



# City of New York

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## OFFICE OF THE COMPTROLLER

**Scott M. Stringer**  
**COMPTROLLER**



## MANAGEMENT AUDIT

**Marjorie Landa**

Deputy Comptroller for Audit

Audit Report on the Maintenance of Bike Share Equipment by New York City Bike Share, LLC in Compliance with its Contract with the Department of Transportation

MJ14-076A

December 11, 2014

<http://comptroller.nyc.gov>



THE CITY OF NEW YORK  
OFFICE OF THE COMPTROLLER  
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NEW YORK, NY 10007

SCOTT M. STRINGER  
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December 11, 2014

**Dear Residents of the City of New York:**

My office has audited New York City Bike Share, LLC (NYCBS), to determine whether it maintained its Citi Bike equipment (bikes and stations) in compliance with applicable provisions of its contract with the Department of Transportation (DOT). We perform audits such as this as a means of increasing accountability and ensuring that contractors perform in accordance with their agreements with the City.

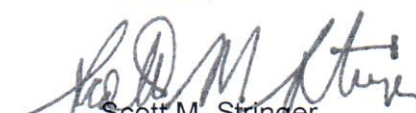
This audit disclosed that during the audit period, NYCBS failed to maintain Citi Bike program equipment as required by its contract with DOT and its own internal operating procedures. Specifically, NYCBS did not perform maintenance checks on all bikes on a monthly basis; did not perform station inspections twice per week; did not ensure that on-street maintenance checks of bikes were properly documented; and did not respond within the required timeframes to cleanliness issues with bikes and stations after discovery or notification.

To address these weaknesses, the audit recommended that NYCBS maintain sufficient staffing levels of on-street bike checkers to ensure that monthly maintenance inspections are performed and appropriately documented. Also, we recommended that NYCBS ensure that station inspections are conducted twice per week as required, and that NYCBS review and modify its operating practices for addressing DOT complaints to ensure that cleanliness issues are addressed in a timely manner. Lastly, the audit recommended that DOT implement effective procedures to continuously monitor NYCBS's equipment maintenance operations.

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

If you have any questions concerning this report, please email my Audit Bureau at [audit@comptroller.nyc.gov](mailto:audit@comptroller.nyc.gov).

Sincerely,

  
Scott M. Stringer

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# THE CITY OF NEW YORK OFFICE OF THE COMPTROLLER MANAGEMENT AUDIT

## Audit Report on the Maintenance of Bike Share Equipment by New York City Bike Share, LLC, in Compliance with its Contract with the Department of Transportation

MJ14-076A

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### EXECUTIVE SUMMARY

This audit was conducted to determine whether New York City Bike Share, LLC (NYCBS) maintained bike-share program equipment in compliance with applicable provisions of its contract with the Department of Transportation (DOT). DOT is responsible for the safe, efficient, and environmentally-responsible movement of people and goods throughout New York City and for promoting the use of sustainable modes of transportation. On May 27, 2013, NYCBS, in partnership with DOT, launched the “Citi Bike” program to provide New York City residents and visitors with an alternative option for getting around the City. The program operates 24 hours a day, year round. It consists of a fleet of approximately 6,000 specially-designed bikes that are locked into a network of approximately 330 stations installed at various sites in Manhattan (south of 59<sup>th</sup> Street) and Brooklyn (north of Atlantic Avenue and west of Nostrand Avenue). Bikes rented through Citi Bike can be obtained from and returned to any station in the system. Under the contract, NYCBS is responsible for installing, cleaning, and maintaining all program-related equipment, including bikes and stations (both docks and kiosks).

### Audit Findings and Conclusions

During the audit period, NYCBS failed to maintain Citi Bike program equipment (bikes and stations) as required by its contract with DOT and its own internal operating procedures. Specifically, NYCBS did not: (1) perform maintenance checks on all bicycles on a monthly basis; (2) perform station inspections twice per week; (3) ensure that on-street maintenance checks of bikes were properly documented; (4) respond within the required timeframes to cleanliness issues with bicycles and stations after discovery or notification of problems; and (5) maintain connectivity of stations to its main database at required levels. As a result of these deficiencies, the riding public is exposed to increased safety risks and customer satisfaction is potentially jeopardized.

### Audit Recommendations

To address the findings raised in this audit, we made the following eight recommendations:

- NYCBS should maintain sufficient staffing levels of on-street bike checkers to ensure that monthly maintenance inspections are performed on bikes in accordance with its contract with DOT.
- NYCBS should ensure that stations are inspected in accordance with the requirements set forth in its contract with DOT.
- NYCBS should ensure that on-street bike checks are appropriately documented and recorded in compliance with its own procedures.
- NYCBS should review its operating practices for addressing DOT complaints and modify them to ensure that station and bike cleanliness issues can be addressed within the time required by its contract with DOT.
- NYCBS should procure the software necessary to allow it to remotely lock bikes at stations.
- NYCBS should develop a strategy for increasing and maintaining station uptime to comply with its contract with DOT. One strategy to consider would be to schedule more frequent station maintenance inspections to ensure quicker identification and handling of station malfunctions or disruptions.
- NYCBS should develop a procedure to ensure that the underlying data feed communicated to the Citi Bike app reflects accurate information about available and working docks and bikes.
- DOT should implement effective procedures to continuously monitor NYCBS's equipment maintenance operations. Those procedures should, at a minimum, include timely follow up in response to conditions reported by DOT inspectors, and verification of NYCBS's self-reported performance metrics.

## Agency Response

Of the eight recommendation made in this audit, seven were directed to NYCBS and one to DOT. In its response, NYCBS generally agreed with 6 of the 7 recommendations made to the company and did not address our recommendation that it review its operating practices for addressing DOT complaints to ensure that station and bike cleanliness is addressed in a timely manner. DOT agreed to implement the one recommendation directed to the agency.

