
POLICY BRIEF FOLLOWING A PERFORMANCE ANALYSIS OF THE QUEENS RESIDENTIAL CURBSIDE ORGANICS (“COMPOSTING”) PROGRAM CALENDAR YEAR 2023

Major Points

- In 2023, only **4.3%** of the residential Curbside Organics that could have been collected in Queens for composting or anaerobic digestion, were in fact collected. The rest (95.7%) went out with the trash. The 4.3% rate is called the “capture rate”.
- In 2023, around **300,000 tons of compostable organics went out for disposal with Queens refuse**. These quantities moved through Queens transfer stations. They ended in landfills and WTE incinerators in eastern U.S. states. About **12,700** tons of residential Curbside Organics, and about **5,100** tons of School Organics (which included an unknown percentage of Smart Bin drop off quantities) were collected for composting or anaerobic digestion locally.
- The capture rate, per household generation rate, and total tonnage of residential Curbside Organics is **lower today than it was in Queens under the previous administrations**, when it was already low.
- **Smart Bin tonnages do not make up for this poor performance.**
- Some Queens Districts perform better than others, but for 2023 none reached double digit capture rates. Regardless of year, month, or Community District, **the 10-year-old Program is underperforming by any metric** – total tonnage, per household quantities, or capture rate.
- Performance is always best in the Fall months of October, November and December. Performance is always higher in less dense districts. The reason for both trends is yard waste – leaves, grass clippings, prunings, and weedings.
- Metrics presented here are **standard to the waste management industry**, and calculable from DSNY Monthly Tonnage and Waste Characterization data posted on Open Data. All calculations referenced here can be re-run by any party. Full methodology is explained in the Performance Analysis companion to this Brief.
- The new residential Curbside Organics Collection Program can succeed, but the City’s approach to this now 10-year effort **must fundamentally change**. Most important is **transparency** in Performance Analytics, and **responsiveness to public engagement around composting**.

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Executive Summary

I have conducted a Performance Analysis of the current NYC residential Curbside Organics (“Composting”) Program that now serves the entire Borough of Queens, New York. The results reveal low levels of participation and tonnage. The Performance Analysis is a companion document to this Policy Brief.

For Calendar Year 2023, **Queens residents are setting out 4.3% of everything that they could for Curbside Organics collection. Almost 96% of food scraps, yard trimmings, and soiled paper in this Borough are going into the trash.**

A Decline Since 2018

NYC’s residential Curbside Organics Program requires all residential buildings to set out food scraps, yard trimmings, and compostable/soiled paper at the curb for weekly DSNY collection. It is extended to all households, rather than only 1-9 unit buildings, which was the practice under a prior version of the Program. It offers more options for bags or bins than that Program, and is meant to be “a model that can actually serve the entire city”.ⁱ

Despite these improvements, performance in Queens for CY 2023 is lower than it was for Queens Districts receiving collection in 2018 and 2019 (service was cut mid 2020). The prior Program already had low capture rates, but it outperformed the current Program on capture rate, per household generation rate, and even total tonnage, despite the fact that prior to 2020, fewer Districts and hundreds of thousands of fewer households enjoyed curbside collection.

The previous Program performed poorly, and at least for 2023, the current Program is performing even more poorly.

