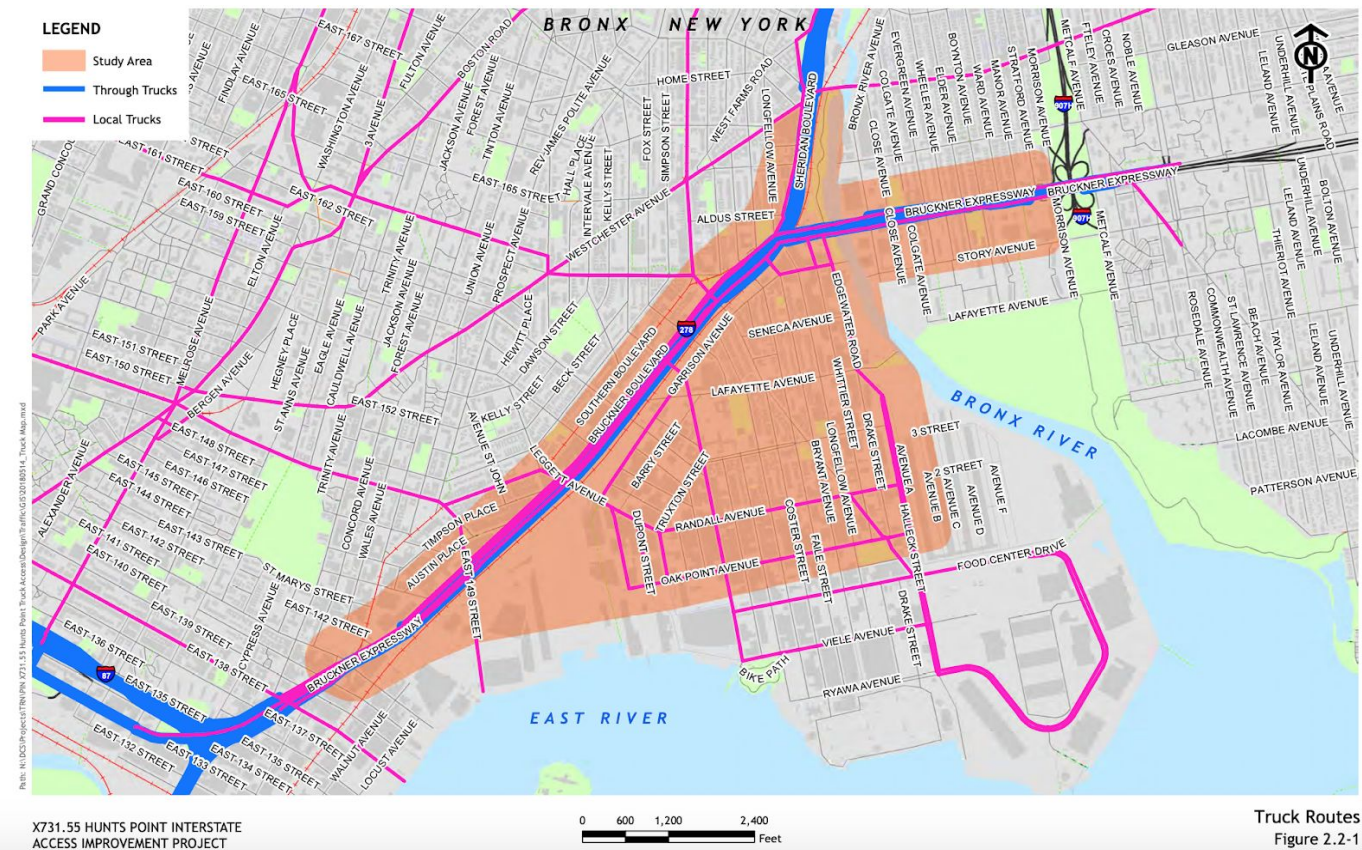
³³ https://edc.nyc/sites/default/files/filemanager/Projects/Hunts_Point_Peninsula/2004_Hunts_Point_Vision_Plan_combined.compressed.pdf



their large supermarkets. Businesses sourcing food also receive the convenience of a “one stop shop” to purchase their produce, meat, and fish from one location.

Most local truckers serving the FDC take ‘one stop,’ transporting food from New Jersey directly into the City where it is sold locally. Food arrives in New Jersey commonly by rail from harvests farther south and is then taken by truck to the FDC. This mode of rail to truck distribution is colloquially called a “piggyback,” and while most of the food at the FDC is delivered in this fashion, each loading dock at the center is capable of hosting direct rail shipments as well. The FDC is also positioned at the edge of the peninsula to accept maritime freight shipments.³⁴

Figure 7. Hunts Point Peninsula Traffic Map



Source: https://www.dot.ny.gov/southbronx/repository/X731.55_FEIS_Chapters_1-6.pdf

³⁴ https://edc.nyc/sites/default/files/filemanager/Projects/Hunts_Point_Peninsula/2004_Hunts_Point_Vision_Plan_combined.compressed.pdf

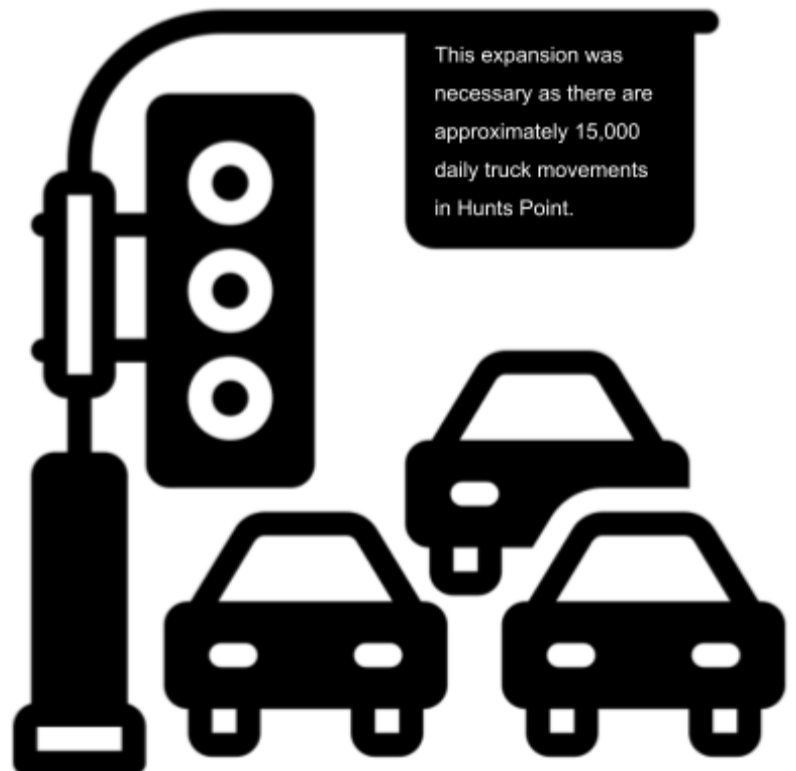


Past Infrastructure Improvements

Expansion of the Sheridan And Bruckner Expressway

Due in large part to the FDC, Hunts Point sees a lot of truck traffic. It is southeast of Sheridan and Bruckner Expressways, which are highlighted in blue in Figure 7, depicting the high volumes of heavy-duty long-haul (blue line) and medium-duty, local truck traffic (pink line). As shown in Figure 7, the trucks that traffic through Hunts Point are predominantly medium-duty vehicles that traverse local roads circulating around Food Center Drive at the edge of the Peninsula. The orange area highlighted on this map was studied to assess the reconstruction of the Sheridan and Bruckner expressways to accommodate pedestrian and bike lanes as well as create a more direct path to the FDC by adding a new entrance, exit, and a third lane. In 2017, Governor Cuomo announced a state commitment of \$1.8 billion dollars for this project.³⁵ Prior to this project, there was only one point of entry and exit off the Sheridan and Bruckner Expressways leading into the center for New Jersey and farther midwest traffic. To address this issue, the Edgewater Access Ramp was built, allowing trucks a more direct route to the FDC that does not cut through the neighborhood.

Given these high volumes, truckers often find themselves idling in heavy traffic and producing even more diesel pollution than when they are simply passing through. It can be argued that the State's commitment is not enough to resolve this issue, despite the large investment. Indeed, the market as a whole has undergone zero major infrastructural changes since its creation in the 1960's, despite the amount and size of the vendors



³⁵ <https://www.governor.ny.gov/news/governor-cuomo-announces-18-billion-project-transform-south-bronx>



growing hugely. This has led to space and storage issues, as the vendors struggle to keep up with the vast demand for their products while occupying a limited space.

Health Issues

Diesel tailpipe emissions are carcinogenic and can exacerbate respiratory and cardiovascular conditions such as asthma, emphysema, and heart disease.³⁶ The residents of Hunts Point suffer from adverse health impacts due to their proximity to medium- and heavy-duty diesel distribution truck traffic.³⁷ Tailpipe emissions include Carbon Monoxide (CO), Nitrogen Oxides (NOx), Sulfur Dioxide (SO₂), Volatile Organic Compounds (VOCs), and Particulate Matter 2.5 (PM 2.5), all capable of inflicting irreversible harm to human health. Greenhouse gas emissions including Carbon Dioxide (CO₂), Nitrous Oxide (N₂O), and Methane (CH₄) are also emitted, which contribute to the global climate change crisis.³⁸

PM 2.5 is widely known as an extremely harmful air pollutant since the particles are so small that they can get lodged in people's lungs, worsening asthma and other respiratory conditions. Figure 8. circles Hunts Point, drawing attention to the fact that Hunts Point is among the areas in the City with the highest levels of PM 2.5.. Tragically, this coincides with the highest levels in the city of asthma hospitalizations among Hunts Point's children. The rate of childhood asthma-related hospitalization is double the city average, and a child living in the South Bronx is approximately ten times more likely to be hospitalized for asthma than a child living on the Upper West Side (less than five miles apart).³⁹

³⁶ https://edc.nyc/sites/default/files/filemanager/Projects/Hunts_Point_Peninsula/2004_Hunts_Point_Vision_Plan_combined.compressed.pdf

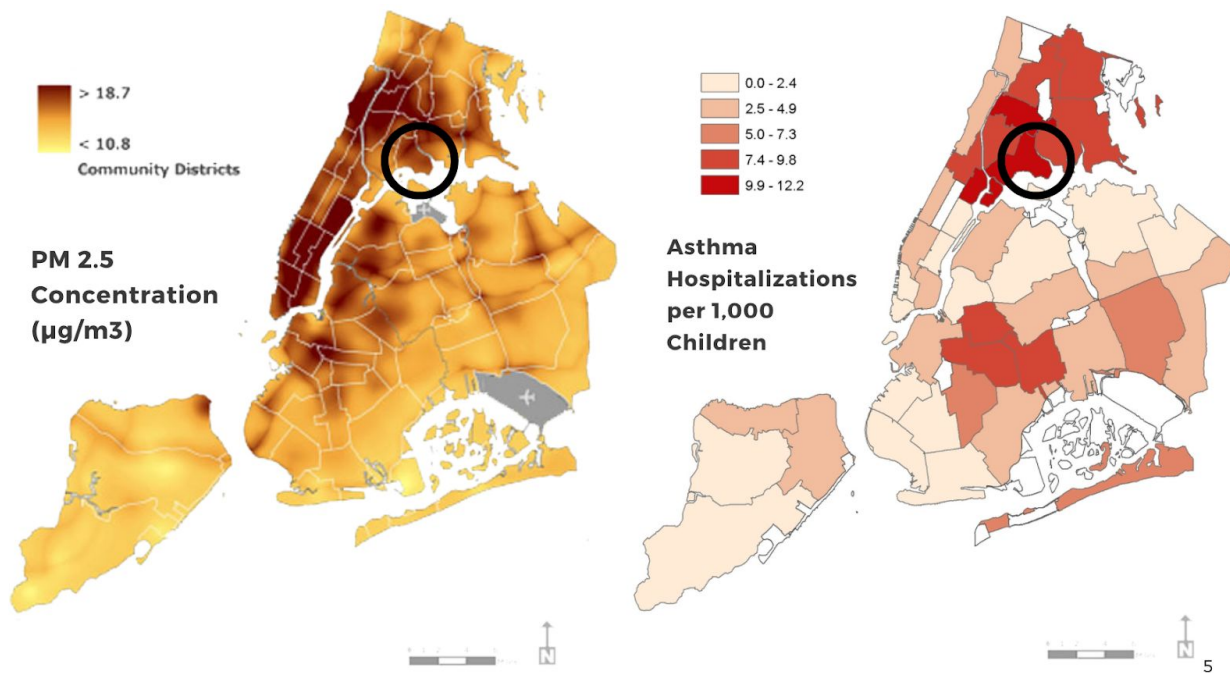
³⁷ <https://edc.nyc/project/hunts-point-peninsula>