# AUDIT REPORT

## Background

DOT is responsible for the safe, efficient, and environmentally-responsible movement of people and goods throughout New York City, and for promoting the use of sustainable modes of transportation. In accordance with this mission, on May 27, 2013, NYCBS, in partnership with DOT, launched the "Citi Bike" bike-share program to provide New York City residents and visitors with an alternative option for getting around the City.<sup>1</sup> The program operates 24 hours a day, year round. It relies on a fleet of approximately 6,000 specially-designed bikes that are locked into a network of approximately 330 stations installed at various sites in Manhattan (south of 59<sup>th</sup> Street) and Brooklyn (north of Atlantic Avenue and west of Nostrand Avenue). Bikes rented through Citi Bike can be obtained from and returned to any station in the system.

NYCBS is a private company that operates the Citi Bike program under a six-year contract with DOT.<sup>2</sup> NYCBS procured all of the Citi Bike equipment and software from its supplier, Public Bike System Company (PBSC).<sup>3</sup> In accordance with its contract, NYCBS must pay the City of New York 50 percent of its net operating revenue from the bike-share program.<sup>4</sup> As of April 30, 2014, the Citi Bike program had a total of 105,367 enrolled annual members, with gross revenues totaling more than \$31 million since the program's inception.

Pursuant to its contract, all costs associated with Citi Bike operations are borne by NYCBS; no taxpayer dollars are used to supplement private funds. NYCBS is responsible for installing, cleaning, and maintaining all program-related equipment, including bikes and stations (both docks and kiosks). In addition, it has the exclusive right to place advertisements and/or sponsorship acknowledgements on the equipment and to collect all corresponding revenues.

NYCBS uses various computer systems to track equipment repair and maintenance and to monitor docking points, including a database called NetSuite, which it relies on to record, track, and report maintenance and repair of NYCBS bikes and stations. In addition, it relies on the PBSC-provided Service Back End (SBE) database, which contains the docking history of all the bicycles in the program.

As of May 31, 2014, DOT had 10 employees assigned to work on the bike share program: 4 administrators and 2 inspectors assigned to the Citi Bike program on a full-time basis, and 4 inspectors assigned to perform Citi Bike inspections on a part-time basis. DOT aims to inspect every station once a week, but no less than once every other week. There are 34 routes, each consisting of approximately 10 stations, which are assigned to inspectors on a rotating basis. DOT inspectors assigned to the Citi Bike program full-time are given 2 to 4 routes each day, covering 20 to 40 stations, while inspectors assigned on a part-time basis are generally given fewer routes. According to DOT, the inspectors follow a prescribed workflow when they visit a station. Inspectors use a mobile device to record the condition of all station elements, including the station kiosk screen, credit card reader, and printer. The inspectors also record the cleanliness of the bikes, stations, and surrounding area.

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<sup>1</sup> The Citi Bike program was scheduled to launch in the summer of 2012. However, the launch date was delayed until May 2013, initially because of software problems and subsequently due to damage to bike share equipment stored at NYCBS' Brooklyn Navy Yard facility as a result of Hurricane Sandy on October 29, 2012.

<sup>2</sup> At DOT's sole discretion, the contract may be renewed for up to two additional terms of five years each.

<sup>3</sup> PBSC is based in Montreal, Quebec, Canada, and provides equipment to third-party operated bike share programs in more than a dozen cities in North America, Europe, and Australia. On January 20, 2014, PBSC announced that it was filing for bankruptcy protection, citing debts totaling about \$49 million.

<sup>4</sup> As defined in section 10 of the agreement between NYCBS and DOT.

The mobile device transmits the inspection data directly to a DOT-administered database, which automatically transmits an e-mail to NYCBS notifying it of any adverse conditions observed.

## **Objective**

The objective of this audit was to determine whether NYCBS maintained Citi Bike equipment in compliance with applicable provisions of its contract with DOT.

## **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 May 27, 2013 through May 31, 2014. For one test involving the Citi Bike mobile application, the audit scope was extended to July 1, 2014. The Detailed Scope and Methodology section at the end of this report describes the specific procedures and tests that were conducted.

## **Discussion of Audit Results with NYCBS and DOT**

The matters covered in this report were discussed with NYCBS and DOT officials during and at the conclusion of this audit. A preliminary draft report was sent to NYCBS and DOT officials on October 7, 2014, and was discussed at an exit conference held on October 23, 2014. On November 14, 2014, we submitted a draft report to NYCBS and DOT officials with a request for comments. We received a written response from NYCBS and DOT officials on December 3, 2014.

Of the eight recommendation made in this audit, seven were directed to NYCBS and one to DOT. In its response, NYCBS generally agreed with 6 of the 7 recommendations made to the company. It did not address the recommendation that it review its operating practices for addressing DOT complaints to ensure that station and bike cleanliness is addressed in a timely manner. DOT agreed to implement the one recommendation directed to the agency.

The full texts of the NYCBS and DOT responses are included as addenda to this report.

# FINDINGS AND RECOMMENDATIONS

During the audit period, NYCBS did not maintain Citi Bike program equipment (bikes and stations) as required by its contract with DOT and its internal operating procedures. While NYCBS has formal policies and procedures for the maintenance and upkeep of Citi Bike equipment and operated a call center for the purpose of receiving and recording customer complaints, it nevertheless failed to comply with a number of contract provisions related to equipment maintenance, thereby exposing the riding public to increased safety risks and potentially undercutting customer satisfaction. Specifically, NYCBS:

- Did not perform maintenance checks on all bicycles on a monthly basis;
- Did not perform station inspections twice per week;
- Did not ensure that on-street maintenance checks of bikes were properly documented;
- Did not respond within the required timeframes to cleanliness issues of bicycles and stations after discovery or notification; and
- Did not maintain connectivity of stations to its main database at required levels.

These matters are discussed in greater detail in the following sections of this report.

## Bike Share Equipment Not Regularly Inspected

### Monthly Bike Checks Not Performed as Required

NYCBS failed to perform inspections/maintenance checks on bikes in accordance with its contract with DOT and its own standard operating procedures. Both require each bike to undergo a complete maintenance check at least once a month to help ensure the availability and safety of the equipment.