Capture Rate is

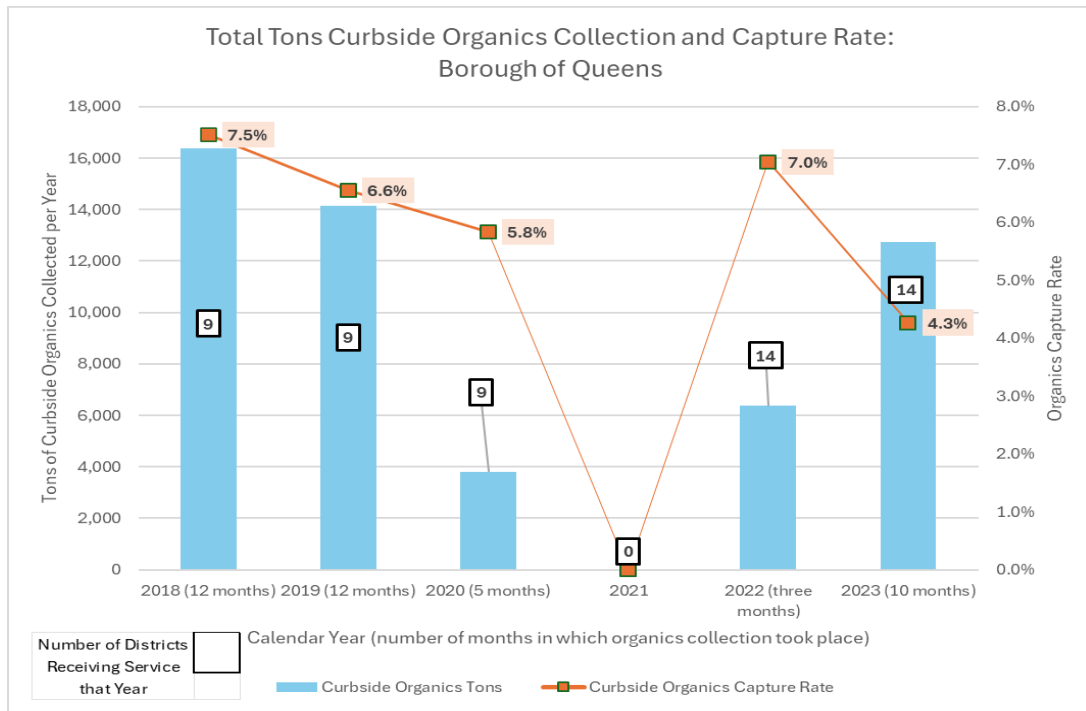
tons of Curbside Organics actually
set out for organics collection
[(total tons of organics left in
refuse) + (tons actually set out for
organics collection)]

*Capture rate measures how much
is being set out properly as
organics vs. how much could be
properly set out for organics if
everyone participated fully*

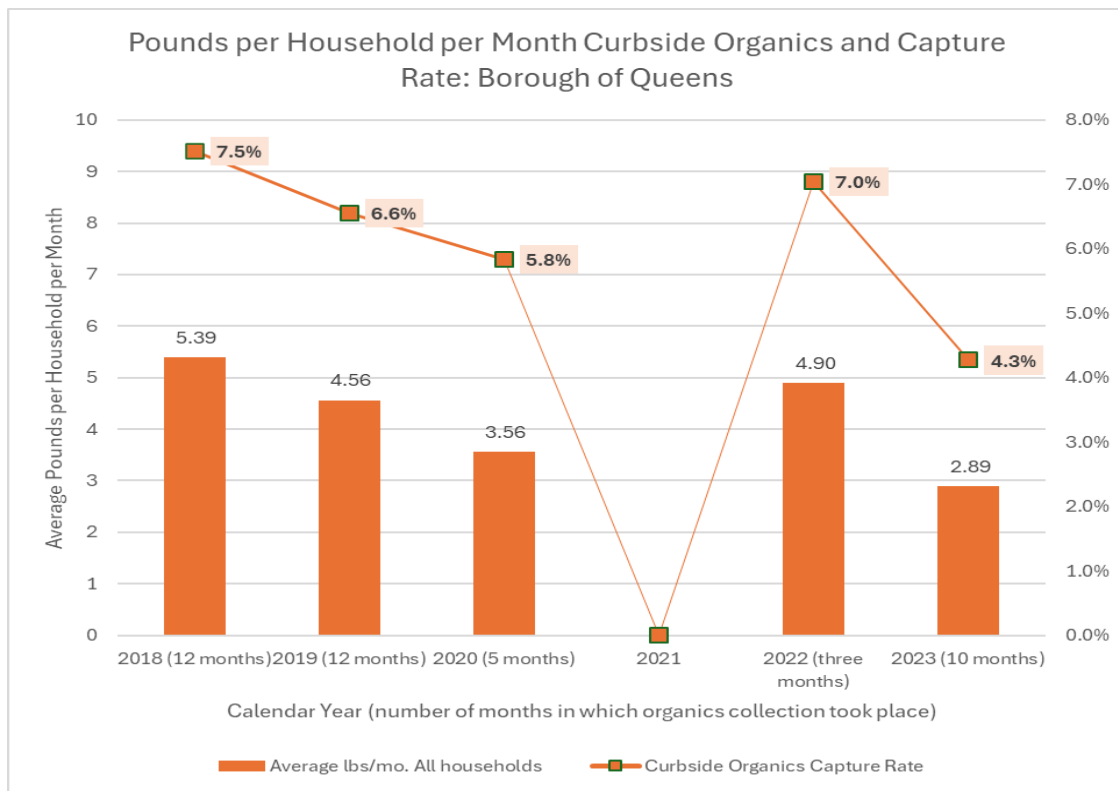
A 4.3% Queens capture rate for 2023 means that out of all of the tons of organics that Queens residents could set out, they are only setting out 4.3%, on average for any month in 2023.

