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**New York State Office of the State Comptroller**  
Thomas P. DiNapoli

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Division of State Government Accountability

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# **Selected Safety and Security Equipment at Subway Stations**

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## **Metropolitan Transportation Authority – New York City Transit**

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Report 2016-S-92

April 2018

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# Executive Summary

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## Purpose

To determine whether the Metropolitan Transportation Authority's (MTA) New York City Transit (Transit) ensures that safety and security equipment, such as cameras and Help Point Intercoms, are working, tested, maintained, and monitored. This audit covers the period January 1, 2014 to July 29, 2017.

## Background

Transit's Electronic Maintenance Division (EMD) is responsible for maintaining and monitoring the equipment used to ensure the safety and security of passengers using the public transportation system in four of New York City's boroughs. EMD is a reporting unit of Maintenance of Way. Transit's safety and security equipment includes Closed Circuit Television (CCTV). CCTV is a TV system in which signals are not publicly distributed but are monitored, primarily for surveillance and security purposes. CCTV relies on strategic placement of cameras and observation of the cameras' input on monitors off site. As of June 1, 2016, Transit had installed 7,152 CCTV surveillance cameras, 1,746 monitors, 332 digital video recorders, five video cassette recorders, and related accessories (e.g., camera components, power supplies, cables) at 322 subway stations. As of July 29, 2017, 2,633 Help Point Intercoms (HPIs) were installed in subway stations for customer use to obtain travel information or emergency assistance. This equipment is installed in all New York City boroughs, except Staten Island.

EMD has a preventive maintenance schedule for all installed CCTV cameras and recording devices. EMD is also responsible for repairing video system equipment, except for equipment still under warranty. EMD has set three days as a target for when a repair should be completed. For HPIs, EMD uses a software program, SolarWinds, to monitor their working condition. EMD responds to the SolarWinds alerts by creating a ticket in the Remedy Management System – the system that tracks repairs. A ticket is created for every alert condition lasting longer than 15 minutes.

## Key Findings

We identified the following conditions that Transit should address:

- Preventive maintenance deters equipment failure and malfunction. However, we determined that from January 1, 2014 to September 30, 2016, not all of the security equipment's scheduled preventive maintenance activities were performed. For example, we reviewed all 223 cameras at ten subway stations and found that 1,328 of the 4,219 (31 percent) expected preventive maintenance visits for CCTV cameras and their affiliated monitors were not done.
- We also found that of the 9,223 trouble calls for cameras and recording devices reported to EMD from January 1, 2014 to September 30, 2016, 2,367 (26 percent) took longer than EMD's three-day target to be repaired or addressed.
- For HPIs, EMD did not establish a preventive maintenance schedule. EMD officials indicated they will develop a preventive maintenance program once all the HPIs have been installed, which is estimated to be in mid-2018.

## Key Recommendations

- Focus resources on meeting preventive maintenance targets. One such option could include ensuring that, when technicians are reassigned after performing maintenance work that required immediate attention, the missed preventive maintenance tasks are given priority when technicians resume their regular schedule.
- Ensure defective cameras are repaired timely.
- Promptly establish and document a preventive maintenance schedule for HPIs.

## Other Related Audits/Reports of Interest

[Metropolitan Transportation Authority - New York City Transit: Selected Aspects of Subway Station Safety \(2016-S-11\)](#)

[Metropolitan Transportation Authority - Staten Island Railway: Safety at Stations \(2016-S-91\)](#)

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**State of New York**  
**Office of the State Comptroller**

**Division of State Government Accountability**

April 12, 2018

Mr. Joseph Lhota  
Chairman  
Metropolitan Transportation Authority  
2 Broadway  
New York, NY 10004

Dear Mr. Lhota:

The Office of the State Comptroller is committed to helping State agencies, public authorities, and local government agencies manage their resources efficiently and effectively. By so doing, it provides accountability for tax dollars spent to support government operations. The Comptroller oversees the fiscal affairs of State agencies, public authorities, and local government agencies, as well as their compliance with relevant statutes and their observance of good business practices. This fiscal oversight is accomplished, in part, through our audits, which identify opportunities for improving operations. Audits can also identify strategies for reducing costs and strengthening controls that are intended to safeguard assets.

