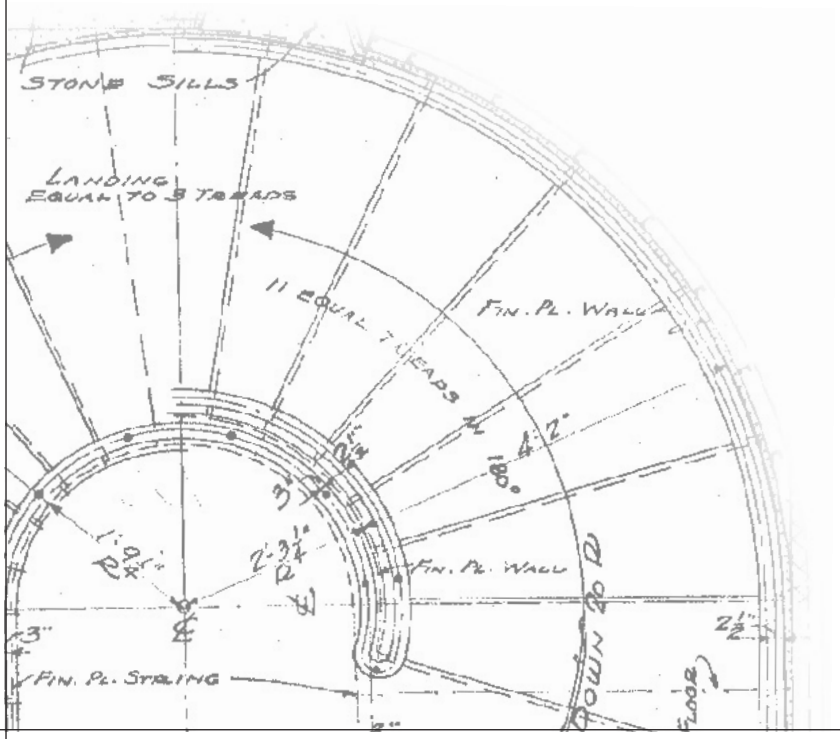
2002-2003 UPDATE



TO THE BLUEPRINT FOR A GREEN CAMPUS

AN ENVIRONMENTAL ACTION PLAN FOR THE UNIVERSITY OF COLORADO AT BOULDER

University of Colorado ENVIRONMENTAL CENTER

Blueprint for a Green Campus 2002-2003 UPDATE

THIS PUBLICATION IS PRODUCED BY

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View the Blueprint for a Green Campus online at www.colorado.edu/ecenter

Blueprint for a Green Campus

2002 Update

The "Blueprint for a Green Campus" is an environmental action plan for a wide variety of issues that CU faces. The document articulates the vision of a growing, dynamic campus that steps lightly upon the earth and satisfies additional demands for energy, transportation, and resources through increased efficiency rather than increased consumption. The Blueprint builds upon CU's existing environmental programs and accomplishments. To achieve sustainability on an institutional scale, the Blueprint for a Green Campus proposes the following goals:

- Creating a Climate-Friendly Campus
- Growing without Increasing Traffic
- Creating a Safe and Healthy Campus
- Green Campus Consumption and Disposal Habits

The 2002 Update to the Blueprint for a Green Campus serves to check in on progress toward these four goals. The Campus Earth Summit will be an opportunity to discuss these issues.

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Summary

In April of 2000, the University of Colorado Environmental Center released the ***Blueprint for a Green Campus***. To quote the introduction to the Blueprint:

> "Building on the environmental successes at CU over the last two decades, we propose a vision of a growing, dynamic campus which steps lightly upon the earth and satisfies additional demands for energy, transportation, and resources through increased efficiency rather than increased consumption."

The Blueprint lays out challenging goals in the areas of climate change, transportation, health and safety, and disposal and consumption habits.

The ***2001 Update to the Blueprint for a Green Campus*** was released in 2001, and the ***2002 Update*** was released last spring as a check-in on the Blueprint. This document seeks to answer questions on support for the Blueprint goals, what progress has been made, obstacles to progress, and newly emerging issues.

The major campus departments have reported on their progress on working toward the goals set forth in the Blueprint. Information from the departments is incorporated throughout this document. The complete reports as submitted by Facilities Management, Housing, UCSU, Environmental Health and Safety, and Parking and Transit Services are available at www.colorado.edu/ecenter, by clicking on the Greening CU sidebar.

The Blueprint has been formally endorsed by two major campus bodies: the University of Colorado Student Union and the Boulder Faculty Assembly. The Blueprint was also recognized by the United States Environmental Protection Agency, which issued a Year 2000 Climate Protection Award to the Environmental Center for the creation of the Blueprint.

The Chancellor's Executive Committee reviewed the ***Blueprint for a Green Campus*** in spring 2000, and set up a Blueprint Committee, chaired by the vice chancellor for administration. The committee has now been replaced by a standing Campus Environmental Council. In 2003, the Boulder Faculty Assembly also created a subcommittee on the environment.

Progress during 2002-2003

There are several initiatives worth reporting on.

Institutional and Structural Issues:
The 2002 Blueprint Update described the debate surrounding the creation of a campus environmental council, and included a resolution by the Environmental Board supporting the creation of a council. In fall of 2002, the vice chancellors agreed to create such a council. In January 2003 the council began meeting. The charge and membership of the council are included as an appendix to this document and can also be viewed at http://www.colorado.edu/ecenter in the Greening CU section.

Last year's update also discussed the move toward paid printing in campus computer labs as a step towards greening the campus marketplace. This is continuing to move forward, with implementation expected for fall semester of 2003. One new aspect is that Imaging Services has agreed to switch to the highest percentage of post-consumer recycled content paper that is compatible with the equipment. The experience to date has indicated that a 100% post-consumer content recycled paper will work. This will reinforce the environmental benefits of the switch from "free" printing to paid printing.

Another area that is in play in the realm of greening the campus marketplace is parking pricing. As part of the planning process for up to 1900 beds of new student housing at Williams Village, the city and the campus agreed to jointly sponsor a transportation and parking study. The study, conducted by Nelson/Nygaard associates, compared a number of scenarios, largely distinguished by the amount and price of parking. One of the key questions is whether the cost of parking should be subsidized by rents, or whether the costs should be born only by those who choose to have a car. If car owners bear the full cost, the rates that must be charged are high enough to significantly dampen demand. At the high end of the range, 4 parking structures housing up to 2200 cars would be built; at the low end only one parking structure would be constructed. http://fm.colorado.edu/planning/bcpc/

An interesting exercise was the 2003 student environmental survey. In April 2003 the UCSU Environmental Center contracted Aspen Media and Marketing to conduct a phone survey of 300 randomly chosen, full-time CU-Boulder students to gauge the current level of environmental concern at the university. Of the students surveyed, 86 percent believed that it is either very important or somewhat important that CU is a leader in campus environmental management.

Survey results indicate that students believe that the university should expand its use of renewable energy; use recycled or tree-free paper; eliminate the use of chemical pesticides on campus lawns; and offer organic food in campus dining halls.

- 92% of the student body supports a $2.00 student fee increase to fund 100% wind generated electricity for the three student controlled buildings – the UMC student union, the Recreation Center, and the Wardenburg Health Center
- 72% of residence hall students would support a $10/month rent increase in order to purchase wind energy for the residence halls
- 74% of students are opposed to spraying pesticides on campus lawns to control dandelions.
- 75% of students believe campus food service should offer organic options; 40% would be willing to pay 20 percent more for organic food.
- 63% of students strongly or somewhat supported the upcoming switch to paid printing in campus computer labs to reduce paper waste.

The survey results can be viewed online at http://www.colorado.edu/ecenter/publications/env_survey/index.html.

Some interesting developments in the individual goal areas include:

Creating a Climate-Friendly Campus:
One major structural change was the creation of the campus energy officer position. This has allowed a renewed institutional focus on energy and resource conservation, as a level not seen since the late 1970s 'energy crisis." An outside force – high natural gas prices – has also created a strong financial incentive for investment in energy efficiency. The energy section of this document will describe some of the actions in this arena.

For the first time in many years, the trend of increased energy consumption per square foot of building area seems to be turning around. The combination of individual response to the generation green energy education campaign, "de-lamping" of campus buildings, and lighting upgrades appears to be having a measurable impact. For the first time in 10 years, energy and water usage declined significantly last year .Per square foot, the CU-Boulder campus used 2.2 percent less electricity during fiscal year 2002-03 compared to the previous fiscal year.
For the last decade, campus energy use has risen each year by about 5 percent per year.

One side effect of the high cost of natural gas is a change to the operations of the campus cogeneration facility. In order to save money by avoiding the use of natural gas, CU-Boulder is now purchasing more power from Excel Energy, and producing less electricity. This means that our power mix is shifted in the direction of coal, rather than natural gas. Because of this the emissions inventory conducted in 2000 probably significantly undercounts our current emissions.

One major new initiative this year was the development of a biodiesel program on the Boulder campus (http://www.colorado.edu/ecenter/alt_trans/biodiesel.html). The lifecycle greenhouse gas emissions associated with the use of biodiesel are far lower than for use of conventional diesel fuel. CU students voted by a margin of 83% to 17% to increase student fees to provide funding for this effort. Transportation Services has teamed up with the student effort to run all of the diesel Buff Buses on biodiesel – 3 on B-100(100% biodiesel)and 10 on B-20(20% biodiesel, 80% conventional diesel mix). Some of this is produced from the grease from campus food services; most is purchased from Blue Sun Biodiesel. Special Transit is also now running one HOP bus on B-100, and we are in discussion on the conversion of more of the HOP fleet; RTD has committed to a pilot project, where they will fuel half of the SKIP buses with B-20; the city is fueling a number of vehicles with B-20, Boulder Biodiesel is selling b-100 to the public, and Bartkus oil has opened a public B-20 pump. CU student Andrew Azman, founder of CU biodiesel, is receiving a Brower Youth award for this effort:
http://www.eii.org/project/newsPage2.cfm?newsID=435&pageID=139&subSiteID=40
or http://nbb.grassroots.com/NBBNewsRelease/Azman_Brower_Award/.

On the academic side, the CU-Boulder team won the national solar decathlon. This team of engineering and architecture students built a remarkable demonstration solar house, which is currently located on the Boulder campus.

Growing Without Increasing Traffic:
In August 2002 the new STAMPEDE shuttle linking east campus and main campus began. Student ridership has reached approximately 17,000 rides/month, making it the fourth highest ridership route behind the SKIP, HOP, and B. Overall, student ridership on RTD routes went up

by 14.3%, or 177,000 trips. Student transit ridership by route and year may be viewed at http://www.colorado.edu/ecenter/alt_trans/buspass_stats/index.html

The economic slowdown has affected RTD's revenues. This has led to several significant issues, including cutbacks to bus service and a proposal to eliminate the Ecopass program. However, compromises have been reached on these issues, allowing the Boulder community transit network to continue, and preserving the Ecopass prpgram, including the faculty/staff program..