**This rate is considered low by
waste management industry
standards.**

Note: For computational simplicity, I have excluded organics mistakenly placed in Paper and MGP Recycling Collections in the capture rate calculations. If I included these, the capture rates would be very slightly lower.



Data Source: *DSNY Monthly Tonnages on Open Data; DSNY Waste Characterization Study 2017*



Data Source: *DSNY Monthly Tonnages on Open Data; DSNY Waste Characterization Study 2017*

The new Program in Queens is performing no better or worse than “Legacy Opt-In” Districts in Brooklyn and the Bronx that opted to continue the prior curbside Organics Program pending full expansion of coverage in their respective Boroughs.

Calendar Year 2023 Curbside Organics Capture Rate and Average Monthly Pounds per Household Per Month (averaged over 10 months because there was no January or February 2023 collection)					
Queens Districts			Legacy Opt In Districts		
	Avg. Capture	Lbs/hh/ /mo		Avg. Capture	Lbs/hh/ mo
QN01	4.2%	1.80	BK01	1.4%	0.74
QN02	2.3%	1.16	BK02	6.0%	2.23
QN03	1.4%	1.09	BK06	11.4%	3.86
QN04	1.2%	0.84	BK07	4.6%	2.72
QN05	4.0%	2.62	BX08	4.7%	1.91
QN06	4.7%	2.18	MN06	0.9%	0.19
QN07	3.6%	2.37	MN07	3.6%	0.92
QN08	3.9%	2.37			
QN09	6.5%	5.17			
QN10	3.3%	2.71			
QN11	8.1%	5.12			
QN12	7.2%	6.15			
QN13	5.1%	4.08			
QN14	4.1%	2.54			
Capture rate and pounds per household per month is the waste management industry standard for performance analysis of areas (Districts) with varying populations and months of service coverage in a year					

Data Source: DSNY Monthly Tonnages on Open Data; DSNY Waste Characterization Study 2017

A Decade of Collection Inefficiency

Very little of the compostable material that could be picked up weekly at the curb by Sanitation trucks is, in fact, making its way into those trucks. This is not a new situation. Low performance has characterized the Curbside Organics Program since 2012, when the City started this effort.

The Program is back, but low resident participation remains. Substantially increasing participation will be needed to address hundreds of thousands of tons in Queens, and over a million tons Citywide, of organics currently sent to refuse disposal. This will require a new set of strategies that begin with more Open Data and regular, transparent performance analytics. It requires extensive attention to performance and needs of 10+ unit buildings and their workers, owners and tenants. High expectations

for an improvement under enforcement of the Mandatory aspect must be built on data and analytics. The City must test different combinations of intensive, extensive, year-round outreach and education until “what works” in conjunction with enforcement is identified and measured. All of this requires vastly more resources devoted to all aspects of outreach and education, as well as field and desk-scale program evaluation.

Given the current trajectory of the present Curbside Organics Program, the City’s ability to meet its GHG reduction goals under the Climate Leadership and Community Protection Act (CLCPA) and related Local Laws is compromised. The Program risks future cancellation due to collection inefficiencies under such a low capture rate scenario. This is true even if, as the City’s early assessments of Program success in Queens suggested, “The new program is built on a number of efficiencies that drive costs down, including the use of dual-bin trucks and a right-sizing of the workforce to reduce overtime.”ⁱⁱ With such low tonnages, high collection costs are guaranteed.

Method of Assessment

The Performance Analysis that is the companion to this Policy Brief details the method by which I calculated performance measures, discusses why a prior assessment issued by DSNY in late 2022 do not hold after a year’s worth of data, and highlights problems in transparency and untested assumptions in the current Administration’s approach to getting Curbside Organics done. It urges more open data and public consultation, and regular performance analytics, published with transparent methodology on how calculations are made.

Residential curbside collection of Organics can succeed in New York City, but the approach that has been taken 2012 – 2024 must radically change. Recommendations follow, but what is most important is for the City to listen to small businesses that haul organics for local composting, community composting organizations, and New Yorkers themselves in order to design a Program that works.

