SUNY Cortland

ARCHITECTS AND PLANNERS, P.C.

Sustainability Master Plan

3 March 2011

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Executive Summary

Overview

In April of 2008, the President of SUNY Cortland signed the American College & University Presidents' Climate Commitment (ACUPCC) acknowledging concerns "about the unprecedented scale and speed of global warming and its potential for large-scale, adverse health, social, economic and ecological effects."[1] The College is committed to the development of a comprehensive plan to achieve carbon neutrality by 2030 or 2050. JMZ and Sasaki were asked to complete, within the context of the SUNY Facilities Master Plan, a Sustainability Master Plan focusing on energy and transportation to inform possible actions for SUNY Cortland to improve energy performance on campus and reduce greenhouse gas (GHG) emissions. Building on the findings and analysis of the first three phases of the Facilities Master Plan, and the subsequent findings of the Energy and Transportation elements, the Sustainability Master Plan highlights a comprehensive approach to sustainability that seamlessly integrates with the final phases of the Facilities Master Plan for SUNY Cortland.

Coordination with AASHE STARS

SUNY Cortland recently adopted the Association for the Advancement of Sustainability in Higher Education (AASHE) sustainability tracking, assessment, and rating system (STARS) to facilitate a comprehensive approach to the College's sustainability progress. Therefore, the Sustainability Master Plan is organized to correspond with the STARS categories. Categories relating to academic and research initiatives as well as some organizational initiatives will be supplemented by the College as initiatives are developed. Some of these initiatives are underway and are further described in the Next Steps section of this report.

Key Findings and Recommendations

The Sustainability Master Plan provides the College with a comprehensive sustainability framework organized by six sustainability elements.

- Energy & Climate
- Transportation
- Natural Systems
- Water
- Materials & Resources
- Community

Issues, goals, and strategies for each element are identified. The focus of the analysis for this report is on energy and transportation although the remaining elements of sustainability are considered for integration into the Facilties Master Plan.

[1] http://www.presidentsclimatecommitment.org/about/commitment

Energy

The challenges for managing energy efficiently on campus have been identified as: achieving carbon neutrality by 2030 or 2050 and setting clear goals for implementing energy strategies.

The energy analysis revealed that the College's building portfolio is performing at or below national averages for energy performance. The underperformance of the building portfolio suggests that the College's goal to reduce energy by 15 percent in six years will not result in meeting the ACUPCC goal of reaching carbon neutrality by 2030 or 2050. It is recommended that the College set benchmarks for implementing energy strategies to meet ACUPCC goals, including:

- Have the LEED Silver (Cortland's version) focus on energy requirements;
- Develop energy policies for the residence halls, which have the greatest need of energy performance improvements;
- Set a more ambitious goal for the next ten years focusing on GHG emissions reduction; and
- Create a Sustainability Coordinator position to oversee and implement sustainability initiatives.

Recently, the American College & University Presidents' Climate Commitment removed from the list 15 colleges that missed initial reporting requirements. SUNY Cortland signed the agreement in November 2007 and missed the September 2008 deadline for submitting its GHG inventory and the September 2009 deadline for submitting its Climate Action Plan. It is recommended that the College adopt the ACUPCC and AASHE STARS recommended methodology for developing a GHG inventory using the Clean Air Cool Planet Calculator[2] and submit it to the ACUPCC as soon as possible. The College should focus on fulfilling the submission requirements for the ACUPCC focusing on sustainable energy performance. This approach will better position the College for AASHE STARS reporting on energy.

Transportation

SUNY Cortland's transportation system comprises the campus fleet as well as parking facilities and measures for student and employee commuting. As a guiding goal with regard to transportation, SUNY Cortland should seek to reduce carbon emissions through social and physical measures to minimize vehicle-miles traveled (VMT) and cold starts in vehicles burning fossil fuels. Any measure that will tend to cause people to drive less, and walk, bike, or take transit more, should be recognized and valued.

In an effort to reduce GHG emissions from vehicles, the College should seek to influence the travel behavior of faculty, staff, students, and visitors. Existing physical conditions will need to be addressed and current policies reworked. It is necessary to

[2] The Campus Carbon Calculator™ is the leading tool for assessing campus greenhouse gas emissions. Currently in use at more than 1200 campuses across the country, the Calculator has already helped schools of all sizes and types, and in all regions to tackle global warming. The Calculator is the "tool of record" for most of the 600 signatories to the American Colleges and University Presidents Climate Commitment, a voluntary agreement to move toward campus "climate neutrality." http://www.cleanair-coolplanet.org/toolkit/

address transportation issues and goals with physical, administrative, and social actions.

The data analyzed in this study indicated that employees have much greater transportation-related carbon impacts than students on a per-capita basis. The lack of clear transportation policies also conveys a mixed-message about the College's commitment to reducing the use of cars to get to and around campus. Challenges for implementing sustainable transportation strategies are a shortage of public transit service options; steep and challenging site topography, which deters pedestrians and cyclists; and a winter climate that fosters auto-dependence.

Key recommendations for the College are:

- Set targeted transportation sustainability goals
- Focus on reducing vehicle-miles traveled by commuters and cross-campus drivers
- Improve sustainable transportation options to, from, and on campus

Potential strategies are identified in the context of their contribution to achieving the College's goal of carbon neutrality by 2030 or 2050 and to meeting the goals identified under AASHE STARS. Recommended strategies include evaluating the true cost of parking and setting parking permit prices accordingly; initiating commuter shuttle and park-and-ride services; expanding support for bicycling through enhancement and publicizing of the Community Bike Program; and converting fleet vehicles to renewable fuels.

Integration with the SUNY Facilities Master Plan

The SUNY Facilities Master Plan provides opportunities to address building energy and transportation management and policies in the near future as a first step for GHG reduction. Preliminary findings of the energy report and the transportation report were integrated in phases IV and X of the SUNY Facilities Master Plan. All six of the sustainability framework elements have been considered, and planning and design strategies have been integrated into the final Facilities Master Plan recommendations.

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Background and Process

Overview

A Sustainability Workshop facilitated by Sasaki and JMZ was held at SUNY Cortland on May 19, 2010. The purpose of the workshop was to identify sustainability issues and goals and outline possible planning and design strategies for the Sustainability Master Plan. The strategies were incorporated into the subsequent phases of the SUNY Facilities Master Plan. Detailed minutes from the workshop are included in the Appendix fo this report. The workshop was comprised of four work sessions:

- Introduction
- Issues, Goals, and Priorities
- Planning and Design Strategies
- Closing

Sustainability Workshop

At the workshop, the College reiterated its commitment to the ACUPCC for achieving carbon neutrality and expressed an interest in AASHE STARS for tracking and documenting sustainability progress. The College has since offically adopted the AASHE STARS tracking and documenting program. The workshop brought to light broader issues, goals, and strategies for a comprehensive approach to sustainability at SUNY Cortland and provided specific direction to the consultant team for developing the energy and transportation strides.

Confirmation of Cortland's Sustainability Commitment

The Introduction Session was attended by campus leadership and was designed to review and confirm the College's commitment to sustainability. The College is reconsidering its timeline for achieving carbon neutrality from 2030 to 2050, similar to Cornell University's revised timeframe. A firm date has not been established or adopted.

The sustainability goals should be linked to the College's Mission and Strategic Priorities, particularly those that emphasize well-being and maximizing resources. It was agreed that students and faculty should be more engaged in the sustainability effort and that attending SUNY Cortland should be a "transforming experience" for young people. While advancing sustainable initiatives on campus is desirable, the College does not have the resources to create a formal Office for Sustainability or to hire a sustainability officer. Consequently, sustainable strategies will need to be carried out by individual departments with existing resources.

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Energy and Climate Analysis

Overview

The College has plans in place to make significant improvements in the management of its energy systems by sub-metering all buildings for electricity and replacing the central heating plant on the upper campus with satellite boilers. The College adopted LEED®[3] Silver or equivalent as the standard for new construction but would like to define specific energy performance targets for each new building and renovation. SUNY Cortland is looking into renewable energy, such as solar for hot water in the residence halls and pool at the new Student Life Center.

Strategies to reduce GHG emissions and to implement an energy management plan were discussed. As a first step, it was recommended that the current GHG inventory, which would establish 2006 – 2007 as the baseline year, be approved and adopted by the College. The GHG inventory should be updated on a yearly basis and be accompanied by a set of incentives to reduce energy consumption and GHG emissions; e.g. establish department accountability/incentives for energy savings. The College should also develop a communication and education plan for energy use on campus. Energy performance should be competitive and visible.

Issues Statement

The following directives were considered in the development of this study:

Achieve Carbon Neutrality by 2030 or 2050

By signing the ACUPCC, the College confirmed that it aims to become carbon neutral by 2030 or 2050. This report will study the College's energy goal of 15 percent energy reduction in six years (2008 – 2014) and the adoption of a LEED Cortland standard in the context of the College's commitment to be carbon neutrality.

Align College Initiatives with AASHE STARS Framework

The College recently adopted AASHE STARS for documenting sustainability progress. The College should make every effort to comply with the requirements of this sustainability tracking and documenting program.

Integrate the Energy Report Findings in the Facilities Master Plan

The College was in the process of conducting a Facilities Master Plan during this study, so the results of the energy analysis informed the Master Plan recommendations.

Set Clear Goals for Implementing Energy Strategies on Campus

The College is looking for achievable goals and strategies to become more sustainable.

[3] Leadership in Energy and Environmental Design, standard for Green Building design. LEED is a recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988

Methodology

Energy performance on campus was studied by assessing data provided by the College about each building's energy consumption and its contribution to the College's total GHG emissions.

Buildings' Energy Performance

Energy data provided by the College for 29 buildings was used to assess individual building's energy performance. The 29 buildings represent about 1.6 M GSF.

The assessment of the energy performance of buildings was performed in three steps.

The first step documented each building's average energy performance using data from 2005 through 2007 provided by SUNY Cortland. Building energy data was compiled for a three-year period for natural gas, electricity, and total energy use.

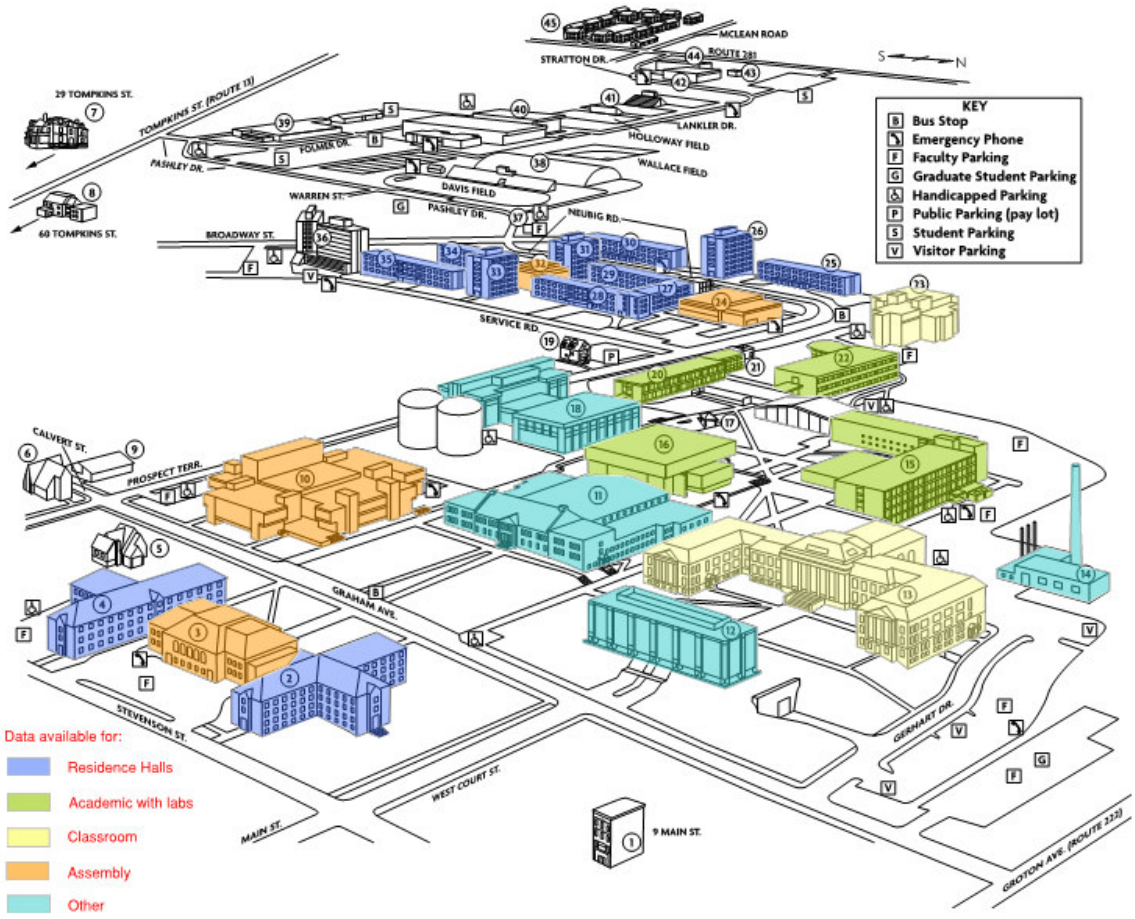


Figure 1: Studied Buildings by Type

Residence Halls: dormitory buildings, residence halls.
Academic with Labs: academic buildings with teaching labs/ research labs.
Classroom: all academic buildings that are not specialized.
Assembly: buildings primarily used for congregation, meetings.
Others: all other building types excluded from above categories.

The second step compared SUNY Cortland's building portfolio with national averages. National averages are compiled by building type or use. For SUNY Cortland, primary uses were determined from program information collected during the Facilities Master Plan.[4]

Cortland's data was compared against the Commercial Buildings Energy Consumption Survey (CBECS) - a national sample survey of commercial buildings in the United States. The data is gathered from the Department of Energy's Energy Information Administration (EIA).[5] Building types not included in the CBECS analysis, mainly laboratories, used data compiled by the Labs21 program.[6] For academic building uses not covered by CBECS or Labs21, data was used from energy studies performed by Sasaki Associates for comparable institutions within similar climatic conditions.

The third step compared the College buildings' performance with sustainability benchmarks as defined by the 2030 Challenge.[7] The 2030 Challenge's goal is for buildings to be carbon neutral by 2030. For the purpose of this report, the 2030 Challenge's targets were selected as a valid benchmark considering the College's goal to be carbon neutral by 2030 or 2050. The first target for the 2030 Challenge is for all new buildings and major renovations to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50 percent of the regional average for that building type by 2006; 60 percent by 2010; 70 percent in 2015; 80 percent in 2020; and 90 percent in 2025; followed by carbon-neutrality in 2030 (using no fossil fuel GHG emitting energy to operate).