In spring of 2003 a year-long study process began, to create a transportation master plan for the campus. This will be the most comprehensive look to date at both supply and demand management options for the campus. This effort can be viewed at http://ucbparking.colorado.edu/transportationmasterplan.

There was also significant progress this year on encouraging bicycle use. Parking and Transit Services, Housing, and the Environmental Center teamed up to jointly fund the replacement of approximately 1,000 out of date bike racks. The University of Colorado Federal Credit Union began a new loan program, the 'Easy Ride," which allows CU students who are credit union members to borrow up to $500 interest free towards the purchase of a bicycle. Finally, the Environmental Center and Parking and Transit Services launched a new 'Buff Bikes" free cruiser bicycle checkout program. Some information can be found online at http://www.colorado.edu/ecenter/alt_trans/index.html#bikes.

Creating a Safe and Healthy Campus:
Facilities Management, Housing and UCSU departments are all working toward using less toxic cleaners in their custodial operations. Facilities Management has developed a toxicity ranking system for cleaners and has reviewed over 200 products to date. The cumulative efforts of all departments could naturally evolve toward a formalized program.

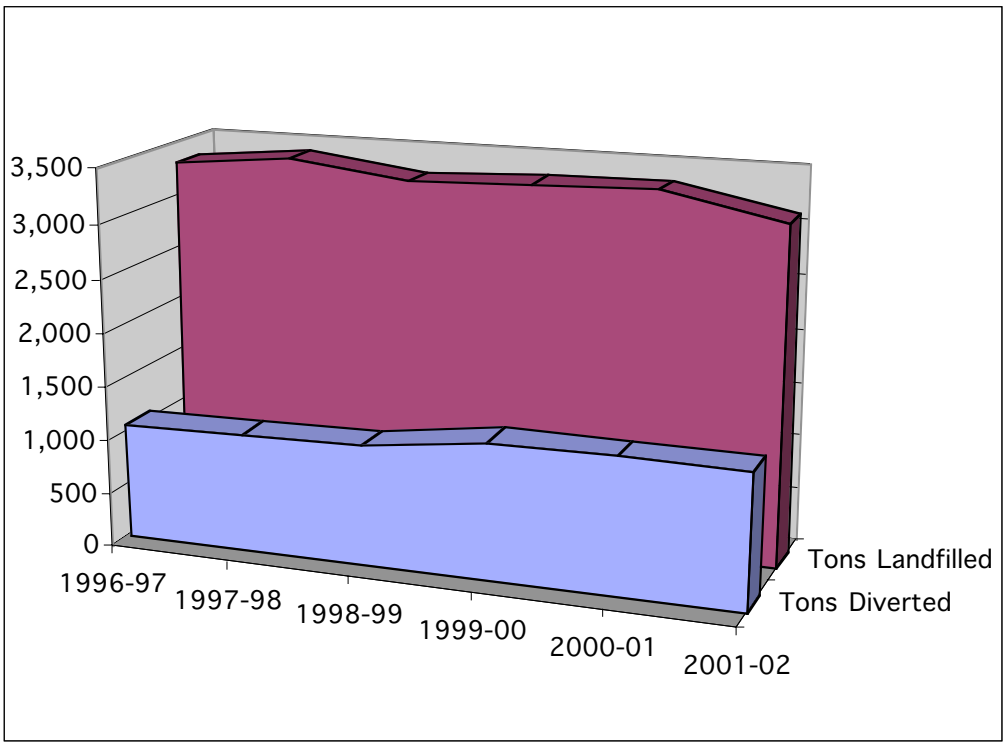
CU's Integrated Pest Management (IPM) program continues to prove its effectiveness in controlling unwanted pests with preventative measures and with the least toxic and most effective approaches. Chemical sprays continue to be avoided for indoor pest control. However, this year, an herbicide spray occurred outdoors in an attempt to control a significant dandelion outbreak which resulted from a moist spring following a severe drought. Controversy followed the decision to spray and discussions will continue in order to seek the least toxic and morst effective approach to controlling broadleaf weeds.

Additionally, Environmental Health and Safety continues to lead the campus toward responsible hazardous waste disposal and reduction efforts. EH&S is implementing a new chemical inventory management system to better track, control and respond to the thousands of chemicals stored and used in laboratories.

Greening Campus Consumption and Disposal Habits:
The Environmental Center added a student position to advance environmentally preferable purchasing strategies for CU. The Campus Environmental Council green purchasing subcommittee will explore opportunities for contract reform and purchasing standards on an institutional scale. A Green Purchasing Expo was held in April 2003 with vendors showing a

variety of products and services geared to institutional applications. An exciting specific accomplishment occurred with Facilities Management converting general fund bathrooms to 100% recycled toilet paper at equal quality and a lower cost than the previously purchased products.

One interesting development on recycling is that analysis conducted by the recycling partnership indicates that CU has been meeting the Blueprint goal of capping solid waste going to the landfill at year 2000 levels. Initial findings suggest that the combination of recycling, composting, and other waste reduction efforts appear to be containing the amount of waste that is landfilled. The following chart shows a gradual reduction in trash dumpster volumes and a corresponding increase in the materials collected through CU Recycling.



In fall of 2002 the vice chancellors of administration and student affairs initiated a "business plan review of recycling activities". This allowed a comprehensive financial analysis of recycling on campus (which is split among multiple departmental budgets) and a comparison to the costs of solid waste disposal. The analysis has shown that the net cost for waste disposal to Facilities Management would increase by at least $174,000 if materials that are currently collected for recycling were instead landfilled. This is the first time that solid evidence has existed that recycling has a net positive fiscal impact on the campus.

2002-2003 Emerging Issues

Water:

The drought which hit Colorado in 2002 has had an impact on the university. CU gets much of its irrigation water from ditch rights from the Boulder creek watershed, and purchases treated water from the City of Boulder. CU uses approximately 450 million gallons of treated water and 85 million gallons of ditch water each year. During the summer of 2002, Colorado suffered the most severe drought since the creation of the university – in fact, tree ring analysis indicates that the last time that water levels were this low in the Boulder Creek watershed was the early 1700s.

In response, the city of Boulder imposed outdoor watering restrictions, and asked for voluntary indoor water conservation efforts. In addition, the city is currently considering revisions to the rate structure designed to provide a larger financial incentive for conservation. The city currently charges an escalating price; that is, as the amount of water used increases, the cost/gallon also increases. The city is considering a proposal to make the surcharge for heavy water use larger, and to impose additional surcharges during droughts. This will increase costs to CU, and may provide additional incentives to conserve.

Already, CU has responded to the drought in several ways. First, efforts to convert fields from city water to ditch water have been accelerated, to minimize the use of expensive treated water for irrigation. The Recreation Center has also developed plans to replace a number of fields with artificial turf, which requires no watering, including Farrand Field, the Business field, and fields at Williams Village. The feasibility study can be viewed at http://fm.colorado.edu/planning/bcpc/Outdoor%20Rec%20Study.pdf.

CU has also taken a number of steps to reduce indoor water use. The most significant have involved changes to campus cooling systems. Most cooling in campus buildings uses chilled water. In many cases, cooling systems have used this water only once, rather than recirculating the water. As an example, the campus is replacing the cooling system for the lasers at the Joint Institute for Laboratory Astrophysics with a new closed loop system, which will save 25 million gallons per year. Per square foot, the CU-Boulder campus saved 11 percent on potable water consumption compared to the previous year.

The Fiscal Impacts of Environmental Programs:

The State of Colorado and the University of Colorado are faced with an unprecedented fiscal crisis, with deep budget cuts affecting nearly every state department. In this situation, can the university afford to improve its environmental programs and attempt to implement new initiatives to reduce impact on the air, water, and land? A number of examples, from this campus and others, suggest that the question may be whether CU can afford not to improve its environmental performance. Right now, the evidence is suggestive, but is program specific and anecdotal; however, the Environmental center will conduct a more comprehensive review of the costs and savings associated with campus environmental programs during the 2003-2004 academic year.

The most comprehensive study of the link between improved environmental performance and lowered costs for campuses is a 1998 study by the National Wildlife Federation, published as a report titled *Green Investment, Green Return: How Practical Conservation Projects Save Millions on America's Campuses*. This report highlights many case studies of campuses "success at achieving the twin goals of doing the right thing for the environment and saving money".

Some of the areas where there is the most potential for reducing costs over the long term are in the areas of transportation, reducing energy use, reducing waste, and recycling and composting. Let's look at each area in turn.

Transportation:
The conventional approach to transportation at many schools has been pretty simple: wait until complaints about parking reach a crescendo, then build some new parking lots and wait a few years until the demand and complaints start to grow, then do it all over again. This may be why the former chancellor of the University of California at Berkeley stated that "A university is a diverse community held together by common complaints about parking"!

However, there is a big financial problem with this approach. Many schools, including CU, do not have additional land that can be devoted to surface parking lots. In fact, new construction often uses up land which used to be devoted to surface parking. The supply of surface parking decreases as institutions convert parking lots into other uses, such as new research buildings, dormitories, stadiums, and theaters, while the new uses increase parking demand. The campus is then faced with either acquiring new land – a very expensive proposition and often impossible – or constructing parking structures over existing surface lots. The capital cost of construction is quite high –in the range of $15,000 to $30,000 per *net new* parking space Thus for 1,000 spaces a campus would be looking at $15 million - $30 million in capital costs. Recovering this from users could require monthly parking fees of $100 or more – much higher than is typically charged or is politically acceptable to the campus community.