Recommendations

1. Pay attention to workers, owners, and tenants of 10+ Unit Buildings (in that order).

There is a clear need for renewed, vastly increased attention to workers, owners, and tenants of multiple unit buildings, in particular 10+ unit buildings. These buildings face challenges to participation that stand unaddressed under the current Curbside Organics Program; these challenges have to do with storage and consolidation space, signage and onsite education, program consistency, concerns over enforcement, and most of all burdens on staff.

The hard-working porters, custodians, and superintendents who sort, consolidate, store and set out organics at the curb make or break all aspects of building-level waste management. These are often hidden jobs staffed by people who don't earn a great deal to begin with. They need respect, recognition and resources far more than their employers need tickets and fines under a future Mandatory scenario. Building owners and workers need to be listened to in formulating future plans to promote Curbside Organics Collection in any Borough, but especially in the planned expansion of late 2024 to the very dense Manhattan, and southern Bronx. Expecting multi-unit buildings to robustly participate in Curbside Organics without these resources is naïve, and runs contrary to all research and accumulated knowledge not only in NYC, but among cities throughout the U.S.

2. Do not pin hopes for future turnarounds on mandatory participation.

There are high hopes that enforcement of the Mandatory aspect of Local Law 85 of 2023 will turn the tide after a decade of low participation. According to recent news accounts, enforcement is set to begin in 2025. Once the Program is implemented Citywide and made Mandatory, the thinking goes, the problems that have beset the Curbside Organics Program will begin to subside. Such expectations need to be met squarely with real world information. Making the Program Mandatory in status ("it's not just a good idea, it's the law") may, or may not, provide an initial boost to participation.

It is certainly reasonable to think that if people and building staff know that the Program is Mandatory, some participation will increase. However, it is one thing to call a program "Mandatory". It is another thing to enforce that program with tickets, and to assess and collect fines as a consequence of violations. DSNY Enforcement staff assess recycling violations by inspecting the content of trash bags and recycling bins/bags, as well as verifying proper set-up, receptacles, and signage to facilitate recycling. DSNY Enforcement agents are required to attest to what they literally observed – not what

they think might be going on – when finalizing a ticket. At times, this requires opening and inspecting a bag or bin.

Recyclable paper, metal, glass, and plastics are relatively clean and distinct in comparison to food scraps mixed into, and smeared all over, refuse. Will it be reasonable to expect DSNY Enforcement staff to assess trash contents for the presence of food waste? Is it reasonable to expect porters to retrieve non-compostable items from Curbside Organics Bins; or even worse, to hand-pluck food items from the garbage? To make Curbside Recycling work in NYC, building workers definitely do this type of after-tenant cleanup to avoid tickets.

Plans for actual DSNY Enforcement (as opposed to promulgation of simple rule changesⁱⁱⁱ) need to be made public now. If collection efficiency gains are expected from Enforcement, such expectations must be analytically sound. **Even more important is to plan for what will happen if going to Mandatory does not increase the capture rate by much, and/or results in highly contaminated organics.**

In fact, there is reason to think that the level of ticketing, whether measured either in numbers of tickets issued, or amounts of fines paid, does not have a direct relationship with capture (or diversion, which tracks the capture rate). This sounds counterintuitive, but data trends don't show a relationship. Deeming a program Mandatory without enforcement may initially boost compliance. But looking at the 30 year history of the Curbside Recycling Program, issuing more tickets and fines doesn't seem to directly affect the diversion or capture rate, or lead to increased recycling tonnages. (See Figure 3 in attached Performance Analysis).

3. Value what you have devalued: community composting and microhauling.

Within NYC, there are anticipated capacity upgrades at the City's aerobic compost facility at Fresh Kills, Staten Island. Plans are in motion to deposit more slurried food scraps for codigestion with sewage sludge at the City's wastewater treatment plants. These industrial-scale outlets do provide near-term, flexible capacity for anticipated increases in Curbside Organics tonnages. But the end products of these methods – especially food scrap codigestion – do not make the most of the multiple, overlapping benefits of aerobic composting that are seen at medium and small-scale sites operating throughout the City. Such sites, managed by community enterprises and integrated into community education, food systems, and job creation, have had to fight against displacement and defunding threatened by a City government that **simply does not value the extensive return on investment they provide**. This must change.