Buildings' Contributions to GHG Emissions

Emissions related to buildings are defined by sources of energy for heating, cooling, and electricity.

- All direct emissions from sources owned or controlled by the College, e.g. the heating plant
- Indirect emissions from purchases of electricity, steam, heating, and cooling

Specific energy sources need to be documented to assess GHG contribution. For example, electricity produced by hydropower or a nuclear plant will have a lower GHG per Million Metric British Thermal Units (MMBTU) compared to energy purchased from a coal plant. Emissions for energy sources should be the same for all SUNY campuses considering that Cortland is part of SUNY's energy purchasing agreement. For example, in 2008, the University at Buffalo reported its GHG emissions per source of energy as follows:[8]

[4] PSIEXTR_Cortland2009_FINAL_CC-edited.xls", June 2010. (Sasaki for JMZ, Facilities Master Plan)
[5] "2003_CBECSPerformanceTargetsTable.pdf", www.energystar.gov
[6] Labs 21 program is a joint program of the US EPA and US DOE, developed as an energy benchmarking tool that allows users to compare laboratories using a standard set of building and system level energy use metrics. http://www.epa.gov/lab21gov/index.htm
[7] Architecture 2030 is a non-profit, non-partisan and independent organization established in response to the global-warming crisis by architect Edward Mazria in 2002. Source: http://www.architecture2030.org/about.php
[8] http://acupcc.aashe.org/site_media/uploads/ghg/2868-2007-inventoryreports.pdf

- Purchased electricity: 0.00038 MTeCO2/kWh
- Natural gas: 0.053 MTeCOs/MMBTU

There will likely be local differences in emissions for SUNY Cortland.

Analysis

Buildings' Energy Performance

Of the 29 buildings monitored, buildings with Energy Intensity Use (EUI)[9] rates of less than 100 KBTU[10]/square feet include Hayes Hall and Hendrick Hall for residential halls, Bowers Hall and Cornish/Van Hoesen Hall for academic/lab building types and Brockway Hall and the Dowd Fine Arts Center for assembly halls. It should be pointed out that the three academic/lab buildings monitored have EUI of 100 KBTU/sf or less, while most of the monitored residence halls have EUI above 100 KBTU/sf including the Glass Tower Hall, which is LEED certified. Lab buildings usually have higher energy consumption rates because of the physical requirements for scientific research and instruction, such as ventilation, climate control, etc. The high EUI of the residential halls indicates that these buildings are underperforming in terms of energy efficiency and is indicative of the overall intensity of use required of 24/7 residence halls.

[9] Energy Use Intensity (EUI): EUI is a unit of measurement that describes a building's energy use. EUI represents the energy consumed by a building relative to its size. A building's EUI is calculated by taking the total energy consumed in one year (measured in kBtu) and dividing it by the total floor space of the building. For example, if a 50,000-square-foot school consumed 7,500,000 kBtu of energy last year, its EUI would be 150. A similarly sized school that consumed 9,000,000 kBtu of energy last year would have a higher EUI (180) to reflect its higher energy use. Generally, a low EUI signifies good energy performance.
http://www.energystar.gov/index.cfm?fuseaction=buildingcontest.eui

[10] KBTU is Kilo BTUs. The British Thermal Unit (BTU or Btu): A BTU is defined as amount of heat required to raise the temperature of one 1 pound (0.454 kg) of liquid water by 1 °F (0.556 °C) from 60 to 61 °F (15.556 to 16.111 °C) at a constant pressure of one atmosphere. It is used in the power, steam generation, heating and air conditioning industries. http://en.wikipedia.org/wiki/British_thermal_unit

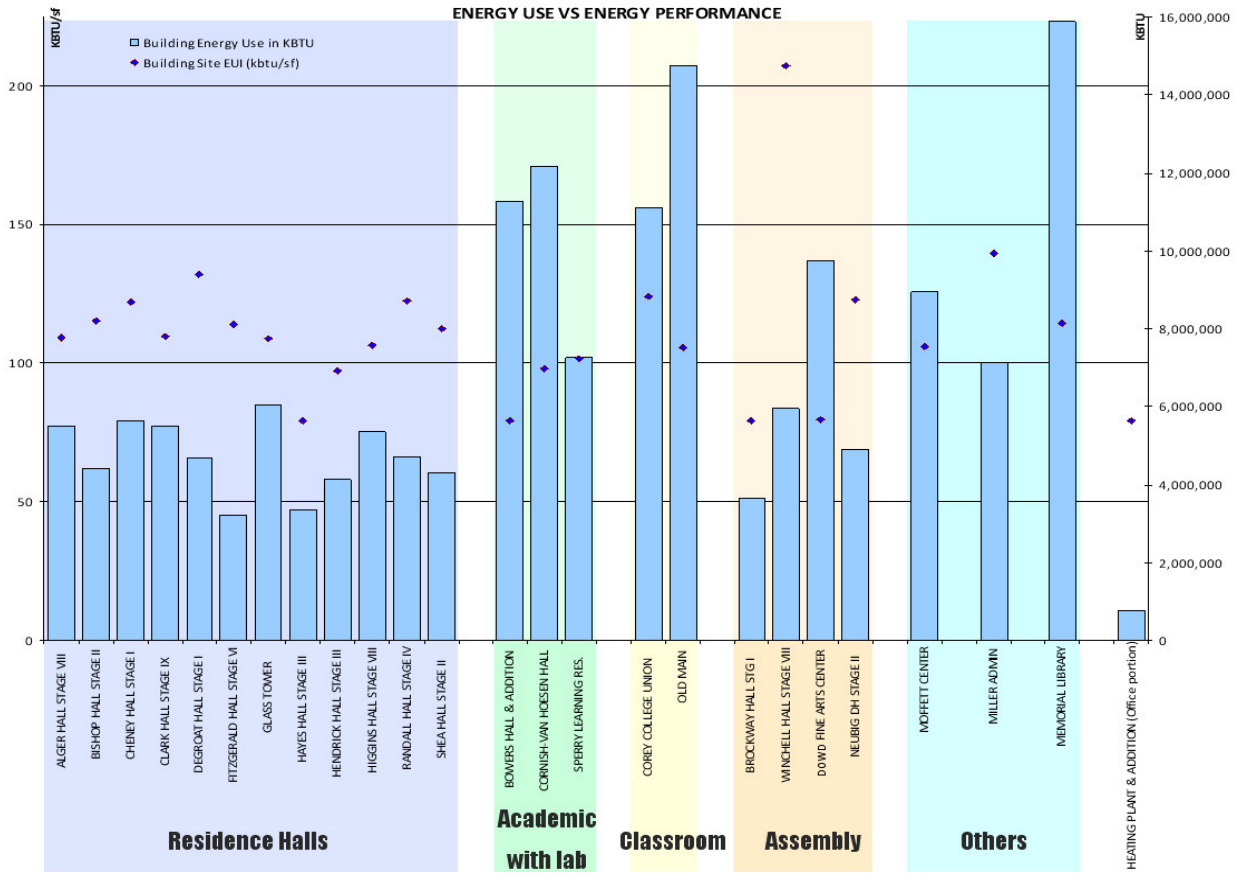


Figure 2: Building Energy Performance

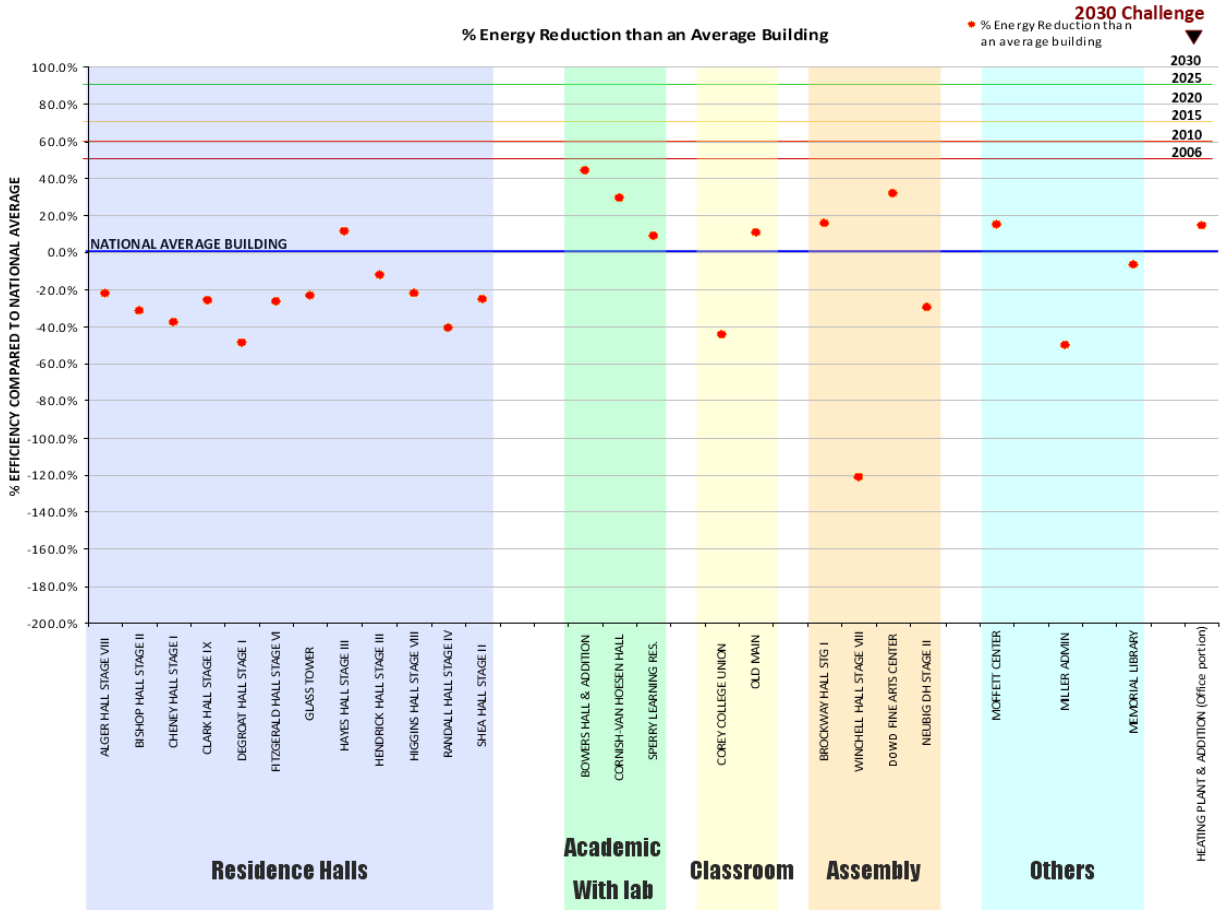


Figure 3: Building Energy Performance Compared to National Average & 2030 Challenge

The comparison between the energy performance of the SUNY Cortland building portfolio with national averages (CBECS and Labs21) further indicates that the residential halls may be underperforming, while the three academic/lab buildings perform above the national average. Academic buildings and assembly buildings have mixed performances. None of the monitored buildings meet the first target of the 2030 Challenge. The Memorial Library reports the highest amount of energy consumption and performs below the national average.

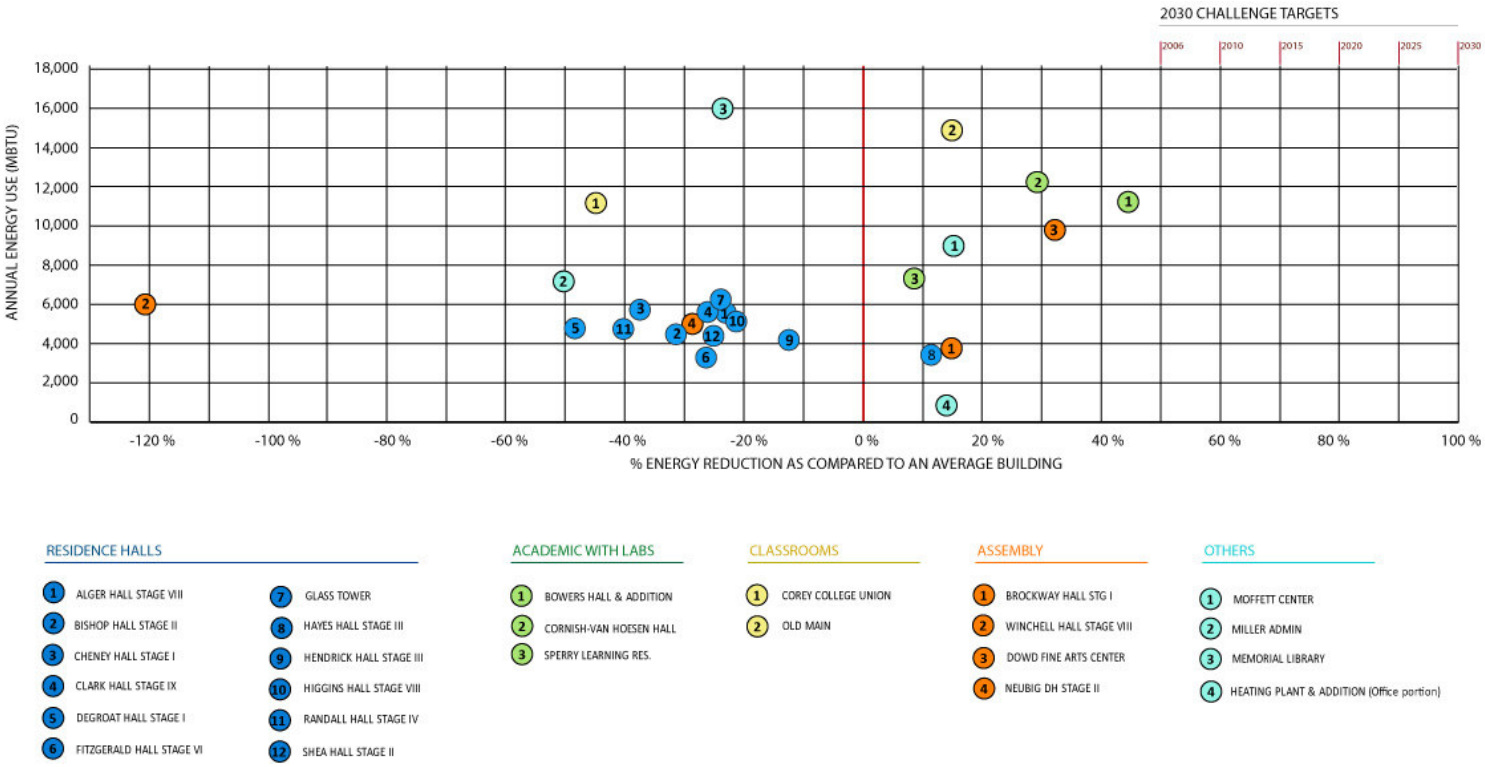


Figure 4: SUNY Cortland Summary of Compiled Building Energy Performance

According to the compiled energy performance of the studied buildings, most of the documented buildings are underperforming taking into consideration that:

- Most documented buildings perform within the national average or below;
- No buildings meet the first target of the 2030 challenge by performing 50 percent better then national average for energy consumption; and
- Residential buildings, as a group, have the worst performance.