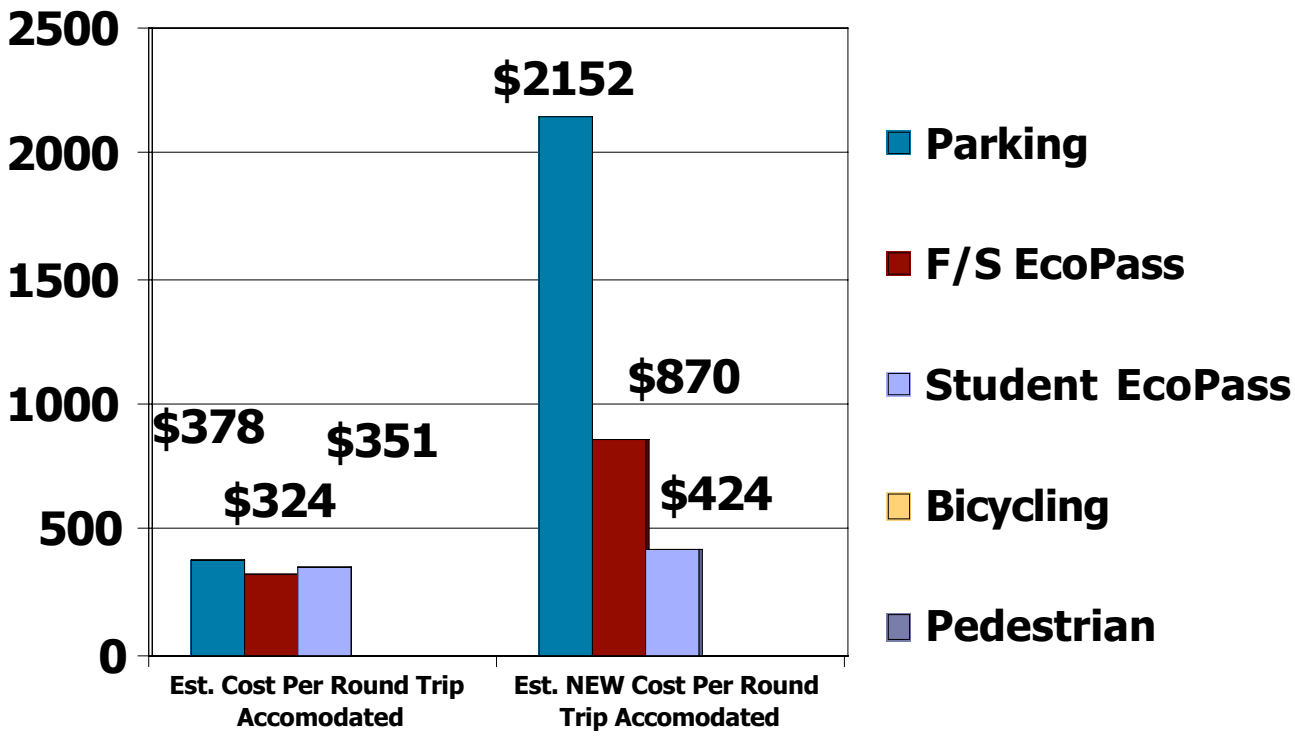
Are there are other approaches to managing transportation demand that are less expensive? In most cases where land constraints lead to the use of structured parking, the answer is yes. And these approaches are better for the environment.

Cornell University provides a great example. In the early 1990s Cornell faced demand for building thousands of new parking spaces. Instead, they decided to create a new transportation demand management program, which emphasized expanded transit, increased parking rates, and strong financial incentives for carpooling. The results were dramatic. Over a 6-year period, the campus built only 350 new parking spaces, instead of the 3100 spaces that would have otherwise been required. After subtracting out the cost of the program, the total savings over these six years approach $13 million dollars. And, the program led to a 25% decline in the number of vehicles driven by faculty and staff to campus.

Here at CU, the faculty/staff bus pass program has also been a good investment for the campus. This program allows each permanent faculty or staff member who is eligible for benefits to ride local and regional buses and light rail by showing his or her university ID. Because some employees have reduced the number of times they drive to campus, or stopped driving to

campus, due to the availability of free transit, some parking spaces are freed up - a total of 350 spaces based on an analysis by Parking and Transit Services. The annual cost of the bus pass program comes to $1,125 per parking space left open. For comparison, the annual debt service required to provide one additional parking space by building a new parking structure on an existing surface lot would be more than $2,700. Thus, it is 2.5 times as expensive to provide one additional parking space compared to reducing demand by one space. The net annual savings to campus, compared to providing 350 new spaces, is $560,000.

An analysis in the existing conditions report for the Transportation Master Plan produced the following table:



Energy:
The bottom line: campus energy use is not cheap. Here at CU, the trend over the last decade has been one of dramatically escalating energy use, with annual increases in electricity consumption hovering around 5%. The actual costs went up even faster. In the 2000-2001 fiscal year, for example, electricity costs rose by 9.9%! Annual utilities costs exceed $6 million. And the campus may need to invest tens of millions of dollars in new power capacity to serve campus growth. Are there opportunities to reduce some of these costs?

Perhaps the best example is the State University of New York. Maybe their hard winters explain it, but SUNY Buffalo (UB) has made energy conservation an integral part of campus operation for twenty years now. One comprehensive energy retrofit project alone led to a $3 million dollar annual saving in energy cost. They estimate that over a 15-year period, the cumulative energy cost savings were over $60 million dollars. According to Walter Simpson, then energy officer at

UB, " Conservation and efficiency mean less strip mines, oil fields, smog, acid rain, and global warming. Moreover, conservation projects can be set up so that they pay for themselves. Campuses would be crazy not to do these projects just from a financial point of view."

Here at CU, the same approach is beginning. In response to the big cost increases, the administration has created a new energy officer position, partially modeled after UB, and has ramped up funding for efforts to reduce energy use on campus. These range from educational campaigns designed to get students and employees to turn off lights and computers when not in use, to major capital investments in energy efficiency. The potential savings are huge. According to an analysis by the energy officer, just getting campus computer users to enable the energy saving sleep mode on their computer monitors could save the campus up to $450,000/year, while also reducing annual emissions of greenhouse gases by 3500 tons of carbon dioxide.

Reducing Waste:
Another area where there is ample room to lower costs while reducing our environmental footprint is through reform of our purchasing practices and materials use. One example is the move towards pay for printing in campus computer labs. The Library estimated that paper use in these labs increased by 28% and toner cartridge use increased by 35% in just one year in 2001. Housing experienced similar increases prior to adopting a pay-for-print system in February 2001." Housing eliminated free printing from computer labs in the residence halls, instead charging individual users. In the first year of implementation Housing estimated a 55% reduction in paper use. Currently, ITS computer labs print approximately 30,000 reams of paper annually. At a conservative estimate of 33% savings, a conversion to pay for printing could save 10,000 reams per year. If the reduction is as large as that within housing, the reduction could be over 15,000 reams per year - all at a net savings to the university.

This is an illustration of how CU can harness the power of the free market. By having individual users pay for their use of resources that have a high environmental impact – whether it is driving a car to a parking space or printing a paper – instead of socializing the cost across the university, resource use goes down while economic efficiency goes up

There are other arenas where costs can be saved and waste reduced through smart purchasing. Some campus departments are saving money by using recycled content paper towels and toilet paper. Other departments have found that it is cheaper for them to purchase furniture made from recycled wheat straw than it is to furniture made from virgin wood. At the University of Wisconsin-Madison, the school saves a quarter-million dollars a year by selling and reusing materials that the university used to throw away. The undergraduate chemistry labs at the University of Minnesota switched to "microscale" lab techniques, which demonstrate chemical principles with much smaller volumes of chemical. The net effect – hazardous waste generated annually went down from 2500 gallons to 23 gallons, for a cost savings of $37,000/year.

There may be many untapped opportunities on this campus to reduce waste and buy greener products, at no net cost to the campus. This could be advanced by adopting an environmentally friendly purchasing policy, requiring that environmentally preferable products be purchased if they are no more expensive than the standard products they substitute for, and by inserting environmental language into the bidding process.

Recycling and Composting:
Colorado has some of the lowest landfill rates in the country – so they have no direction to go but up. From 1996 to 2001 the landfill rates CU has to pay went up by 83%. Despite campus growth during this time, the amount of waste that Facilities Management delivered to the landfill remained flat – there was even a slight decline from 3300 tons in 1996-97 to 3100 tons in 2001-2002. Without the CU Recycling program, CU would have to haul another 1400 tons of waste to the landfill every year – at substantial cost. Not only would the campus be paying to dispose of these materials, instead of getting paid for them, but the materials would have to be hauled much further away (the nearest landfill is in Weld County), with the associated trucking costs. So, while recycling costs money – there's no free lunch! – it also reduces the campus's cost for landfill disposal.

The business plan review of recycling conducted for the vice chancellor's of administration and student affairs in 2002-2003 has provided a comprehensive analysis of the financial impacts of campus recycling activities. There are a number of highlights from the report. It points out that over 1,400 tons will be recycled at CU Boulder this year, which accounts for approximately 30% of the waste generated on campus.

This analysis indicates that recycling is saving Facilities Management a net of $175,000 per year in solid waste costs. For general fund waste, trash disposal costs Facilities Management $601/ton; recycling costs them $286/ton. In the aggregate, every ton recycled in the general fund buildings saves the general fund $315. Each dollar spent on recycling saves $2.10 in trash. The reasons that recycling is so much cheaper are interesting. The primary reason is not the tipping fee charged at the landfill (landfill fees are only $20/ton!), but reflect the fact that the system that has developed on campus for collection and transport of recyclables materials is much lower cost than the collection and transport of solid waste.

It is also striking that some campuses have achieved recycling + composting rates of 50-60%. If CU is able to achieve these rates, the financial benefit to the campus will grow. The next major improvement is food waste composting from residence halls and the UMC – which could divert 600+ tons/year. Now, the savings from, composting will not approach the $315/ton savings that recycling generates for general fund materials, but nonetheless there should be net savings. Right now all of the food waste on campus is thrown away, and trucked to the landfill. Meanwhile, we also buy fertilizer and soil amendments for campus landscaping. A composting program has the potential to save money on both ends – reducing disposal costs and saving money spent on purchasing soil amendments. For example, the housing department estimates that using finished compost instead of purchasing fertilizer could save $10,000 annually,

Creating a Climate-Friendly Campus

The Vision:

CU commits to meet the emissions reduction targets of the Kyoto Protocol, which would reduce CU's greenhouse gas emissions by seven percent below 1990 levels by 2010.

Overview

This year has seen some success in terms of increasing energy efficiency and energy conservation awareness on campus. The highlight of this year is the new Energy Conservation Officer, Moe Tabrizi, who was hired by the Facilities Management Department. Thanks to Vice Chancellor Paul Tabolt and the Executive Dirctor of Facilities Management Jeff Lipton, CU is setting a positive example by becoming the first higher-education institute in Colorado to create a position specifically devoted to energy conservation.

For the first time in 10 years, energy usage declined significantly last year at the University of Colorado at Boulder campus thanks to efforts by staff, students and projects implemented by facilities managers. Per square foot, the CU-Boulder campus used 2.2 percent less electricity during fiscal year 2002-03 compared to the previous fiscal year. University statistics indicate the campus is using about the same resources as it did in 1999-2000, even though there are now more people, facilities and research. A building by building breakdown , showing historical levels of utilities use, can be found online at http://www.colorado.edu/conservation/usage.html.

