



NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

Excess Equipment, Weaknesses in Inventory Management, and Other Issues in BTOP Infrastructure Projects

FINAL REPORT NO. OIG-I4-023-A
JUNE 25, 2014

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Office of Audit and Evaluation

FOR PUBLIC RELEASE





June 25, 2014

MEMORANDUM FOR: Lawrence E. Strickling
Assistant Secretary for Communications and Information
National Telecommunications and Information Administration

FROM: Ann C. Eilers 
Principal Assistant Inspector General for Audit and Evaluation

SUBJECT: *Excess Equipment, Weaknesses in Inventory Management, and Other
Issues in BTOP Infrastructure Projects*
Final Report No. OIG-14-023-A

Attached is our final report on our audit of NTIA's Broadband Technology Opportunities Program (BTOP) equipment acquisitions. Our objectives were to determine whether (1) NTIA has the personnel and processes in place to effectively monitor recipient's equipment acquisitions, including security, inventory controls, and report submittals, (2) recipients have appropriately acquired, tested, and implemented the most effective equipment, and (3) recipients are on track to complete their projects on schedule and achieve project goals.

We found, for the sample of infrastructure recipients reviewed, that they appropriately acquired, tested, and implemented equipment. However, our audit identified problems with excess equipment, inventory management, and that the design of the middle-mile network for one recipient does not follow industry best practice for providing reliable service. The problems identify the need for NTIA to strengthen their oversight. Finally, three of the six recipients reviewed may not be able to sustain network service beyond the grant period.

We summarized your response in the report and made comments and revisions to the report where we believe it was appropriate. Also, the formal response is included as appendix B. The final report will be posted on the OIG's website pursuant to section 8M of the Inspector General Act of 1978, as amended.

In accordance with Departmental Administrative Order 213-5, please submit to us within 60 calendar days of the date of this memorandum an action plan that responds to the recommendations in this report.

We appreciate the assistance and courtesies extended to us by NTIA during our audit. If you have any questions about this report, please contact me at (202) 482-4328 or Chris Rose, Senior Associate, Recovery Act Task Force, at (202) 482-5558.

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Report In Brief

JUNE 25, 2014

Background

The American Recovery and Reinvestment Act of 2009 provided the National Telecommunications and Information Administration (NTIA) approximately \$4.7 billion to establish the Broadband Technology Opportunities Program (BTOP). BTOP is a competitive grant program that provides funds for deploying broadband infrastructure, enhancing broadband capacity at public computing centers, improving access to broadband services for public safety agencies, and promoting sustainable broadband adoption.

Of the \$4.7 billion, NTIA issued 232 BTOP grant awards representing approximately \$3.9 billion. The bulk of BTOP dollars, totaling \$3.5 billion, went toward 123 infrastructure grants.

Why We Did This Review

Office of Inspector General (OIG) oversight identified BTOP equipment as a concern that needed further review.

In OIG's February 2013 testimony on broadband stimulus before the House Subcommittee on Communications and Technology, the Principal Assistant Inspector General for Audit and Evaluation identified challenges that OIG believed NTIA faced in implementing BTOP. These included: (1) some BTOP projects were at risk of not being completed by September 2013, (2) additional monitoring of equipment may be needed, and (3) there was a continued need for effective oversight of BTOP awards. Also, OIG's January 2013 response to a Congressional request regarding an award to the state of West Virginia had identified that equipment was an area that needed close attention.

NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

Excess Equipment, Weaknesses in Inventory Management, and Other Issues in BTOP Infrastructure Projects

OIG-14-023-A

WHAT WE FOUND

Our audit identified the following weaknesses:

- *Site visits identified problems with excess equipment and inventory management.* Visits to six grant recipients found excess equipment (even though the project was complete and being closed out), deficient inventory management controls, and a lack of written agreements addressing the federal interest in the equipment.
- *Technical oversight of BTOP grant recipients needs to be strengthened.* As projects are completed and closed out, sufficient steps must be taken by both NTIA and the grant recipients to ensure that the terms and conditions of the grants are properly satisfied.
- *The design of the middle-mile network for one recipient does not follow industry best practice for providing reliable service.* The modified network design for this project is not as resilient as the network design in the grant application that received the award (and thus has greater potential exposure to extended outages).
- *Three of the six recipients we reviewed may not be able to sustain network service beyond the grant period.* These projects, in which approximately \$154 million in federal grant dollars have been invested, were incurring monthly losses because their expenses exceeded revenues.
- *Many of the projects were not completed on time, requiring that they receive extensions.* Of those 69 recipients that requested and received extensions to complete their projects, 15 awards remained active within their extension period as of March 7, 2014. Also, four of the six grant recipients we visited requested an extension of time to complete their projects.

WHAT WE RECOMMEND

We recommend that the Assistant Secretary for Communications and Information direct NTIA personnel to perform the following oversight activities on all BTOP grants:

1. NTIA should ensure that grant recipients have devised effective inventory internal controls.
2. NTIA program officers should review their awards and, where appropriate, ensure that BTOP grant recipients obtain agreements with all CAIs to secure federal interests in all BTOP equipment.
3. NTIA program officers should work with grant recipients to assess equipment acquisitions to ensure that (1) the justification on the use and benefit of the equipment is adequate and (2) the purchases are allowable.
4. NTIA should work with recipients to identify and employ best practices in network design and risk mitigation strategies for networks in which reliability is a concern.
5. NTIA should reassess its staff's ability to provide technical expertise in order to ensure that awards with complex issues are receiving appropriate oversight.

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COVER: Detail of fisheries pediment,
U.S. Department of Commerce headquarters,
by sculptor James Earle Fraser, 1934

Introduction

The American Recovery and Reinvestment Act of 2009 provided the National Telecommunications and Information Administration (NTIA) approximately \$4.7 billion to establish the Broadband Technology Opportunities Program (BTOP). BTOP is a competitive grant program that provides funds for deploying broadband infrastructure, enhance broadband capacity at public computing centers, improve access to broadband services for public safety agencies, and promote sustainable broadband adoption. Of the \$4.7 billion, NTIA issued 232 BTOP grant awards representing approximately \$3.9 billion. BTOP awards were made in three major areas:

- Program infrastructure (comprehensive community infrastructure, or CCI), to provide institutions such as schools, libraries, and medical facilities with Internet connectivity;
- Public computing centers, to establish new public computer facilities or upgrade existing ones to provide broadband access to the general public or specific populations such as low-income individuals, the unemployed, seniors, children, minorities, and people with disabilities; and
- Sustainable broadband adoption, to promote broadband Internet usage and adoption, including among specific populations traditionally underserved by this technology.

