AUDIT REPORT

CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
BUREAU OF MANAGEMENT AUDIT
WILLIAM C. THOMPSON, JR., COMPTROLLER

Audit Report on the Performance of the New York City Department of Transportation's Pothole Repair Program

MJ02-119A

November 14, 2002

To the Citizens of the City of New York

Ladies and Gentlemen:

In accordance with the Comptroller's responsibilities contained in Chapter 5, § 93 of the New York City Charter, my office has audited the New York City Department of Transportation's performance in addressing pothole complaints within the agency's goal-related time frame. The mission of the Department of Transportation is to maintain and enhance the City's transportation infrastructure; its goals include the rehabilitation and maintenance of City bridges, tunnels, and streets. Our audit resulted in the findings and recommendations that are presented in this report. The findings and recommendations were discussed with City officials; their comments were considered in the preparation of this report.

Audits such as this provide a means of ensuring that City resources are used effectively, efficiently, and in the best interest of the public.

I trust that this report contains information that is of interest to you. If you have any questions concerning this report, please e-mail my audit bureau at audit@comptroller.nyc.gov or telephone my office at 212-669-8945.

Very truly yours,

William C. Thompson, Jr.

Report: **MJ02-119A**
Filed: **November 14, 2002**

The City of New York
Office of the Comptroller
Bureau of Management Audit

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EXECUTIVE SUMMARY

Background

The stated mission of the Department of Transportation (DOT) is to provide for the safe and efficient movement of people and goods in the City and to maintain and enhance the City's transportation infrastructure. DOT's goals include the rehabilitation and maintenance of the City's bridges, tunnels, and streets. Street defects fall under various categories, including potholes. The DOT Street and Arterial Highway Maintenance division (SAM) is responsible for repairing street defects.

Small defects (potholes), the focus of this audit, are generally identified in two ways: (1) through calls received from the general public at DOT's Call-In Center, and (2) by DOT work crews. All identified street defects are entered into DOT's MOSAICS[1] computer system. This information is tracked and reviewed by SAM on the Field Information Tracking System (FITS), a component of MOSAICS. For Fiscal Year 2002, the Mayor's Management Report (MMR) reported that DOT repaired 101,280 potholes citywide.

Objectives

The objective of this audit was to evaluate DOT's performance in completing pothole repairs within the agency's goal-related time frame. The audit also assessed the reasonableness of that time frame.

[1] Management Oriented Street Attribute Information Control Systems

Scope and Methodology

The audit scope covered Fiscal Years 2001 and 2002.

To assess the reliability of pothole repair information shown in FITS, we reviewed 1,788 open pothole repair orders from December 2000, April 2001, and May 2001. To gain an understanding of the procedures for repairing potholes, we interviewed DOT personnel, including the borough office managers and the SAM supervisors and crews. We also accompanied work crew teams from each borough during the period February–March 2002 to observe their daily work routines.

To determine whether DOT had any guidelines regarding timeliness for pothole repairs, we requested all such guidelines from DOT officials. We also reviewed the City's Administrative Code to determine whether it contained any guidelines related to timeliness for repairs of potholes and other street defects.

We requested a record of the number of potholes that were reported and repaired during Fiscal Year 2001, segregated by month. To determine DOT's timeliness in repairing potholes, we reviewed a random week's worth (five workdays) of reported potholes for each of three different months of Fiscal Year 2001.

We conducted our audit in accordance with Generally Accepted Government Auditing Standards (GAGAS) and included tests of the records and other auditing procedures considered necessary. This audit was performed in accordance with the New York City Comptroller's audit responsibilities as set forth in Chapter 5, § 93, of the New York City Charter.

Results in Brief

DOT lacks a useful standard for guiding its pothole repair operations and measuring its performance. DOT has an informal standard—to complete 65 percent of repair orders within 30 days—but this is used only for reporting purposes in the Mayor's Management Report (MMR). Therefore, DOT has no benchmark to guide its operations to help ensure that all potholes are repaired in a timely manner, and to ensure that pothole repair orders do not remain open for lengthy periods of time. In addition, even DOT's MMR-reporting standard ("to complete 65 percent of repair orders within 30 days") is flawed for several reasons. First, the 30-day component of that standard is arbitrarily set. DOT could give no operational reason for establishing a 30-day criterion, and in that context, a 15-day criterion would make just as much sense, since 15 days is the time standard that determines whether civil lawsuits related to potholes can be brought against the City. Second, the standard fails to account for the remaining 35 percent of the pothole repair orders, and how long they take to complete. As a

result, when DOT reports its performance, the agency misrepresents it in terms of the overall timeliness of all repairs.

As far as actual performance is concerned, we took a sample of 1,788 pothole repair orders and concluded that DOT completed 1,774 (99%) of them in 57 days on average. (The remaining 14 were still open as of April 16, 2002.) The number of days that the completed repair orders had been open ranged from one to 2,494 (seven years).

We also found a number of operating weaknesses in the pothole repair program related to DOT's efficiency in completing orders in a timely manner. Specifically, DOT does not prioritize outstanding repair orders by age, FITS is not updated promptly to record completed work, and already completed orders are sometimes reassigned to new work crews. If these weaknesses were corrected, DOT's efficiency in completing repairs in a timely manner would improve.

DOT does not prioritize the repair of reported defects based on their age. As a result, some pothole repair orders are allowed to remain open for years. By not prioritizing the repair of reported potholes by age, DOT increases the risk that personal injury or property damage may occur at some potholes because they are allowed to remain unrepaired for long periods of time.

DOT staff members do not update FITS on a timely basis to ensure that all completed repairs are recorded promptly. As a result, when we accompanied work crews (on five occasions), we observed that 34 percent of the repair orders assigned to them had already been completed. Furthermore, 38 (30%) of the 126 potholes that we observed crews repairing (both assigned repairs and "pick-ups"—potholes identified by crews) were not recorded on FITS the next day. In fact, crews did not even record 11 of the 26 pickup repairs on their gang sheets. Thus, all completed repairs are not recorded, thereby understating productivity.

