City of Chicago

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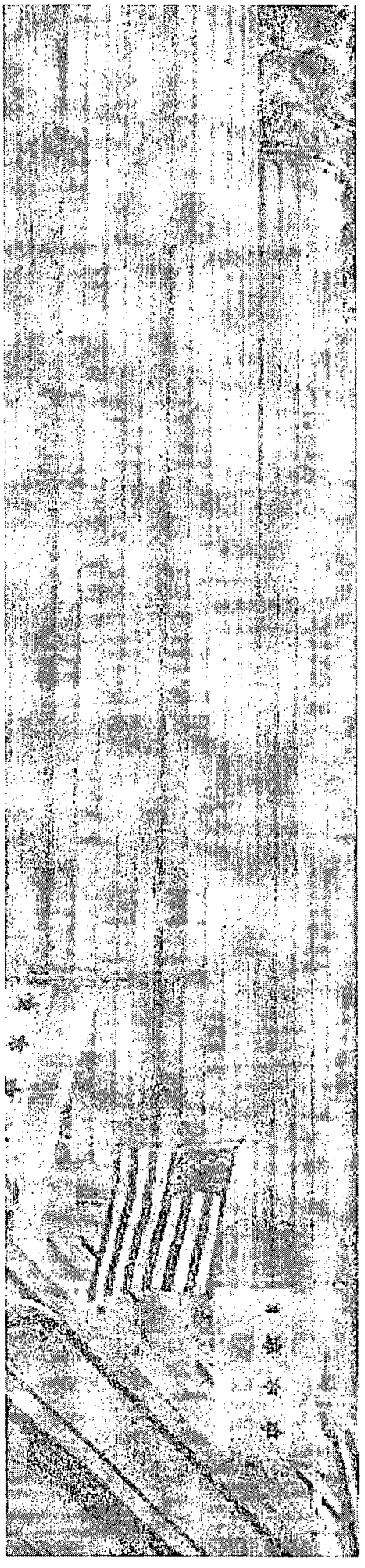

OFFICE OF INSPECTOR GENERAL
City of Chicago

REPORT OF THE OFFICE OF INSPECTOR GENERAL:

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DEPARTMENT OF STREETS AND SANITATION GARBAGE COLLECTION PERFORMANCE MEASUREMENT AUDIT

APRIL 2015

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Joseph M. Ferguson
Inspector General

April 24, 2015

To the Mayor, Members of the City Council, City Clerk, City Treasurer, and residents of the City of Chicago:

The City of Chicago Office of Inspector General (OIG) has completed an audit of the Department of Streets and Sanitation's (DSS) ability to measure performance of and exercise quality control over garbage collection operations. In this audit, OIG assessed garbage collection performance across all service areas (hereafter "divisions"); evaluated DSS's processes for measuring performance of garbage collection; and reviewed DSS's quality control policies that govern garbage collection operations and personnel.

This audit comes at a time of significant operational changes for City garbage service. In April 2013, DSS completed its transition from a ward- to grid-based garbage collection system which, according to DSS management, increased the efficiency of garbage collection operations. Following these improvements, DSS has also stated its commitment to further optimizing its garbage collection service. Notably, DSS plans to improve the system by adjusting collection routes and grid boundaries in spring 2015.

OIG concludes that gaps in DSS performance measurement impede the Department from achieving its goal of optimizing the garbage collection system. Specifically, our review of the Bureau of Sanitation's data, including GPS records, found that DSS does not measure all garbage collection operations and does not know the number of garbage carts that require City service in each division. OIG also found that DSS does not optimally allocate the number of alleys to garbage collection routes or staff resources across divisions. These findings have operational implications not just for the Bureau of Sanitation but across the Department. In response to OIG's analysis of GPS data, DSS acknowledged that an over-allocation of crews to the Bureau of Sanitation divests other Bureaus, namely Forestry, of its optimal number of crews, limiting its productivity.

OIG commends DSS for formalizing and implementing employee management policies for garbage collection, in the form of DSS Order 14-001. However, OIG found that the Order establishes a process that did not provide reasonable assurance of compliance with all of the Order's goals. OIG recommends that DSS update the Order by clarifying the supervisory responsibilities of Division Superintendents and by specifying procedures that provide reasonable assurance of compliance with the Department's lunch break guidelines for laborers.

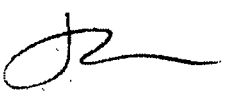
DSS agreed with all the findings of this audit and stated that it would take specific corrective actions to address deficiencies. In order to address the gaps in performance measurement, DSS plans to take a series of actions to review all garbage collection activity and optimally allocate

crew resources across divisions. The Department stated that it will revise its Quality Control Order to require that all tasks and assignments are accurately reported on truck sheets and that management regularly conducts random audits of this information. In efforts to better allocate crew resources, the Department stated that it is currently working to adjust collection routes and is in the process of conducting a full inventory of garbage and recycling carts. The Department has also revised its time per alley performance standard to reflect current performance levels and will continue to regularly review this standard.

To address gaps in supervision, DSS plans to create an addendum to its Quality Control Order. The Department stated that the addendum will clarify the Department's expectations for all levels of field supervision, including their use of GPS data and field observations to monitor crew performance.

We thank DSS management and Bureau of Sanitation staff for their full cooperation during this audit.

Respectfully,



Joseph M. Ferguson
Inspector General
City of Chicago

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Acronyms

DOIT	Department of Innovation and Technology
DSS	Department of Streets and Sanitation
GPS	Global Positioning System
MTD	Motor Truck Driver
OIG	Office of Inspector General
RCC	Refuse Collection Coordinator

I. EXECUTIVE SUMMARY

The Office of Inspector General (OIG) conducted an audit of the Department of Streets and Sanitation's (DSS) ability to measure performance of and exercise quality control over garbage collection operations.

This audit comes at a time of significant operational changes for City garbage service. In April 2013, DSS completed its transition from a ward- to grid-based garbage collection system which, according to DSS management, increased the efficiency of garbage collection operations. These efficiencies include a reduction in the daily average number of garbage trucks required for garbage collection and the corresponding reductions in fuel, maintenance, and repair costs. Finally, in March 2014 DSS introduced Order 14-001, which formalized employee management control protocols. DSS also has stated its intention to further improve grid system collection by adjusting grid boundaries and routes in spring 2015.

The objectives of this audit were to determine if DSS,

1. achieved its stated goal of "balanc[ing] refuse collection resources and geography to ensure maximum utilization of resources;"[1] and
2. ensured effective supervision and quality control over garbage collection operations.

