



# CLEARING THE AIR

**How Reforming the Commercial Waste Sector Can Address  
Air Quality Issues in Environmental Justice Communities**



## ACKNOWLEDGMENTS

This report and underlying research were produced by core members of the Transform Don't Trash NYC coalition, with Priya Mulgaonkar of the New York City Environmental Justice Alliance (NYC-EJA) and Jessica Quiason of ALIGN: The Alliance for a Greater New York (ALIGN) as lead researchers and authors. Many thanks to the community members of THE POINT CDC, UPROSE, El Puente, and Cleanup North Brooklyn; the private sanitation workers who participated in this report; Annel Hernandez and Pamela Soto of NYC-EJA; Michael Heimbinder of HabitatMap; Justin Wood of New York Lawyers for the Public Interest; Cassandra Ogren, Michael Mignano, Lamont Byrd, Asher Tobin, and Alex Moore of the International Brotherhood of Teamsters; and Brigid Flaherty and Lenina Nadal of ALIGN for their research, review, and contributions to this report.

## ABOUT US

The Transform Don't Trash NYC coalition is dedicated to transforming New York City's commercial trash industry to reduce waste and pollution, foster clean and healthy communities for all New Yorkers, and create good jobs. Members include the New York City Environmental Justice Alliance (and its member organizations Brooklyn Movement Center, El Puente, the Morningside Heights/West Harlem Sanitation Coalition, Nos Quedamos, THE POINT Community Development Corporation, UPROSE, and Youth Ministries for Peace and Justice), ALIGN, the International Brotherhood of Teamsters Joint Council 16 & Locals 813, 831 (the Uniformed Sanitationmen's Association), 210, 812, 553, 125, 456, and 445, the Natural Resources Defense Council, and NYLPI.

# INTRODUCTION

Decades of lax regulatory policies have permitted commercial waste haulers and facilities to prioritize their bottom line above the environment, community health, and worker welfare. Haulers bypass closeby transfer stations with available capacity in favor of inefficient and overlapping routes to truck roughly **three-quarters of the City's putrescible and construction/demolition solid waste through a handful of low-income communities and communities of color** in the South Bronx, North Brooklyn, and Southeast Queens. Driving diesel trucks on long routes with hundreds of stops per night exposes workers to excessive levels of pollutants<sup>1</sup>. A recent, unprecedented routing study by DSNY and the Business Integrity Commission (BIC) found that a large share of the 23 million miles traveled by private waste trucks are concentrated along the Gowanus, BQE, and LIE expressways, in all of the Bronx, and in parts of South Brooklyn and Southeast Queens<sup>2</sup>. The health of these communities and the workers that operate these trucks is compromised by an inefficient commercial waste system that has dirty diesel trucks driving millions more miles than necessary to service commercial customers.

In August, New York City Mayor Bill de Blasio and the Department of Sanitation announced that over the next six years, New York will transition to a zoned collection system for commercial waste. The policy, which will reduce truck traffic and pollution while raising recycling rates and labor standards, is supported by Transform Don't Trash NYC and a broad coalition of environmental justice (EJ), labor, environmental protection, and economic justice groups. Under a zoned system, DSNY calculates routes will become drastically more efficient, with haulers servicing **8.7 times more businesses in the same distance as** under the current system, **reducing vehicle miles traveled (VMTs) by 49 to 68 percent**. Zoning will also **reduce the emission of air pollutants closely linked to asthma and other respiratory illnesses by between 34 and 62 percent**<sup>3</sup>.

While the City's study provides a strong basis for a city-wide zoned collection system, it does not highlight the neighborhood- and worker-specific impacts of commercial waste truck pollution on air quality. Establishing commercial waste zones presents a prime opportunity to address the OneNYC goal of achieving the cleanest air quality among all US cities in 2030, specifically as OneNYC aims to incorporate community involvement in this process. For this report, EJ groups in the South Bronx, Southwest and North Brooklyn, as well as workers in the private carting industry, collected air quality measurements and conducted truck counts where they live and work to measure the environmental impacts that excessive truck traffic from commercial waste has on themselves and their neighborhoods. These groups specifically monitored concentrations of fine particulate matter (PM<sub>2.5</sub>), a harmful byproduct of diesel combustion with proven links to respiratory infections, asthma, and cancer<sup>4</sup>.

