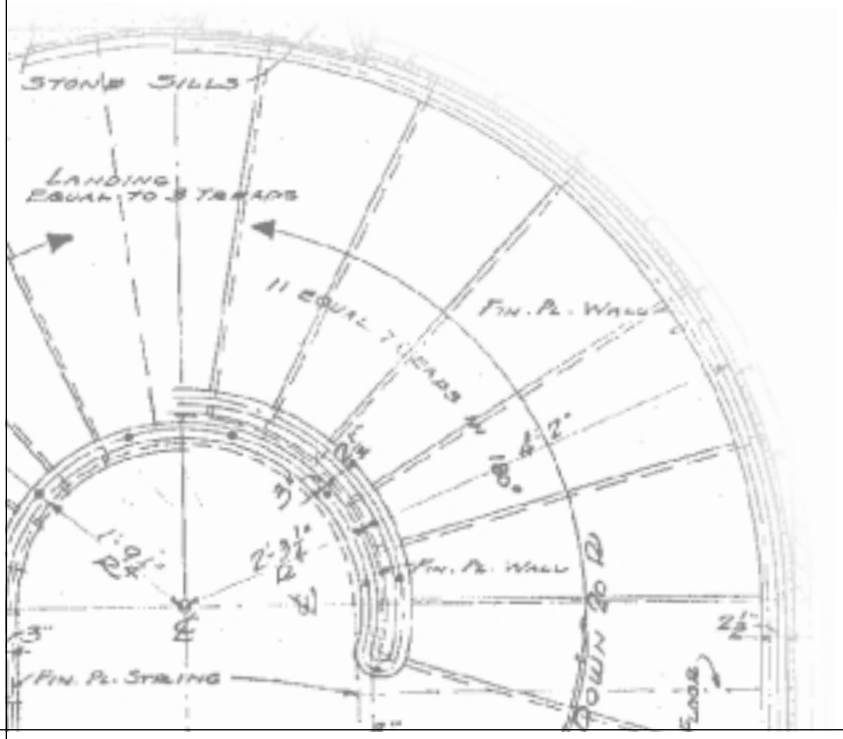
2001 UPDATE



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TO THE

BLUEPRINT FOR A GREEN CAMPUS

90°

AN ENVIRONMENTAL ACTION PLAN FOR THE UNIVERSITY OF COLORADO AT BOULDER

University of Colorado ENVIRONMENTAL CENTER

BLUEPRINT FOR A GREEN CAMPUS

2001 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 2001 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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Blueprint for a Green Campus 2001 Update

This Publication Produced by

CU Environmental Center
Campus Box 207
Boulder, CO 80309
phone | 303.492.8308
e-mail | ecenter@colorado.edu
Web site | www.colorado.edu/ecenter

Special Thanks To

Phil DiStefano
Vice Chancelor for Academic Affairs

Ron Stump
Vice Chancellor for Student Affairs

Paul Tabolt
Vice Chancellor for Administration

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

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David Cook
Parking and Transit Services

Susan Wallace
Department of Housing

Ed von Bleichert
Facilities Management

Michael Bolton
Environmental Health and Safety

Design and Layout by Jordan Lewin

2001 Campus Earth Summit Agenda

University of Colorado at Boulder

Monday, April 16

Environmental Awards Luncheon

12:00-1:00 pm Recreation Center 2

Honor outstanding individuals and departments for their extraordinary environmental achievements at CU with awards to be given out by the chancellor. Please RSVP to the Environmental Center by April 10th if you plan to attend.

The Critical Role of Higher Education in Rapidly Advancing Sustainability

1:00-2:00 pm Recreation Center 2

Dr. Anthony Cortese holds a doctorate in Environmental Health Science from the Harvard School of Public Health. He is president and co-founder of Second Nature, Inc. A Boston-based national non-profit organization, Second Nature is committed to helping higher education prepare future professionals for the environmental and social challenges of the future so as to make the integration of environmental sustainability thinking "second nature" to higher education. Come hear what advice Dr. Cortese has for the University of Colorado.

