CITY OF NEW YORK
OFFICE OF THE COMPTROLLER

John C. Liu
COMPTROLLER

MANAGEMENT AUDIT

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Audit Report on the Department of Transportation's Performance Indicators as Reported in the Mayor's Management Report

MJ11-065A

February 6, 2012

http://comptroller.nyc.gov

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET
NEW YORK, N.Y. 10007-2341

John C. Liu
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February 6, 2012

Dear Residents of the City of New York:

My office has audited the adequacy of the Department of Transportation's (DOT) controls to ensure that the performance indicator statistics it reports in the Mayor's Management Report (MMR) are accurate and reliable. We audit City agencies' controls over the calculation and reporting of management performance data as a means of ensuring that the data are reliably and fairly reported to the public.

The audit concluded that if all procedures and controls for the databases associated with the three tested critical performance indicators, as explained by DOT officials, are consistently applied and followed, the data reflected therein are sufficiently reliable and accurate. However, the audit identified control weaknesses in DOT's manual processes for calculating the indicator values. Specifically, DOT: (1) made errors in calculating the tested indicators and (2) lacked adequate checks (i.e., independent verification) of indicator values prior to them being entered into the Performance Management Application (PMA), the Mayor's Office of Operations performance reporting system. These weaknesses limited our assurance about the reliability and accuracy of the tested performance indicators ultimately reported in the MMR.

To address the above weaknesses, the audit made three recommendations, including that DOT should develop procedures to verify reported performance measure statistics prior to them being recorded in PMA.

The results of the audit have been discussed with DOT officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please email my Audit Bureau at audit@comptroller.nyc.gov.

Sincerely,

John C. Liu

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The City of New York
Office of the Comptroller
Management Audit

Audit Report on the Department of Transportation's Performance Indicators as Reported in the Mayor's Management Report

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AUDIT REPORT IN BRIEF

This audit determined whether the Department of Transportation (DOT) maintained adequate controls to ensure that the performance indicator statistics it reports in the Mayor's Management Report (MMR) are accurate and reliable. This audit focused on the following three critical indicators: (1) average time to respond to traffic signal defect and make safe (hours) (traffic signal indicator); (2) average time to repair street lights (days) (street light indicator); and (3) average time to close a pothole work order where repair was done (days) (pothole indicator).

The MMR serves as a public report card on City services affecting the lives of New Yorkers and mainly covers the operations of City agencies reporting directly to the Mayor. DOT is responsible for bridge and roadway conditions, parking and traffic operations, sidewalks, and other matters that affect the safety of drivers, cyclists, and pedestrians throughout the City. As reported in the MMR, DOT's key public service areas include: ensuring the safety of the traveling public; improving mobility throughout the City; rehabilitating and maintaining the City's bridges, streets, sidewalks, and highways; and expanding walking and cycling options and ferry service. To report on DOT's progress in achieving its critical objectives, the MMR for Fiscal Years 2009 and 2010 included 51 performance indicators, 23 of which were identified as critical indicators.

Audit Findings and Conclusions

Our review of the information technology (general and application) controls for the databases associated with the three tested critical performance indicators provided assurance that if all procedures and controls as explained to us by DOT officials are consistently applied and followed, the data reflected therein are sufficiently reliable and accurate. However, because of control weaknesses disclosed in DOT's manual processes for calculating the indicator values, there is only limited assurance that the traffic signal, street light, and pothole indicators published in the MMR are accurate and reliable.

The audit also determined that DOT's automated processes provided assurance that the data that it used to calculate the values of the subject indicators was complete. DOT's corresponding calculation formulas were consistent with the subject indicator definitions published in the MMR. Further, the indicator values that DOT recorded in the Mayor's Office of Operations performance data collection and reporting system, the Performance Management Application (PMA), corresponded to those that appeared in the preliminary and final MMR versions for Fiscal Years 2009 and 2010.

However, any assurance these results provided was reduced because DOT: (1) made errors in calculating the tested indicators, and (2) lacked adequate checks (i.e., independent verification) of indicator values prior to them being entered into the Mayor's Office of Operations PMA system. These weaknesses limited our assurance about the reliability and accuracy of the tested performance indicators that appear in the PMA system and ultimately the published MMR.

Audit Recommendations

To address the above weaknesses, the audit recommends that DOT should:

- Develop procedures to verify reported performance measure statistics. Such procedures should require that the performance statistics be independently verified by either a second person within each division or another party designated by DOT prior to being recorded in the PMA.

- Consider retaining a snapshot (copy) of data that are used to calculate the reported indicator values as a supplement to the retained hard-copy reports

- Disclose information in the MMR about the underlying factors and relevant calculations from which the *"Average time to respond to traffic signal defect and make safe (hours)"* and other similar "Average" value indicators are based to help users of the MMR better understand the agency's performance in these areas.

