

Chapter 18

Maintaining Facilities in a Sustainable Way

1.0 MAIN POINTS

Saskatchewan Opportunities Corporation (SOCO) operates technology parks that provide companies with access to sophisticated facilities that are unavailable in the general real estate market (e.g., laboratories, greenhouses). We audited whether SOCO had effective processes during 2011 to maintain its facilities in a sustainable way at Innovation Place, Saskatoon. We found that SOCO is missing some critical information to effectively monitor what maintenance is required and when. We make three recommendations to strengthen SOCO's maintenance planning and reporting processes.

2.0 INTRODUCTION

SOCO leases space to companies working with new innovations, scientific advances, and rapidly changing technology to further Saskatchewan's economic growth. Its tenants employ over 5,000 people in agriculture, mining, forestry, life sciences, environmental sciences, and information technology.¹ The close proximity of these tenants within SOCO's technology parks helps them support each other's success.

In 2011, SOCO generated total revenues of \$39.8 million including overall rental revenues of \$37.8 million from leasing space in its 19 facilities located within the three locations. This rental revenue accounted for more than 95% of its total revenue. In 2011, it had expenses of \$35.2 million including operational expenses of \$26.5 million. SOCO is responsible to maintain property with a total net book value in 2011 of \$174.8 million (including buildings, improvements, and equipment).²

Facilities are buildings designed for a specific purpose (e.g., research, offices), the related critical utilities, and the major equipment used to operate the building. Facility maintenance refers to activities that support the intended purpose and capacity of the facilities including tests to determine future maintenance needs (e.g., thermographs, vibration analysis). It includes routine maintenance, whether it is preventive or reactive to events, and upgrading over the long-term.

Keeping facilities well-maintained is important as it makes them safer, extends their useful life span, and can reduce operating costs. Effective maintenance should reduce health, safety, and fire risks, thus protecting people, the facility, and the owner's business investment. Also, well-maintained facilities help to attract and retain tenants.

Technology parks provide companies with access to sophisticated facilities that are unavailable in the general real estate market (e.g., laboratories, greenhouses).³ In addition, technology parks often provide parking, restaurants, shared resources such as telecommunication hubs, and access to skilled trades workers to maintain specialized equipment. This influences the maintenance that is required. Facilities in technology

¹ SOCO's 2011 Performance Management Plan, p. 1. <http://www.soco.sk.ca/>.

² Saskatchewan Opportunities Corporation Annual Report 2011, pp. 29-30.

³ SOCO's 2011 Performance Management Plan, p. 3. <http://www.soco.sk.ca/>.



parks must be maintained to a high standard that minimizes business interruptions and provides a controlled environment for research.

To attract technologically advanced companies as tenants, technology parks must model best practices in current technology and sustainable, environmentally responsible operations. Maintaining facilities within technology parks in a sustainable way reduces the risk of harm to people or the environment (e.g., prevents air pollution). For example, proper maintenance of laboratory ventilation systems could reduce the risk of tenants inhaling harmful substances. Effective, sustainable maintenance can reduce costs (e.g., conserves energy and water). SOCO’s maintenance costs and staffing are set out in Figure 1.

Figure 1 – SOCO’s Annual Maintenance Expense and Staffing 2007 to 2011

| | 2011 | 2010 | 2009 | 2008 | 2007 |
|--|--------|-------|-------|-------|-------|
| Maintenance expense⁴ (millions) | \$13.2 | \$6.6 | \$5.0 | \$5.5 | \$5.2 |
| Full time equivalent staff for maintenance and operations⁵ | 40.8 | 38.3 | 36.4 | 32.4 | 35.7 |

Source: SOCO information systems April 2012.

SOCO states that it values innovation and strives for “leadership in the introduction of new solutions in design, operations and sustainability” in the development and operation of its technology parks.⁶ This Chapter reports audit results on whether SOCO effectively maintains its facilities in an environmentally sustainable way.

3.0 AUDIT OBJECTIVE, CRITERIA, AND CONCLUSION

The objective of this audit was to assess whether the Saskatchewan Opportunities Corporation had effective processes to maintain facilities in a sustainable way at Innovation Place, Saskatoon during January 1, 2011 to January 31, 2012.

This audit focused on SOCO’s Saskatoon technology park, at Innovation Place, near the University of Saskatchewan campus. This technology park opened in 1980 and has 13 facilities with 132 tenants occupying approximately 1.2 million square feet.⁷ It contains office space, research laboratories, greenhouses, a bio-processing plant, storage facilities, and an energy production facility.