One major new initiative this year was the development of a biodiesel program on the Boulder campus (http://www.colorado.edu/ecenter/alt_trans/biodiesel.html). The lifecycle greenhouse gas emissions associated with the use of biodiesel are far lower than for use of conventional diesel fuel. CU students voted by a margin of 83% to 17% to increase student fees to provide funding for this effort. Transportation Services has teamed up with the student effort to run all of the diesel Buff Buses on biodiesel – 3 on B-100(100% biodiesel)and 10 on B-20(20% biodiesel, 80% conventional diesel mix). Some of this is produced from the grease from campus food services; most is purchased from Blue Sun Biodiesel. Special Transit is also now running one HOP bus on B-100, and we are in discussion on the conversion of more of the HOP fleet; RTD has committed to a pilot project, where they will fuel half of the SKIP buses with B-20; the city is fueling a number of vehicles with B-20, Boulder Biodiesel is selling b-100 to the public, and Bartkus oil has opened a public B-20 pump. CU student Andrew Azman, founder of CU Biodiesel, is receiving a Brower Youth award for this effort:
http://www.eii.org/project/newsPage2.cfm?newsID=435&pageID=139&subSiteID=40
or http://nbb.grassroots.com/NBBNewsRelease/Azman_Brower_Award/.

The celebration of the first 100% biodiesel-powered Buff Bus

Progress during 2002-2003

New Organization structure

- Appointed full-time energy conservation officer, Moe Tabrizi in September 2002.
- Supplemented the Campus Resource Conservation Committee (CRCC) with an active steering committee to provide direction, resources and to remove barriers. The steering committee meets monthly and the CRCC (open participation) meets about every other month.
- In October, the energy conservation hotline, (303) 735-6202 and e-mail: energyconservationhotline@fm.colorado.edu was established to receive and benefit from campus conservation suggestions. The hotline and the e-mail have been a very good source of suggestions pointing to areas of energy waste.
- New energy conservation web site which is a source of information to the campus. Building energy usage data as well as energy conservation tips are included on this site.

Energy conservation projects

- There is a concentrated effort to implement the PC monitor sleep mode. The Boulder campus has 18,000 PCs (12,000 faculty/staff and 6,000 student residents). Typical PC's consume 100-150 watts per hour. Monitors use up to 70% of energy when active and less than 5% when in sleep mode. We are encouraging everyone to enable the monitor sleep mode. Monitor goes to sleep mode after a period of 10-20 minutes of inactivity and wakes up with any movement of mouse or space bar. Software tool to enable sleep mode is available to our IT support staff. We have achieved some progress (i.e. PC Labs). More work is pending to

bring all 18,000 PCs into compliance. Savings opportunities are 5-6 million kWh, 7- million lbs CO2 and $300K-$450K per year (depending on the level of campus compliance).

- During 2002, Facilities Management has completed lighting upgrade (Electronic Ballasts and T-8 Lamps) in over 1- million square feet of campus buildings. By example, this technology upgrade has resulted in an estimated 15% (four months average, September through December 2002) consumption reduction for Norlin Library. The annual savings for Norlin is estimated at 80,000 kWh, $42,000 and 100,000 lbs of CO2. Savings in Regent Hall is 23% due to supplementary effort of removal of excess lights ("De-Lamping"). Annual savings for Regent Hall based on the same period is estimated to be 43,000 kWh, $22,000 and 57,000 lbs of CO2. We will continue to monitor the results of this project. Facilities Management is planning to upgrade additional 800,000 square feet of building lights. We will try to include "de-lamping" and the lighting upgrade projects.

- Increase the temperature setting of approximately 750 water coolers with no noticeable impact on users (from 40 to 50 degree-F.). This project will be completed in January, 2003. Savings are estimated to be 50,000 kWh, $6,000 and 66,500 lbs of CO2 per year.

- There is an opportunity to insulate 1,890 feet of bare pipes. These pipes carry low pressure steam from Arnett Hall to the Power House. $16,000 cost of insulation will save an estimated $2,920 per year in cost of energy. This project is funded.

- Evaluated and will fund a proposal for _ FTE or an outside contractor to focus on thermostat calibration and replacement in buildings. Expect positive results on building comfort and energy savings. Implementation in the first four buildings (over 1000 thermostats) is estimated to cost $30,000 with same amount in annual energy savings.

- Expecting response from Pepsi to our request regarding energy conservation roadmap for the 300 campus vending machines. Latest technology vending machines or external occupancy sensors could save estimated 400,000 kWh, $22,000 and 530,000lbs CO2 per year.

- Student Housing department is planning for a major upgrade of lighting, heating/ cooling and other energy inefficient systems within students housing buildings. See section on Housing progress.

Education and awareness campaign

- Due to the success of the "When Not In Use, Turn Off the Juice" stickers in the pilot buildings, we have posted stickers campus wide. (Studies show significantly more compliance of lights off when nobody is in the room in rooms with stickers, compared to rooms without stickers.) A total of 15,000 light switch stickers were placed on campus academic and administrative buildings as a friendly reminder to conserve energy. A similar effort is under way in student housing.

- Several articles designed to draw campus attention to the conservation goal and actionable ways to contribute, have been released in the campus media as well as Boulder, Denver, Longmont and Loveland media and television.

- Distribution of "PC monitor sleep mode" posters throughout campus in addition to guide and tip sheet to save energy at home and office.

- The energy conservation roadmap and strategy have now been benchmarked with that of SUNY-Buffalo (with an impressive 20 years of conservation track record).

- Started intensive communication, face to face with campus building proctors to enlist their support and benefit from their building-specific issues and inputs. Similar communication started with Department IT support (tier II) staff to seek their support for enabling PC monitor sleep mode throughout the campus.

Generation Green –Student Organized Outreach (in addition to above)

- Doubled pilot buildings in Generation Green Campaign. In pilot buildings we have posters stating the cost of energy use for that building, and equivalent CO2 emissions. We have support and cooperation with the building proctor for the campaign, and associated materials in the building. Since September 2002, we have met with over 250 occupants in the pilot buildings.

- Working to implement recommended changes by building occupants. Examples include switching incandescent bulbs to compact fluorescent (compact fluorescents are 70-80% more efficient and last *at least* twice as long) and delamping.

- Continued ads in local busses, newspapers, and during football games. Created new radio ad that began running fall 2002. Expanded ads to include more buses, basketball games, engineering magazine and family housing.

- Working with housing to switch from incandescent bulbs for individual requests to cfls. Creating study to show estimated cost and energy savings.

- Created a poster with instructions on who to call about energy/water waste, or repairs that was posted in all campus bathrooms.

One Sweet Whirled (OSW) Campaign

- The Environmental Center hosted the OSW campaign, a collaborative effort between Ben and Jerry's ice cream, the Dave Matthews Band and the Save Our Environment network, on campus November 18th and 19th. Campaign mission is to raise awareness about global warming, and simple steps individuals can take to reduce personal emissions. Over 120 volunteers aided in distribution of campaign materials, and distributed over 20,000 OSW pamphlets. While on campus, OSW set up games and tips about global warming, and handed out free ice cream. This campaign was a huge success in raising campus awareness about global warming.

Renewable Energy

- Continuing outreach to schools around the nation about our wind purchase in spring, 2000.

- Project in progress to put solar panels on the roof of the UMC with the equivalent energy output of that used by the Environmental Center in one year. The UCSU finance Board has committed 50% of the project funding; we are currently seeking the other 50% in matching funds.

- Created a report outlining various options for continued support of renewables and funding options in preparation for the expiration of the WindSource referendum. (See attached)

Additional Progress by the Housing Department:

- Housing has entered into a contract with Siemens, an energy services company, to perform an energy audit on almost three million square feet of its facilities. We are calling this the "Housing Improvement Project". The results of this audit will be reported as several cost-saving scenarios from which Housing will develop a final list of recommendations. The second aspect of the project will include the installation of the measures identified in the recommendations. This is a very appealing project that is expected to result in an overall energy savings of 15-30%.
- Energy improvements in Newton Court, a Family Housing area, include:
    - The installation of three smaller, more efficient, two-stage boilers. Rather than having one large boiler continually circulating hot water for domestic use during the summer (and when space heating is not needed), now a smaller boiler will provide space heating and domestic hot water with two stages when needed, and only summer domestic water with one stage.
    - High quality, energy-efficient Grundfos pumps are being installed that use about 10% less energy and have a longer life.
- At Newton Court and the College Inn, all porch lights were converted from incandescent to compact fluorescent bulbs.
- At Smiley Court, new light poles are using HID rather than incandescent lamps.
- Retired refrigerators for Family Housing units are being replaced with larger, more energy-efficient Whirlpool models.
- At Marine Court, a domestic hot water loop will be installed in the spring of 2003. This loop will provide hot water, and will allow for the steam line to be shut down during the summer months. This is estimated to save about 20% in steam costs.
- Apartment units at Athens Court are being retrofitted with individual zone controls to provide for more efficient heating.
- In Family Housing, low flow showerheads are being installed as units are vacated and as bathrooms are being remodeled.
- Housing has a contract with a vendor to remove the CFC's from all refrigerators that require disposal. The refrigerators and the reclaimed CFC's are then recycled.
- Housing, with assistance from the Campus Resource Conservation officer and the Environmental Center, posted over 12,000 stickers reminding residents and staff to "Turn Off the Juice When Not in Use". Stickers were posted in every student room, every Family Housing apartment, and in administrative offices, kitchens, and conference rooms.

Plans for the Upcoming Year

Energy Conservation Projects:
- Xcel Energy Building Recommissioning (Building mechanical systems tune-up): We are exploring this opportunity and will consider this program for specific buildings.
- Office/Classroom occupancy study and motion sensor application: Our study results thus far favor classroom and conference room application over offices. We will conclude the study and selectively apply this conservation technology.
- Outside lights (attached to the buildings): Convert to Compact Fluorescent Lamp (CFL) with 75% energy savings and much longer life. We will complete the business case and target four buildings to study illumination level before expanding to cover other buildings.
- Lower domestic hot water temperature in buildings: Hot water data from 53 buildings indicate that at least 30% of buildings having higher than needed water temperature for general use. We will establish a systematic approach to maintain an acceptable hot water temperature.

Generation Green:
- Increase involvement and collaboration with ITS, building proctors and Residence Advisors in campus Residence Halls.
- At a minimum, double the number of pilot buildings and begin expansion to campus wide.
- Incorporate outreach activities into overall Environmental Center outreach programming and creation of "Green Office" program series.
- Create a video describing various ways to save energy at home and on campus to run before selected campus events and in the residence halls.
- Begin an environmental/energy column in the campus newspaper.
- Begin active water outreach/education campaign!

Renewables:
- Complete project to install solar photovoltaic panels on the UMC. Continue to identify other options for PV on campus.
- Continue to combine efforts with the Department of Engineering to involve more students, and allow for more creative solutions addressing renewable forms of energy on campus.
- Continue to explore options for continuing and expanding student support for wind energy and implement new plan (based on report from this year, and recommendation from the Environmental Center board.)

Obstacles and Discussion Topics

- The 4 CU campuses are at very different levels of support for energy and renewable initiatives. Do we move forward in way that eventually we could combine efforts with these schools? Or should we continue in a manner that makes the most sense for CU-Boulder?
- Savings from energy efficiency projects are still being bundled into the larger general fund pool? Given the current fiscal crisis, it seems unlikely that these funds can be put towards new energy or renewable projects, but would it be possible to do in the future?
- It is difficult to track energy savings due to outreach and education, what is a reasonable way to count these savings?
- What are the key steps CU can take to expand the use of renewable energy on campus?