OIG concluded that DSS is not fully equipped to achieve its goal of maximizing resource utilization because it does not measure all garbage collection operations. Specifically,

- DSS lacks data needed to accurately quantify its customer base, including the number and location of households and carts it services;
- DSS lacks data needed to capture all collection field activities, including work done outside of normal routes; and
- DSS's performance standards are not aligned with current work levels. OIG analyzed garbage collection data from summer 2014 and found that DSS did not assign enough alleys per route for crews to meet its expectation that they spend at least 300 minutes per day on their assigned collection routes. In addition, DSS's expectation that crews complete each alley in 40 minutes or less did not reflect current operations and should be recalibrated.

OIG also concluded that while Order 14-001 was an important administrative achievement for the Department, the supervisory process established in the Order does not provide reasonable assurance of compliance with all of the Order's goals. OIG recommends that DSS gather and analyze more complete garbage collection data and that it amend the Order to address supervisory gaps.

The specific recommendations related to each finding, and management's response, are described in the "Audit Findings and Recommendations" section of this report.

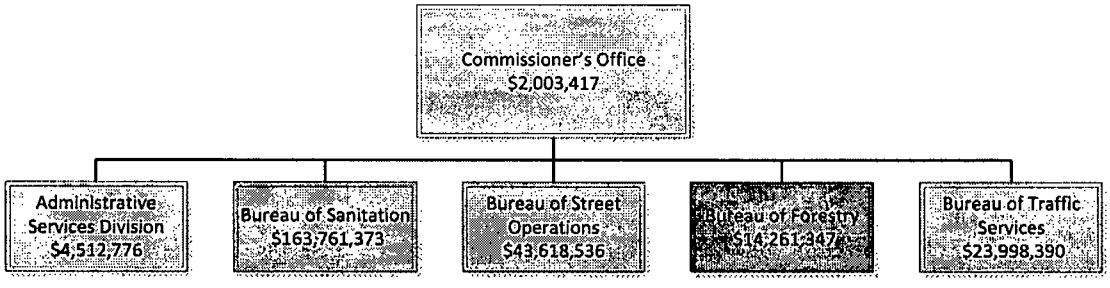
[1] DSS management expressed its goals for the garbage collection system to OIG in correspondence between the departments during the audit.

II. BACKGROUND

The City of Chicago defines DSS's core operations as follows:

> DSS collects recycling and disposes of residential refuse; sweeps city streets; removes graffiti; cleans vacant lots; coordinates the towing of illegally parked vehicles; enforces sanitation ordinances; abates rodents; and plants and trims trees.[2]

For FY2014, the City appropriated a total of $252,155,839 to fund DSS operations, with the following allocations to the Department's five bureaus:[3]



A. Bureau of Sanitation

The Bureau of Sanitation, which receives the largest appropriation of DSS's five bureaus, is responsible for the City's residential garbage collection service. The Bureau's duties are publicly listed as follows:[4]

- Collecting residential garbage;
- Operating the City's Blue Cart Recycling Program;
- Providing technical assistance and support for the City's recycling initiatives;
- Providing assistance for the development of city-wide waste reduction and management programs and policies; and
- Coordinating street sweeping efforts for city main streets and side streets.

The Bureau of Sanitation provides weekly garbage collection service for approximately 600,000 residential households.[5] Owners of commercial, industrial, and larger residential structures do not receive collection service from the City, and are instead required by law to arrange private

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[2] City of Chicago, Office of Budget and Management, "2014 Budget Overview," 111, accessed April 20, 2015, http://docs.chicityclerk.com/budget/2014-budget/2014-budget-overview.pdf.
[3] City of Chicago, Office of Budget and Management, "Annual Appropriation Ordinance for Year 2014," 15, accessed April 20, 2015, http://www.cityofchicago.org/content/dam/city/depts/obm/supp_info/2014%20Budget/2014ordinance.pdf.
[4] City of Chicago, Department of Streets and Sanitation, "Sanitation and Waste Reduction," accessed April 20, 2015, http://www.cityofchicago.org/city/en/depts/streets/provdrs/streets_san.html.
[5] City of Chicago, Department of Streets and Sanitation, "Residential Garbage," accessed April 20, 2015, http://www.cityofchicago.org/city/en/depts/streets/supp_info/residential_garbage.html.

garbage service.[6] City garbage trucks collect standard household garbage that residents place in City-provided 96-gallon black carts.[7] Garbage collection is intended for standard refuse, not construction waste, hazardous materials, or recycling.[8]

DSS operates garbage trucks and a few split-body trucks that collect both garbage and recycling.[9] The trucks typically are staffed by one motor truck driver (MTD) and two laborers. Each truck is assigned to one of DSS's eight yard lots.[10] Generally, laborers and drivers report to work at the yard lots and receive their daily assignments before leaving for preset routes. Laborers are shuttled separately to and from each route by field managers, called Refuse Collection Coordinators (RCCs). RCCs also supervise the laborers and MTDs to ensure routes are completed and staff are active throughout the work day.

B. Transition from Ward- to Grid-Based Garbage Collection

Between June 2012 and April 2013, DSS transitioned from a ward- to a grid-based garbage collection system. Garbage collection is now managed under 9 geographic divisions rather than 50 wards, and collection routes are aligned with main streets and natural boundaries rather than political boundaries.[11]

DSS stated to OIG that the change from a ward- to a grid-based system has produced the following benefits:

- greater operational efficiency resulting from garbage collection routes aligned with main streets and natural boundaries as opposed to the non-linear, political boundaries of the former ward-based collection system;
- more strategic distribution of yard lots, trucks, and staff across the city;
- reduced daily average number of garbage trucks on city streets from 352 before the transition to 310 in 2014. This reduction in trucks also corresponds to reduced fuel, maintenance, and repair costs; and reduced need to "loan in" employees from other DSS

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[6] City of Chicago, Department of Streets and Sanitation, "Sanitation Code Violation," accessed April 20, 2015, http://www.cityofchicago.org/city/en/depts/streets/provdrs/streets_san/svcs/sanitation_ordinance.html.

[7] City of Chicago, Department of Streets and Sanitation, "Refuse Containers or Garbage Carts," accessed April 20, 2015, http://www.cityofchicago.org/city/en/depts/streets/provdrs/streets_san/svcs/roll-out_refuse_carts.html.

[8] City of Chicago, Department of Streets and Sanitation, "Household Hazardous Waste and Electronic Recycling," accessed April 20, 2015, http://www.cityofchicago.org/dam/city/depts/doe/general/RecyclingAndWasteMgmt_PDFs/MultiUnit/FactSheet_HHWandECycling.pdf; City of Chicago, Department of Public Health, "Construction and Demolition Debris Recycling," accessed April 20, 2015, http://www.cityofchicago.org/city/en/depts/cdph/supp_info/environmental_permitsandregulation/construction_anddemolitiondebrisrecycling.html.