To conduct this audit, we followed the *Standards for Assurance Engagements* published in the *CICA Handbook - Assurance*. Our approach to the audit included documenting our understanding of SOCO’s processes, reviewing documents, policies, manuals and other guidance, and testing key aspects of those processes during detailed on-site tours of facilities at Innovation Place, Saskatoon. We did not assess the condition of the facilities.

⁴ Maintenance expense includes maintenance and capital improvement of buildings, infrastructure, furniture, equipment, parking lots and grounds for facilities in all three locations as well as janitorial and associated salaries.

⁵ Maintenance and operations staff is full-time equivalent staff in Technical Operations and Project Management excluding Executive Director and estimated time on new developments or client projects.

⁶ Saskatchewan Opportunities Corporation *Performance Management Plan 2011*, p. 2. <http://www.soco.sk.ca/>.

⁷ Saskatchewan Opportunities Corporation *Annual Report 2010*, p. 13.

To evaluate SOCO's processes, we used criteria based on the work of other auditors and current literature listed in the selected references. Management at SOCO agreed with the criteria (see Figure 2).

Figure 2—Audit Criteria

To have effective processes to maintain facilities in a sustainable way at Innovation Place, Saskatoon, SOCO would:

- 1. Keep reliable information on facilities**
 - 1.1 Identify the facilities that must be maintained
 - 1.2 Determine facilities' condition including energy efficiency status and remaining lifespan (i.e., asset management plan)
 - 1.3 Align service objectives with risks
 - 1.4 Identify replacement value
- 2. Develop a maintenance plan**
 - 2.1 Set specific maintenance objectives and strategies consistent with sustainability objectives
 - 2.2 Set maintenance priorities (short to long term)
 - 2.3 Estimate the cost of strategies (short to long term costs)
- 3. Carry out maintenance effectively**
 - 3.1 Identify maintenance standards (including sustainability requirements)
 - 3.2 Conduct maintenance procedures consistent with standards (including sustainability requirements)
 - 3.3 Track maintenance activities
- 4. Monitor performance**
 - 4.1 Use specific performance measures
 - 4.2 Analyze progress of maintenance compared to plans
 - 4.3 Review results including sustainability (e.g., energy and water conservation, reduced use of toxic materials, waste management)
 - 4.4 Adjust plans as new information becomes available

SOCO is responsible to maintain valuable facilities and equipment with the public purpose of promoting economic growth. Its facilities and equipment are unique and require specialized attention to keep them in working order. Most of SOCO's facilities are more than 20 years old. Increasingly, these facilities will require maintenance to extend their useful life span and reduce costs. SOCO's facilities are in demand; the overall vacancy rate was 2.79% in 2011 (target 3.0%).^{8,9} To fulfill its intended purpose of promoting economic growth, SOCO's facilities need to be well maintained.

We concluded that during January 1, 2011 to January 31, 2012, Saskatchewan Opportunity Corporation had effective processes to maintain facilities at Innovation Place-Saskatoon in a sustainable way except for the following. Saskatchewan Opportunity Corporation did not have effective processes with respect to:

- › **Assessing and documenting the current condition of each facility**
- › **Preparing a complete corporate maintenance plan (i.e., it is missing some key maintenance objectives and priority strategies)**
- › **Monitoring the effectiveness of maintenance with performance measures**

If SOCO does not have complete information on the condition of each facility and does not set clear objectives and priorities for maintenance, there is a risk that it will not perform the right maintenance at the right time. Without performance measures for

⁸ Innovation Place Vacancy Summary at December 31, 2011.

⁹ SOCO's 2011 Performance Management Plan, p. 10. <http://www.soco.sk.ca/>.



maintenance, there is a risk that SOCO will be less able to monitor the results of its maintenance. SOCO might spend more on maintenance than necessary to achieve the Government's objectives for its facilities.

4.0 KEY FINDINGS AND RECOMMENDATIONS

In the following sections, we set out key findings and recommendations by criteria. Expectations related to the criteria are in italics.

4.1 Information on Facilities Not Yet Complete

We expected SOCO to keep up-to-date information about the facilities it must maintain. The information should include each facility's nature (e.g., size, age, structural elements, critical utilities, major equipment), current purpose or service objective, condition, related risks, remaining life span and replacement value. These facts influence how the facility should be maintained.

For each facility that it maintains, SOCO documents the name of the building, age, size, address, and current use. SOCO identifies each facility's key structural elements (e.g., the type of roof, support beams), critical utilities (e.g., gas, electricity, water), and major equipment (e.g., heating, cooling, and ventilation systems). It documents these details in an electronic management information system. Documenting structural aspects, major equipment, and critical utilities helps management identify features requiring special maintenance.