Most stakeholders in NYC organic waste management recognize that the Community Compost movement, including organizations within and outside the now defunded 30-year old NYC Compost

Project, have been and will continue to be pivotal in educating and engaging the public about composting. Contrary to DSNY's assertion, their audience has never been the "truest of true believers."^{iv} These groups have engaged people from all walks of life citywide. The influence and contribution of this movement is woven through the goodwill that composting enjoys in NYC and has been crucial to the development of policy. Through DSNY, or possibly through another city agency, funding for the NYC Compost Project must be restored. DSNY would be wise to consider community composters as allies in a very daunting task ahead of them: how to get capture rates beyond single digits.

Similarly, organics microhaulers and community-based farms and gardens need to be put at the front of the City's approach to organics diversion. During the many pauses in the City's now 10-year-old attempt to collect Curbside Organics, these groups have taken up the slack and have provided collection and composting services at a fraction of what it would cost the City. Staff of the NYC Compost Project have been available at short notice, and without need for pre-training, as contractors to supplement DSNY's limited outreach staff. During the pandemic, they, as well as organics microhaulers, proved what they could do with their own labor power and entrepreneurship. There must be inclusion of these parties in all infrastructure/collection considerations, as well as outreach and education planning. Small is not necessarily "inefficient"; nor is large scale, for the moment at least, proving itself efficient.

4. Be forthright about program performance.

Perhaps the most important recommendation at present is not to let "spin" dominate a transparent discussion of Program performance.

For over a decade, New York City government has struggled to put tonnages behind claims of running the largest compost collection program in the United States. Certainly, in terms of New York City population, DSNY collection workforce, and waste generation in total, we are the largest. In terms of ambition to beneficially use organics, we may lead. But there is a huge gap between ambitious claims and measured results. This gap has been stark for over a decade, and persists to this day, in the face of years of data showing tiny measurable progress in tonnage terms.^v

The tendency to use aspirational statements to position the City as a "leader" of some kind in sustainability obscures real action. Real action is measured in tonnages, and in tangible impacts on people's lives and what they value. In prior Zero Waste efforts, such as DeBlasio's "0 X 30" campaign, the spinning of "success" claims while underplaying performance data hindered progress and eroded

trust among the public. This applied at all times, but especially when success claims were followed by “pauses” of Program expansion and collection.

The first “pause” ceased Program expansions in 2018. The second suspended the Program in July 2020. The third interrupted collection for the months of January and February 2023. The fourth happened in November 2023, when “Adams and his team announced budget cuts that delayed the roll-out date for composting pickup in the Bronx and Staten Island, pushing it from March of this year to October — a change intended to save the city \$4.8 million over two years.”^{vi} The first and last pauses had to do with Program expansion. The second and third to temporary cessation of service. These pauses generate not only confusion, but cynicism among many New Yorkers about the City’s commitment to Curbside Organics Collection. A strong suggestion is this: **don’t commit to what you can’t follow through on**. Don’t claim success that you cannot prove with tonnage.

5. Be forthright about organics collection costs.

It is imperative that the City not cite future collection inefficiencies, which derive from low participation, as a reason for further Program delay or cessation. We must face the fact that there will be substantial collection inefficiencies, and high per-ton costs, with a 4.3% Queens capture rate. These inefficiencies may, or may not, have improved under new agreements with the labor unions that represent Sanitation workers – this too needs to be part of public disclosure.^{vii} If collection is now more cost-efficient in Queens, as DSNY has alluded to, then per ton costs, tons per truck shift, relays reduced, and other key metrics of efficiency have to be made public. Common knowledge in collection operations suggests that inefficiencies will begin to resolve with a 30% capture rate, and will continue to decrease (i.e. will get better) from there if participation is actively cultivated through continuous, community-based, outreach and education.

6. Be forthright about fates of collected organics.

People deserve to know where the organics they set out go. The current Administration has made progress in this area. Firms that receive and process Curbside Organics are now only located within NYC, including the Staten Island Compost Facility and the Newtown Creek Wastewater Resource Recovery Facility. As compared to the prior Administration, there is more sharing of information on where organics go and what happens to them. But more needs to be known about the destinations and end uses of digested solids that started their life as food. There is also the issue of PFAS, which is already affecting how treated wastewater solids will be managed; future regulations will only increase in this area. The City must not oversimplify the benefits of what DSNY has elected to call the Curbside

“Composting” Program, which actually is not composting but collection of compostables for processing using anaerobic digestion in some cases. Anaerobic digestion may have its place securing near-term processing capacity for collected organics, but it is not in most cases transforming collections into nourishing soil amendment, and is not, by definition, composting.