These maintenance checks can be performed either on-street (preventive maintenance) or in-shop (responsive maintenance). According to officials, during the peak months of April through October, NYCBS had up to 16 bike checkers, organized in teams of 2 who worked during the day to perform on-street maintenance checks in Manhattan and Brooklyn. However, these bike checkers were laid off by NYCBS in October 2013.<sup>5</sup> Prior to their layoff, the bike checkers traveled around the City by bike or on foot carrying the necessary parts and tools to perform on-street maintenance checks and minor repairs (e.g., repair and/or replace damaged or missing reflectors, bells, and handle bars). According to NYCBS's procedures, the bike checkers performed a 19-point check on each bike each month, which included inspecting the tires, seat, brakes, lights, and wheels. When finished, the bike checkers would place an appropriate color-coded zip-tie on the bike that indicated the month that the last maintenance inspection was performed. If a bike did not pass inspection and could not be repaired on the street, the bike checker would lock the bike in the dock by pressing the "damaged bike" button on the dock, and contact NYCBS's dispatch so that the bike could be collected and taken to the maintenance shop for repair.

Bikes are usually brought into the maintenance shop for repair of reported defects, such as a missing or broken seat or pedal, flat tire, damaged rim, or any condition that would render the bike inoperable or unsafe. When in-shop, a mechanic is required to perform a full maintenance check in addition to making repairs to the reported defect.

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<sup>5</sup> We were informed that NYCBS rehired people to work as bike checkers in April 2014.



We took a sample of 25 bikes. NYCBS's maintenance records showed that only 84 (60 percent) of the 141 required monthly maintenance checks were performed on the sampled bikes from July 2013 through December 2013.<sup>6</sup> Of the 84 maintenance checks performed, 40 of them were conducted on-street by bike checkers and 44 maintenance checks were performed in-shop.

As shown in Table I, a comparison of the monthly rate of inspections applicable for the 25 sampled bikes shows a sharp decrease in the maintenance checks performed in November and December 2013 as compared to the earlier months of July 2013 through October 2013.

**Table I**

Total Required Monthly Bike Checks vs. Total Actual Bike Checks  
Performed on 25 Sampled Bikes from July 2013 through December 2013

Month	(a) Total Required Monthly Bike Checks for 25 Sampled Bikes	(b) Total Actual Monthly Bike Checks Performed for Sampled Bikes	(c) <i>Percentage</i> <i>(Col b. /Col. a)</i>	(d) Total Monthly Bike Checks Not Performed	(e) <i>Percentage</i> <i>(Col d. /Col. a)</i>
July 2013	23	19	83%	4	17%
August 2013	23	17	74%	6	26%
September 2013	23	20	87%	3	13%
October 2013	23	15	65%	8	35%
November 2013	24*	7	29%	17	71%
December 2013	25**	6	24%	19	76%
<b>Total</b>	<b>141</b>	<b>84</b>	<b>60%</b>	<b>57</b>	<b>40%</b>

\*One bike from our sample was not put into service until November 2013.

\*\*A second bike from our sample was not put into service until December 2013.

Similarly, an analysis of NYCBS's maintenance data for the entire bike fleet for November 2013 through January 2014 showed that, overall, for the 3-month period NYCBS performed only one-third (33 percent) of the required monthly bike checks. The results for each month are as follows:

- In November 2013, inspections were performed on only 1,625 (28 percent) of 5,900 total bikes;
- In December 2013, inspections were performed on only 2,229 (34 percent) of 6,499 total bikes;<sup>7</sup>
- In January 2014, inspections were performed on only 2,048 (38 percent) of 5,441 total bikes.<sup>8</sup>

NYCBS officials explained that these results were a consequence of its suspension of on-street maintenance checks and the layoff of all on-street bike checkers on October 17, 2013. NYCBS officials said these layoffs occurred because of a decrease in ridership and bike usage during off-peak months (defined as November through March by NYCBS). At the exit conference, NYCBS officials

<sup>6</sup> The total number of monthly inspections that were required for the 25 sampled bikes was 141 rather than 150 because 2 of the sampled bikes had been not been put into service until November 2013 and December 2013, respectively.

<sup>7</sup> According to NYCBS officials, the increase of 599 bikes to 6,499 in December 2013 from 5,900 in November 2013 was due to the addition of refurbished bikes, which had been damaged during Hurricane Sandy.

<sup>8</sup> According to NYCBS officials, the drop from 6,499 bikes in December 2013 to 5,441 bikes in January 2014, a decrease of 1,058 bikes, was due to a reduction in fleet size for the winter (off-peak) months. The bikes were removed from the street and stored in a NYCBS warehouse.

said that the decision to lay off the bike checkers was also influenced by the fact that its parent company, Alta Bike Share, denied NYCBS's request for additional funding.

NYCBS officials also attributed the company's inability to meet bike inspection requirements to its supplier's (PBSC) failure to deliver on its promise to provide software capability that would allow NYCBS to remotely lock bikes at stations. Officials explained that the promised software capability would have enabled NYCBS to identify bikes requiring inspections each month and lock them at their location until they could be inspected by an on-street bike-checker or be picked up and returned to the shop for maintenance. At the exit conference, NYCBS officials stated that a third reason for the company's failure to meet bike inspection requirements was that it was difficult to properly document checked bikes in the "cumbersome" paper reporting system that was established for this contract.

Regardless of the reason, because of the layoff of the bike checkers, the focus of NYCBS's maintenance efforts shifted from preventive to responsive maintenance, with checks only performed in-shop and limited to bikes reported as having a problem by DOT inspectors, customers, or NYCBS employees. Near the end of our fieldwork on May 28, 2014, NYCBS officials reported that as of April 14, 2014, on-street bike checking had resumed. According to NYCBS's monthly reports, overall bike maintenance inspections increased from 54 percent of the fleet in March 2014 to 73 percent in April 2014.