Environmental Literacy

2:00-3:15 pm Recreation Center 2

This session will address the levels of environmental awareness among the students, faculty, and staff at CU. It will also discuss to what extent students who aren't majoring in environmental areas are learning the basic concepts necessary to be environmentally informed citizens. Join a panel discussion with Anthony Cortese, Peter Spear (Dean of Arts and Sciences), Tom Dean (Professor of Business Administration), and Bernard Amadei (Professor of Civil Engineering).

Strengthening Environmental Studies

3:30-4:45 pm Recreation Center 2

The ENVS program has grown enormously during the last decade, with new faculty, new courses, and new energy. Join a discussion with students and faculty members on the current status and future direction of the program.

Tuesday, April 17

Clean Energy for Our Campus

12:30-1:45 pm Recreation Center 2

The energy session will recap the Blueprint proposal to reduce CU's greenhouse gas emissions to meet the reduction targets of the Kyoto Protocol. We will also discuss how individual departments can begin to reduce emissions.

CU's Transportation Future

2:00-3:15 pm Recreation Center 2

How can CU continue to grow without clogging the streets with traffic? Can we meet the transportation needs of students, faculty, and staff while keeping the air clean? Join a panel discussion on options including expanded transit, alternative vehicles, and financial incentives not to drive.

Campus Bicycle Summit

3:30-4:45 pm Recreation Center 2

What improvements do you want to see to campus bicycle infrastructure? More bicycle parking, better bike lanes and paths, maybe a bike station? Join a panel of planners and bicycle experts to discuss CU's bicycle friendly future.

Wednesday, April 18

Reducing Campus Construction Waste

12:30-1:45 pm Recreation Center 3

Explore how to reduce construction and demolition waste from campus building projects and how to learn from the UMC construction project. What upcoming projects can apply reduce, reuse, and recycle strategies?

"Green" Building

2:00-3:15 pm Recreation Center 3

Find out about the United States Green Building Council's (USGBC) LEED rating system relating to topics including energy, indoor air quality, and recycling. Can CU use this system? Donna McIntire of the USGBC will present the basics of "Leadership in Energy and Environmental Design" (LEED).

Green Products Purchasing

3:30-4:45 pm Recreation Center 3

Join a session addressing the importance of purchasing environmentally friendly products and services. This presentation will discuss the "Green Products Guide," which examines green products that are available for the campus and how they can be obtained, as well as potential language in contracts to increase preference for environmental features.

Environmental Career Fair

10:00 am- 3:00 pm

Recreation Center 3 & 4

Thirty companies and organizations will share potential employment opportunities with students in search of environmental jobs and internships.

The Future of Recycling on Campus and in the Community

Reception

5:00-6:00 pm

Humanities Lounge

Panel Discussion

6:00-7:30 pm

Humanities 1B80

CU Recycling is celebrating 25 years! What is the vision for recycling and waste reduction? What are the next steps of campus, city, and county efforts? Join a panel including recycling experts from CU, the City of Boulder, Ecocycle, Boulder County, and the state of Colorado.

University of Colorado Student Union UCSU

University of Colorado ENVIRONMENTAL CENTER

For more information:
please call (303) 492-8308
or e-mail ecenter@colorado.edu

Introduction

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*** is intended as a check-in on the Blueprint. The 2001 Update 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 the 2001 Update. The complete reports as submitted by Facilities Management, Housing, Environmental Health and Safety, and Parking and Transit Services are available at www.colorado.edu/ecenter.

The Blueprint has been formally endorsed by 2 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*** last spring, and set up a Blueprint Committee, chaired by the Vice Chancellor for Administration. The committee is meeting quarterly to review the proposed goals, and to make recommendations to the Chancellor on implementation steps.

To date, the committee has not formally endorsed adoption of any of the goals, although it has supported a number of action steps. Some highlights:

- The committee asked that an emissions inventory be completed prior to considering adoption of the climate protection goal. The inventory is now completed, and is attached to the climate section of this report.