³⁸ <https://www.sciencedirect.com/science/article/pii/S0360319920335722>

³⁹ <http://a816-dohbsp.nyc.gov/IndicatorPublic/publictracking.aspx>



Figure 8. PM 2.5 Concentrations and Corresponding Child Asthma Hospitalizations



Source (left image): <https://www1.nyc.gov/assets/doh/downloads/pdf/environmental/comm-air-survey-winter08-09.pdf>

Source (right image): <https://www.cccnewyork.org/blog/concentrations-of-risk-asthma-and-poor-housing-conditions/>

New York City is not oblivious to the health disparities that persist at Hunts Point. Since the release of the Hunts Point Vision Plan in 2004, carried out by a designated Hunts Point Task Force, the City has taken strides to improve the infrastructure and health of the region. City investments have created new jobs, spurred new public parks, and reduced air pollution.⁴⁰ However, more work remains to resolve the vulnerabilities in the community since health outcomes remain disparate.

Since the neighborhood is bisected by the Bruckner and Sheridan expressways, ambient noise from heavy traffic also presents a challenge for the Hunts Point neighborhood. An Environmental Impact Statement (EIS) performed by Dewberry Engineers found that a number of schools and other sensitive resources would experience noise levels over 65 decibels, which was not conducive to an appropriate learning or living environment. This is yet another example of Hunts Point suffering from social vulnerability and environmental racism.⁴¹

⁴⁰ <https://edc.nyc/project/hunts-point-peninsula>

⁴¹ <https://www.mas.org/news/hunts-point-access-project-would-have-drastic-impacts-on-the-south-bronx/>



These health issues are clearly made worse by diesel truck traffic, and reducing those tailpipe emissions would go a long way in increasing health outcomes and quality of life for Hunts Point's residents. Electrifying even a modest 5% of Hunts Point's truck traffic would reduce PM2.5 by 85kg, which along with the other emissions abatements is enough to offset \$300,000 in avoided social costs that would have resulted from the tailpipe pollutants. These social costs take into account "agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change".

Current Electrification State

After conducting research into Hunts Point, which included a site visit, we consolidated our findings to paint the full picture of the current state of electrification in Hunts Point. Our main finding is that there is presently minimal vehicle electrification in the area, and that it is mainly light-duty personal passenger vehicles, with the majority being hybrids. There are, however, scattered examples of truck electrification - the A.Duie Pyle company has a tiny fleet of electric trucks, but they only travel up to 60 miles per charge. In addition, we find piecemeal charging infrastructure, not centralized, and certainly not sufficient for the charging of large portions of the fleets.

There have been successful examples of truck electrification, however, and the city and the state have developed programs that have been used to electrify distribution vehicles in Hunts Point that have contributed to the air pollution reductions. Notably, the DOT administers a Clean Trucks Program and NYSERDA administers the Voucher Incentive Program. Each of these programs provides funds for fleet owners to replace their diesel trucks. These programs are quite similar, and easily confused. The major difference is that the Clean Trucks Program is NYC specific and uses funds from the Volkswagen settlement, while the VIP is statewide and utilizes state funds. Starting in 2012, the DOT began the Clean Trucks Program to replace, retrofit, or scrap the dirtiest polluting trucks in Hunts Point.⁴² Trucks with engines from 1992-2009 are eligible.⁴³ Replacement options are available for Class 3-8 Battery Electric Vehicles (BEV), which are full electric medium- and heavy-duty trucks. With prices of medium- and heavy-duty electric trucks ranging from about \$70,000 to \$310,000 compared to the average cost of medium- and heavy-duty diesel trucks ranging between \$35,000 to \$117,000,

⁴² <https://www.nycctp.com/>

⁴³ <https://www.nycctp.com/available-funding/>



this means that the vouchers cover the difference of between 90% to 95% of the incremental cost, which comes to between \$60,000 to \$185,000. Figure 10 displays the program's incentives.

Figure 9. NYC Clean Trucks Funding Amounts

Class 4	\$100,000
Class 5	\$110,000
Class 6	\$125,000
Class 7	\$150,000
Class 8	\$185,000

*Incentives listed above are subject to change after August 6, 2020. Any changes will be made with at least 30 days' notice. Actual funding cannot exceed program limits for replacement truck incremental costs.⁴²

Source: <https://www.nycctp.com/available-funding/>

Voucher Amounts and Caps for Trucks

Vehicle Technology	Incremental Cost %	Vehicle Weight Class (GVWR)					
		3*	4	5	6	7	8
BEV	95%	\$60,000	\$100,000	\$110,000	\$125,000	\$150,000	\$185,000

Figure 10. NYSERDA Truck Voucher Incentive Program Funding Amounts

*Class 3 is eligible for 80% of the incremental cost

Source: https://www.nyserdera.ny.gov/All-Programs/Programs/Truck-Voucher-Program?utm_source=ITS&utm_medium=subdomain&utm_campaign=truck-vip-ny-govhttps://www.nycctp.com/available-funding/

Plug-in hybrid and diesel electric vehicles are also allocated incentive money, along with compressed natural gas trucks (CNG) and higher-efficiency diesel trucks. Following the success of this program, the model has now moved to other areas in the city and expanded its options



for replacements. Trucks in IBZs, like Hunts Point, have priority access to the funds.⁴⁴ Organizations also have no limits to the number of times they can engage with the program, which puts even more clean trucks on the road from the interested parties who take advantage of this program's funding.⁴⁵

With programs to bring in electric trucks themselves, corresponding charging infrastructure is necessary. The EDC released a request for expressions of interest for initiatives or programs to expand charging infrastructure in April 2019, but nothing has gone beyond this to date, despite the request garnering a modest number of proposals.⁴⁶ However, many of the proposals required intensive capital investment from the city, and once Covid-19 hit, the project essentially stopped. Nevertheless, this shows the EDC recognizes its EV programs must be coupled with chargers. In fact, when asked the most essential steps in preparing Hunts Point for electrification, our EDC interviewee replied that ensuring sufficient electrical and charging capacity to meet current and future needs are at the top of the list. In addition, this would have to be a coordinated effort at the state level between governments and utilities. The EDC may have to pay particular attention to its own programming, rather than state programming at least in the interim; many state programs such as Charge Ready NY that provides \$4000 rebates for charging stations for workspaces, only offer rebates for Level 2 (240v) charging, not the Level 3, or also commonly known as Direct Current Fast Charging (DCFC), that electric trucks require.⁴⁷ These DCFC chargers should be upward of 480v.

Another electrification project in Hunts Point is an electric trailers pilot program launched by the New York City Energy Research and Development Authority (NYSERDA) in partnership with Convoy solutions, and with the support of NYCEDC, Empire Clean Cities, Barroto Bay Strategies, and ENow. This recently developed pilot will provide electric refrigerated truck trailers, known colloquially as 'reefers'. Reefers are fundamental to the FDC since all of the markets bring in fresh food that needs to be kept at a low temperature, and with storage space at a premium within the market, the overflow is stored in trailers in the parking lots. These trailers are diesel fueled, so electrifying these will convert what would have been dangerous tailpipe emissions to zero tailpipe emissions. The goal of the pilot is to provide a proof of concept for large-scale use in the FDC. Notably, this pilot goes one step further than zero tailpipe emissions by seeking to also achieve zero emissions. Zero emissions means zero

⁴⁴ <https://www.nyccto.com/>

⁴⁵ https://edc.nyc/sites/default/files/2020-07/20_hunts_point_vision_plan_spring_2019.pdf

⁴⁶ <https://edc.nyc/press-release/nycedc-lays-groundwork-developing-truck-accessible-electric-charging-stations>

⁴⁷ <https://www.nyserda.ny.gov/About/Newsroom/2019-Announcements/2019-04-23-Governor-Cuomo-Announces-Record-Number-of-Electric-Vehicles>



tailpipe and no greenhouse gas emissions, which is possible when electric charging infrastructure is connected to solar with battery storage technology.⁴⁸

The beginning groundwork has been laid for zero emissions electric vehicles (EVs) in Hunts Point since the NYCEDC sponsored research in 2019 to assess the feasibility of solar and battery storage as well as hydroelectric, anaerobic digestion, and geothermal energy in the area.⁴⁹ While electrifying reefers at scale would be an incredible victory for the wellbeing of the community with the air pollution reduction, they are of course just one contributor to the pollution. These reefers typically do not leave the premises and provide on-site storage when warehouses are otherwise full making them easy candidates for having reliable electric charging.⁵⁰

Katzman Produce has utilized a similar system to electrify their mobile storage containers. Katzman, a family-owned business in the produce market, mentioned as one of the prominent vendors above, has electric storage vans.⁵¹ These mirror the electric reefer pilot under permitting. Being idle, these vans can stay connected to charging sources and therefore, do not require a network. In their experience, their electric equipment requires far less maintenance and repairs compared to their diesel counterparts. However, if full replacements of the electric components are necessary, it is far more expensive than fuel components. Despite the modest success of this program, some barriers still remain. The reefers are still requiring permitting as the New York City Fire Department (FDNY) provides permits for energy storage batteries. These mobile trailers are subject to this permitting so they currently fall under FDNY's domain versus the DOT that normally permits transportation vehicles.⁵² In addition, Katzman had to plan, pay for, and implement the electrical system changes in their area of the market to supply the power to these vans, and the entire process has taken roughly 10 years. So pilots, while providing proof of concept, sometimes are not large enough to receive fast permitting action and substantial enough funding to truly see if such a program could scale.

⁴⁸ https://www.empirecleancities.org/uploads/1/2/4/9/124944244/solar_and_battery_powered_refrigerated_trailers.pdf

⁴⁹ <https://2os2f877tnl1dvtmc3wy0aq1-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/Hunts-Point-TAP-Report-Final-Web.pdf>

⁵⁰ <https://www.empirecleancities.org/huntspointsolar.html>

⁵¹ <https://www.katzmanproduce.com/>

⁵² <https://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-b28-w28-study-material.pdf>



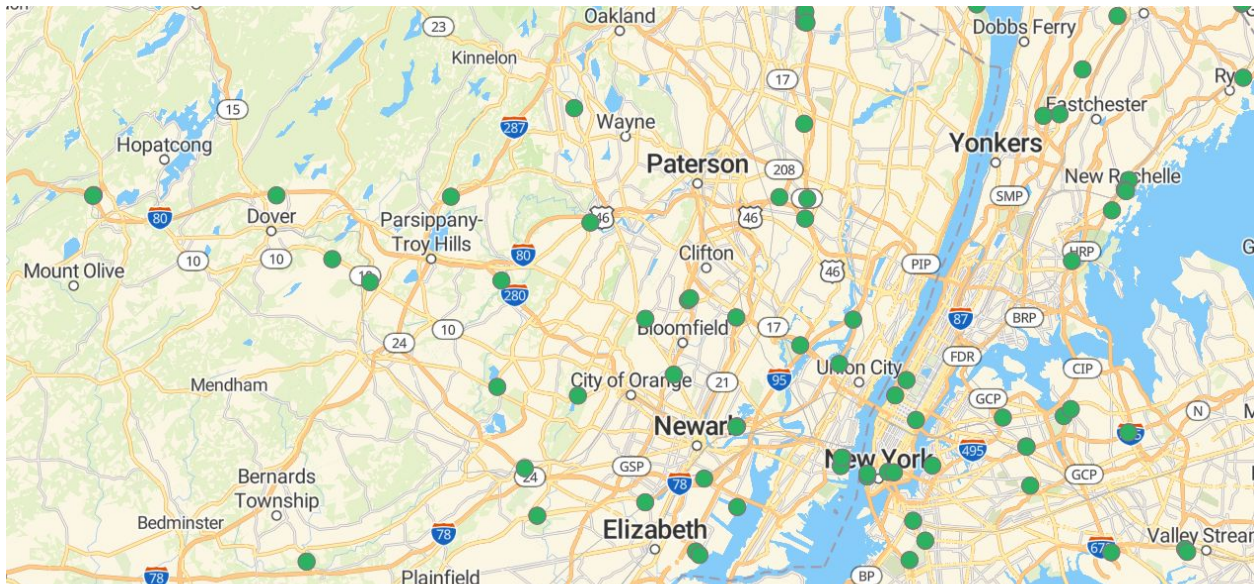
Charging Infrastructure

Charging infrastructure is crucial to the development and the scaling of truck electrification. Without sufficient electrical and charging infrastructure, including chargers that are appropriate for the specific electric vehicle types, it simply does not make sense to purchase and operate an electric vehicle. As such, full scale adoption of electric trucks depends heavily upon the successful implementation of appropriate charging stations in Hunts Point. Currently, there is no such implementation at scale, and this represents a pivotal need.