However, NYCBS's failure to perform regular monthly bike maintenance checks during the winter months was contrary to its contract with DOT. While the contract recognizes peak and off-peak periods with respect to the inventory of on-street bikes and the rebalancing of those bikes, it does not alter NYCBS's obligation to perform monthly maintenance checks. Further, NYCBS's Standard Operating Procedures indicate that on street bike checking would be performed during the fall and winter seasons.

NYCBS's on-street bike checkers are integral to the company's maintenance operations because they ensure that bikes are consistently checked each month as required by the contract. The layoff of bike checkers in mid-October severely limited NYCBS's ability to ensure that all bikes were inspected as required and further undermined its ongoing equipment maintenance strategy.

## **Faulty Documentation of On-Street Bike Checks**

NYCBS failed to maintain documents recording key information about maintenance checks that were supposed to have been performed. Consequently, NYCBS did not have adequate documentation to confirm that on-street bike maintenance checks had been conducted. Absent such documentation, there is an increased risk that bicycles were not actually inspected. This raises concerns that bikes could malfunction due to undetected defects, thereby increasing safety risks to riders.

NYCBS's procedures require that "when a bike is checked, the bike checker will fill out the 'bike check form,' indicating that the bike has been checked, whether it requires repairs, any parts used for on-street repair, whether any damage is suspected to be vandalism, and notes on adjustments made."<sup>9</sup> However, NYCBS officials stated that this requirement was never enforced. The audit found that of the 84 maintenance checks performed on 25 sampled bicycles from July 2013 through December 2013, 40 were on-street checks conducted by NYCBS bike checkers. However, NYCBS did not have hard copy checklists for any of these 40 on-street maintenance checks. The electronic spreadsheet used by NYCBS to record and track on-street maintenance checks is not an adequate substitute for the required "bike check form" because it does not identify the condition of the bike, any parts used for

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<sup>9</sup> Standard Operations Procedures for Citi Bike NYC operated by NYC Bike Share, LLC, p 12.

needed repairs, the cause or nature of any damage, or the name of the bike checker who performed the check.

## Station Inspections Not Performed at Required Level

NYCBS did not inspect stations twice per week as required by its contract with DOT. Of the 29 active stations sampled, NYCBS performed 184 (79 percent) of the 232 required inspections for the month of February 2014.<sup>10</sup> NYCBS performed the required number of inspections for only 11 of the 29 sampled stations. The remaining 18 stations were either inspected less than 2 times per week or not at all in a given week.

By not ensuring that the stations are inspected regularly as required, NYCBS limited its ability to identify and repair equipment problems. Consequently, customers may not be able to use bikes or docks, rent a bike from the kiosk, and/or rely on the Citi Bike mobile application, an issue that is discussed later in this report.

## Recommendations

1. NYCBS should maintain sufficient staffing levels of on-street bike checkers to ensure that monthly maintenance inspections are performed on bikes in accordance with its contract with DOT.

**NYCBS Response:** NYCBS generally agreed, stating: “We are in the process of addressing this issue with our new owners and management team. Last year we had to cut staff in the winter due to our financial situation. While we will always utilize seasonal staff to help in the peak riding seasons, the new management group understands that we must maintain appropriate staff levels to check bikes year-round.”

2. NYCBS should ensure that stations are inspected in accordance with the requirements set forth in its contract with DOT.

**NYCBS Response:** “We agree that having stations and docks in good repair are critical to customer access and experience. We are in the process of addressing this issue with our new management group. The new management team understands that we must maintain appropriate staff levels to inspect and maintain stations year-round. Furthermore the new management is committed to working with our vendors to improve the technology we use to decrease the frequency of malfunctions.”

3. NYCBS should ensure that on-street bike checks are appropriately documented and recorded in compliance with its own procedures.

**NYCBS Response:** “We agree and have found that the bike checking form that was included in our original operating procedures was a cumbersome manual process. Since spring 2014, we have been using a new, automated process to ensure that bike checks are conducted. Each on-street bike checker is assigned a key, and they use that key to check in/out the bikes that are being evaluated. That way, we can easily and reliably determine the bikes that have been checked in a given month.”

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<sup>10</sup> The number of required inspections was calculated as 29 sampled stations by 2 inspections per week by 4 weeks in February 2014 (29 x 2 x 4 = 232).

## Cleanliness Complaints Not Addressed Promptly

Upon receiving a complaint or notice from a DOT inspector, NYCBS did not respond promptly and clean stations and/or bikes of an accumulation of dirt, trash, and/or leaves. According to its contract with DOT, NYCBS must ensure that bike share stations are cleaned within 48 hours of discovery or notification of the need for cleaning. In addition, bikes must be cleaned or removed from the system within 96 hours of discovery or notification of an issue in order to ensure the comfort and safety of the riders. NYCBS officials stated that the conditions related to Field Maintenance Orders (FMOs) were addressed by its cleaner, DynaServ, either when it performed its scheduled bi-weekly cleaning of the stations or when directed by NYCBS to perform a special cleaning of a station.

However, of the 100 sampled complaints that DOT forwarded to NYCBS for the week of March 2–8, 2014, NYCBS generated 22 FMOs related to station cleanliness. As of April 9, 2014—the date data was extracted and reviewed by the auditors—NYCBS had responded to and closed 20 of the 22 FMOs. Of these 20 closed FMOs, NYCBS had completed only 12 (60 percent) within the required timeframe of 48 hours. It took NYCBS an average of 10 days after notification to complete and close the remaining 8 (40 percent) reported complaints. The 2 other FMOs that were still outstanding as of April 9, 2014, had been open for 93 days and 68 days, respectively.

Similarly, NYCBS did not respond, clean, or remove bikes in the required timeframe of 96 hours upon notification of an issue by a DOT inspector. Of the 100 sampled DOT-reported complaints, 12 were related to bike cleanliness for which FMOs were generated. Of these 12 FMOs, NYCBS responded and closed only 2 (17 percent). Both of these were not completed until well after the 96-hour response time requirement. One was completed in 32 days and the other in 96 days after notification. The 10 other FMOs (83 percent) remained open and unaddressed for an average of 79 days (ranging from 34 to 145 days), as of April 9, 2014.

