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Wasted Intuitions: New York City's Solid Waste Management System and the Ambiguous Effects of Traditional Collective Good Provision Analysis

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Abstract

Refuse Collection services' status as a public good has been highly contested. As it is both rivalrous and excludable, basic theory predicts that private provision of solid waste management services will be more efficient. Private trash carters are able to specialize in a way that municipality-run services simply cannot. New York City is unique in that its solid waste management system is rigidly split: residential trash is managed by the city; commercial trash is managed by private businesses. This thesis explores how New York City's public and private solid waste management systems complicate these initial intuitions through a welfare analysis. Price, wage, and operating efficiency are used to measure consumer, employee, and employer welfare respectively. New York City’s private refuse collection industry is characterized by weak unions, systemic bloat, and poor safety standards. Furthermore, they offer higher prices, lower wages, and are less efficient in comparison to their public counterpart. The city hopes to assuage some of these problems by creating Commercial Waste Zones.

Key words: Collective Good, Public Good, Solid Waste Management, Provision, Rivalrous, Excludable

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The optimal provision of solid waste management is a highly contested issue. While it is often provided publicly by municipalities, trash collection fails to meet either qualification of a public good; it is both excludable and rivalrous. Waste management services are excludable insofar as garbage trucks can choose which households' waste they collect. They are rivalrous insofar as garbage trucks are only able to service one household at a time. It is fairly easy to restrict access to refuse collection, and yet, despite this definitional failure, most governments are still interested in managing their citizens' waste. Doing so allows them to avoid negative externalities associated with not providing the service such as litter, illegal dumping, and general filth. It has been posited by Musgrave, Spann, Demsetz, De Alessi, Lindsay, and many others that, if efficiency is the principal concern, private provision of collective goods -- like refuse collection -- may be optimal (Bennett and Johnson 1). Private companies are incentivized to maximize profits in a way that government enterprises are not. Government services can afford to operate inefficiently because of their ability to recoup losses through tax revenue and the issuing of bonds. Private companies have no such recourse, and, as a result, are predicted to run more efficiently. If they continuously run at a deficit, they fail. Furthermore, when multiple private trash collection companies operate in the same area, they are expected to compete with each other. In theory, this should drive down prices for consumers and increase wages for employees. It would seem that the private provision of trash collection services results in universal welfare gains: consumers pay less; workers make more; companies run more efficiently. New York City's solid waste management system complicates all of these basic intuitions. The city-run waste collection program offers higher wages, lower prices, and functions more efficiently. In order to reconcile the competing narratives surrounding solid waste management's status as a public good, I employ a welfare analysis of the industry. I compare the differences in welfare realized by employers, employees, and consumers between New York City's private refuse collection service and its public counterpart using several different metrics. To measure employer welfare, I will look at differences in operating efficiencies between New York's public and private refuse collection companies; to measure employee welfare, I will look at differences in wages earned between publicly and privately employed sanitation engineers; to measure consumer welfare, I will look at differences in prices offered by both sides of the industry.

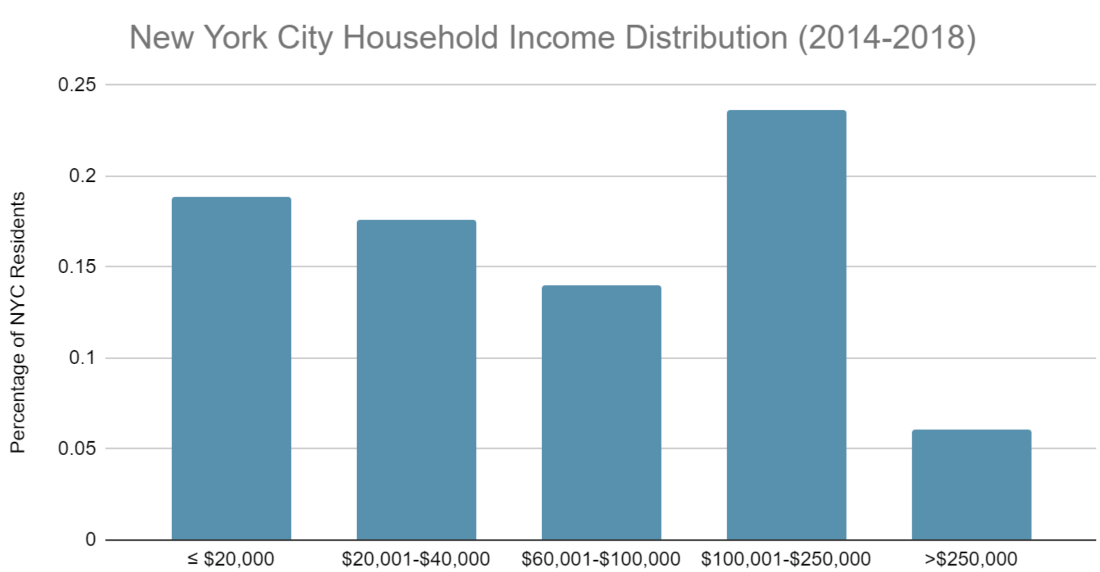
In what follows, I will introduce New York City, its five boroughs, and the unique structure of its solid waste management services. From there, I will move into my analyses of employer, employee, and consumer welfare. I will then discuss current issues and developments that pervade solid waste management at the system level in New York.