In addition to the fact that FITS is not updated on a timely basis, it appears that the reverse also occurs, i.e., some repairs are counted more than once. According to information recorded in FITS and on work crews' gang sheets, some repair orders were closed numerous times, possibly overstating productivity. This is of concern because the productivity figures are reported to the public in the MMR, and FITS is the source for the figures. Consequently, we must question the accuracy of the publicly reported figures.

Recommendations

The audit resulted in eight recommendations, some of which are listed below. The Department of Transportation should:

- Establish an operational standard for completing all pothole repairs (not just the 65 percent covered by the current MMR-reporting standard) within a specific period of time and gear operations to meet that goal.

- Prioritize pothole repair orders by age, when feasible.

- Ensure that work crews record all completed pothole repairs, including pick-ups, on their gang sheets.

- Modify FITS so that personnel cannot enter additional data for closed repair orders.

- Ensure that only completed repairs (not temporary repairs) are included in the productivity figures for pothole repairs that it submits to the Mayor's Office of Operations for inclusion in the Mayor's Management Report.

DOT Response

The matters covered in this report were discussed with DOT officials during and at the conclusion of this audit. A preliminary draft was sent to DOT officials and was discussed at an exit conference on May 21, 2002. On June 7, 2002, we submitted a draft report to DOT officials with a request for comments. We received written responses from the City's Law Department (Law) and DOT on June 21, 2002, and June 24, 2002, respectively. To fully address these responses, we revised the draft report and submitted it to DOT officials on October 11, 2002, along with a request for comments. We received a written response from DOT on October 28, 2002. In its response, DOT generally agreed with the audit's eight recommendations. However, DOT disagreed with the finding related to its lack of a useful time standard to guide its pothole repair operations. The full text of DOT's comments is included as an addendum to this report.

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INTRODUCTION

Background

The stated mission of the Department of Transportation (DOT) is to provide for the safe and efficient movement of people and goods in the City and to maintain and enhance the City's transportation infrastructure. DOT's goals include the rehabilitation and maintenance of the City's bridges, tunnels, and streets. [2]

Street defects fall under various categories, including potholes, cave-ins, and hummocks[3]. The DOT Street and Arterial Highway Maintenance division (SAM) is responsible for repairing street defects.

Small defects (potholes), the focus of this audit, are generally identified in two ways: (1) through calls received from the general public at DOT's Call-In Center, and (2) by DOT work crews. All identified street defects are entered into DOT's MOSAICS[4] computer system. This information is tracked and reviewed by SAM on the Field Information Tracking System (FITS), a component of MOSAICS. SAM employs work crews to canvass the City and repair street defects, whether previously reported to the Call-In Center or observed as "pick-ups" by the work crews during their street surveys.

For Fiscal Year 2002, the Mayor's Management Report (MMR) reported that DOT repaired 101,280 potholes citywide.

[2] The term "street" includes, among other things, an avenue, underpass, alley, concourse, road or path within a park, crosswalk, and sidewalk.

[3] Hummocks are bumps that result when the roadway has been pushed up. Hummocks are commonly located at or near intersections where there is heavy traffic.

[4] Management Oriented Street Attribute Information Control Systems

Objectives

The objective of this audit was to evaluate DOT's performance in completing pothole repairs within the agency's goal-related time frame. The audit also assessed the reasonableness of that time frame.

Scope and Methodology

The audit scope covered Fiscal Years 2001 and 2002.

To assess the reliability of pothole repair information shown in FITS, we randomly selected and reviewed 1,788 open pothole repair orders from December 2000, April 2001, and May 2001. (According to FITS, DOT generated 21,090 pothole repair orders in Fiscal Year 2001.) We obtained the hard copies of the orders and reconciled the information on the hard copies with the information reported on FITS.

To gain an understanding of the procedures for repairing potholes, we interviewed DOT personnel, including the borough office managers and the SAM supervisors and crews. We also accompanied work crew teams from each borough during the period February–March 2002 to observe their daily work routines.

To determine whether DOT had any guidelines regarding timeliness for pothole repairs, we requested all such guidelines from DOT officials. We also reviewed the City's Administrative Code to determine whether it contained any guidelines related to timeliness for repairs of potholes and other street defects. In addition, we contacted 13 other cities and counties to determine whether they used time standards in evaluating the performance of their pothole repair programs.

We requested a record of the number of potholes that were reported and repaired during Fiscal Year 2001, segregated by month. To determine DOT's timeliness in repairing potholes, we reviewed a random week's worth (five workdays) of reported potholes for each of three different months of Fiscal Year 2001—these were the months with the highest, the lowest, and a moderate number of potholes reported.

To ascertain whether any trend existed in the number of claims brought against the City for potholes, we requested a record of the number of claims filed and judgments and settlements paid out for each year from Fiscal Year 1994 through Fiscal Year 2001.

This audit was conducted in accordance with Generally Accepted Government Auditing Standards (GAGAS) and included tests of the records and other auditing procedures considered necessary. This audit was performed in accordance with the New York City Comptroller's audit responsibilities as set forth in Chapter 5, § 93, of the New York City Charter.

DOT Response

The matters covered in this report were discussed with DOT officials during and at the conclusion of this audit. A preliminary draft was sent to DOT officials and was discussed at an exit conference on May 21, 2002. On June 7, 2002, we submitted a draft report to DOT officials with a request for comments. We received written responses from the City's Law Department (Law) and DOT on June 21, 2002, and June 24, 2002, respectively. To fully address these responses, we revised the draft report and submitted it to DOT officials on October 11, 2002, along with a request for comments. We received a written response from DOT on October 28, 2002. In its response, DOT generally agreed with the audit's eight recommendations. However, DOT disagreed with the finding related to its lack of a useful time standard to guide its pothole repair operations. The full text of DOT's comments is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

DOT lacks a useful standard for guiding its pothole repair operations and measuring its performance. DOT uses an informal measure of 30 days, but only for reporting purposes in the MMR. Therefore, DOT has no benchmark to guide its operations to help ensure that all potholes are repaired in a timely manner and that pothole repair orders do not remain open for lengthy periods of time. In addition, even DOT's MMR-reporting standard—to complete 65 percent of repair orders within 30 days—is flawed for several reasons. First, the 30-day component of that standard is arbitrarily set. DOT could give no operational reason for establishing a 30-day criterion, and in that context, a 15-day criterion would make just as much sense, since 15 days is the time standard that determines whether pothole-related lawsuits can be brought against the City. Second, the standard fails to account for the remaining 35 percent of the pothole repair orders, and how long they take to complete. As a result, when DOT reports its performance, the agency misrepresents it in terms of the overall timeliness of <u>all</u> repairs.