NYCBS officials stated that the company can remotely identify the location of bikes. The bikes are equipped with a sensor that communicates the bike number once the bike is placed in a dock. Through this technology, NYCBS SBE database can track the bike locations, trip times, and customers who used the bikes. However, at the time that NYCBS and DOT launched the bike-share program, the company expected its software supplier (PBSC) to provide the software that would also enable NYCBS to both identify bikes that need maintenance and remotely lock them. However, PBSC never delivered that technology; as a result, NYCBS does not have the capability to remotely lock down bikes at stations as it originally intended. Therefore, if a bike in need of cleaning or repair is reported in a complaint to be at one station and a NYCBS employee is dispatched to that location, the bike may be taken by a customer before the NYCBS employee can arrive, which will delay service to the bike.

### Recommendations

4. NYCBS should review its operating practices for addressing DOT complaints and modify them to ensure that station and bike cleanliness issues can be addressed within the time required in its contract with DOT.

**NYCBS Response:** NYCBS officials did not directly address the recommendation. However, they stated: “Station cleanliness has improved since July 2014 and we are continuing to work with our station cleaning contractor to improve performance further.”

5. NYCBS should procure the software necessary to allow it to remotely lock bikes at stations.

**NYCBS Response:** “Our new management team is aware that this software deficiency is an issue for our operations and is committed to working with our vendors to resolve it.”

## Inadequate Station Connectivity

NYCBS did not ensure station communications and transaction systems were fully functional and connected at least 98 percent of the "total station uptime" each month, as required by its DOT contract.<sup>11</sup> Disruptions, malfunctions, and the inconsistency of station communications and transaction systems can prevent customers without an annual membership from purchasing a pass to use bikes. Such disruptions further lead to decreased revenue because patrons are unable to use the credit card payment system from a kiosk with connectivity malfunctions. In addition, equipment problems may go undetected because the main system would not be updated to reflect the problem equipment when a rider locks a bike with a problem.<sup>12</sup> Therefore, the problem would go unreported until the station connectivity is reestablished or the problem is reported by a DOT inspector or to the call center by a customer.

As reflected in Table II, NYCBS's monthly statistics reports for the period July 2013 through April 2014 showed that the monthly uptime of all stations varied.

**Table II**

Reported Connectivity/Uptime of Stations for the Period July 2013 – April 2014

Month	Station Uptime Percentage	Met 98 % Performance Level?
Jul 2013	99.0%	Yes
Aug 2013	85.0 %	No
Sep 2013	97.0%	No
Oct 2013	99.6%	Yes
Nov 2013	99.9%	Yes
Dec 2013	97.0%	No
Jan 2014	86.8%	No
Feb 2014	87.0%	No
Mar 2014	90.0%	No
Apr 2014	91.0%	No

In 7 of the 10 months shown above, NYCBS reported station uptime that fell below the 98 percent requirement; for 5 months the station uptime was at 91 percent or less.

NYCBS officials stated that in January 2014, PBSC, its parts supplier for station communications and transaction systems, filed for bankruptcy. According to NYCBS officials, this hindered its efforts to obtain parts needed to properly maintain its systems and meet station uptime requirements. Notwithstanding, NYCBS officials also stated that PBSC's bankruptcy would not adversely affect Citi Bike operations. NYCBS notified DOT that it would seek to procure the parts needed to maintain and repair the stations from suppliers other than PBSC. Subsequently, NYCBS has been procuring parts from multiple suppliers of various station parts.

<sup>11</sup> The total station uptime represents the total station time (total number of stations installed around the City multiplied by 1440 minutes per day and the total days for the given month) less total downtime, the results of which are then divided by the total station time. According to DOT officials, stations can lose uptime for a variety of reasons (such as having a broken printer) without losing connectivity.

<sup>12</sup> If a rider finds that a bike is not working properly, s/he can simultaneously lock it securely at any station and notify NYCBS by pushing the white wrench button on the top of the dock, which (through a wireless connection) communicates the engagement of the dock lock. This flags the bike as defective by NYCBS's SBE database.

## Recommendation

6. NYCBS should develop a strategy for increasing and maintaining station uptime to comply with its contract with DOT. One strategy to consider would be to schedule more frequent station maintenance inspections to ensure faster identification and handling of station malfunctions or disruptions, so they can be identified, reported and remediated more promptly.

**NYCBS Response:** NYCBS generally agreed stating: “Our new investors are committed to resolving this issue both immediately by increasing maintenance staff and over the next year by addressing the technology issues that are at its root. Potential longer-term solutions to preventing station outages include improvements to both solar power generation as well as reduction in power consumption by our stations.”

## Citi Bike Mobile App Accurate But Not Fully Reliable

NYCBS provides a link on its website to a free mobile application<sup>13</sup> (the Citi Bike app) to inform its customers about the current availability of bikes and docks. The app receives data from NYCBS's SBE database that indicates the number of available bikes and docks at each station. However, because of the inability to remotely detect defective bikes and nonfunctioning docks, the underlying data feed from the SBE database to the Citi Bike app does not reflect such information. Therefore, the Citi Bike app does not reflect it either and as a result, bike share customers cannot fully rely on the information provided by the Citi Bike app.

Audit tests showed that while the app appeared to report accurate information about the number of physically available bikes and open docks at tested stations, the app did not reflect the actual number of available and properly functioning bikes and docks. Specifically, during audit observations of 60 stations in Brooklyn, downtown Manhattan, and midtown Manhattan on June 27, June 30 and July 1, 2014, the Citi Bike app reported that certain bikes and/or docks were available even though they were not working or usable and had "out-of-service" tape wrapped around them. Of the 60 stations observed, we found that 10 bikes and 19 docks were wrapped with out-of-service tape. Consequently, for the 60 stations observed, the app was only 83 percent accurate with respect to available, working docks and 73 percent accurate with respect to available and working bikes.

## Recommendation

7. NYCBS should develop a procedure to ensure that the underlying data feed communicated to the Citi Bike app reflects accurate information about available and working docks and bikes.