New York's solid waste management system is characterized by a split between residential and commercial trash pick up. Residential refuse is handled by the New York City Department of Sanitation (henceforth, DSNY). Private businesses are expected to use private trash carting companies to manage their waste. While households and businesses are not perfect analogues, few communities have such a rigid split between their public and private waste management services. In some cities unannexed neighborhoods cannot utilize public trash services while some businesses can. This makes New York City's strict residential-commercial divide incredibly valuable when trying to compare welfare between the two industries. The two sides are easy to isolate.

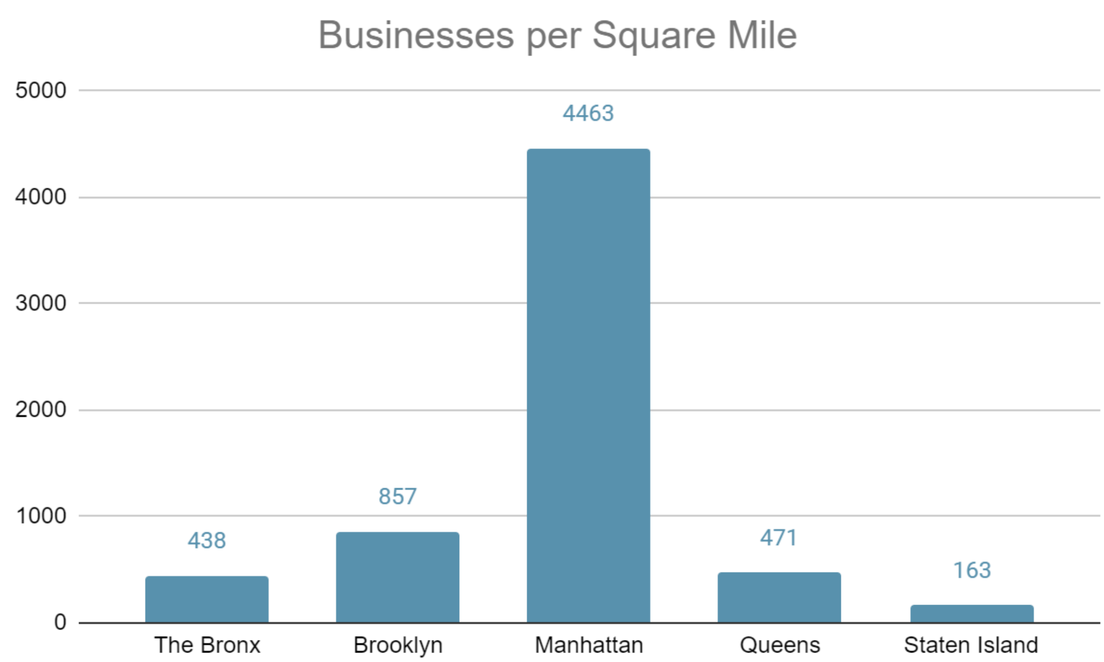
As of 2020, 8.8 million people reside in New York City's five boroughs (US Census Bureau). Of these 8.8 million, 2.7 million live in Brooklyn, 2.4 million live in Queens, 1.7 million live in Manhattan, 1.5 million live in the Bronx, and 0.5 million live in Staten Island.