[9] The Bureau of Sanitation, in collaboration with two private refuse collection companies, also provides residential recycling service. City of Chicago, Department of Streets and Sanitation, "Blue Cart Schedule and Maps," accessed April 20, 2015, http://www.cityofchicago.org/city/en/depts/streets/supp_info/recycling1/blue_cart_schedulesandmaps.html.

[10] The City's grid-based garbage collection system consists of nine divisions. However, DSS does not operate a lot specifically for the Central Business District division as it is comprised primarily of commercial properties that are not eligible for City garbage service.

[11] See Appendix A for a map of the nine divisions.

bureaus. For example, in 2010, the Bureau of Sanitation loaned in 5,665 laborers and 2,615 motor truck drivers. After implementing the grid in 2013, the Bureau of Sanitation loaned in 699 laborers and 365 drivers, saving over 57,700 labor hours that were instead used for services such as tree trimming and rodent baiting.[12]

DSS management also explained that, with the transition now complete, there are opportunities to further improve grid-based collection operations and it intends to adjust grid boundaries and collection routes in spring 2015. In correspondence with OIG, the Department stated that its goals for the grid system are to "balance refuse collection resources and geography to ensure maximum utilization of resources" and "provide residents with best possible services."

C. Garbage Collection Performance Data and Data Monitoring

To monitor its performance,[13] the Bureau of Sanitation uses various data collection instruments, described below, and outlines quality control protocols in DSS Order 14-001.

1. Truck Sheets

MTDs are responsible for completing their crews' truck sheets over the course of their daily route assignments.[14] A truck sheet is a written record of the activities and logistics of a garbage collection route. This includes the assigned MTD, laborer(s), RCC, route mileage, garbage tonnage, fuel usage, lunch and personal break times, alley times, route times, and in-between load and post-route assignments.[15] Division staff sends the completed truck sheets to Department headquarters for review and storage, typically within 24 hours of crews completing their routes. At headquarters, staff periodically reviews truck sheets for completeness.

The Department does not electronically input truck sheet data, so DSS is not able to systemically compile or analyze the information contained therein. DSS stated that it is currently working with the Department of Innovation and Technology (DOIT) to digitize the truck sheet filing process; however, at the time of this audit report, that project is ongoing.

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[12] This list summarizes statements DSS made to OIG during the course of the audit. OIG did not verify DSS's savings claims as these claims were outside the scope of this audit.

[13] Broadly, performance measurement refers to "the ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals...typically conducted by program or agency management." U.S. Government Accountability Office, "Performance Measurement and Evaluation: Definitions and Relationships," May 2005, accessed April 20, 2015, http://www.gao.gov/assets/80/77277.pdf.

[14] See Appendix B for truck sheet template. The current version of the truck sheet was adopted in conjunction with DSS's transition to the grid-based collection system.

[15] In-between load assignments include the work laborers perform when the truck travels to a dump site. During this time, laborers perform tasks that include cleaning and sweeping alleys and lots, as well as "pulling alleys," in which laborers prepare the alley for upcoming garbage collection. Crews conduct post-route assignments when they finish their routes. Assignments may include similar tasks to in-between load assignments as well as emptying public garbage baskets along main streets.

2. GPS Data

City garbage trucks are outfitted with Global Positioning System (GPS) equipment that captures the following information for each route: total travel distance, time spent in each alley,[16] total route time, and times the truck is stopped. At the yard lot, Division Superintendents conduct daily "spot checks," comparing truck sheets with GPS reports for a small number of their crews to identify any discrepancies between the two records.

DSS management has used GPS data to conduct what the Department refers to as "efficiency audits"— assessments of RCC, MTD, and laborer compliance with field protocols. For example, in recent assessments, DSS identified discrepancies between truck sheets and GPS reports related to the times reported for personal breaks (15-minute breaks referred to as "10-7s") and lunch breaks (30-minute breaks) as well as laborers not wearing required safety gear.

In addition to Division Superintendents' "spot checks" and management's "efficiency audits," DSS runs weekly and monthly reports based on GPS data to identify possible crew performance issues as well as any broader, operations-wide inefficiency. For example, in two of its weekly reports, DSS assesses crew compliance with the Department's 300-minute time in alley and 40-minute time per alley standards, defined below:

- The 300-minute time in alley standard reflects DSS's expectation that crews should spend at least 300 minutes (or five hours) of their workday clearing their assigned route alleys. The 300-minute time in alley standard seeks to account only for a crew's garbage collection in their assigned alleys, exclusive of time for travel, personal and lunch breaks, curb routes, and post-route assignments.
- The 40-minute time per alley standard reflects DSS's expectation that crews should clear each assigned alley in 40 minutes or less.[17]

3. RCC Activity Sheets

In accordance with DSS Order 14-001 described below, RCCs are required to conduct twice-daily inspections of each of their assigned crews and document each inspection on an RCC activity sheet.

4. Garbage Tonnage Reports

DSS management monitors electronic reports from each of its contracted dump sites that identify each truck, the time it arrived at and left the dump site, and the tonnage of garbage dumped.

[16] Time spent in each alley is the Department's measure of the time it takes for a crew to collect all garbage in an alley. A garbage pick-up route is comprised of several alleys. Alleys are a generic metric that are not uniform in length. The Department refers to garbage collection for constituents without alleys as "curb routes."

[17] DSS management stated that some years ago the Department had calculated the average time per alley and found that 40 minutes was one standard deviation above the mean. DSS management could not state exactly when they last performed this calculation.

5. 311 Complaint Data

DSS management reviews Sanitation-related 311 complaint data on a routine basis to identify potential crew performance issues such as missed garbage pickups.

6. Order 14-001

On March 27, 2014, DSS issued Order 14-001 (hereafter "the Order") that formalizes goals for what it refers to as "efficient quality control" within the Bureau of Sanitation to include:

a) ensure employees proceed directly to the assigned work site;

b) ensure employees are wearing the required safety equipment;

c) ensure all refuse items are picked up at the assigned work site and the alley or street is "clean";

d) ensure all 10-7 breaks are reported via the radio and are kept strictly to a maximum of 15 minutes for the use of facilities;

e) ensure all lunch breaks are reported via the radio and kept to a maximum of 30 minutes;

f) ensure 10-7 breaks are never taken in conjunction with lunch breaks;

g) ensure refuse trucks do not congregate in areas prior to the start or end of a work shift;

h) ensure laborers have appropriate in between load assignments and they are listed on the RCC daily activity sheet each day; [and]

i) ensure all the enumerated duties and requirements listed within this order, as well as listed within all City and Department orders, are properly supervised and enforced by Refuse Collection Coordinators (RCCs).[18]

To achieve these goals, the Order establishes specific supervisory responsibilities for the following positions, listed here in descending order of responsibility:

- Managing Deputy Commissioner
- Division Superintendents
- Assistant Division Superintendents
- RCCs

These responsibilities are described in Finding 2 and Appendix C of this report.

