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GAO

Report to Congressional Committees

June 2012

MILLENNIUM CHALLENGE CORPORATION

Georgia and Benin Transportation Infrastructure Projects Varied in Quality and May Not Be Sustainable

GAO-12-630

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GAO Accountability * Integrity * Reliability

Highlights

Highlights of GAO-12-630, a report to congressional committees

Why GAO Did This Study

MCC was established in 2004 to help developing countries reduce poverty and stimulate economic growth through multiyear compact agreements. As of June 2012, MCC had signed 26 compacts totaling about $9.3 billion in assistance. Seven compacts, including those with Georgia and Benin, closed in 2010 or 2011. Most had a transportation infrastructure project (a road or a port) that received about 50 percent of the compact's total funding. This report, prepared in response to a congressional mandate to review compact results, examines how MCC ensured the quality and sustainability of MCC's two transportation infrastructure projects in Georgia and Benin. GAO analyzed MCC documents, interviewed MCC officials and stakeholders, and observed the transportation infrastructure projects in those countries.

What GAO Recommends

To ensure that compact projects are implemented to established quality standards, GAO recommends that MCC (1) review how it uses information from its independent engineers, and (2) develop a mechanism to maintain influence on contractor repairs after compact closure. To ensure sustainability of compact projects, GAO recommends that MCC evaluate the tools it uses to ensure that partner countries have adequate resources to operate and maintain MCC-funded infrastructure. MCC agreed with all three recommendations but did not commit to taking any actions to address them.

View GAO-12-630. For more information, contact David Gootnick at (202) 512-3149 or gootnickd@gao.gov.

What GAO Found

In Georgia, quality and sustainability issues jeopardize the long-term usefulness of the Samtskhe-Javakheti road project. The Millennium Challenge Corporation (MCC) funded the rehabilitation of about 217 kilometers of road linking the previously isolated Samtskhe-Javakheti region with Tbilisi, the country's capital, and reducing the driving time from 8 ¼ hours to 2 ¾ hours. The project was intended to increase exports from the region, integrate people in the region with the rest of Georgia, and expand trade with Turkey and Armenia. However, the urgency to meet fixed time frames resulted in problems implementing the project's quality assurance framework. For example, the construction supervisor did not have enough staff to properly monitor construction and ensure quality. Despite several recommendations from MCC's independent engineer, MCC and its Georgian counterpart, the Millennium Challenge Account (MCA-Georgia), did not adequately increase the number of construction supervisors, which resulted in pavement defects in parts of 5 of the 11 road sections and deterioration of structures such as drainage and retaining walls. One 15-kilometer section contained enough defects that the road had to be completely repaved. Furthermore, much of the repair work was to be done in the contracts' 1-year defects liability period, after the compact closed and at a time when MCC no longer had oversight authority. Although MCC took steps to ensure the road project's sustainability, the Georgian government has demonstrated limited ability to keep the road operational and maintained.

In Benin, construction for the Port of Cotonou project generally met established quality standards, but several components were not in operation at the compact's end. MCC funded the construction of several port infrastructure improvements, including a jetty, a wharf, internal port roads, a railway, and security and electricity distribution systems. The project was intended to increase the efficient transport and volume of goods flowing through the port. However, several components—including the new south wharf, the port security system, and the electricity distribution system—were not in operation at compact completion because the Port Authority had not ensured that the necessary infrastructure, staffing, or policies were in place to operate them. For example, the new south wharf, which was intended to increase the cargo tonnage moving through the port, is not in operation in part because the Port Authority does not have the funds to complete the dredging needed to allow large vessels to access the new wharf. Even though MCC took steps to ensure that the government of Benin could sustain the operations and maintenance of the project—such as conducting a feasibility study, incorporating conditions precedent into the compact, hiring a port advisor, requiring a compact closure plan, and identifying steps the government of Benin should take to support sustainability in the compact letter of completion—they were not sufficient. As a result, Benin's inability to supply the resources, manpower, or policies needed to operate all of the port's components calls into question whether the port project will achieve expected compact results or be sustained throughout the life of the infrastructure.

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Abbreviations

CEO	chief executive officer
IRI	International Roughness Index
ISPS	International Ship and Port Facility Security
km	kilometer
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
SOLAS	International Convention for the Safety of Life at Sea

GAO
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

June 27, 2012

The Honorable Patrick Leahy
Chairman
The Honorable Lindsey Graham
Ranking Member
Subcommittee on the Department of State,
Foreign Operations, and Related Programs
Committee on Appropriations
United States Senate

The Honorable Kay Granger
Chairwoman
The Honorable Nita Lowey
Ranking Member
Subcommittee on State, Foreign Operations,
and Related Programs
Committee on Appropriations
House of Representatives

The Millennium Challenge Corporation (MCC), a U.S. government corporation, was established in 2004 to provide aid to developing countries that have demonstrated a commitment to ruling justly, encouraging economic freedom, and investing in people. MCC provides assistance to eligible countries through multiyear compact agreements to fund programs targeted at reducing poverty and stimulating economic growth. MCC compacts may not be longer than 5 years.[1] As of June 2012, MCC had signed 26 compacts with 25 countries, committing a total of approximately $9.3 billion in U.S. funding.[2]

[1]22 U.S.C. § 7708(j).

[2]MCC commits funding when a compact is signed and obligates funds after the compact enters into force. As of June 2012, MCC had signed initial compacts with, in order of signature, Madagascar, Honduras, Cape Verde, Nicaragua, Georgia, Benin, Vanuatu, Armenia, Ghana, Mali, El Salvador, Mozambique, Lesotho, Morocco, Mongolia, Tanzania, Burkina Faso, Namibia, Senegal, Moldova, the Philippines, Jordan, Malawi, Indonesia and Zambia. In February 2012, MCC signed a second compact with Cape Verde.

In the fiscal year 2008 Consolidated Appropriations Act, Congress directed GAO to review the results achieved by MCC compacts.[3] Seven of the 26 compacts were completed in 2010 or 2011, including those with the Republic of Georgia and Benin.[4] All 7 compacts included a transportation infrastructure project (a road or a port) which—except in the case of Armenia—received 50 percent or more of the compact's total funding. In response to the congressional mandate, this report examines the quality and sustainability of MCC's transportation infrastructure projects in Georgia and Benin. GAO has previously reviewed other compact results and found that insufficient planning, escalation of construction costs, and insufficient MCC review led to project delays, scope changes, and cost increases. We made recommendations to address the need for better planning and design.[5] To improve planning and designs, MCC has committed specific funds and has increased the length of time between compact signature and project implementation. MCC developed the compacts with Georgia and Benin before it revised these practices.

[3]Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, § 668(d)(1)(A). The act also required us to examine the financial control and procurement practices of MCC and its accountable entities. We responded to this requirement separately in GAO, *Millennium Challenge Corporation: MCC Has Addressed a Number of Implementation Challenges, but Needs to Improve Financial Controls and Infrastructure Planning*, GAO-10-52 (Washington, D.C.: Nov. 6, 2009).

[4]The 5 other completed compacts are Honduras, Cape Verde, Nicaragua, Vanuatu, and Armenia. We do not include the Madagascar compact in this list of compacts because, as the result of a pattern of actions inconsistent with MCC policy, MCC formally terminated the compact effective August 31, 2009. Protests and instability in Madagascar in January 2009 ultimately led to the forced resignation of the country's elected president.

[5]See GAO-10-52 and GAO, *Millennium Challenge Corporation: Compacts in Cape Verde and Honduras Achieved Reduced Targets,* GAO-11-728 (Washington, D.C.: July 27, 2011). In GAO-10-52, GAO recommended that MCC should (1) establish a programmatic goal that MCAs conclude all project planning efforts—to include MCC final approvals of the MCAs' final feasibility surveys, engineering surveys, environmental surveys, and resettlement studies—prior to entry into force, but not later than the point at which the MCAs issue contract solicitations; and (2) require MCAs to obtain detailed reviews of project cost estimates—to include the extent that risks to projects, such as cost escalation, schedule delays, and other issues, have been considered—and of project designs before contract solicitation for large construction projects to better ensure that projects can be successfully bid and built. In GAO-11-728, GAO recommended that MCC should work with partner countries to make project planning, design, and construction decisions that reduce long-term maintenance needs and costs to maximize the sustainability of MCC-funded infrastructure projects and reduce the amount of maintenance required after compact completion.

To assess the quality and sustainability of the two MCC-funded transportation infrastructure projects in Georgia and Benin, we analyzed U.S. agency documents and observed project results in both countries. We interviewed MCC officials in Washington, D.C., and MCC and Millennium Challenge Account (MCA) officials in Georgia and Benin regarding the results of the transportation infrastructure activities, including their quality and sustainability.[6] We also met with partner country government officials, contractors, project managers, construction supervisors, and relevant private businesses. We based our assessment of the projects' quality on observations of defects in a site visit to the projects, a review of reports provided by MCC, interviews of officials, and the quality assurance framework established by MCC, MCA, and their contractors. For this report, the definition of sustainability is based on the Organisation for Economic Cooperation and Development definition, which defines "sustainability" as "the continuation of benefits from a development intervention (such as assets, skills, facilities, or improved services) after major development assistance has been completed." We operationalized this definition by specifying that sustainability is the ability of MCC's partner country government to operate and maintain the new infrastructure in such a condition as is required to produce the projected benefits for the period of time those benefits are expected.

MCC enters into a legal relationship with partner country governments that vests responsibility for day-to-day management of compact project implementation to the MCA, including monitoring and evaluation activities such as setting and revising targets, but such MCA actions require MCC's direct oversight and approval. Therefore, throughout this report, we attribute all decisions related to project rescoping and compact targets to MCC. See appendix I for further details on our objectives, scope, and methodology.

We conducted this performance audit from November 2011 to June 2012 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 the

[6]Partner country governments vest responsibility for day-to-day management of MCC compact project implementation in accountable entities, usually referred to as Millennium Challenge Accounts.

evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

MCC Organization

MCC is managed by a chief executive officer (CEO), appointed by the President with the advice and consent of the Senate, and is overseen by a Board of Directors. The Secretary of State serves as board chair and the Secretary of the Treasury serves as vice-chair.[7] MCC's model is based on a set of core principles deemed essential for effective development assistance, including good governance, country ownership, focus on results, and transparency. According to MCC, country ownership of an MCC compact occurs when a country's national government controls the prioritization process during compact development, is responsible for implementation, and is accountable to its domestic stakeholders for decision making and results.

In keeping with the MCC principle of country ownership, MCC enters into a legal relationship with partner country governments. During the 5-year compact implementation period, the partner government vests responsibility for day-to-day management, including monitoring and evaluation of the progress of compact projects, to an accountable entity established to implement the compact (an entity's name is usually formed from "MCA" plus the country's name—for example, MCA-Benin). MCC provides the framework and guidance for compact implementation, monitoring, and evaluation that MCAs are to use in implementing compact projects.

Following the compact end date, the partner government must close the program within 120 days (the closure period). During the closure period, MCC funds may be used only for project goods, works, or services incurred before the compact end date, or for closure expenses. For example, the government may expend MCC funds to settle final invoices and claims, secure unfinished project sites against potential health or

[7]Other board members are the U.S. Trade Representative, the Administrator of the U.S. Agency for International Development, the CEO of MCC, and up to four Senate-confirmed nongovernmental members appointed by the President from lists of individuals submitted by congressional leadership.

safety hazards, prepare final reports, and conduct other activities specified in MCC's closeout guidelines. However, the government may not expend MCC funds to undertake or continue activities that were planned for completion within the compact term, including expenses for activities such as completion of works, supervising engineer services, and consulting services.

Quality Assurance Framework

MCC places several requirements on MCAs to ensure proper management and quality assurance of MCC-funded infrastructure projects. These requirements create a quality assurance framework for infrastructure projects that requires that each MCA have an individual project director—for example, a roads director—who oversees the activities of the other actors, including outside implementing entities or project management consultants, construction supervisors, and construction contractors.[8]

- *Project management consultant/implementing entity*: Before receiving project funding, MCC requires the MCAs to engage the services of a project management firm or an implementing entity to help manage administrative aspects of compact projects.
- *Construction supervisor:* MCAs contract with construction supervisors to conduct oversight of day-to-day construction and the activities of the construction contractors to ensure compliance with contract requirements. Construction supervisors play an important role in ensuring construction quality by performing such tasks as approving construction materials, overseeing testing, and inspecting completed work.
- *Construction contractor:* MCAs contract with construction firms to build the project. The construction contractor is also responsible for controlling the quality of its work, which involves, among other tasks, material and construction testing.[9]

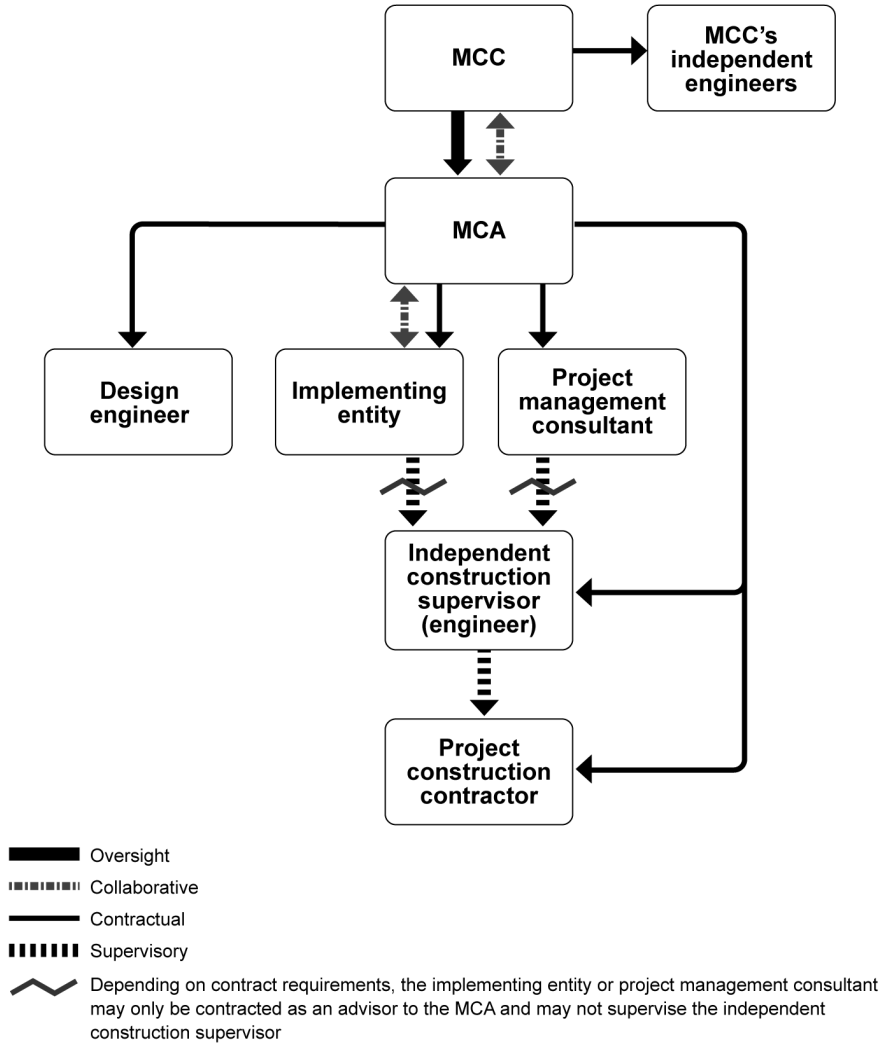
[8]The organization of the management structure may vary across compacts and projects.