Growing Without Increasing Traffic

The Vision:

CU caps traffic at 2000 levels by growing in such a way that there is no net increase in single occupant vehicle trips by students, faculty and staff.

While this is the vision statement of the Blueprint, which has been endorsed by both the University of Colorado Student Union and the Boulder Faculty Assembly, it has not been formally adopted by the campus. The Blueprint Committee has discussed a modified goal such as, "CU will increase the percentage of trips taken in modes other than single occupant vehicles." The development of a Transportation Master Plan, which is discussed below, may allow this goal to be refined.

Progress during 2002-2003

Progress in campus-related transportation issues since the spring 2002 report includes several significant steps. The largest and most visible change was the August, 2002 start-up of the STAMPEDE bus route operating between Broadway and Foothills Parkway along Colorado Avenue with loops on the Main Campus and the East Campus/Research Park. In addition, we have seen:

- The start of a year-long, first-ever, campus-wide master planning process for parking and transportation,
- The 227 bus route to Louisville and Lafayette upgraded to the high-frequency DASH service,
- A major upgrade to the bike parking east of the Ketchum Building;
- The establishment of a fleet of CU Buff Bikes,
- A new no-interest bike loan at the U of C Federal Credit Union,
- A west bound bike lane on Colorado between 28th and 26th Streets,
- North and south bound bike lanes on the 28th Street frontage Road,
- Improvements to the east entrance of the College Avenue underpass beneath 28th Street,
- Retrofitting one of Transportation Service's Buff Buses to operate on biodiesel fuel,
- Development of a facility to process oil and grease from Housing kitchens into biodiesel fuel,
- Purchase of three new natural gas fueled Buff Buses by Transportation Services,
- The addition of three hybrid electric Toyota Prius cars to the campus fleet,
- The addition of an electric GEM panel truck to the fleet at Environmental Health and Safety,
- The addition of two electric GEM cars to the Transportation Services fleet,
- The hire of a new Transportation Outreach Coordinator for the campus,
- The defeat of SB03-74 that would have diverted RTD funds to roadway improvements,
- The defeat of an RTD proposal to eliminate the employee and neighborhood Eco Pass programs,
- The addition of new, campus oriented housing on Taft Avenue,
- CU participation in the advisory committee to the city's Transportation Master Plan Update, as well as in the financing and bike/ped sub-committees,
- First annual "Bike Bash" spring biking event,

- Addition of a "Do you really need a car on campus?" page to the student parking permit sale web site,
- Continuation of alternate modes information outreach at parking permit sales, new student orientations, new faculty orientations and new employee orientations,
- Transportation issue area incorporated into the Campus Resource Conservation Committee,
- Addition of commuter rail between Boulder and Longmont to the Locally Preferred Alternative package of recommendations for the US 36 corridor,
- The sixth faculty/staff Eco Pass program tracking survey was conducted in fall of 2002; showing:
    - The proportion of faculty and staff commuting to campus via transit full-time has more than doubled, increasing by a factor of 2.4 - up from 8.7% in 1997 before the Eco Pass to 21% in late fall of 2002.
    - The proportion of faculty and staff commuting to campus via transit at least one day a week has nearly doubled, up from 17% in 1997 before the Eco Pass to 33% in late fall of 2002; a 194 % increase.
    - A drop in the average number of days/week faculty and staff parked a vehicle on campus, from 2.8 before Eco Pass to 2.4 in fall of 2002, resulting in 536 fewer vehicles coming to campus each day.
    - A drop in the proportion of faculty and staff who park on campus at least one day a week from 64% before the Eco Pass (1997) to 56% in the fall of 2002.
    - Bike parking upgrades at several campus housing facilities
    - Bike racks installed at a number of campus-area bus stops
    - Bike racks upgraded at a number of existing bike lots
    - A partnership with the U of C federal credit Union to create the Easy Ride no interest bike loan program
    - The creation of the Buff Bikes free bicycle rental program

Buff bikes next to the UMC

Next Steps

Emerging opportunities include:

- The creation and promotion of a vanpooling program,
- Integration of "Commuter Choice" information with Human Resources outreach,
- Plans for a high-frequency transit service, the DART, between Boulder & Longmont
- The start of the $15 million environmental impact study for the US 36 improvements, jointly funded by RTD and CDOT
- Completion of a CU Parking and Transportation Micro-master Plan by mid-2004. this ia a critical planning exercise; progress to date can be found at ucbparking.colorado.edu/transportationmasterplan
- Promotion of Eco Pass use for local/regional campus business travel as part of the effort to conserve campus dollars and resources for education,
- Creation of a regional/Front Range campus bicycle program manager's group,
- Taking a new look at creating an east-west bike route across campus. The Environmental Center is funding a consultant to prepare a bikeway corridor functional design plan for an east-west connection through the CU main campus from Broadway / Pleasant to Folsom / Colorado.
- Developing a campus bicycle station, to provide a one stop shop for bicycle registration, the Easy Ride loan program, the Buff Bikes bike check-out program, bicycle and bus information, a pump and tool board, and covered and secure bike parking. A first phase bike station has been developed in a temporary location east of the UMC; and the university is applying for federal transportation funding for a future phase.

Creating a Safe and Healthy Campus
Part I: Minimizing Hazardous Waste

The Vision:

- CU reduces the amount of hazardous waste generated by the campus while maintaining the quality and quantity of research.
- CU continues to advance pollution prevention programs to reduce the quantity of hazardous material present on campus and to promote a safer working and learning environment.

Progress during 2002-2003 and Upcoming Plans

Eight Action Steps towards UCB's waste minimization and pollution prevention programs were originally proposed in the *Blueprint for a Green Campus* issued in April 2000. Since that time, three Action Steps have been completed and five are ongoing. Additionally, the Environmental Health and Safety Center has made several other advancements towards waste minimization and management, pollution prevention, and resource savings, including participation in the campus-wide Environmental Council that was charged by Vice Chancellor for Administration Paul Tabolt (see summary and appendix).

Action Step: Institute a central chemical procurement system.
Current Status: The EH&S Chemical Management Specialist continues to consult with staff from CU's Procurement Service Center and others to explore a centralized chemical purchasing system.

Action Step: Further advance 'Best Management Practices' already adopted by many laboratories and shops to maximize safety and minimize waste. **Completed.**
Current Status: CU-Boulder served on a special commission sponsored and facilitated by the Howard Hughes Medical Institute and comprised of Federal/State regulators and representatives from each of the 10 EPA regions across the nation. A report of the findings from the 'Best Practices' project was submitted to Congress and the EPA. The EPA was complimentary of the report and has adopted rule interpretations that are favorable to university laboratories, based upon the recommendations of the committee. The next step in this process is for the EPA to acknowledge the best practices procedures in well-defined regulations and guidance documents.

Action Step: Investigate the feasibility of applying an 'advanced disposal fee' to discourage bulk purchasing of chemicals. **Completed.**
Current Status: The application of an 'advanced disposal fee' has been explored; however it has been determined to be not feasible at this time. Factors involving customization of procurement procedures, journal entries, and inventory control must be further considered at a future date.

Action Step: Further advance microscaling efforts. (Microscaling involves conducting experiments on a smaller scale thus reducing the quantity of hazardous substances use in experiments, manufacturing, and routine cleaning.)
Current Status: Microscaling efforts continue to be a consideration of faculty for teaching and research at UCB.

Action Step: Add a waste treatment specialist to the EH&S staff to run the waste treatment process and advise on waste minimization techniques. **Completed.**

Action Step: Continue to utilize and expand treatment techniques at the EH&S facility to significantly decrease hazardous waste volumes.
Current Status: For the calendar year ending December 31, 2002, the treatment facility has processed 24,627 liters of materials (6,481 gallons, equal to 118 55-gallon drums). The treatment processes have facilitated the recovery of 3.406 kg (7.5 lbs.) of silver, and 20,741 liters (5,458 gallons) of water for return to the city wastewater treatment facility. Presently, EH&S is looking at metals removal from aqueous solutions as an option to expand the treatment facility processes, allowing a broader range of waste materials to be treated. Also, a new tank has recently been installed to allow for simultaneous treatment of wastes with the three existing processes in the treatment facility (photochemical silver recovery, acid/base neutralization, and organic ozone/UV oxidation). This will allow for increased amounts of waste to be treated and discharged and for increased savings from disposal costs in the future.

Action Step: Reduce photographic chemical waste by utilizing new technologies and procedures.
Current Status: In 1997, digital photo labs were established within UCB's Fine Arts and Publications Departments. These labs have proved a success both academically and environmentally and have significantly reduced the volume of photographic wastes generated on Campus

Action Step: Establish a battery recycling program so that rechargeable and alkaline batteries are recovered for recycling.
Current Status: A study was completed during the past year to determine disposal requirements and the need for recycling alkaline batteries. Though most battery types are regulated and require proper disposal, alkaline batteries have been determined to be non-regulated and trash disposable. Laws prohibiting the production of alkaline batteries with added mercury have been in effect since 1993, and levels in current batteries are well below regulated levels. After consultations with the State, and analyses of samples of alkaline batteries by an independent laboratory and the consideration of cost analyses, it was determined that recycling of alkaline batteries on Campus is not feasible at this time. The existing battery recycling

program within the Hazardous Materials Group has been expanded to include campus drop-off sites, which make proper disposal (recycling) of batteries easier for all campus departments (for an updated list of sites around Campus, call 2-7845).

Additional Progress by Environmental Health and Safety

- As of February 2003, the EH&S chemical inventory management pilot has been successfully tested and is ready to be implemented as a fully operational system. Once EH&S has installed a new dedicated server, the program will be ready for widespread campus and outside agency use. Campus staff will be able to access the system for:
  - A one-stop chemical hazard database that provides a vast array of information about chemicals, e.g., physical properties, safety and parameters, toxicological information, and spill cleanup protocol, etc.
  - Laboratory managers will also have the ability to quickly update and edit their own chemical inventories. Special attention was given to make the program user-friendly, and, most important, secure with password protection.
  - EH&S, as well as outside emergency responders, e.g., Boulder Fire Department, will access the database through special passwords to assist them in knowing what chemicals are on campus and where they are located, providing better knowledge in the event of an emergency.

- The EH&S Chemical Management specialist was effective in acquiring new chemical storage cabinets, primarily in the Chemistry Department, to provide additional chemical security as well as to bolster pollution prevention measures.

- EH&S is has published and distributed the *Generators' Guide to Hazardous Material/ Waste Management*. The new booklet has several improvements, including comprehensive biowaste management procedures and a simplified Emergency Action Plan, in an improved, easier-to-use, format.

