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OFFICE OF THE STATE COMPTROLLER

January 12, 2017

Ms. Joanne M. Mahoney
Chair
New York State Thruway Authority
200 Southern Boulevard
Albany, NY 12209

Re: Infrastructure Inspection and
Maintenance
Report 2016-F-20

Dear Ms. Mahoney:

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, we have followed up on the actions taken by officials of the New York State Canal Corporation to implement the recommendations contained in our audit report, *Infrastructure Inspection and Maintenance* (2014-S-45).

Background, Scope, and Objectives

The New York State Canal Corporation (Corporation), a subsidiary of the New York State Thruway Authority (Thruway Authority), was created in 1992 to operate and maintain the New York State Canal System. The Canal System includes 524 miles of waterways for four canals (Erie, Oswego, Champlain, and Cayuga-Seneca) and consists of 2,358 structures, including 88 locks, 19 lift bridges, 55 permanent dams, and 14 movable dams. The Corporation also maintains approximately 300 miles of adjacent recreational trails and 22 reservoirs that are used to manage the Canal System's water levels. The Canal Law requires the Corporation to maintain the Canal System in good condition. To accomplish this, the Corporation has implemented an inspection program to identify structures with any critical weaknesses (e.g., deterioration, corrosion, material defects, and damage) that need repair.

The Corporation's inspection program includes an annual operations inspection of the Canal System by boat, checking the general condition of mechanical and electrical systems of locks and lift bridges, appearance, and customer service elements; as well as other inspection options to monitor structures' safety and reliability (e.g., unannounced site visits, inspections of certain structures by consultants or other agency divisions). In addition, the Corporation performs in-depth structural inspections (Inspections) at varying time periods depending on the structure type. When we did our original audit, all structures were supposed to have an Inspection every

two years. In contrast to the annual operations inspection and visual site checks, these Inspections involve in-depth engineering evaluations of structural safety and integrity, as prescribed in the Corporation's Canal Structure Inspection Manual-95 (Manual). Based on Manual guidelines, excluding upland disposal sites, 497 of the Canal System structures (typically those partially and/or substantially under water such as locks, guard gates, and dams) require both an Above-Water and a Below-Water Inspection. When deficiencies are found – either upon inspection or during routine duties – inspectors prepare flag (“Red,” “Yellow,” and “Safety”) reports to identify the degree of criticality.

In 2008, the Corporation began to phase in its comprehensive asset management system, the Canal Infrastructure Management System (CIMS), which was intended to help managers prioritize inspections and repairs and monitor capital and maintenance work for funding allocation purposes. According to the Thruway Authority's 2015 Revised Budget and 2016 Budget, \$129.4 million (\$76.7 million in 2014 and \$52.7 million in 2015) was allocated to Canal System capital projects and equipment.

Our initial audit report, issued on May 26, 2015, examined whether the Corporation's inspection scheduling procedures ensure that all high- and intermediate-importance structures were periodically inspected and whether inspection results were considered when maintenance activities were prioritized. The audit report concluded that, while the Corporation performs routine operational and reliability checks of the Canal System's critical structures, it had not performed biannual inspections of a significant number of them – some for many years, and others not at all. In addition, the report concluded a risk existed that critical structures most in need of repair were not given priority, as the Corporation's process for determining inspection and maintenance priorities lacked clarity and funding limitations have significantly inhibited the Corporation's ability to address its priority maintenance needs.

On April 1, 2016, legislation authorizing the transfer of the Corporation from the Thruway Authority to the New York Power Authority (Power Authority) was passed by the New York State legislature. The legislation authorized the Power Authority to transfer moneys, property, and personnel to the Corporation and also authorized the Power Authority to issue debt for the purposes of financing the construction, reconstruction, development, and improvement of the Canal System. At the time our follow-up fieldwork was completed, the Power Authority was in the process of transitioning the Corporation's operations, effective January 1, 2017.

The objective of our follow-up was to assess the implementation, as of October 31, 2016, of the seven recommendations included in our initial report. With the merger of the Corporation to the Power Authority, significant organizational and operational changes are underway. Given the time period of our review, our follow-up primarily focused on actions taken by the Corporation and Thruway Authority since our last audit.

Summary Conclusions and Status of Audit Recommendations

The Corporation made considerable progress addressing the issues identified in our initial audit report. Of the initial report's seven recommendations, two have been implemented and five have been partially implemented.