DOT Response

We received a written response from DOT officials on January 20, 2012. In their response, DOT officials agreed with the audit's findings and recommendations.

INTRODUCTION

Background

Chapter 1, § 12 of the New York City Charter mandates that the Mayor report to the public and the City Council twice each year on the performance of City agencies in delivering services. Accordingly, the MMR serves as a public report card on City services affecting New Yorkers.[1] The MMR reports on key public service areas and critical objectives that reflect the policy priorities and operational strategies of the City's Commissioners and agency heads. The MMR does not report on all the activities of each agency, but rather the activities determined by agency officials and the Mayor's Office of Operations to have a direct impact on the public, including the provision of fundamental support services to other agencies involved in serving citizens. The results of an agency's major activities appear in the MMR both in narratives and statistics (key performance indicators).

DOT provides overall policy guidance and direction for all transportation matters in New York City. DOT is responsible for bridge and roadway conditions, parking and traffic operations, sidewalks, and other matters that affect the safety of drivers, cyclists, and pedestrians throughout the City.

As reported in the MMR, DOT's key public service areas include: ensuring the safety of the traveling public; improving mobility throughout the City; rehabilitating and maintaining the City's bridges, streets, sidewalks, and highways; and expanding walking and cycling options and ferry service. To report on DOT's progress in achieving the eight critical objectives established to address its key service goals, the MMR for Fiscal Years 2009 and 2010 included 51 performance indicators, 23 of which were identified as critical indicators.

DOT is responsible for maintaining more than 12,000 traffic signals and over 300,000 street lights throughout New York City. Additionally, DOT reported that it repaired an average of 260,000 potholes a year during Fiscal Years 2009 and 2010. DOT's Division of Traffic Operations (Traffic Operations) is responsible for traffic signals and street lights. Traffic signals and street light repair and maintenance are directly carried out by DOT contractors. DOT's Division of Roadways, Repair, and Maintenance (Roadways) is responsible for pothole repairs, which are carried out by DOT personnel.

The two divisions maintain different computer database systems to track and report on performance data for the service areas under their respective jurisdictions. With regard to the indicators that are the focus of this audit, such systems include the Signal Defect and Repair (SDR), Street Lighting Maintenance Program (SLMP), and Field Information Tracking System (FITS).[2]

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[1] The MMR is released twice a year; the Preliminary MMR is released in February and covers the first four months (July 1–October 31) of the fiscal year and the final MMR (covering July 1–June 30) is released in September following the end of the fiscal year.

[2] FITS is a component of DOT's Management Oriented Street Attribute Information Control System (MOSAICS), a mainframe application that resides on the City's legacy system operated by the Department of Information Technology and Telecommunications (DOITT).

Each division has designated staff members who use the data from the respective computer systems to calculate performance measurement statistics and enter the monthly and year-to-date calculated values for each indicator into PMA. PMA is used to compile monthly and year-to-date performance measurement values across City agencies for publication in the MMR and the online Citywide Performance Reporting (CPR) system.

Transparency and accountability are essential to the efficient and reliable delivery of services and in measuring DOT's performance in carrying out its mission. Accordingly, DOT must ensure that its published performance measures are relevant, accurate, and reliable so that decision-makers and the public have a clear understanding of the agency's performance.

Audit Objective

The objective of the audit was to determine whether DOT maintains adequate controls to ensure the performance indicator statistics it reports in the MMR are accurate and reliable. This audit focused on the following three critical indicators:

1. Average time to respond to traffic signal defect and make safe (hours) (traffic signal indicator)
2. Average time to repair street lights (days) (street light indicator)
3. Average time to close a pothole work order where repair was done (days) (pothole indicator)

Scope and Methodology Statement

We conducted this performance audit in accordance with generally accepted government auditing standards. 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. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The audit scope covered Fiscal Years 2009 through 2011 (through April 30, 2011). For certain tests involving analyses of reported indicators, we expanded the audit scope to include Fiscal Years 2005 through 2011. To accomplish our objective, we carried out various audit procedures. Please refer to the "Detailed Scope and Methodology" section at the end of this report for the specific procedures and tests that were conducted.

Discussion of Audit Results

The matters in this report were discussed with DOT officials during and at the conclusion of this audit. A preliminary draft report was sent to DOT officials and discussed at an exit conference held on December 15, 2011. On December 29, 2011, we submitted a draft report to DOT officials with a request for comments. We received a written response from DOT officials on January 20,

2012. In their response, DOT officials agreed with the audit's findings and recommendations. The full text of the DOT response is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

Our review of the information technology (general and application) controls for the databases associated with the three tested critical performance indicators provided assurance that if all procedures and controls as explained to us by DOT officials are consistently applied and followed, the data reflected therein are sufficiently reliable and accurate. However, because of control weaknesses we found in DOT's manual processes for calculating the indicator values, there is only limited assurance that the traffic signal, street light, and pothole indicators published in the MMR are accurate and reliable.