These five boroughs are each coterminous with one of New York City's counties: Brooklyn with Kings County, the Bronx with Bronx County, Manhattan with New York County, Queens with Queens County, and Staten Island with Richmond County. While they all are a part of New York City, they are still very disparate. Brooklyn is home to more than five times as many people as Staten Island. Although Brooklyn and Queens are connected by a sizable land border, the other boroughs are, at least in some sense, separated. This distance is most clearly seen in Staten Island's connection to the rest of New York City. Transportation between Staten Island and Brooklyn (and consequently, to the rest of the boroughs) is limited to ferries and the Verrazano-Narrows Bridge.

The boroughs' differences are not purely geographical. Median rent differs significantly amongst them (Furman Center). Rent ranges from an average of $1,260 per month in the Bronx to $1,770 per month in Manhattan. Additionally, New York City residents' income levels vary wildly. While nearly a third of New Yorkers make more than six figures, 36.5% make less than $40,000 (Furman Center). These disparities in rent prices and income levels are suggestive of consumers' different price preferences.



Because of the residential-commercial split of New York City's solid waste management regime, business density becomes a key statistic. Increases in congestion, accidents, and commute times caused by the prevalence of garbage trucks will be further exacerbated in areas with high business density as more trucks will have to cover the same area. Here business density is defined as the number of employer enterprises per square mile. According to the U.S. Census Bureau, an employer enterprise is "a single physical location at which business is conducted or where services or industrial operations are performed." In Manhattan, with its numerous skyscrapers, there are approximately 4,463 brick and mortar businesses per square mile. In Staten Island, there are only 163 (U.S. Census Bureau).



This all points to the incredible statistical diversity of New York City's boroughs. Considering the incredibly disparate population sizes, income levels, median rent levels, and business densities amongst the boroughs, it is expected that private carting will thrive. Private carting companies can specialize to serve different communities better. Private carters are able to offer different prices to different consumers based on their income levels. Additionally, private carters can decide to not offer a particular service if their clientele does not require it. Private carters can also select their clientele. They can choose to only serve one area and one type of customer. If they only want to operate in Staten Island or in low-income neighborhoods, they can. They can choose which waste removal services they want to provide. If they do not want to offer electronics waste collection, yard waste collection, or medical waste collection they do not have to. These are luxuries that public waste management systems are not afforded. Their clientele must be the entirety of the municipality they are based in. They cannot discriminate in price, service, or location.

According to the Citizens Budget Commission (henceforth, CBCNY), DSNY and private carters spend a total of $2.3 billion annually on waste management. It costs DSNY $1.6 billion to deal with 3.8 million tons of trash whereas it costs private carters an estimated sum of $730 million to handle 4 million tons. This conundrum -- whereby private characters operating at smaller scales are able to collect more trash at a lower cost -- seems troubling. However, this inefficiency is a product of multiple effects. As mentioned earlier, government-operated entities are not incentivized to maximize profits and minimize costs in the same way that private businesses are. Additionally, the costs associated with public trash collection are offset by gains realized in employee wages and consumer prices.

Differences in welfare will be measured through three variables: operating efficiency, employee wages and benefits, and consumer price.

Salaries and wages differ greatly between public and private trash collection. In 2019 the starting salary for DSNY's sanitation engineers was $83,236. Every additional year a driver spends with DSNY their salary increases up to a maximum of $103,854 after five years (Office of Labor Relations). Furthermore, DSNY is also responsible for the city's snow removal. During the winter months, workers are asked (and often expected) to pick up overtime shifts that pay time and a half. Because of this, some sanitation engineers' salaries can approach $300,000 (Duffy). The private carting industry cannot compete with these numbers. Entry level sanitation engineers who are not employed by the state make on average $41,430; experienced collectors make $70,520 (Private Carting). Even more worryingly, some private trash carters make even less. "Helpers" -- the name given to workers who ride on the back of the truck -- are often paid by the shift. (Feldman). Many of these employees make less than $35,000 annually and are "off-the-books." As such, their employer does not offer them health insurance, a retirement plan, or overtime pay; they are particularly vulnerable to wage theft -- or to not being paid at all (Feldman). While some private carting companies do have unions, they are largely ineffective. They are characterized by wasteful spending -- with some of them using up to 45% of their healthcare funds for "administrative expenses" (Feldman). Some of these unions are not merely ineffective -- they are actively malicious. At some private carting companies, unions set starting pay just $0.25 above minimum wage. Such a wage looks less like the result of aggressive collective bargaining on the behalf of the employee and more like price collusion. In fact, private carting unions have actually caused wages to decrease over the past 30 years. As Feldman reports, "In 1985, a helper started out making $16 an hour. At #1 Waste in 2016, [drivers] made less."