7. Care for people and systems that turn organics into compost.

The City’s present approach brands Curbside Organics collection as “more efficient” than Community Composting, which is sidelined into a “truest of true believers” niche activity. Relationships with Community Composters cultivated productively over 30 years are suddenly severed. There is Mandatory to look forward to, with ticketing and fines on the horizon. None of these approaches have shown results in data points and proven outcomes. None are consistent with an ethics of care in public policy.^{viii}

We are in a new era of awareness of the catastrophic implications of Climate Change. Our communities are now threatened by flooding, heat, fires, and storm damage as never before. Lands needed to grow crops and build houses see soil erosion and fertility loss. Human and non-human health is taxed by accumulation of toxic substances in air, water, and ground. These and other features of Climate Change are linked with other concurrent ecological and social crises that unfold inequitably, cruelly affecting those without wealth and power the most. On some level, most of us feel anxious and uncertain about the future. The prospect is not rosy.

We must take a new path – and that path should be built with clean compost. This is no idealistic statement made without practical experience or direct stake. It is what most who work with organics and compost in NYC – within and outside City government -- already know. Compost heals and protects against current crises in complex, whole-greater-than-sum-of-parts fashion.

It is time to face the inefficiencies and inequities of the City’s now 10-year approach to Curbside Organics Collection honestly and without spin, competitiveness, punishment, or aggression. The situation can improve, but the way things have been done by the City must radically change.

Details

On Smart Bins

The return of the newly structured Curbside Organics Program for residents has been paired with an innovation in organics drop off – the Smart Bin. DSNY has not reported tonnages from these bins as such by DSNY on Open Data, although they are said to be included with School Organics collections posted on this site. School Organics collections today are about three times more than they were in 2019, the last full year of Curbside Organics Collection. Some of the increased tonnage that DSNY labels as “School Organics” comes from Smart Bin participation.

However, as welcome as these additional tonnages are, they do not make up for the underperformance in the residential Curbside Organics Program, because this Program, which serves all residences with one-time weekly collection in front of their door, aspires to collect the lion’s share of hundreds of thousands of tons of organics that are currently going out with trash. This is the Program that will be integrated with refuse and recycling collection, will occupy thousands of Sanitation workers and supervisors on daily routes, will serve all NYC residences, will lead to tickets and fines, and will entail complex logistical, cost, and labor-relations issues. As popular as they are with some New Yorkers, Smart Bins are supplementary to curbside collection, not meant to replace it.

This fact becomes evident when looking at the tonnages of potential, vs. actual, Curbside and School Organics Collections under various capture rate scenarios for the Borough of Queens. In the Figure below, the green bars show how the annual quantity of organics that could be collected in Queens under a 100%, 70% and 30% capture scenario. The orange and purple bars show actual capture in comparison. Citywide figures look similar, only three times larger.



Figure 1. Table 3. Data Source: DSNY Monthly Tonnages on Open Data; DSNY 2017 Waste Characterization. School Organics tons include an unknown portion of Smart Bin tonnages.

How to Test and Prove what Boosts Participation.

NYC citizens groups have been asking the City for 30 years to do more outreach and education. But what kind of outreach, what educational messages, and at what level of staffing and deployment? Is what sounds like a good idea really effective where it counts in terms of reducing disposal, diminishing contamination, or collection efficiency gains? Approaches have never been put to the test against measured performance in tonnages, capture rates, violations, or other measures.

DSNY must test outreach and education strategies in a quasi-experimental^{ix} framework. with enough time, staff, and resources devoted to meaningful outreach and education to begin with. Starting with several low- and high-density Queens District sections, DSNY should undertake periods of intervention, lasting no less than three solid months, with varying strategies by District or District Section.^x Such intervention may include, but must go beyond, periodic mass door knocking, direct mailers, and media advertising currently employed by DSNY. Given performance to date, these outreach methods have

not worked well enough. Shockingly, a quasi-experimental approach has never been tried in the 30-year history of recycling in NYC, much less its efforts at Curbside Organics collection.