Following is a report of our audit entitled *Selected Safety and Security Equipment at Subway Stations*. This audit was performed pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of the Public Authorities Law.

This audit's results and recommendations are resources for you to use in effectively managing your operations and in meeting the expectations of taxpayers. If you have any questions about this report, please feel free to contact us.

Respectfully submitted,

*Office of the State Comptroller*  
*Division of State Government Accountability*

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**State Government Accountability Contact Information:**

**Audit Director:** Carmen Maldonado

**Phone:** (212) 417-5200

**Email:** [StateGovernmentAccountability@osc.state.ny.us](mailto:StateGovernmentAccountability@osc.state.ny.us)

**Address:**

Office of the State Comptroller  
 Division of State Government Accountability  
 110 State Street, 11th Floor  
 Albany, NY 12236

This report is also available on our website at: [www.osc.state.ny.us](http://www.osc.state.ny.us)

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## Background

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The Metropolitan Transportation Authority's (MTA) New York City Transit (Transit) operates the subway system in four of New York City's boroughs, carrying an average of 5.66 million passengers per day. Transit has two units that are predominantly responsible for safety and security equipment.

- The Electronic Maintenance Division (EMD) is responsible for maintaining and monitoring the equipment used to ensure the safety and security of passengers using the public transportation system. EMD is a reporting unit of Maintenance of Way, one of the primary divisions of Transit. In addition, EMD retrieves recorded videos for user departments, such as the New York City Police Department (NYPD) and Transit's Security Division and Law Department.
- The Department of Security (DOS) is responsible for subway station access control and perimeter protection, for detecting and deterring intrusion, theft, and vandalism, and for responding to any unsafe, unusual, suspicious, or unlawful activities. As of March 22, 2016, the Transit Security Command Center monitored 1,490 cameras in real time, which have been retrofitted with electronic security systems (ESS). The remaining cameras in the subway stations are used by the NYPD to conduct criminal investigations and by Transit's Law Department for accident claims investigations.

Transit's safety and security equipment includes 7,152 Closed Circuit Television (CCTV) surveillance cameras, 1,746 monitors, 332 digital video recorders (DVRs), five video cassette recorders (VCRs), and related accessories (e.g., camera components, power supplies, cables). During 2017, Transit opened three additional stations whose equipment is not included in this count. CCTV is a TV system in which signals are not publicly distributed, but are monitored, primarily for surveillance and security purposes. CCTV relies on strategic placement of cameras and observation of the cameras' input on monitors off site.

CCTV camera defects are reported to EMD by the user departments, such as the NYPD, Transit's DOS, and Transit's Law Department. These reports are in addition to a small percentage of cameras capable of self-reporting defects.

In addition to cameras, Transit has mechanisms for riders to self-report safety and security issues. The Help Point Intercom (HPI) is a dual-purpose piece of emergency equipment installed at subway stations (in Manhattan, Queens, the Bronx, and Brooklyn) for customers to obtain subway travel information or request emergency assistance. The emergency calls are routed to the station's booth agent and the Rail Control Center (RCC). If an emergency call is answered by the booth agent or Travel Information Center, it will be rerouted to the RCC for assistance.

There is a minimum of eight HPs per station: at least two per platform with two at the exits. There is no requirement for how many HPs should be installed at each station, the number depends on each station's specific needs. The working condition of the HPs is continuously monitored by the SolarWinds system, which generates an alert in case of a defect. EMD responds to most alerts by creating a ticket in the Remedy Management System (Remedy) – the system that tracks repairs.

## Audit Findings and Recommendations

The MTA has installed several safety and security systems at its Transit subway stations. An essential part of deterring break-ins and theft, and ensuring continuous surveillance and the overall security of the area(s) being monitored, is preventive maintenance and timely repair of equipment. However, the MTA has not always performed preventive maintenance or repairs on a timely basis.