The bulk of BTOP dollars, totaling \$3.5 billion of the approximately \$3.9 billion in awards, went toward 123 infrastructure grants. As of September 2013, there were 116 active CCI awards, totaling approximately \$3.3 billion (5 were terminated by grantees and 2 were terminated by NTIA). Table I summarizes the active CCI awards with regard to the amounts awarded and withdrawn as of September 2013.

Table I. Active BTOP CCI Grants as of September 2013

	Number of Grants	Amount of Award	Amount Drawn	Percent Drawn
Initial grants	123	\$ 3,469,978,021	\$ 2,722,837,970	78%
Terminated grants	7	\$150,745,590	10,470,592	7%
Active grants	116	\$ 3,319,232,431	\$2,712,367,378	82%

Source: OIG based on NTIA data

A significant portion of federal funds used to implement these projects (an average of 45 percent for the six grants we included in this review) has been spent on purchasing network equipment. Equipment includes fiber, base tower stations, switches, microwave radio equipment, etc. As such, proper internal controls must be in place to guard against fraud, waste, or abuse associated with these assets purchased using BTOP funds.

OIG oversight identified BTOP equipment as a concern that needed further review. In our February 2013 testimony on broadband stimulus before the House Committee on Energy and

Commerce, Subcommittee on Communications and Technology,¹ the Principal Assistant Inspector General For Audit and Evaluation identified challenges that the OIG believed NTIA faced in implementing BTOP. The identified challenges included: (1) some BTOP projects were at risk of not being completed by September 2013, (2) additional monitoring of equipment may be needed, and (3) there was a continued need for effective oversight of BTOP awards. Also, our January 2013 response to a Congressional request regarding an award to the state of West Virginia had identified that equipment was an area that needed close attention.

The objectives of this audit were to determine whether:

1. NTIA has the personnel and processes in place to effectively monitor recipients' equipment acquisitions; including security, inventory control, and report submittals,
2. Recipients have appropriately acquired, tested, and implemented the most effective equipment, and
3. Recipients are on track to complete their projects on schedule and achieve project goals.

To ensure that NTIA processes were in place and effective, we first obtained an understanding of NTIA's oversight of equipment acquisition and implementation and then considered risk in the selection of six BTOP CCI recipients to review. The focus of our review was to determine how effective the oversight of equipment acquisition and implementation was for the selected BTOP recipients (see Appendix A for a detailed summary of our audit objectives, scope, and methodology). During the course of the review, we provided NTIA management with interim results of our site visits to allow them to expediently work with the grant recipient to address any issues noted. We reviewed subsequent information provided by NTIA in response to our interim results and have considered this information in preparing our report.

¹ Testimony of Ann C. Eilers, Principal Assistant Inspector General For Audit and Evaluation, U.S. Department of Commerce before the House Energy and Commerce Committee, Subcommittee on Communications and Technology, "Is the Broadband Stimulus Working," February 27, 2013.

Findings and Recommendations

As part of its oversight of the BTOP awards, NTIA has assigned personnel and established processes to monitor recipients' implementation of awards, including the acquisition and implementation of equipment (security, inventory control, and report submittals). NTIA holds conference calls with awardees (at least monthly, and weekly for awards needing additional oversight) and uses site visits performed by NTIA staff (supported by BTOP contractor personnel), to closely monitor implementation of the awards by grant recipients. During the site visits, NTIA observes facilities and equipment procured with federal funds. Following each site visit, NTIA documents its findings in a summary report and, when it believes it is warranted, provides technical assistance or issues a corrective action plan. The problems we discuss in the following paragraph demonstrate the need to further strengthen oversight.

Overall, we found that for the sample of infrastructure recipients reviewed, they appropriately acquired, tested, and implemented equipment. However, our audit identified certain weaknesses and recommends steps to improve NTIA's oversight controls. Specifically, we identified findings related to excess equipment and inventory management. We also noted that the design of the middle-mile network for one recipient does not follow industry best practice for providing reliable service.

Finally, many of the projects were not completed on time, requiring that they receive extensions. Of those 69 recipients that requested and received extensions to complete their projects, 15 awards remain active within their extension period as of March 7, 2014. While the projects we visited will result in expanded broadband infrastructure, four of the six grant recipients requested an extension of time to complete their projects. Also, three of the six recipients we reviewed may not be able to sustain network service beyond the grant period.

I. Site Visits Identified Problems with Excess Equipment, Inventory Management, and Network Design.

As part of our oversight of the acquisition and implementation of equipment funded by BTOP, we conducted site visits of six recipients of CCI grant awards. During these site visits, we met with recipient managers to discuss project details, inventory controls, and procurement practices. We visited data centers, warehouses, points of presence (POP),² and community anchor institutions (CAIs) to verify that equipment existed and was inventoried, labeled, and functional. Also, we performed procedures to determine whether CAIs had improved broadband services and that the telecommunications technology implemented was appropriate.

While performing these site visits, we found specific issues concerning excess equipment, deficient inventory management controls, lack of CAI agreements and a flawed network design. These issues are summarized in table 2 and discussed in detail in sections A through D.

² An Internet *point of presence* is an access point to the Internet. It is a physical location that houses servers, routers, ATM (asynchronous transfer mode) switches, and digital/analog call aggregators.

Table 2. Issues Identified During OIG Site Visits to Six Recipients of CCI Grant Awards

Recipient	Excess Equipment	Physical Inventory	Inventory Management/ Tracking	CAI Agreements	Network Design
1		X			
2	X				
3		X	X	X	X
4			X		
5			X		
6	X				

Source: OIG data

A. Excess Equipment

Federal regulations place certain requirements on grantees regarding excess equipment. We observed that one of the six recipients (Recipient 2) we visited had excess equipment valued at \$3.6 million. We observed during our site visit in March 2013 that although the project is complete and being closed out, the recipient's records indicated that its inventory contained \$3.6 million of excess equipment—including patch panels, fiber, and intelligent Multiservice Gateway (iMG) fixed-form factors—in anticipation of potentially servicing additional CAIs and residential end-users. NTIA management stated on May 7, 2013, that recipients should not have a warehouse full of inventory after the award is closed out. In addition, it was unclear during our site visit if this equipment will be fully deployed and used for this project or, if not used, will receive proper disposition. We continue to believe full deployment of equipment for this project remains a concern.