[9]Testing is typically completed to ensure construction materials meet performance characteristics. For example, compaction tests are done to ensure underlying soils can support pavement structures. In addition, completed work is tested to ensure that it was installed properly and performs as intended. For example, smoothness tests are performed on newly placed pavements.

In general, MCAs deliver infrastructure projects through a design-bid-build approach in which the MCA contracts with a design engineer to develop technical plans and specifications that are used by a construction contractor, hired under a separate MCA procurement action, to build the project. In some cases, project designs already exist and MCAs do not engage a design engineer in implementing the project. In other cases a design-build approach is used and MCA contracts with a contractor that becomes responsible for both project design and construction.

In addition, MCC may hire an independent engineer to assist in overseeing the progress of construction as managed by the MCAs and executed by their contractors. The objective of engaging an independent engineer is to obtain high-quality technical support in order to strengthen MCC's ability to better assess the quality of ongoing program activities and to make better informed judgments about the status of ongoing activities, particularly where assessment of project activities affects MCC's ability to further disburse funds. An independent engineer may also provide technical input on program decisions and documents submitted by MCC partner-country counterparts and help MCC ensure that funds are being spent according to the conditions and frameworks established in the compact. Figure 1 depicts the oversight, management, and contractual relationships among MCC, the MCA, and their contractors for infrastructure projects.

Figure 1: MCC's Contract Management Structure for Infrastructure Projects



Source: GAO interpretation of contract and project management structures for large infrastructure projects.

Sustainability of MCC Projects

MCC takes steps to ensure the sustainability of the projects it funds during both the design and implementation phases. First, MCC compacts are to be designed so that projects are sustainable for about 20 years, or as appropriate for the structure. Also, during the compact development process, MCC assesses the mechanisms in place to enhance sustainability, including a partner country's policies and practices that will enable MCC investments to continue to provide benefits. For instance, as

part of compact proposals submitted to MCC, partner countries are required to identify risks to project sustainability and describe the measures needed to ensure that project benefits can be sustained beyond the period of MCC financing. Partner countries are to consider a number of issues affecting sustainability, including environmental sustainability; institutional capacity for operations and maintenance; and, for proposed infrastructure projects, recent funding, performance, and expected expenses for operations and maintenance.

During compact implementation, MCC tracks progress against key policy reforms and institutional improvements that were included as conditions in the compact to enhance project impact and sustainability. Such conditions in an agreement are known as conditions precedent, which must be met by one party before a second party to the agreement can perform or do its part. In the case of an MCC compact, MCC establishes conditions precedent that must be met by the partner government or MCA before financial disbursements are made. For example, MCC may require that the government increase its budget allocation for road maintenance before releasing final payments.

Transportation Infrastructure Projects

For the purposes of this report, transportation infrastructure comprises public works that provide the conveyance of passengers or goods from one place to another. It includes structures such as roads, seaports, airports, and railways. Such projects may take years to plan and implement. For example, typical highway projects in the United States can take from 10 to 15 years for planning, design, and construction.

Transportation infrastructure construction contracts may contain a defects liability clause that obligates a contractor to repair or rectify defects in the construction for a set period after the construction supervisor has deemed the works substantially complete.[10] In a construction agreement, a contractor's main obligation is to carry out the works to final completion, free of defects and to the standard set out in the agreement. A defects liability clause is intended to supplement this obligation by ensuring that the contractor remedies any defective work that becomes noticeable during the defects liability period, usually 1 year. The clause also provides

[10]In essence, "substantially complete" means that the works can generally be used as intended and that only minor work remains.

a mechanism for repairing defects that may arise during the defects liability period.

In Georgia, Quality and Sustainability Issues Jeopardize the Long-Term Usefulness of the Samtskhe-Javakheti Road Project

In Georgia, MCC funded the rehabilitation of about 217 kilometers[11] of road linking the previously isolated Samtskhe-Javakheti region with Tbilisi, the country's capital.[12] However, the urgency to meet fixed time frames resulted in problems implementing the quality assurance framework and led to construction defects in parts of 5 of the 11 road lots.[13] Furthermore, while MCC took steps to ensure the road project's sustainability, the Georgian government has demonstrated limited ability to keep the road operational and maintained up to this point.

MCC Compact Funded the Rehabilitation of the Samtskhe-Javakheti Road in Georgia

MCC signed a compact with the Republic of Georgia in September 2005 to stimulate growth in regions outside Tbilisi where more than 40 percent of the country's total population resides. A rough asphalt road before the compact, the Samtskhe-Javakheti Road was in such disrepair it prevented residents in the region from easily reaching Tbilisi. The purpose of the rehabilitation was to improve transportation for regional trade to

- increase exports from the region;
- increase social, political, and economic integration of the people in the region with those in the rest of Georgia;

[11]The number of kilometers of road rehabilitated (217) is based on GAO's review of MCC provided takeover certificates indicating the number of kilometers of road accepted from the construction contractors as complete and a March 2012 trip report issued by MCC's independent engineer. In some documents, MCC reports rehabilitating 220 kilometers of road, including sections of the road where small amounts of finishing work (e.g. painting) were undertaken even through major road works were not done on those sections.

[12]Actual construction began in the town of Teleti, at the outskirts of Tbilisi.

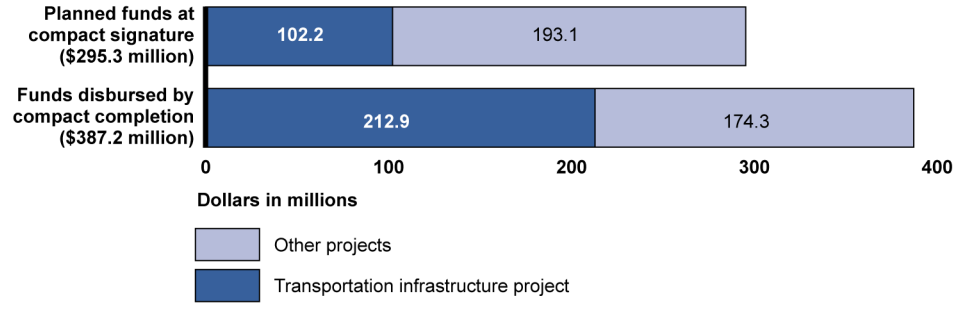
[13]Each section of road to be constructed in Georgia is described as a lot. The lots include construction works such as pavement rehabilitation, bridge rehabilitation or replacement, drainage systems, guardrails and concrete barrier walls, signage, and pavement markings. MCA-Georgia named the lots as follows: 1, 2, 3, 3A, 4, 5i, 5ii, 6i, 6ii, 6iii, and 7. We have used its nomenclature.

- expand international trade by providing a more direct link from Tbilisi and eastern and southern Georgia to Turkey and Armenia;[14] and

- develop the tourism potential of Vardzia, a 13th century rock-cut monastery.

MCC originally granted $295.3 million for the compact's two projects—Enterprise Development and Regional Infrastructure Rehabilitation, which included the Samtskhe-Javakheti Roads Rehabilitation activity (see fig. 2).[15] In November 2008, after Georgia's war with Russia over South Ossetia, MCC increased the compact by $100 million. The compact entered into force in April 2006 and ended in April 2011.

Figure 2: MCC-Georgia Compact Funding at Signature and at Completion



Source: GAO analysis of MCC data.

Note: MCC added $100 million to the compact in November 2008 after Georgia's war with Russia. Other projects include funds disbursed before entry into force to facilitate the implementation of the compact. At compact close, $8.1 million remained undisbursed.

MCC originally planned to rehabilitate 245 kilometers of existing road at a cost of $102.2 million (or $417,000 per kilometer), but after several changes to the project's scope, rehabilitated about 217 kilometers at a cost of about $212.9 million (or $981,000 per kilometer). The road project's length was first reduced after the initial contract solicitation

[14]As of our December 2011 site visit, the border crossing with Turkey was not open because the Turkish government had not yet installed the necessary infrastructure on its side of the border. The government of Georgia anticipates its opening in 2013.

[15]For additional information on the projects included in the Georgia Compact, see GAO, *Millennium Challenge Corporation: Summary Fact Sheets for 17 Compacts,* GAO-10-797R (Washington, D.C.: July 14, 2010).

attracted bids that exceeded the amount of funding originally available for the road work. As a result, the project was divided into shorter sections and contracts were let for about 170 kilometers of road. In the winter of 2008-2009, after MCA-Georgia allocated an additional $60 million to the road project, about 50 kilometers of road were added to the project (see fig. 3). MCA-Georgia also reallocated an additional $50.7 million from other activities to the road project between May 2008 and January 2011 to cover additional cost increases, including costs to accelerate work to ensure its completion before the end of the compact.[16]

[16]Funds were transferred from the regional infrastructure development project, energy rehabilitation project, Georgia regional development fund project, agribusiness development project, program administration, audit, and fiscal and procurement management activities.

Figure 3: Scope Changes for the Samtskhe-Javakheti Roads Rehabilitation Project

245 km: Initial project scope

~170 km: Scope reduced because initial bids exceeded budget

~217 km: Scope increased when additional funding was added to compact

Road completed

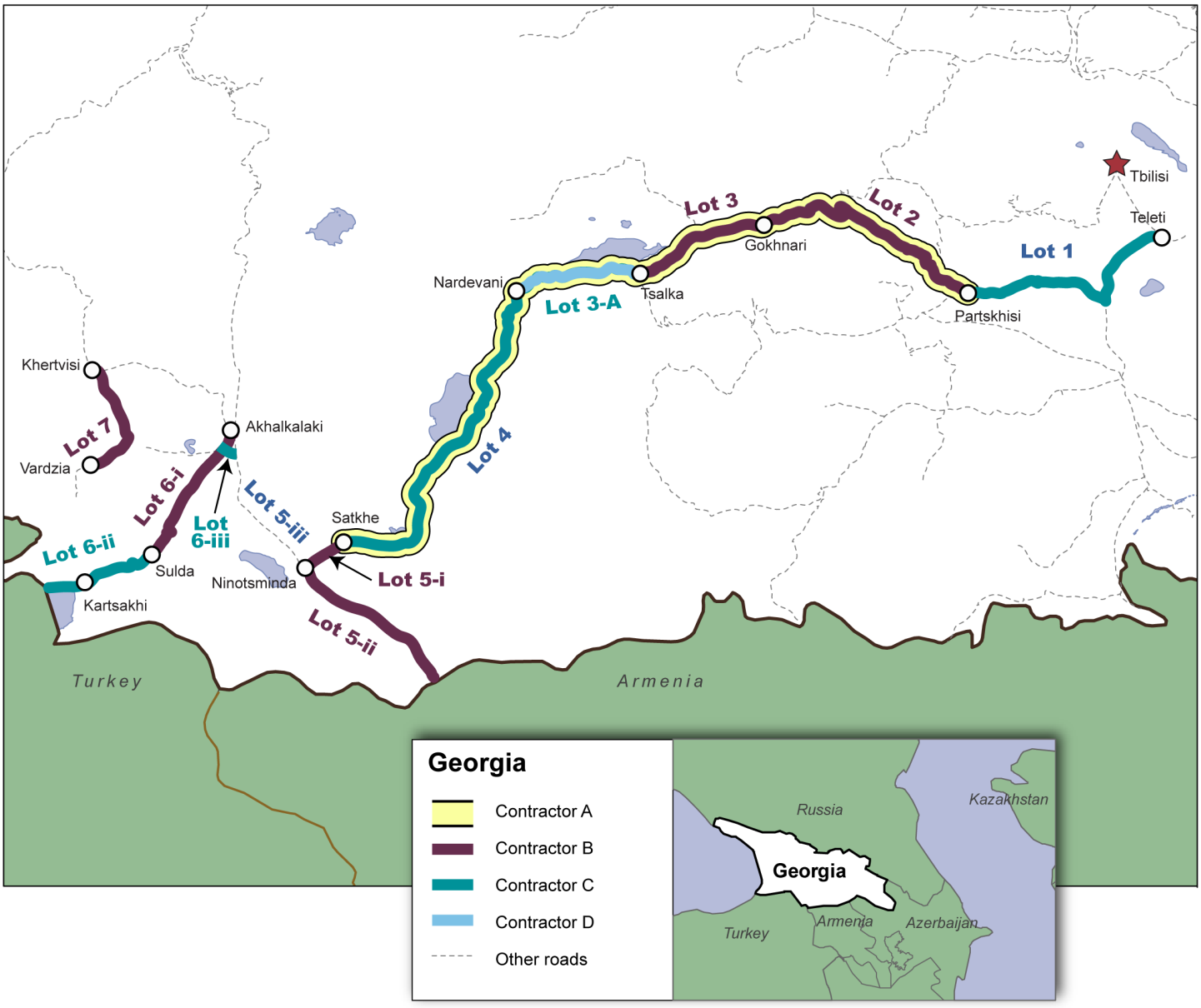
Road outside scope

Source: GAO analysis of MCC and Republic of Georgia's government data, and Map Resources (maps).