**NYCBS Response:** “We agree that our customers should have reliable real-time information at their fingertips. Our new investors have already added a Vice President for Technology to our management team. We are working to address this issue and ensure that the Citi Bike app provides accurate and reliable information.”

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<sup>13</sup> The Citi Bike app was developed by a third-party vendor.

## Other Matter

### Weaknesses in DOT's Overseeing of NYCBS Maintenance Operations

The audit disclosed weaknesses in DOT's oversight of NYCBS's maintenance operations. DOT does not have procedures in place to effectively monitor NYCBS's maintenance of bike share equipment (stations and bikes) on an ongoing basis. In addition, DOT does not follow-up on conditions observed and reported by DOT inspectors nor does it perform routine verification of NYCBS's self-reported performance metrics.

PPB Rule § 4-01 states that "(a) The agency awarding the contract shall identify specific objectives and evaluation criteria to be included as part of the contract. Where practicable, the agency shall develop both qualitative and quantitative performance indicators, including outcome criteria. . . . (b) The agency shall monitor the vendor's performance against such standards and indicators on an ongoing basis . . ." Additionally, Comptroller's Directive 1, "Principles of Internal Control, § 4.5 requires that "[a] sound internal control system . . . be supported by ongoing activity monitoring. . . . Agency management must perform continual monitoring of activities and programs."

DOT has established a Bike Share Unit, organized under the executive unit. The Bike Share Unit is headed by an Executive Director and is staffed with approximately 10 employees including the 6 inspectors discussed earlier in the report who are assigned to perform inspections of the Citi Bike equipment. Although the DOT inspectors appear to be carrying out their duties and reporting deficient conditions observed at the stations, DOT does not follow-up, either on a periodic or sample basis, to ensure that the conditions are appropriately addressed. Instead, DOT relies on NYCBS's self-reported performance metrics to assess whether the Citi Bike equipment is being suitably maintained.

In compliance with the contract, NYCBS has provided DOT with monthly reports reporting on various statistics, such as ridership, membership levels, and various performance metrics. However, when questioned about any ongoing monitoring procedures (i.e., analysis, assessment, and/or independent verification of reported performance measures) in place to oversee the contract, DOT officials stated that they had been in active discussions with NYCBS to ensure that its performance improves. Nevertheless, DOT had no information to show that it engaged in continuous monitoring of NYCBS's performance in line with the maintenance of program equipment as established in the contract.

Only through implementing ongoing monitoring procedures of NYCBS's performance can DOT be assured that the Citi Bike equipment is being maintained in accordance with the contract.

**DOT Response:** "Contrary to the Comptroller's assertion, DOT has continually monitored NYCBS's maintenance of its equipment (stations and bikes) since the inception of the Program. In addition to the regular inspections described in the audit report, this monitoring has included periodic, targeted follow-up on conditions observed and reported by DOT, and verification of NYCBS's self-reported performance metrics."

**Auditor Comment:** Although requested, DOT provided no evidence during the audit to support officials' assertion that the agency continuously monitors NYCBS's maintenance of Bike Share equipment.

### Recommendation

8. DOT should implement effective procedures to continuously monitor NYCBS's equipment maintenance operations. Those procedures should, at a minimum, include following up on

conditions reported by DOT inspectors and performing some verification of NYCBS's self-reported performance metrics.

**NYCBS Response:** “This is a recommendation for DOT but we are committed to working with them to ensure that we provide high quality service for New Yorkers.”

**DOT Response:** DOT tacitly agreed, stating: “DOT's oversight workflow at launch did not include automated follow-up procedures, in part because NYCBS's Netsuite system was not in use at that time; DOT's updated inspection tools will interface with Netsuite directly, and will improve DOT's ability to track, re-inspect, and close out its submitted tickets. In addition, the amended contract and new ownership and management will provide DOT with increased visibility into the bike share system's back-end, which will enhance the Agency's abilities to verify NYCBS's self-reported metrics.”



## 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.

The audit scope covered May 27, 2013, through May 31, 2014. For one test involving NYCBS's Citi Bike mobile application, the audit scope was extended to July 1, 2014. This audit focused on NYCBS's maintenance and upkeep of Citi Bike equipment. The audit did not address, review, or evaluate NYCBS's financial position, the accuracy of revenue it reported to DOT, or the placement of bike stations. To accomplish our objective, we carried out various audit procedures, which are discussed below.

To gain an understanding of NYCBS's responsibilities regarding the maintenance of bike share equipment (bikes and stations), we read and abstracted relevant provisions of NYCBS's contract with DOT, which formed the basis of our audit criteria.

To assess NYCBS's operations, practices, and controls over the repair and maintenance of the equipment, we interviewed key officials, conducted walk-throughs of various functions and departments (i.e., customer service, dispatch, repair, and station technician units), reviewed relevant documentation and reports, and performed tests of controls. In addition, we toured the customer call center and evaluated whether it was operated in accordance with NYCBS's contract with DOT. We documented our understanding of NYCBS's operations and controls in written narratives and memoranda. We also reviewed applicable procedures, including NYCBS's *Standard Operating Procedures Handbook* and NYCBS's *Co-Pilot Manual*, which includes job descriptions along with the roles, responsibilities, and step-by-step instructions on how to perform certain functions related to each position. These procedures were also used as audit criteria.

To familiarize ourselves with NYCBS' two databases, NetSuite and SBE, we interviewed appropriate personnel, read available user manuals and system documentation, obtained read-only access, and reviewed various reporting functions.

The SBE database tracks and logs the docking history of each bike, availability of docks and bikes, and disruptions/malfunctions in connectivity between the stations and the database. To assess the reliability and accuracy of the database for audit testing purposes, we visited two judgmentally selected stations on December 20, 2013, and observed and recorded the identification numbers and maintenance tags (zip ties) for the first 25 bikes observed. Subsequently, we requested the docking history for each of the 25 sampled bikes and compared the SBE data to the information we recorded during our observations and determined whether SBE reflected the same location, date, and time as our visit.