We reviewed the preventive maintenance of the safety and security equipment at ten judgmentally selected stations. Our review found that preventive maintenance was not performed in accordance with the scheduled frequency levels set by Transit for both cameras and monitors. Additionally, for HPIs, EMD has not established a timetable for preventive maintenance.

Moreover, when a problem is identified, repairs are not always made on a timely basis. For instance, the MTA set a three-day target for resolving trouble call tickets for cameras and other video equipment. For approximately 26 percent (2,367 of 9,223) of such tickets, EMD does not meet this standard. Additionally, for HPIs, approximately 9.6 percent of the 3,970 trouble tickets requiring technicians took over three days to address.

### Equipment at Subway Stations

#### *Preventive Maintenance*

Preventive maintenance helps deter equipment failure and malfunction. Schedules for preventive maintenance have been established in consultation with equipment vendors for all installed CCTV cameras and recording devices, as shown on Table 1.

**Table 1**

Preventive Maintenance Frequency	Device Description
Monthly	Crowd Control
Monthly	One Person Train Operation
Monthly	Police Omega
Monthly	Police Security
Monthly	Train Identification
Monthly	Recording Device Maintenance
Quarterly	Passenger Identification
Quarterly	Stations
Bi-Monthly	Platform Edge
Twice Annually	Department of Security

Preventive maintenance visits are scheduled by EMD supervisors to ensure the working condition of the equipment. Based on these schedules, technicians visit subway stations installed with CCTV surveillance cameras for inspections and repairs. Preventive maintenance for monitors is done

simultaneously with the camera to which it is connected. For example, a monitor would receive bi-yearly preventive maintenance visits if it was connected to a camera type with a bi-yearly preventive maintenance schedule; consequently, monitors connected to cameras with monthly preventive maintenance would receive more frequent visits.

We reviewed preventive maintenance records created by EMD technicians to document visits to ten sampled subway stations for the period January 1, 2014 to September 30, 2016. For the 223 cameras we identified, we determined that, based on the schedule and type of camera, 4,219 preventive maintenance visits were expected during the period. However, we found that only 69 percent (2,891) of the visits were made. In addition, we reviewed EMD's compliance with the monthly scheduled preventive maintenance visits for DVR devices connected to CCTV cameras at each of the sampled subway stations during the same time period. We determined only 65 percent, or 215 of the 330 scheduled visits, were made.

Additionally, for the same time period, we examined preventive maintenance visits for monitors attached to different types of cameras (for types that were not present in the stations we visited). Of the 122 monitors we examined, 2,860 preventive maintenance visits were expected. However, only 77 percent (2,189 out of 2,860) of the visits were performed.

Transit claimed that the failure to complete all preventive maintenance is due to two factors – new employees who lack technical skills, and competing priorities. According to Transit officials, new employees do not always have the technical skills required for the job; therefore, maintenance supervisors must take time from their regular schedule to provide training and assist in the development of training programs. EMD officials also indicated that competing priorities impact their work. They stated that when significant events occur, they are required to reprioritize their work to ensure that CCTV cameras in the affected stations are in working order. They cited big celebrations, such as the Thanksgiving Day parade, New Year's Eve celebrations, snow storms, and more recently, the opening of the 2nd Ave stations, as examples. According to agency staff, the reassignment of technicians to these unscheduled activities negatively affects performance of the scheduled preventive maintenance activities.

## Trouble Calls

EMD is responsible for maintaining and repairing video system equipment, except for equipment still under warranty. Trouble calls for equipment under warranty are referred to MTA Capital Construction (MTACC) and Capital Project Management (CPM). MTACC and CPM subsequently notify the responsible vendors to repair/address the warrantied defective equipment. EMD has set three days as a target for when a repair should be completed.

We reviewed the time taken to address defective CCTVs, monitors, and recording devices reported to EMD from January 1, 2014 to September 30, 2016. EMD's office in East New York in Brooklyn receives calls, which are entered into the Incident Tracking System, a component of the Radio Maintenance Information System. We analyzed the time taken to repair/address 9,223 reported trouble calls to EMD. Table 2 shows the results of our analysis.