The Urgency to Meet Compressed Construction Time Frames Resulted in Problems Implementing the Quality Assurance Framework and Construction Defects in 5 of the 11 Road Lots

The road was rehabilitated at an increased cost in a compressed construction time frame because of insufficient planning, work added late in the compact, and poor performance by one contractor. Because of the compressed construction time frames, MCA-Georgia's construction supervision and construction contractors had difficulty fully implementing the quality assurance framework. In addition, problems identified by MCC's independent engineer were not adequately addressed. As a result, repair work remained at the end of the compact and the quality of construction varied across the lots. Although some infrastructure, such as the bridges, appeared to be well built, parts of 5 of the 11 lots—representing about 60 percent of the kilometers rehabilitated—had noticeable pavement deterioration and other defective structures. The extent of the defects varied among the lots, with some lots requiring pavement surface sealing or a relatively small amount of patching. However, the road in one lot was planned to be entirely repaved. As of March 2012, work was ongoing. (Figure 4 shows how the road was divided into lots and handled by different contractors.)

Figure 4: Division of the Samtskhe-Javakheti Roads Rehabilitation Project into Lots

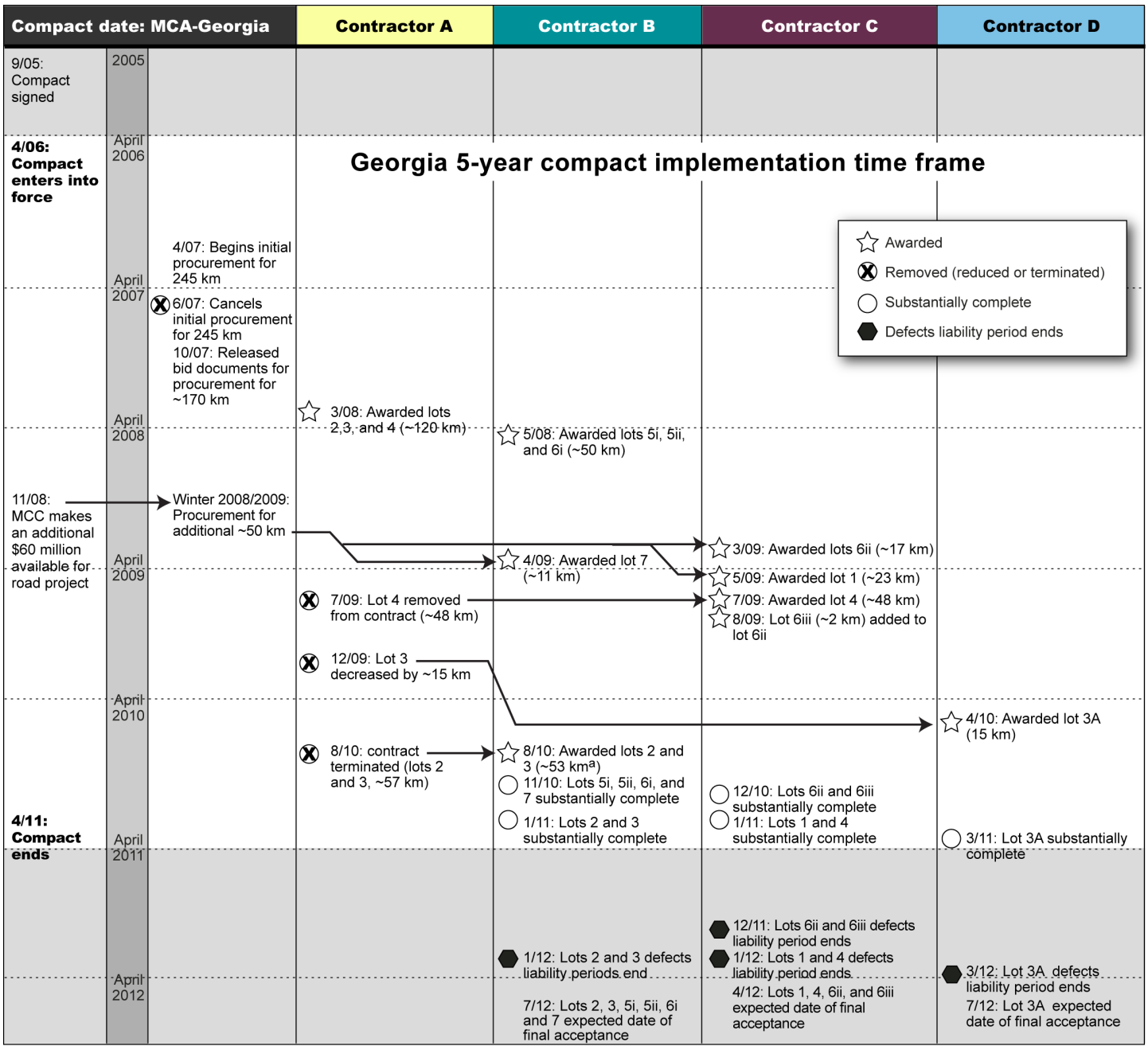


Source: GAO analysis of MCC and Republic of Georgia's government data, and Map Resources (maps).

Road Was Rehabilitated at Increased Cost under Compressed Construction Time Frames because of Several Factors

MCA-Georgia awarded most of the final construction contracts with 2 years or less before the compact end date because of planning delays, work added late in the compact, and poor performance by one contractor. See figure 5 for a timeline of the compressed time frame under which the road rehabilitation occurred.

Figure 5: Georgia Construction Timeline



Source: GAO analysis of MCC and MCA-Georgia documents and interviews.

Note: Contractor A lot lengths were as of the time the event occurred, Contractors B, C, and D lot lengths were as of the end of the compact. Individual lot lengths may not add to total lengths because of rounding.

[a]When lot 3 was awarded to contractor A, it included work later re-awarded as lot 3A as well as 4 kilometers of road at Tsalka that were eventually removed from the project altogether.

Insufficient planning delayed construction: MCC reports that conducting feasibility studies and preparing designs and bid documents took over a year of compact time. In addition, a lack of accurate cost estimates resulted in a delay of 8 to 10 months in the first contract's award. In April 2007, MCA-Georgia made its initial procurement for two road contracts and found that the project cost was greater than estimated and exceeded the funds available for the road work.[17] As a result, it removed about 75 kilometers from the scope, revised the project into smaller lots, conducted a new procurement, and awarded contracts for lots 2, 3, and 4 (about 120 kilometers total) to contractor A in March 2008 and for lots 5i, 5ii, and 6i (about 50 kilometers total) to contractor B in May 2008—23 and 25 months after the compact entered into force, respectively.

New work was added when additional funding became available late in the compact implementation period: In November 2008, MCC made additional funds available for the road project. The following spring, 3 years after the compact entered into force, MCA-Georgia awarded three additional road contracts (lots 1, 6ii,[18] and 7). At this point, only about 2 years remained under the compact to complete the work.

Poor performance by one contractor delayed implementation by about a year: Contractor A failed to meet its contractual obligations. After removing segments from contractor A's scope of work in July and December 2009 and awarding them to other contractors, MCA-Georgia terminated the contract in August 2010. While reassigning the work from contractor A to the other contractors allowed the contract to be completed before the end of the compact, MCC officials reported that the process cost MCA-Georgia about $45 million more than the original $65 million contract and added at least 1 year of construction time.

[17]GAO discussed these initial cost escalation and planning challenges in a previous report. See GAO-10-52.

[18]Lot 6iii was added as an addendum to the contract for lot 6ii in August 2009.

- MCA-Georgia provided a notice of nonperformance to contractor A in April 2009. That July, MCA-Georgia removed lot 4 from the contract (48 kilometers) and awarded it to another contractor through a limited procurement process. By using the quicker limited procurement process, MCA-Georgia hoped to take advantage of time remaining in the 2009 construction season and improve the likelihood of getting the work completed in the 21 months remaining in the compact.

- In December 2009, contractor A's performance was still a problem, and MCA-Georgia removed an additional 15 kilometers from the contract (lot 3A). According to MCC officials, MCA-Georgia re-awarded this work through a full, competitive procurement process. As a result, the procurement took more than 4 months, mostly over the winter season, which left about 1 year to complete the work.

- In August 2010, MCC terminated the contract with contractor A for the remaining 57 kilometers of road (work for this section was about 80 percent complete, according to MCC's independent engineer). With only 8 months left before the compact was to end—and most of those being winter months—MCA-Georgia removed about 4 kilometers from the project and re-awarded the other 53 kilometers using a limited procurement process so that work could begin immediately. According to MCC, MCA-Georgia paid contractor B $31.8 million to complete the work before the compact's April 2011 deadline. An independent adjudicator found the additional cost for completing the work to be within the bounds of what may reasonably be expected in such circumstances.

Quality Assurance Problems Identified by MCC's Independent Engineer Not Always Addressed

The MCC-required quality assurance framework was in place, but issues identified by MCC's independent engineer—the technical advisor MCC hired to assist in overseeing the progress of construction—were not always addressed. Specifically, the contractors did not always perform their quality control responsibilities, the construction supervision firm had insufficient staff to conduct its work, and MCA-Georgia did not always use the construction supervisor as set out in the quality assurance framework.

Contractors did not always conduct quality control activities: The contractors did not always fulfill their contractual quality control role, according to MCC officials and MCC's independent engineer's reports. For example, MCC's independent engineer reported that some contractors continued work in less-than-favorable conditions, such as cold and rainy weather, to complete the work before the end of the compact. Conducting work in these conditions can cause problems with curing

concrete (such that it does not reach its design strength) or with asphalt raveling (not bonding to other asphalt layers). In addition, to meet time frames, much work was completed at night when poor lighting, less inspection, and colder temperatures made it more difficult to perform high-quality work. Finally, one contractor did not supply a required quality assurance plan.[19] Without the contractor's quality assurance plan for the specific contract, the construction supervisor did not know when the contractor would be testing materials or who to contact regarding identified problems. In addition, the same contractor turned in test reports after the tested work had already been covered by subsequent stages of work. As a result, if the construction supervisor found that the earlier work was defective, the contractor would have to remove the subsequent work to repair it.

Construction supervisor had insufficient staff: Quality control errors by the contractors should have been caught by the construction supervisor, but the construction supervisor had insufficient numbers of staff to adequately implement the quality assurance framework, according to MCC's independent engineer. MCA-Georgia did increase the contract supervision, but not to the independent engineer's recommended level. While MCC had taken steps to try to ensure sufficient supervision of the construction, it did not have authority to enforce the independent engineer's recommendations.

- MCC's independent engineer, accompanied by MCC officials, visited the road project and provided written reports almost quarterly between February 2009 and November 2010—the compressed construction time frames under which most of the roadwork occurred. The reports stated that there were not enough construction supervision staff, and, in four of those reports, the independent engineer advised that the supervisory situation was jeopardizing the project's quality and success. A project management official told us that, because of the insufficient number of staff, the construction supervisor did not observe some quality testing that was done by the construction contractors, as required in its contract.

[19]A contractor's quality assurance plan identifies such things as the type of tests to be conducted, the frequency at which materials will be tested, and how the results will be reported.

- In February 2009, MCA-Georgia increased the number of construction supervision staff to oversee the three lots added to the project's scope.[20] In addition, MCA-Georgia hired a separate construction supervisor to oversee lot 3A when it was created, increasing the staff available overall for construction supervision on the project. However, the MCC independent engineer recommended that additional construction staff were still needed to ensure the quality of the work under way. The independent engineer also reported that the construction supervisory firm's fee was lower than typical for this type of international work.[21] Nonetheless, MCA-Georgia chose not to fund additional staff for the construction supervision firm.

- MCC had included a condition precedent in the compact that required MCA-Georgia to engage a construction supervisor. However, because the condition was satisfied once MCA-Georgia engaged a supervisor, MCC stated that the condition precedent did not give it any authority to withhold funds because of insufficient supervision staffing.

Construction supervisor was not always used in accordance with the quality assurance framework: According to two reports by MCC's independent engineer, MCA-Georgia did not always use the construction supervision staff effectively. According to the quality control framework in the construction firms' contracts, the construction supervisor should issue all instructions to the contractors. However, MCC's independent engineer noted that the MCA-Georgia staff responsible for the road project communicated directly with construction contractors and issued oral instructions directly to the contractors to accelerate work. The independent engineer further noted that this practice could lead to claims of additional work, increasing costs, because contractors received different instructions from the construction supervisor and MCA-Georgia.

Road Was Improved, but Quality Problems Exist in the Pavement and Some Structures

The MCC project generally improved the road by reducing its driving time and roughness and installing bridges that appeared well built. However, several sections of the road had pavement defects and structures such as drainage systems and retaining walls that are deteriorating.