For this recipient, according to federal regulations,³ equipment that (a) was procured with grant funds, (b) is no longer needed by the grant recipient, and (c) has a current per-unit fair market value of less than \$5,000 may be retained, sold, or otherwise disposed of with no further obligation to NTIA. For equipment with a current per-unit fair market value of \$5,000 or more, the recipient may retain the equipment for other uses provided that it pays compensation—computed by applying the percentage of federal participation in the cost of the original project or program to the current fair market value of the equipment—to NTIA or the government. If the recipient has no need for the equipment, it must request disposition instructions from the grants officer.⁴ As such, the grants officer can either request that the grant recipient ship the

³ 15 C.F.R. § 14.34(g).

⁴ In addition, these instructions must be issued no later than 120 calendar days after the recipient's request. If instructed to do so, or if no instructions are issued within 120 days, the recipient must sell the equipment and reimburse the Department of Commerce an amount calculated by applying to the sales proceeds the percentage of federal participation in the cost of the original project or program. Furthermore, if the grant recipient is

equipment to an entity that has a use for it or request that the equipment be sold and the government reimbursed for its share.

Also, during our site visits, we concluded that one of the six recipients had incurred costs totaling roughly \$157,000 to purchase a router for a data center that is no longer needed. According to the recipient, after re-engineering and re-designing its network to account for changes in demand, one data center was deemed unnecessary. Therefore, we believe that the router is no longer necessary to the project and should already have been disposed of. As discussed with NTIA, it has agreed to work with Recipient 6 to sell the item and return the proceeds to the award. While this is a positive step, this action should have been taken sooner.

B. Inventory Management

Federal regulations require that a physical inventory of equipment must be taken and the results reconciled with the equipment records at least once every two years.⁵ A physical inventory count is a critical part of inventory internal controls and, without completion, recipients cannot ensure adequate accountability for BTOP equipment, thereby increasing the risk of theft, loss, or mismanagement of equipment purchased with federal grant funds.

Federal regulations state that property records must be maintained to include a description of the property/equipment, a serial number or other identification number, the source of the property/equipment, the location and condition of the property/equipment, and any ultimate disposition data.⁶ Federal regulations also state a control system must be developed to ensure adequate safeguards to prevent loss, damage, or theft of the property.⁷ In addition, according to the *Broadband Technology Opportunities Program Federal Interest Requirements Fact Sheet*, during the useful life of the property, NTIA retains an undivided equitable reversionary interest in the BTOP property.⁸ Any loss, damage, or theft of equipment must be investigated.

During our site visits, we noted that four of the six recipients needed to strengthen their internal controls by improving their inventory management. Table 3 summarizes the inventory deficiencies we identified.

instructed to ship the equipment to another location, the recipient will be reimbursed commensurate with the percent amount of its participation in the cost of the original program. Otherwise, the recipient will be reimbursed by the Department for the cost of equipment disposal. 15 C.F.R. § 14.34(g)(1)–(3).

⁵ 15 C.F.R. §§ 14.34(f)(3), 24.32(d)(2).

⁶ 15 C.F.R. §§ 14.34(f)(1), 24.32(d)(1).

⁷ 15 C.F.R. §§ 14.34(f)(4), 24.32(d)(3).

⁸ National Telecommunications and Information Administration, July 1, 2011. *Fact Sheet: Broadband Technology Opportunities Program Federal Interest Documentation Requirements*. Washington, DC: NTIA, 1.

Table 3. Summary of Inventory Management Deficiencies Found at Four Recipients of CCI Grant Awards

Recipient	Required Physical Inventory Performed?	Percent of Inventory with Deficiencies ^a	CAI Agreements Properly Managed?
Recipient 1	No	0%	Yes
Recipient 3	No	47%	No
Recipient 4	Yes	2%	Yes
Recipient 5	Yes	48%	Yes

^a Tested by OIG

Source: OIG data

- During our site visit, Recipient 1, which had an equipment budget of approximately \$15 million, did not provide evidence of a physical inventory. Subsequently, this grant recipient indicated that it uses Solarwinds Network Configuration Manager and other software tools to administer a real-time inventory management system that can detect devices if they go offline and are no longer in operation. However, there was no indication that this software was ever reconciled with the recipient's internal inventory tracking system.
- At the site visit for Recipient 3, which had an equipment budget of approximately \$20 million, we noted that the inventory records do not effectively track the equipment purchased to complete the BTOP project. During our visit, we completed inventory testing at six of the project's sites, including two CAIs, three POPs, and the grantee's warehouse. For inventory items reviewed, we could not find 22 of 47 (or 47 percent) of the inventory items at the location that was noted in the grantee's inventory tracking system. Consequently, we do not believe that Recipient 3 has adequate controls in place to safeguard equipment purchased with BTOP funds, nor that adequate property records were maintained in accordance with federal regulations.⁹ In addition, Recipient 3 did not provide us with documentation that a physical inventory had been performed.
- The site visit of Recipient 4, which had an equipment budget of approximately \$90million, revealed that a deficiency existed in the tracking of accountable property. We found a deficiency in 1 of 45 (or 2 percent) of items tested: one of the items listed on management-provided inventory lists could not be verified at the site.
- At the site visit to Recipient 5, which had an equipment budget of approximately \$5 million, we observed specific deficiencies in the inventory records provided by management for 16 of 33 (or 48 percent) of items tested: (a) 15 of 23 equipment items selected as warehouse inventory could not be verified and (b) 1 of the 10 pieces of equipment recorded as being located at two tower sites could not be found where

⁹ 15 C.F.R. § 24.32(d)(1).

indicated. In addition, 5 equipment items at two tower/POP sites were not included on the official equipment list.