**Table 2**

Type of CCTV Camera	Total Defects	Completed After 3 Days		Completed Within 3 Days	
		No. of Tickets	Percent	No. of Tickets	Percent
Station	1,837	328	18	1,509	82
Passenger Identification	1,814	370	20	1,444	80
Platform Edge	1,477	122	8	1,355	92
Police IESS	1,184	872	74	312	26
One Person Train Operation	642	52	8	590	92
DOS	564	178	32	386	68
Police Omega	482	164	34	318	66
Police Security	443	73	16	370	84
Train Identification	366	51	14	315	86
Crowd Control	36	4	11	32	89
Under River Tube	90	77	86	13	14
Other	288	76	26	212	74
<b>Total</b>	<b>9,223</b>	<b>2,367</b>	<b>26</b>	<b>6,856</b>	<b>74</b>

On average, 26 percent (2,367 calls) of the 9,223 trouble calls took more than three days to complete.

We randomly sampled 80 of the 2,367 trouble call tickets completed after three days to determine the reason for the delay. We separated the tickets into four categories based on the number of days taken to complete the repairs, as shown on Table 3.

**Table 3**

Repairs Not Completed Within Target				
Range of Days to Complete	4-10	11-30	31-90	90-818
Sampled Number of Trouble Tickets	28	19	11	22

Of the 22 tickets that took 90-818 days to complete, 10 were under warranty and reported to MTACC and to CPM.

We also analyzed 564 trouble calls that were reported by Transit's DOS (see Table 4). These cameras are placed in stations to identify security-related issues and are monitored in real time. Nonetheless, despite their importance to ensuring security, 4 percent of these cameras took over 100 days to repair.

**Table 4**

<b>Range in Days Delayed</b>	<b>Number of Trouble Calls</b>
382 to 846	8
102 to 314	14
4 to 99	156
Under 3 Days	386
<b>Total</b>	<b>564</b>

In responding to the preliminary findings, EMD indicates there is no three-day requirement and that it is only a guideline. EMD aims to repair trouble calls within three days, but multiple factors affect assignments on a day-to-day basis. Higher priority work often takes precedence.

## Recommendations

1. Reassess the training program given to new employees to ensure that it provides the appropriate level of skill to do the work, such as diagnosing and repairing defective security equipment.
2. Focus resources on meeting preventive maintenance targets. One such option could include ensuring that, when technicians are reassigned after performing maintenance work that required immediate attention, the missed preventive maintenance tasks are given priority when technicians resume their regular schedule.
3. Ensure defective cameras are repaired timely.

## Help Point Intercoms

HPIs are new devices placed on subway platforms that the public can use to call for travel information or emergency assistance. As of August 4, 2017, Transit officials indicate they have spent approximately \$47 million for HPI equipment installed at 344 stations. Although installation of HPIs began in 2012, EMD has not established an official timetable for preventive maintenance for them. Installed HPIs have a one-year warranty period (see Table 5).

As of July 29, 2017, only 755 were still under warranty.

Table 5

HPIs Installed as of	Number Installed	Number In Warranty	Expired Warranty as of July 29, 2017
October 18, 2012	4	0	4
December 31, 2013	40	0	40
December 29, 2014	612	0	612
December 31, 2015	867	0	867
December 14, 2016	833	478	355
As of July 29, 2017	277	277	0
<b>Total</b>	<b>2,633</b>	<b>755</b>	<b>1,878</b>

We note that HPIs operate indoors, outdoors, and in environments with a wide range of temperatures, and are subject to moisture and steel dust. We contacted the manufacturer of the HPIs, who indicated that conditions in the subway require that HPIs receive preventive maintenance, but did not specify a cycle for Transit. The absence of a preventive maintenance program can result in an HPI not being available in an emergency. As of July 29, 2017, 1,878 HPIs were no longer under warranty.