Follow-Up Observations

Recommendation 1

Improve the clarity and effectiveness of the inspection scheduling process for high- and intermediate-importance structures. This should include, but not be limited to, taking the necessary steps to:

- *Ensure CIMS properly accounts for all structures that require inspections and contains accurate inspection data.*
- *Determine the optimal inspection frequency requirements, taking into account available resources, legal and safety requirements, and industry best practices.*
- *Establish a sound and supportable risk-based method for determining inspection priorities.*
- *Develop and abide by written guidelines that reflect the current overall inspection program and promote clarity in decision making.*

Status – Partially Implemented

Agency Action – Since our initial audit, the Corporation has implemented a new, risk-based Inspection scheduling matrix for determining inspection priorities. Under this approach, there is no longer an internally imposed two-year requirement for Inspections; rather, Inspections are aligned with legal and safety requirements and industry best practices. Based upon our review of supporting documentation provided by the Corporation, the new scheduling methodology seems reasonable. Furthermore, the Corporation developed and disseminated written procedures in April 2016 related to the new Inspection scheduling approach for Above-Water and Below-Water Inspections. However, while the Corporation has made strides improving its Inspection program, it has not completely validated the information in CIMS. Specifically, as of October 2016, the Corporation was still in the process of accounting for all the structures that need Below-Water Inspections.

Recommendation 2

Promptly conduct inspections of any high- and intermediate-importance structures that have never had inspections or where significant time has elapsed since the last inspection.

Status – Partially Implemented

Agency Action – Subsequent to our initial audit, the Corporation increased its Inspection performance. Previously, only 42 percent of high- and intermediate-structures received an Above-Water Inspection within the Manual's timeframes, and only 18 percent received timely Below-Water Inspections. As of September 1, 2016, the ratio had improved to 76 percent for Above-Water Inspections. However, the Corporation only partially addressed the Inspection backlog identified in our initial audit. Of the 47 high-importance structures that had not been inspected in over ten years or ever inspected at the time of our last audit, eight have been or will be removed from CIMS. Of the 39 remaining structures, 16 have been inspected. Further, our review of the Below-Water Inspections shows the

inspection backlog remains. Officials indicated this is due to the fact that Below-Water data has not been fully validated. Officials told us that the Corporation is working with the Power Authority to make this a priority moving forward.

Recommendation 3

Account for the Corporation's true inspection program resource needs and incorporate them into budget requests.

Status – Partially Implemented

Agency Action – As part of its 90-day Response (Response) to our initial report, the Corporation indicated that responsibility for the structural inspection program had been transferred to the Thruway Authority's Department of Engineering (Engineering). The Response further indicated that a comprehensive review of the inspection program's resource needs was underway by Engineering. As evidence of this assessment, Engineering officials showed us an organization chart dated March 19, 2015 which depicted the additional staff needed to address inspection program backlogs. However, due to the Power Authority's impending takeover of the Corporation, these staffing plans were not implemented. On October 20, 2016, a representative from the Power Authority provided an implementation plan that explains the guiding principles for the merger. The implementation plan indicates no final decision has been made on a formal organizational structure for the Canal Corporation. It also indicates that moving forward the Canal Corporation's organization structure will "reflect that of a modern public corporation with a technical mission," and will be comprised of the necessary departments to effectively accomplish that mission. A slideshow posted on the Power Authority's website shows preliminary discussions took place at the September 27, 2016 Power Authority Finance Committee Meeting concerning the additional staffing needed after the merger to manage the Canal System.

Recommendation 4

Enter into a formal agreement with the DOT that covers inspection responsibilities for all State-owned Canal System bridges and adhere by its provisions.

Status – Implemented

Agency Action – The Corporation entered into an agreement with the New York State Department of Transportation (DOT) on October 16, 2015 that clarifies responsibilities for movable bridges over the Canal System. This agreement places inspection responsibility with DOT.

Recommendation 5

Improve the process for prioritizing infrastructure maintenance by taking the following steps, including but not limited to:

- *Ensuring all high- and intermediate-importance structures, and all inspection results, are considered when deciding on maintenance priorities and capital plans.*
- *Implementing reliable maintenance prioritization tools to identify the highest repair priorities for improving the overall condition of the Canal System and maximizing the impact of capital investments while balancing safety, operational, and legal considerations.*
- *Using CIMS and other available maintenance prioritization tools to develop maintenance schedules and capital plans, and documenting the basis for decisions.*

Status – Partially Implemented

Agency Action – In responding to our initial audit, the Corporation reported that it was integrating these recommendations into its day-to-day operations and implementing enhancements to CIMS. The Response also indicates the Corporation would incorporate inspection results and integrate all available tools to fully support the professional judgment and decision making of its engineering and executive staff. During our follow-up review, we asked Corporation officials for evidence of these actions. In response, officials explained that it was not easy to document how CIMS was used when deciding on maintenance priorities and capital plans. They also emphasized that inspection results, particular any significant conditions, are definitely considered when deciding upon maintenance priorities. Because CIMS identifies which items need repair and the nature of the deficiencies, officials indicated the system is routinely queried for maintenance planning purposes. Our testing tended to confirm this assertion, as nearly all outstanding red flags noted during the original audit were addressed as circumstances permitted.