[20] MCC stated the value of the construction supervisor's contract increased from an initial value of $2.7 million to a final value of $7.4 million.

[21] The independent engineer reported that the firm's fee was 3.5 percent of the contract cost, while the international norm is 5 to 6 percent. According to MCC, MCA-Georgia spent a total of 4.2 percent of the overall construction costs on supervision of all road lots.

MCC Project Created Improved Road and Bridges

The MCC project improved the condition of the road. Before rehabilitation, the Samtskhe-Javakheti road was passable but rough, with a driving time of about 8¼ hours. The project decreased the road's roughness, and after rehabilitation, the same trip could be made in about 2¾ hours. MCC reported roughness measurements before rehabilitation that indicated a vehicle would have to drive under about 30 miles per hour for passengers to ride comfortably.[22] Road roughness measurements made after project completion indicated that passengers could ride comfortably even at speeds of 75 miles per hour. We traveled a portion of the road that was bypassed by the rehabilitation project and found it to be filled with potholes and patches. We found the new road was much smoother (see fig. 6).

Figure 6: Example of the MCC-Funded Road, Lot 1 (Inset: Unrehabilitated Road Bypassed by MCC-Funded Road)

Source: GAO.

The scope of the project also included rehabilitating or rebuilding 27 bridges (see fig. 7). In March 2012, MCC's independent engineer reported that all bridges were performing well and had only a few defects

[22]MCC reports indicated an average International Roughness Index (IRI) of 16.6 before the rehabilitation and 1.5 after the rehabilitation. IRI is a measure of road pavement roughness in terms of meters per kilometer. The IRI affects vehicle operating costs, ride quality, and road damage.

such as erosion of embankment slopes, and incomplete guardrail hardware. We observed only minor defects such as a small chip in a bridge beam but no apparent quality problems.

Figure 7: MCC-Funded Bridge in Lot 7

Source: GAO.

Pavement Defects Occur in Parts of 5 of the 11 Road Lots

While the pavement in some lots appeared to be in good condition, the pavement in other lots was not. We observed that the pavement in road lots 1 and 7 was smooth with minimal defects. However, we found pavement deterioration in parts of 5 of the 11 road lots.[23] The amount of deterioration and completed repair work varied in those lots, which constituted about 60 percent of the total kilometers of the final project.

[23]We found noticeable pavement deterioration and repairs in lots 2, 3, 3A, 4, and 6ii.

- In lots 4 and 6ii, surface deterioration had been treated with a surface sealer to keep the surface from deteriorating further (see fig. 8). While seal coating may keep water from entering the cracks and make the road look better in the short term, it does not add pavement strength. As a result, deterioration will continue under the anticipated increased traffic loads for the project if the underlying cause of the cracking is not repaired.

Figure 8: Seal Coat Repair on Center of Road in Lot 4

Source: GAO.

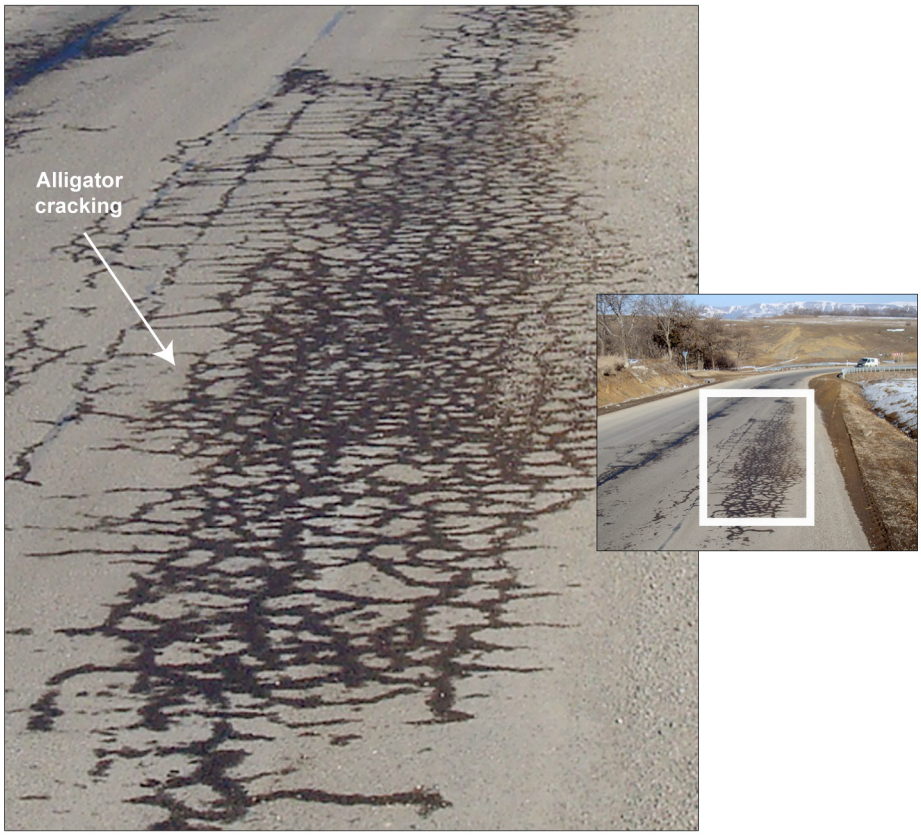
- Lots 2 and 3 had undergone patching, but in one case the patch failed and the deterioration had continued beyond the patch, as shown in figure 9.

Figure 9: Failed Patch and Continued Deterioration in Lot 3

Source: GAO.

- In other places, we found continued cracking in need of repair, as shown in figure 10. This type of cracking—known as alligator cracking—is caused by fatigue failure of the asphalt surface, which is related to weakened layers of asphalt beneath the pavement, insufficient pavement thickness, excessive loading, or some combination of these factors.

Figure 10: Additional Pavement Cracking in Lot 2



Source: GAO.

- In lot 3A, much of the pavement was failing and under repair. The contractor was in the process of milling the top layer of pavement in some areas and full-depth patching of the pavement in other areas (see fig. 11). In June 2011, MCC's independent engineer noted that the entire lot 3A section of road (15 kilometers) had been constructed poorly and had moderate to severe levels of distress in the pavement, which indicated that a poor quality of asphalt had been used. The construction supervisor stated that the contractor paved the road in lot

3A in two layers and that the second layer was paved when the weather was rainy to complete the project on time. However, the second layer did not bond to the first and thus fell apart. According to the independent engineer, some portions of the road will require full-depth reconstruction of the road. A Georgian government official stated that the lot 3A contractor had agreed to replace the base materials in some places and repave the entire lot.

Figure 11: Pavement Milling and Patching Under Way in Lot 3A

Source: GAO.

The construction supervisor's most recent (December 2011) list of pavement defects indicated pothole patching and surface dressing was needed for lots 2, 3, 3A, 5i, and 5ii. However the independent engineer's March 2012 trip report stated there were more extensive pavement defects that required correction measures such as pothole repair, surface dressing, crack repairs, or full-depth reconstruction for lots 1, 2, 3, 3A, 4, 5ii, 6ii, 6iii, and 7. The independent engineer also noted in several locations that the defects resulted from incorrectly repaired previous defects, the inadequate winter maintenance of the roads, and, in one

section of road, traffic loads heavier than the road was designed to carry. The independent engineer also stated that if the roads are not correctly repaired, they will worsen. Defects not properly repaired will likely fail under increased traffic loads or further deteriorate, creating potholes as water enters the cracks in the winter and then freezes. On the basis of the independent engineer's assessment that some of the project contractors were not meeting contract specifications, MCC sent a letter to MCA-Georgia in September 2010, noting that the work methods on lots 2, 3, 3A, and 4 were not to the standards expected and that the base material and pavement compaction required immediate improvement. The letter also stated that if the contractors did not improve the work, it would not be accepted.

Some Drainage Structures and Retaining Walls Were Defective

Structures such as drains and retaining walls are critical to a road's longevity. A working drainage system helps to keep water off the road, which is critical to safety and to keep pavement from prematurely deteriorating. However, we found defects in the drainage systems of 7 of the 11 lots. For example:

- In lots 1, 5ii, 6i, 6ii, and 7, we found some of the drainage channels collapsing or cracked, which could cause the drains to become blocked (see fig. 12).

Figure 12: Defective Drain Tops

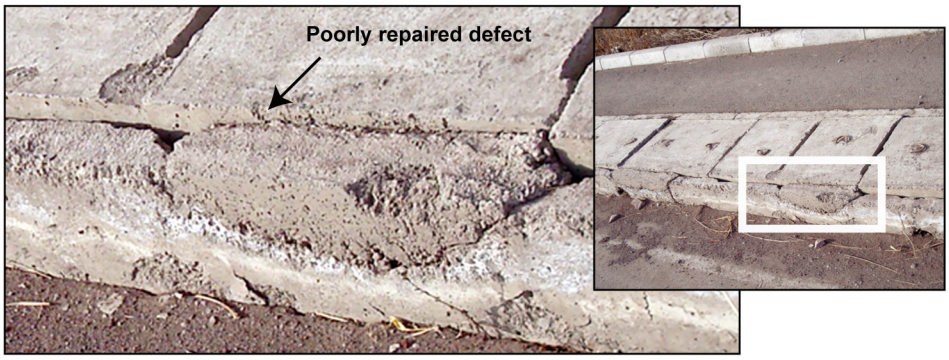
Source: GAO.

In lots 2, 6i, and 6ii, we found the concrete drainage channels with defects because of poor concrete construction (see fig. 13).

Figure 13: Drainage Channel Construction Defects in Lots 2 and 6i

Lot 2

Lot 6i



Source: GAO.

- In lots 3, 5i, and 5ii, drains were installed above the water level in some places, making it impossible for water to drain off the road (see fig. 14).

Figure 14: Drainage System Drain Holes Too High to Allow Water to Drain in Lot 3

Source: The Louis Berger Group, Inc.

According to MCC's independent engineer, the quality of the drain placement and the construction of the tops were inadequate because the concrete did not cure properly or had already started to harden before it was poured. If the drainage system does not work properly, the water will saturate and weaken the underlying ground and cause the road to deteriorate or freeze in the winter and create a safety hazard.

Furthermore, we observed a failed retaining wall that, if left unrepaired, could damage the road. Because the retaining wall had failed, serious erosion had occurred, and if the erosion continues, it will progress until it reaches the road, jeopardizing the road's future usefulness (see fig. 15).

Figure 15: Failed Retaining Wall in Lot 2

Source: GAO.

We also found additional erosion in lots 2, 6ii, and 7 (for example, see fig. 16). The independent engineer in his March 2012 report indicated a few erosion concerns for lots 2, 3, and 7 that needed to be corrected. The corrections are necessary for motorist safety and to protect the pavement, bridges, and retaining walls.

Figure 16: Erosion

Drainage area–lot 2

Road embankment–lot 7

Source: GAO.

Work and Defects Remained after Compact End Date, but MCC Has No Authority to Ensure Their Completion and Repair

Although the construction supervisor certified the contracted road work as substantially complete by the end of the compact, the previously described construction defects had not been repaired. Once the work was certified as substantially complete, responsibility for the roads moved from the contractors to MCA-Georgia, and final contract payments with MCC funds were made. However, according to the contracts, contractors continue to be responsible for the completion of any work or defects related to work quality during a 1-year defects liability period. The transfer of the road lots to MCA-Georgia included a list of about 700 defects identified by the construction supervisor to be completed or repaired after substantial completion and before the end of the defects liability period (see table 1). Additional defects can be added to the list by the construction supervisor if they appear in the 1-year liability period. MCC officials stated that it is desirable to complete as much of the work as possible before the defects liability period starts. However, it was necessary to accept the work as substantially complete before the end of the compact time frame so that final MCC funds disbursement could be

made to MCA-Georgia. As a result, the work that remained and the repair of the remaining defects were moved into the defects liability period.[24]

Table 1: Defects as of Substantial Completion by Lot

Lot	Number of defects
1	33
2	85
3	24
3A	70
4	128
5i[a]	43
5ii[a]	37
6i[a]	129
6ii	58
6iii	13
7	32
Other[b]	49
Total	**701**

Source: GAO analysis of MCC documents

[a]An additional 49 defects were listed on bridges on lots 5i, 5ii and 6i, which we could not attribute to a specific lot.

[b]Defects not attributable to a specific lot.

Additional factors present challenges to ensuring the defective work is adequately repaired:

- MCC's independent engineer reported in October 2011 that the repair work under way on lot 3A was not in accordance with standard procedures and that the road that had been patched was unsatisfactory. For example, the contractor did not apply sufficient bonding material to ensure that the layers of asphalt would adhere to each other before laying additional asphalt. In addition, the

[24]We received an update from the construction supervisor of the construction defects remaining as of March 2012, but the reporting format is not the same as used at the time of takeover, and as a result, it is not possible to evaluate how many of those defects remain or new defects have appeared.

independent engineer commented that patch cutting and laying of asphalt were not properly done.

- We observed in December 2012 that much repair work remained to be done. In addition, during the summer construction season in 2011 no construction supervision firm was in place for about 2 months of August and September 2011. According to the October 2011 report of MCC's independent engineer, this may have affected the contractors' progress in rectifying construction defects. The gap in supervision occurred because the Georgian government contracted with a new construction supervisor for the defects liability period after the compact-funded construction supervisor's contract ended. The new construction supervisor provided us with a summary of defects remaining at the end of 2011, but it was not in the same format as the original defects list. It was thus impossible to determine which defects had been corrected and which had been added.