EMD stated that as HPI devices have only been fully operational since early 2012, they are still working on documenting procedures and training the appropriate staff. EMD indicated that it fully intends to establish and document a formal preventive maintenance schedule upon completion of installation at all stations, which is estimated to be in mid-2018.

### *Monitoring HPIs*

EMD has not established an official timetable to respond to reported HPI defects; however, it has a three-day target to repair/address defects.

An EMD official stated that the working condition of the HPIs is continuously monitored by the SolarWinds system, which generates an alert in case of a defect. EMD responds to the alerts by creating a ticket in the Remedy system for every alert that lasts at least 15 minutes. The 15-minute time is in place because momentary power fluctuations also generate an alert, but HPIs automatically recover from them. However, EMD will occasionally dispatch technicians to investigate alerts shorter than 15 minutes when it is deemed necessary.

From October 1, 2015 to June 1, 2017, EMD entered 9,438 HPI trouble tickets in Remedy. We analyzed these tickets to determine how long it took EMD to respond to the reported tickets. We determined that 4,685 (or 49.6 percent) of the HPI Remedy tickets were marked with a Tier 1 resolution code of "Opened in Error." (EMD advised that since HPIs are a new product, with no historical data available, they are gradually learning which SolarWinds alerts warrant opening Remedy trouble tickets.) Another 783 records had various other resolution categories. The remaining 3,970 showed the amount of time taken to resolve the ticket (see Table 6).

**Table 6**

<b>Number of Trouble Tickets</b>	<b>Days Taken to Repair/Address</b>	<b>Percent</b>
1,413	0 Days	35.59
1,890	1-2 Days	47.61
285	3 Days	7.18
382	4 Days or More	9.62
<b>3,970</b>	<b>Total</b>	<b>100.00</b>

We selected a judgmental sample of 38 of the 382 tickets that took four days or more to complete, ranging from 4 to 35 days. We requested documentation from Transit officials regarding the causes for the delays. In response to our preliminary findings, Transit indicated that 15 did not affect service and did not require immediate attention, 11 were waiting for repair by a third-party vendor, four were awaiting parts, and 13 remained open after the HPI was repaired for monitoring purposes to ensure reliability. (Note: The reasons exceed 38, but Transit did not provide any additional information.) EMD officials advised us that they do not have written documentation to support the information provided. However, without written information on why delays occur, EMD lacks critical data that may enable it to improve the timeliness of its operations.

## Recommendations

4. Promptly establish and document a preventive maintenance schedule for HPIs.
5. Establish an acceptable occurrence rate for each type of ticket, with a focus on “Opened in Error,” to reduce these incidents.
6. Document reasons for delays in repairs to HPIs.

## Audit Scope, Objective, and Methodology

To determine if MTA – Transit ensures that safety and security equipment, such as cameras and HPIs, are working, tested, maintained, and monitored. This audit covered the period January 1, 2014 to July 29, 2017.

To accomplish our objective, we reviewed policies, procedures, and guidelines related to the processes for addressing safety and security equipment at the subway stations. We interviewed Transit officials and employees to evaluate the internal controls related to our objective.

We selected a judgmental sample of ten subway stations from EMD’s “CCTV Cameras Asset List” as of June 1, 2016. We reviewed EMD preventive maintenance visits for CCTV cameras, monitors, DVRs, and VCRs installed at the sampled subway stations. The sampled subway stations were selected from the four New York City boroughs in which Transit operates (three in Manhattan, four in Queens, two in Brooklyn, and one in the Bronx).

We selected a judgmental sample of 38 HPI trouble tickets from 382 trouble tickets that took more than four days to address during the period October 1, 2015 to June 1, 2017.

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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

In addition to being the State Auditor, the Comptroller performs certain other constitutionally and statutorily mandated duties as the chief fiscal officer of New York State. These include operating the State's accounting system; preparing the State's financial statements; and approving State contracts, refunds, and other payments. In addition, the Comptroller appoints members to certain boards, commissions, and public authorities, some of whom have minority voting rights. These duties may be considered management functions for purposes of evaluating organizational independence under generally accepted government auditing standards. In our opinion, these functions do not affect our ability to conduct independent audits of program performance.