[18] This is an excerpt from DSS Order 14-001. See Appendix C for the full text.

III. OBJECTIVES, SCOPE, AND METHODOLOGY

A. Objectives

The objectives of the audit were to determine if DSS,

- achieved its stated goal of "balanc[ing] refuse collection resources and geography to ensure maximum utilization of resources;" and
- ensured effective supervision and quality control over garbage collection operations.

B. Scope

In this audit, OIG reviewed the Bureau of Sanitation's garbage collection operations between April and August 2014 and accompanying performance measurement processes. OIG also reviewed the quality control responsibilities of Bureau of Sanitation staff as defined by DSS Order 14-001, specifically the positions of Managing Deputy Commissioner, Deputy Commissioner, Division Superintendent, Assistant Division Superintendent, RCC, MTD, and laborer.

OIG did not review the Bureau's recycling service, contracted garbage dump operations, or street sweeping. With respect to the management structure of Bureau of Sanitation staff, OIG did not evaluate the positions of Ward Superintendent[19] or Field Sanitation Specialist.[20]

C. Methodology

For the first objective, OIG analyzed the Bureau's GPS data to assess the performance of the system across eight divisions during non-holiday weeks, Monday through Friday, between April 14, 2014, and August 1, 2014.[21] OIG excluded from this analysis GPS data from the Central Business District division because the division is comprised primarily of commercial properties that are not eligible for City garbage service. OIG interviewed DSS management and DOIT staff regarding the Bureau of Sanitation's processes for data collection and analysis.[22] Through interviews, OIG also documented DSS's plans to improve the efficiency of the garbage collection system by adjusting grid boundaries and collection routes in spring 2015.

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[19] While Ward Superintendents perform garbage collection-related duties, they also perform several duties unrelated to garbage collection (e.g., liaise between aldermanic offices and City departments, respond to 311 complaints, and issue citations). Order 14-001 does not enumerate any quality control responsibilities for Ward Superintendents Therefore, an evaluation of the role of Ward Superintendent was outside the scope of this audit.

[20] Field Sanitation Specialist (FSS) is a newly-created position, and, during the fieldwork stage of this audit, a FSS had yet to be assigned to each division. Order 14-001 does not enumerate any quality control responsibilities for FSSs. Therefore, an evaluation of the role of FSS was outside the scope of this audit.

[21] DSS management stated that garbage collection data gathered during holiday weeks are generally not representative of a typical week as shortened work weeks skew alley times. Moreover, DSS management explained that summer months represent typical operations as they are unaffected by winter weather.

[22] OIG assessed the reliability of the GPS data by interviewing DSS and DOIT employees knowledgeable about the data. OIG determined that the data were sufficiently reliable for the purposes of this report.

For the second objective, OIG reviewed DSS's quality control order, Order 14-001, and interviewed DSS management, Division Superintendents, and RCCs to assess staff compliance with and overall efficacy of the Order.

For both objectives, OIG conducted site visits and field observations of garbage collection operations in four of the City's nine garbage collection divisions.

D. Standards

We conducted this audit in accordance with generally accepted Government Auditing Standards issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

E. Authority and Role

The authority to perform this audit is established in the City of Chicago Municipal Code § 2-56-030 which states that the Office of Inspector General has the power and duty to review the programs of City government in order to identify any inefficiencies, waste, and potential for misconduct, and to promote economy, efficiency, effectiveness, and integrity in the administration of City programs and operations.

The role of OIG is to review City operations and make recommendations for improvement.

City management is responsible for establishing and maintaining processes to ensure that City programs operate economically, efficiently, effectively, and with integrity.

IV. FINDINGS AND RECOMMENDATIONS

Finding 1: Gaps in DSS's performance data and measurement significantly limit the Department's ability to measure performance in support of maximizing utilization of resources.

OIG found several gaps in DSS's performance measurement tools which limit the Department's ability to optimize the grid system.

DSS Lacks Data Needed to Accurately Quantify Its Collection Base

In order to achieve its goal of maximizing the use of its resources, DSS must first know the number of collection sites and operational units it must serve.

First, DSS does not track the actual number of sites it serves. The Department uses U.S. Census data from 2000 to approximate the number of households receiving City garbage collection service. The 2010 Census revealed substantial shifts in population and population density since the prior Census.[23] DSS's continued use of 15-year-old Census data does not reflect current household numbers and distribution.

Second, although DSS only collects garbage from City-provided carts, it does not track the total number of carts in service or their approved location. DSS initiated a cart inventory in January 2013 to count the number of carts and determine their location. However, at the time of this audit report, the cart inventory was not complete.

Without accurate data about its collection base, DSS cannot calculate basic measures of operational efficiency such as the City resources expended per cart or per household.

DSS Lacks Data Necessary to Capture All Activities in the Field

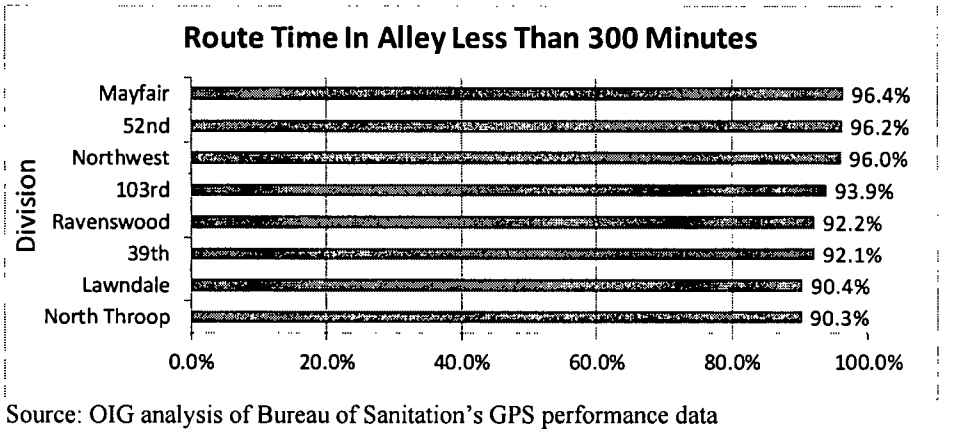
In order to maximize the use of personnel resources, DSS needs to measure all work that is performed in the field. However, DSS's GPS data collection misses some of the critical work performed by crews, including collection along curb routes, in-between load assignments like sweeping alleys, and post-route assignments such as emptying public garbage baskets along main streets. DSS captures information regarding this type of work only on truck sheets that are manually recorded in the field. In addition, as detailed in the Background section of this report, DSS does not collect and store truck sheet data electronically and therefore cannot systematically assess the data contained therein for comprehensive performance assessment.