Electric trucks do exist at Hunts Point (Figure 14); however, reportedly not enough charging infrastructure is present so truckers remain worried about the range they can travel if they were to use an electric truck. At least DCFC infrastructure is needed to accommodate medium- and heavy-duty trucks and the current charging layout in NYC can be seen in Figure 11. When looking at Hunts Point and then the larger tri-state area around it, there is a stark lack of DCFC stations in the Hunts Point area (Figure 12). Trucks travelling northbound from New Jersey may have access to chargers in Elizabeth and Newark, but there is a distinct lack of charging along the main routes north along route 95. As it stands, trucks would need to travel through Manhattan to have access to any appropriate chargers. This is infeasible for a number of reasons, including restrictions on heavy duty trucks travelling through Manhattan and the vast majority of routes using route 95. Consequently, as reported by our stakeholder interviews, electrifying Hunts Point's distribution trucks would require a huge investment in DCFC infrastructure.



Figure 11. Existing DCFC infrastructure in NY

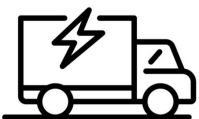


Source: https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC&ev_levels=2&ev_levels=dc_fast&ev_levels=3

Figure 12. Existing DCFC infrastructure relative to Hunts Point (Denoted by red pin)



Source: https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC&ev_levels=2&ev_levels=dc_fast&ev_levels=3



One program launched by the state to tackle this issue is EVolve NY, administered by the New York Power Authority. EVolve NY plans to install 200 EV chargers across the state. However, only one of these chargers is located in close proximity to Hunts Point (Figure 13).⁵³ While this one charging station is not nearly enough to scale electric freight in Hunts Point, this is the first step towards expanding the infrastructure in the coming years. It should be noted that these chargers are DCFC, which can be beneficial to medium-duty and heavy-duty fleets that need DCFC stations or ones that have an even higher voltage.⁵⁴ Unfortunately for progress towards electrifying Hunts Point, EVolve NY is much more state-focused as a policy, with only 6 of the 50 existing or planned chargers located within the 5 boroughs of NYC. This program will hopefully be expanded, and lobbying for more chargers to be placed within the city as well as near high-freight areas of the city like distribution centers or fleet operation centers should be a priority.

Make-Ready New York, funded by NYSERDA and administered by Con Edison, targets passenger vehicles and light-duty vehicles only, even though they have some funding for DC Fast Charging that would lend itself nicely to electric trucks. However, they have no funding for deploying DCFC to advertise to medium- and heavy-duty trucks.⁵⁵ Volkswagen Settlement funds have made Make-Ready possible, but with the entire state to consider, not just NYC, passenger and light-duty vehicles dominate the market and these settlement funds should not be an expected or sustainable source of future funding.⁵⁶

NYSERDA has also implemented the DCFC Electric Vehicle Supply Equipment (EVSE)⁵⁷ in select New York State Regional Economic Development Councils (REDCs). The program is starting round 1 of funding and it is intended to reduce the cost of purchasing and installing DCFC EVSE. This program currently exempts NYC but should be expanded to cover areas such as Hunts Point.

⁵³ <https://www.nypa.gov/services/clean-energy-advisory-services/evolve-ny>

⁵⁴ <https://www.nypa.gov/-/media/nypa/documents/document-library/evolveny/nypa-ev-charging101.pdf?la=en>

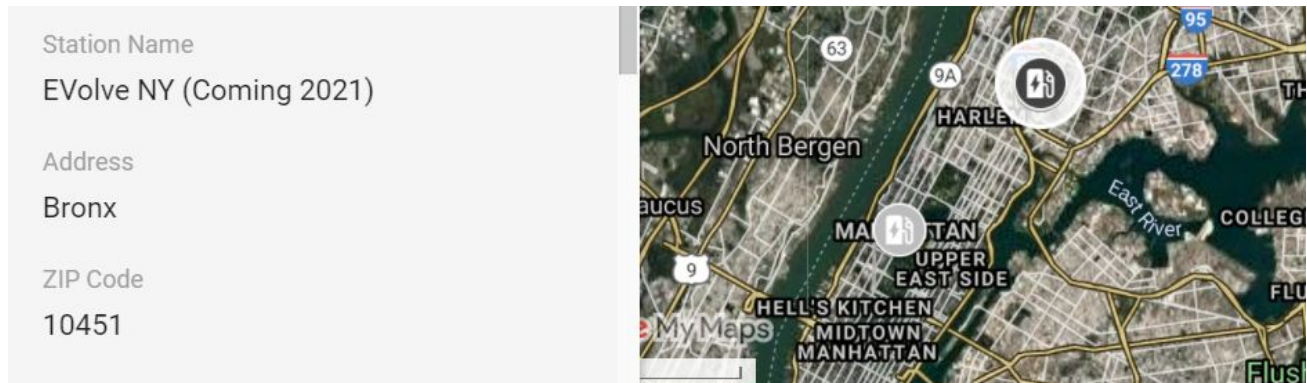
⁵⁵ <https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles/make-ready-program>

⁵⁶ <https://www.governor.ny.gov/news/governor-cuomo-announces-11-million-volkswagen-settlement-funds-expand-electric-vehicle-fast>

⁵⁷ <https://portal.nyserderda.ny.gov/servlet/servlet.FileDownload?file=00P000000QSRqIEAH>



Figure 13. EVolve NY planned EV charger installation Upper Manhattan and the Bronx Snapshot



Source: <https://nypa.gov/services/clean-energy-advisory-services/evolve-ny>

EV Landscape

The current landscape for electric trucks is one of an emerging market - not fully scaled, but steadily making progress towards full commercialization. Costs are a huge concern for fleet owners, and depending on the truck class, electric trucks can cost anywhere from about \$60,000 to \$190,000 more than their diesel counterparts. In addition, owners and operators have cited the “range anxiety” stemming from the current battery capacities as a primary concern for adopting electric trucks. To better understand the potential for adoption of these electric trucks, we sought to understand the needs and minimum requirements of vendors and fleet owners for their fleets (also refer to Appendix IV for more information on various electric truck models, battery sizes, ranges, and availability in the market).

Katzman reports that their typical delivery routes are throughout the 5 boroughs, but approximately 15-20 mile runs each. So while in Figure 12, one sees the charging in Hunts Point to be desolate, there are some chargers primarily in lower Manhattan and sparsely across Brooklyn, Brooklyn having more than the Bronx. These local truck routes with limited distances would likely yield less range anxiety from people driving electric trucks if they are able to take advantage of the chargers in the other boroughs. With this assumption, Katzman is one of many vendors who could potentially uptake electric trucks that are able to travel and maintain charge over these 15-20 mile routes.⁵⁸ It is unclear whether these routes are fixed, or if they are

⁵⁸ <https://www.katzmanproduce.com/>



variable based on logistics needs, but it is clear that route dynamics will have an effect on charger placements, or perhaps the inverse.

Figure 14. EV Medium-Duty A.DuiePYLE Truck



Electric Truck in Hunts Point. Captured by the Authors October, 2020

As the market demands a more sustainable option, this also affects the logistics and transportation sector. This has driven the industry to transition toward a cleaner approach, such as implementing electric trucks. During our visit to Hunts Point Distribution Center, we observed these transitions in the logistics sector already. A. Duie Pyle has successfully become the first motor carrier in the U.S. that deployed electric Fuso eCanter medium-duty trucks to its fleet for urban business-to-business and business-to-consumer deliveries in the New York metro area.⁵⁹ As part of the company's green initiatives, the electric Fuso eCanter truck is an ideal stepping-stone for the company to transition from the current hybrid-electric diesel to emission-free fully electric trucks. The eCanter is equipped with 185 kW of power with a driving range of 60 to 80 miles between charges. In addition, in terms of chargers, the trucks can be fuelled with both 230-volt standard 230 VAC single-phase charger (8 hours) or

⁵⁹ <https://www.truckinginfo.com/332335/why-a-duie-pyle-is-adding-electric-trucks-to-its-last-mile-delivery-fleet>



industry-standard 50 kW DC charger (1-2 hours); which make the trucks highly suitable for urban deliveries, between Bronx Service Center and across NYC, without the need of major improvements in charging infrastructures.⁶⁰ However, the Fuso trucks are not currently available for purchases - the two eCanter Trucks are being leased by the company on a 24-months term. For a new player in the electric trucks industry that does not own an electric fleet, this is an advantage for A. Duie Pyle, as there is no concern about the maintenance or hiring specialized technicians experts for operations and maintenance (O&M).

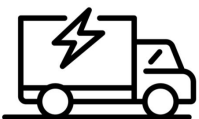
Despite this promising progress from A. Duie Pyle, the eCanter Truck does not offer a refrigerated option which does not allow the truck to deliver certain temperature-sensitive products from the Hunts Point Distribution Center. Options exist, however, and in 2018 Mercedes-Benz announced the launch of the company's first refrigerated electric trucks, "eActros Sports". The truck is available in two different sizes, 18 or 25 tonnes with a maximum load of 10 tonnes. Consisting of a 240 kWh battery pack, this allows the truck to operate up to 200 km (125 miles) of driving range per charge.⁶¹ In terms of charging, the truck is compatible with both fast charging at 150 kW (two hours) and the standard 20 kW (11 hours). The model is known for having optimum insulation for energy-efficient transport of refrigerated goods. Crucially, it is purely electrically operated with a net zero-carbon footprint, specially designed for distribution transport. Thus, since the first on-road testing by Meyer-Logistik in Hamburg in 2018, eActros trucks have gained significant attention and have expanded across Europe to Switzerland, Belgium and Netherlands within one year.⁶² According to Simon Loos, a leading company for logistics in the Netherlands, the drivers were very pleased with the truck's performance, especially with its continuous availability of torque across the entire speed range.

Truck models are primarily being marketed and sold in China and Europe primarily as well as in California. In 2019, China's BYD signed an agreement with Bronx truck sales and leasing dealer Milea Trucks, and plans to offer BYD's full line of electric trucks, including all class 6 and class 8 trucks, and "the world's first All-Electric Refrigerated Box Truck". These versions of BYD's electric trucks are currently not on the road and not yet available for purchase. BYD offers truck models 6F and 8TT, which are Class 6 and Class 8 electric trucks, respectively. Both of these models are available for purchase today. In fact, BYD developed a partnership with Anheuser-Busch in 2019 that delivered 21 8TT trucks to be used at four of the latter's

⁶⁰ https://www.mitfuso.com/images/manuals/ecanter_specsheet1.pdf

⁶¹ <https://insideevs.com/news/340553/mercedes-benz-eactros-sports-a-refrigeration-unit/>

⁶² <https://www.greencarcongress.com/2020/08/20200807-eactros.html>

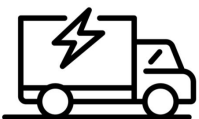


distribution facilities across southern California. Globally, BYD has reached 12,000 zero-emission electric trucks delivered across all classes.