Since 2003, the College has proceeded with major renovations to the Sperry Center, Moffett Center, Brockway Hall, Cornish Hall, and nine residence halls.[11] Another important addition to the campus was the Glass Tower Hall, which is a LEED certified residential facility. According to the analysis, the Glass Tower Hall performs 24 percent below the national average; the Sperry Center performs about nine percent above the average; the Moffett Center is approximately 15 percent above the national average, and Brockway Hall and Cornish/Van Hoesen perform 15 percent and 30 percent above the average respectively.

[11] http://www2.cortland.edu/bulletin/news-detail.dot?id=205694&backUrl=/bulletin/issues/bulletin-09-10/bulletin-13--march-22.dot

Figure 5: Mapping SUNY Cortland Building Energy Performance

Figure 6: Facilities Master Plan - Phase II Assessment of Existing Conditions

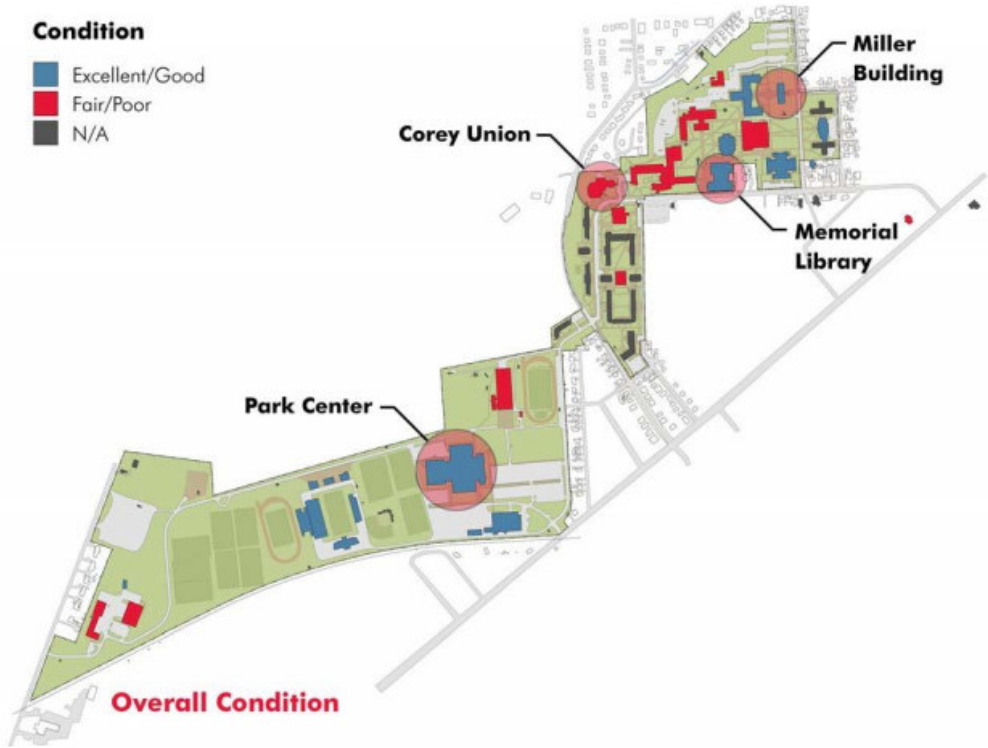


Figure 7: Building Performance Facilities Master Plan & Energy Combined

The findings of the energy report have been combined with the preliminary building assessment documented in the Phase II Report of the Facilities Master Plan (FMP). Fifteen buildings are covered by the two studies. There is a consensus that Corey Union, Neubig Hall, and Winchell Hall underperform. The FMP identifies these buildings as being in fair/poor condition and are also the worst/poor performers for energy. The building assessment suggests that energy improvement could be achieved by replacing the existing single glazed windows in the Corey Union and Winchell Hall and by upgrading the HVAC systems in Neubig and Winchell.

Brockway Hall, the Dowd Fine Arts Center, Old Main, and the Sperry Center are performing well. These buildings have been assessed in good/excellent condition and perform above average to better for overall energy performance.

The Miller Building, Moffett Center, Bowers Hall, the Memorial Library, and Cornish/Van Hoesen received mixed reviews. The Miller Building received a good/excellent performance in the building assessment, but received a worst energy performance. The building assessment identifies energy reduction potential in Miller by replacing the single-glazed windows and upgrading the HVAC system. Bowers Hall is

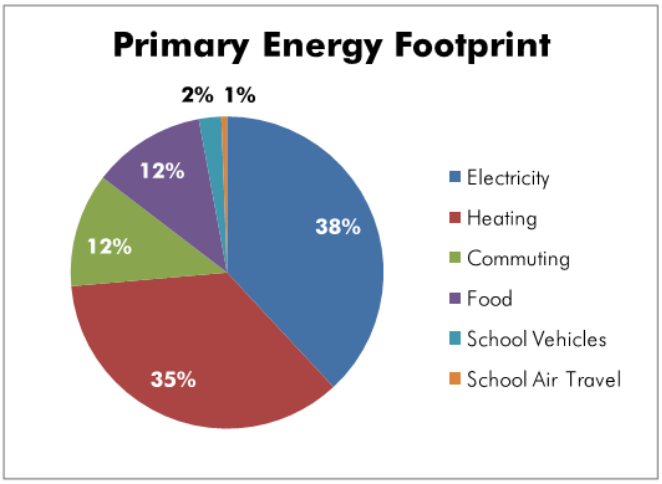
identified as in fair/poor condition but is a better energy performer. A renovated and expanded Bowers Hall science building is planned for the near future.[12]

Residential halls have not been addressed in the building assessment of the Facilities Master Plan but are discussed in a separate Residence Hall Facilities Master Plan.

Buildings' Contribution to GHG Emissions

AASHE STARS acknowledges that an institution's existing building stock is typically the largest source of energy consumption and greenhouse gas emissions on campus. It promotes efficient building operations and provides credits for adopting and following a sustainable operations and maintenance framework to conserve energy.[13]

The College's total emissions were published in the Phase II Report of the Facilities Master Plan. According to the current draft of the GHG report, electricity and heating represent 73 percent of the primary energy footprint, which measures total emissions.[14]



Source: Email from Brice Smith, Chair of the Physics Department, to Jean Stark dated 25 February 2010

Figure 8: GHG Inventory [Draft 2007]

The 29 monitored buildings count for approximately 1.6 million GSF for a total energy use of 170,268,783 KBTU. Specific data for energy sources other than gas, such as electricity and oil/fuel, were not consistently monitored for the documented buildings. Consequently, their GHG emissions could not be assessed. Energy sources should be identified and GHG emissions per energy source should be assigned. For example, at Cornell University, on-site combustion is the largest component of the University's GHG emissions at 176,000 metric tons CO_2-e and represents approximately 55 percent of the University's total footprint.[15] Cornell is in the process of replacing the

[12] http://www2.cortland.edu/bulletin/news-detail.dot?id=205694&backUrl=/bulletin/issues/bulletin-09-10/bulletin-13--march-22.dot

[13] http://www.aashe.org/files/documents/STARS/STARS_1.0_Technical_Manual.pdf, page 73

[14] GHG report quoted in Facilities Master Plan, Phase II report, "Assessment of Conditions", JMZ Architects and Planners, March 2010

[15] http://www.sustainablecampus.cornell.edu/climate/inventory.cfm

existing system with a Combined Heat and Power Plant (CCHPP) that is expected to reduce CO_2 emissions by over 20 percent.[16] SUNY Cortland is in the process of making significant improvements in replacing the central heating plant on the upper campus with satellite boilers. These improvements should have an important impact in reducing GHG emissions.

Campus GHG Emissions

A draft GHG inventory for SUNY Cortland was completed in 2008 as part of an academic course. The inventory has not been published or distributed within the College. The AASHE STARS rating system provides credits for completing a GHG inventory and for reducing GHG emissions. The credit requires completing a GHG emissions inventory covering scopes 1, 2, and 3 emissions based on the Clean Air Cool Planet calculator, which is also recommended by AASHE.[17] The three scopes are defined as follows:

- Scope 1 emissions: all direct emissions, i.e. from sources owned or controlled by the institution
- Scope 2 emissions: indirect emissions from purchases of electricity, steam, heating, and cooling
- Scope 3 emissions: all other indirect emissions upstream and downstream

It is also recommendd that the GHG inventory be publicly available, either through the ACUPCC reporting site, the institution's website or another public website.[18] Information available for this report relates to the purchase of gas - part of scope 2 in the Clean Air Cool Planet calculator. Gas consumption (in decatherms[19]) at SUNY Cortland has been relatively constant since 1990 except for significant reductions during the winters of 2003 and 2004. (See Figure 9 on the following page.) This may be an anomaly in data collection. The black line indentifies the average.

[16] http://www.sustainablecampus.cornell.edu/climate/inventory.cfm
[17] http://www.cleanair-coolplanet.org/toolkit/
[18] OP Credit 4: Greenhouse Gas Emissions Inventory (page 93) & OP Credit 5: Greenhouse Gas Emissions Reduction (page 96) STARS 1.0. Technical Manual.
http://www.aashe.org/files/documents/STARS/STARS_1.0.1_Technical_Manual.pdf
[19] Decatherms (DTH): Unit of energy equal to 10 therms or one million British thermal units (MMBtu) or about 1 gigajoules (GJ). Also spelled as decatherm. (1dth = 1MMBTU = 1000 KBTU)
http://www.businessdictionary.com/definition/dekatherm-DTH.html

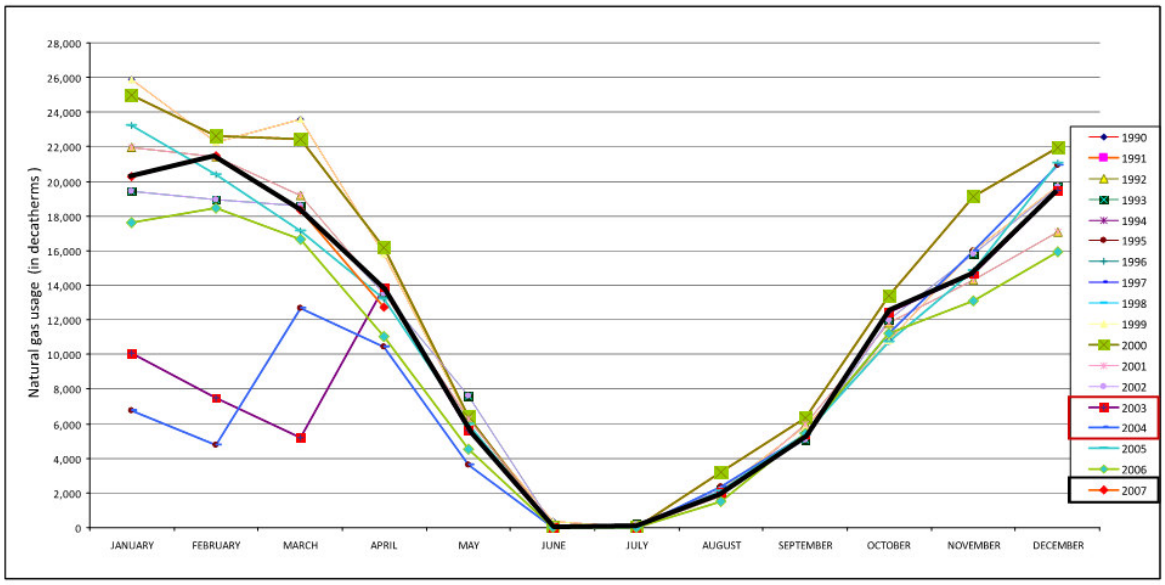


Figure 9: SUNY Cortland Natural Gas Usage 1990-2007

An important element in reducing GHG emission within scope 2 is the increase in use of renewable energy. The energy category of AASHE STARS recognizes institutions that are reducing their GHG emissions through clean and renewable energy including solar, wind, geothermal, and low-impact hydro-power. [20]

[20] Energy Category (pages 114-130) STARS 1.0. Technical Manual, page 73. http://www.aashe.org/files/documents/STARS/STARS_1.0.1_Technical_Manual.pdf

Figure 10: State of New York Renewable Energy Potential[21]

Cortland participates in SUNY's Energy Buying Group or ISO for renewable energy. SUNY's intent was to increase that percentage to 30 percent, but now it is down to three to five percent. Preliminary findings indicate that renewable energy potential for SUNY Cortland for solar is fair, which means that supplemental solar energy is worth investigating on a project basis, but there is not enough potential for having a district-wide approach or central plant for solar energy. Wind potential appears poor or marginal.

[21] source: http://www.eia.doe.gov/emeu/reps/rpmap/rp_mid-atl.html

For the Lower Campus, the College recommends that new construction include geothermal systems. During the spring of 2010, the College began drilling the first two of 60 geothermal wells behind the Professional Studies Building. The wells will be used to heat and cool the new facility.[22] It is important to note that a geothermal exchange system is not a method for generating energy but it is a more efficient use of energy "as is." It still takes energy to operate a ground source heat pump system, but it can be as much as three to four times more efficient when compared to highly efficient furnaces.[23]

The challenge for the College in adopting and implementing renewable energy practices will be to find and secure access to renewable energy. It is understood that the College has to develop renewable energy goals with other SUNY colleges and universities with the State as a potential partner. NYSERDA is working to build a vibrant renewable energy industry by 2013, in which twenty-five percent of all power used in New York would come from renewable resources via the Renewable Portfolio Standard. Renewable resources include solar, wind, biomass, and some hydroelectricity.[24]

Key Findings

The College's Goal of 15 Percent Energy Reduction in Six Years is not Aligned with the ACUPCC Goal.