As far as actual performance is concerned, we took a sample of 1,788 pothole repair orders and found that 1,774 were completed in 57 days on average (the remaining 14 were still open as of April 16, 2002). The number of days that the completed repair orders had been open ranged from one to 2,494 (seven years).

We also found several operational weaknesses in DOT's management of pothole repairs. DOT does not prioritize pothole complaints by age, thus increasing the risk of accidents caused by potholes because they are allowed to remain unrepaired for long periods of time. Also, DOT does not ensure that all completed repairs are recorded in its database. As a result, crews are sometimes sent out to repair potholes that have already been repaired. Finally, according to information recorded in FITS and on work crews' gang sheets, some repair orders were recorded as being completed numerous times. Consequently, DOT's productivity figures reported in the Mayor's Management Report may not be reliable.

These issues are discussed in further detail in the following sections of this report.

<u>DOT Does Not Have a Useful Performance Standard For the Timely Completion of Pothole Repairs</u>

DOT lacks a useful standard for measuring its performance related to the timely completion of pothole repairs. Therefore, DOT has no benchmark to guide its operations and to help ensure that all potholes are repaired in a timely manner, and that pothole repair orders do not remain open for lengthy periods of time.

We asked DOT to provide us with its guidelines regarding timeliness for pothole repairs. DOT officials told us that the agency does not have any such formal timeliness standard. The agency does have an informal measure related to a 30-day criterion; however, it is used only for reporting purposes in the MMR. For Fiscal Years 2000 and 2001, DOT's goal as stated in the MMR was to complete 65 percent of pothole repair orders within 30 days. DOT

does not gear its operations to meet this MMR-reporting standard. When generating pothole-repair work assignments, borough offices generally do not prioritize them by age.

For several reasons, DOT's MMR-reporting goal to complete 65 percent of orders within 30 days is inadequate as a tool to ensure that pothole repairs are completed timely. First, the 30-day time-related component of the goal is arbitrary. Second, the goal only applies to a percentage of repair orders completed within 30 days, but omits the remainder, and as a result it misrepresents DOT's performance in terms of the overall timeliness of all repairs.

The 30-day time-related component of the MMR-reporting goal is subjective. During the course of the audit, DOT officials told us that the informal standard of 30 days was a more or less arbitrary period based on the City's Customer Service Initiative established by the Mayor's Office of Operations. Officials told us that the completion goal of 65 percent for Fiscal Years 2000 and 2001 was based on the percentage of orders completed within 30 days in prior years. DOT increases the goal as performance improves: in Fiscal Years 1998 and 1999, the goals were 40 and 50 percent respectively.

Considering the fact that DOT could give no operational reason for establishing a 30-day criterion, we conclude that a 15-day criterion would make just as much sense, since 15 days is the time standard that determines whether civil lawsuits related to potholes can be brought against the City[5].

In addition, DOT's MMR-reporting goal to complete 65 percent of pothole repair orders (within 30 days) applies only to fewer than two-thirds of repair orders. Therefore, there is neither a time standard for the remaining 35 percent of orders, nor is the time it takes to repair them measured, which leaves open the question as to what happens to those orders open more than 30 days. Even if DOT were to gear its operations to meet the MMR-reporting standard, there would be limited incentive to complete orders that have been open for more than 30 days as soon as possible, since they could not be applied toward the 65 percent goal. As a result, repair orders may be allowed to remain open for lengthy periods of time. (As shown in Table III on page 7, 132 (7%) of the 1,788 repair orders in our sample had been open for more than 180 days.)

As a result, DOT's data for the MMR-reporting standard misrepresents DOT's performance in terms of the overall timeliness of all repairs, since it only applies to the percentage of orders completed within 30 days. The measure does not provide information regarding DOT's overall effectiveness in completing all orders in a timely manner. This point is further illustrated in Table I, following, which shows how misleading the measure can be:

[5] The City's Prior Notice Law (Administrative Code, Chapter 2, §7-201(c)(2)), states that "no civil action shall be maintained against the City for damage to property or injury to person or death" resulting from a street defect unless the City failed to repair the defect or make the place reasonably safe within 15 days after (1) written notice of the street defect was given to DOT, (2) written notice of a previous injury or damage caused by the street defect was given to a City agency, or (3) the City acknowledged the defect in writing.

TABLE I

Repair Orders Completed within 30 Days
Versus Overall Average Number of Days Orders Were Open
Breakdown by Borough

Borough	Total Number Of Repair Orders Sampled	Repair Orders Completed within 30 days		Total Number of Repair Orders Completed	Average Number of Days Repair Orders Were Open
		#	%		
Bronx	403	212	53	401	98
Brooklyn	333	211	63	331	73
Manhattan	296	118	40	294	42
Queens	390	240	71	382	30
Staten Island	366	263	72	366	38
Totals	1,788	1,044	58	1,774	57

Using the MMR-reporting standard, the Bronx repair orders we sampled came closer to meeting the goal (to complete 65% of the repairs within 30 days) than the Manhattan repair orders did, making the Bronx appear as the better performer. However, the Manhattan repairs were completed on a more timely basis overall. As shown in Table I, the Bronx had a higher percentage of repairs completed within 30 days than Manhattan—53 percent compared to Manhattan's 40 percent—although the average number of days that the completed repair orders had been open for the Bronx orders was more than twice the average for Manhattan—98 days and 42 days, respectively.

DOT Completed Sampled Pothole Repairs In 57 Days on Average

For our sample of 1,788 pothole repair orders, DOT completed 1,774 (99%) of them in 57 days on average. (The remaining 14 were still open as of April 16, 2002—four were from the December 2000 sample, five were from the April 2001 sample, and five were from the May 2001 sample.) The number of days that the completed repair orders had been open ranged from one to 2,494 (seven years).