Also, we found that one of the six recipients we visited did not properly manage BTOP equipment agreements with their respective CAIs. Two of the three CAI agreements of Recipient 3 we reviewed did not include language addressing the federal interest in the equipment. Consequently, the CAIs may not understand the restrictions placed upon their authority to dispose of the equipment.

C. Network Design

During each of our site visits, we assessed the adequacy of the network designs. We found that the current design of the middle-mile network for one of the six recipients (Recipient 3), does not follow the industry best practice of fiber ring design. Therefore, parts of the network are exposed to potential extended outages. The original design contained in the grant application called for a ring format for fiber routes, which would allow continuous service through an alternate route should a cable breakage occur. A unidirectional or bidirectional ring fiber network design is commonly used in self-healing fiber network deployments. Such a ring structure allows for fast and automatic service restoration in case of cable breakage.

Due to funding limitations, the current design of the network for this recipient will instead have an open-ended loop, which does not provide alternative paths in case of cable breakage. This could lead to extended periods of outages if a fiber link goes down.

II. Technical Oversight of BTOP Grant Recipients Needs to Be Strengthened

The problems detailed in the previous section of this report—relating to excess equipment, inventory management, and an inadequate network design—make plain the importance of exercising strong technical oversight over BTOP grantees. As these projects are completed and the awards are closed out, it is important that sufficient steps be taken by both NTIA and the grant recipients to ensure that the terms and conditions of the grants are properly satisfied.

The *BTOP Recipient Handbook* clearly identifies the NTIA program office's responsibilities for assisting recipients. For example, the *Handbook* states that "the program office responsibilities focus on assisting recipients with programmatic, scientific, or technical aspects of each project." In addition, it states that federal representatives are assigned to support and provide guidance to grant recipients¹⁰ as they try to meet program objectives while complying with grant rules and regulations.

¹⁰ National Telecommunications and Information Administration, February 2012. *BTOP Recipient Handbook*.

Recommendations

We recommend that the Assistant Secretary for Communications and Information direct NTIA personnel to perform the following oversight activities on all BTOP grants:

1. *NTIA should ensure that grant recipients have devised effective inventory internal controls. Such an internal control system should provide effective monitoring and accountability of the recipient's equipment inventory records. This system must ensure that the location of all BTOP equipment is correctly tracked in an inventory tracking system and a physical inventory is performed at least once every two years.*
2. *NTIA program officers should review their awards and, where appropriate, ensure that BTOP grant recipients obtain agreements with all CAIs to secure federal interests in all BTOP equipment. For those recipients that already have agreements in place, we recommend that they include language that protects the federal interest in all BTOP equipment against loss, damage, or theft.*
3. *NTIA program officers should work with grant recipients to assess equipment acquisitions to ensure that (1) the justification on the use and benefit of the equipment is adequate and (2) the purchases are allowable. NTIA should obtain from recipients an explanation and documentation supporting the appropriateness of the equipment and documentation to demonstrate that the decision to purchase the equipment was reasonable and complied with Notice of Funds Availability (NOFA) requirements. If NTIA determines that the equipment exceeds requirements or is no longer necessary, NTIA should refer to federal regulations and determine whether the recipient (a) has no further obligation to the awarding agency, (b) is able to use the equipment for other uses requiring compensation to NTIA, or (c) should contact the program officer for disposal instructions. If NTIA determines that the costs are not allowable, these costs should be removed from the recipient's BTOP budget and associated funds returned to the government.*
4. *NTIA should work with recipients to identify and employ best practices in network design and risk mitigation strategies for networks in which reliability is a concern.*
5. *NTIA should reassess its staff's ability to provide technical expertise in order to ensure that awards with complex issues are receiving appropriate oversight. As the BTOP program is technical in nature, NTIA should have knowledgeable staff available to appropriately respond to grantees' technical questions.*

Other Matters

A. Sustainability of Projects Is in Question

NOFA Round 2, section V, part F, “Use of Program Income,” states that projects funded by BTOP grants are expected to convincingly demonstrate the ability to be sustained beyond the funding period. This criterion suggests that BTOP was established to produce sustainable projects. Accordingly, we feel it is important to report that there are concerns with the sustainability of three of the six projects we visited, in which approximately \$154 million in federal grant dollars have been invested.

We noted that three of the six recipients we reviewed may not be able to sustain network service beyond the grant period. The recipients were incurring monthly losses because their expenses exceeded revenues. Table 4 summarizes the net loss per month for these three recipients.

Table 4. Summary of Net Losses Reported by Three Grant Recipients

Recipient	Revenue	Expenses	Average Net Loss per Month	Comment
Recipient 3	\$1,100,000	(\$3,500,000)	(\$200,000)	Revenue and expense for the period July 2012–June 2013
Recipient 5	\$12,000	(\$150,000)	(\$138,000)	May 2013 estimate per recipient
Recipient 6	\$0	(\$988,000)	(\$494,000)	Per recipients’ general ledger, May and June 2013

Source: OIG data

- We noted with Recipient 3 that the completed project will not provide the same results that were included in the grant application. This recipient also had cash flow problems: for the period July 2012 through June 2013 the recipient had a deficit of about \$2.4 million. The recipient reached an agreement with a network operator which would invest more capital to expand the broadband network being developed by the recipient. However, the sustainability will be determined by the recipient’s ability to secure customers for its services.
- Recipient 5 has a cash flow problem. Its expenses were approximately \$150,000 per month, while revenue from customers was only \$12,000 per month, for a net loss of about \$138,000 per month. This recipient explained that the project may be losing potential clients because the grant was suspended for a short time and a group of public detractors of the award may be undermining the network’s success. In conversations on

this issue, the recipient noted that in order to sustain the network beyond the grant period they must secure a business partner to invest cash in the project and provide last-mile service to potential CAs. Their managers informed us that negotiations with business partners were in progress. In the fall of 2013, a formal request for approval of the chosen strategic partner was submitted to NTIA by Recipient 5. The request was approved by the Grants Officer later in the fall.

- We noted that Recipient 6 also has a potential sustainability issue. The recipient was not receiving any outside revenue, only grant funds. A review of the general ledger showed that expenses for May and June 2013 totaled \$577,000 and \$411,000 respectively. This recipient's management informed us that while negotiations with some Internet service providers are in progress, no agreements had been reached as of August 1, 2013. We therefore have no reasonable assurance that sufficient financing can be secured to sustain the project beyond the grant period. To resolve the sustainability issue, the recipient is currently seeking a business partner to provide a cash infusion and take over network operations.