Our review of DOT's automated processes provided assurance that the data that it used to calculate the values of the subject indicators was complete. Further, we found that DOT's corresponding calculation formulas were consistent with the subject indicator definitions published in the MMR. We also noted that the indicator values that DOT recorded in PMA corresponded with those that appeared in the preliminary and final MMR versions for Fiscal Years 2009 and 2010.

However, any assurance these results provided was reduced because DOT: (1) made errors in calculating the tested indicators, and (2) lacked adequate checks (i.e., independent verification) of indicator values prior to them being entered into the Mayor's Office of Operations PMA system. These weaknesses limited our assurance about the reliability and accuracy of the tested performance indicators that appear in the PMA system and ultimately the published MMR.

Finally, in our survey of other municipalities, we found no consensus among the types of response time indicators reported.

These matters are discussed in greater detail below.

Weaknesses in Controls over the Calculation of Performance Indicators

Our review disclosed control weaknesses in DOT's manual processes for calculating the traffic signal, street light, and pothole indicators. DOT does not require that the manual calculations of performance statistics be independently verified by a second party within the agency or tested prior to them being entered into the Mayor's Office of Operations' PMA system. These weaknesses limited our assurance about the reliability and accuracy of the tested performance indicators.

Weaknesses in Manual Calculations

DOT manually calculates the monthly and year-to-date values for each indicator. Such manual calculations inherently increase the risk that errors can be made and go undetected, thereby limiting assurance about the accuracy of reported monthly and year-to-date performance values recorded in PMA for the tested indicators, which are the same values published in the MMR.

The processes for calculating the traffic signal and street light indicators, although separate, are similar. At the beginning of each month, Traffic Operations' personnel generate reports from the SDR and SLMP databases for the previous month ended. The reports are run for each borough and reflect the number of traffic signal and street light defects reported and closed for the prior month and the total and average time (in days, hours, and minutes) to remediate traffic signal or repair street light defects. The summary information from these reports are manually entered into electronic spreadsheets that are used to calculate the monthly and year-to-date traffic signal and street light performance indicators, respectively. Such calculations include converting the final resulting value from an hour/minute format into a decimal format. Thereafter, the calculated performance statistic is manually entered into the PMA system.

For the pothole indicator, at the beginning of each month, data on pothole work orders opened and closed during the prior month are exported from FITS into an Access database. A query is run to filter all work orders closed in the prior month where work was performed. The results of this query are then exported into an electronic spreadsheet, which is used to calculate the pothole indicator monthly and year-to-date values, which are subsequently entered into PMA.

Early in the audit, we worked with DOT to address difficulties in recalculating the traffic signal indicator for 2009. DOT officials told us that during their review, they found that the values that had initially been calculated and recorded in PMA for the traffic signal indicator for the months of April, May, and June 2009 were inaccurate. The monthly and year-to-date values recorded for each of the three months were not properly converted by DOT staff from an hour/minute format to a decimal format prior to being entered into PMA, as all other months were reported. Consequently, DOT officials corrected the reported traffic signal indicator in the PMA system for those three months.

As a result of our audit, DOT officials also reviewed the calculations for the pothole indicator for Fiscal Year 2009 and found a small number of work orders that had taken more than one year to close. They said that this occurred because a closed pothole work order could be opened and re-closed with a later date. Therefore, pothole work orders could erroneously be reported as being open for much longer than they had actually remained open. This weakness occurred because all users in FITS had the capability to re-open previously closed work orders. To address this weakness, DOT officials took action to restrict the ability to change or modify (re-open) a pothole work order to one (senior) person in the division.

The problems with the traffic signal and pothole indicators did not materially affect the Fiscal Year 2009 overall values of the three subject indicators reported in the MMR. However, these problems provided evidence of control weaknesses in DOT's calculation of the subject indicators. These weaknesses stem from manual processes (i.e., data entry and number format conversions) that DOT uses in computing the indicators.

Lack of Independent Verification

Our review disclosed that each division in DOT is directly responsible for ensuring the accuracy of the performance indicator(s) calculated. However, DOT does not require that the

computed values be independently verified (rechecked) by a second party prior to being entered into the PMA system.