The Georgian government held performance guarantees from the contractors to ensure the work was completed.[25] However, correction of the work could not be completed in the 1-year defects liability period, and the independent engineer reported in March 2012 that the performance guarantees for lots 1, 4, 6ii, and 6iii had expired before the lots were accepted as complete. The independent engineer also reported the performance guarantees for lots 2, 3, 3A, 5i, 5ii, 6i, and 7 were extended until August 2012, after the expected date that those lots will be accepted.[26]

Although several officials in Georgia stated that the repairs will be made, MCC has little ability to ensure the work will be done or done correctly. MCC has little oversight ability to ensure the work is completed now that the compact has ended. For example:

[25]These performance guarantees are contractual instruments with a third party that allow the Georgian government to ensure a contractor meets its contractual obligations or the Georgian government can have the third party pay to complete the contractors' commitments, up to the amount of the guarantee.

[26]The MCC independent engineer reported in March 2012 that it expected final acceptance of lots 1, 4, 6ii, and 6iii in April 2012—about 3 to 4 months after the end of their 1-year defects liability periods and final acceptance of lots 2, 3, 3A, 5i, 5ii, 6i, and 7 in July 2012—about 4 to 8 months after the end of their defects liability periods.

- MCC reported that documentation regarding the status of the projects in the defects liability period is held by the Georgian government. While the Georgian government provided MCC the project status for 3 of the 11 lots as of April 2012, the documentation provided was not in English.

- MCC's independent engineer's last trip to Georgia to review the status of the project was in March 2012, just before its contract expired. MCC will have little technical assistance in determining the extent to which all quality issues were addressed through the planned end of all of the defects liability periods in July 2012. MCC stated that it is considering other arrangements to support a site inspection in June 2012.

- All funds have been paid to the Georgian government for the project, and the conditions precedent for the compact are no longer in force, such as requiring a project management consultant and a construction supervisor to be in place. MCC officials stated that they therefore have no authority to ensure the road is repaired appropriately before the Georgian government takes final acceptance of the roads and releases the funds retained to the contractors.

MCC Took Steps to Ensure Sustainability, but the Georgian Government Shows Limited Ability to Keep the Road Operational and Well Maintained

To sustain planned benefits such as reduced travel times and reduced user costs, Georgia will need to keep the road operational and maintain the pavement in good condition.[27] Before signing the compact, MCC took several steps to ensure that Georgia would be able to sustain the planned benefits of the rehabilitated road. However, we found that regular maintenance requirements, snow removal operations, and limited funds will challenge the Georgian government's ability to sustain MCC's investment in the road.

MCC Took Steps to Ensure Sustainability

MCC took steps to ensure sustainability by including conditions precedent in the compact and by funding some equipment for road maintenance.[28]

[27]User costs include such items as vehicle maintenance, tire wear, increased fuel and oil costs, and vehicle depreciation.

[28]"Conditions precedent" are terms in an agreement that indicate that certain conditions must be met by one party before a second party to the contract is obligated to perform or do its part. In the case of an MCC compact, MCC establishes conditions precedent that must be met by the partner government or MCA before MCC disburses funds.

MCC officials stated that the Georgia compact included a condition precedent requiring the Georgian government to maintain a certain level of funding to ensure proper maintenance of the road during the compact.[29] MCC officials further stated that the condition precedent followed a similar requirement set in a World Bank loan agreement that had been entered into slightly earlier than the MCC compact, which emphasized ensuring that the government has the resources necessary to care for its national roads. MCC reported that, to sustain the economic opportunities generated by the road improvements, Georgia increased road maintenance funding from $33.6 million in 2006 to $56 million in 2010. In addition, MCC officials stated that the Roads Department of the Ministry of Regional Development and Infrastructure had been working with the World Bank to develop the institutional framework and technical capacity to provide good road maintenance. MCC officials also stated that they allowed MCA-Georgia to use funds left over at compact end to purchase some equipment (such as an excavator and a road-patching vehicle) that would help equip the Georgian road department to perform maintenance. Finally, MCC officials stated that Georgia, similar to other developing countries, will face difficult decisions in how it spends its money. They noted that the Georgian government has a preference for constructing new roads instead of maintaining old ones; however, they believed that Georgia would maintain the new road as a source of national pride and hoped that, by working with MCC and other infrastructure development partners such as the World Bank, the government had come to realize the value of maintaining its investments.[30]

[29]According to MCC, the funding requirements set out as the condition precedent were for the entire Georgian road network and not just for the MCC-funded road.

[30]In its response to a draft of this report, MCC again stated that the government of Georgia has communicated its commitment to ensuring the defects are fixed and to maintain the road over the long term. See appendix III.

Routine and Emergency Maintenance Not Done

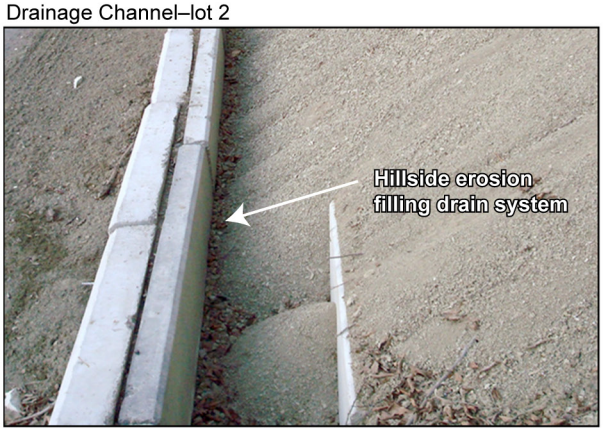
During our visit to the road, we found that many maintenance items not covered under the contractors' defects liability period were not being done. For example, we found several lots where the pavement markings were worn and needed to be repainted, guardrails and concrete barrier walls had been damaged and not repaired, drainage systems needed repair, and erosion was filling the drainage system and had not been cleaned (see fig. 17).

Figure 17: Damaged Concrete Barrier Wall, Drainage Channel Needing Maintenance, and Erosion-Filled Drainage

Concrete barrier wall–lot 2

Drainage Channel–lot 6i

Drainage Channel–lot 2



Source: GAO.

The MCC independent engineer also noted in June 2011, October 2011, and again in March 2012 that routine maintenance seemed to be lacking on some lots, including cleaning drainage channels and culverts, repairing damaged guardrails, and repairing erosion spots, and other miscellaneous damages. A Georgian official stated that there were maintenance contracts in place to make these kinds of repairs, and the MCC independent engineer stated in March 2012, that it did find Georgian road department contractors performing some routine maintenance tasks, but additional efforts were needed, and that a lack of snow removal in the 2011-2012 winter had likely resulted in increased road deterioration.

Lot 4 Is Subject to Road Closure because of Snow

The feasibility study for the road project noted that portions of lots 3, 4, 5ii, 6i, and 6ii are prone to snow drifts and part of lot 4 is sometimes closed from October to March. Snow removal is part of keeping the road operational. In its absence, the road is closed to traffic and the planned benefits of the improved road such as reduced user costs, reduced travel time to Tbilisi, and economic benefits from increased trade will not be fully realized.

In the curved areas of the road prone to icing, we saw small piles of salt and sand; however, we did not see snow removal equipment or any winter maintenance operations, even though the Georgian government officials stated they had maintenance contracts in place to provide snow removal operations. The project's feasibility study had recommended installing snow fences to minimize snow drifts on the road, but on the basis of environmental concerns, MCA-Georgia chose to plant trees (living snow fences) to stop the snow drifting across the road and reduce maintenance costs. However, many of these trees did not survive. Living snow fences take several years to provide effective snow control.

During our December 2011 field work, we found that the road was closed in lot 4 for the 2 days we were on-site because of snow drifts on one short (about a quarter of a kilometer) portion of lot 4. The project included electronic message signs on the road leaving Tbilisi to allow motorists to choose an alternate route. In addition, we found other portions of lot 4 to have only one lane open to traffic (see fig. 18). The independent engineer's March 2012 trip report stated that the Georgian road department's snow removal operations had been lacking during the 2011-2012 winter season, which had heavy and repeated snow storms. The engineers stated the road had been closed in lot 4 from December 2011 until they visited in March 2012 and they found other sections of the road with only narrow lanes open, resulting in traffic jams and minor accidents.

Figure 18: Snow on Roads in Lot 4

Snow-closed road

Snow constricts road to one lane

Source: GAO.

Available Maintenance Budget May Be Insufficient for Road Upkeep and Operation

The Georgian government may not have a sufficient maintenance budget to maintain and operate the road. A Georgian government official stated that it had about $63 million in its 2012 budget to maintain roads. This appears to be a decrease from previous years' road maintenance budgets ($81 million in 2011 and $90 million in 2010). However, this is still an increase over the $56 million MCC reported that it had budgeted in 2010 to fulfill a condition precedent in the compact. Furthermore, of the overall 2012 road maintenance budget, the government had budgeted about $720,000 for maintaining the MCC road specifically. However, this amount of funding may be insufficient because MCA-Georgia approved paying contractors almost $700,000 to provide winter snow removal for only part of the road (lots 2, 3, 3A, and 4) during the 2010-2011 winter.

Road Construction Defects Jeopardize Long-Term Sustainability

The road construction defects discussed above may increase maintenance costs, decrease the life span of the project, and result in reduced benefits from the project. Even if the road defects are adequately repaired, they could increase the cost of maintenance because of the need to seal cracks at the edges of pavement patches and reseal road surface treatments periodically to provide protection to the pavement. If not adequately repaired, the roads will need ongoing maintenance to keep them in such condition that they can provide benefits to the citizens of Georgia.

In Benin, Port Construction Is Generally Good Quality, but Full Operability of Port Components Is Uncertain

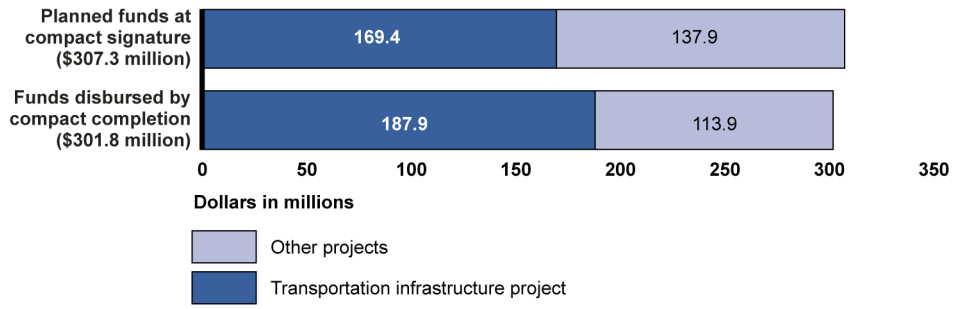
In Benin, MCC constructed several infrastructure improvements to the Port of Cotonou, including a jetty, a wharf, internal port roads, a railway, and security and electricity distribution systems. The project was intended to increase the efficient transport and volume of goods flowing through the port. At project completion, the quality of construction generally met established quality standards. However, several of the port's critical components were inoperable at the end of the compact, including the new south wharf, the port security system, and the electricity distribution system. The government of Benin's inability to supply the resources, manpower, or policies needed to operate all of the port's components calls into question whether the port project will meet expected compact results or be sustainable for the life of the infrastructure.

MCC Compact Funded Infrastructure Improvements to the Port of Cotonou in Benin

In February 2006, MCC signed a compact with Benin, providing $307 million for four projects—Access to Land, Financial Services, Justice, and Markets—to improve physical and institutional infrastructure and increase private sector activity and investment.[31] The Access to Markets activity, which accounted for just over $169 million, or 55 percent of the total compact funding, went to improve the Port of Cotonou's infrastructure, specifically to increase efficiency and the volume of goods flowing through the port. By the time the compact ended, the final cost of the infrastructure improvements increased to about $188 million, accounting for over 60 percent of the final compact amount (see fig. 19). The compact entered into force in October 2006 and ended in October 2011.

[31]For additional information on the projects included in the Benin compact, see GAO-10-797R.

Figure 19: MCC Benin Compact Funding at Signature and Completion



Source: GAO analysis of MCC data.

Note: Other projects include funds disbursed before entry into force to facilitate the implementation of the compact. At compact close, $5.5 million funds remained undisbursed.

The project components were awarded to construction contractors in a series of lots, as follows (see fig. 20):

- lot 1: jetty to slow the rate at which sand will fill the access channel;
- lot 2: south wharf, a new wharf intended to increase volume of goods;
- lot 3: east-west road, security, electricity distribution system, fire protection, and lighting; and
- lot 3A: bypass road, railway, boundary wall, truck parking lot, and lighting.

In addition, the MCC funds allowed the port to purchase oceanographic equipment, antipollution equipment, and a tugboat.