We obtained from DOT the number of pothole complaints the Call-In Center received during Fiscal Year 2001, segregated by month, as reported in FITS. According to FITS, DOT received 21,090 complaints during the year. We selected a sample of open pothole repair orders from three different months in Fiscal Year 2001. The months were selected based on their workloads (i.e., number of pothole complaints received). We selected December 2000, the month with the lowest number of complaints received; April 2001, the month with the highest number of complaints; and May 2001, a month with a moderate number of complaints. For each month, we reviewed open repair orders during a randomly chosen week (five workdays) for each borough and identified when they were completed, as reported in FITS. (Appendix I provides a breakdown of the repair orders by month and by borough.)

For the 1,788 repair orders reviewed, 14 were still open as of April 2002 (four were from the December 2000 sample, five were from the April 2001 sample, and five were from the May 2001 sample). For the remaining 1,774 repair orders, DOT completed the repairs in 57 days on average. The breakdowns by month and by borough are shown in Table II, following.

TABLE II

Average Time to Repair Reported Potholes
Breakdown by Borough and Year

Borough	December 2000	April 2001	May 2001	Total
	Avg. days to repair	Avg. days to repair	Avg. days to repair	Avg. days to repair
Bronx	142	58	125	98
Brooklyn	114	19	89	73
Manhattan	39	48	41	42
Queens	32	28	32	30
Staten Island	46	35	39	38
Totals	82	37	64	57

As shown in Table II, the repair orders sampled from April 2001 required the fewest number of days on average for completion. DOT's performance in completing pothole repair orders in a timely manner varies greatly among boroughs. Queens was most effective in completing repair orders quickly, averaging 30 days, while the Bronx was the least effective, taking an average of 98 days to complete repair orders.

There was a wide discrepancy in the number of days that the completed repair orders had been open. A frequency distribution is shown in Table III, following.

TABLE III

Frequency Distribution of Number of Days Sampled Repair Orders Open
Breakdown by Borough

Borough	Number of Repair Orders							
	30 Days or Less	31-60 Days	61-180 Days	181 Days -1 Year	1-2 Years	2-4 Years	Over 4 Years	Totals
Bronx	212	65	56	53	10	2	5	403
Brooklyn	211	45	56	14	1	2	4	333
Manhattan	118	83	90	1	4	0	0	296
Queens	240	84	51	4	11	0	0	390
Staten Island	263	58	24	17	3	1	0	366
Totals	1,044	335	277	89	29	5	9	1,788

As shown in Table III, the majority of pothole repair orders were open no more than 60 days. Nevertheless, a significant number of orders were still open after 60 days, many of them

open for more than six months (180 days). Sample repair order #84 (DX1995067003) had been opened on March 8, 1995, and was completed on January 14, 2002, seven years later.

DOT Response: DOT officials disagreed with the finding related to the number of days that pothole repair orders remained open:

"The revised report includes an aging schedule of the pothole repairs and some examples of repairs that reportedly took an excessive amount of time to repair. Here too, the report contains flawed data. For example, the report specifically identifies sample order 84 (DX1995067003) as taking seven years to complete. However, this repair order was not even a pothole. Rather, this was for a ponding condition that was reported in 1995. On the same date as it was reported, a crew corrected the condition by milling in the area. Subsequently, in 1997, the street was completely milled and resurfaced. Another complaint of ponding was received and a follow up in 2002 indicated that there was no ponding. In essence, the defect was immediately addressed and corrected and not outstanding for seven years as the report indicates.

"There were other complaints that appeared to be still open or unresolved because of coding categories. For example, there were situations in which crews visited sites and did not find any defects and reported this in FITS. In addition, when a crew would report an activity as 'make safe temporary,' FITS would still reflect the complaint as being outstanding and not reflect the complaint as closed. We are reviewing FITS to determine the modifications that are necessary to better reflect our activities."

Auditor Comment: All information regarding the age of the repair orders in our sample was obtained from DOT's own records. Sample repair order #84 was included in the pothole repair orders we received from DOT. Furthermore, the work order itself classifies this defect as a pothole. According to FITS, this repair order was opened on March 8, 1995, and was not closed until January 14, 2002, approximately seven years later. Table III merely reports the age of the repair orders as reported in FITS. If the report contains flawed data, it is because DOT's own records contain flawed data. DOT appears to recognize this, as its response refers to "coding categories" as the reason for misleading information in its records. (Later in this report, we cite another example in which DOT claims an open repair order had actually been already completed; this issue is discussed in more detail beginning on page 15.)

We spoke to officials regarding the timeliness of repairs. They stated that there are a number of factors that affect the timeliness of repairs, such as the number of roadway miles in a borough. (It should be noted that Queens, which has the highest number of roadway miles, had the lowest average number of days that the orders had been open.) Nevertheless, the wide disparity in the timeliness of repairs among the boroughs may be due in part to the absence of an operational timeliness standard to which all of the borough offices would be required to adhere.

To determine whether government entities elsewhere used time standards in evaluating the performance of their pothole repair programs, we contacted 13 cities and counties.[6] We received responses from six: Boston, MA; Miami, FL; Philadelphia, PA; Mount Vernon, NY; Nassau County, NY; and Rockland County, NY. All six stated that they use time standards for repairing potholes; the standards ranged from one to 15 days. We do not suggest that DOT should establish a time standard necessarily within this range, but it should establish a specific time standard, and one which covers all repairs.

In the absence of an operational time standard for completing pothole repair orders, it is difficult for DOT to ensure that all reported potholes are repaired as soon as possible. The timeliness of repairs is a significant factor in limiting both the number and severity of pothole-related accidents. The likelihood of pothole-related accidents that are injurious to people and damaging to property increases over time, as potholes tend to worsen with age. An operational standard for the timely repair of all potholes would facilitate the tracking of repairs and help reduce the risk of pothole-related accidents.

DOT Response: In its response, DOT disagreed with the finding that it has no useful time standard to guide its pothole repair operations:

"The revised draft report includes new conclusions that show an apparent misunderstanding of DOT operations. For example, it incorrectly notes that DOT lacks a useful standard for guiding the pothole repair program and similarly that it could not give an operational reason for establishing a 30-day standard.

"The basis for establishing a 30-day standard (vs. 15-day) was explained to your staff on several occasions and in response to the original draft report. The standard is an indicator developed based on optimizing the overall efficiency and effectiveness of operations."