At the time of our initial audit, the Corporation was also developing prioritization tools for purposes of maintenance schedules and capital planning. However, we concluded that the Corporation made limited progress in addressing this issue. Officials provided a June 6, 2016 “Asset Management Update” presentation, which consisted of slides and notes indicating that the Corporation must validate inspection data “in order to develop asset deterioration rates and a methodology for investment priority.” Also, the slides indicated this will “likely not be complete before the transfer to the Power Authority on January 1, 2017.” As a result, Corporation officials intend to “ensure that a knowledge transfer occurs to continue these efforts moving forward.”

Recommendation 6

Routinely re-evaluate whether the Canal System’s current maintenance and capital plans target funding toward its most pressing needs, and redirect funding when necessary.

Status – Partially Implemented

Agency Action – The Corporation’s original response indicated it would continue to seek all available funding for infrastructure repair, and promptly meet funding reimbursement requirements. The response further stated that all decisions made relative to funding the Corporation’s maintenance and capital programs would be fully informed by an accurate

assessment of the Canal System's most pressing needs. During our current review, as previously indicated, we found evidence that actions have been taken to address many of the major long-standing deficiencies (i.e., red flags) that we reported on in the original audit. However, other significant deficiencies still have not been addressed.

At the time of our initial audit, 14 capital projects totaling \$79.2 million had been delayed one to six years as of September 2014. According to officials, as of October 2016, eight of these projects had been deferred even longer to redirect funding to other more pressing needs. The remaining six projects have either been completed or started. Because the Corporation has still not established prioritization tools for maintenance scheduling and capital planning, we cannot determine whether capital spending decisions made since our initial audit appropriately target funding to the Canal System's most pressing needs. Officials acknowledged that there were significant repair projects that could not be started due to funding limitations. Also, officials indicated they had met with Power Authority staff concerning the Canal System's higher repair and maintenance priorities, including the related budgetary needs, going forward.

Recommendation 7

Work with the Thruway Authority to develop a realistic, long-term, detailed strategic and financing plan aimed at improving the overall condition of the Canal System's infrastructure while also dealing with emergency response. As part of this process, take the necessary steps to:

- *Seek all available funding for infrastructure repair and promptly meet funding reimbursement requirements.*
- *Ensure the Thruway Authority Board of Directors and other State decision makers are aware of the Canal System's most critical maintenance needs when making funding decisions.*

Status – Implemented

Agency Action - Since the 2016-17 State budget was passed, a transfer program has been mobilized that is comprised of representatives from the Canal Corporation, the Thruway Authority, and the Power Authority. As part of the transfer program, joint working groups were established related to finance, procurement, shared services, human resources, information technology, operations and engineering, safety, and legal, all of which designed to better ensure that the Canal System's most pressing needs are considered when making funding decisions. The legislation provides that the transfer will be effective on January 1, 2017. However, the legislation also authorizes the Power Authority to reimburse the Thruway Authority for Canal System expenses incurred for the interim period of April 1, 2016 through January 1, 2017. On April 1, 2016, a Funding Agreement was executed between the Power Authority and Thruway Authority that covers the costs of maintaining the Canal System during the transfer period. According to the Power Authority's website, asset condition and safety were the highest priorities when developing the 2017 budget for the Canal System. When developing priorities, particular emphasis was given to dam safety, culvert and embankment repair, feeder canal rehabilitation, and preventive maintenance.

Major contributors to this report were Brian Reilly, Mark Ren, Kathleen Garceau, and Philip Boyd.

We would appreciate your response to this report within 30 days, indicating any additional actions planned to address the unresolved issues discussed in this report. We also thank Corporation and Thruway Authority management and staff for the courtesies and cooperation extended to our auditors during this review.

Very truly yours,

John F. Buyce, CPA, CIA, CFE, CGFM
Audit Director

cc: Division of the Budget
Brian Stratton, Director of Canals
William Finch, Acting Executive Director