**This report seeks to inform the City's commercial waste zone planning process** while also giving recommendations for how the City can meet its air quality goals outlined in the OneNYC plan. EJ communities play host to numerous facilities associated with solid waste. The findings in this report show the impacts of truck traffic on air quality and quality-of-life for workers in the trucks and residents in these communities. To protect the places where low-income people of color live, work, learn, and play, the City must maximize truck routing efficiency for commercial waste zones, increase worker safety, and incentivize the use of cleaner fuel. With ambitious environmental targets and high-road labor standards, the City can require commercial waste haulers to shrink their environmental footprint while improving quality of life for all New Yorkers<sup>5</sup>.



<sup>1</sup> The DSNY/BIC report found the median number of stops in one route across 90 haulers to be 165, with some reporting 600 or more.

<sup>2</sup> <http://www.nyc.gov/privatecarting>

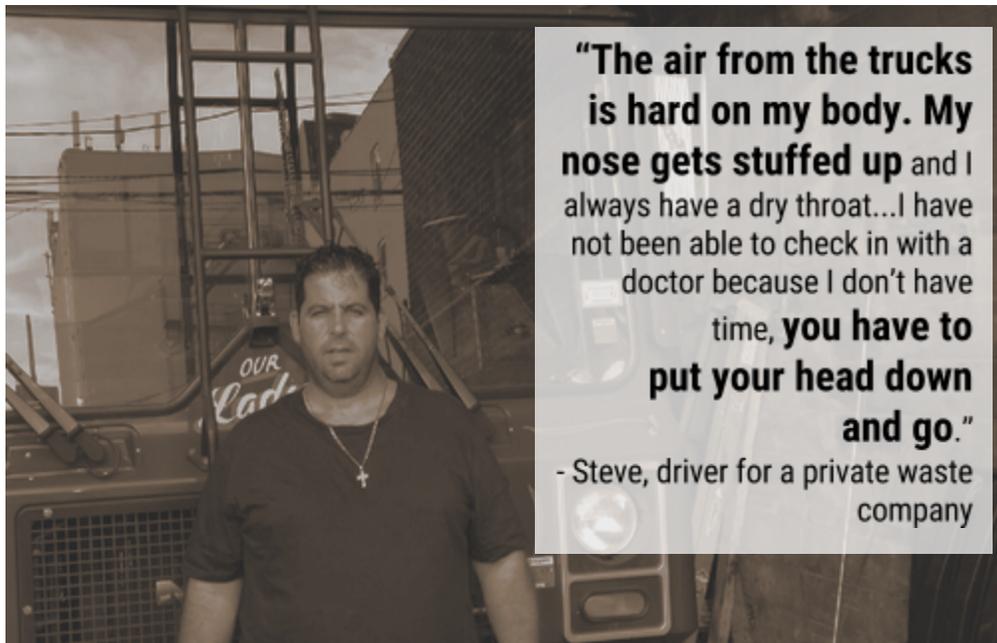
<sup>3</sup> Ibid.

<sup>4</sup> <http://hydra.usc.edu/scehsc/pdfs/Trucks%20issue%20brief.%20January%202012.pdf>

<sup>5</sup> Dirty, Wasteful & Unsustainable: The Urgent Need to Reform New York City's Commercial Waste System, 4

## KEY FINDINGS

- ✦ The South Bronx recorded the highest number of trucks per hour and the highest proportion of which were trash trucks: **304 commercial trucks per hour, almost half of which were commercial waste trucks**. That's one commercial waste truck every 24 seconds.
- ✦ The South Bronx also recorded the highest concentration of asthma-inducing pollutants<sup>6</sup> in traffic-heavy areas: **between 2x and 7x greater than the average** for that area in the South Bronx.<sup>7</sup>
- ✦ North Brooklyn recorded up to **203 trucks per hour on weekdays with an average of 30% being commercial waste trucks**. Asthma-inducing pollutants were up to **5x higher than the average** for that area in North Brooklyn.
- ✦ Southwest Brooklyn: pedestrians at truck-heavy intersections on weekdays inhaled up to **4x greater** concentrations of asthma-inducing pollutants than the average for that area<sup>8</sup>.
- ✦ Private waste workers on their routes were exposed to concentrations of asthma-inducing pollutants that are up to **7x higher within the cab of the trucks alone** than the average for the area.<sup>9</sup> Helpers and drivers on commercial waste routes also spend large amounts of time behind and near the truck engaging in rigorous physical labor, which may worsen the effects of pollution on their bodies.<sup>10</sup>