The Volvo LIGHTS (Low Impact Green Heavy Transport Solutions) project is a collaboration between the South Coast Air Quality Management District, Volvo Trucks and 14 other organizations to introduce a range of vehicle, charging and workforce development innovations that are crucial for the commercial success of battery electric trucks and equipment. Over a period of three years, LIGHTS will aim to demonstrate the ability for heavy-duty, battery electric trucks and equipment to dependably move freight between major ports and warehouses in California with less noise and zero emissions. The total project cost is \$90 million, with \$44.8 coming as a funding award from the California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work to reduce greenhouse gas emissions, strengthening the economy and improving public health and the environment, particularly in disadvantaged communities. Volvo Trucks itself is investing \$36.7 million in the project.

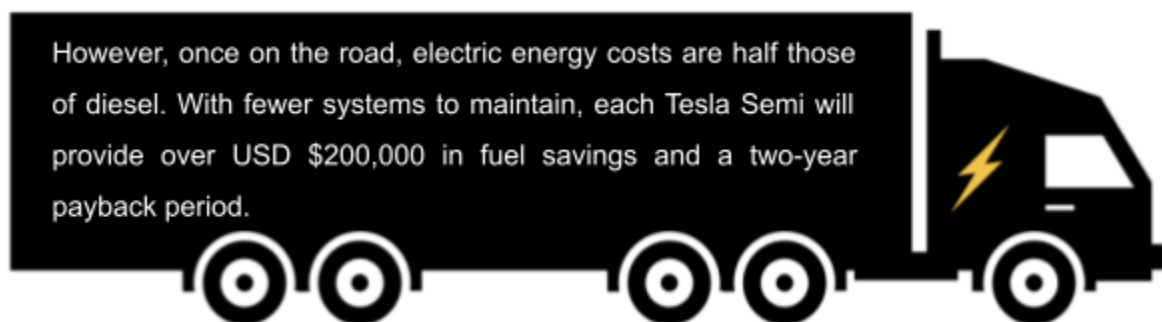
LIGHTS will begin with five Class 8 Volvo VNR plug-in trucks, which will grow to 23 with time. Moreover, the program will include 29 other battery electric vehicles, such as forklifts and smaller work trucks, 58 public and private EV chargers, two electric truck service centers and two colleges with electric truck maintenance programs. However, it is currently unknown exactly what the range of the VNR Electric trucks are, they will run routes between 75 and 175 miles during the LIGHTS showcase project phase. VNR Electric trucks can be ordered and are currently in production, projected to put in service for Volvo's customers and partners starting in 2021.

Daimler is another company stepping up to the plate with plans to offer electric vehicles in all its main sales regions by 2022. The plan is to offer the Freightliner eM2 in the medium-duty segment, and the Mercedes-Benz eActros and the Freightliner eCascadia in the heavy-duty segment. Their light-duty segment offering, the Mitsubishi FUSO eCanter, has been in demonstration since 2019. The eActros, the all-electric truck short-range urban delivery truck, has been undergoing real-world trials since 2018 in Germany and Switzerland, as well. In September 2020, Mercedes-Benz introduced a new model, the eActros LongHaul, which is to be a long-range electric truck, and concept fuel cell truck with a range of about 310 miles. This truck is estimated to be ready for series production in 2024.



As for other electric trucks that are available currently, there is the Chanje V8100 (range of 150 miles), a medium-duty electric panel van intended for last mile delivery, of which FedEx acquired 1,000 of in 2018. The GreenPower EV Star Cargo, Lightning Systems' Ford Transit 350HD, Ford E-450, and Chevy 6500XD are other medium-duty trucks that are for sale as of November 2019. However, BYD's 8TT remains the only Class 8 electric truck that is widely available, while others, such as the Toyota T680, Xos ET One, and Peterbilt Model 579, are in demonstration stages as of 2019. Other companies, including Nikola, are planning for production in 2022. For a complete list of truck availability, please refer to Appendix II.

One of the most popular examples of a fully electric heavy-duty class 8 truck is Tesla's Semi truck. The design was unveiled in 2017 and it was advertised to be the quickest, safest and most comfortable truck on the market. It recorded the fastest 0-60 mph acceleration in 20 seconds and there is instant traction control with four independent motors. It also has 'Enhanced Autopilot' to help avoid collisions. The Semi truck is able to travel 300 or 500 miles per charge, depending on the battery size, and consumes less than 2 kWh per mile. Although, it is unclear if the truck is refrigerated. Depending on the battery range, the base price of the Semi is either USD \$150,000 for the 300 mile battery or USD \$180,000 for the 500 mile battery. Like most other electric trucks, the Semi is not yet commercially available.⁶³ Production at the gigafactory is expected to only start in 2021 and entities still need to put down a \$5,000 deposit and enter a waiting list. Anheuser-Busch, PepsiCo and Walmart have all placed orders for replacing their fleets and have been waiting for 3 years.⁶⁴ Charging stations for the Semi are also not fully developed or commercialized and it is unclear if trucks can use the current supercharging network.



⁶³ <https://www.tesla.com/semi>

⁶⁴ <https://www.cnbc.com/2020/04/29/tesla-delays-semi-production-and-deliveries-until-2021.html>



In partnership with Amazon, Rivian has launched its first all-electric medium-duty truck for Prime deliveries.⁶⁵ Amazon and Rivian announced the new delivery van as part of Amazon's climate pledge to become a carbon-neutral company by 2040.⁶⁶ The automaker typically sells its own electric R1T pickup or R1S SUV, but with the financial backing from the e-commerce giant, Cox Automotive and Ford, Rivian was able to produce a van prototype that had exclusive Alexa integration, delivery optimization software, and safety features, including a bulkhead door and multiple 360-degree view cameras. However, it is unclear if the truck is refrigerated. In NYC, there is already a small fleet of Rivian trucks, some even operating in Hunts Point. This last mile delivery vehicle has an expected range of 150 miles, and Rivian hopes to increase its fleet to 100,000 by 2030.

Since 1993, the U.S Department of Energy's (DOE) Vehicle Technologies Office has awarded nearly \$460 million to fund hundreds of projects across the country to undertake research and development on alternative fuels and energy efficient vehicle technologies. These projects include activities such as understanding transportation electrification in public and private fleets, integrating fueling infrastructure in urban and rural communities, developing fueling and charging stations along busy transportation corridors, and providing resilience planning through diversified vehicle and fueling options, and more. Moreover, the DOE's Office of Energy Efficiency and Renewable Energy (EERE) exchange and the government's grants funding opportunity announcements website includes opportunities to receive funding for R&D programs in vehicle technologies and hydrogen and fuel cell technologies. Additional sources of funding for R&D for EV related activities are provided mostly in the form of grants through channels such as the Vehicle Innovation Act of 2019 (\$1.7 billion through FY2024), Congestion Mitigation and Air Quality Improvement Program (\$2.3 to \$2.5 billion per year), Voluntary Airport Low Emissions Program (\$13 million in 2020), Diesel Emissions Reduction Act (\$44 million in 2020), and several other similar initiatives.

⁶⁵ <https://www.caranddriver.com/news/a34315562/amazon-rivian-electric-van-prototype-revealed/>

⁶⁶ <https://www.theverge.com/2020/10/8/21507495/amazon-electric-delivery-van-rivian-date-specs>



Case Studies

California as a Truck Electrification Leader

The Port of Oakland, CA

The Port of Oakland was selected as a case study since it is a distribution center in a state that supports electrification. California is also not only just a supporter, but arguably a policy leader in the United States. Markets follow the lead of other markets, and California provides a proof of concept for other states including New York to learn from. The Port of Oakland is a distribution center with maritime, rail, and truck deliveries like in the FDC and also includes the Oakland International Airport.⁶⁷ The Port cares deeply about its air quality because, like the FDC, it creates a local emissions hotspot. As of August 24th, 2020, the Port is swapping out its diesel yard cranes for hybrid electric cranes. While not fully electric or trucks, the Port received a grant from the Bay Area's Air Quality Management District (BAAQMD), an entity solely dedicated to reducing air pollution. No such governmental entity exists in NYS.⁶⁸

The Concept of Governmental Air Quality Agencies

In fact, the BAAQMD is the first regional air pollution agency in the country. It can provide funding and serves as a regulatory body for air pollution related policy enforcement.⁶⁹ The BAAQMD receives its funding from transportation surcharges. Every motor vehicle registration in the Bay Area is charged \$6 extra, generating nearly \$33 million dollars annually for the BAAQMD.⁷⁰ These surcharges were authorized by the California Clean Air Act and it's not just



Localized funding could benefit NYC significantly. The priorities for the State are different from those in NYC, especially when considering that NYC would worry about trucks in Hunts Point, but the state has many more passenger vehicles to worry about than trucks. Consequently, the majority of current NYS incentive programs target passenger EVs, not trucks.

⁶⁷ <https://www.oaklandseaport.com/>

⁶⁸ <https://www.portofoakland.com/press-releases/port-of-oakland-hybrid-electric-cranes-deliver-major-emissions-savings/?lang=ja>

⁶⁹ <https://www.baaqmd.gov/about-the-air-district>

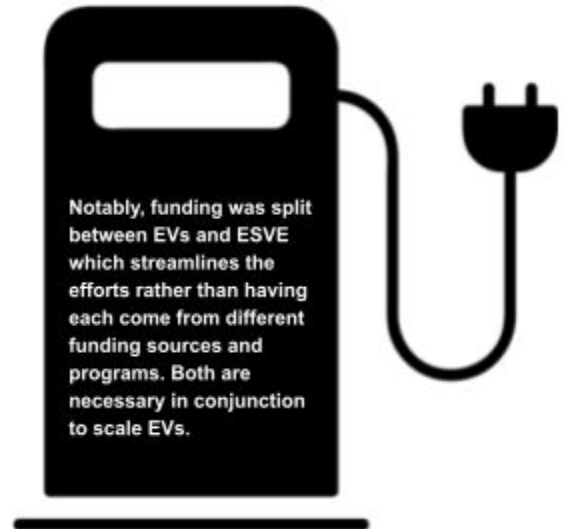
⁷⁰ <https://www.baaqmd.gov/funding-and-incentives/funding-sources>



the Bay area that has a district now. There are 35 regional AQMDs across the state.⁷¹ The state law ultimately sets standards for the AQMDs, but the AQMDs are responsible for ensuring compliance of the safe air quality standards set by the state.⁷² Furthermore, by providing each region with the authority to collect their own funds and use them as they would like, the state is able to provide autonomy for regions to focus on their local issues. In our conversation with the Mayor’s Office of Sustainability, we discussed AQMDs as intriguing avenues of potential future policy, but there are currently no plans in place to move this forward in NYC.