Intervention strategies should be designed collaboratively with community representatives in each District, targeting not just organics but also paper/MGP recycling, textile reuse, e-waste collections, HHW diversion, and other Zero Waste programming. Collaboration and consultation must take sufficient time, and not be completed as a one-off set of public hearings. Collaboration and consultation should be planned and facilitated by individuals outside of DSNY but familiar to, and ideally part of, communities, rather than large consulting firms that serve the public sector generally. There is a clear need to take the time to design and refine outreach and education approaches in genuine dialogue with those familiar with community concerns. We need real input from multiple community-based organizations involved in community justice, safety, jobs, health, housing, as well as micro-scale organics hauling and onsite composting. Results of consultations must be documented and integrated into near, medium and long-range planning.

Comparison of pre- and post-intervention performance should be carried out at intervals, using metrics of capture rates, diversion rates, refuse tonnage reductions, and collection efficiency measures. Standard waste metrics may be paired with surveys of residential and building worker behaviors and opinions. Results should be posted publicly, accessibly, and in a timely fashion. This will cost money, and require staff, but DSNY already has the analytic and field capacity to do this type of assessment within its own ranks, as well as among its recently-severed partners in the NYC Community Composting sector.

If budgetary reasons prevent Performance Analysis and Program option development and testing, the City should be forthright about this and **should not substitute aspirational statements in place of proper analytics.**

Where do the Claims in this Document Come from?

All statements about tonnages, capture rates, enforcement rates, and other metrics are detailed in a Performance Analysis that accompanies this document, along with a full explanation of methodology.

Anyone can reproduce this work and put it to the test. The statistics reported here are derivable from knowledge of the tons per month of residential Curbside Organics and residential Curbside Refuse collected in Queens Districts, and Legacy Opt-In Districts. This information is published in the table called “Monthly Tonnages” on Open Data.^{xi}

Calculation of a capture rate also requires Borough-specific estimates of the percentage of Organics in refuse. Estimates here are taken from the 2017 Waste Characterization Study on DSNY's website. There is a more recent Waste Characterization Study to 2017, but it has not yet been released by DSNY.^{xii}

Numbers of households in a District come from the American Community Survey (ACS), a product of the U.S. Census, and the NYC Department of City Planning's attribution of 2021 ACS results to NYC Community Districts. For calculations before 2021, annual ACS values are used.^{xiii}

The calculations here would show lower Queens capture rates and per household organics generation rates than if presented on a straight annual basis, as opposed to an average monthly basis, because many years did not see 12 full months of Organics collection (e.g. 2022 and 2023). The calculations presented here look only at months in which Organics collection took place, and average monthly findings across the year for an annual number. In all instances, I have been conservative in criticisms of performance. Alternate, straight tonnage calculations will show lower capture rates.

Conflict of Interest

I have not been paid or funded by any party to write this Policy Brief. I am the sole author of this document and all content is my own. I sell no product, service, technology solution, or commodity. I do not stand to gain financially, I am not a consultant and have no plans to contract with the City. I am affiliated with no political party or politician. I am a retired NYC civil servant, and pro-bono Advisor to Earth Matter, a community composting organization formerly funded under the NYC Compost Project. I am a paid faculty member at Baruch College, Marxe School of Public and International Affairs.

Acknowledgements

I worked at DSNY as an analyst and manager between 1998 and 2012, and then again from 2015 to 2020. I worked at the NYC DEP's Bureau of Wastewater Treatment between 2020 and my retirement at the end of 2022. Prior to my departure from DSNY in 2020, I learned a great deal from the hard-working Sanitation supervisors, superintendents, and Chiefs with whom it was my privilege to serve. These uniformed staff understand Performance Analysis. They see the consequences of performance every day – they know it, they live it, they are experts. This expertise extends to dedicated, creative, quantitatively skilled civilian analytic staff in Bureaus that support DSNY's core functions, as well as in the DEP's Office of Energy and Resource Recovery. When it comes to data science as applied to waste statistics, they know what they are doing.

Today, I work at Baruch College of Public and International Affairs where I teach students who are vitally interested in the topics discussed in this Performance Analysis. Some graduates are now working in sustainability careers in City Government, including Mayoral offices and the City Council itself. I also do work supporting the Community Composting movement in NYC, and have learned a lot from hard-working people in this space who think about matters differently.

I thank those in NYC's long-historied Community Composting movement for the vitally important work they do. I am grateful to my former colleagues at DSNY and DEP for all that they taught me. I acknowledge the generous engagement with officials at Seattle Public Utilities, as well as faculty colleagues at Baruch whose input and comments have improved this document. I look to my students – who value transparency, accountability, justice, and the ethics of care – for inspiration in this uncertain world.