NetSuite is used to record, track, and report maintenance and repair of equipment (bikes and stations). It is also used to record and track complaints. To evaluate the database's reliability and accuracy for audit testing purposes, we randomly selected 50 "Bicycle Maintenance Forms" (completed by a mechanic for each in-shop bike repair) and compared the information recorded on the hardcopy forms (i.e., the date of repair, bike number, and work performed) to the maintenance history recorded in NetSuite. We also determined whether an FMO had been created and was subsequently completed for each bike repair, and whether the information matched the hard copy forms. In addition, we selected all 43 FMOs for bike maintenance that were recorded in NetSuite from August 1, 2013, through December 17, 2013, for the 25

bikes selected and used in the SBE database evaluation (discussed above). We requested the maintenance forms related to these FMOs and determined whether a form existed for each FMO, and whether the information recorded there matched the information reflected in NetSuite.

On a limited basis, we also assessed the general controls and backup policies in place to protect the data from unauthorized access and unplanned interruption. The results of the above tests provided reasonable assurance that the data from the two databases were reliable for audit testing purposes. To determine whether NYCBS performed monthly bike checks as required by the contract, we reviewed NYCBS's maintenance records for the period July 2013 through December 2013 for the initial sample of 25 bikes observed on December 20, 2013. We determined the number of bike checks required for the sampled 25 bikes during the test period and ascertained the number of bike checks that NYCBS actually performed either on-street or in-shop. Further, using the maintenance data for the entire bike fleet for the months of November 2013 through January 2014, we determined the number of bike checks performed overall in comparison to the total bike population for each of the three months.

To determine whether bike stations were inspected at least two times per week, as required by the contract, we judgmentally selected 29 stations for the month of February 2014. We obtained the FMOs, cleaning schedules, and technicians' logs and determined the dates that inspections were performed. We calculated the number of inspections required for the 29 stations during February 2014, and then compared it to the inspections performed (reflected in NYCBS's records). NYCBS provided data that we requested detailing 5,448 complaints identified and communicated via email by DOT inspectors for the period December 2, 2013, through March 11, 2014. From this population, we judgmentally selected the week of March 2–8, 2014, representing a recent week (at the time the test was performed in early April 2014) during which there was little, if any, snowfall. For this week there was a total of 470 complaints reported by DOT inspectors, from which we randomly selected a sample of 100 complaints to evaluate NYCBS's efforts to respond to cleanliness issues reported by DOT inspectors.

From the 100 sampled complaints, we identified those related to station and bike cleaning issues. Subsequently, using NetSuite, we determined whether FMOs had been generated for those complaints and, if so, calculated the status of each and the time it took NYCBS to respond and close those FMOs. We determined whether the FMOs were responded to within 48 hours if related to bike station cleaning and 96 hours if related to bike cleaning.

We visited a judgmentally selected sample of 60 stations from the population of 330 stations in Manhattan and Brooklyn and noted conditions during our visits. We visited these stations on June 27, June 30, and July 1, 2014. During our visits, we assessed whether NYCBS conspicuously posted a notice on each station advising the public of the telephone number of the call center for reporting complaints and provided "way finding" components (i.e., maps and orientation point) on each station. During our visits, we also counted the number of docks and bikes at each station and compared those results to the number of available docks and bikes reflected on the Citi Bike app at the time of our visits to assess the accuracy of the application.



December 2, 2014

Ms. Marjorie Landa  
Deputy Comptroller for Audit  
Municipal Building  
1 Centre Street, Room 1100  
New York, NY 10007

RE: *Audit Report on the Maintenance of Bike Share Equipment by New York City Bike Share, LLC in Compliance with its Contract with the Department of Transportation*  
Audit MJ14-076A  
November 14, 2014

Dear Ms. Landa,

Thank you for providing us with the opportunity to comment on your audit of the operations of Citi Bike. We received your draft on November 14 and thank you, in consideration of the holiday, for extending the date on which these comments are due from December 1 to December 3.

We appreciate the time and attention paid to the review of our operations and the report your office generated. We know that this program is very much in the public spotlight and we take our responsibility to provide high-quality service to the public very seriously.

The timeframe for your audit covered May 27, 2013 through May 31, 2014, though in some cases the data your staff analyzed was only through December 2013. We know that during this timeframe this program has not met customer expectations. This audit correctly identifies a number of deficiencies. Many of the problems have roots in two issues:

- The technology that powers bike share in New York has not worked as intended. On the operations side this has impacted our ability to extract information from our system and take timely corrective action. On the customer-facing side this has impacted customer experience including the performance of the Citi Bike mobile phone app.

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- The parent company of NYC Bike Share was experiencing financial difficulties during this timeframe.

As the Comptroller's office will be aware, a new investment group has recently signed an agreement to take control of the parent company. While the transaction is still in the final stages of approval, the new investment group has already provided additional financial resources and put a new management team in place. The new owners are investing millions of dollars to address some of the fundamental flaws in the system that were identified by the Comptroller's office in their audit. This will ensure that we can deliver better service to New Yorkers beginning with our peak riding season in 2015 and beyond.

We have the following responses to the eight recommendations you made:

**Recommendation 1:** NYCBS should maintain sufficient staffing levels of on-street bike checkers to ensure that monthly maintenance inspections are performed on bikes in accordance with its contract with DOT

**NYCBS Response:** We are in the process of addressing this issue with our new owners and management team. Last year we had to cut staff in the winter due to our financial situation. While we will always utilize seasonal staff to help in the peak riding seasons, the new management group understands that we must maintain appropriate staff levels to check bikes year-round.

**Recommendation 2:** NYCBS should ensure that stations are inspected in accordance with the requirements set forth in its contract with DOT.

**NYCBS Response:** We agree that having stations and docks in good repair are critical to customer access and experience. We are in the process of addressing this issue with our new management group. The new management team understands that we must maintain appropriate staff levels to inspect and maintain stations year-round. Furthermore the new management is committed to working with our vendors to improve the technology we use to decrease the frequency of malfunctions.