B. EAGLE-Net

On May 9, 2013, we received a letter from members of the United States Congress. The letter stated that Congress was pleased to learn that OIG was planning to audit EAGLE-Net Alliance of Colorado, which had received a \$100.6 million BTOP grant in September 2010. The letter noted that the grant to EAGLE-Net has been criticized for overbuilding existing infrastructure rather than delivering service to unserved communities. In addition to the issues we planned to examine in the audit, we were asked by Congress to investigate other areas and to provide written answers to specific questions. The responses to those questions are reported in a separate OIG memorandum.¹¹

¹¹ OIG, "Letter to Chairman Walden, Representative Gardner, and Representative Tipton re: Review of NTIA's Broadband Technology Opportunities Program Grant to EAGLE-Net Alliance of Colorado," January 23, 2014.

Summary of Agency Response and OIG Comments

In responding to our draft report, NTIA acknowledged OIG's findings and recommendations and described the actions they are taking to address them. We believe these actions are consistent with the intent of recommendations. Also, NTIA provided additional details relating to its oversight of grant recipients and noted where it took issue with the OIG findings within the report. In the following paragraphs, we comment on certain issues NTIA raised within the response. We have made revisions to the report where appropriate.

In its response, NTIA challenged our use of the term "excess equipment," stating that the recipient has assured NTIA that it will continue to build out its network and will use the majority of the "excess equipment" to serve additional homes in an expanded service area. However, during the audit we were provided with an inventory listing showing over \$3.6 million in inventory, even though the project was complete and being closed out. NTIA management stated that, while BTOP usage may fluctuate, recipients should not have a substantial quantity of inventory after the award is closed out. The high value of equipment remaining at the end of the award and the recipient's acknowledgment that it will use not all (but the majority of) the equipment leads us to continue to be concerned about excess equipment. Also, in the draft report we noted that a \$157,000 router (with a different recipient) was no longer needed and was determined to be a questioned cost. After reviewing the NTIA response we concur that the router is not a questioned cost, but is an example of excess equipment which would be categorized as "funds put to better use." This router was identified as being no longer needed by the grant recipient about a year ago but it has yet to be disposed of. Therefore, we believe that action should have been taken sooner to dispose of this unnecessary equipment.

NTIA believed that the use of Network Operations Center (NOC) database employed by a number of recipients to check for the representation of deployed equipment and continued presence of the equipment is an appropriate approach to performing an inventory. NTIA's response was silent about grantees that did not use this approach. Nevertheless, we believe this approach is not a substitute method for a physical inventory that is required to be done every two years, as it does not indicate the presence of sub-components nor address equipment not in use.

NTIA stated that the network design issue we cited in our report made the most effective use of recipient resources. However, we continue to believe that the ring design approach called for in the original grant application—which was the approach funded by the award, but subsequently modified by the grantee—is more resilient and therefore less likely to encounter extended outages.

Appendix A: Objectives, Scope, and Methodology

The objectives of this audit were to determine whether (1) NTIA has the personnel and processes in place to effectively monitor recipients' equipment acquisitions including security, inventory controls, and report submittals; (2) recipients have appropriately acquired, tested, and implemented the most effective equipment; and (3) recipients are on track to complete their projects on schedule and achieve project goals. Fieldwork was completed between February and August 2013.

To meet our objectives, we reviewed BTOP compliance with laws, regulations, policies, and procedures including:

- The American Recovery and Reinvestment Act of 2009,
- The July 9, 2009, and January 22, 2010, Notice of Funds Availability for the Broadband Initiative Program and BTOP,
- Department of Commerce financial assistance terms and conditions and BTOP special terms and conditions for property,
- *BTOP Recipient Handbook*, February 2012,
- BTOP's *Effective Grant Monitoring: Site Visits*, February 2012, and
- BTOP's *Federal Interest Documentation Requirements Fact Sheet*, July 2011.

To gain an understanding of internal controls and assess how NTIA monitors the grantees' equipment acquisitions throughout the grant period, we interviewed pertinent staff including NTIA compliance officials, BTOP federal program officers, and grantee financial and program personnel. During these interviews, we discussed the scope of the projects, network design, current project schedule and status, project sustainability, and any other project-related issues.

Additionally, we performed site visits of six recipients, based upon our risk ranking of their respective projects, the proximity of their site locations to OIG offices in Washington DC, Atlanta, and Denver, and a Congressional request. During these site visits we:

- Obtained and reviewed procurement procedures, network design diagrams, and equipment periodic test results;
- Compared recipients' equipment/inventory lists to equipment housed at various warehouse, POP, and CAI locations;
- Compared the amount included in the equipment budget line item with equipment expenses posted in the recipients' general ledgers, including reviewing expenses included in the general ledger for unreasonable or unallowable expenses;

- Examined equipment at various sites and performed speed tests at Network Operation Centers (NOCs) to assess the performance of the equipment; and
- Obtained a sample of testing and utilization reports to determine if ongoing system performance testing is completed and how much the network is being utilized.

To assess the reliability of computer-processed data obtained from the various recipients, we directly tested and compared it with the actual physical inventory of equipment. We determined that the computer-processed data regarding inventory lists was not always accurate. In the findings and recommendations section, we identify deficiencies in inventory records.

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. We conducted our review from January 2012 through August 2013 under the authority of the Inspector General Act of 1978, as amended, and Department Organization Order 10-13. We performed our work at the Department of Commerce headquarters; NTIA offices in Washington, DC; and various recipient sites in Florida, Colorado, Washington, DC, and Georgia.