- UCB essentially completed the identification and labeling of all interior and storm water drains on the main and east campuses. Turf and grassy areas are expected to be marked during the summer of 2003. Additional detail included under Facilities Management Progress below.

- EH&S has completed implementation of most of its Spill Prevention Control and Countermeasure Plan (SPCC) for above-ground petroleum tanks and emergency generators. This includes secondary containment, berms and spill prevention equipment. Full campus implementation is expected by June 2003. Additional detail included under Facilities Management Progress below.

- Last year, a pilot program, funded primarily by a water conservation project, installed six new specialized vacuum pumps in Ekeley and Cristol Chemistry that replaced water aspirators used to distill solvents. Based upon the success of this pilot program, UCB will be installing several more new vacuum pumps to replace the wasteful aspirators. The obsolete water aspirators waste millions of gallons of water per year, cause sanitary sewer violations and the threat of potential fines, and cause concern among building occupants about odor and

health issues. These issues will be successfully mitigated once the installation of the vacuum pumps is completed. This project is now able to be expanded campus-wide. Any one still using water aspirators are urged to contact Moe Tabrizi, at the UC-Boulder Energy Conservation Office. Additional detail included under Facilities Management Progress below.

- UCB strives to comply with, and, in most cases, exceed the new EPA regulations for storm water management and permit requirements. The Boulder Campus began implementing storm water management programs and practices more than 20 years ago to control and eliminate sources of water pollutants. UCB has developed and maintained a number of aggressive storm water management programs, placing UCB in a position of environmental leadership.

Additional Progress by Facilities Management

- $1500 funded for removal of Vinyl Asbestos Tile (VAT) in Porter. There was about 800 sq. ft removed in JILA in January of this year. Not aware of any other large projects for this fiscal year.
- Aspirator-type (water-wasting) vacuum devices in Cristol are being replaced with vacuum pumps. This eliminates the entrained chemicals in the water being wasted - and eliminates waste of potable water for these applications (which is another environmental benefit). Also mentioned above under EH&S progress.
- Environmental Services currently reviewing and rating all cleaners and disinfectants used by custodians based on toxicity. This is an ongoing project; To date, 206 cleaners have been reviewed and ranked.
- Storm water drain assessment completed by Physical Plant. Rerouted worst five illicit storm drain connections to sanitary sewer, including drains in Engineering, Duane Physics, and Chemistry.
- Several cooling tower and outdoor fountain drains have been re-routed to sanitary sewer at a cost of $15,000.
- Fluid labs in Engineering were also re-piped to sanitary sewers at a cost of $40,000.
- Continued progress on storm drain stenciling project. To date 90% of all ‘hardscape’ drains have been labeled, with Euclid and Regent Autoparks being the exceptions. A plan is currently being devised for storm drains located in turf or other landscape areas. The most current Storm Drainage project completed last summer, has incorporated the use of manhole covers that have the "dispose no waste drains to creek" right in the castings. We also are working on including these covers in our Construction Standards.
- Currently working on more complete mapping of drain network and emergency contingency plans. This involves linking catch basins to the next manhole in the system and then to the next outfall to the creek. The primary use of this will be to trace a pollution stream back to the source but can also be used to determine where a pollutant will enter the creek. Work continues on the data bases associated with catch basins, outclass, and manholes.
- Funded a manhole audit to determine condition of existing manholes and inlets; $12,500 for sanitary and $20,000 for storm. This project also includes working with the city to create a uniform numbering system that can be used by both entities. We are currently are done with the Sanitary manholes and are planning to be done with the Storm manholes by the end of

April. We have also identified certain catch basins that need initial cleaning and are seeking funding to get these cleaned this summer.

- $20,000 funded in FY01/02 to implement campus Spill Containment and Control Plan (SCCP) for all above ground gas tanks and diesel generators. Includes purchase of emergency spill containment equipment as well as installation of permanent berms around tanks. Future funding will look to replace certain old tanks/generators with newer double-wall tanks. Projects complete to date include: 1. Generator at Stadium replaced w/ new double wall tank. 2. Poorly designed fill station at Muenzinger removed completely. Pipe leading from fill station and tank excavated and removed. Construction of spill containment berm for Physical Plant emergency generators and Engineering S. generator currently underway. Additional $7,000 funded in FY03 (total of $27,000) for replacement of tank at IBG from single- to double-wall. This is not required by the current SCCP regulations but was deemed appropriate due to the proximity of the IBG tank to the Boulder Creek. All SCCP projects scheduled to be complete by 6/1/03.
- Members of the Physical Plant attended annual refresher SCCP refresher course presented by EH&S on 2/11/03.
- $35,000 funded in FY01/02 to install CFC monitors in RL-3 and Education chiller rooms. Previously installed Engineering monitor also repaired with this money. Refrigeration shop has identified 8 other chiller rooms needing monitors. Temporarily postponed due to budget cuts.
- Currently working with State on voluntary CFC audit of campus to assure complete compliance with CFC regulations. All of our chillers are now registered with the state and all fees are current.
- The refrigeration shop has also created a tracking system for use and releases of CFC's. All contractors have been notified about the requirements we have established for the tracking of their work as well.

Additional Progress by the Housing Department:

- All Housing-owned unwanted or malfunctioning computer equipment is inventoried through Housing IT. If it requires disposal, it is then sent to Property Services. In February '03, Property Services notified all departments that the sale of unwanted computer equipment through pallet auctioning would no longer be possible, and that there will be a per item fee to process all computer equipment. Housing will be looking into the feasibility of leasing computer equipment to see if we can approach cost-neutrality by avoiding disposal fees. We will also be asking Housing's Residence Hall Association (RHA) if they would be interested in surveying residents to determine if there is a need for a student computer disposal program.
- Housing is evaluating all cleaning products used in its six kitchens for acute or chronic toxicity. Hazardous products are currently being identified. More user- and environmentally-friendly substitutes will be tested by kitchen staff for their acceptability and suitable performance. These substitutes will then become the standard for all the kitchens, and for some applications in housekeeping.
- Housing is working with EH&S towards converting approximately eight remaining floor drain connections. Currently, these connections route to the storm sewer yet need to route to the sanitary sewer.

- Dining and Housekeeping staff have been informed of all stormwater regulations that prohibit all treated water from entering a stormsewer, i.e., they may no longer rinse off equipment at back docks or on any hardscape.
- All spent fluorescent lamps containing mercury are disposed of by Facilities Management through an EPA-approved lamp crusher, designed to capture the mercury vapor.
- All batteries generated by Housing Services—i.e., those from cell phones, palm pilots, hand-held tools and smoke detectors in Family Housing—are collected from the Housing Maintenance Service Center by EH&S for proper disposal.
- A new battery-free flashlight is being used in Housing Services. The user generates electrical energy by shaking the flashlight, which has a generator and capacitor to store the energy. It is expected to save approximately $40 in batteries per year per flashlight, with a payback period of less than one year.

Creating a Safe and Healthy Campus
Part II: Minimizing Exposure to Toxic Chemicals and Pesticides

The Vision:

- CU significantly reduces the use of harmful chemicals and volatile pesticides in buildings and grounds management through integrated pest management.
- Campus buildings provide high indoor air quality through improved ventilation and control of indoor air pollution sources.

Progress toward Integrated Pest Management during 2002-2003

Facilities Management is active with the following efforts:

- Physical Plant pursued an additional FTE to be split between structural IPM and the Integrated Weed Management (IWM) program. This was abandoned due to budget cuts.
- Grounds experimented with use of Cashmere goats to graze noxious weeds on 12 acres at Research Park (4/00, 11/00). Goats were again used on the Research Park in Dec. of '01 for the control of knapweed, and various thistles. Grazing was again used at the Research Park in June of '02, adding a new section to the routine. Goats were also used for the first time on the South Campus in July of '02. We are hopeful to complete a three year cycle of grazing at the Research Park this Spring as well as continuing grazing on the south campus. This will be dependent on funding.
- Additional releases of seed-head and root-feeding insects were conducted on both the Research Park and South Campus properties in the summer of '01. No further releases were conducted by Grounds in '02 but research projects under Professor Tim Seastedt continue at both the research park and South Campus. The Grounds division hopes to release more bugs this season.
- Division took lead in drafting campus IPM Policy currently under review by the Administration. Policy adopted campus wide 3/12/02. "Threshold Action Levels" determine appropriate treatment that is: Least hazardous to human health; Least damaging to the environment; Effective in controlling the pest; Has minimal negative impacts to non-target organisms; Within available resources All proposed pesticide applications reviewed & approved by coordinator. Only "Qualified Supervisors" have authority to purchase pesticides.
- Funded roughly $10,000 in Deferred Maintenance monies for the commencement of parasitic wasp releases in certain research labs in the Ramaley biology building. The release of over 16,000 wasps, Anastatus teuipes and Comperia merceti, will occur from March 18th to July 14th with subsequent monitoring through the end of October.
- In Aug. of '02 the Grounds division established 34 different turf test plots. The purpose of the test plots was to test alternatives to synthetic herbicides used for dandelion control. A post emergent herbicide made of sugar beets (Nature's Weed Control©), and Corn Gluten Meal, a pre-emergent herbicide, were applied on the majority of the test plots. Several test plots received only cultural techniques while 2 of the plots received a synthetic herbicide treatment.
- On 4/4/03 Corn Gluten Meal applications were repeated on the original test plots. Nature's Weed Control will also be applied in early May to all original test plots.
- The Grounds Turf Manager will be experimenting with the use of organic fertilizers on certain fields across campus over the next year.

Housing has made the following progress in reducing chemical and pesticide use.

- Housing is in the second year of a three-year protocol of using a corn gluten meal pre-emergent control on weedy areas of turf, and a slow-release, alfalfa-based fertilizer. Cultural practices are also being modified so that grass is mown to a taller height, and watering is done at the most optimum time of day, as well as in the most optimum amounts (the feeling being Housing has been over-watering much of its grounds in prior years; clearly, the drought is going to have an impact on this aspect of the program). The objective is to reduce the spread of dandelions and other visible weeds in turf areas, and to build soil health so that the turf is more able to out-compete weeds.
- A vinegar and soap solution is being used on weeds in sidewalk and asphalt cracks with good success. Housing has not applied pesticides in over 10 years.

Progress toward Improving Indoor Air Quality during 2002-2003

Facilities Management has made the following progress on improving ventilation and controlling indoor air pollution sources.