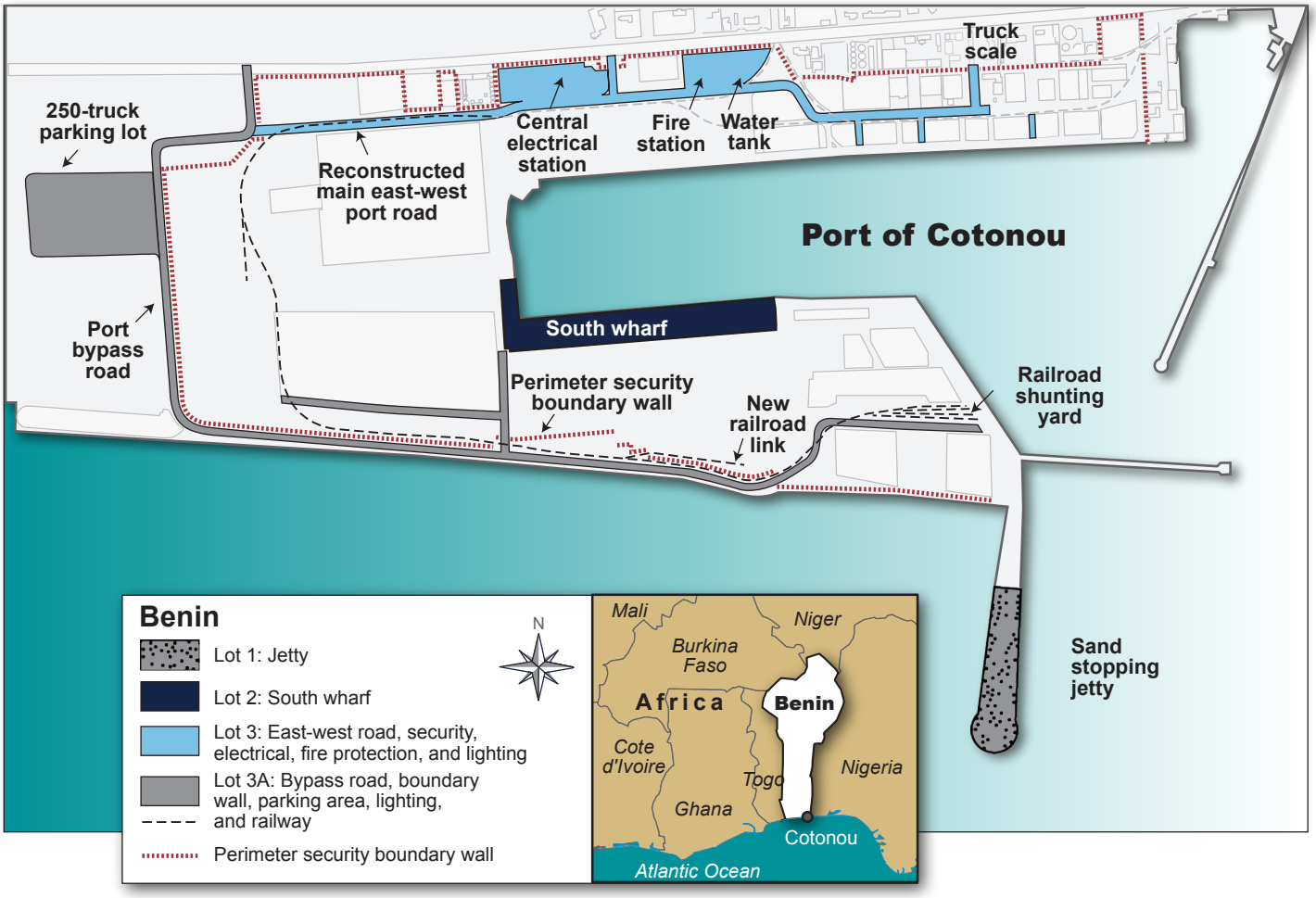
Figure 20: Compact-Funded Improvements in the Port of Cotonou

Interactive graphic

Directions:

Online: Mouse over each TEXT LABEL below for more information and photo

Print: To print photos and additional information, go to appendix II.



Source: GAO analysis of MCC data; Map Resources (map).

While the project was largely completed as planned, components for a proposed Lot 4—which included a storage facility for dry bulk goods such as grains and sand and a fish quality inspection station—were deemed not viable once MCA-Benin conducted its feasibility studies. As a result, MCA-Benin did not tender a bid for that lot. According to MCC officials, the funds originally planned for those items were shifted to the other infrastructure components. The funds also helped cover cost increases and additional work on the wharf such as increasing wall length and dredging the berth.[32]

The Quality of Construction Was Generally Good, but Many Defects Left for Repair or Minor Works to Be Completed after Compact Closure

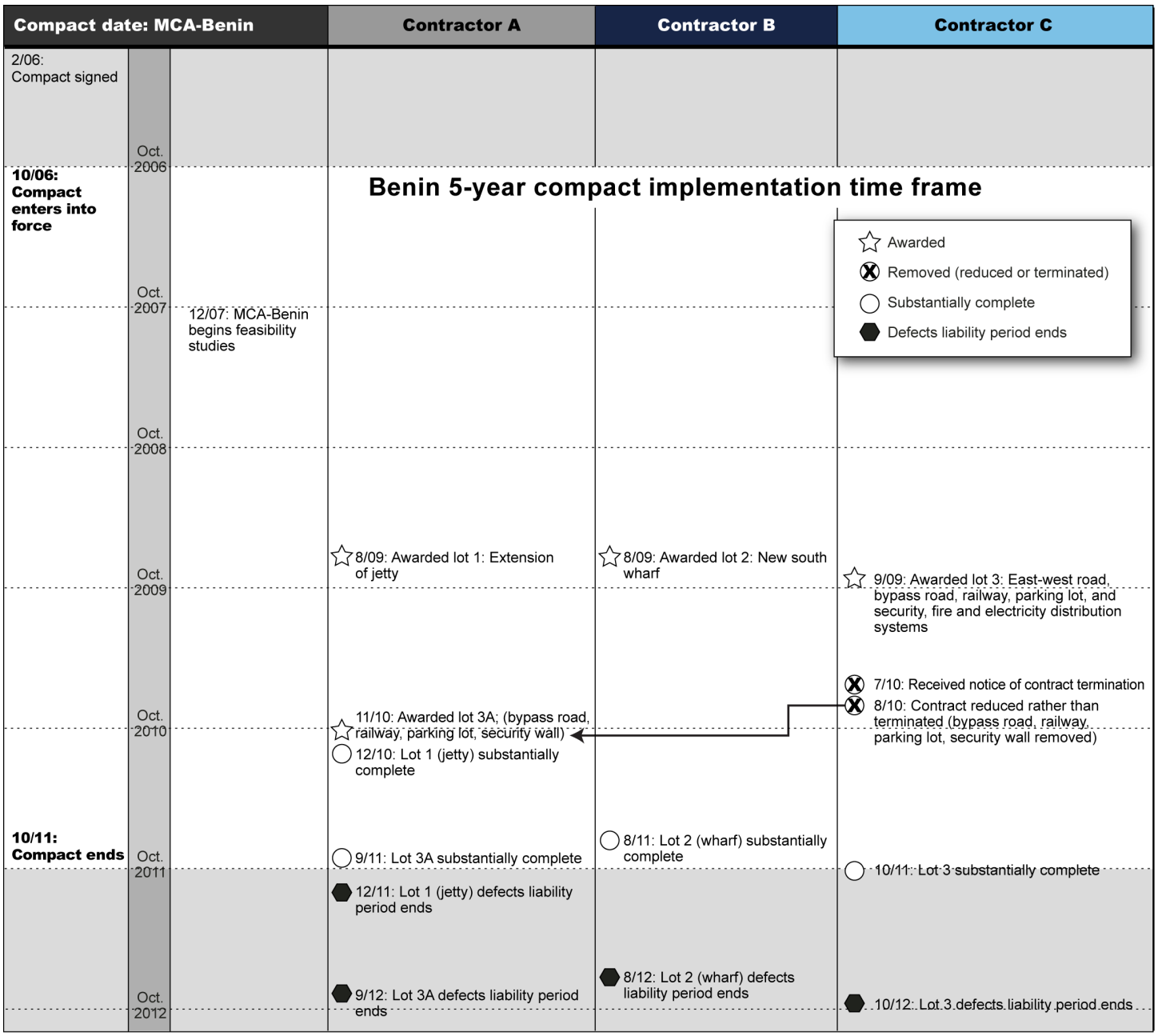
MCC's two primary challenges in completing the port project were overcoming a late start to the construction, and managing the underperformance of one contractor. Despite these challenges, most of the infrastructure components had no or only minor quality issues. However, one lot had over 500 uncompleted tasks or defects when the compact closed.

Implementation Challenged by Delayed Start and One Underperforming Contractor

MCA-Benin did not sign contracts with its construction contractors until almost 3 years after the compact entered into force. During those years, MCA-Benin studied what components of the port project would be feasible. As a result, construction contractors had just 2 years to complete their work (see fig. 21).

[32]Additional dredging is required to accommodate larger ships as set out in the conditions of the concession agreement negotiated by the Port Authority for a private firm to operate the new south wharf.

Figure 21: Benin Construction Timeline



Source: GAO analysis of MCC and MCA-Benin documents and interviews.

In addition, MCA-Benin had to manage the poor performance of the contractor for lot 3 to get the project finished within the compact's time frame. According to MCC, the lot 3 contractor experienced internal management problems, missed important contract deadlines, did not perform contracted work, and provided inconsistent information to MCA-Benin and MCC. In August 2010, MCA-Benin terminated components of the contract, including the bypass road, railway, parking lot, and boundary wall. MCA-Benin awarded the terminated components as lot 3A to the contractor for the jetty that had been successful in meeting the time frames for the jetty component. After several extensions of time, the lot 3 contractor's remaining work was certified as substantially complete, months after the originally anticipated contract completion date and 1 day after the end of the compact. However, several components were left to be finished or corrected during the defects liability period.

Some Project Components Were Well Constructed, but One Lot Had Over 500 Problems

We found some of the project components to be completed and functioning for their intended use with only minor repairs needed during the defects liability period. For example, the lot 1 jetty was installed and reducing the amount of sand coming into the port from the ocean, thereby reducing periodic dredging maintenance costs (see fig. 22). We did observe that some areas of the jetty's concrete surface had small areas of cracking, which will require future maintenance.

Figure 22: Jetty Is Complete and Serving Its Intended Purpose

Source: GAO.

The construction supervisor reported that some project components needed to be repaired or completed upon substantial completion of the contracts. However, because the construction supervisor deemed these issues minor, he was able to certify each contract as substantially complete and allow each contractor to make repairs or finish the work during the 1-year defects liability period following the substantial completion of the contract. MCC officials stated that the use of the defects liability period to complete work was not an ideal situation, but it was appropriate for situations in which the contractor needed to rely on an outside entity to complete the work (such as for the electricity distribution system) and in cases where the construction supervisor deemed the work to be minor.[33]

We observed some of these items during our field work and also concluded that they were generally minor in nature; however, lot 3 had

[33] In technical comments on a draft of this report, MCC noted that MCA-Benin's works contracts were based on the FIDIC yellow book, pursuant to which a third-party engineer, hired by MCA-Benin, was contractually responsible for determining when the works had achieved substantial completion. MCC also noted that all but 5 have been remediated.

over 500 items to be completed or corrected in the defects liability period (see table 2). As of April 2012, the project management consultant provided documentation that only 20 items remained to be completed and 5 items were listed as outstanding defects in lot 3. The consultant reported no uncompleted work or outstanding defects reported to be remaining from the takeover date on lots 1, 2, or 3A.

Table 2: Uncompleted Works and Outstanding Defects as of Substantial Completion, by Lot

Lot	Uncompleted work	Outstanding defects	Total
1	0	0	**0**
2	13	30	**43**
3	219	290	**509**
3A	4	120	**124**
Total	**236**	**440**	**676**

Source: GAO analysis of MCA-Benin construction supervisor documents.

Note: The lots' dates of substantial completion range from December 2010 to October 2011.

For lot 3, the construction supervisor reported that minor items needed to be completed or corrected included connecting the fire pump to the power supply, completing some paved areas, and installing a truck weigh station. In lot 3A, we also observed uncompleted work—such as lighting poles had not been completed in the 250-truck parking lot—and some minor defects needing repair—such as missing manhole covers in the road and a leaking pipe connecting the water tank to the fire control system (see fig. 23).

Figure 23: Lighting Pole under Construction

Source: GAO.

MCC Took Steps to Ensure Sustainability, but Port Authority Has Not Been Able to Operate Key Project Components

Although MCC took steps to ensure the port project's sustainability, many of the project's key components—the south wharf, the security system, the electricity distribution system, and the fire station—were either not operational or only partially operational at the end of the compact. The south wharf had additional work remaining to be completed by the Port Authority and the concessionaire hired to operate the wharf for it to be functional, and the Port Authority had not ensured that all other necessary infrastructure and staffing were in place for the security system, the electricity distribution system, and the fire station.

MCC Took Steps to Ensure Sustainability

MCC took several steps to ensure that the government of Benin could sustain the operations and maintenance of the project components. These steps included conducting a feasibility study, incorporating conditions precedent into the compact, hiring a port advisor, requiring a compact closure plan, and identifying steps the government of Benin should take to support sustainability in the compact letter of completion.

Feasibility study: In accordance with its policies, MCC funded a study to determine the technical and financial feasibility of the port activities proposed by the government of Benin. Through this process, MCC identified activities that would provide an economic benefit to Benin and ensure the likelihood for future sustainability.

Conditions precedent: Two conditions precedent were included in the compact to help ensure the sustainability of the port.

- First, the compact required the Port Authority to enter into a contract with a private firm to operate the new south wharf to ensure its open and transparent operation, eliminate corruption, and improve operations.

- Second, MCC required the Port of Cotonou to meet the International Ship and Port Facility Security code.[34] Meeting the code means that that ships stopping later at U.S. ports would not be required to undergo increased security scrutiny, thus decreasing costs to shipping companies.

Port advisor: MCC funded the hiring of a port advisor to review port operations and make recommendations to improve the operations of the port and ensure an adequate cash flow through increased shipping fees to operate the port.

Compact closure plan: MCC requires all MCAs to create a Program Closure Plan, outlining the steps it will take when the compact ends to finalize any compact commitments in an orderly fashion. The Program Closure Plan for Benin includes some steps aimed at helping sustain the compact's investment, including for the Port of Cotonou. Most notably, the compact closure plan describes the government of Benin's intention to establish an agency, in part, to complete and implement a "MCA-Benin experience sustainability program."