- The committee asked for a draft Integrated Pest Management (IPM) policy for review. Staff from Facilities Management, Housing, and the Environmental Center agreed on a draft last fall. The committee reviewed the draft in December, and expressed significant concerns with its length and level of detail, and a concern that it may be too restrictive on the use of pesticides. Facilities Management has drafted a shorter version which is currently being circulated for comments, and is appended to the IPM section of this report.

- While the committee did not endorse the transportation goal, it has been supportive of a goal to reduce the single occupant vehicle mode share of trips to and from campus. This is a significant step, since the campus master plan assumes no change in modal split. In addition, the committee expressed support for improving campus bicycle infrastructure.

Progress during 2000-2001

There are a number of major accomplishments that are worth highlighting in this introduction.

Institutional and Structural Issues:
First, in the arena of "accounting for true costs", the Blueprint recommended that the campus marketplace be adjusted to send the right price signals. Currently, the campus marketplace often encourages excess resource consumption, through practices such as 'free' printing in computer labs, un-metered energy use by campus departments, and parking prices which treat the land under parking lots as free. In the last year there have been two major steps in this direction:

- Facilities Management has begun significant investments in accurately metering building energy use.
- Housing eliminated free printing from computer labs in the residence halls, instead charging individual users.

Another recommendation involves more consistent and accurate monitoring of campus environmental performance. Some progress on this front includes:

- The creation of a greenhouse gas emissions inventory for campus.
- Facilities Management, Housing and the Environmental Center are working cooperatively to gather baseline data to accurately track landfill diversion rates; and are beginning to work on consistent surveying of campus transportation habits..
- The proposed Integrated Pest Management policy requires reporting and tracking of campus pesticide use.

The Blueprint also recommends the creation of a campus environmental council. The Blueprint Committee has at least partially served this role. In addition, the Housing department created a new position this fall dedicated to recycling and environmental management. This is a major step forward, as there is now an institutional voice within that department. It is interesting to consider the broader context that Facilities Management created an environmental operations supervisor position 3 years ago, and Parking and Transit Services created a transportation modes coordinator position 2 years ago. This means that all of the major operational departments on campus now have dedicated staff paying attention to environmental issues. These staff meet and communicate quite regularly, forming at least an informal network of environmental managers on campus.

Creating a Climate-Friendly Campus:

- Students voted overwhelmingly in favor of increasing student fees by $1/semester in order to purchase 2 million kilowatt-hours per year of wind generated electricity, establishing CU as the nation's largest university green power purchaser.

- Just last month the chancellor agreed to fund a lighting upgrade for 15 general fund buildings, which will reduce lighting energy use in these buildings by approximately 30%.

Growing Without Increasing Traffic:

- This spring, a student group has collected signatures to place a ballot issue before the student body, asking students to raise fees to generate over $100,000 per year to build state-of-the-art bicycle facilities on campus to encourage non-motorized transportation.

Creating a Safe and Healthy Campus:

- Two new staff positions were funded within Environmental Health and Safety. The Chemical Management Specialist position will focus on chemical inventories, chemical redistribution, and centralized procurement. The Waste Treatment Specialist position will run waste treatment processes at the new facility and advise on waste minimization techniques.

Greening Campus Consumption and Disposal Habits:

- UCSU allocated significant capital funding for expanding recycling in both the 2000 and 2001 academic years, and Facilities Management and Housing are working cooperatively with the Environmental Center to implement this aggressive expansion program.

- The UMC remodeling and expansion project has involved a much more extensive recycling and reuse effort than any previous campus construction project, with over 1,000 tons of material diverted from the landfill.

Obstacles and Outstanding Issues

At the same time that there has been significant progress in some areas, there are still major challenges ahead. Some of the issues we face:

- Energy use continues to increase rapidly, with four to five percent annual growth rates. We will not be able to meet the climate goal without substantially slowing this growth rate.

- Increasing housing costs are leading to an ever larger percentage of university employees and students living outside of Boulder. Unless the university can build significant amounts of housing on or near campus, this trend will make it more difficult to meet the transportation goal.