Auditor Comment: DOT now claims that its 30-day standard is an operational standard. However, this contradicts what we were told, both orally and in writing, during the course of the audit. DOT officials repeatedly told us that the 30-day standard was established solely for reporting purposes in the MMR. For example, on March 20, 2002, we sent an e-mail to DOT requesting the agency regulations pertaining to the 30-day standard. We received an e-mail response on March 22, 2002, that stated: "There needs to be clarification on what you're requesting. . . . There is no SOP [standard operating procedure]. **The 30 days is a reporting requirement**." [Emphasis added.] We were shown no analysis underlying the 30-day standard that justified it based on "optimizing the overall efficiency and effectiveness of operations." This, coupled with the fact that the MMR-reporting goal calls for only 65 percent of pothole repairs to be completed within 30 days, shows the inadequacy of the standard—as it was presented to us during the course of the audit—as a useful tool to help DOT guide its pothole repair program. Accordingly, our finding remains unchanged.

[6] The 13 cities and counties were: Baltimore, MD; Boston, MA; Chicago, IL; Detroit, MI; Houston, TX; Los Angeles, CA; Miami, FL; Mount Vernon, NY; Nassau County, NY; Philadelphia, PA; Rockland County, NY; San Francisco, CA; and Washington, D.C.

DOT Response: DOT also claims that the report asserts that DOT should use a 15- rather than 30-day standard:

"A 30-day standard enables more potholes to be grouped geographically and is much more efficient than targeting potholes for repair within 15 days. While we agree the sooner potholes are repaired, the better, assigning crews predominantly to potholes that have existed for less than 15 days would result in work crews incurring much more travel time and less work time; greatly decreasing productivity and the overall effectiveness of the program. The report's suggestion that a 15-day standard be used because it is also the time standard that determines whether civil lawsuits related to potholes can be brought against the City is without merit."

Auditor Comment: DOT either misunderstood our finding or purposely avoided addressing it directly. Nowhere in this report do we state that DOT should use a 15-day standard rather than a 30-day standard for repairing potholes. We do state that considering the fact that DOT could produce no evidence that the 30-day standard was based on any operational consideration, a 15-day standard would make just as much sense. Nevertheless, we do not recommend that DOT necessarily use a 15- or 30-day standard, but that it establish a specific time standard to apply to all repairs.

DOT Response: DOT further stated:

"There is also a fundamental misunderstanding of DOT's operations. The revised report inappropriately criticizes DOT for only targeting 65 percent of the potholes for repair. DOT crews have the goal of repairing as many potholes as possible; not just 65 percent. The 65 percent is a performance expectation of repairing potholes within 30 days of notification based on existing resources and competing objectives, i.e., pothole repair vs. resurfacing. To imply that DOT does not target the repair of all potholes is inaccurate."

Auditor Comment: There appears to be a misunderstanding on DOT's part about what is stated in the report. The report does not state that DOT targets only 65 percent of potholes for repair. Rather, it states that DOT targets only 65 percent of potholes for repair *within 30 days*, the "performance expectation" DOT refers to in its response.

Recommendation

DOT should:

1. Establish an operational standard for completing all pothole repairs (not just the 65 percent covered by the current MMR-reporting standard) within a specific period of time and gear operations to meet that goal.

DOT Response: "The Department's operational standard is to complete all pothole repairs within 30 days. The 65 percent is the performance measurement of repairs

within 30 days of notification. The performance is a result of allocating resources between various operations are seasonally affected. During January, February and March, resources are almost exclusively devoted to pothole repairs and expected and actual performance is much higher than the overall annual average. Conversely, during the other months, the same employees are primarily assigned to resurfacing operations and the performance on pothole repair is adversely affected while resurfacing goals are achieved."

Auditor Comment: As we stated earlier, during the course of the audit DOT officials contended that the agency had no operational time standard for repairing potholes and that the 30-day standard was for reporting purposes only. Nevertheless, we are pleased that DOT has now decided to establish 30 days as its operational standard, and we hope that it will gear its operations to meet that goal for all pothole repairs.

Weaknesses in DOT's Management Of the Pothole Repair Program

There are a number of operational weaknesses in the pothole repair program related to DOT's efficiency in completing orders in a timely manner. Specifically, DOT does not prioritize outstanding repair orders by age, FITS is not updated promptly to record completed work, and already completed orders are sometimes reassigned to new work crews. If these weaknesses were corrected, DOT's efficiency in completing repairs in a timely manner would improve.

DOT Does Not Prioritize Outstanding Repair Orders By Age, Thus Increasing Risk of Accidents

DOT does not prioritize the repair of reported defects based on their age. As a result, some pothole repair orders are allowed to remain open for years. By not prioritizing the repair of reported potholes by age, DOT increases the risk that personal injury or property damage may occur at some potholes because they are allowed to remain unrepaired for long periods of time.

Potholes are not repaired in the order in which the complaints were received. As a result, repair orders may remain open for lengthy periods of time before they are completed. (As stated previously in this report, sample repair order #84 had been open for seven years before the pothole was repaired.) The only borough that prioritizes its repair orders by age is Queens, which also appears to be the borough that is most effective in repairing potholes in a timely manner. The borough managers of the other four offices stated that they do not prioritize repair orders by age because they do not know how to manipulate FITS to do so. Repair orders that are not completed are merely reassigned the next day. As a result, DOT does not ensure that older potholes are repaired before newer ones. For example, sample repair orders #53 (#DX1995346002) and #63 (#DX2000349001) from the Bronx were generated on December 12, 1995, and December 14, 2000, respectively. However, repair order #63,

although generated five years after repair order #53, was completed on December 19, 2000—while repair order #53 was completed on December 20, 2000, a day later.

At the exit conference, DOT officials stated that crews are assigned to sectors with the largest number of work orders that are no more than 25 days old. (This policy appears to be geared towards DOT's MMR-reporting goal of completing a certain percentage of pothole repair orders within 30 days.) Crews are provided with a list of all open orders for their assigned sectors. Officials stated that the crews map out their routes so that the sector areas with the highest concentration of orders receive priority, regardless of the age of the orders within the sector areas.