**Recommendation 3:** NYCBS should ensure that on-street bike checks are appropriately documented and recorded in compliance with its own procedures.

**NYCBS Response:** We agree and have found that the bike checking form that was included in our original operating procedures was a cumbersome manual process. Since spring 2014, we have been using a new, automated process to ensure that bike checks are conducted. Each on-street bike checker is assigned a key, and they use that key to check in/out the bikes that are being evaluated. That way, we can easily and reliably determine the bikes that have been checked in a given month.

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Berlin to Landa, page 3

**Recommendation 4:** NYCBS should review its operating practices for addressing DOT complaints and modify them to ensure that station and bike cleanliness issues can be addressed within the time required by its contract with DOT.

**NYCBS Response:** Station cleanliness has improved since July 2014 and we are continuing to work with our station cleaning contractor to improve performance further.

**Recommendation 5:** NYCBS should procure the software necessary to allow it to remotely lock bikes at stations.

**NYCBS Response:** As noted in the report, we are hindered in our ability to improve our performance on bike cleaning (mostly graffiti and sticker removal) due to our software's inability to remotely lock bikes. If we receive a report of a bike that has been vandalized we currently have no way to lock it in place for a repair team to service the bike.

Our new management team is aware that this software deficiency is an issue for our operations and is committed to working with our vendors to resolve it.

**Recommendation 6:** NYCBS should develop a strategy for increasing and maintaining station uptime to comply with its contract with DOT. One strategy to consider would be to schedule more frequent station maintenance inspections to ensure quicker identification and handling of station malfunctions or disruptions.

**NYCBS Response:** Our new investors are committed to resolving this issue both immediately by increasing maintenance staff and over the next year by addressing the technology issues that are at its root. Potential longer-term solutions to preventing station outages include improvements to both solar power generation as well as reduction in power consumption by our stations.

**Recommendation 7:** NYCBS should develop a procedure to ensure that the underlying data feed communicated to the Citi Bike app reflects accurate information about available and working docks and bikes.

**NYCBS Response:** We agree that our customers should have reliable real-time information at their fingertips. Our new investors have already added a Vice President for Technology to our management team. We are working to address this issue and ensure that the Citi Bike app provides accurate and reliable information.

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**Recommendation 8:** DOT should implement effective procedures to continuously monitor NYCBS's equipment maintenance operations. Those procedures should, at a minimum, include timely follow up in response to conditions reported by DOT inspectors, and verification of NYCBS's self-reported performance metrics.

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**NYCBS Response:** This is a recommendation for DOT but we are committed to working with them to ensure that we provide high quality service for New Yorkers.

Thank you for taking the time to review our operations. With new management in place we look forward to many years of outstanding service to New York City.

Sincerely,

A handwritten signature in black ink, appearing to read 'Matt Berlin', with a long horizontal line extending to the right.

**Matt Berlin**  
General Manager



Department of Transportation

POLLY TROTTEBERG, Commissioner

December 3, 2014

Ms. Marjorie Landa  
Deputy Comptroller for Audit  
Office of the Comptroller  
Municipal Building  
1 Centre Street –Room 1100  
New York, N.Y. 10007

Dear Deputy Comptroller Landa:

Thank you for the opportunity to provide comments on your **Audit Report on the Maintenance of Bike Share Equipment by New York City Bike Share, LLC in Compliance with its Contract with the Department of Transportation (MJ14-076A)**.

On behalf of Commissioner Trottenberg and of New York City Bike Share LLC, (NYCBS), I am submitting comments to the report and its recommendations. The New York City Department of Transportation's response is provided below. New York City's Bike Share, LLC response is also attached under separate cover.

**New York City DOT's Response to Comptroller's Audit**

DOT has reviewed the Comptroller's Management Audit of the Bike Share System and welcomes its recommendations for this brand-new program.

DOT recently signed an amended agreement for the bike share system with a new vendor, Bikeshare Holdings, LLC, which is taking over NYCBS's operations through the purchase of Alta Bicycle Share. DOT conducted its negotiations with Bikeshare Holdings, LLC having full awareness of the issues identified in the Comptroller's report, and has sought to address those issues through changes to the original program contract and by engaging with a new, more capable vendor.

**Response to Recommendation #8: Weaknesses in DOT's Overseeing of NYCBS Maintenance Operations**

Contrary to the Comptroller's assertion, DOT has continually monitored NYCBS's maintenance of its equipment (stations and bikes) since the inception of the Program. In addition to the regular inspections described in the audit report, this monitoring has included periodic, targeted follow-

up on conditions observed and reported by DOT, and verification of NYCBS's self-reported performance metrics.

By early 2014, DOT concluded that NYCBS inadequately managed its operations and was an undercapitalized company unable to operate a bike share system in New York City at the standard to which it had contracted. Having reached this conclusion, DOT recognized that refining its own oversight procedures alone would not be an effective means of improving program performance. Rather, efforts were directed towards moving Alta to a pathway where program and software improvements could be made to the system.

As noted above, NYCBS is imminently coming under new ownership and new day-to-day management. Accordingly, DOT staff is currently strengthening its oversight procedures to reflect both the Agency's experience to date in overseeing this program, and aligning these procedures to the amended contract terms so as to better interact with Alta's upgraded management and personnel.

DOT's oversight workflow at launch did not include automated follow-up procedures, in part because NYCBS's Netsuite system was not in use at that time; DOT's updated inspection tools will interface with Netsuite directly, and will improve DOT's ability to track, re-inspect, and close out its submitted tickets. In addition, the amended contract and new ownership and management will provide DOT with increased visibility into the bike share system's back-end, which will enhance the Agency's abilities to verify NYCBS's self-reported metrics.

We would like to thank your staff for all their efforts on this assignment.

Sincerely,



Amy Hutner  
Auditor General  
New York City Department of Transportation

Cc:  
P. Trottenberg, Commissioner  
L. Ardito, FDC  
M. Craven, Sr. Ex. Dir.