DSNY employees are stipulated to receive payouts from the Sanitation Officers Security Benefit Fund and an annuity fund. They also receive a health care plan of their choice and may also choose to use a flexible healthcare spending account provided by the New York state government. Additionally, the families of DSNY employees will benefit from a special life insurance policy -- a sum of $25,000 -- if they die while carrying out the duties of their vocation. DSNY also guarantees its sanitation engineers nearly four weeks of annual leave. DSNY employees are able to rely on the sanitation engineers' union -- who originally argued for many of these benefits they now enjoy (DSNY). DSNY employees also have unlimited sick days and four weeks paid vacation (Feldman). No private trash carter can come anywhere close to supplying nearly as many benefits. While many large private carters do provide health insurance and pensions, they are not ubiquitous amongst the industry -- nor are they on the same scale as DSNY's benefits (Private Carting).

The difference in welfare realized by employees clearly favors DSNY. Wages, benefits, and security are all higher in the public sector than in the private sector.

New York does not charge a fee for residential refuse removal, nor does it levy an additional tax to pay for trash removal; DSNY is funded entirely out of the general tax fund (CBCNY). Because of this, households do not directly pay for waste management services in the way that residents of other states might. Additionally, DSNY provides other services (bins, recycling, electronics disposal) at no additional cost (CBCNY). However, conflating DSNY being funded by the general tax fund with a consumer price of zero is unsatisfactory. Trash removal and disposal costs New York approximately $500 per year per household. Since DSNY is run as a service, this cost can be used as a better stand-in for the price consumers pay. However, because tax paid varies with income, an annual fee of $500 is not identical with price. New York collected $80.7 billion of tax revenue in the 2019-2020 fiscal year (New York Department of Taxation and Finance). Of this, approximately $1.6 billion -- 1.98% -- was used to fund DSNY (CBCNY). The cost of trash services consumes a relatively small portion of the general tax fund. Most New Yorkers' taxable income is low enough that they will actually end up paying less than $500 for their yearly trash services.

Price is not standard across the private waste collection industry. However, New York's Business Integrity Commission caps the rate private charters can charge for their services at $20.76 per cubic yard of loose refuse and at $13.62 per 100 pounds of refuse. Whether a customer's price will be based on volume or weight is determined by negotiations between the business and the carter. While this is just a price ceiling, it is, at the very least, binding. Boro-Wide -- a prominent New York refuse collection company -- uses these prices as their baselines (Boro-Wide). In 2014, the rate cap was set to $18.27 and private customers paid an average of $12.68 per cubic yard. Since then, prices have increased significantly (Private Carting Study 42).

Putting New York's private and public prices for solid waste management in conversation can be difficult as they are based on different metrics. Private carting costs scale with either volume or weight. DSNY's costs are $500 per household per year, but how much a household actually pays is more analogous to 1.98% of their taxable income -- the portion of total tax revenue used to fund DSNY annually. In an effort to bridge the two, we can look at the pricing schemes of public waste collection in Los Angeles and Philadelphia -- two other populous cities. For weekly service of two three-cubic-yard bins one for general refuse and one for recycling), Los Angeles charges $281.65 per month (RecycLA). Assuming that there are four pick up days in a month, this equates to a maximum of twenty-four cubic yards of refuse and recycling being collected each month and a collection rate of $11.74 per cubic yard of refuse. At $281.65 per month, Los Angeles's pricing scheme is still more cost-effective than the New York private rate cap as long as a household produces at least fourteen cubic yards of trash per month. Philadelphia charges its citizens a flat fee of $500 per year for trash removal services; income and tax revenue do not factor in (City of Philadelphia). In order for this to benefit consumers more than the price cap that New York City's private carters are subject to, households need only produce an excess of 24 cubic yards of waste.