Following the exit conference, DOT officials provided us with copies of FITS computer reports related to the five-year-old pothole repair order #53 (#DX1995346002) cited above to argue that this repair order was initially addressed long before the newer order. According to the documentation, a crew visited the reported site of the pothole on April 19, 1996, and was unable to find the pothole. Accordingly, the repair order was closed. The FITS report shows that this defect was subsequently repaired: the repair order was "closed" two more times, on January 20, 1999, and on December 20, 2000. According to a DOT official, the "most likely explanation" is that new potholes were repaired as pick-ups at this site on these two dates, and that a data entry clerk used a closed repair order number to record the work. However, this explanation cannot apply to the December 2000 repair, based on the documentation we reviewed. According to the December 20, 2000, gang sheets, the five-year-old repair order was assigned to a work crew. Furthermore, this work crew reported on its gang sheet that it repaired the potholes. Therefore: (1) new potholes had coincidentally developed at the same site as for the original complaint; or (2) the crew found the potholes already repaired, but did not report them as required; or (3) the potholes were never repaired in the first place. (In further reviewing some gang sheets, we found other instances in which closed repair orders were subsequently reassigned for completion. This issue is discussed in more detail in the section beginning on page 15 of this report.) In any event, it appears that the age of the two above-mentioned repair orders was not a determining factor when they were assigned for completion. By not prioritizing repair orders by their age, DOT is unable to minimize the risk of personal injury or property damage at potholes that remain unrepaired for long periods of time.

Recommendations

DOT should:

2. Prioritize pothole repair orders by age, when feasible.

DOT Response: "The pothole repair orders are generated based on several criteria, including location, age, and severity. Borough managers seek to maximize the productivity by grouping the orders geographically. Directors and Deputies have been reinstructed on how to establish priorities."

3. Provide additional training on FITS to personnel at the borough offices to ensure that they are proficient in its use, particularly in regard to prioritizing repair orders by age.

DOT Response: "We agree and training has been provided to applicable personnel."

FITS Is Not Updated in a Timely Manner To Reflect Work Completed

DOT staff members do not update FITS on a timely basis to ensure that all completed repairs are recorded. As a result, when we accompanied work crews (on five occasions), we observed that 34 percent of the repair orders assigned to them had already been completed. Furthermore, 38 (30%) of the 126 potholes that we observed crews repairing (both assigned repairs and pick-ups) were not recorded on FITS the next day. In fact, crews did not even record 11 of the 26 pickup repairs on their gang sheets. DOT procedures also call for staff members in the borough offices to enter completed repairs on FITS at the end of each workday. This helps ensure that completed repair orders are not reassigned to work crews. (Crews are given their assignments at the beginning of each workday, based on the open repair orders.) The information entered on FITS also serves as a legal basis for identifying whether repair orders are completed within 15 days.

While accompanying work crews, we observed that some potholes assigned to crews had already been repaired when we arrived at the pothole sites. Of the 151 repair orders assigned to the crews, 51 (34%) of them had already been completed. Table IV below provides a breakdown of the assigned pothole repairs that were not recorded in FITS.

TABLE IV

Assigned Repair Orders Not Recorded in FITS
Breakdown by Borough

Borough	Repair Orders Assigned to Crews	Repair Orders Previously Completed	%
Bronx	24	18	75%
Brooklyn	52	16	31%
Manhattan	20	9	45%
Queens	21	5	24%
Staten Island	34	3	9%
Totals	**151**	**51**	**34%**

As shown in Table IV, the Bronx had the highest percentage—75 percent—of assigned repair orders that were already completed; Queens and Staten Island had the lowest percentages—24 percent and 9 percent respectively. In addition, we observed work crews

repairing potholes, but those repairs were not recorded in FITS when we reviewed the system the next day. Of the 126 potholes repaired by the crews we accompanied, 38 (30%) were not recorded in FITS. Table V, following, contains a pothole repair analysis by borough.

TABLE V

Observed Pothole Repairs Not Recorded in FITS
Breakdown by Borough

Borough	Pothole Repairs Completed by Crews (both Repair Orders and Pick-Ups)	Repair Orders Completed by Crews but Not Entered on FITS	Pick-Ups Completed but Not Entered on FITS	Total Pothole Repairs Not Entered on FITS	%
Bronx	11	0	5	5	45%
Brooklyn	43	0	7	7	16%
Manhattan	13	1	2	3	23%
Queens	22	0	6	6	27%
Staten Island	37	11	6	17	46%
Totals	**126**	**12**	**26**	**38**	**30%**

As shown in Table V, the Bronx and Staten Island failed to record more than 40 percent of the repairs that we observed crews perform. None of the 26 pick-ups that crews repaired was recorded in FITS. Moreover, the Bronx and Staten Island work crews did not record the pick-ups they repaired on their gang sheets. It is possible that some of the potholes repaired in these pick-ups had already been reported and that repair orders had been generated for them. If so, those repair orders would have been identified and closed out if the pick-up repairs were recorded in FITS as required. Since the pick-up repairs were not recorded on FITS, however, it is possible that some repair orders remained open unnecessarily.

DOT's failure to update FITS in a timely manner results in crews being inefficiently used by sending them to make repairs that have already been completed. The time crews spend revisiting sites where repairs were already made takes them away from repairing potholes for which the City is liable.

Recommendations

DOT should:

4. Ensure that work crews record all completed pothole repairs, including pick-ups, on their gang sheets.

DOT Response: "We agree and crew supervisors have been retrained on how to complete gang sheets including how to properly account for all pothole repairs. The procedures will be formalized in a manual. Additionally, gang sheets are routinely reviewed to ensure compliance."

5. Ensure that all completed pothole repairs are recorded in FITS at the end of each workday.

DOT Response: "The Department has ensured, by changing clerical shifts and assignments, that all pothole repair data will be entered in FITS either at the end of the work day or before assignments are given for the next day."