Other Forms of Transportation Funding in California

In 2018 the Port of Oakland, Long Beach, and Stockton were awarded a cumulative \$50 million dollar “Sustainable Terminals Accelerating Regional Transformation” (START) grant from the California Air Resources Board (CARB). The CARB is responsible for vehicle emission standards across the state.⁷³ The Port of Oakland was given \$9 million, two million of which had to be dedicated to charging stations. The other \$7 million allowed the Port to purchase 5 yard trucks and 10 container trucks, the latter of which are heavy-duty trucks. Certainly a portion of the \$7 million also went to overhead administration of the grant too.⁷⁴



The CARB received money to issue this START grant from the California Climate Initiative’s Cap-and-Trade-program.⁷⁵ The Cap-and-Trade law applies to power plants and fuel distributors requiring them to meet certain carbon emissions standards. Since 2013, the program has generated approximately \$5 billion dollars. Understandably, this initiative has many other priority areas besides zero emissions vehicles; however, with regional air district administrators able to develop tailored programs, the initiative

⁷¹ <https://ww2.arb.ca.gov/california-air-districts>

⁷² <http://www.aqmd.gov/nav/about/authority#:~:text=The%20California%20Clean%20Air%20Act%20%28CCAA%29,%20The%20CCAA,feasible%20measures%20and%20an%20expeditious%20adoption%20schedule%20.>

⁷³ <http://www.aqmd.gov/nav/about/authority#:~:text=The%20California%20Clean%20Air%20Act%20%28CCAA%29,%20The%20CCAA,feasible%20measures%20and%20an%20expeditious%20adoption%20schedule%20.>

⁷⁴ <https://www.portofoakland.com/seaport/port-oakland-add-electric-trucks-thanks-state-grant/?lang=ja>

⁷⁵ <https://www.portofoakland.com/seaport/port-oakland-add-electric-trucks-thanks-state-grant/?lang=ja>



can ear-mark funds for freight electrification by passing grants down to CARB for example, who can award them to the AQMDs. In turn the AQMDs can create effective local programs.⁷⁶

California's Cap-and-Trade versus New York's Cap-and-Trade

New York State participates in the Regional Greenhouse Gas Initiative (RGGI), which is a Cap-and-Trade program across the Northeastern states that caps carbon emissions for the power sector. Through this initiative, NYSERDA and the NYS Department of Environmental Conservation (DEC) auction off clean credits to polluting plants so that they can pay to meet the carbon cap if they are not able to meet it on-site. The revenue from this system, similar to that of California, is used for carbon abatement projects; but once again, it appears electric trucks are not currently a state priority that is being backed by substantial funding.⁷⁷ There is a fundamental difference between California's and New York's Cap-and-Trade programs when it comes to transportation. California's cap applies not only to the power sector, but also to fuel distributors such as gasoline companies. This increases the money California collects and allows the state to funnel these transportation cap funds directly to electric transportation projects. For the states in RGGI, there is no cap on fuel distributors. In 2018 there was a tentative Transportation Climate Initiative on the table, composed of 12 states formed in 2010, from which nine states banded together to discuss the feasibility of what they called a 'Transportation Cap-and-Trade program.' Unfortunately, due to equity concerns, New York was not one of the nine states that sought to move this forward.⁷⁸ While Cap-and-Trade programs are beneficial for targeted funding, they require careful implementation to ensure equitable development and there has yet to be a strong example of such a program to follow.

The Port of Long Beach, CA

The Port of Long Beach also received a portion of the \$50 million dollar START grant. The Port is the second largest seaport center in the United States.⁷⁹ Their START money was used to fund five electric trucks and two heavy-duty charging stations, among other zero-emission measures targeting their maritime operations. The Port is an ambitious leader for shipping electrification in California, declaring goals for zero-emissions goods movement targeting electric terminal equipment by 2030 and all electric vehicles by 2035. The START projects are a

⁷⁶ <https://www.c2es.org/content/california-cap-and-trade/>

⁷⁷ <https://www.nyserdera.ny.gov/Researchers-and-Policymakers/Regional-Greenhouse-Gas-Initiative>

⁷⁸ <https://energynews.us/2019/09/06/northeast/cap-and-trade-for-transportation-must-consider-environmental-justice-advocates-say/>

⁷⁹ <https://www.polb.com/port-info>



few of the many ongoing projects striving to achieve this goal. There are critical operations tools for companies in the Port to calculate what their electricity demand would be when switching to electric in order to plan the necessary EVSE, as well as a workforce development program to help with the transition and ongoing maintenance of EVs. There is an online calculator tool for EV owners to understand the credits they would receive from the State's Low Carbon Fuel Standards Program that ties into California's Cap-and-Trade for transportation.^{80 81} There is a published roadmap for 100% electrification in the Port, funded with over \$200,000 from the California Energy Commission, California's NYSERDA counterpart. The roadmap has a blueprint for the necessary EVSE in the port, what available technologies there are for EVSE and EVs alike, and laid the groundwork for their workforce development programs and calculator tools for their constituents.⁸² Thus, the Port of Long Beach provides yet another example of combined programming for EVSE and EVs, while also demonstrating the importance of providing workforce tools to help with the uptake of the infrastructure and expedite the transition.

California Clean Truck Mandates and Laws

In June of 2020, the CARB put forth the Advanced Clean Truck rule, which aims to have every new truck sold in California be zero-emission by 2045.⁸³ The rule sets bold electrification goals with the intent to stimulate technological advancements in medium- and heavy-duty electric vehicles and investments in these vehicles by fleet owners who operate in the state. The proposed regulation is composed of two main components, one component which targets manufacturers by requiring them to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035, and a second component which requires large employers and fleet owners to file a one-time report that will be used to develop future strategies to ensure the

New York's Senate Bill S8765A mimics California's Advanced Clean Truck Rule with the aim to expand New York's Zero-Emissions Vehicle program to also include medium- and heavy-duty vehicles. Similar to California's Advanced Clean Truck Rule, the bill will require truck manufacturers to incrementally increase the percentage of clean vehicles they sell each year, with zero-emission trucks accounting for 5-9% of sales in 2024, increasing to 30-50% by 2030 and 40-75% by 2035, and specific sales targets varying by vehicle class. The bill currently sits in the Senate Committee for review.

⁸⁰ <https://www.polb.com/environment/our-zero-emissions-future/#program-details>

⁸¹ <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/about>

⁸² <https://www.polb.com/environment/our-zero-emissions-future/#program-details>

⁸³ <https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-fact-sheet>

NY Senate Bill: <https://www.nysenate.gov/newsroom/press-releases/jen-metzger/sena>
<https://www.governor.ny.gov/news/governor-cuomo-announces-new-york-and-14-st>



electrification of California's medium- and heavy-duty vehicle fleets. The requirement to transition medium- and heavy-duty trucks from diesel to electric will help to address the largest single source of air pollution from vehicles, responsible for 70% of the smog-causing pollution and 80% of carcinogenic diesel soot, and will put California in a more advantageous position to reach its climate goals and meet federal air quality standards.⁸⁴

Houston, Texas, another striving sustainable port

The City of Houston, Texas

The City of Houston, Texas was selected as another case study since it has already successfully electrified their vehicle fleet. When people think about Texas, sustainable transportation does not usually come to mind. Rather it is the oil and natural gas capital of the United States famous for large diesel trucks. However, it is actually the third largest municipal alternative fuel vehicle (AFV) and hybrid fleet in the country. In fact, it has already converted some of its fleet into plug-in hybrid electric vehicles (PHEVs), such as Toyota Prius hybrids, and battery electric vehicles (BEVs), like the Nissan Leaf. Hybrids now constitute more than 50% of the city's light-duty fleet, and PHEVs and BEVs account for 25% of its passenger fleet. Each of these vehicles are estimated to save the city \$7,000- \$8,000 in fuel and maintenance over a three-year period and the city estimates that its fleet of 27 Nissan LEAFs will accrue \$110,000 in annual savings compared to internal combustion engine vehicles.

Similarities with Hunts Point

Like Hunts Point, Houston faces severe air quality issues. The city is currently designated by the EPA as having high ground-level ozone levels in areas paired with an increased frequency of respiratory issues like asthma. Volatile organic compounds (VOCs) are key contributors to ground-level ozone, and a 2005 inventory of metro-area emissions found that vehicles are responsible for more than two-thirds of Houston's VOC emissions. Similar to Hunts Point, city officials knew air quality was a challenge that needed to be addressed and stakeholders were willing to help undergo the EV transition.

⁸⁴ <https://ww2.arb.ca.gov/news/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-drastically-reduce>



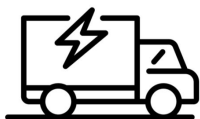
Electrification Strategies

Management of city-owned vehicles in Houston were previously spread out in hundreds of locations around the city, and each city department managed its own small fleet of vehicles. This resulted in excess fleet purchasing, chaotic planning and excess operating expenses. In addition, those responsible for the procurement budget were not responsible for operations and maintenance, which was a disconnect that led to vehicles with low up-front costs being prioritized even though these vehicles ultimately were less advantageous from an operations and maintenance standpoint. To combat these common municipal issues, Houston made the bold move to centralize its vehicle fleets, allowing for more clarity and efficiency.

In 2012, Houston city officials decided to rectify the situation and reorganized the operations of all fleets to become a centrally managed vehicle pool. This improved operational efficiency, bettered procurement processes to make smarter purchasing decisions, shrunk operating expenses, increased vehicle utilization rates, and built a strong financial case for more vehicle electrification. Having a centrally managed vehicle pool allowed Houston to better understand vehicle route dynamics and the total cost of ownership. Most importantly, the city recognized that a widespread charging network was crucial to the transition to electric vehicles, so they partnered with private charging companies like ChargePoint and GridBot to deploy a robust network of charging stations and an advanced mobile application with a locating and reservation system. ChargePoint and GridBot, and other charging station manufacturers provided all their stations for free and other stations were funded using the American Recovery and Reinvestment Act (ARRA) and the city's budget. Currently, the city has installed more than 32 level one and 66 level two charging stations in the central fleet garage. The installation process proved to be straightforward, cost effective, and required no new transformers, only a small upgrade to the circuit breaker panel. This shows the success of a private-public partnership to promote fleet electrification.

Applicability of “FleetShare”

Houston's Fleet Management department also partnered with ZipCar to create “FleetShare”, a pilot car sharing program for government employees. This program mostly consisted of light-duty vehicles and Hunts Point probably cannot fully mimic this tactic due to its complex web of independent truck ownership and leasing. However, Hunts Point can take inspiration from Houston:



- ❑ Form more private-public partnerships;
- ❑ Centrally manage charging stations rather than motor pools;
- ❑ Allocate federal funding for charging network expansion.⁸⁵

Policies, Incentives, and Opportunities

Federal Level

As a state, New York relies on the federal government for new laws, incentive programs, and grant opportunities when available. For example, federal tax credits exist for EVs that New Yorkers can take advantage of; but these credits only apply to passenger vehicles, not trucks.⁸⁶ That being said, the Department of Energy (DOE), Environmental Protection Agency (EPA), and the United States Department of Transportation (DOT) can all be players in electric truck programs. As an example, Hunts Point was previously awarded a \$10 million dollar grant from the DOT. While this was for rail improvements, the federal government's allocation of \$10M demonstrates that federal agencies see the value in investing into the Hunts Point FDC.⁸⁷ The DOE also has an EV credit for over 200,000 EV passenger vehicles and a purchase and leasing program to public agencies for electric buses; however, the DOE has no funding currently for private trucks fleets as it stands today.⁸⁸ ⁸⁹ Electrifying trucks in Hunts Point will require a state program that considers the relative share of vehicle pollution given that indeed there are more passenger vehicles statewide, but trucks have higher emissions.

State Level

New York State electrification efforts have already been mentioned in the context of past and current work in Hunts Point and statewide NYSEERDA and utility programs including EVolveNY and Make-Ready (which both strive to scale EVSE across the state for light-duty vehicles). There are additional EVSE programs offered in NYS that help EV users save money. One program is Con Edison's Time of Use (TOU) Rate for EVs. This innovative program reduces the

⁸⁵ http://www.greenhoustonx.gov/ev/Houston_Case_Study_2013.pdf

⁸⁶ <https://www.fueleconomy.gov/feg/taxevb.shtml>

⁸⁷ <https://railroads.dot.gov/elibrary/us-department-transportation-announces-10-million-tiger-grant-hunts-point-terminal-produce>

⁸⁸ <https://www.fueleconomy.gov/feg/taxevb.shtml>

⁸⁹ <https://www.transit.dot.gov/funding/applying/notices-funding/low-or-no-emission-program-low-no-program-fy2020-notice-funding>



cost of electricity for charging when participants charge their EV during “off-peak” hours.⁹⁰ This program is currently not available for the commercial customers in Hunts Point. It highlights some of the barriers to electrification while at the same time providing a proof of concept for residential EV owners to effectively save money, which would encourage the use of more EVs on a broader scale. Thus, there is a potential opportunity for Hunts Point to have a tailored program based on this model.