Service objectives state the intended use of a facility over a specific life span. For example, one facility might be used for experiments where light and air quality must be controlled and have a life span of 25 years for that research purpose. Another facility might be intended for office space that is energy efficient over a life span of 75 years. Service objectives help determine what maintenance is most important and how often the condition of a facility should be reassessed.

SOCO documents the current use of its facilities (e.g., office building, greenhouse, bio-processing plant) in its computerized (IT) preventive maintenance system. It does not document the remaining service life span of each facility. SOCO's facilities are aging and documenting the remaining life span could help SOCO make resource allocation decisions. SOCO management estimates the replacement value of its facilities for insurance purposes.

SOCO has begun documenting the condition of each of its facilities. It has a draft strategy that requires each facility's physical condition to be visually inspected and its life span and costs estimated. It has a manual that identifies key information to be collected and provides checklists for assessing the condition of its facilities, including structural elements. SOCO tests the condition of critical utilities (e.g., water lines, electrical systems) and some structural elements (e.g., roofs) through preventative and reactive maintenance. It completes some tests as part of daily maintenance and some periodically in response to events. For example, after a leak in 2008, SOCO assessed the condition of one facility's roof membrane and the underlying components. In 2011, it

assessed corrosion of the utilidor or culvert-type pipe through which it delivers hot and cold water and other utilities from the central energy centre.

As of February 2012, SOCO had not finalized a condition report for any of its facilities. It had a draft condition report for one facility. When SOCO has documented complete information about the condition of its facilities, it will be better able to identify risks and estimate the remaining service life span of each facility.

Complete information about each facility's condition would strengthen SOCO's long-term planning and resource allocation processes. Also, this information would reduce the risk of unexpected costs and/or downtime for emergency maintenance. Unexpected maintenance often increases as facilities age.

- 1. We recommend that Saskatchewan Opportunities Corporation document, for each of its facilities, current condition, key risks, and remaining life span in the context of the facility's intended use.**

4.2 Corporate Maintenance Plan is Incomplete

We expected SOCO to have a corporate maintenance plan to help set maintenance priorities across all its facilities. We expected the maintenance plan to establish maintenance objectives, strategies, and related performance measures. Maintenance objectives and strategies influence the nature, timing, and cost of maintenance. We expected the maintenance plan to assign available resources to maintenance priorities (e.g., preventative, reactive, rehabilitative, and/or replacement activities).

SOCO documents some of its maintenance objectives and strategies in various internal publications. For example, its technical operations department has some objectives and strategies related to maintenance in its performance management plan, some in its business plan, and some in individual staff work plans. SOCO's balanced scorecard also refers to some aspects of a maintenance plan. Management told us it also has informal, unwritten maintenance objectives. For example, SOCO staff informally aim to do timely, appropriate maintenance that extends the service life of equipment, minimizes downtime, and reduces energy use. During the audit, we observed the commitment of SOCO's management and staff for these unwritten objectives.

- 2. We recommend that Saskatchewan Opportunities Corporation expand its corporate maintenance plan to include all its maintenance objectives and priority strategies for the short and long term.**

SOCO sets some short-term and medium-term priority maintenance strategies and evaluates the cost of its major maintenance strategies. It documents these priorities in multiple documents. For medium-term priorities, SOCO uses a list of expected capital costs within five years, including when to replace structural elements of various facilities (e.g., replace roof). To set short-term maintenance priorities, SOCO's experienced managers make proposals to a Capital Committee that consists of senior managers



from across the corporation. The Capital Committee assesses requests for large maintenance projects (including costs and timing) and ranks them in priority order. The committee bases its priority ranking on relevant risks (e.g., safety, legal, revenue, impact on tenant satisfaction).

SOCO keeps a financial schedule to track the estimated dollar value of maintenance projects over a ten-year period. This process works for SOCO but needs better documentation as recommended above. Including all its short and long-term priority strategies in its maintenance plan would give SOCO an overview of all its priorities. It would strengthen SOCO's ability to make trade-offs when resources are not available for all required maintenance.

4.3 Maintenance is Sustainable, Effectiveness Unclear

We expected SOCO to formally adopt the standards it uses for maintenance and document the standards in a corporate maintenance plan. We expected SOCO to establish maintenance procedures consistent with its chosen standards and to track whether it completed maintenance activities, when, and as expected.

In its manuals, SOCO documents that it follows maintenance standards published under ISO 9001:2008. ISO is the International Organization for Standardization and publishes a wide range of international standards.¹⁰ In 2011, SOCO used the ISO standards to guide internal inspections of maintenance.