<sup>6</sup> Fine particulate matter, or PM<sub>2.5</sub>

<sup>7</sup> Compared to the ambient levels measured during the same date and time by the closest NY Department of Environmental Conservation (DEC) located at the top of buildings.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> [https://www3.epa.gov/airnow/2014conference/Plenary/Monday/Boehmer\\_NAQC\\_2014\\_final2.pdf](https://www3.epa.gov/airnow/2014conference/Plenary/Monday/Boehmer_NAQC_2014_final2.pdf)

# KEY FINDINGS

## SOUTH BRONX

Almost **half** of all trucks are **private waste trucks**



Up to **7x** higher  
asthma-inducing  
pollutant levels  
compared to area average

ONE  
COMMERCIAL  
WASTE TRUCK



## NORTH BROOKLYN

**1/3** of all trucks are **private waste trucks**



Up to **5x** higher  
asthma-inducing  
pollutant levels  
compared to area average

ONE  
COMMERCIAL  
WASTE TRUCK



## WORKER FINDINGS

Asthma-inducing pollutants  
inside private waste trucks are  
up to



# POTENTIAL HEALTH IMPACTS OF COMMERCIAL WASTE

## *Diesel emissions affect air quality and health outcomes*

Currently, **only 10 percent of the garbage trucks carting putrescible waste in New York City meet 2007 EPA emissions standards**, meaning the vast majority of commercial waste trucks emit significantly greater quantities of harmful fine particulate matter (PM<sub>2.5</sub>) and nitrogen oxides (NOx) than newer collection vehicles<sup>11</sup>. Starting in 2020, Local Law 145 will reduce pollution from waste trucks by mandating the installation of emissions control technologies, however, the law does not incentivize a shift from diesel to cleaner fuels and technology, such as compressed natural gas or electric hybrid trucks. Local Law 145 promises only to lower diesel emissions. However, exposure to air pollution, even at concentrations below regulatory thresholds, causes chronic illnesses such as asthma and bronchitis and contributes to terminal illnesses such as cancer and heart disease.<sup>12</sup>

Exposure to PM<sub>2.5</sub> is a serious health threat for vulnerable New Yorkers, especially children and older adults, living in the most polluted areas of the City. The NYC Department of Health and Mental Hygiene (DOHMH) estimates that PM<sub>2.5</sub> pollution causes more than 3,000 deaths, 2,000 hospital admissions for lung and heart conditions, and approximately 6,000 emergency department visits for asthma in children and adults annually. DOHMH also found that even a 10 percent reduction in current PM<sub>2.5</sub> levels could prevent over 300 premature deaths, 200 hospital admissions and 600 emergency department visits every year<sup>13</sup>.

## *Certain populations are disproportionately affected by diesel pollutants*

Each night, haulers transport around 8,000 tons of waste<sup>14</sup> to a handful of low-income communities and communities of color where waste transfer stations are clustered. These neighborhoods include North Brooklyn and the South Bronx which collectively host 32 of the 58 transfer stations citywide<sup>15</sup>. Children living in close proximity to the pollution caused by diesel trucks face an increased risk of experiencing asthma symptoms, such as wheezing, and are more likely to require asthma medication<sup>16</sup>. They are also particularly susceptible to the health effects associated with commercial waste trucking.

Poor health outcomes from truck pollution are also experienced inequitably across racial lines; for example, one study showed a **strong association between asthma hospitalization rates, poverty, the percentage of Hispanic residents, and the number of industrial facilities in the Bronx**, and that higher asthma hospitalization rates are more likely to occur in areas with lower-income residents and in areas with a high proportion of Latino/Hispanic residents<sup>17</sup>.