The College's building portfolio is performing within or below national average for energy performance. None of the 29 monitored buildings meet the 2030 Challenge's first benchmark of being 50 percent more energy efficient compared to national averages. By signing the ACUPCC commitment, the College shares the 2030 Challenge's goal of becoming carbon neutral by 2030 or 2050. The College has set a goal for achieving a 15 percent reduction in energy use within six years (2008 – 2014). In 2014, the College should reevaluate the energy performance of its buildings and establish a new energy reduction target that will help the College achieve carbon neutrality by 2030 or 2050.

The College's Adoption of LEED Silver or Equivalent as the Standard for New Construction may not be Sufficient for Achieving Significant Energy Performance Improvements.

SUNY Buffalo (UB) realized that LEED Certified and Silver buildings may be too "modestly green." Within the context of meeting the ACUPCC, UB realized that colleges and universities serious about green building design should aim for LEED Gold and Platinum certification, with a focus on maximizing LEED energy points.[25]

[22] http://www2.cortland.edu/bulletin/issues/bulletin-09-10/bulletin-13--march-22.dot
[23] http://greenbuildingelements.com/2008/03/06/geothermal-energy-and-ground-source-heat-pumps/
[24] http://www.powernaturally.org/
[25] Simpson, Walter "Organizing an Effective Campus Energy Program: Lessons from the University at Buffalo" http://www.aashe.org/files/resources/Simpson2008-Organizing-an-Effective-Campus-Energy-Program.pdf

The College does not have a Complete GHG Inventory that Documents Findings and Methodology for Assessing GHG Emissions for Buildings and Energy Sources.
Goals for energy reduction and energy performance have to be defined in the context of the College's total GHG emissions.

Recommendations

Achieve Carbon Neutrality by 2030 or 2050

The first step toward carbon neutrality is complying with the reporting requirements of the ACUPCC and the creation of a GHG inventory. The American College & University Presidents' Climate Commitment has recently removed 15 institutions from its list. The institutions missed the first three initial reporting requirements:

- An Implementation Profile due within two months of their start date;
- A Greenhouse Gas Emissions Inventory due within one year of their start date; and
- A Climate Action Plan due within two years of their start-date.[26]

Cortland signed the agreement in November 2007 and has missed two of the initial reporting requirement deadlines as stated above. The deadline for the College to submit a GHG inventory was September 2008 and the deadline for submitting a Climate Action Plan was September 2009.[27] It is imperative that the College fulfill the requirements to comply with the ACUPCC.

At the Sustainability Workshop, the consultant recommended that the College adopt the draft 2008 GHG inventory. However, given that the GHG inventory was not available to reference in the Suastainability Master Plan or the Facilities Master Plan Phase II Report, this recommendation should be revised. The College should adopt the ACUPCC and AASHE STARS recommended methodology and proceed with a new GHG inventory using the Clean Air Cool Planet Calculator[28] as soon as possible.

In addition to the creation of a GHG inventory, the College needs to establish and adopt a clear carbon neutrality timeframe – 2030 or 2050. This will impact the types of benchmarks and energy initiatives required to meet the deadline.

[26] http://www.insidehighered.com/news/2010/07/02/qt#231513
[27] As a good example for a Climate Action Plan (CAP) is the one submitted by the University of Buffalo http://www.buffalo.edu/ub2020/environmentalstewardship/files/UB_CAP_FINAL_September15.pdf
[28] The Campus Carbon Calculator™ is the leading tool for assessing campus greenhouse gas emissions. Currently in use at more than 1200 campuses across the country, the Calculator has already helped schools of all sizes and types, and in all regions to tackle global warming. The Calculator is the "tool of record" for most of the 600 signatories to the American Colleges and University Presidents Climate Commitment, a voluntary agreement to move toward campus "climate neutrality." http://www.cleanair-coolplanet.org/toolkit/

Align College Initiatives with AASHE STARS Framework

The College should continue to comply with the AASHE guidelines, including the following recommendations:

- Complete a GHG emissions inventory based on the Clean Air Cool Planet calculator
- Reduce energy consumption through lean and renewable energy including solar, wind, geothermal, and low-impact hydro-power
- Adopt LEED Silver for operations, renovations, and construction

While LEED Silver is mandated by the State, SUNY Cortland should consider adopting LEED Gold as the standard for new construction to significantly improve the energy performance of its buildings. LEED Gold was reported as the goal for the future Student Life Center. Complying with AASHE STARS comprehensive LEED approach for operations and renovations, in addition to new construction, is a logical next step.

The scope of AASHE STARS extends beyond energy. It provides a framework for understanding sustainability in all sectors of higher education and enables meaningful comparisons over time and across institutions.[29] Institutions must document and report on all aspects of sustainability including education and research, operations and planning, administration and engagement. In the absence of staff dedicated to sustainability, it seems unlikely that the College could undertake a comprehensive report on sustainability on campus in the near future. The recommendation is for the College to first fulfill requirements for the ACUPCC focusing on sustainable energy performance. Fulfilling the ACUPCC requirements will position the College for AASHE STARS reporting on energy.

Integrate the Energy Report Findings in the Facilities Master Plan

The Facilities Master Plan provides opportunities to address building energy management and maintenance policies. Some estimates suggest that energy management and maintenance programs can reduce energy use in individual buildings by as much as 40 percent. The U.S. Department of Energy (DOE) estimates that operation and maintenance programs targeting energy efficiency can save 5 to 20 percent on energy bills with little capital investment at all.[30] Preliminary findings of the energy report and the building assessment findings have been factored in to the Facilities Master Plan final recommendations.

Set Clear Goals for Implementing Energy Strategies on Campus

The College is looking for achievable sustainability goals. It is recommended that the College:

- Require new buildings and major renovations to meet an energy consumption performance standard of 50 percent of the regional average. Energy policy should be the focus of "LEED Silver for Cortland."

[29] http://www.aashe.org/files/documents/STARS/STARS_1.0.1_Technical_Manual.pdf
[30] http://www.nrel.gov/applying_technologies/climate_neutral/energy_efficient_building_management.html

- Develop energy policies for the residence halls to improve their energy performance. Recommended strategies should provide for maintenance and operations guidelines as well as recommendations for behavioral changes. [31]
- Set a more ambitious goal for the next ten years, focusing on GHG emissions reduction that makes a clear connection between the campus' annual/mid-term performance and the long-term commitment for achieving carbon neutrality. [32]

[31] As reported for SUNY Buffalo: *Most colleges and universities have seen an explosion of computer use in the past 15 years. Coincident with this development is higher energy use--sometimes referred to as "load creep." A 150-watt personal computer system (CPU, monitor, and printer) will use 1,314 kilowatt hours of electricity a year if left on continuously. To generate that much electricity it takes the energy equivalent of over 1,000 pounds of coal or 100 gallons of oil. At UB's electric rates, 1,314 kilowatt hours cost over $100. While that is a relatively small amount compared to our $25 million annual energy bill, the energy used by all of our computers adds up. Nonetheless, we estimate that our annual computer-related energy costs at approximate $2 million a year.*
http://www.aashe.org/files/resources/Simpson2008-Organizing-an-Effective-Campus-Energy-Program.pdf

[32] Many schools are reporting on a yearly basis GHG reduction. For example, it is posted on Cornell University's website that by 2010 Cornell will drop below 1990 carbon emission levels. (That is two years ahead of schedule.) http://www.sustainablecampus.cornell.edu/climate/cornellscommitment.cfm

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Transportation Analysis

Overview

The responsibility for sustainable transportation falls at all levels in a university. Everyone from a freshmen to the college president has a role in reducing an institution's transportation-related carbon footprint. It is necessary to address transportation issues and goals with physical, administrative, and social actions.

As a guiding goal with regard to transportation, SUNY Cortland should seek to reduce carbon emissions through social and physical measures to minimize vehicle-miles traveled (VMT) and cold starts in vehicles burning fossil fuels. Any measure that will cause people to drive less, and walk, bike, or take transit more, should be recognized and valued.

Issues Statement

The following are challenges to the sustainability of transportation energy systems:

- Resource depletion
- Energy dependence
- The need to stave off the worst effects of global warming by moderating carbon emissions

SUNY Cortland's transportation impacts are generated by the campus fleet, student commuting, and employee commuting. The campus has a fleet of Global Electric Motorcars (GEM) cars – 28, more than any other campus in the SUNY system. SUNY Cortland's efforts to minimize the environmental impacts of its own fleet are valuable in themselves and also as a model for private action. However, by far the most vehicle-miles traveled are by employees and students.

In the effort to reduce greenhouse gas (GHG) emissions from vehicles, the College will seek to influence the travel behavior of faculty, staff, students, and visitors. These efforts will need to address certain existing conditions and policies:

- Parking is not restricted on campus in terms of space availability and fees.
- Parking is heavily subsidized and permit prices are very low.
- Regional/citywide transit options are limited.
- The campus does not have a walking culture. Walking is inhibited by geography and weather.
- Lack of a downtown grocery store increases automobile dependence.
- All students are allowed to bring cars to campus.
- As a group, employees travel twice as far daily as students; ten times as far as freshmen. The employee average VMT is driven up by adjuncts and part-timer employees, who tend to live further away.

A general fact that must be taken into account when planning for transportation sustainability is that automotive GHG emissions are not a direct function of VMT. Up

to 80 percent of emissions occur during the first ten minutes of operation, when the engine is running rich, the oxygen sensor is not yet operational, and the catalytic converter has not reached its 'light-off' temperature.[33] See Figure 1. It is therefore most important to reduce the number of short vehicle trips, both intra-campus and off-campus, not just the total mileage traveled.

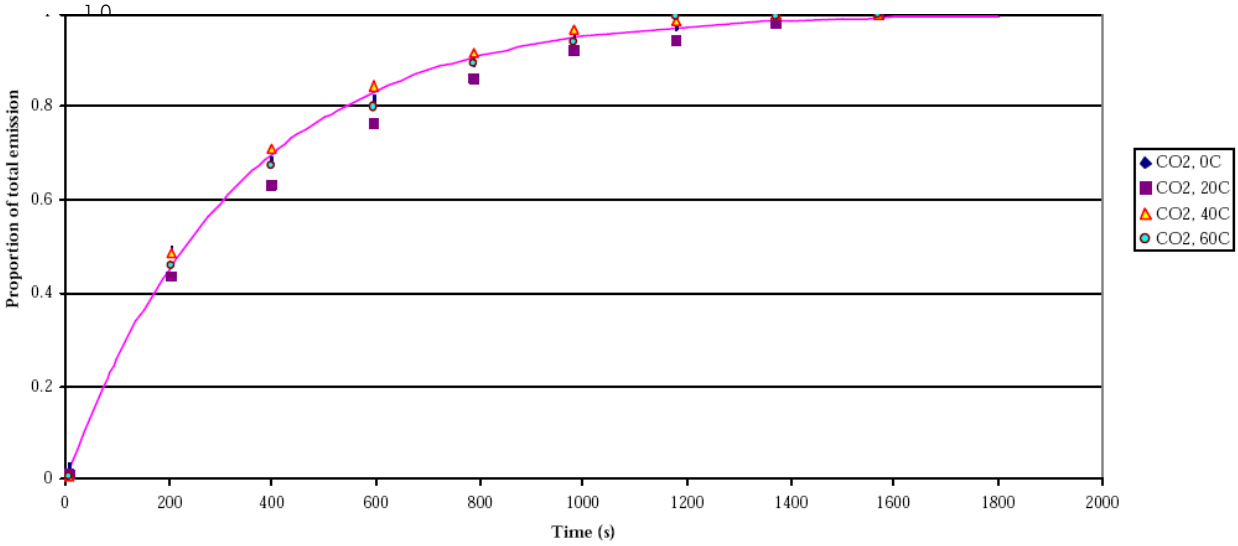


Figure 1. Proportion of Total CO_2 Emissions as a Function of Time at an Ambient Temperature of 32°F, for a VW Golf[34]

Methodology

In terms of sustainability, the effectiveness of a transportation systems management plan depends on how well it identifies the potential for carbon emissions reductions. This in turn depends on understanding which segments of the college community – employees, resident students, and commuter students – drive the furthest and the most frequently. Estimates of each segment's VMT per capita can spotlight opportunities to significantly reduce the VMT of the College as a whole.

In developing recommendations for action by the College with regard to transportation policy, operations, and capital investments, all available relevant information was reviewed. Patterns of commuting were inspected, available transportation alternatives were identified and assessed, and parking policies were analyzed in terms of how they affect mode choice. The recommended strategies – primarily incentives and disincentives – are targeted at the people who are most likely to be able, consistent with their self-interest, to modify their travel behavior toward decreased dependence on fossil fuels.

[33] Michael E. Karpuk, TDA Research Inc., "Catalysts for the Control of Automotive Cold Start Emissions". National Center For Environmental Research, 1994.

[34] DCW Blaikley, AP Smith, EA Feest, AH Reading, AEA Technology plc, "UG219 TRAMAQ- Cold Start Emissions.(Summary report)". Charging and Local Transport Division, UK Department of the Environment Transport and the Regions (DETR), 2001.

Analysis

Demographics

Residential Distribution and Commuting Patterns

Figures 2 and 3 show the distribution of faculty residences. The figures show significant concentrations of faculty living in Tompkins and Onondaga Counties as well as Cortland.