ⁱ City of New York. "Mayor Adams Announces Roadmap for Nation's Largest Compost Collection Program, Including Achieving Decades-Long Goal of Providing Curbside Service to Every New York City Resident", February 1, 2023, <https://www.nyc.gov/office-of-the-mayor/news/084-23/mayor-adams-roadmap-nation-s-largest-compost-collection-program-including-achieving#/0>

ⁱⁱ City of New York. "Mayor Adams Announces Roadmap for Nation's Largest Compost Collection Program, Including Achieving Decades-Long Goal of Providing Curbside Service to Every New York City Resident", February 1, 2023, <https://www.nyc.gov/office-of-the-mayor/news/084-23/mayor-adams-roadmap-nation-s-largest-compost-collection-program-including-achieving#/0>

ⁱⁱⁱ . New York City Department of Sanitation. "Notice of Adoption of Final Rule Regarding the Residential Collection of Designated Recyclable Materials to Require the Source Separation of Organic Waste," October 21, 2023, <https://rules.cityofnewyork.us/rule/requirement-of-source-separation-of-residential-organic-waste/>

^{iv} Howard, Hilary. December 1, 2023. "Composting's 'True Believers' Jilted as N.Y.C. Curbside Program Grows, New York Times

^v . see NYC Get Stuff Done. 2024, "Expanding Curbside Composting," <https://www.nyc.gov/content/getstuffdone/pages/curbside-composting>, accessed 2/18/24

^{vi} Gartland, Michael. "Mayor Adams hails faster compost process ahead of expanding program citywide," Daily News, January 4, 2024, n.p.

^{vii} City of New York. "Mayor Adams Announces Roadmap for Nation's Largest Compost Collection Program, Including Achieving Decades-Long Goal of Providing Curbside Service to Every New York City Resident", February 1, 2023, <https://www.nyc.gov/office-of-the-mayor/news/084-23/mayor-adams-roadmap-nation-s-largest-compost-collection-program-including-achieving#/0>

^{viii} . Pla-Julián, Isabel, and Sandra Guevara. "Is circular economy the key to transitioning towards sustainable development? Challenges from the perspective of care ethics." Futures 105 (2019): 67-77.

^{ix} .This is a form of Program Evaluation that replicates some of the experimental design aspects seen in laboratory research (control groups, statistical methods) but does not use randomization. It is common to use this method in public administration.

^x . The principles of Program Evaluation, including the structuring of quasi-experimental approaches to testing, are well known. These skills are part of graduate training in social sciences, education, and public administration. There are many forms that a quasi-experimental inquiry could take. As a conceptual illustration, below is one framework involving four District Sections, testing the individual and combined effect of Outreach and Enforcement on tonnage, with comparison to a control Section, as well as the test sections over past and future periods.

Quasi-Experimental Design Conceptual Framework				
		Test Year		
Month		7	8	9
Section 001	Outreach strategy 1			
	Outreach strategy 2			
	Pre-Enforcement Warning			
	Enforcement			
Section 002	Pre-Enforcement Warning			
	Enforcement			
Section 003	Outreach strategy 1			
	Outreach strategy 2			
Section 004 Control				

	One or More Past Years												Test Year				One or More Future Years											
Month	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	
Section	pre-measure						intervention									post-measure												
tonnages and violations are tracked weekly as a matter of course, no special effort needed																												
Helpful but not required: special measures such as surveys are taken in comparable months over a 3 year period. Special pre-measurement may be omitted, especially with geographic controls																												

An actual evaluation design would no doubt be different, but not difficult to develop.

^{xi} . New York City Department of Sanitation. February 8, 2024. "DSNY Monthly Tonnage Data", Open Data Portal.
https://data.cityofnewyork.us/City-Government/DSNY-Monthly-Tonnage-Data/ebb7-mvp5/about_data

^{xii} New York City Department of Sanitation. "Waste Characterization: Reports for 2017, 2013 and 2005", accessed January 20, 2024 at <https://www.nyc.gov/assets/dsny/site/resources/reports/waste-characterization>

^{xiii} NYC Department of City Planning. "Population: American Community Survey (ACS) Data Tables", accessed January 24, 2024, <https://www.nyc.gov/site/planning/planning-level/nyc-population/american-community-survey.page.page>