The South Bronx has...	
<b>14</b> waste transfer stations	Asthma fatality rates <b>3x higher</b> than the nat'l avg
	Asthma hospitalization rates <b>5x higher</b> than the nat'l avg

<sup>11</sup> <http://www.edf.org/sites/default/files/EDF-BIC%20Refuse%20Truck%20Analysis%20092713.p>

<sup>12</sup> [http://ephtracking.cdc.gov/docs/NYC\\_Air\\_Quality\\_Impact\\_2011FINAL.PDF](http://ephtracking.cdc.gov/docs/NYC_Air_Quality_Impact_2011FINAL.PDF)

<sup>13</sup> [http://ephtracking.cdc.gov/docs/NYC\\_Air\\_Quality\\_Impact\\_2011FINAL.PDF](http://ephtracking.cdc.gov/docs/NYC_Air_Quality_Impact_2011FINAL.PDF)

<sup>14</sup> NYC Commercial Solid Waste Study and Analysis - Summary Report, 2012, DSNY, 35. [https://www1.nyc.gov/assets/dsny/docs/about\\_2012-commercial-waste-study\\_0815.pdf](https://www1.nyc.gov/assets/dsny/docs/about_2012-commercial-waste-study_0815.pdf)

<sup>15</sup> [http://www.habitatmap.org/habitatmap\\_docs/BargeNYC'sGarbage.pdf](http://www.habitatmap.org/habitatmap_docs/BargeNYC'sGarbage.pdf)

<sup>16</sup> <http://hydra.usc.edu/scehsc/pdfs/Trucks%20issue%20brief.%20January%202012.pdf>

<sup>17</sup> NYU Environmental Health and Policy Study, [http://www.icisnyu.org/south\\_bronx/admin/files/NYUWagnerPhaseVIreport.pdf](http://www.icisnyu.org/south_bronx/admin/files/NYUWagnerPhaseVIreport.pdf), 12

# COMMUNITY AND RESEARCH FINDINGS: Truck traffic and PM<sub>2.5</sub>

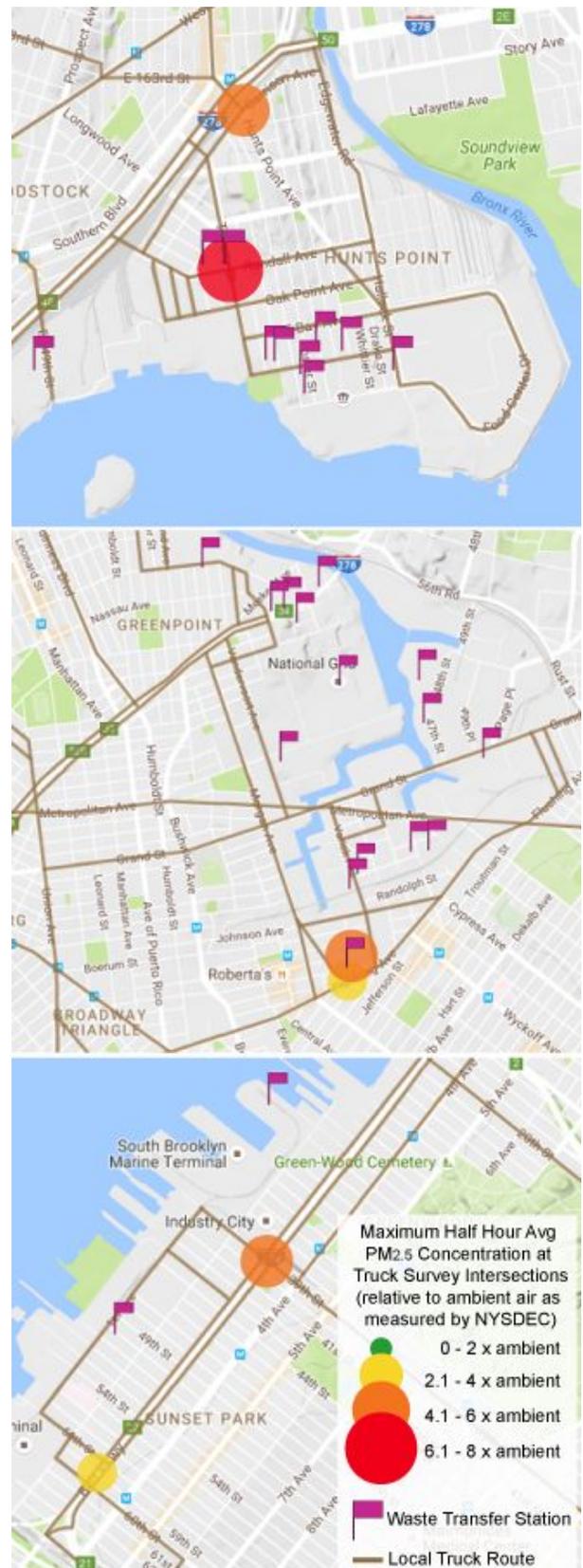
Many truck routes and transfer stations utilized by commercial haulers are located in dense residential neighborhoods. The Department of Transportation found that **some local truck routes in Williamsburg, Bushwick, and the South Bronx traverse neighborhoods that are more than 75% residential**.<sup>18</sup> Commercial trash trucks account for a large portion of traffic in these neighborhoods – up to 80% of all vehicles at one intersection in the South Bronx<sup>19</sup>. To quantify the impact of diesel truck emissions on their communities, NYC Environmental Justice Alliance members UPROSE (Sunset Park, Brooklyn), THE POINT CDC (South Bronx) and El Puente (Williamsburg, Brooklyn) partnered with Clean Up North Brooklyn (Bushwick, Brooklyn) and counted trucks while monitoring the air quality at select intersections. Workers in the private waste industry also sampled the air inside their truck cabs to quantify pollution exposures while working their lengthy and circuitous collection routes.