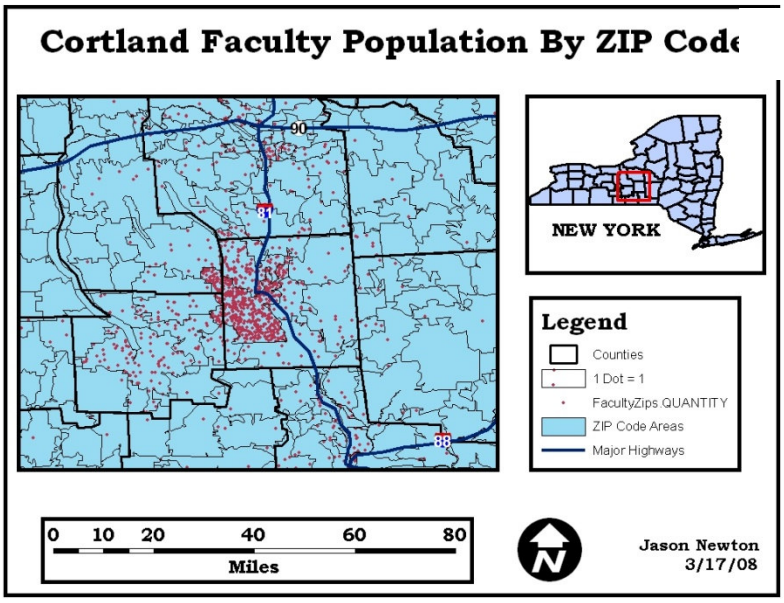


Figure 2. Faculty Residential Distribution

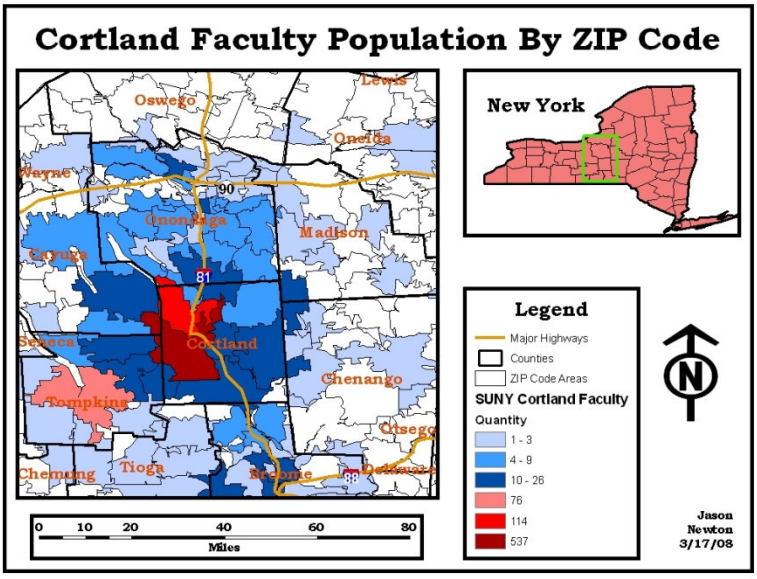
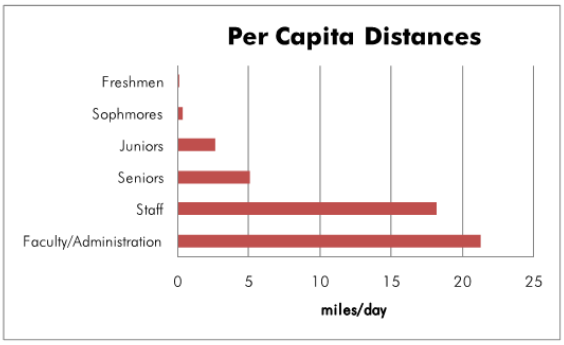
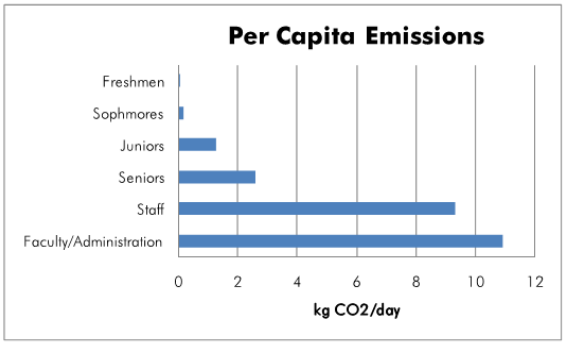


Figure 3. Faculty Residential Distribution, by Zip Code



Source: Email from Brice Smith, Chair of the Physics Department, to Jean Stark dated 25 February 2010



Source: Email from Brice Smith, Chair of the Physics Department, to Jean Stark dated 25 February 2010

Figures 4 and 5. Per Capita Commuting Distances and Daily CO_2 Emissions

	Pop.	VMT day*	Kg CO2 day*
Faculty /Staff/ Admin.	1,294	23,290	11,650
Freshmen	1,321	240	120
Sophomores	1,584	710	360
Juniors	1,718	3,870	1,930
Seniors	1,636	7,360	3,680
All Undergrads	6,258	12,180	6,090

Table 1. Daily Vehicle-Miles Traveled and Emissions by Group

Figures 4 and 5 and Table 1 deal with the average distances traveled from home to campus by faculty, staff, and students. The figures show that, on a per-capita basis, faculty and staff travel substantially exceeds that of students.

Lot	Fac/ Staff	Student	Grad Student	Timed	VIP	Open	HP	Service	Police & State	Other	TOTAL
Bowers	33			0	0	0	1		0	0	34
Casey	35			4	0	0	1		0	4	44
Commissary	44			0	0	0			0	0	44
Dowd	30			0	0	0	2		0	0	32
Heating Plant	100			0	0	0	3	5	0	0	108
McDonald	6			0	0	0	1		0	0	7
Neubig	12			0	0	0	2		0	4	18
PER Lot	43	498		0	0	0	6		0	0	547
Brockway	32			0	0	0	4	2	0	0	38
Corey	4			8	0	0	3	8	0	2	25
DeGroat	9			0	0	0	1		0	2	12
Graham Ave.			142	0	0	0			0	0	142
Library				0	0	0	2	4	0	0	6
Miller	66			3	11	0	3		0	0	83
Pashley			59	0	0	0			0	0	59
NW PER		87		0	0	0			0	6	93
SW PER		114		0	0	0	3		0	0	117
Service Group	17			0	0	0			0	0	17
Service Group Yard				0	0	0		40	14	0	54
Stadium	51			0	0	0	3		0	0	54
Studio West*	21	340		0	0	10	3		0	0	374
Smith	4			0	0	0			0	2	6
Van Hoesen	152			0	0	1	4		6	6	169
Van Hoesen Conf.	16			0	0	0			0	0	16
Whitaker	13			0	0	0	5		0	5	23
281 Lot		400		0	0	0			0	0	400
TOTAL	688	1,439	201	15	11	11	47	59	20	31	2,522

*Now the Professional Studies Building.

Table 2. Parking Inventory by Space Assignment

Parking

Table 2 and Figure 6 on the following page show the assignment of parking between user groups. Spaces for students, undergraduate and graduate, comprise two-thirds of the total parking inventory; faculty spaces just over one quarter. As Figure 7 shows, these proportions have been steady over the past five years.

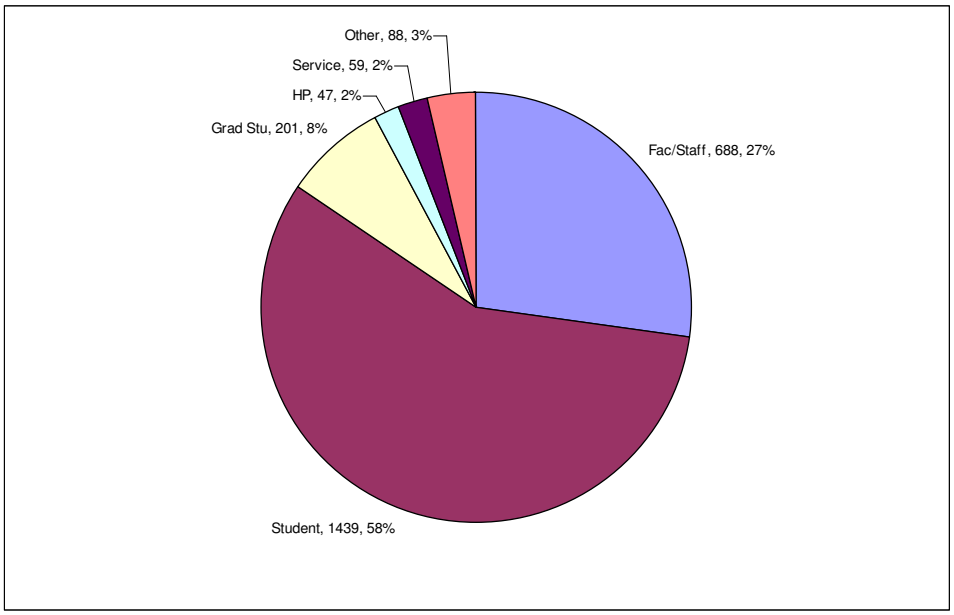


Figure 6. Assignment of Parking Spaces

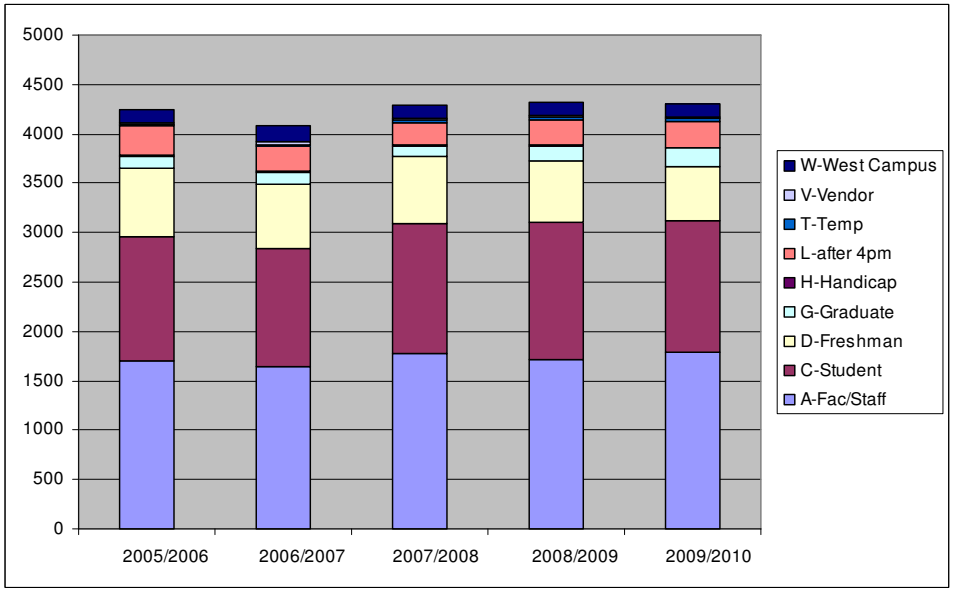


Figure 7. Parking Permit Types, 2005 - 2010

To better understand patterns of parking usage, Table 3 compares parking permits and parking spaces with the populations of students and employees. Many employees have more than one permit, presumably for display in each car of a two-car family. Although this fact does not necessarily indicate a high amount of car use by employees, it does point to a problem that was identified in the workshop, i.e. that employees could take extra permits and allow non-employees to use them. Employees are allocated three times as many spaces per capita than students.

	Pop.	Permits	Permits Capita	Spaces	Spaces Capita	Spaces permit
Faculty/Staff/Admin.	1,294	1,791	1.4	764	0.6	0.4
Students	7,322	2,455	0.3	1700	0.2	0.7
Total	8,616			2,464	.29	

Table 3. Population, Permits and Spaces by Employee/Student

Parking pricing is an important tool in transportation demand management. However, at SUNY Cortland the cost of parking permits is not a disincentive to auto use, as permit fees are negligible for employees and freshmen.

Faculty/Staff/Admin.	$15/yr	A spaces
Upperclass	$112.50/yr	C spaces
Freshmen	$15/yr	D spaces

Table 4. Parking Permit Fees

Bicycling

The campus has a strong bicycle culture, with a college-sponsored Community Bike Program, bike-sharing and on-campus bike shop/center, and protected bike parking in Glass Tower. The Bike Program is an established, visible, successful grassroots expression of commitment to sustainability. However, bicycle racks are in short supply and inconsistent in quality.

Transit

On-Campus. SUNY Cortland has a shuttle service with three regular bus routes whose primary function is to connect the upper campus with the lower campus and the parking there. Bus schedules are structured to coincide with class changes. This is practical and convenient for students, but it results in irregular headways, meaning that the service is less useful for general cross-campus mobility. Figure 8 shows how ridership fluctuates throughout the day and indicates that the shuttle is not used much except during class change times.

Class Start Times	8:00 a.m.	9:10 a.m.	10:20 a.m.	11:30 a.m.	12:40 p.m.	1:50 p.m.	3:00 p.m.	4:25 p.m.
Departures From Moffett	7:40 a.m.	8:50 a.m.	10:00 a.m.	11:05 a.m.	12:20 p.m.	1:25 p.m.	2:30 p.m.	3:55 p.m.
	7:45 a.m.	9:00 a.m.	10:05 a.m.	11:15 a.m.	12:25 p.m.	1:35 p.m.	2:40 p.m.	4:05 p.m.
	7:50 a.m.	9:05 a.m.	10:10 a.m.	11:20 a.m.	12:35 p.m.	1:40 p.m.	2:50 p.m.	4:25 p.m.
	8:00 a.m.	9:10 a.m.	10:20 a.m.	11:25 a.m.	12:40 p.m.	1:50 p.m.	3:00 p.m.	4:55 p.m.
	8:05 a.m.	9:20 a.m.	10:25 a.m.	11:35 a.m.	12:45 p.m.	1:55 p.m.	3:05 p.m.	5:25 p.m.
	8:10 a.m.	9:25 a.m.	10:40 a.m.	11:45 a.m.	12:55 p.m.	2:00 p.m.	3:25 p.m.	5:55 p.m.
	8:25 a.m.	9:30 a.m.		12:00 p.m.	1:05 p.m.	2:10 p.m.	3:45 p.m.	6:25 p.m.
	8:45 a.m.	9:40 a.m.						*6:55 p.m.

*Evening departures from Moffett continue at approximately X:25 and X:55 until 10:25 p.m.

Table 5. Shuttle Schedule, Moffett to Park Center

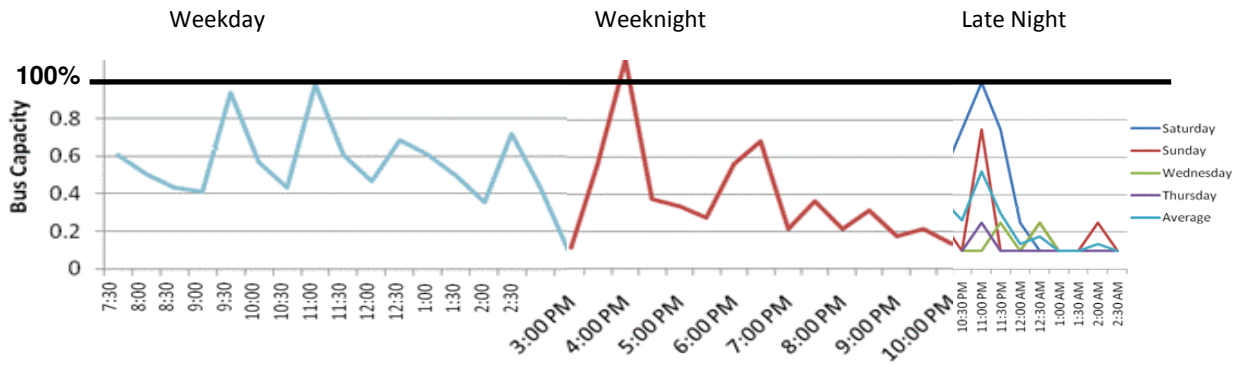


Figure 8. Campus Shuttle Ridership, 2008

Regional Public Transit. Cortland Transit runs six bus routes – three within Cortland and three further afield. See Figures 9 and 10.