## Authority

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The audit was performed pursuant to the State Comptroller's authority as set forth in Article X, Section 5 of the State Constitution and Section 2803 of the Public Authorities Law.

## Reporting Requirements

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We provided a draft copy of this report to MTA – Transit officials for their review and formal comment. We considered their comments in preparing this final report and attached them in their entirety to it.

MTA officials replied that they do not concur with the findings and conclusions as written, stating they have processes in place for maintaining and monitoring safety and security equipment, take maintenance seriously, and set appropriate goals. They, therefore, disagree with the need for change within their current process. Officials claim that the auditors' conclusions are based on "faulty analysis and incomplete information." However, the MTA agreed cameras should be repaired timely and the reasons for delays in repairing HPIs should be documented. The MTA's response does not demonstrate a knowledge of the audit process, which includes: auditors sharing results with Department of Subways (Subways) officials throughout field work, Subways providing auditors with a formal response, and auditors then making edits to written findings as needed. For example, we revised our report to use the term "target" instead of "goals" because Subways does not set goals. The conclusions are based on the information provided by Subways management and employees. Our rejoinders to certain MTA comments are included in the report's State Comptroller's Comments.

Within 90 days after the final release of this report, as required by Section 170 of the Executive Law, the Chairman of the Metropolitan Transportation Authority shall report to the Governor, the State Comptroller, and the leaders of the Legislature and fiscal committees advising what steps were taken to implement the recommendations contained herein, and where the recommendations were not implemented, the reasons why.

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## Contributors to This Report

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**Carmen Maldonado**, Audit Director

**Robert C. Mehrhoff**, Audit Manager

**Myron Goldmeer**, Audit Supervisor

**Robert Tabi**, Examiner-in-Charge

**Susan Gordon**, Senior Examiner

**Nareen Jarrett**, Senior Examiner

**Steven Saleeby**, Senior Examiner

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## Division of State Government Accountability

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Andrew A. SanFilippo, Executive Deputy Comptroller

518-474-4593, [asanfilippo@osc.state.ny.us](mailto:asanfilippo@osc.state.ny.us)

Tina Kim, Deputy Comptroller

518-473-3596, [tkim@osc.state.ny.us](mailto:tkim@osc.state.ny.us)

Ken Shulman, Assistant Comptroller

518-473-0334, [kshulman@osc.state.ny.us](mailto:kshulman@osc.state.ny.us)

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### Vision

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To improve government operations by conducting independent audits, reviews, and evaluations of New York State and New York City taxpayer-financed programs.

# Agency Comments

2 Broadway  
New York, NY 10004  
212 878-7000 Tel

**Joseph J. Lhota**  
Chairman



## Metropolitan Transportation Authority

State of New York

February 13, 2018

Ms. Carmen Maldonado  
Audit Director  
The Office of the State Comptroller  
Division of State Government Accountability  
59 Maiden Lane, 21<sup>st</sup> Floor  
New York, NY 10038

**Re: Draft Report #2016-S-92 (NYC Transit: Selected Safety and Security Equipment at Subway Stations)**

Dear Ms. Maldonado:

This is in reply to your letter requesting a response to the above-referenced draft report.

I have attached for your information the comments of Andy Byford, President, MTA New York City Transit, which address this report.

Sincerely,

A handwritten signature in blue ink that reads "Joseph J. Lhota".

Joseph J. Lhota

c: Veronique Hakim, MTA Managing Director  
Michael J. Fucilli, Auditor General, MTA Audit Services

Attachments

*The agencies of the MTA*

MTA New York City Transit  
MTA Long Island Rail Road

MTA Metro-North Railroad  
MTA Bridges and Tunnels

MTA Capital Construction  
MTA Bus Company




# Memorandum



**Date** February 12, 2018

**To** Joseph Lhota, Chairman, MTA

**From** Andy Byford, President, NYC Transit 

**Re** **New York State Comptroller Report #2016-S-92: Selected Safety and Security Equipment at Subway Stations**

This information is being provided in response to the New York State Comptroller's above-referenced audit report. The stated purpose of the audit was to determine whether NYC Transit (NYCT) "ensures that safety and security equipment, such as cameras and Help Point Intercoms, are working, tested, maintained, and monitored." NYCT's Electronic Maintenance Division (EMD), a reporting unit of the Maintenance of Way (MOW) Division within the Department of Subways, is responsible for maintaining and monitoring this equipment.