Compact completion letter: MCC also sent a letter to the government of Benin in January 2012 to formally mark the conclusion of the compact and to provide final recommendations to ensure the sustainability of compact investments, among other things. In addition, MCC noted that efforts made by Benin to maximize the results and ensure the sustainability of this compact would be considered in decisions related to a potential second compact. The letter specifically identified the following as actions the government of Benin needs to complete:

[34]The International Ship and Port Facility Security (ISPS) code is a comprehensive set of measures to enhance the security of ships and port facilities. The purpose of the ISPS code is to provide a standardized, consistent framework for evaluating risk, enabling governments to offset changes in threat with changes in vulnerability for ships and port facilities through determination of appropriate security levels and corresponding security measures. The ISPS code is implemented through chapter XI-2 special measures to enhance maritime security in the International Convention for the Safety of Life at Sea (SOLAS), 1974.

- ensure the competitiveness of the Port of Cotonou and increase its throughput (including ensuring the fluidity of traffic through the port, implementing a suitable operations scheme for the truck parking facility, and controlling total fees charged to importers);
- complete customs department reforms;
- enforce port security systems (including control of truck and pedestrian access traffic); and
- execute the port channel access improvements required to meet the terms of the south wharf concession agreement and to achieve the intended increase in port capacity.

The Port Authority Has Been Unable to Operate Key Components of the Port, Calling into Question the Port's Long-Term Sustainability

Despite the steps MCC took to help ensure sustainability, several key port components were not operational at the end of the compact because the Port Authority had not taken the necessary steps to operate all project components (see table 3). The Port Authority's inability to operate all components of the port at compact completion calls into question its ability to maintain port operations and to achieve MCC's anticipated economic return.

Table 3: Status of Key Components of Port of Cotonou

Lot	Component	Status as of December 2011[a]	GAO findings	Status as of April 2012[b]	April 2012 updates
1	Jetty	●	Jetty is slowing the entry of sand into the port.	●	
2	South wharf	○	Concessionaire needs to install paving, cranes, and other infrastructure. Planned operational date: January 2013.	○	Port Authority has requested the International Finance Corporation to assist in finding a way to fund its commitment to dredge the port entry as required in the concession agreement.
3	East-west road	◐	Congestion worse than before; 28 hours average truck-in-port-time versus 24 before compact.	◐	Congestion still a problem.

Lot	Component	Status as of December 2011[a]	GAO findings	Status as of April 2012[b]	April 2012 updates
	Security system	○	Lacks staff. Planned operational date: unknown.	◐	Facilities turned over to the Port Authority in February 2012, about 10 staff in the control centers, in the process of hiring additional staff to operate the system, and identification badge system not in use.
	Electricity distribution system	◐	Needs new increased power feed from local utility. Planned full operational date: unknown.	◐	Waiting on increased power feed from local utility, but not expected before January 2013.
	Fire protection (station, trucks, and water tank)	○	Lacks staff, and traffic congestion prevents circulation of fire trucks. Planned full operational date: unknown.	◐	Port Authority is using fire trucks, developing operation plan, increasing staff, recruiting staff, training staff, and waiting for correction of construction defects to be fully operational.
	Weigh station	○	Under construction.	○	Construction complete, calibration of scales and training under way; plan is to be operational in June 2012.
	Lighting	●	In operation.	●	
3A	Bypass road	◐	Parked trucks prevent one lane from being used.	◐	Trucks still using one lane of road for parking.
	Railway	●	In operation.	●	
	Boundary wall	◐	At least one breach in wall identified, gates need to be installed by concessionaire at south wharf site.	◐	Gates not yet constructed by concessionaire.
	Truck parking lot	○	Lot not in use and no concessionaire hired to operate the lot. Planned operational date: unknown.	◐	Port Authority plans to sign a concession agreement in July 2012, and Port Authority occasionally uses the lot.
	Lighting for parking lot	○	Lights not yet installed.	●	Lighting completed.

●: In operation
◐: In operation but not fully utilized
○: Not in operation

Source: GAO analysis of data from MCC, the Autonomous Port of Cotonou, Bolloré Africa Logistics, Maersk Line, and Royal Haskoning.

[a]GAO conducted a site inspection in December 2011.

[b]Update based on April 2012 correspondence with the construction supervisor, Port Authority, and port shipping companies.

South Wharf Is Not in Use

Although MCC funded a new south wharf to increase tonnage moving through the port, and ensured that the Port Authority contracted a concessionaire to operate the south wharf, to increase private investment and generate income for the Port Authority, it is not in operation because the Port Authority has not completed additional dredging and the concessionaire has not finished the landside works, such as paving the wharf area or installing cranes (see fig. 24).[35]

Figure 24: Constructed South Wharf without Landside Infrastructure

Source: GAO.

In exchange for the right to manage and operate the south wharf, the concessionaire paid the Port Authority a concession fee. The Port Authority intended to use that fee to deepen the access channel—its contractual obligation under the agreement—so that larger cargo ships

[35]In technical comments provided by MCC on a draft of this report, MCC stated that there was never an expectation that all landside works required to operate the new south wharf at full capacity would be completed by the end of the compact term (October 2011). However, the economic analysis prepared for MCC's investment decision in 2005 shows that the expansion of shipping capacity due to the South Wharf investment would be fully available in 2010.

could use the concessionaire's facility. The concessionaire also agreed to construct or install the necessary landside equipment and infrastructure. However, because of an error in assessing the amount of work to be done and an underestimation of the cost, the concession fee was insufficient to fund the required dredging. A Port Authority official stated in April 2012 the Port Authority is currently evaluating bids for the work. The concession agreement also stipulated that the concession should be operational 18 months after the concession start date. However, according to a concessionaire official, the concession company had not yet agreed upon a start date with the Port Authority as of April 2012.[36] However, the concessionaire was proceeding with constructing its portion of the landside works. MCC officials stated that the concessionaire's construction will be completed in December 2012, and a concessionaire official told us the wharf would be operational in January 2013; however, if the Port Authority does not honor its part of the concession agreement and finish the dredging, a concessionaire official stated it may reduce the amount of landside works it is going to finish, such as not install as many cranes or not pave the entire wharf area, because it could operate the south wharf only for smaller ships. Smaller ships and reduced wharf area would likely reduce the amount of cargo tonnage through the port and the fees the port would receive from the concession. As of April 2012, the Port Authority had requested the International Finance Corporation's assistance investigating how it could fund the required dredging and meet its commitment of the concession agreement, but it had not yet awarded any contracts to perform the work.[37]

Security System Is Not Being Fully Utilized

The Port of Cotonou may be unable to provide effective security for the port or retain its International Ship and Port Facility Security certification because the MCC-funded port security system was not in operation as of

[36]In its initial economic rate of return analysis, MCC had anticipated that, by 2010, the south wharf would have increased the capacity of the port by almost 30 percent.

[37]The International Finance Corporation is a member of the World Bank Group.

our December 2011 visit.[38] The Port Authority had not hired sufficient staff, enforced its security policies, or maintained its security perimeter.

- The security system requires 150 to 257 individuals to staff the operations on a 24-hour basis.[39] As of April 2012, there were about 90 security personnel on staff and, according to a port authority official, the port authority was recruiting an additional 25 people. The construction supervisor stated that as of April 2012 the Port Authority had about 10 individuals staffing only the operation of two control and surveillance centers, which, according to MCC officials, were being operated only during the day. Without adequate trained staff, the security system cannot function to its full capacity.

- The Port Authority was not fully enforcing established security policies, as of December 2011. For example, the port was not fully controlling access to the port. Even though a Port Authority official stated that everyone entering the port is required to wear some form of identification (a badge, arm bracelet, or uniform), in our December 2011 site visit we observed several visitors with improper or no identification at all. According to a Port Authority official, the MCC-funded access system was still not in full operation as of April 2012.

- In December 2011, we also observed a railway access gate had not been installed on the south wharf site, creating a breach in the boundary wall allowing people to bypass the security system and gain entry into the port. The gate was not a part of the MCC-funded work, and while the Port Authority is working with the wharf concessionaire to install a gate at the location, the temporary measure implemented by the Port Authority leaves the port vulnerable (see fig. 25).

[38]The new security system was turned over to the Port Authority in February 2012 and includes a control and surveillance center, a secondary control and surveillance center, a visitors' reception center to issue badges, six access control stations, perimeter fencing with port intrusion detection, security cameras, alarms, radio communications, and computer equipment to operate it.

[39]The port authority estimated 150 security personnel are required to operate the new security system, while the contractor installing the system calculated about 192 security personnel are required to operate the system 24 hours a day, 7 days a week, and the project management consultant for the project calculated 257 security personnel were required to adequately secure the port 24 hours per day.

Figure 25: Breach in Boundary Wall

Source: GAO.

Electricity Distribution System Lacks Sufficient Power to Operate at Capacity

MCC funded an electricity distribution system for the port that does not function to capacity because the Port Authority had not ensured that the amount of power transmitted to the port from the power company would be adequate. The MCC-funded distribution system was designed to distribute 15 megavolt-amps of electricity and planned to initially provide 10 megavolt-amps; however, the current conduit to the port provides only 2 megavolt-amps. Until the 10 megavolt-amps of power is provided, the contractor cannot make final connections or test the system. As of April 2012, a project management official reported that the increased power service had not yet been provided to the system and the officials did not expect it to be provided before the October 2012 end of the defects liability period. That same month MCC officials told us that they did not expect the power service to be upgraded before January 2013.

Fire Station Lacked Sufficient Staff to Operate MCC-Funded Fire Engines

The MCC-funded fire station was not in use as of December 2011 because the Port Authority had not hired sufficient staff. The Port Authority received three new fire engines as part of the MCC project, but had not increased the staffing level, which MCA-Benin's feasibility study stated was necessary to operate the fire engines on a 24-hour basis. In addition, truck congestion on the roads within the port prevents the fire engines from circulating when needed.

As of April 2012, port authority officials stated that the fire protection system was still not in service because of construction defects in the water tank valve and testing had not been completed. However, the port officials stated that they had recruited and trained additional firemen, and were recruiting other personnel to operate and maintain the system, such as inspectors, a diesel mechanic, and plumbers. At the time of the feasibility study, the Port Authority had 14 fire prevention staff. In April 2012, a Port Authority official stated that the authority plans for a total staff of 25.

Port Roads Are Severely Congested

Although the east-west port road and the bypass road were completed with only minor quality issues such as missing manhole covers, significant truck congestion jeopardizes their utility. The compact goal was to reduce the average number of hours trucks stayed at the port from 24 hours to 7 hours. However, the average after the compact ended is 28 hours. According to officials from two shipping companies, one of their primary concerns was that truck congestion at the port would likely limit their ability to increase the volume of merchandise passing through the port (see fig. 26).

Figure 26: Congestion on the East-West Port Road

Source: GAO.

The Port Authority has taken some steps to alleviate the truck congestion. For example, the Benin government engaged a private firm to install tracking and communication devices in trucks beginning in December 2011 that would allow trucks to enter the port when their shipper is ready to load or unload them. However, an official from the firm stated that, as of April 2012, the Benin government had not allowed the firm to initiate the system even though it has been ready to operate since late November 2011. The government of Benin also has plans to move some operations to off-site "dry ports" where containers will go through customs and be loaded and emptied. However, shipping company officials questioned whether the existing railway will be able to transfer the cargo to the dry ports. According to March 2012 statements by shipping company officials, the Port Authority attempted to implement the use of the railway and a privately operated dry port for containers going to hinterland countries at a site about 55 kilometers away from the port.[40] However, according to one of the shipping company officials, the railway could transport only 90 of the 200 containers needed to be transported daily to the dry port. One shipping company official stated the company

[40]Hinterland countries are those inland countries that lie behind a port. For Benin, the hinterland countries include Niger, Burkina Faso, Chad, and Mali. Togo and Nigeria are also common destinations for goods transiting through the Port of Cotonou.

had over 1,700 containers backlogged in the port in early March 2012, taking an average of more than 25 days to get a container from the port to the dry port. Shipping officials reported that as of late March 2012, port officials have allowed the containers to be either loaded and emptied in the port or transported by truck to another dry port, but congestion was still a problem.

Parking Lot In Operation but Not Being Fully Utilized

MCC funded the construction of a 250-truck parking lot that was handed over to the Port Authority in September 2011; however, as of April 2012, Port Authority officials stated the parking lot was not in full use because they had not engaged a company to manage the concession. MCC officials stated that trucks are occasionally moved to the lot to alleviate congestion. Port Authority officials stated that they plan to sign a concession agreement In July 2012 to manage the lot.

Conclusions

Some of the challenges MCC faced in Georgia and Benin were not unique. As with other early compacts, insufficient planning, escalation of construction costs, and insufficient MCC review led to project delays, scope changes, and cost increases. In the case of Georgia, MCC specifically had problems ensuring the quality of its transportation infrastructure project even though it had a quality assurance framework because it did not adequately address problems in contract supervision identified by the independent engineer. As a result, the road had significant pavement defects and numerous quality issues at compact completion. Furthermore, MCC has no leverage over the government or contractors once compacts end, even though contractors may be expected to continue work in the 1-year defects liability period following the contract. In Georgia, the construction contractors were required to remediate quality issues after the end of the contract, but MCC cannot at this point ensure that the repair work is properly done.

Even though MCC took steps to provide for the sustainability of its investments in both Georgia and Benin, the projects in both countries have maintenance and operability challenges that jeopardize the benefits they were projected to achieve. In Georgia, the ability of the government to maintain the road is in question. Without sustained maintenance—such as repairing drainage systems and removing snow—the road will need additional repairs and have limited usefulness in the winter. In Benin, key project components, including security and electricity distribution systems and the south wharf, were not operational at the end of the compact. The

operation of these and other interconnected systems depends on the partner government, which to date has been unable to fund and implement the work required to begin port operations. As a result, MCC may have invested considerable U.S. resources in equipment and structures that will not be used to maximum benefit and thus not provide the expected economic benefits. MCC should take this opportunity to review the problems that emerged from Georgia, Benin, and other completed compacts and to establish or strengthen mechanisms by which it can better invest U.S. resources in future compacts.