## Methodology

Community members collected street-level PM<sub>2.5</sub> readings at intersections in their neighborhoods with heavy truck traffic during early morning and early evening sessions across several weekdays and weekends. The readings were then compared to atmospheric PM<sub>2.5</sub> readings from the closest stationary monitors operated by the New York State Department of Environmental Conservation<sup>20</sup>. Pollutant concentrations were recorded using AirBeams, a low-cost instrument for measuring PM<sub>2.5</sub>. Private waste workers installed the AirBeam devices within the cabs of their trucks to measure PM<sub>2.5</sub> concentrations during their entire 8-hour shifts.

## Community findings

In the South Bronx and North Brooklyn, community groups found commercial waste trucks accounted for a significant proportion of truck traffic, and the air quality was significantly worse than ambient levels. In the South Bronx, community members found PM<sub>2.5</sub> concentrations **up to 7x higher** than ambient levels. These members also witnessed up to **304 trucks per hour**, of which **45% were transporting commercial solid waste**. In North Brooklyn, community members found PM<sub>2.5</sub> concentrations **up to 5x higher** than ambient levels, and counted up to **203 trucks per hour**, **30% of which were trash trucks on average**. Community members in Sunset Park, a neighborhood identified by DSNY as having disproportionately high commercial waste traffic, counted 243 trucks per hour and PM<sub>2.5</sub> concentrations of up to 5x ambient levels.



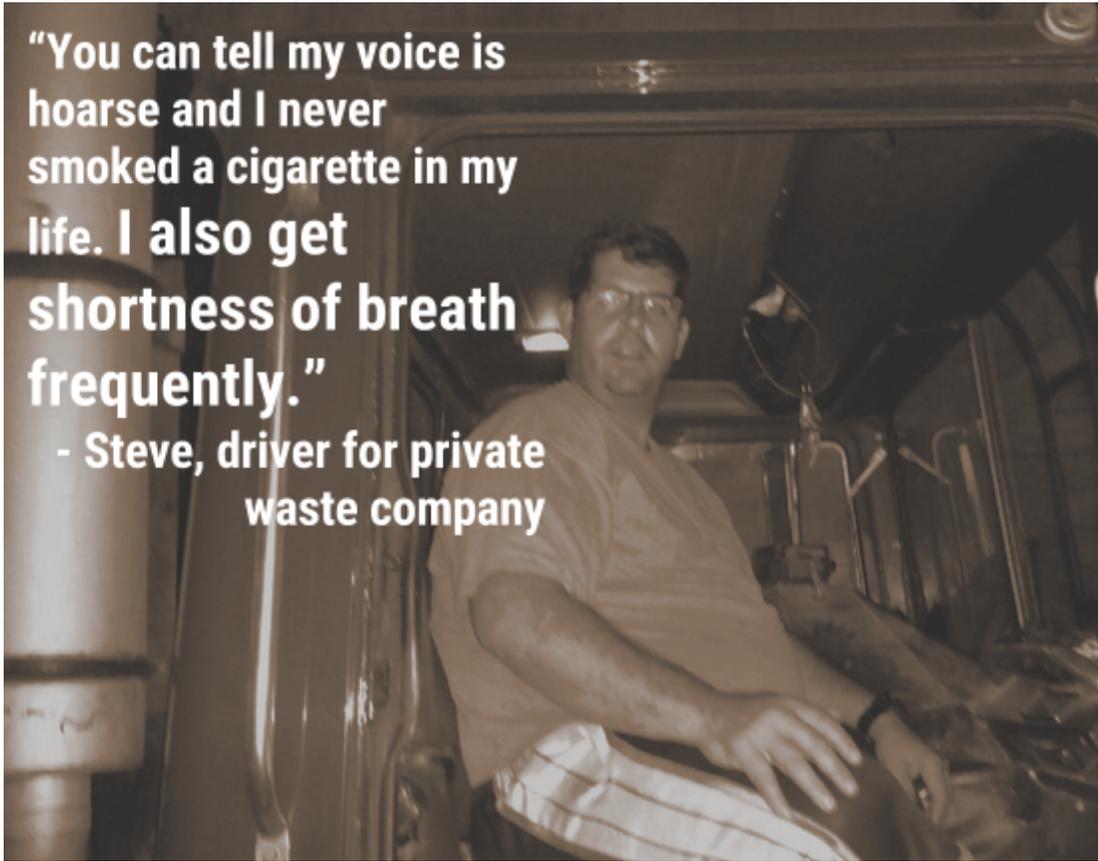
<sup>18</sup> [http://www.nyc.gov/html/dot/downloads/pdf/tm2\\_part2.pdf](http://www.nyc.gov/html/dot/downloads/pdf/tm2_part2.pdf)