Governmental Accounting Standards Board (GASB) *Suggested Guidelines for Voluntary Reporting: Service Efforts and Accomplishments (SEA) Performance Information* (June 2010) (Suggested Guidelines) establish that performance measures need to be verifiable to provide assurance that the information reported would be replicated by independent evaluators using the same measurement methods. Assurance may be achieved by verification of a measure itself or by selected testing to verify the procedures used to obtain the information reported by the measure.

DOT was able to recalculate the monthly value for each indicator for July 2008 and later for April 2011, within acceptable parameters. However, as reflected below, some differences (variances) existed between the recomputed values and those reported in PMA.

Table I

Comparison of Tested Performance Indicators Reported and Recomputed for the Months July 2008 and April 2011

Tested Indicator	*Measure*	July 2008			April 2011		
		PMA Reported	Recom-puted	Variance	PMA Reported	Recom-puted	Variance
Average time to respond to **traffic signal** defects and make safe (hours)	*hours*	4.6	4.28	-.32 *(6.9%)*	2.98	2.99	+0.01 *(0.3%)*
Average time to repair **street lights** by DOT (days)	*days*	**1.0**	**1.8**	+0.8 *(80%)*	2.16	2.16	0 *(0%)*
Average time to close a **pothole** work order where repair was done (days)	*days*	1.97	1.98	+0.01 *(0.5%)*	11.87	12.14	+0.27 *(2.2%)*

Note: The variation in the pothole indicator for July 2008 and April 2011 is related to the time of year. Generally, there is a higher quantity of potholes and related repairs that occur during the cold weather months than any other time of year.

We considered any variance less than or equal to 5 percent (≤ 5 percent) to be free from material errors. Therefore, the indicator values were reasonably verified. Accordingly, with the exception of the July 2008 traffic signal and street light indicators, the values recomputed by DOT fell within acceptable parameters and reasonably compared to those reflected in PMA.

With regard to the variances in the July 2008 traffic signal and street light indicator values along with the other noted variances, DOT officials stated that they had to re-extract data from SDR, SLMP, and FITS for July 2008 and April 2011 to recalculate the indicator values, as we requested. The data did not exactly match those originally used in calculating the values that DOT staff recorded in PMA. This is because the status of repairs is constantly updated as they are completed. Therefore, at the time the reports were re-generated and data re-extracted to recalculate the values, the updated status information was included in the newer reports as well as in the recalculated average repair time calculated for traffic signals, street lights, and potholes.

At the exit conference, DOT officials stated that the original reports that were used to calculate the street light and traffic signal indicator were kept on file, but they did not maintain a snapshot of the data from the day the reports were originally generated. Subsequently, we obtained copies of the original reports from DOT. Using these reports, we recalculated the two indicators for July 2008 and verified the accuracy of the DOT calculations. However, neither of the values we calculated nor those calculated by DOT (denoted on the reports) matched the indicator values that appeared in PMA for July 2008. On discussing this observation, DOT officials stated that in July 2008 the indicators were new, lending to the difference. However, they could not explain the anomaly. Since DOT did not maintain a snapshot of the data from the day the original reports were run, there was no other means for us to assess differences.

DOT's Director of Metrics and Data Management (of the Performance Management and Accountability Unit) reviews the performance statistics that are entered into PMA. He may question any significant deviations from prior years' indicator values for the same months. Aside from this single control, however, there is no mechanism or requirement to independently re-check and verify the calculations of the performance statistics reported by each division prior to the information being entered into PMA. Because of the lack of adequate checks, the likelihood that errors such as those we encountered would occur and go undetected and uncorrected is increased, consequently limiting assurance about the reliability and accuracy of the three tested performance indicators as reported in the MMR.

Recommendations

DOT should:

1. Develop procedures to verify reported performance measure statistics. Such procedures should require that the performance statistics be independently verified by either a second person within each division or another party designated by DOT prior to being recorded in the PMA.

DOT Response: DOT agreed, stating: "As a short-term measure, DOT will have a second person in the division review data as recommended.

"DOT understands that this audit only examined internal DOT processes, but the root cause of the inaccurate data noted in that information already in DOT computer systems must be manually retyped into the Mayor's Office of Operations' (Ops) systems. Redundant data entry introduced human error and wasted time and effort. Hence, to prevent the inefficiency, DOT has started investigating opportunities for greater automation of data reporting."

Auditor Comments: We concur with DOT's assessment that errors can and do occur and inefficiencies exist with redundant data entry. However, as disclosed in our audit, the inaccurate indicator values we noted in the Mayor's Office of Operations' PMA system were caused by errors in the manual calculations of tested indicator values, not erroneous data entry, as DOT suggests.

2. Consider retaining a snapshot (copy) of data that are used to calculate the reported indicator values, as a supplement to the retained hard-copy reports.