NYCT does not concur with the report and findings as written. We take this maintenance duty seriously and set appropriate goals for maintaining and repairing the equipment. The Comptroller's premise and recommendations appear to be based on faulty analysis and incomplete information, and we disagree with the need for changes to our current processes.

*Comptroller Recommendation #1: Reassess the training program given to new employees to ensure that it provides the appropriate level of skill to do the work, such as diagnosing and repairing defective security equipment.*

NYCT Response: We disagree with this recommendation, as an additional reassessment of EMD's training program. EMD's training program is continually reassessed on an ongoing basis. As new equipment comes on-line, we make adjustments and additions as necessary.

*Comptroller Recommendation #2: Focus resources on meeting preventive maintenance (PM) targets. One such option could include ensuring that, when technicians are reassigned after performing maintenance work that required immediate attention, the missed preventive maintenance tasks are given priority when technicians resume their regular schedule.*

NYCT Response: We disagree with this recommendation, because it implies that EMD is not adequately establishing a maintenance schedule that balances its priorities appropriately. EMD establishes maintenance schedules to optimize a balance between its available workforce and equipment reliability, based on manufacturer recommendations, component age, and operating conditions. We set an aggressive preventive maintenance schedule for security equipment, and in 2016, we completed 84% of our PMs. As acknowledged in the report, however, more urgent priorities sometimes require us to reallocate staff to ensure the security of our customers and employees. For example, equipment repairs and installation, rush video retrieval requests (e.g., following the December 11 attack at the Times Square station), or PMs on Police and Transit

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Comment  
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Comment  
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Comment  
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\* See State Comptroller's Comments, page 19.

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radios take precedence and may result in a redirection of resources and the deferral or cancellation of certain CCTV PMs.

*Comptroller Recommendation #3: Ensure defective cameras are repaired timely.*

NYCT Response: We agree that cameras should be repaired in a timely fashion but believe the audit mischaracterizes the state of repairs. The report uses EMD's three-day guideline that EMD has set for itself to repair trouble calls but correctly cites that "EMD indicates there is no three-day requirement and that it is only a guideline. EMD aims to repair trouble calls within three days, but multiple factors affect assignments on a day-to-day basis. Higher priority work takes precedence." The report then includes a table showing 74 percent of total defects completed within three days and 26 percent completed after three days – and, based on this criterion, the implication is that we are not repairing defects timely.

As discussed with the Auditors, we disagree with this analysis for the following reasons:

- While the stated purpose of the audit is an evaluation of EMD practices, the auditors group together disparate camera systems that have differing levels of criticality, different maintenance requirements, and may be primarily managed by groups outside of EMD. While EMD tracks and follows up on all trouble tickets, much of the equipment (at least 15%) was under warranty during the audit period or the responsibility of outside vendors. In these cases, trouble call response time is dictated by our vendors based upon contractual terms and conditions. It is inaccurate to group all cameras together and presume a common repair goal.
- The report fails to take into consideration legitimate reasons why some trouble tickets remain open for extended periods of time – such as construction work, track access issues (especially for Under River Tubes), or parts availability.

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Comment  
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*Comptroller Recommendation #4: Promptly establish and document a preventive maintenance schedule for Help Point Intercoms (HPIs).*

NYCT Response: We agree that a preventive maintenance schedule should be developed but we feel that this is premature, prior to the completion of construction of the HPI project. Throughout the audit, EMD communicated to the auditors that the HPI project was still in construction and that a preventive maintenance program, which will largely consist of periodic cleaning, will be established upon completion. Until that time, there is little increased risk of HPI unavailability since the Help Point units, which are comprised of solid state electronic components, are remotely monitored 24/7 by our Solar Winds system, which reports the working condition of each unit. We know in real time when a Help Point is not available and can respond in a timely manner. In addition, Stations personnel conduct physical inspections every 72 hours and clean HPIs once daily. As noted in the report, EMD fully intends to establish and document a formal preventive maintenance schedule upon completion of construction (estimated mid-2018) and will base this schedule on analyzed data of failures.