SOCO uses an IT system to establish maintenance tasks consistent with ISO standards and to track the completion of planned short-term maintenance activity. This system also tracks the preventative maintenance completed monthly. SOCO uses this system and a planning spreadsheet to schedule and track the progress of longer-term capital maintenance projects recommended by SOCO's Capital Committee.

SOCO uses *BOMA BEST* standards (see Figure 3) to guide it to carry out maintenance activities in a sustainable way. Of the 13 facilities at Innovation Place Saskatoon, 11 facilities have *BOMA BEST* certification. SOCO has policies about waste management, reducing the use of water and energy, and selecting safe materials to use during maintenance. These policies promote completion of maintenance in a sustainable way.

We observed that SOCO performs maintenance in a sustainable way related to energy conservation, water conservation, and sustainable practices for heat, ventilation, and air conditioning. For example, to save energy, SOCO uses automatic variable frequency controls so that fans only run as fast as required to maintain building temperature.

¹⁰ Adapted from: <http://www.iso.org/iso/about.htm>. (24 Feb 2012)

Figure 3—What is BOMA BEST?

BOMA BEST are the *Building Environmental Standards* of the Building Owners and Managers Association (BOMA) of Canada. The *BOMA BEST* standards consider best practices, energy and environmental performance, and building management.¹¹ The program provides a consistent framework for owners to assess key areas of environmental and management performance including energy, water, waste reduction, emissions and effluents, indoor air quality, and the environmental management system.¹² To obtain certification, a qualified third party must physically inspect a building.¹³ Certification under *BOMA BEST* verifies that a building meets specific environmental standards at a particular point in time. *BOMA BEST* certification does not provide an assessment of the appropriateness of maintenance completed on a building.

We observed that SOCO staff identify and carry out detailed daily maintenance tasks. To support decisions about what maintenance is needed, SOCO constantly monitors the performance of some of its major equipment, air temperature, water use, energy use, and other factors. SOCO monitors this information through a complex IT system of electronic alerts in a control centre that is staffed at all times.

SOCO depends on its experienced staff to decide if maintenance is sufficiently complete. Staff do not have access to complete, detailed information about the condition of all facilities as SOCO has not completed condition reports (as explained earlier). When SOCO has complete information about each facility's condition and related risks, it will be better able to verify and document that SOCO effectively maintains all aspects of its facilities.

4.4 Need to Better Monitor the Effectiveness of Maintenance

We expected SOCO to use performance measures specific to maintenance and to analyze its progress in maintaining its facilities. We expected management to review the results of SOCO's maintenance activities (including whether the processes were environmentally sustainable). We expected SOCO to adjust maintenance in light of new information or emerging risks.

SOCO uses a few key performance measures including customer satisfaction, achievement of *BOMA BEST* average points per facility, energy consumption, and a carbon footprint measure.¹⁴ Senior management approves these measures, monitors and reports them along with related results in its business plan and/or balanced scorecard report.

Internally, SOCO tracks other performance information electronically, such as costs and response times to complete minor maintenance requests from tenants. SOCO also measures tenant satisfaction using a questionnaire distributed to tenants following minor maintenance requests. This perspective provides a narrow evaluation of the result of minor repairs but does not reflect the effectiveness of all types of maintenance.

SOCO needs performance measures that focus on effectiveness to better monitor the results of maintenance. Tracking the effectiveness of maintenance would help management monitor progress toward its short and long-term maintenance objectives.

¹¹ Adapted from: <http://www.bomabest.com/about-boma-best/>. (1 Mar 2012)

¹² Ibid.

¹³ Ibid.

¹⁴ Customer satisfaction is measured with the percentage of tenant CEOs who recommend Innovation Place to other potential tenants. The carbon footprint measure is under review.



For example, SOCO might track downtime, business interruption, or costs of unplanned maintenance as measures to help monitor whether it is doing all the right maintenance at the right time.

3. We recommend that Saskatchewan Opportunities Corporation identify and use performance measures to better monitor the effectiveness of its maintenance activities.

SOCO's management reviews the progress of maintenance activities using a variety of formal reports and regular, informal meetings between maintenance staff and management. Senior management is aware of the progress of major maintenance projects through attendance at SOCO's Capital Committee meetings. In addition, SOCO maintenance managers receive a monthly report of outstanding maintenance that was scheduled and not completed for various reasons (e.g., parts not available). SOCO's management also reviews periodic third party reports on whether SOCO's processes are environmentally sustainable.

SOCO has a process to adjust maintenance as circumstances change. SOCO's Capital Committee receives new maintenance requests throughout the year. SOCO adjusts the timing of planned projects based on their priority compared to other emerging risks as judged by this committee of experienced managers.

5.0 SELECTED REFERENCES

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