Cortland Transit is not a viable commuting option for most. Its long headways (30 minutes) and limited coverage (no service to Onondaga County or Ithaca) make it impractical for daily transportation.

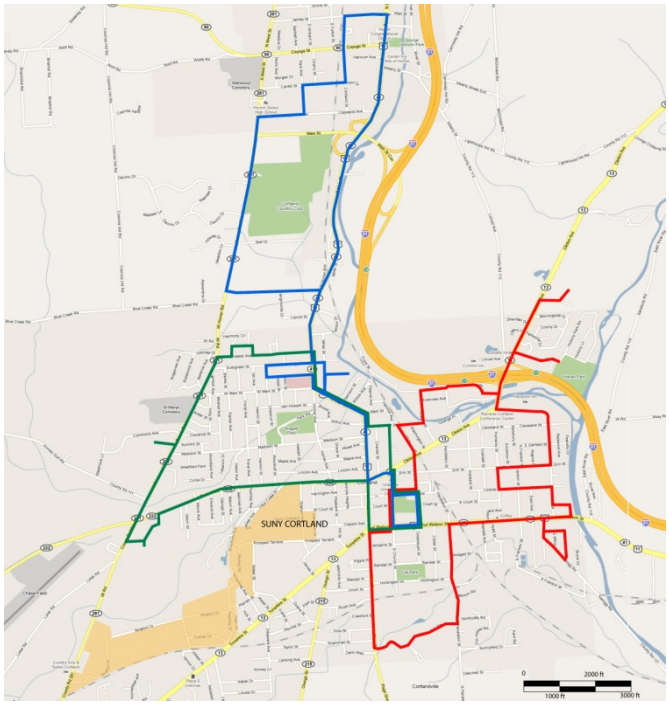


Figure 9. Cortland Transit Routes 1, 2 and 3

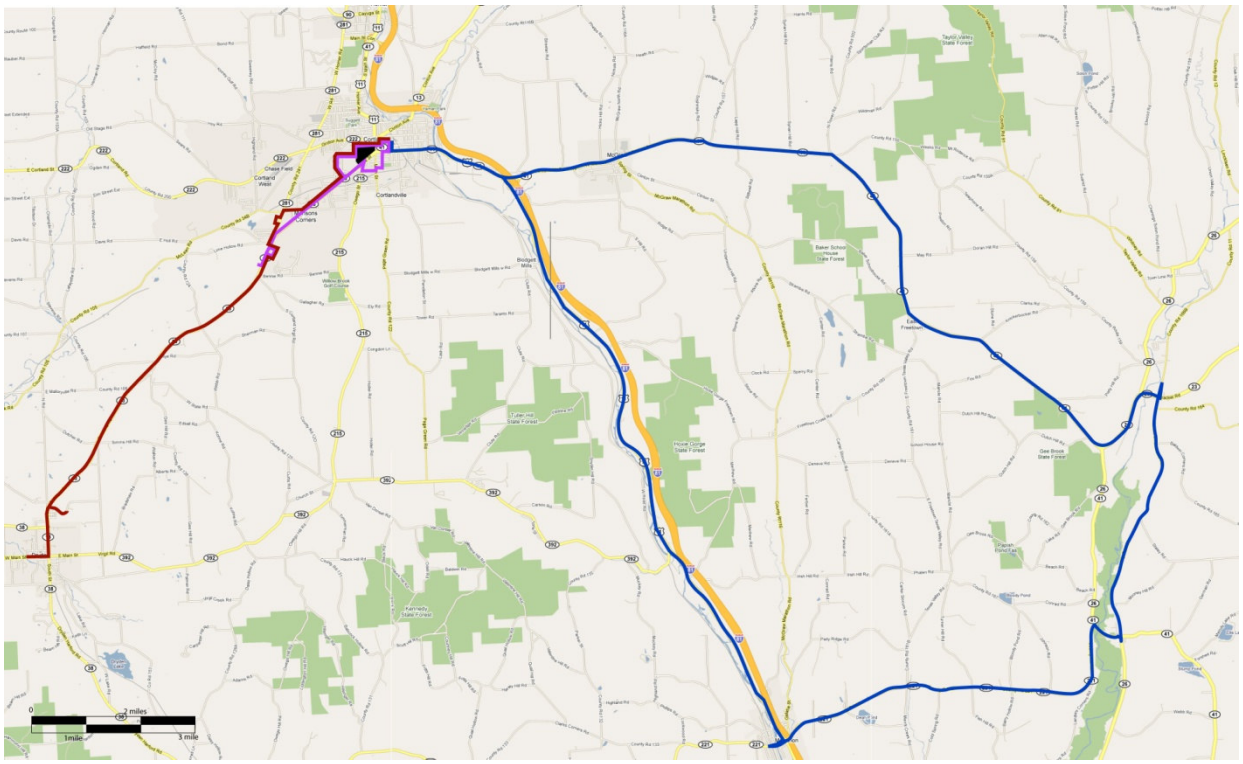


Figure 10. Cortland Transit Routes 4, 5 and 6

Key Findings

- Employees have much greater transportation-related carbon impacts than students on a per-capita basis.
- A shortage of public transit services hinders Transportation Demand Management (TDM) efforts.
- Dispersal of employee residences compels long commute trips.
- The shape and topography of campus is challenging to pedestrians and bikes.
- Rain/cold/snow also foster automobile dependence.
- The administration has sent mixed messages about the use of cars to get to and around campus.

Recommendations

Transportation Sustainability Goals

- Reduce vehicle-miles traveled for commuting; reduce single occupancy vehicular use. Commuting, in particular by employees, is the single largest component of the College's ground transportation mileage.
- Reduce cross-campus automobile trips. In order to minimize cold starts for short trips, which on a per-mile basis are much more harmful than long trips, the amount of driving between upper and lower campus must be reduced.
- Provide alternatives to off-campus driving for residents. Short off-campus car trips, such as to downtown Cortland, are also responsible for disproportionate GHG emissions on a per-mile basis.

- Assess baseline cost of parking. To the extent that people's mode choices are price-sensitive, parking permit fees should serve as a disincentive to automobile use. Understanding the full cost to the College of providing parking on a per-space basis – including annualized costs of construction, maintenance, operations and land – is a step toward pricing it fairly and rationally.
- Improve sustainable transportation modes to and on campus. Transit, walking, and bicycling options should be developed to foster appreciation and use of transportation alternatives.

Potential Strategies

The following recommendations are made in the context of their contribution to achieving the College's goal of carbon neutrality by 2050, meeting the goals identified under AASHE STARS, and their impact on the Facilities Master Plan.

General

- Develop strategies for improving local/regional transit options (access and availability).
- Continue to improve campus shuttle service; market to entire campus community.
- Educate the campus community on the GHG impact of driving.
- Consider allowing employee telecommuting and flex-time resulting in VMT reduction.
- Investigate transit synergies with neighboring colleges and universities (Cornell, Ithaca, and Tompkins County Community College).
- Sustainable transportation practices should be mentioned in the College's strategic plan.
- Restrict parking for freshmen and sophomores.

Off-Campus Travel

- Raise parking permit prices and eliminate hidden subsidies.
- Offer TDM incentives: occasional parking permits; guaranteed rides home; preferential parking for ridesharers and low-emission vehicles.
- Initiate commuter shuttle services and park-and-ride.
- Increase percentage of resident students.
- Provide commuter shuttles to employees living in clusters (e.g. Ithaca, Syracuse).
- Encourage and market residences within walking/cycling distance to employees and students.
- Extend regular shuttle service to downtown.

Intra-Campus Travel

- Improve campus environment for walking and bicycling.
- Expand support for bicycling through enhancement and publicizing of the Community Bike Program.
- Convert fleet vehicles to renewable fuels.
- Enhance shuttle service.
- Examine the influence of shuttle scheduling on the number and length of vehicle trips.
- Enhance on-campus entertainment and recreation to reduce the desire for students to travel off-campus.

Sustainability Framework

Overview

The Sustainability Master Plan provides a comprehensive sustainability framework organized by six sustainability elements: Energy & Climate, Transportation, Natural Systems, Water, Materials & Resources, and Community. Two work sessions were held during the Sustainability Workshop to identify issues, goals, and strategies for each element of the comprehensive framework. While the focus was on energy and transportation, the remaining elements were considered for their potential synergies, as advocated by AASHE STARS. The issues, goals, and strategies identified in the Sustainability Framework correspond to AASHE STARS and will provide the College with an excellent platform for organizing their reporting as they move forward with their sustainability initiaitives.

Energy and Climate

The College has made significant improvements in the management of its energy systems by sub-metering all buildings for electricity and replacing the central heating plant on the upper campus with satellite boilers. The College adopted LEED® Silver or equivalent as the standard for new construction but would like to define specific energy performance targets for each new building and renovation.

Strategies to reduce GHG emissions and to implement an energy management plan were discussed. As a first step, it was recommended that the current GHG inventory, which would establish 2006 – 2007 as the baseline year, be approved and adopted by the College. The GHG inventory should be updated on a yearly basis and be accompanied by a set incentives that reduce energy consumption and GHG emissions; e.g. establish department accountability/incentives for energy saving. The College should also develop a communication and education plan for energy use on campus. Energy performance should be competitive and visible.

Transportation

The GHG inventory suggests that transportation accounts for 12 percent of GHG emissions. Parking on campus is considered “free,” and the cost for stickers is negligible. The lack of a "walking culture" on campus and limited options for regional/citywide transit are considered challenges for developing alternative transportation strategies. The campus has a growing bicycle culture. The goals for sustainable transportation should be to reduce vehicle-miles traveled for commuting and to reduce single occupancy vehicle trips. Sustainable transportation options on campus should be improved by increasing the overall walkability of the campus and availability of bicycles.

Possible strategies for developing a sustainable transportation plan for the College were discussed. One important strategy would be to educate the campus community on the GHG impact of driving and to create a mission statement related to sustainable transportation practices. It was also recommended that the College

investigate transit synergies with neighboring institutions, such as Cornell University, Ithaca College, and Tompkins Cortland Community College (TC3), to broaden commuting options.

Natural Systems

The harsh winter climate challenges the year-round use of open spaces on campus. The College should consider the integration of seasonal landscapes to encourage year-round use of the campus. SUNY Cortland should also consider developing sustainable landscape requirements for future capital projects. Sustainable goals and strategies for natural systems should be integrated in the Facilities Master Plan.

Water

Consistent with its mission to "maximize resources," the College would like to minimize potable water use as part of its sustainable education. The College does not have a stormwater management plan and will eventually develop a plan as part of the State and City-wide mandate, understanding that this is not currently a priority.

Materials and Resources

In the current GHG inventory, food represents 12 percent of emissions (the same as transportation). This number is unusually high but is justified by the methodology developed by the College for calculating GHG emissions. As a first step, it will be important for the College to understand how the emissions were calculated and set goals for reducing GHG emissions related to food.

Community

The Cortland County Relocalization and Resilience Initiative (CCRRI) is in the process of establishing a baseline for sustainability for the local community. Most opportunities to advance community-related sustainability goals would involve developing synergies between SUNY Cortland and community groups, such as CCRRI.

Next Steps

Coordination with AASHE STARS

As mentioned earlier in the report, SUNY Cortland has enrolled in the Association for the Advancement of Sustainability in Higher Education (AASHE) sustainability tracking, assessment, and rating system (STARS) to facilitate a comprehensive approach to sustainability progress. The Sustainability Master Plan is organized to correspond with the STARS categories that are included in this study (see comparison table below).

AASHE STARS	SUSTAINABILITY MASTER PLAN
1. Education and Research	
Curriculum	
Research	
Co-Curricular Education	
2. Operations	Environmental Sustainability
Grounds	Natural Systems and Landscape
Water	Water
Energy/Climate/Buildings	Energy
Waste/Purchasing/Dining Services	Materials & Waste
Transportation	Transportation
3. Administration and Finance	Economic and Sustainability
Investment/Diversity and Affordability	Cost & Economic Indicators
Public Engagement/Human Resources	Master Plan Community
Diversity and Affordability	Local Community
Coordination and Planning	

Categories relating to academic and research initiatives, as well as some organizational initiatives, will be supplemented by the College as they are developed. Some of these initiatives are underway and are further described below.

STARS Category 1: Education and Research

Co-Curricular Education

The College has invested in four initiatives to increase the awareness and engagement of students in sustainability initiatives:

- The Green Office Competition hosted by Student Affairs is a checklist and point system to improve the sustainability of offices. Individual offices participated voluntarily and could choose which "green" behaviors they wished to undertake. The offices that scored the most points won prizes.
- The Cortaca Climate Challenge was a competition between SUNY Cortland and Ithaca College to reduce their carbon footprint. Participants learned new ways to live more sustainably. SUNY Cortland won this competition in 2010. The efforts to

reduce the campus carbon footprint would have ranked Cortland in the top ten Green Campuses in 2009.
- The Earth Day event - "Wellness Wednesday" - was conducted in coordination with Cathy Smith's Health Promotion Office. The table and exhibits set up in the Corey Union vary from year to year. One year, Cortland hosted a sustainability game show where students would answer questions to win prizes.
- In 2010, SUNY Cortland held an inaugural Sustainability Week on campus, in celebration of the 40th Anniversary of Earth Day. Faculty, administrators, staff, and students were invited to get involved in the Sustainability Week activities including Green Workshops, Poster Sessions, and Research Sessions.

Curriculum

During Sustainability Week, SUNY Cortland offered opportunities to showcase courses incorporating sustainability into their curriculum. These courses were advertised as part of the overall campus program. Faculty interested in devoting at least one class during that week to sustainability issues were highlighted.

Research

SUNY Cortland has many faculty involved in sustainability research. Brice Smith, Lynn Anderson, Eddie Hill, and Lindsey Brown have researched the impact of SUNY Cortland's Community Bike Project. Various research projects have stemmed from this effort to determine the need and impact of this project. Sharon Todd has given multiple presentations related to: Taking Small Steps to Save the World: Our College Community's Ecological Values, Attitudes, and Behaviors. She surveyed the campus to assess current sustainably practices.