[23] For U.S. Census data see http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. A comparison of the City's population changes between the 2000 and 2010 censuses is available on the City's website at http://www.cityofchicago.org/content/dam/city/depts/zlup/Zoning_Main_Page/Publications/Census_2010_Community_Area_Profiles/Census_2010_and_2000_CA_Populations.pdf (accessed February 20, 2015).

DSS Performance Standards Are Not Aligned With Current Work Levels

At the start of OIG's audit, DSS stated its intention to implement changes to increase the efficiency of the grid system. In spring 2015, DSS plans to adjust division boundaries and routes to more equitably distribute crews in order to "balance refuse collection resources and geography to ensure maximum utilization of resources." The Department's planned adjustments are informed by a variety of operations-related data, including GPS data and 2000 U.S. Census data. DSS management stated that adjusting grid boundaries will positively impact the Department's compliance with its 300-minute time in alley[24] and 40-minute time per alley standards.[25]

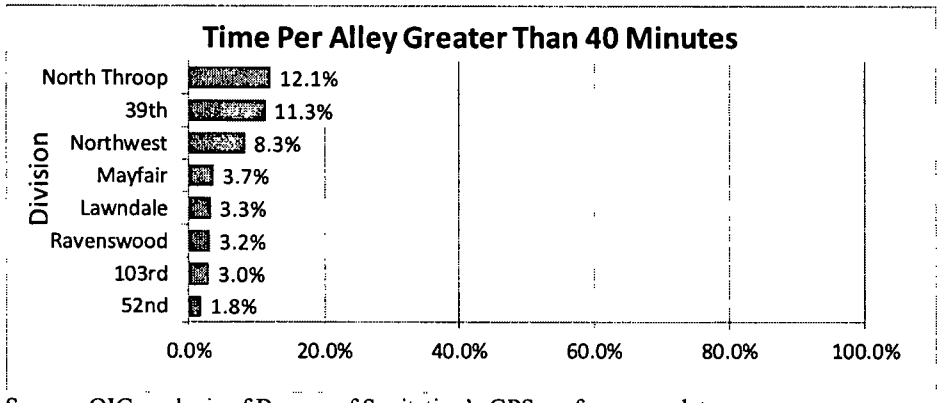
In this audit, OIG tested summer 2014 garbage collection operations using these metrics. OIG analyzed garbage truck GPS data to assess the performance of the system between April 14, 2014, and August 1, 2014, using the 300-minute and 40-minute standards.[26] We found that over 90% of crews across all divisions completed their assigned routes in less than the Department's 300 minute time in alley standard. In fact, OIG found that the average time in alley for all garbage collection crews was 185 minutes. We concluded that DSS did not assign enough alleys per route to fill 300 minutes. Therefore, according to its own metric, DSS may not be maximizing its use of available Bureau of Sanitation staff resources for grid system collection. In response to these results, DSS stated that it will consolidate some routes as part of its adjustments to the grid-based collection system in spring 2015.



Source: OIG analysis of Bureau of Sanitation's GPS performance data

In our analysis of GPS data related to the 40-minute time per alley standard, OIG found that the average time per alley was 22 minutes, and most divisions rarely exceeded the 40-minute maximum.

[24] As defined in the Background section of this report, the 300-minute time in alley standard reflects DSS's expectation that crews should spend at least 300 minutes clearing their assigned route alleys.
[25] As defined in the Background section of this report, the 40-minute time per alley standard reflects DSS's expectation that crews should clear each alley in 40 minutes or less.
[26] See Appendix D for the detailed results of OIG's testing.



Source: OIG analysis of Bureau of Sanitation's GPS performance data

We concluded that the 40-minute per alley threshold is not aligned with current field collection practices and performance. DSS does not routinely evaluate this standard to determine if it reflects current collection practices. DSS set the 40-minute standard an unknown number of years ago by measuring the average time per alley and determining that 40 minutes was one standard deviation above the mean. Using summer 2014 data, OIG calculated that one standard deviation above the time per alley mean was 32 minutes. As a result, DSS appears to be evaluating crews and operations based on a standard that is incongruous with field operations. This diminishes the standard's usefulness both for assessing crew performance and for optimizing grid operations. Given the limited time period that we analyzed, OIG has an insufficient basis to specifically suggest that DSS adopt 32 minutes. However, the eight-minute difference between our sample period and DSS's current yardstick demonstrates the importance of regularly re-evaluating the standard to correspond to changes in operations and/or environment over time.

Due to gaps in performance measurement data, DSS's current plan to adjust grid boundaries and routes may not achieve its goals for an optimized grid system. Without knowing the actual number of constituents served and without using relevant and current standards to assess all work performed by crews, DSS cannot know if it is efficiently allocating work assignments. As a result, divisions may remain unbalanced even after the Department's planned adjustments. In addition, these gaps limit DSS's ability to optimally allocate crews to each bureau (e.g., Sanitation, Forestry).[27]

Recommendation:

OIG recommends that DSS design and implement a performance measurement process that will enable it to meet its goal of "balanc[ing] refuse collection resources and geography to ensure maximum utilization of resources." To this end, OIG recommends that DSS,

- systematically assess data on garbage collection operations that are not captured by GPS, such as truck sheet records of curb routes, in-between load assignments, and post-route assignments;

[27] In response to OIG's analysis of GPS data, DSS acknowledged that an over-allocation of crews to the Bureau of Sanitation divests other Bureaus, namely Forestry, of its optimal number of crews, limiting its productivity.

- review the 40-minute time per alley performance standard on a routine basis to ensure that it is set relative to current performance levels;
- review the number of assigned alleys per route to determine appropriate route consolidation or modification of crew staffing levels to align assignments with the 300-minute time in alley standard; and
- more precisely measure the number of households and the corresponding number of carts that require City refuse service in each division.

Management Response:

- *"DSS crews complete numerous tasks each day in addition to collecting refuse in the alleys to keep Chicago's neighborhoods clean and vibrant. These activities include litter basket collection, lot cleaning, hand cleaning along main streets, and viaduct cleaning. These sanitation functions are an important component of the work performed by crews each day and should be recorded and reported on daily truck sheets in order to assess a crew's full scope of work. By collecting complete and accurate information through the truck sheets, DSS can better determine how to most effectively deploy resources across the city.*

  "DSS is issuing a revised addendum to the Quality Control Order (14-001) that will ensure every task, break, and assignment is captured on the truck sheets. Sheets will then be randomly audited using GPS records by the Division Superintendent with results and related action reported to the Deputy Commissioner. By accurately accounting for all time during the day and regularly auditing routes, Division Superintendents will be able to ensure maximum utilization of crews.