The TOU Rate Price Guarantee allows customers to save money. Normally customers are charged a flat electricity supply rate no matter whether they are using electricity during peak or off-peak hours. In a case where a customer is using more electricity during off-peak hours, they warrant lower rates as the peak supply costs more and results in a higher charge for customers. This program targets customers with EVs as they can save a lot of money by planning to charge their EVs during off-peak hours. Con Edison also benefits from this demand management, as it “smooths” the amount of energy demanded during those peak hours. Without such demand management measures, Con Edison may need to meet growing demand by building other substations and distribution facilities to provide adequate power. Building another power station would be a large financial investment, which is why Con Edison offers this program among other energy efficiency programs to keep their existing infrastructure meeting demand. This program pairs nicely with another program Con Edison offers called SmartCharge New York. Customers that opt in to this program receive an interactive digital platform and device that records one’s charging data, including whether you are charging during off-peak hours so one can track their usage. Con Edison has strategies to try to increase customer uptake by offering cash upfront for installing a charger and one receives Refer-a-Friend cash rewards.⁹¹ While Con Edison’s EV TOU rate and SmartCharge programs are only offered for residential electricity customers, this model could hypothetically be expanded to those with commercial meters, such as the vendors at the FDC. A similar program expanded for commercial customers would be beneficial for trucks that idle during off-peak hours, since they could save costs during off-peak charging.

⁹⁰ <https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles/electric-vehicles-and-your-bill>

⁹¹

<https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-residential-customers/electric-vehicle-rewards>



Demand Charges and Charging

Another consideration for this commercial market and possible FDC vendors is the electricity demand charge for commercial meter users. A demand charge is an extra utility charge on top of one's supply charge, and is dependent on the maximum usage of power that a customer used in any interval (typically 15 minutes) during the billing cycle. When an EV is charged during a time when a commercial entity is already using a lot of electricity, this demand peak could rise higher, leading to a higher demand charge. These charges can significantly impact electric utility bills, especially considering Hunts Point's need for DCFC, required by medium- and heavy-duty vehicles, which typically supplies 50kW of power or more and can quickly replenish a vehicle's battery in approximately 20 minutes⁹².

To overcome the financial barriers associated with demand charges, which can discourage the deployment of DCFC infrastructure, some utilities have reduced or eliminated demand charges for these types of stations.⁹³ Studies have shown that eliminating the demand charge can decrease the operational costs of a DCFC station by up to 85%.⁹⁴ Due to the level of local and state interest in addressing air quality and emissions concerns related to medium- and heavy-duty trucks in historically disadvantaged areas, Hunts Point could make a good case for customized energy rate structures which exclude demand charges. Additionally, Con Edison currently provides special, reduced energy rates through their Electric Vehicle Charging Business Incentive Rate program for businesses who install publicly accessible charging stations with a minimum of 100kW of charging capacity.⁹⁵ The electric rate delivery reduction from this program ranges between 34% and 39%.

Hunts Point may be able to take advantage of this type of incentive, and it is recommended that a consultation take place with Con Edison in order to determine and advocate for an optimal electricity rate schedule for a Level 3 or DCFC station at Hunts Point.

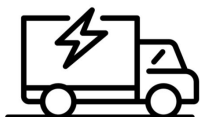


⁹² <https://www.osti.gov/servlets/purl/1507680>

⁹³ <https://chargedevs.com/features/utility-demand-charges-and-electric-vehicle-supply-equipment/>

⁹⁴ <https://www.betterenergy.org/blog/demand-charges-and-dcf/>

⁹⁵ <https://www.coned.com/en/commercial-industrial/economic-development/business-incentive-rate>



Hunts Point's Utilities

While Con Edison installs the power infrastructure, Hunts Point customers actually fall under NYPA's domain for their demand and supply charges. Consequently, programming for such a customized energy rate schedule in Hunts Point would require Con Edison and NYPA to collaborate. NYPA, without owning the infrastructure in Hunts Point, would not economically benefit from reducing strain on the grid that Con Edison controls. This highlights the difficulty for targeting Hunts Point as it is split across two utilities for its power needs.

NYSERDA and Utility Joint Programs

The Public Service Commission (PSC) regulates the utilities that operate in the state, whether they are public like NYPA or private like Con Edison. Rate structures are proposed by the utilities and must be approved by the PSC in rate cases, which happen every few years. Rate cases balance the interests of ratepayers on the one hand and a utility's revenues on the other. The PSC can also require utilities take certain actions to ensure compliance with state mandates and other climate policies. If the PSC requires certain expenditures of utilities, such as expanding EVSE, it can also provide financial assistance from the state. This is exactly what Make-Ready and EVolve NY have been born out of with the utilities receiving substantial NYSERDA funding to administer these programs. As administrators and recipients of these state funds, the utilities are held accountable by the rate case agreements to achieve certain goals, such as installing 200 chargers by 2021 through EVolve NY.



Another policy opportunity to install EVSE within Hunts Point in preparation for vehicle fleet electrification is the Alternative Fuels and Electric Vehicle Recharging Property Credit from the New York State Department of Taxation and Finance.⁹⁶ This program offers participants a nonrefundable credit for investments in new alternative fuels vehicle refueling property or electric vehicle recharging property. The credit for each installation of property is equal to the lesser of \$5,000 or 50% of the installation costs. Con Edison's EV Fast Charging Per-Plug

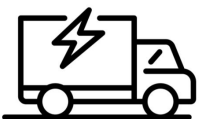
⁹⁶ https://www.tax.ny.gov/pit/credits/alt_fuels_elec_vehicles.htm



Incentive is also another EVSE-based incentive which helps to offset the upfront costs associated with EVSE installation.⁹⁷ Each DCFC connector (i.e., plug) that meets the requirements of Con Edison's EV Fast Charging Per-Plug Incentive program is eligible for an annual incentive payment. The full incentive is available for plugs rated with power capacity of 75kW and higher, whereas a 60% incentive is available for plugs rated 50kW to 74kW. The EV Charging Per-Plug Incentive is approved for up to \$6.4 million or up to 400 individual EVSE plugs through 2025, and provides participants with annual payments from the date equipment is placed in service through the end of the program in 2025. Hunts Point may be eligible for Con Edison's EV Charging Per-Plug Incentive if they install DCFC EVSE that is publicly accessible without restriction or fees for parking.

In order to support the transition from diesel to electric vehicle fleets at Hunts Point, the installation of adequate EVSE is critical and must be considered a priority and first step in the electrification process. Strategically placed DCFC EVSE at Hunts Point can ensure that the high energy demands of electric medium- and heavy-duty truck fleets will not be a limiting factor in their future implementation. Installation of DCFC EVSE will also help to mitigate range anxiety of electric medium- and heavy-duty truck drivers who operate out of Hunts Point. To demystify the process of EVSE construction and the electric service upgrades that may be required in tandem, an EVSE Installation Primer (Appendix III) was developed. The EVSE Installation Primer breaks the process into four major steps: the initial contractor consultation, submission of an expanded electric service request through Con Edison's Project Center Portal, coordination with Con Edison regarding the electric service layout, and procurement of the necessary city certificates and building permits for the project. A fifth step, which describes the application process for Con Edison's EV Charging Per-Plug Incentive, is included for those who qualify. If the existing electric service is not adequate to support the project, Con Edison will issue the necessary work orders to install electric service updates. However, upgrades to Con Edison's primary or secondary electrical systems may result in additional costs. If upgrades to the systems are not required, Con Edison will provide service to one point of entry (POE) for free. A preferred POE that follows a route different than the most direct route as proposed by Con Edison will also result in additional costs.

⁹⁷ <https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles/electric-vehicle-fast-charging-per-plug-incentive>



New York's MOU for Electrification

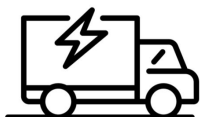
New York's Governor Andrew Cuomo, along with the governors from 14 states and the Mayor of the District of Columbia, signed a joint Memorandum of Understanding (MOU) in July 2020 with the aim of electrifying the transportation sector, specifically focused on medium- and heavy-duty vehicles. This promoted state involvement in the Zero Emissions Vehicles (ZEV) Task Force and subsequent Multi-State ZEV Action Plan to implement strategic initiatives, financial incentives and technological developments to bolster the market for zero emission medium- and heavy-duty vehicles.

Previous efforts of the ZEV Task Force had focused on accelerating consumer adoption of light-duty passenger vehicles; however, the 2020 MOU expanded the scope of electrification by recognizing that attention must also be directed towards the adoption of ZEV options for medium- and heavy-duty vehicles, which are not as publicly visible or commercially available. Although the Multi-State ZEV Action Plan for 2018-2021 (ZEV Action Plan), developed prior to the 2020 MOU, is geared more towards light-duty vehicles, similar strategies to those that are laid out in the plan are needed in order to accelerate the electrification of medium- and heavy-duty vehicle fleets. The recommendations and priorities laid out in the ZEV Action Plan are both relevant and important for supporting growth in the early market for electric medium- and heavy-duty vehicles. After seeing where this action plan drives state money, gaps should be filled by other programs either with utilities or public-private partnerships.

Ideally, the ZEV action plan will consider incentives that pair EVs with their required chargers. Hunts Point requires one additional step of having a sub plan to consider where to place chargers in the community. The Action Plan's offerings previously have provided up to \$500,000 to municipalities for public charging facilities, which would include NYC to take part in the State's other programs as previously stated like ChargeNY, Level 2 chargers only (and NYC did pursue this and approximately 600 Level 2 charging stations).⁹⁸ However, if the 2020 MOU leads to a similar development where NYC could receive up to \$500,000 for DCFC installations, this would completely change the landscape in Hunts Point to draw in electric truck manufacturers and users alike.⁹⁹

⁹⁸ [OneNYC-2050-A-Livable-Climate-11.7.pdf \(netdna-cdn.com\)](#)

⁹⁹ [Alternative Fuels Data Center: New York Laws and Incentives \(energy.gov\)](#)



City Level

The Mayor's Offices, such as the Office of Sustainability, have the authority to offer technical assistance programs, while city agencies such as the Department of Transportation (DOT) can offer programs with direct funding. Both assistance programs and funding are necessary for Hunts Point's transition. As of 2019, NYC is considering how to allocate dedicated curb space to ZEVs.¹⁰⁰ Perhaps this curb space could also include public DCFC chargers if the law were to truly consider its use to electrify trucks specifically.

NYC does have instituted and relevant laws beyond what's in consideration. Local Law 130 of 2013 amended 2009 building codes to require that any new garages/parking lots or alterations to old lots must install EV chargers for at least 20% of spaces.¹⁰¹ Requirements such as this ensure that new developments take into account a true future transportation sector that has EVs. To promote electric trucks, a similar policy that requires DCFC in areas best suited on delivery routes could make FDC's tenants' use of electric trucks possible as such a local law could help scatter more DCFC chargers around the five boroughs.

The NYC Economic Development Corporation offers a range of funding, financing, and tax benefits. NYCEDC administers city capital funds to initiate, enhance, and complete projects for the organizations that are awarded a city capital funding allocation. These capital improvements can involve energy and infrastructure - and as the landlord of the Food Distribution Center, the EDC is perfectly suited to assist in implementation of electrification projects in the Point.¹⁰²¹⁰³ Lastly, implementation of a designated Air Quality Agency like that of California's could supply consistent project funding, although NYC has no current plans to pursue this.