Appendix B: Potential Monetary Benefits

	Questioned Costs	Funds Put to Better Use
Excess equipment—router	\$0	\$157,000

Appendix C: Agency Response



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Communications
and Information
 Washington, D.C. 20230

May 20, 2014

The Honorable Todd J. Zinser
 Inspector General
 United States Department of Commerce
 1401 Constitution Avenue, N.W.
 Washington, D.C. 20230

Dear Mr. Zinser:

This letter replies to your March 24, 2014 draft audit report, *National Telecommunications and Information Administration (NTIA) Excess Equipment, Questioned Costs, Weaknesses in Inventory, and other Issues in BTOP Infrastructure Projects* (Draft Report). As you noted in previous reports, NTIA implemented a rigorous monitoring and oversight plan for Broadband Technology Opportunities Program (BTOP) grants. NTIA's regular monitoring activities include multiple reviews of recipients' adherence to equipment inventory requirements, including performance report reviews and risk assessment analyses. NTIA also specifically informed all recipients, including the six recipients that were part of this review, of their property management requirements and provided ongoing technical assistance throughout the recipients' periods of performance.

NTIA thanks the Office of Inspector General (OIG) for providing the opportunity to comment on interim drafts for each grant it audited and for your willingness to share feedback and acknowledge our concerns before issuing your draft. We acknowledge your findings and recommendations and, as outlined below, we believe that NTIA has taken steps to effectively address the OIG's concerns.

Findings and Recommendations

NTIA appreciates OIG's recognition of the extensive oversight NTIA has engaged in throughout the BTOP program. In addition to the monitoring and oversight activities the OIG references, including ongoing recipient calls and site visits, NTIA staff regularly engages in quarterly desk reviews and the BTOP Program Services team reviews all recipient audit reports for violations of federal award requirements. This review is conducted in addition to both the National Oceanic and Atmospheric Administration's (NOAA) Grants Office audit oversight and the OIG's audit-review processes under DAO 213-5. Additionally, as recipients started to close out their awards, NTIA provided several webinars and developed substantial guidance material around the closeout process and recipients' ongoing property management requirements, along with the numerous other pieces of guidance material that NTIA prepared throughout the BTOP award periods.¹

¹ NTIA's public guidance on these subjects has been extensive, including webinars, Fact Sheets, the *BTOP Recipient Handbook*, and the *Closeout Notification Packages*. Compliance material and programmatic guidance is publicly distributed for recipients through the BTOP website and is available at

Sections A through D, below, outline NTIA's response to the specific findings the OIG raises in its draft report.

A. Undeployed Equipment

The Draft Report raises concerns about one recipient's undeployed equipment holdings at the end of the award period. However, the Draft Report does not define "excess equipment," and the Department's rules do not even reference such a term.² NTIA does not consider this equipment to be excess in light of the recipient's demonstrated need for the equipment.

During the audit review period, NTIA worked directly with this recipient to better understand the reasons why it acquired the equipment at issue. Due to the decreased worldwide supply of fiber as a result of the tsunami in March 2011, NTIA encouraged recipients to accelerate their fiber purchases to avoid supply issues later in the award period. As a result, the recipient decided to purchase all required equipment and fiber earlier in the project's schedule than originally planned. In this case, the recipient purchased enough equipment and fiber to potentially connect 8,000 residential customers and approximately 300 Community Anchor Institutions (CAIs).

The recipient later identified an opportunity to enter into an indefeasible right-of-use (IRU) agreement with another provider in lieu of performing new construction for the western ring of its middle-mile network. With the IRU, the recipient was able to lower its deployment costs and avoid potential overlap in that section of its build. Because of that IRU, certain fiber and equipment the recipient purchased upfront was no longer needed for the original construction. However, the recipient later identified additional homes that it could serve if it were to expand its last mile service area. NTIA approved the recipient's supplemental environmental assessment associated with this project change in March 2012. The recipient repurposed its equipment and fiber for this new build and also bought some additional lateral fiber. However, because the recipient's project ended in November 2012, the recipient had only approximately seven months of active construction to deploy its equipment and was unable to complete the build before the end of the award period.

The recipient has assured NTIA that it will continue to build out its network using its own resources and will utilize the majority of what the OIG calls "excess" equipment to serve customers in these areas, further fulfilling the purposes of the BTOP program. The recipient also provided an inventory trend report to NTIA indicating that the Intelligent Multiservice Gateways (iMGs) in stock have continued to decrease by approximately 57 units per month as it services additional homes, and fiber in stock has decreased by approximately 85,986 feet per month since December 2012.

<http://www2.ntia.doc.gov/ManagementResources>; past training and webinar presentations are available at <http://www2.ntia.doc.gov/Workshops>.

² *But see*, 15 C.F.R. § 14.2, which contains the closest corollary, "excess property," but that section only references Department of Commerce owned or controlled equipment, not equipment titled in the recipient or subrecipient's name.

As a result of these facts, NTIA believes that the recipient reasonably acquired the equipment and continues to deploy it. The equipment is still very much needed for the project for which it was acquired. It would be premature and in fact contrary to Department regulations to require the recipient to dispose of this equipment. The Department's Uniform Administrative Requirements (UARs) state that "[t]he recipient shall use the equipment in the project or program for which it was acquired as long as needed, whether or not the project or program continues to be supported by Federal funds . . ."³ If the recipient no longer needs such equipment, then the rules in 15 C.F.R. § 14.34(g) apply. In this case, the recipient continues to need the equipment to support its project. Although the recipient has yet to fully deploy the customer premises equipment (CPE) and fiber, it has identified potential customers to connect to its network and remaining fiber may be used for repair purposes. Additionally, NTIA's review of the recipient's remaining inventory identified that the majority of remaining last mile assets (batteries, iMGs, and 24-port 100/10000BX FTTx iMAP Service Modules) has a per-unit fair market value of under \$5,000. Under 15 C.F.R. § 14.34(g), the recipient has no further obligation to NTIA for this equipment and may retain, sell, or otherwise dispose of it. The OIG recognizes this in its Draft Report.

Finally, NTIA considers it appropriate for BTOP recipients to retain a reasonable quantity of spare equipment and supplies that can be used to repair the network or replace components that fail or become damaged. The OMB cost principles applicable to all BTOP awards require that costs be reasonable, necessary, and allocable.⁴ Retention of a reasonable quantity of spare equipment and supplies is reasonable in light of best practices in the telecommunications industry, according to the extensive telecommunications industry experience of NTIA's federal staff. It would take significant time for a network operator to order and obtain new components only as the need for repair arises. Thus, a reasonable quantity of undeployed equipment and supplies are necessary to ensure reliability, which, for example, is essential for public safety and data centers, and important to all users. Without quick repairs, users could suffer from prolonged network outages, and the recipients' networks will likely lose customers as they fail to deliver the benefits promised under their BTOP awards. Allowing recipients a starting inventory of undeployed equipment and supplies will help them transition into the operational phase of their projects and ensure the sustainability of their networks. Finally, the undeployed equipment and supplies are allocable to the award, because they are to be used within the scope of the project, to deliver the benefits of the award-funded networks. Thus, the equipment at issue meets the OMB cost eligibility requirements.