DOT Response: DOT agreed, stating: "DOT is in the process of building a repository where the archived performance data for each month will be stored for Traffic and Street Lighting such that the reports could be reproduced whenever necessary. The estimated time to complete the performance data archive is 10 week[s]."

Disclosure of the Traffic Signal Indicator Calculations Could be Improved

Our review of the DOT information reported in the preliminary and final versions of the MMR for Fiscal Years (FY) 2005 through 2011 found that changes involving the critical performance indicators were reasonably disclosed. However, DOT could improve its disclosure of the traffic signal indicator calculations.

GASB Concept Statements No. 2, No. 5, and Suggested Guidelines establish that performance information should be communicated in a readily understandable manner to any reasonably informed, interested party. The information should also include explanations and interpretations about important underlying factors and existing conditions that may have affected performance to help users comprehend the information.

DOT made a number of changes, additions, deletions, and/or restatements in its critical performance indicators reported in the MMR from FY 2005–FY2011. (See Appendix A for changes affecting the traffic signal, streetlight, and pothole indicators reviewed in this audit.) DOT disclosed all such changes in the MMR so that readers would be aware of them. In many cases, when DOT included a new indicator, it included metric values for prior periods affording readers of the MMR the ability to make comparisons of the new indicator over two or more periods. Nevertheless, we also noted that the disclosure for changes to one of the critical indicators we tested could be enhanced to equip users of the MMR with a better understanding of underlying calculations and related factors affecting the reported indicator.

DOT tracks contractor performance in responding to traffic light defects in three time intervals: two hours, 12 hours, and 48 hours (the expected response interval is dictated by the severity of the condition). Prior to 2008, DOT used the indicator, "*Traffic signal defects responded to within 48 hours of notification (%)*" to report on its performance for addressing traffic signal defects in the MMR. In addition, prior to 2008, the Supplemental Indicator volume of the MMR (covering FY 2005 through 2007) reported the indicator "*Average Time to Respond to Defects Requiring -2 Hour Response, -12 Hour Response, and -48 Hour Response."* Hence, the three response time intervals were disclosed to users of the MMR.

In the preliminary MMR for Fiscal Year 2008, DOT replaced the indicator "*Traffic signal defects responded to within 48 hours of notification (%),*" with another indicator, "*Average time to fix traffic signals (hours),* which was subsequently replaced in the final version of the Fiscal Year 2009 MMR with the indicator "*Average time to respond to traffic signal defect and make safe (hours).*" The newest indicator is a weighted average of the three response time intervals.

Our review of the MMR disclosed that since FY 2009, DOT has reported a value of approximately four hours for the "*Average time to respond to traffic signal defect and make safe (hours)"* indicator. However, no supplemental information was provided to disclose the underlying calculations or explain that the indicator is a weighted average of the three response time intervals, most of which are two-hour calls, and smaller quantities for 12-hour and 48-hour calls. For example, our review of July 2008 data of the reported 5,483 traffic signal defects made safe, 4,033 (74 percent) were two-hour calls, 105 (2 percent) were 12-hour calls, and 1,345 (25 percent) were 48-hour calls. Users of the MMR could better understand DOT's performance if it disclosed these underlying calculation facts.

Recommendation

3. DOT should disclose information in the MMR about the underlying factors and relevant calculations from which the *"Average time to respond to traffic signal defect and make safe (hours)"* and other similar "Average" value indicators are based to help users of the MMR better understand the agency's performance in these areas.

DOT Response: DOT agreed, stating: "DOT's Performance Management and Accountability unit will contact the Mayor's Office of Operations to discuss adding more detail about calculations, perhaps within the MMR Indicator Definitions."

Survey of Other Municipalities

We conducted a survey of traffic signal, street light, and pothole response time indicators used by other cities to assess the relevance of the indicators used by DOT. We found no consensus regarding the types of response time indicators reported. Regarding the number of indicators reported, New York City, along with one other city, reported more indicators than any of the other municipalities surveyed. The results of our survey are presented in Appendix B for informational purposes.

DETAILED SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. 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. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

This audit addressed DOT's controls over the processes involved in collecting and reporting performance data (associated with the subject indicators) that are recorded in the Mayor's Office of Operations' PMA system and subsequently reflected in the published MMR and online Citywide Performance Reporting (CPR) system. This audit did not assess the PMA system or relevant processes outside of DOT's jurisdiction that are involved in compiling and reporting citywide performance measurements information. The audit also did not attest to the appropriateness or selection of specific DOT performance indicators reported in the MMR and the CPR system. These matters were considered outside the audit scope.

The audit scope covered Fiscal Years 2009 through 2011 (through April 30, 2011). For certain tests involving a review of DOT's critical indicators, we expanded the audit scope to include Fiscal Years 2005 through 2011. To accomplish our objectives, as discussed below, we carried out various audit procedures.