Greater Tristate Region

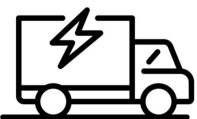
As discussed earlier, FDC routes pass from New Jersey into New York, so this is where New York State can play a big role in collaborating with New Jersey to create accessible charging stations on the routes to the FDC that have the highest traffic and resulting highest emissions. So a truly effective program to disseminate charging stations in Hunts Point would likely require New Jersey governmental agencies, NYSERDA, and NYC Mayoral Offices or the DOT to combine efforts. This is what makes Hunts Point so complex, but also with the backing of all of

¹⁰⁰ [OneNYC-2050-A-Livable-Climate-11.7.pdf \(netdna-cdn.com\)](https://www1.nyc.gov/assets/buildings/local_laws/ll130of2013.pdf)

¹⁰¹ https://www1.nyc.gov/assets/buildings/local_laws/ll130of2013.pdf

¹⁰² <https://edc.nyc/finance-solutions>

¹⁰³ <https://edc.nyc/funding-agreements>



these governmental institutions, a comprehensive and subsequently sustainable and effective program could possibly be instituted. With the sheer volume of policies, we thought it prudent to aggregate them into a single, easy to use policy factsheet. For each policy, this factsheet will provide a quick overview, the amount of the incentive, the organization offering the policy, and other relevant information.

This policy matrix¹⁰⁴ lays out the landscape of policies and incentives that address the electrification process of fleets in Hunts Point. It includes policies and incentives that: a) exist and already target fleet electrification, b) exist but currently only target personal/light-duty electric vehicles and c) they don't exist but offer an opportunity to further develop the fleet electrification agenda. They are also organized by the issue they are addressing: a) charging infrastructure, b) electric trucks and c) Hunts Point community.

Ecosystem Readiness

In general, there are seven main requirements for the transition to EVs; 1) EV Infrastructure, 2) Regulations and Policies, 3) Incentives, 4) Costs, 5) Availability of EVs in the Market, 6) EV Governance by Public Sector and 7) Community Supports for the Transition. By ranking these factors based on their readiness, we were able to determine Hunts Point's overall readiness for a transition to EVs. For instance, in terms of cost readiness, this represents the prices of electric trucks in the current market and whether they are economically competitive to their corresponding fossil fuel vehicles. Additionally, Hunts Point's governance readiness describes political stability and its support for electric vehicles. The purpose of EV Ecosystem Readiness is to enable policy-makers and businesses to identify strengths and weaknesses in order to successfully transition towards electric vehicles in Hunts Point.

As shown in Figure 15, Hunts Point's electrification readiness strengths are concentrated around community and political support, whereas its weaknesses are more technical, such as EV infrastructure and product availability or cost. However, although there are many existing policies and incentives that promote the implementation of electric vehicles and charging infrastructure at Hunts Point, the majority of these only address electric passenger and

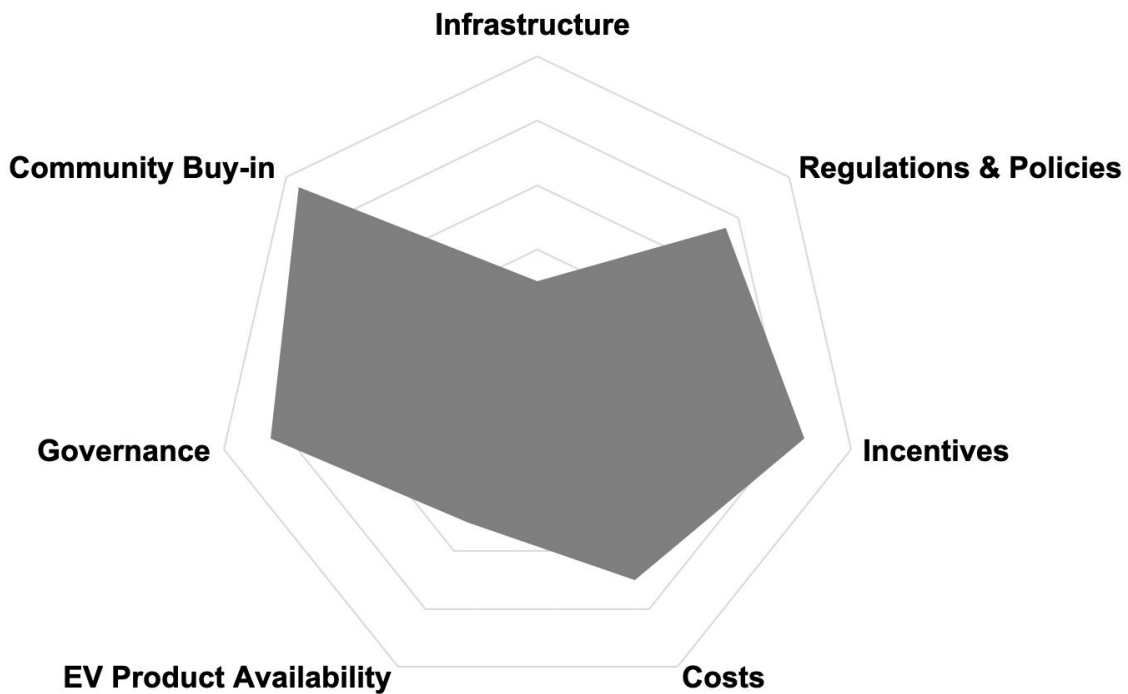
¹⁰⁴ Please refer to the attached matrix.



light-duty vehicles. Crucially, although these electric trucks will only be used for urban deliveries, the current charging infrastructures have failed to address the need of adequate charging stations for electric heavy-duty vehicles at Hunts Point and across the city.

Furthermore, when comparing Hunts Point's readiness to both the Oakland and Houston case studies, Hunts Point is lacking in terms of EV readiness in numerous ways, especially with regards to EV infrastructure. Having implemented the first regional air pollution agency in the country, this allowed the Port of Oakland to effectively focus and prioritize its needs in supporting and developing a strong foundation for EVs, such as constructing charging stations specifically for electric heavy-duty vehicles or allocating the START grant just to EVs alone.

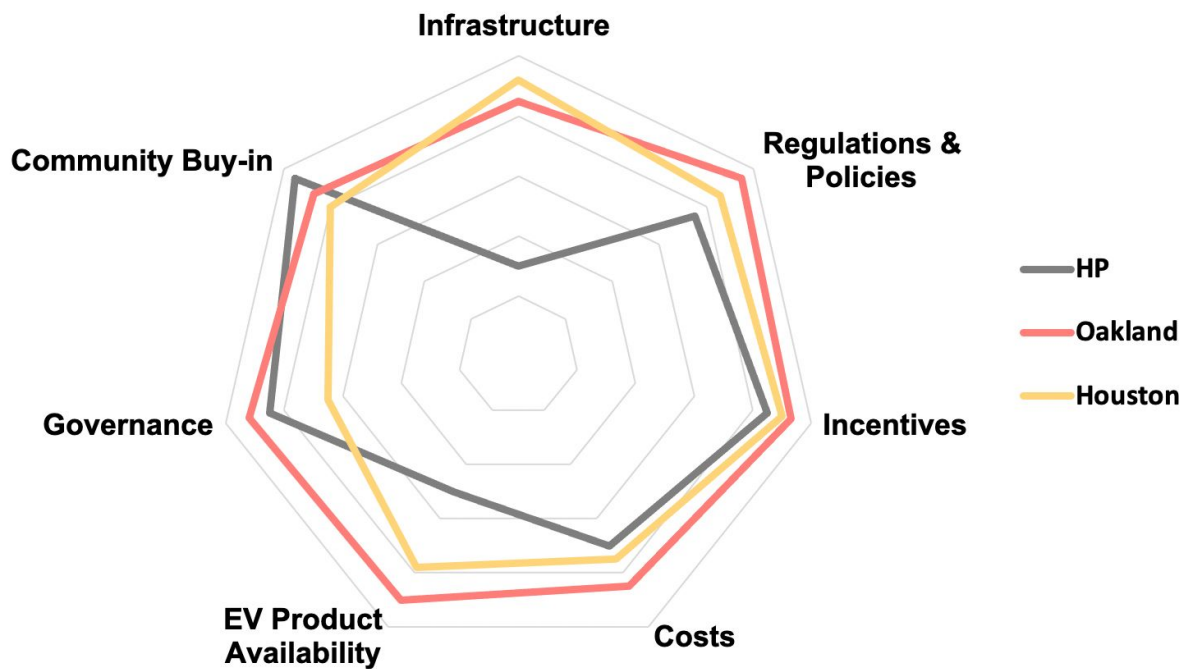
Figure 15. Ecosystem readiness spider diagram



Created by the authors



Figure 16. Ecosystem readiness spider diagram to compare Hunts Point, Oakland and Houston



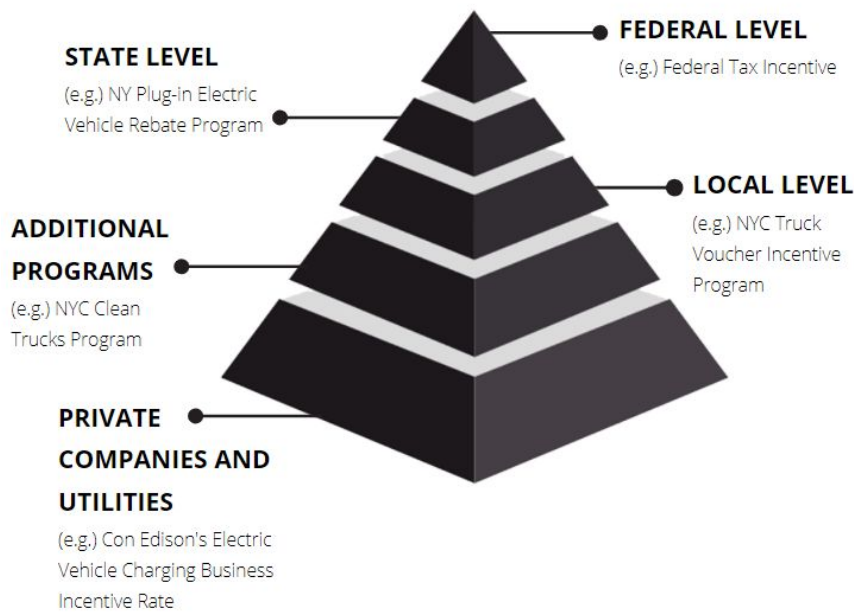
Created by the authors

Electrification Roadmap

When approaching the electrification of Hunts Point, we recommend taking an approach that maximizes the time and effort of ENY and has the greatest impact in driving progress. To that end, we created a policy pyramid to illustrate the specifics of this strategy. We advocate working from the bottom of the pyramid upwards, starting with expanding charging infrastructure via utilities and private companies as it would provide a solid foundation for electrification in NYC, and arguably the greatest impact in drawing electric trucks to Hunts Point. As you move up the pyramid, ENY's potential advocacy influence narrows and the likelihood of localized policy interventions shrinks, so we suggest focusing initial efforts and resources on the base of the pyramid.



Figure 17. Policy pyramid



Created by the authors

In the short term, the EV toolkit and policy matrix can be utilized to demystify the complex set of policies, incentives, and processes that are involved in electrification. These will assist stakeholders in making decisions, and drive electrification when the limiting factor is ignorance of existing policy options. In the medium-term, ENY should advocate for the expansion of existing policies and incentives to include medium- and heavy-duty vehicles, and advocate for policies that generate their own revenue streams. In the long term, ENY can assist in the process of fleet replacement with electric trucks, promote the expansion of charging infrastructure, and support partnerships that provide equitable access for workforce training.