³ 15 C.F.R. § 14.34(c).

⁴ See Office of Management and Budget, Circular A-87, App. A, para C; Circular A-122, App. A, para A; Circular A-21, App A, para C; 48 C.F.R. Subpart 31.2.

B. Questioned Costs

The Draft Report questioned costs totaling roughly \$157,000 for the cost of a router that was previously targeted for deployment in a network data center. NTIA has reviewed the facts leading OIG to question this cost, and as a result of this review, NTIA believes the router is an eligible cost under the BTOP award.

Because the recipient purchased the router in accordance with the previously approved network design for its project, NTIA believes that at the time the router was purchased, it was an allowable direct cost of the award.⁵ The recipient purchased the router to meet the needs of its originally planned network, which called for three routers to be deployed in three data centers in support of its network build. After re-engineering and re-designing its network to account for a lost partnership opportunity and changes in anticipated demand, the recipient needed to remove this router from its re-designed network. NTIA notes that OMB Circular A-122, Appendix A, judges the reasonableness of a cost according to “the circumstances prevailing *at the time the decision was made* to incur the costs” rather than in hindsight (emphasis added).

C. Inventory Management

The Draft Report also raises concerns with several recipients’ inventory management practices. Throughout the award period, NTIA worked with all recipients to ensure that they were fully aware of the requirements. The Uniform Administrative Requirements (UARs), which are incorporated into BTOP awards, outline the inventory management requirements and define equipment as personal tangible property with an acquisition cost of greater than \$5,000 and a useful life of greater than one year.⁶ Not only are the requirements incorporated into the BTOP awards’ terms and conditions, but NTIA has consistently reinforced the message that recipients should establish sound property management practices. NTIA communicated this message through recipient workshops and various monitoring activities, such as initial desk reviews, site visits, ongoing recipient calls, and numerous guidance documents.

During the interim response period associated with this audit, NTIA confirmed that a number of recipients rely on their Network Operations Center (NOC) databases to provide a comprehensive representation of deployed equipment and to check for the continued presence of the equipment. Given the nature of telecommunications networks, and the inability to remove and physically

⁵ See Cost Principles for Non-Profit Organizations, OMB Circular No. A-122, App. A, ¶ A.3. These cost principles define equipment as nonexpendable tangible personal property with a useful life of greater than one year and an acquisition cost greater than \$5,000. *Id.*, App. B., ¶15. The cost principles further define capital expenditures for special purpose equipment, which includes equipment used for technical activities, as direct allowable costs. *Id.* The router in question certainly meets the general equipment definition, and, as it was acquired in accordance with a previously approved project plan and to serve a technical activity, it qualifies as special purpose equipment appropriately charged as a direct cost.

⁶ See 15 C.F.R. §§ 14.2, 24.3.

inspect key network assets without seriously damaging network operations, NTIA believes that a NOC database provides an adequate inventory tracking system for these pieces of equipment and does so in real-time.

Following the Draft Report, NTIA specifically reached out to Recipient 1 and confirmed that not only is the organization in the process of completing an inventory, but its property management practices also require reconciliation between its NOC database and its physical inventory of BTOP equipment. NTIA fully appreciates that the OIG did not have the opportunity to consider this additional information during the audit. Combined with a physical inventory of equipment not accounted for by the NOC database, NTIA believes that a recipient managing a portion of the inventory (*i.e.*, deployed network equipment) through a NOC is an appropriate practice.

Additionally, in preparing interim responses to this audit, NTIA worked with one of the recipients identified in this report to account for all items the OIG said it was unable to locate, including those that did not meet the UAR definition of “equipment.”⁷ NTIA provided this information to the OIG prior to the completion of the current Draft Report and OIG revised its response accordingly.

The OIG also raises a concern that several recipients do not have property management agreements with all of their CAIs or partners at Point of Presence (POP) locations. However, as we have discussed with OIG staff, such agreements are not necessary because recipients retain title to any equipment deployed at CAIs or POP locations and are ultimately responsible for compensating the federal government should the equipment be damaged or fall into disrepair. More specifically, the federal interest is not compromised by the absence of language reinforcing this requirement in a CAI agreement because the requirement is formally implemented through the Department’s rules, which are incorporated into all BTOP Broadband Infrastructure awards. Given the safeguards provided to the federal government by recipients’ underlying grant obligations, NTIA believes that its interest in the BTOP-funded equipment remains secure. However, NTIA advised recipients that modifications of the CAI agreements, in accordance with the OIG’s recommendation, would further protect recipients’ and the federal government’s interests, serving as a best practice for fulfilling recipient responsibilities outlined in the UARs.

D. Network Design

The Draft Report raises concerns regarding the design of one of the BTOP networks. However, NTIA believes that the network, as approved, makes the most effective use of recipient resources, while taking into consideration existing broadband resources and potential network overlap concerns. NTIA considered these factors in approving the current network design, as do commercial operators when they implement similar network designs.

⁷ See 15 C.F.R. §§ 14.34(f)(3), 24.32.

The OIG raises concerns about extended outage periods. However, in a typical buried fiber network, customers may have temporary outages of around two hours and a permanent repair takes an average of eight hours.⁸ Fiber optic cable reliability is directly related to the frequency of cable breaks and failures in a telecommunications system.⁹ Further, in trunk-design networks, if a segment of the network is down, it does not mean that all of the network will cease to operate. Instead, the network will continue to operate properly between the network endpoint and the endpoint where the network disturbance begins. The majority of the network will continue to function while the impacted portion of the network is repaired.