- *"The Department agrees with the importance of routinely reviewing the time per alley performance standard to ensure this measure reflects the realities of refuse collection and helps achieve maximum efficiency. The Department has calculated the average amount of time to complete an alley during the 2014 summer months (the heaviest season) with one standard deviation away from the mean for a new performance metric of 32 minutes per alley. Effective April 12, 2015, the Department is using 32 minutes as the performance measurement for time per alley. The Department will continue to adjust the time per alley performance metric moving forward to ensure the Bureau of Sanitation is using the most appropriate performance measurement tools.*

- *"It is important to note that the time in alley metric does not include daily work assignments like garbage collection along curb routes, litter basket collection, lot cleaning, hand cleaning along main streets, viaduct cleaning, in between load assignments, special collections, or emergency responses. It also does not account for travel time between alleys or assignments, authorized lunches or breaks, trips to the transfer station, or the start and end of the work day. These additional activities account for crews' 'out of alley time' each day.*

"Since the implementation of the grid garbage collection system, DSS has achieved significant efficiencies, including decreasing the average daily crew deployment from 352 to 310 trucks; increasing the average number of alleys serviced by a crew from 10 alleys to 11 alleys per day; and reducing the number of employees borrowed from other bureaus to support refuse collection operations, resulting in nearly 58,000 work hours now used to complete tasks such as rodent baiting and tree trimming.

"DSS believes that the initial gains achieved through the implementation of the grid system will continue to grow, and agrees that ongoing evaluation of performance measures and operations are key to realizing additional efficiencies and improving service. DSS is currently working to adjust routes to ensure that crews are spending even more time each day servicing alleys and are providing the best possible services to residents. DSS plans to make a series of adjustments to the grid system beginning in the spring of 2015 and continuing through the summer. Going forward, DSS will continue to adjust the grid as operations evolve and as more data, such as the inventory of the City's refuse and recycling carts, becomes available.

- *"Currently, the Department is in the process of conducting a full inventory of refuse and recycling carts to confirm the total number of carts each crew is servicing on a given route. This information will be used to determine the average amount of time taken to service a cart, which will inform future adjustments to the grid system. Additionally, DSS is working with the US Census Bureau to obtain updated Census data in a format that is compatible with DSS' Sanitation tracking system."*

Finding 2: The supervisory process established in DSS's "Quality Control" Order does not provide reasonable assurance of compliance with all of the Order's goals.

OIG found that, with one exception, supervisors complied with the process outlined in DSS's Quality Control Order. However, despite this compliance, OIG found that DSS staff did not meet all of the Department's goals regarding timely lunch breaks and appropriate in-between load assignments for laborers.

DSS Order 14-001 organizes quality control activities into three levels: "Department Quality Checks," "Division Quality Checks," and "Quality Checks." These levels correspond to the positions of Managing Deputy Commissioner, Division Superintendent, and RCC, respectively.

1. Department Quality Checks

OIG found that the Managing Deputy Commissioner complied with the Order by assigning staff to conduct random quality checks in each division. For example, the Managing Deputy Commissioner stated that he reviews Sanitation-related 311 complaint data, such as those related to missed garbage pickups, to identify potential crew performance issues and assigns administrative personnel to conduct Department Quality Checks accordingly. The Managing Deputy Commissioner stated that he communicates the results of the Division Quality Checks to the appropriate Division Superintendent via email, typically on the same business day. Division Superintendents confirmed that these Department Quality Checks occur and promote accountability among crews, RCCs, and Division Superintendents.

2. Division Quality Checks

Although the Managing Deputy Commissioner conducted Department Quality Checks in accordance with the Order, OIG found that he did not complete Division Quality Checks. Specifically, he did not assign random alleys or streets to be inspected by Assistant or Division Superintendents. OIG also found that the only explicit quality control responsibility defined for Division Superintendents in the Order is carrying out the Managing Deputy Commissioner's assigned Division Quality Checks. Without other quality control responsibilities defined for Division Superintendents in the Order, OIG observed that Division Superintendents employed varying and inefficient approaches to quality control.

OIG observed Division Superintendents inconsistently using GPS data as a crew performance monitoring tool. One Division Superintendent reviewed GPS data for all 48 crews in the division on a daily basis and compared each GPS report to the corresponding truck sheet. In contrast, another Division Superintendent only reviewed GPS data for one crew per day. In some cases, OIG found that Division Superintendents were duplicating the supervisory responsibilities that the Order tasks to RCCs.[28] For example, one Division Superintendent would observe the majority of crews while they were in the field in order to ensure safety equipment was worn and

[28] See Appendix C for RCC responsibilities as defined in DSS Order 14-001, Section II A.

alleys were cleared properly and then would sign the truck sheets, a task which the Order assigns to RCCs.[29]

3. Quality Checks

OIG found that RCCs generally comply with the Order's requirement to inspect at least two alleys per crew per day and review and sign each crew's truck sheet accordingly.[30] However, despite compliance with the Order's process, OIG found that limitations of GPS tracking and logistical challenges prevented RCCs from supervising laborers during lunch breaks and in-between load assignments.[31] Consequently, the Order's process does not provide reasonable assurance that laborers' lunch breaks are "kept to a maximum of 30 minutes" and that laborers "have appropriate in-between load assignments," hindering DSS's ability to ensure maximum productivity in a workday.

During interviews, Division Superintendents and RCCs in multiple divisions expressed concerns regarding possible abuse of the Department's 30-minute lunch break policy. According to one respondent, it is typical for the MTD to make the first trip to the dump then stop to take a lunch break en route to the next alley. DSS management explained that garbage truck cabs can only accommodate two people; therefore, DSS does not permit laborers to ride to the dump site in the cab with the MTD. Moreover, the RCC decides when the laborers take their lunch, which may or may not coincide with the MTD's lunch break—usually timed to the MTD's midday garbage drop off. The RCC makes this decision based on the timing of the other crews.

With respect to the timing of crew lunch breaks, an RCC stated that DSS policy is "not uniform in any way." One RCC explained that if the laborers' lunch break does not coincide with the MTD's lunch break, then the RCC is to ensure that laborers remain productive by assigning them to sweep and prepare alleys, among other in-between load assignments. However, an RCC reported having observed laborers getting "double" lunch breaks, once for their assigned 30-minute lunch and then another during the driver's 30-minute lunch. OIG also interviewed a Division Superintendent who stated that he/she ensures timely lunch breaks by instructing MTDs to drive with the laborers to the dump site, a directive that OIG found to conflict with the two-person capacity of the truck cabs.