- Environmental Services has phased out the use of upright vacuum cleaners in lieu of more ergonomically correct canister and backpack vacuums that do not emit as many particulates into the air. Environmental Services has reduced the total number of vacuums needed by moving toward a "team cleaning" concept. At this point all vacuums used (55-60 total) are backpack vacuums capable of filtering out 99.99% of particles less than or equal to 0.3 microns.
- Performing minor upgrades to campus ventilation systems such as balancing and improving ventilation of fume hoods, removing obstructions, and improving make-up air. Funded $12,000 in FY01/02 for fume hood balancing as needed. Completed $4,000 in work and returned additional $8,000. Additional $12,000 funded in 02/03 in order to complete work.
- Funded $35,000 in FY01/02 for significant improvement to Fine Arts duct work and ventilation system including removal of unused fume hoods, improving fans, lowering of exhaust drops to sit directly over emissions sources, and adding exhaust vents to photo lab hazardous waste SAA. Project will be wrapped up by 6/1/03.
- Performed major upgrades to ventilation systems through deferred and controlled maintenance projects. These have included significant improvements in Chemistry (fume hoods), Imig Music (raising of fresh air intakes from street level), the Grounds Building (emissions exhaust system and HVAC improvements), and Environmental Design (raising of air intakes). No major projects this year but effort will continue.
- $2.3 million project in Chemical Engineering is 75% complete. $80,000 funded in FY 01/02 for improvements to Ramaley cadaver room ventilation system. Repairs completed but seem ineffective. Further action necessary.
- Environmental Services currently reviewing and rating all cleaners and disinfectants used by custodians based on toxicity. This is an ongoing project. To date, 206 cleaners have been reviewed and ranked.
- Purchase and use of low/no VOC paints, finishes, and adhesives. Ongoing.
- All outside-air intake louvers have been retrofitted with outside screens which makes them easier to keep clean, thus not reducing the amount of fresh air that can be brought into the buildings.

- Retrofitted of Regent 3rd floor ventilation system complete to correct inadequate airflow in early 2003. Replaced 2 air handling units and a chiller.

Next Steps and Discussion Topics

- Conduct education about campus IPM policy and procedures

To promote preventative measures and awareness of the campus IPM program, the Environmental Center developed and distributed fact sheet fliers for lab, kitchen and office areas. There is a strong need to develop additional materials educating campus users about IPM efforts and procedures. Plans are underway to print a general brochure. Other outreach and education services could include presentations to building users, building displays, and appropriate signage posted in outdoor areas. An IPM education plan should be developed after determining the best outreach means.

- Implement the IPM policy and procedures

As laid out in the policy, duties and responsibilities are to be assigned to and enacted by various campus departments, personnel, and contractors. All departments are to utilize integrated pest management methods.

- Restrict the use of the most harmful pesticides and chemicals

Although the pest control policy outlines IPM criteria, it does not specifically limit the more harmful pesticide applications which include the use of pesticides in aquatic areas, the use of persistent chemicals which pose a long term threat after application or which bio-accumulate in fatty tissue, and the use of compounds in EPA toxicity categories I and II. Initial review of potential chemicals should begin with the least toxic compounds, i.e. chemicals in EPA Toxicity Categories III and IV. The use of compounds in EPA Categories I and II should be avoided if possible or used as baits or soil/trunk injections where exposure to the active ingredient is limited. The Campus Environmental Council could consider strengthening the policy.

- Address future plans for outdoor integrated pest management to safely and effectively control broadleaf weeds.

In June of 2003, an herbicide application occurred on selected campus grounds to control a significant dandelion outbreak. The herbicide contained 2,4-D which is a suspected carcinogen. It is not clear how the criteria laid out in the IPM policy were applied in this case. An article with more details can be found in the environmental center September 2003 newsletter at http://www.colorado.edu/ecenter/publications/index.html#newsletter.

- Establish registry of chemically-sensitive campus individuals.

Greening Campus Consumption and Disposal Habits
Part I: Purchasing Environmentally-Responsible Products

The Vision:
CU adopts an environmentally-preferable purchasing policy which will institute standards for environmentally responsible purchasing.

Progress during 2002-2003

General Campus-wide Progress:
There has been significant progress by a number of campus departments, but not institutional progress on the goal of establishing an environmentally preferable purchasing policy for the CU-Boulder campus.

- Tree-Free Paper Consumption: Wilderness Study Group campaigned for increasing the use of recycled disposal paper consumption on the CU campus. After researching and recommending 100% recycled content toilet paper and paper towels products, Facilities Management not only switched to recycled paper products in all general fund building bathrooms, but also saved money in the process. The products now in use cost slightly less than previously used non-recycled products.

- Campus Printing Initiative (CPI): The CPI's pay-for-print program is estimated to reduce the amount of paper used in computer labs by 50 percent, or approximately 7,5000,000 sheets of paper. The tests of recycled paper in printers have been positive, showing that 100% post-consumer recycled paper is performing well in the machines. To date, the program has been using Eureka 100 paper.

- Policy/Contract Reform: Meetings with the staff of CU's Procurement Service Center (PSC) have addressed key issues necessary to implementing environmentally preferable purchasing policies. Discussions in 2002-2003 with PSC related to prioritizing goods and services where procurement standards and contract reform could be piloted. Computers were selected as one of the product categories to pilot but this work is delayed as CU will be part of a regional contract for computer products slated for revision within 3 years. Further discussion and recommendations need to occur. PSC also agreed to generate a list of upcoming contracts where environmental standards could apply.

- Green Purchasing Expo: The Green Purchasing Expo, held in conjunction with the Campus Sustainability Summit, was organized to bring higher education purchasing departments together with environmentally friendly product and service vendors. Oftentimes, despite a desire to green their campuses, higher education procurement staff are simply unaware of the environmentally preferable alternatives available in the marketplace. The intent of the Expo was to provide a much-needed link between procurement personnel and environmentally friendly businesses. Over twenty businesses attended the first Expo.

Progress by Facilities Management:

- Environmental Services currently reviewing and rating all cleaners and disinfectants used by custodians based on toxicity. This is an ongoing project; To date, 206 cleaners have been reviewed and ranked.
- Environmental Services continues to research, test, and use least-toxic pesticides for use in the IPM program. All pesticides used have the least possible potential to impact human health, the environment and non-target species.
- Environmental Services switched to 100% recycled content (minimum 20% post-consumer) toilet paper stocked in general fund buildings in February, 2003.

Progress by Housing:

- Housing is underway with its green building program. In the fall of 2002, Housing contracted with a green building consultant to identify opportunities to incorporate green building materials and methods in both major construction and smaller maintenance projects. Procurement procedures that currently act as barriers to using green products will be modified to support this activity. Training sessions to familiarize project managers and supervisors will be provided, and project management procedures will be modified to help make incorporating green measures a new Housing standard.
- Items typically stocked in Housing Services' warehouse such as paints, finishes, and adhesives will be evaluated for cost and performance against environmentally healthier alternatives. If this evaluation favors these alternatives, they will likely become standard stocked items.
- The maintenance supervisors for Family Housing are looking at making recycled content/recyclable carpeting the standard for replacement carpeting in all apartment units.

Outreach to Campus Departments:

The student outreach staff at CU Recycling have been conducting visits to campus offices to share information and make recommendations on a variety of environmental issues, particularly recycling, waste reduction, and environmentally friendly purchasing options. The Green Products Guide and updated recycled paper price, quality and availability information are distributed as part of a "green" folder containing a variety of campus environmental information. Staff have already visited and shared information with over 50 offices in 10 buildings.

Next Steps

- The Environmental Center will update, reprint and redistribute the Green Products Guide.

- Based on consumption reports from cost centers, UCSU staff plan to develop and propose a pilot environmentally-preferable purchasing policy.

- The Campus Environmental Council formed a subcommittee to research and recommend next steps for environmentally preferable purchasing programs and policies.

Discussion Topics

- How can Procurement Services assist in tracking the amount of green products being purchased and in determining the price, quality and availability of the more environmentally friendly products?
- What would be an appropriate green procurement policy for CU-Boulder and/or the University of Colorado system?
- Which vendor contracts could be revised to include environmentally-preferable alternatives?

Additional Information

- Center for a New American Dream:
  http://www.newdream.org/procure/
- EPA guide to state and local green purchasing:
  http://www.epa.gov/oppt/epp/pdfs/statenlocal.pdf

Greening Campus Consumption and Disposal Habits
Part II: Capping Solid Waste Going to the Landfill at Year 2000 Levels

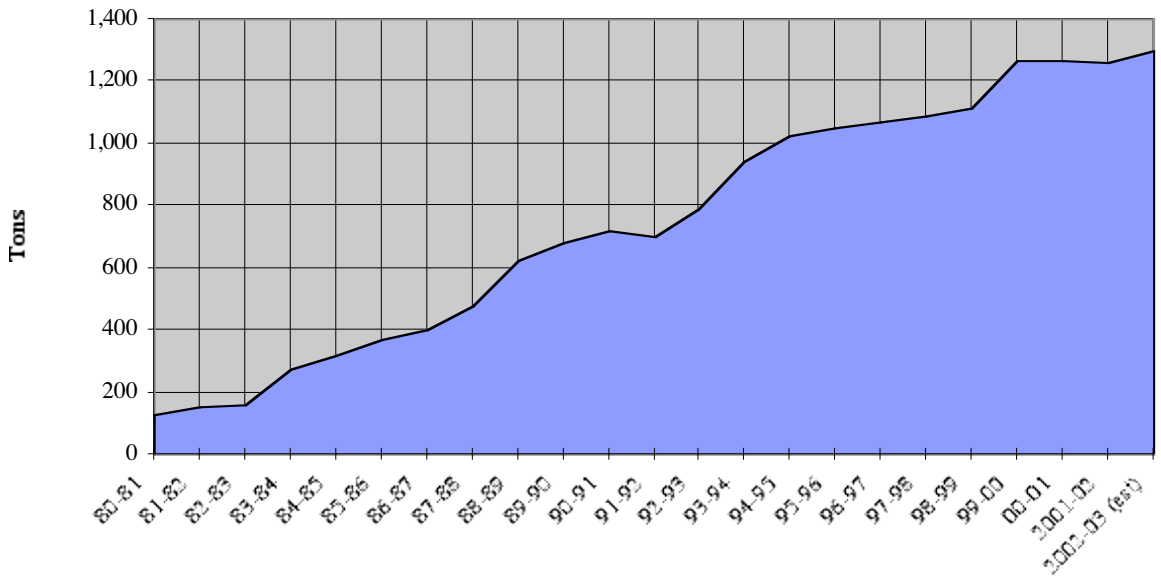
The Vision:
As CU grows, we will cap the amount of solid waste going to the landfill at year 2000 volumes by increasing recycling and composting efforts and by using market incentives, new technologies, and purchasing policies to reduce waste generation on campus.

Progress during 2002-2003

The recycling program continues to make important advances yet faces significant challenges in the coming year. Accomplishments include record levels of grant funding, continued capital investment by UCSU, and dozens of operational, managerial, and promotional improvements. The Student-Administrative Partnership for Recycling, formed by the Chancellor in 1991, continues to serve the campus well.