Source for Productivity Figures Reported in The Mayor's Management Report May Not Contain Reliable Data

In the preceding section of this report, we discussed the fact that FITS is not updated on a timely basis. Thus, all completed repairs are not recorded, which results in an understating of productivity. Based on our review of the supporting documentation for DOT's pothole productivity figures, it appears that the reverse also occurs, i.e., some repairs are counted more than once. According to information recorded in FITS and on work crews' gang sheets, some repair orders were closed numerous times, possibly overstating productivity. This is of concern, because the productivity figures are reported to the public in the MMR, and FITS is the source for the figures. Consequently, we must question the accuracy of the publicly reported figures.

Documentation Supporting MMR Data

The Mayor's Office of Operations compiles the MMR using performance data submitted by some 44 agencies and offices. The Fiscal Year 2001 MMR reported that DOT: (1) received 31,913 complaints for potholes, (2) repaired 70 percent of potholes reported via complaints within 30 days, and (3) completed 121,331 pothole repairs during that year.

At the audit's inception, we requested a breakdown of the complaints received by DOT during Fiscal Year 2001. We received a summary report generated from MOSAICS with a breakdown by month of complaints received by the Call-In Center. (All complaints are required to be entered on FITS, which assigns them repair order numbers.) According to MOSAICS, the Call-In Center received a total of 21,090 calls during Fiscal Year 2001, 10,823 fewer than the figure reported in the MMR. On numerous occasions during the course of the audit, we asked DOT the reason for the discrepancy, but officials could not provide a satisfactory explanation. At the exit conference, DOT officials provided us with a spreadsheet that listed the number of complaints DOT received, segregated into various categories. According to the spreadsheet, DOT received 31,991 pothole complaints, which is about the same as the number reported in the MMR. Of these, DOT received 20,267 complaints through the Call Center, 823 fewer than the number we were initially given. The remaining 11,724 complaints were received through other sources, such as DOT's Compliance Inspections Unit and the Maintenance Yards. (We did not verify the accuracy of the complaint information provided by DOT.) Since we were not provided these figures during the course of the audit, we were unable to verify that 70 percent of the complaints received in Fiscal Year 2001 were completed within 30 days, as reported in the MMR.

We also asked DOT for the supporting documentation for the number of pothole repairs reported in the MMR. A DOT official initially told us that the figure was calculated by the Mayor's Office of Operations; however, a representative from the Mayor's Office of Operations told us that the figure came from DOT. After the exit conference, DOT provided us with a computer file downloaded from FITS that listed all repairs completed during the year, segregated by borough, date, and crew supervisor. (The gang sheets serve as the primary source for these figures.) This information generally reconciles with that reported in the MMR. According to these data, DOT repaired 121,326 potholes during the year, only five repairs fewer than reported in the MMR.

Reconciliation of FITS Data with Source Documents

To verify the pothole repair information we were provided, we randomly selected two days in April 2001 for each borough and attempted to reconcile the number of completed repairs as contained in the FITS data with the number of repairs reported by the work crews on the gang sheets. For the days selected, we had gang sheets for 28 crews on which the crews reported that they completed 1,683 repairs. FITS reported that these crews completed 1,680 repairs. Our analysis is shown in Table VI, following.

TABLE VI

Reconciliation of Repair Information
As Recorded in FITS and on Gang Sheets
Breakdown by Borough

Borough	Dates	Number of Potholes Repaired According to FITS	Number of Potholes Repaired or Made Safe According to Gang Sheets	Gross Discrepancy	Percentage of Gross Discrepancy
Queens	4/2, 4/25	268	267	1	0%
Bronx	4/7, 4/24	392	377	15	4%
Brooklyn	4/7, 4/9	550	550	0	0%
Manhattan	4/19, 4/20	286	305	19	7%
Staten Island	4/10, 4/18	184	184	0	0%

As shown in Table VI, the numbers on FITS and on the gang sheets generally reconciled. Only two boroughs had a discrepancy: the Bronx pothole repairs were overstated by four percent (15 repairs), and the Manhattan repairs were understated by seven percent (19 repairs).

Reassignment of Closed Repair Orders

During our reconciliation of FITS data with source documents, we noticed several instances in which the same repair orders were reported to have been completed several times. We reviewed the status of 374 repair orders that were closed during the days reviewed; 29 (8%) of them had been closed more than once. For example, we found one repair order for potholes in Brooklyn that three different crews were credited with completing over a 38-day period. According to the gang sheets for April 9, 2001, a work crew was assigned repair order #DB2001089012. The work crew found 12 potholes at this site (a repair order may encompass more than one pothole). The supervisor noted "MST" (make safe temporary) on the gang sheet, and this repair order was closed on FITS. Nevertheless, on May 7, 2001, and May 17, 2001, this same work order was reassigned to two different work crews. On each occasion, the crews reported that they made the 12 potholes temporarily safe, and the order was again closed on FITS. As of May 30, 2002, no further action was reported on this order.

There are a number of weaknesses highlighted in this example. First, supervisors do not ensure that repair orders remain open until the potholes are completely repaired or until some other type of permanent solution is made. Second, FITS allows additional data to be entered for orders that have already been closed. Third, supervisors reassign closed repair orders, using the same order numbers. Last, temporary measures taken by work crews are credited as completed repairs by DOT. Each instance in which a pothole was made temporarily safe in the above example was counted as a repair in DOT's productivity figures. (Of the 550 pothole repairs performed in Brooklyn for the two days we reviewed, the crews recorded 59 as MST.) Therefore, although the gang sheets showed that all of the repairs for the 12 potholes associated with this work order were temporary, DOT took credit for repairing 36 potholes (based on three visits) during Fiscal Year 2001.

The fact that supervisors assign closed repair orders to crews points to a significant weakness in DOT's controls over the pothole repair process. As stated earlier in this report, a DOT official acknowledged that the same repair orders could be closed numerous times on FITS. This, combined with our earlier finding that completed repairs may not even be entered on FITS, raises questions about the integrity of the information recorded in FITS. Accordingly, since the information recorded in FITS is the basis for the productivity figures reported in the MMR, we must question whether the figures in the MMR are accurate.

Recommendations

DOT should:

6. Modify FITS so that personnel cannot enter additional data for closed repair orders.

DOT Response: "We agree and the MIS unit is currently modifying FITS to prevent people from entering data for a closed work order."

7. Ensure that supervisors do not reassign a closed repair order to a crew unless adequate justification is provided and the order is reopened.