NTIA believes that the network in question has already showed its resiliency, which NTIA would expect to see in any undeployed portions of the network, as well. The network design aptly demonstrated its reliability during extensive flooding that occurred throughout the state where it is located earlier this year. This flooding resulted from storms that inflicted the heaviest total rainfall recorded in the state and reports have described the weather disaster as a “100-year” or even “1,000-year” event. However, the extremely heavy rains and flooding damaged network facilities in just three locations. Despite the damage, only one customer temporarily lost service. The recipient and its partner were able to reroute traffic and establish an alternate path that restored that customer’s service within eight hours, despite the affected facilities remaining underwater for a number of days. These results suggest that the existing network design satisfies the technical feasibility considerations of the grant and the OIG’s concerns about reliability are unwarranted.

Technical Oversight of BTOP Grant Recipients

NTIA actively engages in providing technical assistance to recipients. To this end, NTIA has had a dedicated Technical Assistance team throughout the active award period and has contracted with network deployment experts to provide even greater expertise when needed. To some degree, the Draft Report recognizes this, as it references the technical oversight referenced in the *BTOP Recipient Handbook*. Further, the Draft Report expressly states that NTIA will provide technical assistance after site visits, and while that is definitely the case, NTIA’s ability to provide technical assistance is ongoing and not directly tied to a site visit—it is an option available whenever it is necessary. In addition to some of the activities already outlined above, NTIA has also worked extensively with recipients to address specific deployment issues. NTIA

⁸ See RELIABILITY OF FIBER OPTIC CABLE SYSTEMS: BURIED FIBER OPTIC CABLE, OPTICAL GROUNDWIRE CABLE, ALL DIELECTRIC, SELF SUPPORTING CABLE, Alcoa Fujikura Ltd. (May 2001), available at <http://www.southern-telecom.com/solutions/AFL-Reliability.pdf>. (Alcoa Fujikura Ltd., an aerial fiber cable manufacturer, conducted a study on cable breaks between 1986 and 1998).

⁹ Fiber cables and installations must undergo standards certification to ensure a minimum level of reliability. See, e.g., ANSI/TIA/EIA-758, CUSTOMER-OWNED OUTSIDE PLANT TELECOMMUNICATIONS CABLING STANDARD, Telecommunications Industry Association, available at <http://tiaonline.org/standards/>; ANSI/SCTE 86 2010, SCTE RECOMMENDED OPTICAL FIBER CABLE TYPES FOR OUTSIDE PLANT TRUNK AND DISTRIBUTION APPLICATIONS, Society of Cable Telecommunications Engineers (2010), available at http://www.scte.org/documents/pdf/standards/ANSI_SCTE%2086%202010.pdf.

has always been willing to support recipients throughout the process by providing technical assistance staff or moving resources in order to best help its recipients deploy their networks.

NTIA Response to the Draft Report's Recommendations

1. *Ensure grant recipients have devised effective inventory internal controls.*

NTIA will continue to monitor BTOP recipients' compliance with their inventory management requirements. To this end, NTIA will continue to inform recipients of their ongoing post-closeout requirements regarding property management and will continue to review recipient-specific audit reports, which offer independent appraisals of BTOP projects.

2. *NTIA program officers should review their awards and, where appropriate, ensure that BTOP grant recipients obtain agreements with all CAIs and POPs to secure federal interests in all BTOP equipment.*

NTIA will continue to recommend these agreements with recipients as a best practice notwithstanding our conclusion that the federal interest is effectively protected through the titleholder of the equipment, which, absent specific Program Office and Grants Office approval, is always a recipient or subrecipient of the award. Further, NTIA requires all Broadband Infrastructure recipients to properly record and file notice of the federal interest in any BTOP-funded property, further placing third parties on notice as to the existence of the federal interest.

3. *NTIA program officers should work with grant recipients to assess equipment acquisitions to ensure that (1) the justification on the use and benefit of the equipment is adequate and (2) the purchases are allowable.*

At this point in the BTOP program, NTIA does not foresee many more equipment purchases, given the low number of active BTOP projects. However, if this issue arises, program staff will work with recipients and NTIA will consider this recommendation for future grant programs, as necessary and appropriate.

4. *NTIA should work with recipients to identify and employ best practices in network design and risk management strategies for networks in which reliability is a concern.*

NTIA considered network reliability issues and risk management strategies throughout the program. Further, NTIA approved original network designs and subsequent modifications after careful review, weighing a variety of deployment concerns. Although NTIA is currently not in a position to reevaluate network designs because the majority of the broadband infrastructure awards are approaching completion or closed, NTIA will continue to work with recipients that have open awards to provide continued technical assistance and best practice advice on issues such as network design and risk management strategies.

5. *NTIA should reassess its staff's ability to provide technical expertise in order to ensure that awards with complex issues are receiving appropriate oversight.*

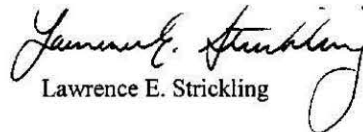
NTIA believes that its staff's technical expertise regarding broadband deployment is unmatched within the federal government. NTIA has provided the right resources to assist recipients with technical, financial, or other project issues and ensure appropriate oversight. As such, NTIA will continue to provide robust technical assistance to ensure that they fulfill the purposes of their award. To accomplish this goal, NTIA will reassess staff allocations, as necessary, to provide such technical assistance and appropriate oversight.

Long-term Sustainability of Projects

Finally, the Draft Report raises concerns with long-term project sustainability. NTIA is already working very closely with all recipients to address any sustainability concerns and ensure that they continue to operate long after the BTOP program comes to an end. To that end, NTIA has worked diligently to respond to recipient concerns, encourage partnerships with different providers, and create a regime that allows recipients to enter into symbiotic IRU agreements while protecting the federal government's interest. However, this is all done in recognition of the fact that the BTOP program is a one-time funding opportunity that will come to an end. NTIA's capabilities in this regard are limited by this reality.

If you have any questions or concerns regarding this response to the draft report, please contact Milton Brown, NTIA's Liaison to the OIG, at (202) 482-1853.

Sincerely,



Lawrence E. Strickling

cc: Ann C. Eilers, Office of Inspector General, U.S. Department of Commerce
Chris Rose, Senior Auditor, Recovery Act Task Force, OIG
Milton Brown, NTIA Audit Liaison
Douglas Kinkoph, NTIA
Aimee Meacham, NTIA