<sup>19</sup> [http://www.nyc.gov/html/dot/downloads/pdf/tm2\\_part2.pdf](http://www.nyc.gov/html/dot/downloads/pdf/tm2_part2.pdf), p 36

<sup>20</sup> NYS DEC stationary monitors used: PS 314, 330 59th St, Brooklyn; IS 74, 730 Bryant Ave, Bronx

“You can tell my voice is hoarse and I never smoked a cigarette in my life. I also get shortness of breath frequently.”

- Steve, driver for private waste company



### Worker findings

While operating their collection vehicles, private waste workers experienced average  $PM_{2.5}$  concentrations in their truck cabs that were up to 7x higher than ambient levels. Even a worker driving the newest truck from 2007 experienced an average  $PM_{2.5}$  concentration that was 3x higher than ambient levels.

The map at the right shows one worker’s air pollution exposures during his shift. In the cab of his truck, he was exposed to  $PM_{2.5}$  concentrations 6 to 25x higher than ambient levels while navigating across two boroughs, including nearly the entire length of Manhattan.



In the cab of their truck, commercial carting company drivers & helpers were exposed to  $PM_{2.5}$  levels 4 to 7 x higher than ambient levels for the duration of their shifts.

## CONCLUSIONS & RECOMMENDATIONS

The recently announced commercial waste zone policy presents an opportunity for New York City to reduce air pollution from the private sanitation industry. The TDT-NYC coalition believes that the best way to incentivize the commercial waste sector to invest in cleaner trucks and more efficient routes is to establish a competitive RFP process that awards 10-year exclusive contracts, guaranteeing the steady customer base necessary to make investments in cleaner truck and facilities technology. As the City begins devising its implementation strategy for commercial zones, the RFP process must account for the neighborhood-specific impacts of the commercial carting industry in EJ neighborhoods and the impacts on worker health in the following ways:

### ***Reduce VMTs through Efficient Routes within Exclusive Zones***

Exclusive collection zones are critical to reducing excessive vehicle miles travelled (VMTs) by trucks and achieving high diversion rates in an efficient, lowest cost way. By creating rational commercial districts, haulers can better facilitate separate collection of recyclables, compostable organic waste, and garbage without adding to citywide vehicle miles travelled by collection trucks. Indeed, the DSNY study of the commercial carting industry's routes found that every neighborhood would likely see a decrease in truck traffic and related emissions, with the greatest VMT reductions occurring in the EJ communities in Bronx and along the BQE and LIE.