DOT Response: "We agree and supervisors will be so instructed."

8. Ensure that only completed repairs (not temporary repairs) are included in the repair-related productivity figures it submits to the Mayor's Office of Operations for inclusion in the Mayor's Management Report.

DOT Response: "We agree and temporary repairs are not included in the productivity statistics provided for the Mayor's Management Report."

Appendix

Repair Orders Reviewed

Number and Breakdown by Borough and Month

Borough	December 2000 (Low)	April 2001 (High)	May 2001 (Moderate)	Total
Bronx	126	185	92	403
Brooklyn	80	107	146	333
Manhattan	74	68	154	296
Queens	86	212	92	390
Staten Island	78	181	107	366
Totals	444	753	591	1,788

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Iris Weinshall, Commissioner

October 28, 2002

Mr. Greg Brooks
Deputy Comptroller
Policy, Audits, Accountancy & Contracts
The City of New York
Office of the Comptroller
1 Centre Street, Rm 530
New York, NY 10007-2341

Re: MJ02-119A

Dear Mr. Brooks:

This is in response to your revised draft "Audit Report on the Performance of the New York City Department of Transportation's Pothole Repair Program".

The revised draft report includes new conclusions that show an apparent misunderstanding of DOT operations. For example, it incorrectly notes that DOT lacks a useful standard for guiding the pothole repair program and similarly that it could not give an operational reason for establishing a 30-day standard.

The basis for establishing a 30-day standard (vs. 15-day) was explained to your staff on several occasions and in response to the original draft report. The standard is an indicator developed based on optimizing the overall efficiency and effectiveness of operations. A 30-day standard enables more potholes to be grouped geographically and is much more efficient than targeting potholes for repair within 15 days. While we agree the sooner potholes are repaired, the better, assigning crews predominantly to potholes that have existed for less than 15 days would result in work crews incurring much more travel time and less work time; greatly decreasing productivity and the overall effectiveness of the program. The report's suggestion that a 15-day standard be used because it is also the time standard that determines whether civil lawsuits related to potholes can be brought against the City is without merit. The Law Department's response to the prior draft report clearly states that it is unlikely that this has any impact on liability.

There is also a fundamental misunderstanding of DOT's operations. The revised report inappropriately criticizes DOT for only targeting 65 percent of the potholes for repair. DOT crews have the goal of repairing as many potholes as possible; not just 65 percent. The 65 percent is a performance expectation of repairing potholes within 30 days of notification based on existing resources and competing objectives i.e. pothole repair vs. resurfacing. To imply that DOT does not target the repair of all potholes is inaccurate. DOT's performance increased to 70 percent for Fiscal Years 2001 and 2002.

The revised report includes an aging schedule of the pothole repairs and some examples of repairs that reportedly took an excessive amount of time to repair. Here too, the report contains flawed data. For example, the report specifically identifies sample repair order 84 (DX1995067003) as taking seven years to complete. However, this repair order was not even for a pothole. Rather, this was for a ponding condition that was reported in 1995. On the same date as it was reported, a crew corrected the condition by milling in the area. Subsequently, in 1997, the street was completely milled and resurfaced. Another complaint of ponding was received and a follow up in 2002 indicated that there was no ponding. In essence, the defect was immediately addressed and corrected and not outstanding for seven years as the report indicates.

There were other complaints that appeared to be still open or unresolved because of coding categories. For example, there were situations in which crews visited sites and did not find any defects and reported this in FITS. In addition, when a crew would report an activity as "make safe temporary", FITS would still reflect the complaint as being outstanding and not reflect the complaint as closed. We are reviewing FITS to determine the modifications that are necessary to better reflect our activities.

The revised report contained eight recommendations most of which we agree with and have already implemented. The following are the recommendations included in the report and our comments:

1. "Establish an operational standard for completing all pothole repairs (not just the 65 percent covered by the current MMR-reporting standard) within a specific period of time and gear operations to meet that goal."

The Department's operational standard is to complete all pothole repairs within 30 days. The 65 percent is the performance measurement of repairs within 30 days of notification. The performance is a result of allocating resources between various operations that are seasonally affected. During January, February and March, resources are almost exclusively devoted to pothole repairs and expected and actual performance is much higher than the overall annual average. Conversely, during the other months, the same employees are primarily assigned to resurfacing operations and the performance on pothole repair is adversely affected while resurfacing goals are achieved.

2. "Prioritize pothole repair orders by age, when feasible."

The pothole repair orders are generated based on several criteria, including location, age, and severity. Borough managers seek to maximize the productivity by grouping the orders geographically. Directors and Deputies have been reinstructed on how to establish priorities.

3. "Provide additional training on FITS to personnel at the borough offices to ensure that they are proficient in its use, particularly in regard to prioritizing repair orders by age."

We agree and training has been provided to applicable personnel.

4. "Ensure that work crews record all completed pothole repairs, including pick-ups, on their gang sheets".

We agree and crew supervisors have been retrained on how to complete gang sheets including how to properly account for all pothole repairs. The procedures will be formalized in a manual. Additionally, gang sheets are routinely reviewed to ensure compliance.

5. "Ensure that all completed pothole repairs are recorded in FITS at the end of each workday."

The Department has ensured, by changing clerical shifts and assignments, that all pothole repair data will be entered in FITS either at the end of the work day or before assignments are given for the next day.

6. "Modify FITS so that personnel cannot enter additional data for closed repair orders."

We agree and the MIS unit is currently modifying FITS to prevent people from entering data for a closed work order.

7. "Ensure that supervisors do not reassign a closed repair orders to a crew unless adequate justification is provided and the order is reopened."

We agree and supervisors will be so instructed.

8. "Ensure that only completed repairs (not temporary repairs) are included in the repair-related productivity figures it submits to the Mayor's Office or Operations for inclusion in the Mayor's Management Report".

We agree and temporary repairs are not included in the productivity statistics provided for the Mayor's Management Report.

If you have any questions concerning this response, I can be reached at (212) 788-8162.

Very Truly Yours,

Thomas C. Mathews

Thomas C. Mathews
Auditor General

cc: Commissioner Iris Weinshall
F/D/C Judith E. Bergtraum
D/C Leon Heyward
Maria Guccione, MOO