OIG recognizes that management's "efficiency audits" and "spot checks"[32] may provide assurance that laborers' lunch breaks are "kept to a maximum of 30 minutes" and that laborers "have appropriate in-between load assignments" while drivers are at lunch or unloading trucks. However, DSS has not incorporated these protocols into the Order.

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[29] The Division Superintendent described these daily activities in an interview with OIG staff.
[30] See Appendix C for RCC responsibilities as defined in DSS Order 14-001, Section II A.
[31] See Background Section C of this report for definition of in-between load assignments.
[32] See Background Section C of this report for descriptions of DSS management's "efficiency audits" and Division Superintendents' "spot checks."

Recommendation:

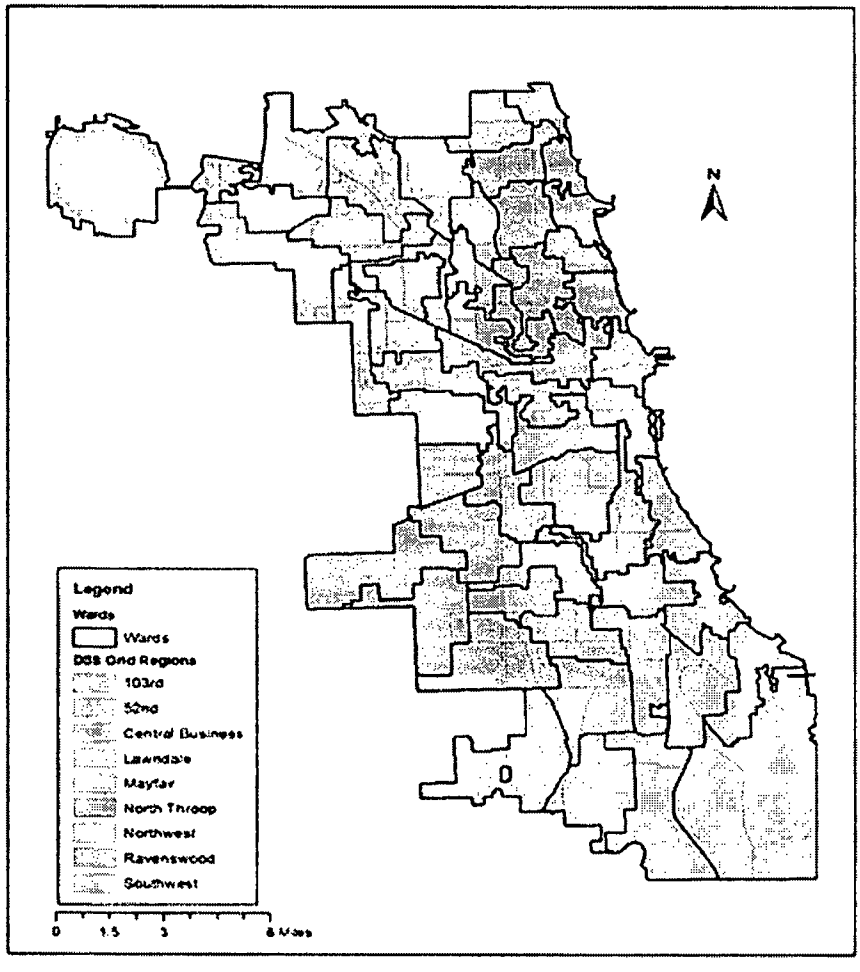
OIG recommends that DSS update Order 14-001 to clarify the Department's expectations for Division Superintendents' quality control responsibilities, including their use of GPS data and field observations to monitor crews. OIG also recommends that DSS address gaps in supervision by specifying procedures in the Order that provide reasonable assurance of compliance with the Department's lunch break guidelines.

Management Response:

"The Department is focused on maximizing taxpayer dollars to provide the highest quality services, and in order to achieve high quality delivery of service, effective field supervision at all levels with clear quality controls is necessary. As recommended by the OIG, DSS is creating an addendum to Order 14-001 to clarify the Department's expectations for quality control responsibilities, including supervision roles and regular use of supervisory tools. This order will further outline the roles of the supervisors and provide explicit guidelines for field supervision at all levels. The order will provide specific directives regarding regular audits of truck sheets, tighter supervision of breaks and lunches, more detailed accounts of work completed on truck sheets, and other operational areas."

V. APPENDIX A: MAP OF GRID-BASED DIVISIONS

OIG created the map below to depict changes in City garbage collection resulting from DSS's transition from a ward- to grid-based system.



VI. APPENDIX B: TRUCK SHEET TEMPLATE

This is an example of a truck sheet, which is the record of a Bureau of Sanitation crew's daily activities. It is manually completed by the crew's MTD.

DEPARTMENT OF STREETS AND SANITATION REFUSE COLLECTION DAILY LOG

Code: 1 - Accident 2 - Breakdown 3 - Dump Delay 4 - Traffic Delay 5 - Fuel Dump Delay 6 - Diversion

MAYFAIR **WEDNESDAY**

Day		Date	[redacted]
Truck Information	**Truck Number**	10241	
Fuel Received		**Gallons**		**Time In**		**Time Out**	
Starting Odometer		**Ending Odometer**		**Total Miles**	
Code		**Downed Location**		**Time Downed**	
Replacement Truck Number		**Replacement Truck Time**	

Crew Information

		Day		Approved Stop			Lunch		
Employee	**Title**	**Start**	**End**	**Start**	**Location**	**End**	**Start**	**Location**	**End**
[redacted]	MTD								
[redacted]	LAB								
[redacted]	LAB								

Basket Run/Between Loads Information

Basket Location		**Start Time**		**End Time**	
Between Loads		**Start Time**		**End Time**	

Route: Loading/Dumping Information

Grid	Unit	Route Type	Ward	Completed	Supv Initial	Grid	Unit	Route Type	Ward	Completed	Supv Initial
N036W040	8	A	30			N036W040	18AC	A/C	30		
N036W040	9AC	A/C	38			N036W040	19AC	A/C	30		
N036W040	8	A	38			N036W040	20AC	A/C	30		
N036W036	25	A	30			N036W040	21	A	30		
N036W036	26	A	30								
N036W036	27	A	30								
N036W036	19	A	30								
N036W036	18	A	30								
N036W036	28	A	30								
N036W036	29	A	30								
N036W036	17	A	30			Call in all 10-7/10-8 via Radio to RCC					
Total Number of Units Completed											

Dump Location - Circle One Medill Northwest Hooker Other:

Load	Load Time Start	Time Finished	Last Unit Comp.	MTD	Dump Arrival	Dump Departure	Weight
1							
2							
3							

End of Day Load Status - Please Check One	Empty		**Partial**		**Full**	

Remarks

Motor Truck Driver		**End of Day Arrival Time**	
Refuse Collection Coordinator	[redacted]	**Ward Superintendent**	

VII. APPENDIX C: DSS ORDER 14-001

CHICAGO DEPARTMENT OF STREETS & SANITATION

ORDER NO: 14-001

TITLE: QUALITY CONTROL

ISSUE DATE: 27 MARCH 2014

EFFECTIVE DATE: 27 MARCH 2014

DISTRIBUTION: BUREAU OF SANITATION

Efficient quality control is required for all organizations. The Department of Streets & Sanitation has always engaged in quality control but not to the extent which is now required with the restructuring of this Department.