### ***Maximize Efficiency and Equity by Incentivizing Haulers to Use Barge and Rail Transport***

While the DSNY's study was able to quantify the efficiency gains a zoned approach could offer, it did not consider the locations of waste transfer, recycling, and other waste processing facilities in its routing analysis. Zoning will not inherently lessen the burden currently borne by communities where truck-based waste transfer stations are currently clustered. Under the city's 2006 Solid Waste Management Plan (SWMP), DSNY and private-sector partners are constructing new marine and rail-based waste facilities to lessen the environmental impacts of the residential waste system. This new infrastructure also creates opportunities to lessen the environmental impacts of commercial waste. As the City prepares its zoning strategy, DSNY could structure tipping fees to incentivize haulers use of more efficient, more equitably dispersed facilities such as the upcoming, state-of-the-art Marine and Rail Transfer Stations. The City should also consider both the locations and community impacts of private, truck-based transfer stations to be used by commercial haulers when awarding contracts under a zoned waste system. Each facility could be scored based on criteria such as indoor truck queuing, strict anti-idling policies, and record of compliance with safety and environmental regulations. Zoning provides an opportunity to design an efficient and equitable commercial waste system that distributes the impacts of waste across all the boroughs—not just in low-income communities of color.

### ***Incentivize Haulers to Use Alternative and Clean-Fuel Technology***

Through the RFP process used in a zoned collection system, the city can also require or incentivize haulers to adopt low-emissions truck technologies. Long-term exclusive collection agreements also give haulers the financial stability they require to make investments in non-diesel fleets. For example, San Jose's 15-year agreement with the city's exclusive commercial waste hauler, Republic Services, specifies that the company must use 100% natural gas vehicles.<sup>21</sup> Similarly, Seattle's contracts with the city's two franchised haulers require the use of vehicles powered by either natural gas or at least 20% biodiesel.<sup>22</sup> Newer, cleaner technologies such as hybrid-electric garbage trucks may also become financially feasible with the financial stability and efficiencies engendered by a zoned commercial waste system.<sup>23</sup>

<sup>21</sup>City of San Jose Franchise Agreement with Allied (Republic) Services, Appendix C1. Available at: <http://www.sanjoseca.gov/ArchiveCenter/ViewFile/Item/2835>

<sup>22</sup> [http://www.seattle.gov/util/cs/groups/public/@spu/@garbage/documents/webcontent/spu01\\_005943.pdf](http://www.seattle.gov/util/cs/groups/public/@spu/@garbage/documents/webcontent/spu01_005943.pdf) p. 11

<sup>23</sup>For example, see

<http://www.forbes.com/sites/samabuelsamid/2016/06/07/mack-trucks-to-demonstrate-wrightspeed-turbine-plug-in-hybrid/#724d9d7e67da>

# APPENDIX

## Note on Air Quality Measurements:

AirBeams were used to collect the air quality measurements cited in this study. The AirBeam is a low-cost, open-source instrument for measuring PM2.5 that is manufactured by HabitatMap, a Brooklyn-based environmental health justice non-profit. AirBeam performance has been evaluated by multiple regulatory agencies and academic groups including the Environmental Protection Agency<sup>24</sup>, South Coast Air Quality Management District<sup>25</sup>, and NYU School of Medicine<sup>26</sup>. These evaluations have consistently proven that the AirBeam's PM2.5 measurements correlate well with measurements recorded by the Federal Equivalency Method (FEM) and Federal Reference Method (FRM) instruments that make up the State and Local Air Monitoring Stations (SLAMS) network used by the EPA to evaluate compliance with the National Ambient Air Quality Standards. However, the AirBeam is not an FEM or FRM instrument and the methods used to collect the air quality data for this study are not directly comparable to the methods used by the SLAMS network. Given this fact, we have elected to present the AirBeam measurements as multiples of the ambient concentration recorded by the closest New York State Dept. of Environmental Conservation monitoring site(s), rather than the absolute values. This was done to emphasize that AirBeam measurements are best interpreted as a relative indicator of PM2.5 concentrations rather than an absolute value that is directly comparable to SLAMS network measurements.

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<sup>24</sup> <https://www.epa.gov/air-research/community-air-sensor-network-caisense-project-lower-cost-continuous-ambient-monitoring>

<sup>25</sup> <http://www.aqmd.gov/air-spec/product/airbeam>

<sup>26</sup> <http://www.takingspace.org/airbeam-technical-specifications-operation-performance/>