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Comment  
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*Comptroller Recommendation #5: Establish an acceptable occurrence rate for each type of ticket, with a focus on "Opened in Error," to reduce these incidents.*

NYCT Response: We disagree with this recommendation, as the fact that there is a high volume of trouble tickets designated "opened in error" does not necessarily represent a problem with the system nor does it degrade the effectiveness of monitoring the availability of HPIs. As noted in the report, since HPIs are a new product, with no historical data available, we are gradually learning which alerts warrant opening trouble tickets and which do not. The procedure for determining which problems warrant opening tickets relating to HPIs will be formalized in 2018 upon completion of the project installation after reviewing and analyzing the collected data.

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Comment  
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*Comptroller Recommendation #6: Document reasons for delays in repairs to HPIs.*

NYCT Response: We agree with the notion but we believe that existing procedures already capture HPI data relating to delays. Including additional documentation of the reasons for the delay does not provide EMD with any necessary data that it lacks. The Audit Report includes the statement "without written information on why delays occur, EMD lacks critical data that may enable it to improve the timeliness of operations." EMD documents all details in our Trouble Ticket System necessary for operations to repair and maintain the HPIs in a timely manner (the detailed trouble ticket reports were provided and discussed with the audit team). Per the table supplied by auditors, EMD has effectively addressed over 90 percent of sampled defects in three days or less. We provided specific explanations as to why the remaining 9.6 percent were delayed, such as awaiting parts delivery or repair by a third-party vendor.

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## State Comptroller's Comments

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1. The audit findings and conclusions are based on sufficient audit evidence and accurately reflect the preventive maintenance performed at the stations we reviewed. The results are based on a straightforward calculation of the number that should have been performed and the number that Subways' EMD management and employees reported as done. Similarly, the handling of trouble calls reflects that they were addressed in the three-day target as reported by EMD. We reviewed the supporting documentation to check the time frames in the files provided. Moreover, the audit process provided Subways and EMD management ample opportunity to accurately report on their maintenance and monitoring activities.
2. The response does not address the recommendation, which focuses on the new employees and not the new equipment. We reiterate that the new employees need to be trained on the equipment, whether it is new or old. Moreover, EMD did not have any documentation to support its "assessment" of training when new equipment was introduced.
3. We disagree that the recommendation implies EMD did not have an adequate maintenance schedule. The issue that needs to be addressed is ensuring the preventive maintenance tasks that were not done (due to other priorities) are revisited and not overlooked.
4. Our report captures the fact that 10 of the 22 trouble calls were under warranty and reported to MTACC and CPM. However, many trouble calls took longer to address and were due to delays from EMD in responding to the calls.
5. Preventive maintenance is defined as maintenance that is regularly performed on a piece of equipment to lessen the likelihood of it failing. Considering it's been five years since the installation of the HPIs first started, it is reasonable to expect that EMD is capable of establishing a preventive maintenance schedule, regardless of the type of work that has to be done (i.e., cleaning vs. parts). Thus, the recommendation states that the action should be taken "promptly."
6. In the absence of any valid reason for almost 50 percent of tickets being "Opened In Error," MTA management should have focused some attention on this, in light of the fact that tickets are created when an HPI sends a signal that it was not working for 15 minutes or longer. In five years, MTA should have sufficient data about the project installation to determine the reasons and establish a reasonable rate of occurrence.
7. MTA officials claim they have information about the reasons why the HPIs were not repaired within the three days, but they did not have any documentation for 38 of the 382 tickets we sampled. They also rejected three days as being their time frame for addressing trouble calls, yet, when it is to their benefit, the time frame applies.