Effective immediately, the following steps involving quality control will apply to the Bureau of Sanitation. Quality control measures for remaining Bureau's will be forthcoming.

I. PURPOSE

This Order:

A. Establishes a process to ensure the quality of work delivered by Streets & Sanitation personnel meets or exceeds written protocols to include; a) ensure employees proceed directly to the assigned work site. b) ensure employees are wearing the required safety equipment. c) ensure all refuse items are picked up in the assigned work site and the alley or street is "clean" d) ensure all 10-7 breaks are reported via the radio and are kept strictly to a maximum of 15 minutes for the use of facilities. e) ensure all lunch breaks are reported via the radio and kept to a maximum of 30 minutes. f) ensure 10-7 breaks are never taken in conjunction with lunch breaks.

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TITLE **QUALITY CONTROL**

g) ensure refuse trucks do not congregate in areas prior to the start or end of a work shift. h) ensure laborers have appropriate in-between load assignments and they are listed on the RCC daily activity sheet each day. i) ensure all the enumerated duties and requirements listed within this order, as well as listed within all City and Department orders are properly supervised and enforced by Refuse Collection Coordinator's (RCC"S)

II. Quality Checks

A. RCC's will inspect at least 2 alleys (or streets) for each crew they are assigned to supervise. This inspection will ensure all items of refuse were collected from within an assigned alley or street. (9 crews equals 18 alleys were inspected) RCC's will list the alleys inspected on their daily activity sheet. If the alley (or street) was not clean the RCC will also list what disciplinary action was initiated as a result of the alley (or street) not being cleaned.

B. RCC's will inspect the truck sheets for each truck they are assigned to supervise at least once during their shift. They will sign the truck sheet with the date and time inspected.

C. RCC's will monitor 10-7's and lunch breaks closely.

D. RCC's will ensure trucks completing their daily assignments are properly utilized for assisting other routes and baskets if time permits and trucks do not sit and congregate prior the start or end of a shift unless reporting to a checkpoint.

III. Division Quality Checks

A. The Managing Deputy Commissioner for the Department of Streets & Sanitation will assign random alleys, or streets to be checked by

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TITLE **QUALITY CONTROL**

Division personnel. These checks will be performed by the Assistant Division Superintendent, or the Division Superintendent. Results of these random checks, and the conditions found and any action taken will be emailed back to the Managing Deputy Commissioner with a cc for the 1st Deputy Commissioner for the Department of Streets & Sanitation and the Commissioner of the Department of Streets & Sanitation. These emails will be returned on the same day the assignment was received.

IV. Department Quality Checks

The Managing Deputy Commissioner for the Department of Streets & Sanitation will assign random quality checks for field personnel on a daily basis. The random checks will be conducted by supervisory exempt personnel. Results of these random checks, and the conditions found and any action taken will be emailed back to the Managing Deputy Commissioner with a cc for the 1st Deputy Commissioner for the Department of Streets & Sanitation and the Commissioner for the Department of Streets & Sanitation. These emails will be returned on the same day the assignment was received.

Charles L. Williams
Commissioner
Department of Streets & Sanitation

VIII. APPENDIX D: OIG ANALYSIS OF GPS PERFORMANCE DATA BY DIVISION

OIG analyzed the Bureau of Sanitation's garbage truck GPS data to assess the performance of the system across eight divisions during non-holiday weeks, Monday through Friday, between April 14, 2014, and August 1, 2014. The following tables present the detailed results described in Finding 1.

Table 1: 300-Minute Time In Alley Noncompliance Rates By Division

Division	Total # of Routes	Routes Completed in Less Than 300 Minutes		Average Time in Alley (minutes)
		#	%	
39th	2,317	2,135	92.1%	182
52nd	2,708	2,606	96.2%	185
103rd	3,107	2,918	93.9%	183
Lawndale	2,803	2,534	90.4%	210
Mayfair	2,615	2,521	96.4%	153
North Throop	2,237	2,019	90.3%	189
Northwest	4,243	4,074	96.0%	191
Ravenswood	2,086	1,923	92.2%	179
All Divisions	22,116	20,730	93.7%	185

Table 2: 40-Minute Time Per Alley Noncompliance Rates By Division

Division	Total # of Alleys	Alleys with Time Per Alley Greater Than 40 Minutes		Average Time per Alley (minutes)
		#	%	
39th	17,338	1,963	11.3%	24
52nd	25,311	467	1.8%	20
103rd	27,528	831	3.0%	21
Lawndale	28,517	927	3.3%	21
Mayfair	18,857	690	3.7%	21
North Throop	16,377	1,985	12.1%	26
Northwest	33,344	2,772	8.3%	24
Ravenswood	18,524	590	3.2%	20
All Divisions	185,796	10,225	5.5%	22

CITY OF CHICAGO OFFICE OF INSPECTOR GENERAL

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MISSION

The City of Chicago Office of Inspector General (OIG) is an independent, nonpartisan oversight agency whose mission is to promote economy, efficiency, effectiveness, and integrity in the administration of programs and operations of City government. OIG achieves this mission through,

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- audits of City programs and operations; and
- reviews of City programs, operations, and policies.

From these activities, OIG issues reports of findings, disciplinary, and other recommendations to assure that City officials, employees, and vendors are held accountable for the provision of efficient, cost-effective government operations and further to prevent, detect, identify, expose, and eliminate waste, inefficiency, misconduct, fraud, corruption, and abuse of public authority and resources.

AUTHORITY

The authority to produce reports and recommendations on ways to improve City operations is established in the City of Chicago Municipal Code § 2-56-030(c), which confers upon the Inspector General the following power and duty:

> *To promote economy, efficiency, effectiveness and integrity in the administration of the programs and operations of the city government by reviewing programs, identifying any inefficiencies, waste and potential for misconduct therein, and recommending to the mayor and the city council policies and methods for the elimination of inefficiencies and waste, and the prevention of misconduct.*