Operations:
CU's recycling program is organized as a partnership among UCSU, the Housing department, and Facilities Management. Twenty-seven UCSU employees, ten Facilities Management and Housing employees, one full-time VISTA volunteer, and countless volunteer hours provide staffing for the program. The program recycles between 3-5 tons each workday from more than 750 locations on campus. Over 30 percent of the campus waste stream is diverted through the recycling program.

A steady progression in CU Recycling's collection and processing can be seen below:



Some of the recent operational improvements that contribute to these increases include:

- Expanded collection of valuable high-grade paper from Family Housing courts.
- Expanded automated collections of cardboard from residence halls and family housing courts.
- Expanded the Construction and Demolition waste recycling and reuse effort as part of UMC project. UCSU and Facilities Management worked to determine potential for C&D recovery in the Grandview area and Hunter demolition. Note that the volume of C&D material recycled is not included in addition to that shown above.
- Expanded toner cartridge collections and increased confidential shredding service as revenue-generating mechanisms
- Boosted Facilities Management's central collection locations from 650 in 2001 to 765 currently
- Increased desk-side recycling bins to over 10,000

CU Recycling also continued its cardboard recycling program during residence hall move-in. This fall, over 6,000 CU students loaded with moving boxes for computers, stereos and bicycles recycled 16.5 tons of cardboard during the two-week move-in period. Participation was close to 100%, which diverted over 400 cubic yards of cardboard from the landfill. This effort is an exceptional example of achieving both disposal cost savings and environmental benefits and reflects the strength of the program's partnership between UCSU, Facilities Management and Housing. It also exposes incoming students from the beginning to recycling at CU.

The recycling program offers recycling at special events on-campus such as concerts, career fairs, the Bolder Boulder, and home football games. The 2002 football season was one for the recycling record books as over 9,541 pounds of co-mingled containers, 1,999 pounds of cardboard, and 798 pounds of office paper were collected by student staff.

CU Recycling now partners with Cerebral Palsy to collect donated charitable goods (i.e., clothing and appliances) during residence hall move-out. CU Recycling also coordinates the proper disposal of common move-out items such as loft wood and cinderblocks as part of this reusables drive.

Outreach:

- Conducting additional outreach to hall directors and resident advisors
- Conducting surveys of resident hall students and building proctors
- Initiating the "Green Office Project" which performs environmental assessments of offices, increases direct contact with faculty and staff, and provides information and recommendations for improved recycling and waste reduction
- Reinstituting the custodial appreciation program
- Improving communications between operations and outreach staff to better track contamination and prevent overruns.

Program Development:

Continued Capital Expansion Plan

The recycling program continued to benefit from UCSU's resolution in 2000-01 to support a four-year capital development campaign. This campaign prioritizes capital improvements based on:

- amount of recyclables diverted from the waste stream,
- visibility,
- ease of implementation,
- cost-effectiveness.

$83,500 was approved by UCSU in fiscal year 2000-01 to fund purchase of recycling containers, distribute new outreach materials, and implement an automated cardboard recycling system. $61,533 in Year Two expansion was approved for additional containers, improved visibility and collections in the Housing department, and increased catalog, magazine, and textbook recycling. $63,500 was approved for the current year to continue placing containers as well as a cardboard compactor for the UMC and beginning phases of a food waste composting project.

These capital improvements are having desired effects. Cardboard collections for instance have increased 52 percent (to 239 tons last year), as a result of new equipment. Visibility and convenience for students has also been enhanced with approximately 35 additional locations and 15 upgraded containers. These improvements have also helped stimulate operational involvement from Facilities Management and the Housing department, particularly in the area of composting.

The four-year capital expansion plan as approved and funded by UCSU has also advanced educational materials and activities. Years One, Two and Three capital outreach projects, as listed below, have produced signs, displays and brochures and have resulted in improved information and increased awareness.

- Green products guide
- Family Housing cabinet stickers and Housing in-room container stickers
- Deskside container stickers
- Color poster displays in residence halls and academic buildings
- Family Housing signs
- Housing dock signs
- Expanded information on container labels
- Signage in classrooms
- Signage at indoor central locations
- Stamps for mail clerks to use on incoming cardboard boxes

The fourth year of capital funding assistance from UCSU will continue to lever increased involvement from other departments. CU Recycling is currently evaluating the projects for the coming Fiscal Year. A funding request will be presented to UCSU Finance Board.

Food Waste Composting:
CU Recycling was awarded $10,000 by the Governor's Office of Energy Management and Conservation last year to research and recommend food waste composting options for institutions in Colorado. The planning guide which students and staff created can be viewed at http://www.colorado.edu/ecenter/news/publications/index.html#composting_guide.

As a result of the research, CU's composting proposal was defined. Several operational options to cost-effectively process 650 tons annually from the Housing department are being finalized. Capital funding from UCSU has been an important factor in enabling the Housing department's participation. The United States EPA also awarded the Housing Department $55,000 towards implementation of an in vessel food waste composting project, to be developed in cooperation with the Environmental Center and Facilities Management. The housing department is also leveraging investment from its performance contract with Siemens. The largest outstanding issue is the siting of the facility.

Electronics:
The emerging problem of "e-waste" is also being addressed. Last year, the Environmental Protection Agency funded CU Recycling to recommend reuse and recycling options for computers and electronics. Regulations now require businesses and institutions to change their disposal methods for this toxic part of the waste stream. CU's President's Office, the State Office of Economic Development, and the Corporation for National Service are assisting the project.

Thus far, 105 computer systems have been provided to disadvantaged groups around the state. In addition to the social benefits of donating an estimated $69,000 worth of equipment, COMEX was able to divert an estimated 5,300 pounds of lead, cadmium, mercury and other materials from local landfills. This information was recently delivered at seven Small Business Development workshops around the state.

Recycling Facility Relocation:
Recycling staff in the Environmental Center, Facilities Management, and Housing spent hundreds of hours over the past year trying to find a suitable location for a new recycling facility before the second phase of stadium expansion displaces the current one. The Environmental Center's requirements for a new facility were reiterated to the Athletic Department, Facilities Planning department, and the Boulder Campus Planning Committee (BCPC). These provisions include full replacement funds for the facility from Athletics, no interruption in service, access by student employees, and room for planned expansion. UCSU passed a student government resolution in 2000. In 2001, BCPC revised the Athletics Micro-Master Plan to require that recycling's basic needs be met. A Business Plan which quantified financial and operational impacts of relocating the facility off campus was requested by the Vice Chancellor for Administration and was completed in 2002. The subsequent site selection process for possible locations was taken to BCPC in April 2002. Facilities Management recommended an east campus site; the site selection committee recommended that both east campus and main campus sites be considered, and BCPC asked for additional financial analysis of the impact of a move to east campus before making a decision. The next step was the initiation of a "business plan review."

Business Plan Review:
In November, the Vice Chancellors for Administration and Student Affairs contracted a consultant to conduct a thorough assessment of CU Recycling's activities and finances and to recommend the most cost-effective scenarios for a future recycling program at CU. The report, released in Spring 2003, contains historical and structural information and finds that CU's recycling program serves the campus cost-effectively. There are a number of highlights from

the report. It points out that over 1,400 tons will be recycled at CU Boulder this year, which accounts for approximately 30% of the waste generated on campus.

This analysis indicates that recycling is saving Facilities Management a net of $175,000 per year in solid waste costs. For general fund waste, trash disposal costs Facilities Management $601/ton; recycling costs them $286/ton. In the aggregate, every ton recycled in the general fund buildings saves the general fund $315. Each dollar spent on recycling saves $2.10 in trash. The reasons that recycling is so much cheaper are interesting. The primary reason is not the tipping fee charged at the landfill (landfill fees are only $20/ton!), but reflect the fact that the system that has developed on campus for collection and transport of recyclables materials is much lower cost than the collection and transport of solid waste.

The complete review can be viewed at http://www.colorado.edu/reports/recycling/.

Additional Progress by Facilities Management:

- Partnered with Housing and UCSU to implement automated collections of cardboard from residence halls and family housing courts. Plans in place to expand program further with additional funding from UCSU and Housing. A six-month temporary position was created for the purpose of expanding and formalizing automated cardboard locations in Housing.
- Grounds partnered with UCSU to establish collection of recyclables from outdoor recycling stations. Looking at possibility of revising entire grounds trash collection program to maximize efficiency, reduce costs, and include recycling at majority of outdoor trash locations. Project was temporarily delayed by budget cuts but on track for partial implementation in Fall 2003.
- Environmental Services is also investigating the possibility of using high efficiency hand dryers in campus restrooms. This could save over 5600 cases of paper towels paper year.

Additional Progress by Housing:

- Housing is investigating the possibility of a food compost project for handling pre-consumer food in all eight of Housing's kitchens. There is an estimated 600 tons of pre-consumer food waste that could be diverted from the landfill. With the support of the Environmental Center and an EPA grant, we are currently looking at partnering with a local recycler to compost the food waste off campus through either aerated windrows (long rows) or vermicomposting (using worms to accelerate the decomposition). If this project were to get the green light, Housing could increase its diversion rate from 15% to 42%.
- 610 pallets were reused/recycled by a pallet vendor; any broken ones are chipped up and used as mulch.
- In the Fall of 2003, the Pay-for-Printing program will return to Housing's computer labs, saving an estimated 800 reams of paper annually.
- Housing has chipped its organic wastes since 2001, diverting an estimated 36 tons from the landfill, and using it as mulch.
- All scrap metal generated by Housing Services is recycled.

Next Steps

Capital Development:
As previously mentioned, the goal for the coming year will be to fully implement the projects already approved by UCSU. Specific activities will address:

- Grounds department's collection of 14 outdoor public recycling stations,
- Siting 11 new cardboard recycling locations at residence halls and family housing courts,
- Siting additional locations for catalogs and magazines.
- Improving appearance and functionality of 16 outdoor locations
- Resolving space constraints for a textbook shear which removes covers and bindings, and allows high-grade fibers to be recovered for recycling.
- Contributing to the Housing department's purchase of food waste composting equipment

The successful development of a food waste composting system is a time consuming challenge, but when implemented, will increase the number of tons of material diverted from the landfill by 50%.

An additional goal will be to recommend a forth year of funding for capital improvements. While this request is still being finalized, it will reflect the analysis and discussion currently underway as part of the Vice Chancellor's business review as well as CU Recycling's program assessment.

Waste Diversion Potential Analysis:
The Housing department has provided funding for an outside consultant (Skumatz Economic Research Associates) to conduct an analysis of the potential for waste diversion activities. This will be important information in order to design a replacement recycling facility.

Recycling Financial Advisory Board:
The vice chancellors have created a new advisory board to provide advice on major programmatic and capital decisions. It will begin meeting in fall 2003.

New Recycling Facility:
A site needs to be selected and a facility designed to replace the existing campus recycling center, which will be displaced by the next phase of the stadium expansion.