- The university has not yet made a firm commitment to any of the goals proposed. This contrasts to schools like Stanford University or the University of Washington, which have committed to the transportation goal; or Tufts University, which has committed to the climate goal. While we can make some progress without a formal commitment to the goals, there are difficult decisions that will require policy guidance from the highest levels of the university administration. Without clear goals it will be difficult to resolve these issues.

- Finally, the physical growth of the Boulder campus means we must continuously reduce our per capita or per square foot use of energy, paper, and other resources in order to meet our

goals. This is clearly technically possible. As Lovins, Lovins, and Hawken point out in *Natural Capitalism*, a 10-fold increase in efficiency is possible with today's technology. The real question is whether we have the political will.

Invitation

Some of these issues that are highlighted in the ***2001 Update to the Blueprint for a Green Campus*** as well as other campus environmental topics will be featured at the **2001 Campus Earth Summit** from April 16th to 18th, 2001. All interested parties – students, faculty, staff, and community members – are invited to attend and participate in these sessions. The 2001 Campus Earth Summit agenda is located in the front of this document and online at www.colorado.edu/ecenter.

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.

The Blueprint committee asked that an emissions inventory be completed prior to deciding whether to adopt the goal. A team of student researchers have completed the inventory which shows that emissions have increased by nine percent. However, alternative assumptions could be made that significantly affect this conclusion. It is also important to consider that emissions would be far higher without the 1991 conversion of the steam plant to a high efficiency co-generation facility. Please see the attached inventory.

Progress Within the Past Year

Wind Power Purchase

Students voted last spring to increase their fees by $1 a semester for the next four years to purchase wind power for the University. This is enough money ($50,000 per year) to purchase the output of an entire wind turbine (2 million kWh/year). The emissions saved are approximately 567 tons of carbon, 7 tons of sulfur dioxide and 5 tons of nitrogen oxide.

Energy Efficiency

Facilities Management has recently been funded by the Chancellor to implement a lighting upgrade for fifteen general fund buildings on campus including Norlin Library, the Koenig Alumni Center and the Engineering Center. The carbon savings for this lighting upgrade project will be approximately 921 tons.

Facilities Management has also purchased nine new "alternative" vehicles in the past year including four metro micro vans (gas), 3 Mitsubishi's (gas), and 2 Club Cars" (electric). Two older Mitsubishi's were also refurbished and returned to service. The department now has a total of 20 alternative vehicles.

Additionally, a Utilities Master Plan Committee has been created to look into three options to bring/create more power on campus to fulfill campus energy needs.

The Department of Housing has also taken significant steps towards reducing energy use. Student rooms in Farrand and Aden were equipped with individual heat controls, and the buildings systems were "rezoned" to more appropriately deliver steam where it is needed. Incandescent lights were replaced with fluorescent lamps and electronic ballasts in the Farrand lounges. This project improved lighting quality and realized an approximate energy savings of seven percent. In Cheyenne-Arapaho, 90-watt incandescent hallway lighting has been replaced with 32-watt fluorescent T-8 lamps and electronic ballasts.

In Family Housing, space heating and domestic water heating energy has been saved as a result of installing more efficient, staged boilers at Newton Court. The new boilers use roughly 60%

less energy than the original boilers. Insulation levels were increased from R-3 to R-36 in the new roofs on two Smiley Buildings. A combination of approximately 300 higher-efficiency refrigerators and stoves replaced older appliances. In the Service and Administration areas the insulation level was increased from R-7 to R-51 in the new roof on the College Inn.

A resolution supporting energy efficiency on campus and expanded use of renewable energy was approved by the UCSU Environmental Board and University of Colorado Student Union Legislative Council, and unanimously "applauded and strongly supported" by the Boulder Campus Planning Commission. The Resolution is attached as an appendix to this section.

Plans for Upcoming Year

Facilities Management is looking to purchase a street-legal electric “GEM” car this spring. Housing has several plans, including installing about 150 new appliances in Family Housing. Housing also plans to work with Transportation Services and the Alternative Transportation Coordinator to consider the feasibility of phasing in the replacement of service vehicles with cleaner vehicles. Also, they will investigate purchase options for an alternative-fuel vehicle for employees needing to travel between East and Main Campus.