To understand DOT's general roles and responsibilities and to ascertain requirements for compiling and reporting agency performance data and the computer systems used therein, we reviewed various reports, publications, and other relevant materials obtained from the DOT website and other sources. We also reviewed the City Comptroller's Directives #1 "Principles of Internal Control" and #18 "Guidelines for the Management, Protection & Control of Agency Information and Information Processing Systems," Chapter 1, §12 of the City Charter, and applicable sections of the City's Administrative Code. Further, we referred to Governmental Accounting Standards Board (GASB) Concept Statements No. 2 (April 1994) and No. 5 (November 2008), *Service Efforts and Accomplishments (SEA) Reporting*, and GASB's *Suggested Guidelines for Voluntary Reporting: SEA Performance Information* (June 2010).[3] Lastly, we reviewed the Mayor's Office of Operation's 2010 memorandum to City agencies' MMR liaisons that provided guidance on the compilation of performance data published in the MMR. These cited references were also used as audit criteria.

We analyzed relevant sections of the preliminary (four-month) and annual (12-month) versions of the Mayor's Management Report for Fiscal Years 2009 and 2010 to ascertain the performance indicators reported by DOT. Based on this review, we selected the three critical performance indicators (noted earlier), based on the fact that DOT has control over the response to address the repair of defective traffic signals, street lights, and potholes. To understand the specific

[3] GASB Concept Statements #2 and #5 establish qualitative standards for the compilation and reporting of government performance information.

factors that affect performance in these areas, we interviewed key DOT personnel and reviewed relevant documentation. Further, we reviewed previous audit reports issued by this office that addressed these service areas.[4]

As part of our review of internal controls over the recording, compiling, and reporting of agency performance data, we interviewed DOT officials, conducted walk-throughs and observations of relevant processes, and reviewed DOT operating procedures. Where formal procedures were not available, we documented our understanding of existing procedures and obtained verification from DOT officials. In addition, we reviewed the agency's self-assessment of its internal controls covering calendar year 2009, performed in compliance with the City Comptroller's Directive #1.

To understand the SDR, SLMP, and FITS computer systems, we interviewed key officials responsible for these systems and reviewed system generated reports and other related documentation. On a limited basis, through interviews with relevant DOT officials and observations, we evaluated key information technology general and application controls for these systems, including physical and logical access controls, input controls, hardware and software support, network administration, monitoring, backup, and disaster recovery plans.

As part of our assessment of the accuracy and reliability of the subject indicators, we reviewed the criteria used to extract and report on data used in calculating the monthly indicator values. We also reviewed the formulas used in such calculations and compared them to the indicator definitions published in the MMR. Further, to ensure that complete, objective, relevant data was compiled for use in calculating monthly indicator values, we obtained copies of Fiscal Year 2009 data for the three databases (associated with the three indicators). For the test month of July 2008, we applied the business rules to the data sets and reconciled the resulting record totals to those reported by DOT.

To test the accuracy of the calculated values, we attempted but encountered difficulties in re-computing the respective indicators. Therefore, we asked DOT to perform the recalculations for the sampled months of July 2008 and later April 2011 and compared their results to those recorded in the PMA system for the same months. To test DOT's consistency in reporting, we compared the indicator values that DOT calculated and reported in the PMA system to the corresponding values reported in the preliminary and final MMR versions for Fiscal Years 2009 and 2010.

To assess the comparability and consistency of the indicators used by DOT from year-to-year, we expanded our review of the MMR to include the preliminary and annual versions published for Fiscal Years 2005 through 2011. In addition to the traffic signal, street light, and pothole indicators, we reviewed all reported critical performance indicators to determine whether the indicators were consistently reported from year-to-year or not. We also reviewed DOT's Key

[4] Office of the New York City Comptroller, "Audit of the Department of Transportation's Monitoring of Traffic Signal Maintenance Contractors" (#MJ97-197A), issued June 30, 1998; "Audit Report on the Department of Transportation's Monitoring of Street Light Maintenance Contractors" (#MJ98-222A), issued May 27, 1999; and "Audit Report on the Performance of the New York City Department of Transportation's Pothole Repair Program" (#MJ02-119A), issued November 14, 2002.

Public Service Area statements and Critical Objectives. If any modifications were noted, we ascertained whether such changes were disclosed.

Further, we surveyed traffic signal, street light, and pothole response time indicators used by 12 major United States cities to assess the relevance of the indicators used by DOT to measure and report on its performance in these areas. To choose the 12 cities for survey, we judgmentally selected the 10 largest U.S. cities, according to population size (based on the July 2009 estimates reported by the U.S. Census Bureau), limiting our selection to no more than two cities per state. We then judgmentally selected two additional major cities based on their proximity to New York City. (For a listing of the cities surveyed, see Appendix B).