Governor Cuomo announced in 2019 that the State's goal is to increase the number of EVs in New York to 850,000 by 2025 and two million by 2030.¹⁰⁵ The type of EV is not specified though. There is no goal for trucks and without a clear goal, NYS lacks the same dedicated funding that the FDC and Hunts Point community desperately needs. It is projected that truck volume in Hunts Point will increase by 7% through 2025 and 17% by 2055.¹⁰⁶ The average useful lifetime of a medium-duty truck is between 10.5 and 16.5 years - heavy-duty leans

¹⁰⁵

<https://www.nysed.gov/About/Newsroom/2019-Announcements/2019-04-23-Governor-Cuomo-Announces-Record-Number-of-Electric-Vehicles#:~:text=The%20electric%20vehicles%20analysis%2C%20funded%20by%20the%20New.850%2C000%20by%202025%20and%20two%20million%20by%202030.>

¹⁰⁶ https://www.dot.ny.gov/southbronx/repository/X731.55_FEIS_Chapters_1-6.pdf



towards 16.5 years as well - and switching to electric before the useful life of a truck has ended is unfavorable economically.¹⁰⁷ However, making electric truck options available for the new trucks that will join the distribution through 2055 would start a new asset lifecycle with zero tailpipe emissions. The growth in trucks will continue for the next decades and so can a path to electrification. In doing so, the FDC and residents of Hunts Point could co-exist in an electric future without the threats of air pollution from diesel transportation. The state must invest to provide the city and utility stakeholders with program funding and to ready the market for public-private partnerships.



A prime example of a private-public partnership is the collaboration between ChargePoint and NYSERDA. ChargePoint is the largest network of independently owned EV charging stations operating in more than 14 countries with more than 11,000 charging spots already installed. It provides everything an EV station owner needs to deliver turnkey EV charging services. For drivers, ChargePoint is a free online tool and mobile application that allows them to easily locate, reserve, and navigate to unoccupied charging stations based on their destination and geolocation. The ChargePoint network is

currently open to all universal charging station manufacturers.¹⁰⁸ ChargePoint is also the leading provider of EV charging in NYC with nearly 200 EV charging stations already installed, mostly level 2, and through other successful Request for Proposals (RFP), the company was able to install stations in other car-cultured cities like Grand Rapids, Michigan and Pacific Grove, California.^{109 110}

In 2013, ChargePoint agreed to install more than 80 EV charging stations around New York with the help of a \$1 million incentive from NYSERDA. An EV charging station is installed at The

¹⁰⁷ <https://www.treasury.gov/resource-center/tax-policy/Documents/Report-Depreciation-Trucks-1991.pdf>

¹⁰⁸ <https://www.chargepoint.com/about/news/chargepoint-launches-first-more-80-electric-vehicle-charging-stations-funding-nyserda/>

¹⁰⁹ <https://www.parking.org/wp-content/uploads/2017/10/EV-Charging-Station-RFP.pdf>

¹¹⁰ <https://www.cityofpacificgrove.org/sites/default/files/projects/electric-vehicle-charging-stations/ev-rfp-design-and-installation-electric-vehicle-charging-stations-project.pdf>



Solaire in Battery Park City, the nation's first LEED Gold-certified residential building, and the company aims to install more stations at LEED-certified properties and other residential, commercial and public workplace locations. In 2017, Governor Cuomo announced \$4.4 million being awarded to 10 EV companies, municipalities and other entities, including ChargePoint, to encourage more private-public partnerships and bring additional 325 charging stations to New York. Additionally, Mayor Michael Bloomberg had a plan to make 20% or 10,000 spaces of new NYC parking spaces EV-ready, encouraging more private charging companies to partner with state agencies and commercial landlords/parking garage owners.

The Hunts Point community is ready to support the EV transition, but tools are lacking. Tools can include information about current incentives in the market and ways to calculate how one's electricity costs, and on the flip side fuel savings, would be impacted by charging electric trucks (as instituted in the Port of Long Beach). Both of these would be most effective if they are user-friendly whether that be in an online or paper medium dependent on the stakeholder.

Recommendations

With the toolkit we have provided, including the policy fact sheet and charging installation primer, we recommend disseminating this information to all relevant stakeholders. We want to support ENY's mission, and increasing the general knowledge and awareness of existing policies will potentially enhance the efforts towards electrification in New York State and Hunts Point.

Next, advocating for medium- and heavy-duty truck specific policies is vital, as discussed in the various policy opportunities available for adapting existing programs and local laws. The vast majority of electrification policies are tailored towards personal vehicles, and this represents a huge missed opportunity to affect a large portion of the pollution and emissions coming from the transportation industry. This can take the form of adapting existing policies to include medium- and heavy-duty, or advocacy for brand new policies that explicitly cover the appropriate classes. In addition, current policies could be adjusted to be slightly more economically friendly. For example, the Voucher Incentive Program includes a scrappage requirement, meaning that to qualify for NYSERDA's funds for covering the incremental cost of a new electric truck, an



existing and fully functional diesel truck must be scrapped and removed. This policy is designed to ensure that a diesel truck is fully and completely replaced by a lower emissions electric truck; however, this means that the diesel truck has not reached the end of its life, and the owner of the diesel truck ends up losing money when considering the full lifetime costs. This policy would be more popular and result in many more electric trucks on the road if it allowed fleet owners to replace a vehicle at the end of its life.

Along with advocating for the inclusion of medium- and heavy-duty vehicles, ENY should also consider pushing for policies that could provide a sustainable source of funding, such as a possible surcharge fee on diesel vehicle registrations, as inspired by the State of California. These policies would be self-reliant, and would create a constant source of funds to our targeted area rather than relying on potential budget negotiations. This recommendation is especially pertinent given the current budgetary crisis created by the Covid-19 pandemic, as exploratory budget allocations may take a backseat to funding critical city and state operations for the foreseeable future. In addition to policies that would provide pure funding, special attention should be paid to policies that target costs, like utilities presenting incentive rates for charging vehicles.

In tandem, local talent must be trained in the manufacturing, operations, and maintenance of electric trucks, especially those who currently perform maintenance on diesel vehicles in Hunts Point. It is essential to treat this as the equity concern that it is; with the neighborhood already facing potential gentrification, adding higher skill and higher paying jobs without allowing the current residents the chance to upgrade their skills would exacerbate the issue. Luckily, workforce development programs are well established in Hunts Point and the process of training workers on hybrid and electric engines and motors has already begun. The Consortium for Worker's Education trains 50,000 workers per year and partners with local community colleges, the CUNY system, and trade high schools to train the next generation of mechanics and machine workers, of which there is currently a lack. A successful path to electrification is only a success if it considers equity. For example, any sort of surcharge or fee that would broadly apply to all Hunts Point's tenants needs to be holistically considered, as the smaller local tenants would be burdened by this whereas the larger wholesalers would be able to afford it. Having some sort of sliding fee would be ideal to mitigate this concern. Public funding also oftentimes comes with a heavy administrative burden with cumbersome application paperwork and strict reporting requirements. This could deter smaller vendors from taking advantage of



programs and therefore, programs should consider how they can add administrative support to their awards.¹¹¹ Lastly in the vein of ensuring equity, many current incentives apply to firms to install their own charging stations and electrify their own fleets leaving independent trucking contractors at the whim of finding charging stations and facing the upfront costs of their charging and vehicle acquisition and maintenance alone. Organizing these independent contractors in New York State and City to be stakeholders in policy and program formation would help better understand how to meet their needs on top of the needs of vendors and their fleet.

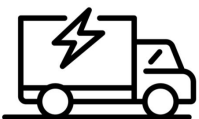
Lastly, ENY can do what ENY does best: reach out to its vast network of transportation alliances as well as relevant public agencies, private companies and prominent politicians. Younger and progressive politicians are looking to advance a more sustainable public agenda, and Hunts Point represents an opportunity to tackle environmental justice issues as well as the sustainability goals of the city and state. There has been plenty of political discussion around decarbonizing the transportation sector, particularly with personal vehicles and buses, but truck fleets have been mostly out of focus and they deserve and need to be part of the conversation.

Advocating for policies cannot be done without acknowledging the many barriers in the marketplace. High upfront costs of electric trucks, lack of commercial availability, unknowns in the prices of electricity and fuel for promoting switching, and an unknown in the scrap/value of an electric truck at end of life — these are market and technology barriers. Governmental barriers also exist (such as the passenger vehicle vs. truck focus). Indeed, sometimes other initiatives simply have to take priority. The EDC, for example, as the FDC's landlord, is vested in improving the FDC's physical infrastructure and manpower infrastructure of Hunts Point's residents. However, the EDC is already managing \$91 million dollars of grant funding for Hunts Point projects that remain from federal disaster recovery dollars from Hurricane Sandy. Grants require regular reporting and the money often expires past a certain point so EDC will want to close out existing projects such as climate resiliency efforts, before embarking on new ones.¹¹²

Mitigating air pollution is one of many needs in Hunts Point. This is why ENY's backing of electrifying Hunts Point is even more paramount. Every actor in the space can work towards the fair transitioning of Hunts Point to a vibrant and electric future. The electrification of fleets surrounding the FDC must remain a priority for the community and for the decision makers in NYC. It does not stand to be forgotten that the impact of electrification is known to notably

¹¹¹ <https://www.polb.com/environment/our-zero-emissions-future/#program-details>

¹¹² <https://edc.nyc/project/hunts-point-resiliency>



reduce air pollution and increase quality of life in the community, and if there are user-friendly tools presenting all of the incentives offered across public and private firms, along with workforce training programs and technological solutions - electrifying Hunts Point's fleets is possible. Hunts Point is ready.



Appendix

I. List of Other Charging Companies that also Operate in NY

- [Electrify-America](#)
- [Plug in stations online](#)

II. Other Interesting Documents and Programs

- [EV Watts](#)
- [Energetics Guide](#) for developers and planners guide to electric vehicles and charging stations

III. Another Interesting Case Study for Vehicle Electrification

- [EV Tompkins](#)

IV: Availability of Electric Trucks in the United States as of November 2019

Manufacturer	Model	Range	Battery or H ₂ Capacity	Availability
Delivery Vans, Shuttles, and Straight Trucks				
BYD	6F	124 miles	221 kWh	Today
Chanje	V8100	150 miles	100 kWh	Today
Freightliner (Daimler)	eM2	230 miles	325 kWh	Production in 2021
GreenPower	EV Star Cargo	150 miles	118 kWh	Today
International (Navistar)	eMV	250 miles	321 kWh	Production in 2021
Lightning Systems	Ford Transit 350HD Ford E-450 Ford F-59 Chevy 6500XD	120 miles 110 miles 110 miles 130 miles	86 kWh 129 kWh 128 kWh 192 kWh	Today
Lion	Lion8	Unknown	480 kWh	TBD
Mitsubishi (Daimler)	Fuso eCanter	80 miles	83 kWh	Demonstration



Motiv	Ford E-450 Ford F-53 Ford F-59	100 miles 125 miles 90 miles	127 kWh 127 kWh 127 kWh	Today
Peterbilt (Paccar)	Model 220EV	100 miles	148 kWh	Demonstration
Phoenix Motor Cars	Ford E-450	100 miles	105 kWh	Today
Rivian	Unknown	Unknown	Unknown	Deployment in 2021
Renault	D Range	124 miles	200 kWh	Today
Man	eTGM	118 miles	185 kWh	Today
E-Force	EF26 KSF + more in One AG line	280 miles	340 kWh	Today
Workhorse	C1000	125 miles	70 kWh	TBD
Xos	Medium Duty	200 miles	Unknown	Today
Tractor Trucks				
BYD	8TT	125 miles	409 kWh	Today
Freightliner (Daimler)	eCascadia	250 miles	550 kWh	Production in 2021
Nikola	Nikola One (sleeper) Nikola Two (day)	750 miles 400 miles	80 kg H ₂ 1,000 kWh	Production in 2022 Production in 2022
Peterbilt (Paccar)	Model 579	250 miles	352 kWh	Demonstration
Tesla	Semi	500 miles	Unknown	Production in 2020
Toyota/Kenworth (Paccar)	T680	300 miles	60 kg H ₂	Demonstration
Volvo Group	VNR	Unknown	Unknown	Production in 2020
Xos	ET One	300 miles	Unknown	Demonstration
Emoss	-	125 miles	280 kWh	Today
Terberg	YT203-EV	62 miles	222 kWh	Today
DAF	CF Electric	137 miles	350 kWh	Today
Siemens	eHighway	Unknown	Unknown	Demonstration
Scania	BEV	155 miles	300 kWh	Today