More than ninety carters operated within the city in 2018 (Garcia). Furthermore, some neighborhoods solicited service from more than fifty different trash pick up companies (CWZ A Plan). Compared to the public sector -- wherein only one trash service operates (DSNY) -- this is incredibly inefficient. Businesses are incentivized to choose the cheapest price for refuse collection, recycling, electronic waste, and for every other service they might need. Because no carting company can guarantee the lowest price on all of these, a single firm may employ several carting companies in the management of its waste. Doing so forces multiple carters to drive past the same business, needlessly congesting streets. Using multiple carting companies increases the number of man hours required to remove a business's trash. Even if a single business only employs one trash pickup company, its neighbors may still use differing services. This results in a similar inefficiency. Instead of stopping at every business on a street, a carting company may only pick up trash from one building. Other trucks from other companies will still have to drive their slow, cumbersome, fuel-inefficient trucks down this same stretch of road to service their customers. According to Feldman, "In one five-block stretch near Rockefeller Center… 27 garbage companies stop at 86 businesses." Conversely, a DSNY truck can stop at every residence along a street -- guaranteeing that traffic caused by waste removal is minimal.

Critics of New York's commercial trash management system have cited this saturation of carting companies (and garbage trucks) as a likely cause of the industry's flaws. The city reports that trucks controlled by commercial trash collection companies crash three times as often as those in West Coast cities like Los Angeles, San Francisco, and Seattle (More Dangerous).

Additionally, a higher percentage of crashes involving New York City's private carters end in a fatality -- a percentage that has increased in recent years (More Dangerous). From 2017 to 2018, private sanitation trucks were involved in 73 crashes -- five of which included fatalities (Unsafe Sanitation 6). In the same period -- and for the three preceding years -- DSNY trucks only had one fatal accident. At the base level, the goal of any private carter is to make a profit. Because of this, speed becomes their primary concern. If it takes 14-hour shifts, running red lights, and various maiming of employees to accelerate the process, so be it (Feldman). Ironically, this dogged prioritization of speed slows them down and costs them more. It causes their vehicles to wear down faster, and, in tandem with their desire to maximize profits, keeps worn down vehicles on the road longer. Of safety inspections of private garbage trucks conducted in 2017 and 2018, 67% resulted in at least one violation (Unsafe Sanitation 1). The most common infraction was malfunctioning brakes (Unsafe Sanitation 5)

The origins of these commercial waste problems can be traced back to 1957 when New York City decided -- seemingly overnight -- that they were no longer interested in providing trash collection services for businesses; the mafia took over in the city's absence (Feldman). Things quickly moved downhill from here. The different carters began to engage in collusion in order to keep prices high. This era of New York trash involved bid-rigging, firebombing garbage trucks, and a severed head of a dog (Feldman). As recently as 2012, the New York City Business Integrity Commission had to prevent a private carter from employing a convicted drug trafficker as their sales representative (Feldman). While most of the mobsters were disbarred from the industry in the 90s, many of their businesses are still controlled by their children and spouses. The industry is still plagued by relics of this age. New York City's private carting business has weak unions, poor safety standards, and is racked by bloat.

In 2019, in order to assuage the difficulties posed by the city's unique private pickup provision problems, Mayor de Blasio ratified a bill that will establish "Commercial Waste Zones" throughout New York's boroughs (DSNY). The program plans to split the city into twenty distinct zones wherein no more than three trash pickup providers can operate within a single zone. DSNY asserts that this will eliminate fifty percent of the traffic that stems from commercial waste collection. Carting companies have since been asked to submit bids for control of different zones. The window for these submissions will close on July 15, 2022. While reducing the number of active private refuse collection companies within a given area will reduce traffic, emissions, and bloat, it is unclear how the industries consumers and employees will fare. If the basic intuitions about collective goods are to be trusted, the decrease in competition will cause average prices to rise and wages to fall. However, because of the rate cap and poor wages that define the industry, it is unclear how much more these conditions can worsen.

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