We searched the Internet websites of the 12 sampled cities to ascertain whether those municipalities regularly and publicly report performance indicators in citywide reports. We reviewed the performance indicators reported by each municipality's Department of Transportation or its equivalent and determined which ones were related to response times to traffic signals, streetlights, and potholes repairs. We then identified those response time performance indicators for each city and those reported in the MMR by DOT.

Appendix A

Analysis of Three DOT Critical Performance Indicators Selected for Audit Testing from the FY 2009 MMR along with Changes, Additions, or Replacement of Corresponding Indicators Reported for the Fiscal Years 2005-2011

Item #	**Critical Performance Indicator/Statistic**	**Indicator Definition**	*Ut meas*	**2005**		**2006**		**2007**		**2008** (First year Critical Indicators specified)**		**2009**		**2010**		**2011**
				Prelim MMR	**Final MMR**	**Prelim MMR**	**Final MMR**	**Prelim MMR**	**Final MMR**	**Prelim MMR**	**Final MMR**	**Prelim MMR**	**Final MMR**	**Prelim MMR**	**Final MMR**	**Prelim MMR**
1	***Traffic signal*** defects responded to within 48 hours of notification (%)	The percent of signal defects corrected within 48 hours of the Department's notification by members of the public, other City agencies, or DOT inspectors. Includes intersections made temporarily safe with measures such as a temporary Stop sign, until permanent signal repairs can be made	*pct*	Y	Y	Y	Y	Y	Y							
2	Average time to fix ***traffic signals*** (hours)	The average number of hours it takes to fix traffic signal defects	*hrs*							Y*	Y	Y				
3	Average time to respond to ***traffic signal*** defect and make safe (hours)	The average number of hours it takes DOT contractors to repair and restore signal operation. A repair can be temporary or permanent provided that the signal problem at the intersection is corrected and made safe	*hrs*										Y*	Y	Y	Y
4	***Streetlight*** defects responded to within 10 days of notification (%)	The number of streetlight defects addressed within 10 days of notification.	*pct*	Y	Y	Y	Y	Y	Y							
5	Average time to repair ***streetlights*** - by DOT (days)	The average number of calendar days it takes DOT to repair streetlights.	*dys*							Y*	Y	Y	Y	Y	Y	Y
6	***Pothole*** work orders closed within 30 days of notification (%)	The percent of pothole (small street defect) work orders closed within 30 days of being opened in response to	*pct*	Y	Y	Y	Y	Y	Y							
7	Average time to close a ***pothole*** work order where repair was done (days)	The average number of calendar days it takes to close a pothole work order where at least one repair was completed.	*dys*							Y*	Y	Y	Y	Y	Y	Y

Note: **The MMR first distinguished Critical Indicators in FY 2008. The three indicators (#3, 5, and 7) selected for review in the audit were selected from the FY 2009 final MMR. Thereafter, we backtracked to FYs 2005-2008 to assess corresponding and/or similar reported indicators. All indicators included in the above analysis reflect those classified by DOT as Critical indicators in FY 2008 and after, and the same or corresponding indicators reported prior to FY 2008.

Legend: Y = Yes, indicator reported. Y* = Yes, indicator reported for the first time

Traffic Signal, Street Light, and Pothole Response Time Indicators
Reported by New York City and 12 Surveyed Municipalities

		Name of Surveyed City→	New York, NY	Chicago, IL (a)	Detroit, MI (a)	Houston, TX (a)	Indianapolis, IN (a)	Jacksonville, FL (a)	Los Angeles, CA (a)	Philadelphia, PA (a)	Phoenix, AZ (a)	San Antonio, TX (a)	San Diego, CA (a)	Buffalo, NY (b)	Newark, NJ (b)	Total Yes
		Are Response Time Indicators currently reported by the Surveyed City?	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**5**
Response Time Indicators	1	Average time to respond to traffic signal defect and make safe (hours)	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
	2	Average time to repair priority regulatory signs after notification (days)	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
	3	Average time to repair street lights - by DOT (days)	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
	4	Average time to close a pothole work order where repair was done (days)	**Yes**	No	No	No	No	No	No	No	No	No	No	No	No	**1**
	5	Percentage of street lights modernized	No	No	**Yes**	No	No	No	No	No	No	No	No	No	No	**1**
	6	Response time to traffic signal service calls	No	No	**Yes**	No	No	No	No	No	No	No	No	No	No	**1**
	7	Pothole Response Time (days)	No	No	No	No	No	No	No	**Yes**	No	No	No	No	No	**1**
	8	Pothole (in street) response time, average days	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**
	9	Stop Sign Repair response time, average days	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**