Eddie Hill and Amy Shellman, along with graduate students, are working on a research project to Measure the Educational Impact of the Promoting Environmental Awareness in Kids (PEAK) Program: The Development and Implementation of a New Scale. This collaborative project includes the Colorado-based Leave No Trace: Center for Outdoor Ethics.

Early Actions for Sustainability Achievements

The Sustainability Master Plan outlines a number of "early actions" that the College can pursue in the near term. Many initiatives have already been undertaken during the course of the planning process including:

- Since 2008 when the President signed the American University President's Climate Commitment (AUPCC), a sustainability task force was formed and a series of ad hoc and/or individual initiatives have flourished, such as the Green Reps program at the residence halls.
- The President formed a Sustainability Steering Committee to coordinate sustainability efforts on campus.
- The College has adopted the Association for the Advancement of Sustainability in Higher Education (AASHE) STARS for tracking, assessing, and reporting sustainability progress.

- Based on the costs of energy since 2007, the Facilities Management (FM) and the Information Resources established the "Green Building Collaborative Committee" to identify the easy to implement projects and programs that would reduce energy and enhance green programs including application for the NYSERDA grants. The FM unit applied for the American Recovery and Reinvestment Act (ARRA) grant in 2009 through NYSERDA and received two grants in two rounds for a total of $175,000.
- SUNY Cortland is a forerunner in the SUNY system in creating and implementing strategies for the buildings maintenance, new construction, and indoor air quality since 1995. In 2006 the SUNY Cortland Physical Plant received the prestigious Governor's Work Force Champions award for its efforts to engage the campus community in energy savings initiatives over the winter of 2005-2006.
- All new projects are designed to comply with the State mandated LEED Silver requirements. The campus has started to recommission its older building; four buildings have been addressed to date. SUNY Cortland is in the process of decentralizing its heating and has introduced solar hot water in residence halls. This will likely reduce gas use by 40 percent.
- SUNY Cortland is following the State requirements on pest control. Since 2009 Cortland has started low mow and no mow landscaping programs. Cortland has also adopted the green purchasing and recycles materials program.
- Transportation needs to be addressed in the near term. Cortland is exploring the regional transit system as well as carpooling programs.
- SUNY Cortland has an active recycling program.
- Cortland's food provider, ASC, has developed programs to purchase local foods and reuse oil byproducts for biodiesel.

Additional near term sustainable recommendations for the College include:

- Use the Clean Air Cool Planet calculator to develop a baseline GHG inventory. The GHG inventory should be submitted as soon as possible to the ACUPCC to meet the September 2008 requirement.
- Calculate the cost per parking space.
- Develop an exterior signage and wayfinding plan ("from here to there") that advertises timed walking distances to different buildings on campus to encourage the campus community to walk.
- Establish and adopt a target date for carbon neutrality.
- Appoint a Sustainability Coordinator to oversee sustainability initiatives on campus.

Integration with the Facilities Master Plan

The Sustainability Master Plan has run more or less concurrently with the SUNY Cortland Facilities Master Plan (FMP). The goals, analysis and strategies have been coordinated at key milestones throughout the process. Overall, the FMP plan incorporates sustainability best practices in the following key areas:

Climate Responsive Design

Given the cold winter climate of central New York, improvements to the landscape character of outdoor gathering spaces should be made to protect them from harsh winter winds and promote excellent solar access. Selecting plant materials and trees to allow for color and variation, especially during the winter and limiting the amount of shade created by landscape features are also important design considerations for future projects.

The FMP illustrates the realignment of some of the major pedestrian paths on campus, especially around and through the Cornish-Van Hoesen complex. Addressing the transparency and pedestrian flow between buildings and through buildings is a critical design strategy in the FMP. Currently, Van Hoesen presents a significant barrier between the upper campus and Corey Union and middle campus. The FMP proposes the creation of a highly visible and direct route through the building.

Energy Performance of Existing Buildings

In order to meet the ACUPCC goal of reaching carbon neutrality by 2050, the College needs to make dramatic improvements to the energy performance of campus buildings.

To improve campus energy performance, theFMP recommends repurposing and renovation of the buildings with the worst energy performance, namely Corey Union, Winchell Hall, and Neubig Hall. Proposed renovations focus on upgrading mechanical systems, improving energy efficiency by upgrading building envelopes, windows, improving climate controls and adapting buildings to create more opportunities for passive heating and cooling. These recommendations are further detailed in the FMP.

Renovations to the Memorial Library were explored in an independent program study and will, among other imporvements, address poor energy performance issues.

Transportation Demand Management

The challenges for implementing sustainable transportation options on campus are: a shortage of public transit services; the topography of the campus that challenges pedestrians and bicycles; and the winter climate fostering automobile dependence. To address these challenges, the College should develop a transportation demand management strategy that promotes pedestrian, bicycle, and transit use while limiting single-occupancy vehicle use and managing parking as part of a comprehensive set of programs aimed at diminishing the transportation-related carbon footprint of the College.

The College should set targeted transportation sustainability goals, such as reducing vehicle-miles traveled for commuting and cross-campus automobile trips or improving sustainable transportation modes to, from, and on campus. Potential strategies are identified in the context of their contribution to achieving the College's goal of carbon neutrality by 2050 and to meeting the goals identified under AASHE STARS. Recommended strategies include raising parking permit prices, initiating commuter shuttle and park-and-ride services, expanding support for bicycling through enhancement and publicizing of the Community Bike Program, and converting fleet vehicles to renewable fuels.

Improved Pedestrian Connectivity

One of the most important design strategies in the FMP is to improve the pedestrian and bicycling experience along Neubig Road. Improving the landscape character of the middle campus will help promote pedestrian use. A parking management strategy that encourages commuters to park once and walk, combined with improvements on Neubig Road, should help reduce cold start short vehicle trips.

Overall, the FMP focuses on creating higher quality and more accessible pedestrian routes through buildings and across campus.

Functional Attributes of the Landscape

Landscape projects associated with building renovations will improve the character and usability of the outdoor campus setting and help to address storm water management issues. Reducing the amount of pavement and replacing existing impervious pavement with permeable paving where appropriate will reduce the storm water load on existing drainage infrastructure.

Another important design goal is to support learning opportunities everywhere on campus as part of building and site improvement projects. For example, in the plaza areas proposed at the southwest entrance to Van Hoesen B-Wing, and the eastern entrance to C-Wing off the Quad, seat walls and paving patterns will create opportunities for outdoor learning.

Future landscape development should incorporate sustainable practices. All parking lots should be well screened and canopy trees incorporated where possible to break up large expanses of pavement and reduce the heat island effect.

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Appendix

Detailed Minutes of the Sustainability Workshop

Introduction Session

Introductory Comments

- The Sustainability Master Plan will tie into the Facilities Master Plan.
- The goal is to end up with concrete sustainable strategies.
- Architecture 2030 Challenge – focus on climate change.
- President's Climate Commitment – goal to become climate neutral.
- Mississippi State University has a web site for AASHE STARS.
- Princeton Review Green Campus – green report cards for campuses.
- AASHE – social/environmental/economic components.

General Feedback

- Sustainability needs to be integrated with curriculum.
- There are three sanctioned sustainability groups at Cortland:
  - Energy Task Force
  - Carbon Neutrality Committee – met last year
  - Green Collaborative Opportunity Assessment (collaboration between IT and Facilities). This group meets monthly to identify grants to handle very specific items (ex: stadium lights). It focuses on energy reduction; reducing energy center power use; $250,000 worth of grants from NYSERDA in last two years.
- Money is the primary limitation with regard to creating a formal "office of sustainability."
- President: Envious of campuses that have the resources to hire a Sustainability Officer. Current budget challenges make that idea cost prohibitive. "Whatever we decide, we need to do it with existing resources."
- President: Cornell's President changed end date for carbon neutrality from 2030 to 2050. He was one of the people to initiate President's Climate Commitment. Cortland is planning to use the Facility Master Plan to help set the College up to develop AASHE goals. Cortland delayed acting upon the ACUPCC to see how Cornell's adjustments to the timeline from 2030 to 2050 would play out. President felt signing the Commitment was the "right thing to do." Does not matter if the College gets credit.
- Cortland is currently very active in terms of sustainable actions. ASC (food service), for example, got rid of their Styrofoam products and switched to porcelain. Students at Cortland also opted for a self-imposed tax for more sustainable food. President: "There are 'lots of flowers' blossoming (individual sustainability efforts), but they need to be integrated. Things are happening, they just are not visible."
- President: Need to identify champions and then tie them together and make it visible. Could identify champions for each aspect of AASHE STARS, translating them into "manageable bites."

- Nasrin: AASHE STARS will be an excellent tool for connecting all efforts on campus.
- President: Would like graduating students to say that course work and living in college community "changed my way of looking at the world and sustainability." The President would like it if not only biology majors talk about being green. Would like students to leave with a sense of civic and environmental responsibility.
- At Cortland sustainability is driven by administration, facilities, and finance.
- Cortland is the fourth most energy efficient campus within the SUNY system. This was evaluated on a per FTE basis.
- Mark: Strategic plan staked out terrain for sustainability in two of the four topics:
  - Academic excellence
  - Transformative education
  - Well being
- Cortland is working to define what this means. Cortland does not want to solely focus on the individual well being but also the need for a healthful environment. Middle states also addressing sustainability. Therefore, the College is at a good crossroads for aligning all efforts.
  - Maximizing resources to support sustainability
- Student Affairs staff – student competition to reduce energy use. Efforts to change student behavior.
- College has many different sustainability champions around the campus, but some faculty do not really care about being green. Have leadership in Facilities Department; have vision for campus.
- Cortland is not interested in buying credits because it is "not a sustainable strategy." Some departments do not incorporate sustainable curriculum.
- Bill: When buildings are constructed, sustainable strategies always seen to get cut. The College does not have enough money for additional faculty to teach students. The College is already committed to changing temperatures in buildings.
- AEI prepared Cornell's Sustainability Study.

Session One: Issues, Goals & Priorities

1. Energy

General Comments

- Central Heating Plant also includes a second power sub-station. There are two campus substations.
- Campus-wide electrical distribution redesign is underway.
- Sub-metering for electricity is located on every building – although not always reliable. Cortland is not set up to monitor natural gas, however.
- The hope is that with the switch to satellite boilers, each building will have metering capacity for natural gas and electricity.
- Tim Slack – in charge of all utilities. No current accountability for energy use.
- In total, there are three projects underway at Cortland:
  - Satellite boiler project (decommissioning of the central power plant for the upper campus only, the lower campus is already on a satellite boiler system).
  - Electric distribution project (do not yet know if campus will end up with one or two substations).
  - Sub-metering for electricity.
- Cortland currently participates in load sharing with SUNY.
- Buying power through SUNY's independent system operator (ISO), which is currently three to five percent renewable energy.
  - Cortland purchases electricity on a daily basis at a daily rate.
  - For natural gas, Cortland purchases it at an annual rate.
- Cortland is locked into the SUNY rate with regard to energy supply. This also means that it is bound to the SUNY system's approach to renewable energy:
  - Ten percent of SUNY's energy supply was considered renewable.
  - SUNY's intent was to increase that percentage to 30 percent, but now it is down to three to five percent.
- Few buildings are air conditioned.
- Joe Fox, System Administrator, has reports on energy (natural gas, electric, and water) monthly and yearly basis and compares Cortland to other SUNY institutions that participate in the ISO.
- Mary Kay Murphy, Business Officer, can give us the total utility usage for the entire campus (based on what they pay). Brice used the utility bills for the GHG study (2006-2007). She has information on sewer, water, oil, and natural gas. She shows the projected use and actual use and compares it to where Cortland was last year.
- 1990 – SUNY Survey Task Force used that date as baseline with a goal of 30 percent reduction: gas 27 percent reduction and electric ten percent reduction since 1990. Have not experienced a lot of growth since 1990.
- College (since 1990) appears to have met energy reduction of 13 percent by 2010.
  - Plug loads – electrical equipment students are bringing to campus is a serious issue.
- SUNY Energy Task Force uses 1990 as the baseline year but no accountability. Tim Slack can give us the baseline.

  - Per Nasrin: "Forget about this." SUNY has dropped this initiative. Monitoring is still in place, via Joe Fox, however accountability and enforcement is absent.
  - 1990 as baseline is not possible because data is not reliable.
- Cortland is ranked fourth in terms of energy efficiency within the SUNY system. The other three campuses have employed cogeneration.
- The Greenhouse Gas Inventory (GHG) was developed for the year 2006 – 2007. This should be regarded as Cortland's baseline year.
- Actual utility bills used for GHG report – based on 2005 – 2006, not back to 1990.
- Methodology of GHG report has been accepted by campus.
- Goal is for all buildings at Cortland to meet a minimum of LEED Silver standards. LEED Silver means the following at Cortland:
  - Daylight harvesting
  - Reuse waste water
  - Operable windows
  - Visible energy usage monitoring (communication and behavioral change)
  - Solar heat for pool
  - Green roofs
- New program under review with SUNY for Masters in Sustainable Energy; they will redo the GHG each year.
- Food sources and composting are being considered by ASC.

Priorities/Goals for Energy

- Would like to reduce energy use overall by ten percent in ten years – one percent per year.
- Adopt GHG inventory with 2006 – 2007 as the baseline year.
- Document impact of new satellite boiler project.
- Set goals for 2030 and 2050 to be carbon neutral.
- Measure GHG on a yearly basis.
- Improve education of and communication of energy use with the College community.

2. Transportation

General Comments

- Mostly about demand – "everybody moves."
- More faculty/staff parking permits are distributed than the number of faculty/staff.
  - Student workers can purchase multiple permits – as both a student and a staff member.
  - Multiple permits issued for multiple cars.
- There is a $15 registration fee for car but no actual cost for parking on the campus.
- Faculty/staff – contract issue that parking is free.
- Transportation equals twelve percent of College's GHG.
- Current vehicle or registration fees may not cover cost of operational costs and personal costs.
- Assess real cost of parking.