Students will continue to work with the energy resolution as a tool for gathering support from several major departments on campus and the Boulder Faculty Assembly for energy efficiency on campus.

New Issues

With increasing gas prices, the current energy crisis in California, and a new administration actively pushing for increased drilling on public lands, energy issues have entered the public arena and dialogue with new vigor.

Universities and companies around the world are continuing to make energy reduction and efficiency a priority, despite the inability of several countries' representatives to come to agreement on the Kyoto Protocol. For example, the presidents of all 56 colleges and universities in New Jersey as well as 13 other New Jersey organizations and businesses endorsed a Sustainability Greenhouse Gas Action Plan for New Jersey. The plan calls for a 3.5 percent reduction below 1990 levels in the state's greenhouse gas emissions by the year 2005. By signing onto the plan, the signers commit to the implementation of voluntary programs and initiatives to accomplish the plan's goal. (Go to http://www.ramapo.edu/njheps or http://www.state.nj.us/dep/dsr/gcc/gcc.htm for more information on the New Jersey commitment.)

In addition, Oberlin College has begun a 20/20 project that has the goal of reaching campus-wide climate neutrality by the year 2020. Climate neutrality means having a net total of emissions for the college equal to zero. To do this, the campus has created an emissions inventory of all greenhouse gases emitted through the college and secondary sources. They are now working to create several scenarios to reach climate neutrality which include reducing emissions, increasing

efficiency and using alternative sources or energy. To offset the emissions produced, some ideas are to look into carbon sequestration or projects helping other businesses in the area to reduce their emissions. When the report of scenarios for climate neutrality is completed, the College will decide what actions to take. (Go to http://www.oberlin.edu/~envs/2020proj/home.htm for more information on the Tufts 20/0 Project.)

At CU, students and staff are working with Off-Campus Housing to actively distribute wind power information to students looking for apartments off campus. Students are also working with Housing and making plans to work with several other departments to buy wind power. In addition, the Boulder Campus Planning Commission unanimously voted in support of the creation of an energy/resource committee.

Finally CU's natural gas contract will be ending within the next few years. As gas prices continue to rise, it may open up an opportunity to purchase other sources of energy, such as wind power for the campus.

Shortcomings

- The CU administration has not yet agreed to formally adopt the emissions reduction goal.
- Energy use continues to grow at 4 to 5 percent annually.

Discussion Topics

- How can individual departments continue to/ and begin to reduce emissions and decrease energy use?
- There was some discussion in BCPC to create a campus energy or resource committee. Who should be involved with BCPC's recommended campus energy/resource committee? What should the focus of the committee be?

Carbon Emissions Summary

University of Colorado at Boulder last updated 4/10/01

1990

	Amount	Unit	Emissions Equivalent (Tons Carbon)
Natural Gas Purchases			
For Central Steam Plant	634,159	MMBtu	10,115
For Individual Buildings	55,326	MMBtu	882
+ Williams Villiage	60,649	MMBtu	967
Natural Gas Leakage (0.07%)	525	MMBtu	-
Electricity Purchases			
-- Central Meter	66,024,000	kWh	18,704
-- Other buildings	15,596,910	kWh	4,419
-- Williams Villiage	5,185,600	kWh	1,469
Transportation			
Unleaded fuel vehicles	62,410	Gallons	167
Diesel Fuel vehicles	16,133	Gallons	43

Total 1989-1990 Emissions, in US Tons **36,767**

2000

	Amount	Unit	Emissions Equivalent (Tons Carbon)
Cogeneration Plant			
Natural Gas Purchased By Co-Gen Plant	1,936,341	MMBtu	30,885
Electricity bought from Public Service Co.*	39,937,364	kWh	
Electricity sold to Public Service Co.*	74,893,631	kWh	
Net electricity sold to Public Service Co.	34,956,267	kWh	(9,903)
(this values net export at the PSCO fuel mix - primarily coal)			
Net electricity sold to Public Service Co.	34,956,267	kWh	(4,136)
(this values net exports at the marginal fuel use by PSCO - natural gas)			
Buildings not served by Cogen Plant			
Electricity bought from PSCO	3,971,104	kWh	1,125
+ Williams Villiage	5,998,904	kWh	1,699
Natural gas purchased (non-cogen)	596,402	MMBtu	9,513
+ Williams Villiage	35,575	MMBtu	567
Natural Gas Leakage (0.07%)	442	MMBtu	-
Transportation			
Total Campus Fleet Vehicles	96,878	Gallons	256

