




Improving

CAMPUS SUSTAINABILITY

Through

SPACE UTILIZATION

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Aerial view of the NSCC Waterfront Campus in Dartmouth, Nova Scotia. Skyline of the city of Halifax in the background.

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NSCC proudly waving its flags at the NSCC Waterfront Campus.

Sustainability serves as a core value in the Nova Scotia Community College (NSCC) Strategic Plan. Tracking the progress toward more sustainable operations ensures that NSCC's sustainability goals are met. Resource management strategies including infrastructure changes have led to improved building efficiencies at many of NSCC's campuses in recent years.

However, if a room is empty or at far less than capacity, then how efficient is it? Space utilization has proven to be a substantial piece of the puzzle that is often neglected when considering sustainable building use. This article outlines NSCC's work to improve campus sustainability through better space utilization.

THE CORE VALUE OF LEADING BY EXAMPLE

Nova Scotia Community College's mission statement is "Building Nova Scotia's economy and quality of life through education and innovation." This statement goes beyond classroom education—it is embedded in all that we do, including how we manage our building space.

Every institution in the postsecondary sector has an opportunity to lead by example and have significant influence on both the future workforce, as well as the communities that they serve. For over 15 years, sustainability has been a driving force for the College. It is a core value in our strategic plan, and is one of the many arenas in which we strive to lead by example. Over the past eight years, NSCC has reduced energy consumption by 23 percent, reduced greenhouse gas emissions by 31 percent, and our water consumption by 40 percent. In addition, 75 percent of the waste that we generate has been diverted away from landfill.

These improvements were achieved largely through infrastructure changes such as lighting upgrades, improved waste management systems, and building envelope improvements. However, something we learned along the way is that in order to optimize building performance, infrastructure upgrades, and space utilization are interdependent of each other.

ANALYZING THE USE OF SPACE

It started with a simple thought: we can have the most efficient buildings systems available, but if a room is sitting empty or at far less than capacity, then how efficient is it? To answer this question, we conducted a space utilization analysis across our 13 campuses and discovered there was opportunity for improvement. The analysis also impacted how we looked at operational cost. The efficiency of buildings is often measured by cost per square foot. We adopted another perspective: cost per student.

First we needed to *change the ownership of space*. The results from the data analysis largely showed that spaces that were dedicated to serving the needs of a particular academic program or specific function achieved lower utilization rates than those rooms that served multiple groups.

To capitalize on this finding, we introduced scheduling and space utilization software, which simplified the development of efficient schedules, and tracked the use of the spaces. This resulted in real energy savings as the College no longer needed to heat and cool spaces that were empty. Since implementing this new software, the College has seen utilization improvement rates at several of our 13 campuses jump from 40 to 70 percent.

Second, we *addressed our physical footprint*. Utilizing infrastructure funding from the Province of Nova Scotia, we evaluated the ability of our existing traditional learning spaces to meet the requirements of the College's high-quality program delivery needs, as well as to support its mission statement. We found that



Students making use of common learning spaces at the NSCC Waterfront Campus.

there was, again, room for improvement. Rather than creating additional traditional learning spaces, we implemented an innovative design approach to space management. The design approach was based on three pillars: 1) Reducing our footprint, 2) Flexibility, and 3) Engagement.

Building on the findings of the space analysis, we conceptualized spaces that were both smaller, and could serve multiple groups. This started by challenging ourselves to work with a reduced footprint, while still providing the program excellence NSCC is known for. This included learning spaces (e.g., trade shops) that were as small as a third of their typical size.

To work within this smaller footprint meant working as a team to change the way our programming was delivered. We designed open concept spaces that could be flexible and quickly adapted for various programs. A detailed material handling process was

technical experts for innovative building systems projects and to access the latest in energy research and technologies.