Traffic Signal, Street Light, and Pothole Response Time Indicators
Reported by New York City and 12 Surveyed Municipalities

		Name of Surveyed City→	New York, NY	Chicago, IL (a)	Detroit, MI (a)	Houston, TX (a)	Indianapolis, IN (a)	Jacksonville, FL (a)	Los Angeles, CA (a)	Philadelphia, PA (a)	Phoenix, AZ (a)	San Antonio, TX (a)	San Diego, CA (a)	Buffalo, NY (b)	Newark, NJ (b)	Total Yes
Response Time Indicators	10	One Way Sign repair response time, average days	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**
	11	Do Not Enter sign repair response time, average days	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**
	12	Time to complete resurfacing project, average days (*for streets resurfaced*)	No	**Yes**	No	No	No	No	No	No	No	No	No	No	No	**1**
	13	Routine traffic operation requests for service completed within 30 days (target 95%)	No	No	No	No	No	No	No	No	**Yes**	No	No	No	No	**1**
	14	Number of days to review and respond to street light requests (target is 5 days)	No	No	No	No	No	No	No	No	**Yes**	No	No	No	No	**1**
	15	Complete requests for signs and crosswalk work within 45 days (target is 90%)	No	No	No	No	No	No	No	No	**Yes**	No	No	No	No	**1**
		Total No. of Response Time Indicators Reported (Rows # 1 through 15)	4	5	2	0	0	0	0	1	3	0	0	0	0	**15**

Legend: (a) Ten largest U.S. cities selected based on their population size.
(b) Two major cities selected because of their proximity to New York City.

Note: The performance measures noted herein were found in the corresponding cities' respective budgets.

NEW YORK CITY DOT Department of Transportation

JANETTE SADIK-KHAN, Commissioner

January 20, 2012

Ms. Tina Kim
Deputy Comptroller for Audits
1 Centre Street Room 1100
New York, N.Y. 10007-2341

Re: ***DOT's Response to Draft Audit Report on the Department of Transportation's Performance Indicators as Reported in the Mayor's Management Report MJ11-065A***

Dear Ms. Kim:

The NYC Department of Transportation ("NYCDOT") has reviewed the draft report and acknowledges the professionalism and courtesy of the staff in the conduct of the audit. NYCDOT agrees that the issues discussed in the draft report did not materially affect the Fiscal Year 2009 overall values of the three subject indicators reported in the MMR and is pleased to respond to the recommendations as follows:

Recommendation 1: Develop procedures to verify reported performance measure statistics. Such procedures should require that the performance statistics be independently verified by either a second person within each division or another party designated by DOT prior to being recorded in the PMA.

DOT's Response: As a short-term measure, DOT will have a second person in the division review data as recommended.

DOT understands that this audit only examined internal DOT processes, but the root cause of the inaccurate data noted is that information already in DOT computer systems must be manually retyped into the Mayor's Office of Operations' (Ops) systems. Redundant data entry introduces human error and wasted time and effort. Hence, to prevent the inefficiency, DOT has started investigating opportunities for greater automation of data reporting.

Recommendation 2: Consider retaining a snapshot of data that are used to calculate the reported indicator values, as a supplement to the retained hard-copy reports.

DOT's Response: DOT is in the process of building a repository where the archived performance data for each month will be stored for Traffic and Street Lighting such that the reports could be reproduced whenever necessary. The estimated time to complete the performance data archive is 10 week

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Recommendation 3: Disclose information in the MMR about the underlying factors and relevant calculation from which the "Average time to respond to traffic signal defects and make safe (hours)" and other similar "Average" value indicators are to help users of the MMR better understand the agency's performance in these areas.

DOT's Response: DOT's Performance Management and Accountability unit will contact the Mayor's Office of Operations to discuss adding more detail about calculations, perhaps within the MMR Indicator Definitions.

Additionally, we would like to inform you that effective January 2012, the Division of Traffic Operations which is discussed in the report as responsible for the street light and traffic signal indicators, has been renamed as Division of Traffic and Planning. Moreover, on page 8, 1st sentence, 2nd paragraph of the report, instead of "DOT's Director of Performance Management and Accountability looks over the performance statistics ...", the title should be changed to Director of Metrics and Data Management. Performance Management and Accountability is actually a DOT work unit which has two Directors; the individual responsible for the above function is the Director of Metrics and Data Management.

We thank you for this opportunity to respond to the draft report. If there are questions on this response, I can be reached at (212) 839-4408.

Sincerely yours,

LUCITA C. ANDRES

cc: Comm. J. Sadik-Khan, FDC L. Ardito, DC B. Schaller, Exec. Dir. S. Galgano, Dir. J. Speroni, L. Price