- Community is trying to get better transportation and a grocery store in city.
- Regional Council for transportation: Cayuga, Tompkins, Onondaga, and Cortland Counties working together.
- Cortland transit has no evening service.
- Campus transit – recent change to run in concert with class change times.
- However, if bus is to be viewed as convenient, no one should have to wait for more than five minutes.
- Recoup all costs from student fees with exception of bus drivers and bus washers – permanent employees. Permanent drivers are subsidized.
- Ten to 20 percent of transportation cost for shuttle is subsidized.
- College wants to promote walking and using bikes for intra-campus transportation.
- Cortland needs to put signs up that show walking time between locations.
- It is just over a two minute walk from the bottom most parking space in the Miller parking lot to the front door of Old Main.
- Not enough bike racks.
- Hill is not a problem for accessibility, as ADA path is five percent grade or less.
- Would like four to five hubs/kiosks around campus for handing out bikes. It would be expensive, however.
- Alternative: automated bike checkout system (card swipe), but it would be a significant capital investment.
- Potential grant opportunity – maybe a demo center.
- Also provide more secure locations to store student bikes.
- Buses need to have bike racks on front of bus, but buses with racks do not fit in garages. Need to have fold-up racks.
- Need a better regional transportation system to and from campus.
- Seventy percent of emissions in a typical trip occur at start up – cold starts.
- Teacher student observations and student teaching trips add significantly to carbon footprint.
- Adjuncts – some drive one hundred plus miles per round trip.
- Conflicted between using the lure of allowing "freshman parking" as a recruitment tool versus reducing Cortland's carbon footprint.
- Transportation web site will come on-line soon with transportation data.

Priorities/Goals for Transportation

- Reduce number of first year students that bring cars to campus.
- Establish baseline opportunity cost for parking.
- Improve access to city/regional transportation.
- Reduce intra-campus driving.
- Reduce commuting, especially faculty and staff commuting.
  - Adjunct faculty travel – may be largest impact on transportation. David Miller, geography – get map.
- Improve walkability of campus.
- Improve access to bike programs.
- Enhance transportation decisions through education and visibility.

3. Natural Systems

Priorities/Goals for Natural Systems

- Establish an overall open space management system.
  - Have identified (zones) of landscape to manage maintenance.
- Make every space (indoor and outdoor) a learning space.
- Link landscape with building strategies.
  - Good opportunity to integrate with Facilities Master Plan, projected paths for walking (especially in winter).
- Further develop the tree management system on campus.

4. Water

General Comments

- SUNY (Joe Fox) measures water use per student (monitored by monthly cost monthly).
- SUNY Cortland is located on an aquifer.
- Cortland does not have a stormwater management plan.
- Monitoring potable water is not a priority.

Priorities/Goals for Water (overall, water is not a priority at SUNY Cortland)

- Establish a baseline for water consumption.
- Minimize potable water demand.
- Establish a comprehensive stormwater management plan (not a top priority but hope to have a stable capital plan project).
- Link stormwater management strategies with open space plan – a more sustainable and cost efficient approach.

5. Materials & Waste

General Comments

- ASC – is thinking about reducing its radius of food purchase.
- Annual recycling report is available from SUNY.
- Debate is whether Cortland should pursue improvements to food operations first and then tackle transportation. Food is far less controversial than transportation and may generate a more positive response than removing parking spaces.

Priorities/Goals for Materials and Waste

- Use/purchase local resources.
- Establish goals for recycling.
- Establish a baseline understanding of materials and waste at Cortland – reference and validate GHG.
- Better incorporate ASC/food within baseline.

6. Community

General Comments

- Institute for Civic Engagement (ICE) and Main Street Initiative are limited in terms of funding and grant availability.
  - Initiatives based on funding sources.
  - No integrated strategy for initiatives.
  - Adjust focus to available funding.
- Community outreach in planning process is missing.
- Cortland County Relocalization and Resilience Initiative (CCRRI). Peak oil, climate change, and other issues discussed by community leaders and faculty and administration. Trying to establish a baseline for sustainability for local community.

Priorities/Goals for Community

- Develop synergies between SUNY Cortland and community groups, including the CCRRI.
- Explore partnerships with the county and city with regard to food acquisition and production.

Session Two: Sustainable Planning Strategies

General Comments

- New buildings – orientation and natural ventilation.
- Existing buildings – screening with deciduous trees.
- Executive Order 111 – Clean Air Act must be above and beyond energy code.
- Need a specific campus sustainability mission statement.

1. Energy

General Comments

- Jeff Lallas – goals should come with a little pain. "It should hurt just a little to meet goals."
- Be sure building projects accomplish LEED® energy conservation points (also addressed in Executive Order 111).

Planning / Design Strategies

- Formalize a policy that each new building should be LEED Silver (Cortland's version).
- Any new construction should include geothermal systems (on lower campus).
- Meter buildings to understand energy impact (residential and others).
- Institute energy competitions between dorms.
- Establish and visibly publish energy usage data for each building as a way of changing culture.
- Properly orient new buildings to maximize solar benefits.
- Explore renewable energy options with every new project.
- Explore grant opportunities to achieve energy measures.
- Establish goals for energy performance at the earliest stages of planning for every project.
- Create a sustainability mission statement (Nasrin likes Cornell graph).

2. Transportation

General Comments

- Adjuncts have a large impact on transportation.
- Lack of convenient county transportation system is a problem.
- If you drive two miles to work you might as well drive ten miles because catalytic converter does not warm up; therefore, you get more potential out-gas at start up. (Three minutes is needed to warm up.) Need to cut out intra-campus driving.
- Spectators at events add to GHG output.
- Grant to have Cornell "TCAT" bus system to be extended to Cortland – as a holistic commuter system.
- 1.4 permits per faculty, staff, and administration; Parking Committee sent recommendation to FMPOC to use hang tags rather than stickers so faculty, staff, and administration would not need to buy more than one tag.

- Town working with County on transportation; there is also a Regional Transportation Initiative.
- Transportation fees cover cost of bus, gas, maintenance, and temporary workers but not full time employees.
- Considering only running buses from/to the extremes of the campus and cutting out the stop at Neubig.

Planning/Design Strategies

- Focus on reducing employee travel (students contribute minimal impact).
- Proactively encourage/cooperate with location – regional groups to improve public transportation (access and availability).
- Take measures to make walking and biking more prolific (bike paths, landscaping, safety).
- Educate campus community on impact of driving (such as emissions at start up, GHG implications).
- Introduce shuttles to/from Ithaca (cooperate with Cornell, Ithaca College, and Tompkins Cortland Community College).
- Reduce intra-campus trips.
  - Signage from here to there.
  - Bike program that introduces more/better bike racks and more convenient bike rental distribution hubs.
- Create a parking-transportation mission statement related to sustainability.
- Establish the institutional cost per parking space (baseline).
- Explore incentives to encourage faculty, staff, and administrators to live closer to campus.
- Allow telecommuting where practical, especially for staff, so as to preserve faculty and student interaction.
- Develop strategies for improving local/regional transit options (access and availability).
- Continue to improve campus shuttle service; market to entire campus community.
- Expand support for bicycling.
- Consider allowing telecommuting and flex-time resulting in VMT reduction.
- Sustainable transportation practices should be in the College's mission statement.

Closing Session

Early Actions for SUNY Cortland

- Form a Sustainability Steering Committee (President has started to form a committee already).
- Adopt the GHG inventory.
- Calculate cost per parking space.
- Install signage ("from here to there") showing timed distances to different buildings on campus (by Fall 2010).
- Update and expand sustainability web page to let college community know what is going on.
- Get Green information about progress in their area from all VPs.
- Establish a clearing house for all Green initiatives on campus.
- Contact ASC to share workshop results and touch base.
- Investigate the feasibility of adopting AASHE STARS for tracking sustainability progress.
- Adopt the 2006-2007 GHG inventory.

Next Steps for the Sustainability Planning Team

- Obtain/review key documents discussed at the workshop for a better understanding of available metrics and existing conditions.

19 May 2010

Sustainability Workshop
SUNY Cortland

Attendance

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ATTACHMENT #1: COMPILED BUILDING ASSESSMENT

Prepared by Sasaki, July 2010

Building	Square Feet	Average Total Energy Use/BTUs	Avg total Energy in KBTU	Primary space use	% energy reduction	Construction Year (BCI)	GSF (BCI)	NASF (PSI)	BCAS Condition	BCAS Electrical	BCAS Exterior	BCAS HVAC	BCAS Interior	Suitability and Reuse	Building Suitability	Building Reuse Potential	Energy Reduction Potential	Comments	Other Issues
										Generally Consistent with BCAS				current use, without rehabilitation	current use, current condition	use TBD, rehabilitated condition	Observed during consultants walk-		
Bowers I	79,097	6,272,498,418	6,272,498	acad-lab	**44.1%**	1962	142097	85202	Fair	Yes	Yes	Yes	Yes	Under	Good	Good	Major	Bowers Hall is rated "good" suitability because of its location on campus and its general configuration is well suited for classrooms, labs, and offices. It is assumed that the planned renovations will improve the building condition and modernize the learning enviroments. Code issues include a dead-end corridor on the northeast side of the building. Accessibility issues include nonaccessible door hardware and signage. Energy reduction potential includes replacement of single-glazed windows throughout the building	Bowers Hall is scheduled to be renovated.
Bowers II	63,000	4,996,092,914	4,996,093	acad-lab															
Brockway****	46,062	3,652,912,892	3,652,913	assembly-academic	**15.4%**	1951 [Renovation 2003+]	36,870	18,540	Good	Yes	Yes	Yes	Yes	Over	Good	Excellent	Minor	Energy reduction potential includes replacement of single-glazed windows and HVAC upgrades. Although Brockway Hall is well-suited for its use as a dining facility and offices, its location between residence halls make it appropriate for student-related functions.	None
Corey	89,500	11,106,377,666	11,106,378	academio	**-44.7%**	1967	89,500	51,792	Fair	Yes	Yes	Yes	Yes	Over	Poor	Good	Major	Code issues include non-rated glazing in the stair. Accessibility issues include nonaccessible main entrance, door hardware, and handrails. Energy reduction potential includes replacement of single-glazed windows and HVAC upgrades. Refer to Phase II: Section K for suitability issues.	None
Cornish/VanHoesen	124,176	12,160,873,579	12,160,874	acad-lab	**29.6%**	1962 [Renovation 2003+]	124,176	62,872	Fair	Yes	Yes	Yes	Yes	Over	Good	Good	Major	Overall the Suitability of Cornish/Van Hoesen Hall for classrooms and offices is good, however the circulation is convoluted and the condition of the portions that have not been renovated compromise the building's functionality. The Tomick Finess Center portion has "fair" suitability and will be made obsolete by the new Student Life Center. See K. Suitability section for further information.	BCI does not reflect new Education Building and recent renovations to Cornish and Van Hoesen Hall.
Dowd Fine Arts	122,650	9,747,973,024	9,747,973	assembly - academic	**32.1%**	Fine Arts Center	1967	Steel Con	106,740	Assembly/	No	N/A	N/A	Yes	Yes	Yes	Fair	None	Minor
Glass Tower	55,443	6,037,243,697	6,037,244	residence	**-23.6%**	after 2003													
Hayes Hall**	38,232	3,031,797,600	3,031,798	residence	**11.3%**														
Hayes Hall Annex***	4,072	322,909,600	322,910	residence															
Memorial Library	59,000	7,333,152,747	7,333,153	library	**-23.3%**	1974	133,483	94,258	Good	No	Yes	Yes	No	Over	Good	Excellent	Minor	The Library is rated "Good" suitability because its location is ideal for its function and generally the building design is well suited for a library. However, the Program Concept Study, completed in April of 2010, identifies much needed improvements. See Section F. Physical Conditions for further information. Building code issues observed during the consultants review include: The separation of exit stairs on the north side of the building does not meet current code requirements. Accessibility issues include nonaccessible signage and handrails. In addition, the distance between some stacks is less than the required minimum. Energy reduction potential includes HVAC upgrades.	Program Concept Study was recently completed
Library Addition	79,436	8,540,958,800	8,540,959																
Miller	51,000	7,127,960,510	7,127,961	Academic	**-50.3%**	1967	51,000	33,683	Good	No	Yes	Yes	Yes	Over	Fair	Good	Major	Accessibility issues include nonaccessible door hardware. Energy reduction potential includes replacement of single-glazed windows and HVAC upgrades. Refer to Phase II: Section K for suitability issues.	None
Moffett	84,448	8,944,687,115	8,944,687	other	**15.3%**	1954 [Renovation 2003+]	84,448	43,683	Fair	Yes	Yes	Yes	No	Under	Fair	Excellent	Major	Exterior stairs do not have code required handrails and/or are a tripping hazard. Accessibility issues include door clearances and nonaccessible door hardware. Energy reduction potential includes replacement of single-glazed windows and renovations to the gymnasium to eliminate the heating/cooling load of the large space. Refer to Phase II: Section K for suitability issues.	Recent renovations include the installation of a fire protection system in the west portion of the building. The remainder of the building is scheduled to be renovated.
Neubig	39,788	4,883,975,101	4,883,975	assembly	**-29.5%**	1960	39,788	28,056	Good	No	No	Yes	No	Under	Fair	Good	Minor	Accessibility issues include nonaccessible door hardware and signage. Energy reduction potential includes HVAC upgrades. Refer to Phase II: Section K for suitability issues.	None
Old Main	139,800	14,760,409,522	14,760,410	academio	**10.6%**	1922	139,800	79,437	Good	Yes	Yes	Yes	No	Over	Fair	Excellent	None	Code issues include basement stair. Accessibility issues include nonaccessible main entrance. Refer to Phase II: Section K for suitability issues.	None
Sperry	71,250	7,246,801,790	7,246,802	acad-lab	**9.2%**	1967 [Renovation 2003+]	62,550	31,212	Excellent	Yes	Yes	Yes	Yes	Over	Good	Fair	Minor	The Sperry Learning Resource Center is rated "Good" suitability due to its location on campus and recent upgrades. However, due to the original design of the building envelope, offices and classrooms on the third floor do not have access to windows. Energy reduction potential includes replacement of single-glazed windows in the circulation spaces throughout the building.	None
Winchell Hall	28,640	5,943,927,066	5,943,927	Assembly	**-121.5%**	1966	28,640	15,096	Good	Yes	No	Yes	Yes	Under	Poor	Fair	Minor	Accessibility issues include nonaccessible elevator, door hardware, and signage. Energy reduction potential includes replacement of single-glazed windows and HVAC upgrades. Refer to Phase II: Section K for suitability issues.	None

Sources:
Facilities Master Plan - Phase II Assessment of Existing Conditions: Buildings, Document produced by a team of consultants led by JMZ, Spring 2010.
Building energy data from 2005 to 2007 as provided by SUNY Cortland.