This building looks and feels unlike any other trades and technology building in Nova Scotia or the rest of Canada. In addition to its minimal ecological footprint, the CBE provides a unique learning experience for students in 13 programs within the academic school, and represents a huge step forward for the College in sustainable design. Embedded in the curricula for all programs delivered in the space is an ecological theme that goes hand-in-hand with the College's environmental goals.

Upon reflection, it is clear that there were several factors that aided in the success of this project, and would be recommended for any similar, future undertaking. Engaging staff and students from the start is important, making sure that they have a say, that they understand what the goals are, and how the changes



NSCC Waterfront Campus front entrance, located in Dartmouth, Nova Scotia.

put in place to cut down on the need for fixed equipment, and overhead doors were installed between shops to support this flexibility. Adopting more portable and scaled-down training aids and specific infrastructure supports were also required—such as drop-down electrical connections and high-density racking systems.

Third, to make this work and to better understand the variety of demands on the space, it was also *important to have all stakeholders engaged* from the conceptual design phase through to construction and operations. We struck a team that included academic chairs, curriculum development staff, facilities staff, construction managers, and an industrial process engineer.

THE CENTRE FOR THE BUILT ENVIRONMENT

While still ongoing, a product of this work was the creation of the Centre for the Built Environment (CBE) at our Waterfront Campus. Constructed in 2010, the CBE is dedicated to the School of Trades & Technology. It is a dynamic and interactive learning environment for academic and research programs focused on more sustainable practices for the building industry. The CBE brings together trades and technologies students with

may impact them. It also helps to make the project part of your brand. We branded our sustainability focus to help generate support and buy-in from our community. Setting goals and creating accountability are other important tools to ensure success. We set aggressive goals and policies related to sustainability, including space utilization.

ESTABLISHING MEASURES FOR ACCOUNTABILITY

Accountability means that senior leaders support the efforts and provide ongoing supervision to ensure the work stays on track. This can include annual auditing and reporting responsibilities. In addition, focusing on flexibility when purchasing space assets can have a big impact. Furniture, which can meet multiple users' needs, will play a key role in whether a space/room is used or sits empty.

The benefits of optimizing sustainability of building operations are multifaceted. Through our work, we challenged the operational status quo. An example of this was reducing the number of parking spaces at some of our campuses. We wanted to influence a behavioral change and increase staff and students use of alternative transportation. Also, as a publicly funded insti-

tution, we are required to develop business cases for much of the funding we receive.


In our business cases, we highlight the long-term sustainability of investing in our infrastructure, which, to date, has been a very successful approach for us. It ensures that money invested in the College provides best value. The efficiencies introduced in our buildings through infrastructure changes and more efficient space utilization save the College over a \$1 million each year. These recovered funds are reinvested into building upgrades in an effort to continuously improve and

extend the life of the College's buildings by addressing critical and deferred maintenance. By increasing the efficiency and capabilities of our buildings, we have built additional capacity within the same walls that did not exist before. For the College, this has resulted in an ability to grow our program offerings and increase the number of students at our Campuses.

Finally and most importantly, NSCC strives to lead by example. Sustainability is part of how NSCC does business and serves as a core value in our Strategic Plan. The College operates under a board-approved sustainability policy, and sustainability is embedded in all aspects of the learning experience. We create buildings that can be used as learning tools that enrich curriculum, foster research, and promote better understanding of responsible building practices for students and faculty, industry partners, and the public at large.

In addition to the curriculum and training tools, students are learning ways to efficiently and sustainably run an operation. This will help them as they enter the workforce and implement these lessons learned. The College's sustainability work also bolsters student awareness, and ultimately encourages behavioral changes that are essential to continually improve not only the College's, but the community's sustainability performance overall.

This year, NSCC is set to begin its next phase of major renovations. We do not want to build new buildings because it is the exciting thing to do, we want to continue to leverage and maximize what we have. This journey has helped us develop a new way of approaching space design that will allow us to work through similar

integrated design approaches, as we continue to develop and improve our space utilization processes. 

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