Recommendations for Executive Action

To maximize the quality and sustainability of future projects, we recommend that the MCC Chief Executive Officer take the following actions:

To ensure that its quality assurance framework is fully implemented and to ensure that transportation infrastructure projects are built to the established quality standards, MCC should

- review how MCC uses information and professional recommendations provided by its independent engineers to address identified deficiencies and to ensure projects are constructed to the quality standards set out in contracts, and
- develop a mechanism to maintain influence through contracts' defects liability periods when they extend beyond the compact end date.

To ensure sustainability of compact projects, MCC should evaluate the effectiveness of the tools it uses (such as its feasibility studies and conditions precedent) to ensure that partner countries have adequate infrastructure, staff, and policies necessary to operate and maintain MCC-funded infrastructure following the compact.

Agency Comments and Our Evaluation

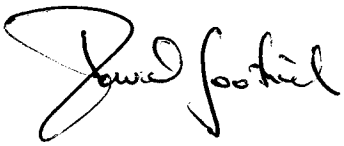
In written comments on a draft of this report, MCC stated that it agrees with our three recommendations; however, it did not commit to undertaking any specific actions to address them. With respect to the first recommendation to review its use of information and recommendations from its independent engineers, MCC stated that it does guide its oversight of compact projects using the analysis provided by its independent engineers, but that the quality of advice can vary and independent engineers are not always privy to all factors affecting compact programs. However, MCC did not state that it would review its

practices regarding how it uses information from these independent engineers. With respect to our second recommendation regarding the need for a mechanism to maintain influence on contracts whose defects liability periods extend beyond compact end dates, MCC noted that it sustains a dialogue with its partner countries after compact closure to emphasize the importance of continued oversight. However, as MCC officials have noted, because its authorizing legislation limits the term of compacts to 5 years, MCC's ability to assist partner countries directly once a compact closes is restricted. MCC did not state that it would seek any additional authority to maintain influence after the end of a compact. With respect to our third recommendation, to evaluate the tools it uses to ensure projects' sustainability, MCC listed ways that it works to ensure sustainability throughout the development, implementation, and closure of compact programs. MCC also noted that it revised its Compact Development Guidelines in January 2012 and included steps to strengthen the agency's assessment of sustainability during compact development. However, MCC did not commit to evaluate the effectiveness of the tools it has used or plans to use to ensure its projects' sustainability.

We have reprinted MCC's comments in appendix III. We have also incorporated technical comments from MCC in our report where appropriate.

We are sending copies of this report to interested congressional committees and the Millennium Challenge Corporation. In addition, this report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions about this report, please contact David Gootnick at (202) 512-3149 or gootnickd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff members who made major contributions to this report are listed in appendix IV.



David Gootnick
Director
International Affairs and Trade

Appendix I: Objectives, Scope, and Methodology

The fiscal year 2008 Consolidated Appropriations Act, Public Law 110-161, mandated that GAO review the results of Millennium Challenge Corporation's (MCC) compacts. For the purpose of this engagement, we examined the quality and sustainability of MCC's two transportation infrastructure projects in Georgia (the Samtskhe-Javakheti Road Rehabilitation Activity) and Benin (the Port of Cotonou Access to Markets Project). Transportation infrastructure is defined as public works that provide the conveyance of passengers or goods from one place to another.

GAO selected MCC's compacts in Georgia and Benin as the focus of this engagement through a subjective process. Our selection universe was those compacts ending in 2010 and 2011 that had a transportation infrastructure project. In a previous engagement we had reviewed the MCC-funded transportation infrastructure projects in Cape Verde and Honduras.[1] Georgia and Benin, in combination with these previously reviewed projects, provided some geographic variety as well as the ability to compare two port projects and two large road projects.

We based our assessment of the projects' quality on the quality assurance requirements established by MCC, the partner countries' Millennium Challenge Accounts (MCA), and their contractors. MCC requires the MCAs to (1) have an individual project director or to engage the services of a project management firm to help manage the administrative aspects of compact programs, (2) contract with implementing partners (such as construction firms) using MCC's procurement guidelines, and (3) engage a construction supervisor to oversee the day-to-day construction and ensure compliance with contract requirements.

For this report, the definition of sustainability is based on the definition from the Organisation for Economic Cooperation and Development's Development Assistance Committee, which defines "sustainability" as "the continuation of benefits from a development intervention after major development assistance has been completed." The Organisation for Economic Cooperation and Development's Development Assistance Committee is an international forum of many of the largest funders of aid

[1]GAO, *Millennium Challenge Corporation: Compacts in Cape Verde and Honduras Achieved Reduced Targets,* GAO-11-728 (Washington, D.C.: July 25, 2011).

with a mandate to promote development cooperation and other policies so as to contribute to sustainable development. We operationalized this definition by specifying that sustainability is the ability of MCC's partner country governments to operate and maintain the new infrastructure in such a condition as is required to produce the projected benefits for the period of time those benefits are calculated.

To assess the quality and longer-term sustainability for compacts in Georgia and Benin, we analyzed MCC, MCA, and other documents; interviewed MCC officials and stakeholders; and observed project results in both countries.

- We reviewed the compact agreement for Georgia and Benin. We also reviewed documents prepared by MCA officials, independent construction supervisors, project management consultants, MCC independent engineers, and government officials, including monthly reports, special studies, testing reports, and daily inspections. We also reviewed final reports submitted to MCA by contractors on compact activities.

- We interviewed MCC and MCA officials in both countries regarding the results of each compact activity, including the quality and sustainability of the projects. We visited infrastructure projects in both countries, including visits to the port in Benin, and to the Samtskhe-Javakheti road in Georgia. We met with project construction contractors, independent construction supervisors, and MCA project management consultants. In addition, we interviewed officials from the governments of Georgia and Benin about compact implementation, results, and sustainability, including Benin's Ministry of Maritime Economy and Port Authority, and Georgia's Ministry of Infrastructure.

- We traveled to Benin and the Republic of Georgia in December 2011 and conducted site inspections to verify the extent to which the MCC-funded transportation infrastructure projects had been completed and to observe whether there were any visible deficiencies in construction. All photographs in this report attributed to GAO were taken during this time period.

These interviews, document reviews, and site visits were used to determine if the MCAs had implemented MCC's quality assurance framework, if there was supporting documentation to verify that quality testing had been undertaken, if any quality deficiencies were encountered during construction, if any quality deficiencies remain, and whether the

infrastructure projects would be sustainable. We were not able to view actual work in progress or visit testing facilities for most infrastructure contracts because the work had already been completed.

To determine the amount of funding used for transportation infrastructure projects, we reviewed MCC financial data. We included compact implementation funding—funds disbursed before entry into force to facilitate the implementation of the compact—with other projects not related to transportation infrastructure.

MCC enters into a legal relationship with partner country governments, which vest responsibility for day-to-day management of compact project implementation in the MCA, including monitoring and evaluation activities such as setting and revising targets, but such MCA actions require MCC's direct oversight and approval. Therefore, throughout this report, we attribute all decisions related to project rescoping and compact targets to MCC.

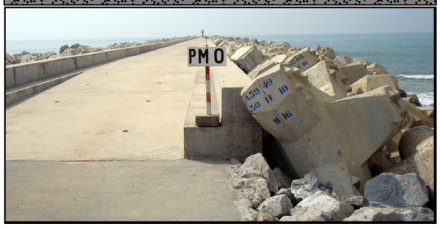
Finally, some of the reports and documents referenced above were written in French or Georgian. We translated these documents internally to enable our analysis.

We conducted this performance audit from November 2011 to June 2012 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 the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Additional Photographs Related to Figure 20: Compact-Funded Improvements in the Port of Cotonou

The following photographs illustrate various components of the MCC-funded Port of Cotonou project in Benin. For a map of the port, which indicates where these components are located, see figure 20.

Lot 1: Top of extended jetty



Lot 3: Central power supply station equipment

Lot 3A: Railroad shunting yard

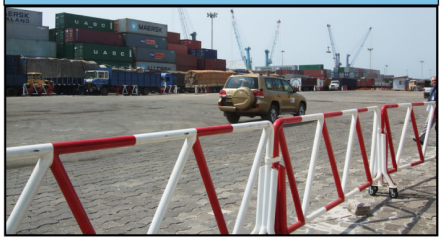
Lot 2: Waterside view of the south wharf

Lot 3: New truck scale

Lot 3A: New narrow-guage train tracks

Lot 3: New fire station and new fire trucks

Lot 3: East-west road



Lot 3A: 250-truck parking lot

Lot 3: Water storage tank for fire system

Lots 3 and 3A: Perimeter security boundary wall

Lot 3A: Port bypass road

Source: GAO.

Appendix III: Comments from the Millennium Challenge Corporation

June 13, 2012

David Gootnick
Director, International Affairs and Trade
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Gootnick:

Subject: MCC: Georgia and Benin Transportation Infrastructure Projects Audit

Thank you for the opportunity to review and comment on the U.S. Government Accountability Office's draft report, "Georgia and Benin Transportation Infrastructure Projects Varied in Quality and May Not Be Sustainable." I was pleased to see the report acknowledge many of the important achievements of MCC's transportation projects in Georgia and Benin.

For example, GAO finds that MCC's rehabilitation of the 217 km Samtskhe-Javakheti road, which links Georgia's capital with Turkey and Armenia, has reduced travel time by 60 percent, from 8 1/4 to 2 ¾ hours. In Benin, GAO found that MCC's construction of a new jetty, wharf, roads, and railway for the Port of Cotonou met established quality standards. The MCC-funded improvements also played an important role in attracting a private port operator that is investing $130 million to develop additional container loading and offloading capacity, which once complete in 2013 will make Benin more competitive as a hub for maritime trade in West Africa.

MCC agrees with GAO's first recommendation to review the use of information and recommendations made by its independent engineers. MCC guides its project oversight with the analysis of its independent engineers, and may share this analysis with its partner country accountable entities (MCAs) who then factor it, along with advice from their own consultants and contractors, into management decisions.

In Georgia, the MCA increased the contract of the construction supervisor for the Samtskhe-Javakheti road from $2.7 million to $7.4 million, in accordance with the recommendation of MCC's independent engineer. Both MCA-Georgia and MCC found this level of funding acceptable, even though construction supervision did not reach the full level recommended by the independent engineer. While MCC values the advice of its independent engineers, their perspective does not necessarily take into account the full range of issues that come into play in the management of compact programs, and the quality of their advice can vary.

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The GAO report also recommends that MCC develop a mechanism to maintain influence on contracts whose defects liability periods extend beyond compact end dates. MCC agrees with this recommendation, and seeks to maintain influence after compact closure to the extent legally permitted under statute. The Millennium Challenge Act of 2003, as amended, which created MCC and governs implementation of MCC compacts, limits the term of any compact to no more than five years. Accordingly, upon the expiration of a compact, MCC's ability to assist partner countries directly during the defects liability period is restricted.

Nevertheless, the agency sustains a dialogue with country partners after compact closure, including to emphasize the importance of proper oversight during the defects liability period and to relay any continuing concerns regarding the sustainability of MCC-funded activities. For countries under consideration for a subsequent compact, continued eligibility for compact assistance is based in part on the successful completion of the prior compact program, including prudent management of the defects liability period.

It is important to note that during the time the GAO report was compiled, Georgia's road construction contracts were in the defects liability period and that the defects are in the process of being corrected. The Government of Georgia has communicated to MCC their commitment to ensuring the defects are fixed and to maintaining the road over the long-term.

Finally, GAO recommends that MCC evaluate the effectiveness of tools such as feasibility studies and conditions precedent to ensure that partner countries can sustainably operate and maintain MCC-funded infrastructure. MCC agrees with the recommendation, and works to ensure sustainability throughout the development, implementation, and closure of compact programs.

In January 2012, MCC released revised Compact Development Guidelines that strengthen the agency's assessment of sustainability during compact development, which factors prominently into project selection decisions. For example, prior to disbursement of compact funding, MCC required the Government of Georgia to increase road maintenance funding and the Government of Benin to make significant administrative changes at the Port of Cotonou (e.g., improved auditing and internal management standards) as a demonstration of political commitment to sustainability.

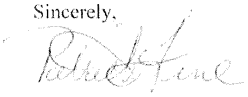
During compact implementation, MCC works to build the capacity of the organizations responsible for operating and maintaining compact-funded assets. In Benin, MCC funded consultants to assist the Port of Cotonou's management to improve its operational and financial management. In Georgia, compact funds were allocated for the purchase of road maintenance equipment to assist with road upkeep, and to complement longstanding World Bank efforts to build the operations and maintenance capacity of Georgian roads authorities.

In preparation for compact completion, MCC works with MCAs to develop compact closure plans, including for the operations and maintenance of compact-funded assets. Once a compact ends, MCC monitors the implementation of compact closure plans and conveys through official correspondence its concerns and expectations with respect to the operations, maintenance, and sustainability of compact-funded assets.

2

I want to thank you and your staff for the professional manner in which this audit was conducted and for the opportunity to provide additional information and feedback on the GAO draft report. MCC looks forward to continued engagement with GAO to improve its compact assistance programs.

Sincerely,



Patrick C. Fine
Vice President
Department of Compact Operations

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Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

David Gootnick, (202) 512-3149, or gootnickd@gao.gov

Staff Acknowledgments

In addition to the contact named above, Emil Friberg Jr. (Assistant Director), Michael Armes (Assistant Director), Leslie Locke, and Miriam Carroll Fenton made key contributions to this report. Additional technical assistance was provided by John Bauckman, Lynn Cothern, George Depaoli, David Dornisch, Aryn Ehlow, Etana Finkler, Heather Hampton, Ernie Jackson, and Jena Sinkfield.

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