Total 1999-2000 Emissions, in US Tons **34,143**

(based on valuing electricity exports as replacing coal generation)

Percent Change = ***-7%***

Total 1999-2000 Emissions, in US Tons **39,910**

(based on valuing electricity exports as replacing electricity generation)

Percent Change = ***9%***

Carbon Emissions Inventory for the University of Colorado Boulder Campus

INTRODUCTION

In the United States, 98% of carbon dioxide is emitted as the result of the combustion of fossil fuels. Consequently, carbon dioxide emissions and energy use are highly correlated. At the University of Colorado, electricity and steam consumption have increased substantially between 1990 and 1999, However, the cogeneration plant has also substantially decreased the carbon output per unit of energy consumed. This inventory compares carbon dioxide emissions from 1990 and 1999 to see how the cogeneration plant and increased energy demand has effected emissions.

We calculate it using two different assumptions on the proper valuation of electricity exported from campus. One assumption shows emissions going down 7%over the 10 year period ; the other shows emissions going up 9% during the 1990s. For comparison, electricity use has been going up 4-5% every year.

METHODOLOGY

What this inventory includes:

- CO_2 emissions due to heating, cooling, and providing electricity to campus buildings
- CO_2 emissions due campus fleet vehicles
- Carbon equivalent due to leakage of natural gas in pipelines

What this inventory does not include:

- Emissions due to trips to and from campus by faculty and students in non university vehicles
- Emissions due to burning fuels other than natural gas on campus
- Emissions due to CFC's leaking from cooling systems
- Emissions due to gases other than CO_2(except for natural gas leakage)

A “bubble” was placed around the CU campus. For 1990, this bubble includes the central steam and chiller plant and all the campus buildings. For 1999 the bubble now includes the cogeneration plant in place of the steam plant. Emissions are calculated at each interface of this bubble, whether energy is entering or leaving the campus. For example, in 1999-2000, emissions from natural gas are calculated in two places: 1) from natural gas that the cogeneration facility purchases and 2) natural gas that individual campus buildings purchase. In 1999-2000, emissions from electricity is actually calculated at three different interfaces: 1) electricity purchased form PSCO by the cogeneration facility, 2) electricity purchased by PSCO *from* the cogeneration facility, and 3) electricity purchased from PSCO from individual campus buildings. The campus is a net exporter of electricity. There is an unresolved conceptual issue on the appropriate carbon valuation for power export - should we value the net export based upon the actual fuel mix for CU power production Public Service's overall fuel mix, or the fuel used by

PSCO for expanding their generating capacity? Reasonable arguments can be made for each of these, and this leads to substantial changes in the bottom line.

In 1990, this methodology is much simpler, simply because CU did not export any electricity before the cogeneration plant was built. Therefore all emissions are calculated based on energy, either in the form of natural gas or electricity, entering the "bubble" that represents the campus. The emissions coefficients used in this inventory assume, of course, that all natural gas that enters the campus is eventually combusted.

Natural Gas. Natural gas is actually purchased from both the central plant and individual campus buildings. Emissions were calculated by applying emission coefficients (obtained from the Department of Energy) to the amount of gas used at both points.

Electricity. In 1990, emissions from electricity were calculated by multiplying an emission coefficient by the amount of electricity bought from the utility. This is based upon the actual fuel mix of Public service (almost all coal). This methodology was somewhat complicated by the implementation of the cogeneration plant in 1992. Today, the cogeneration plant provides most of the campus with electricity in addition to selling back to the utility. However, the cogeneration plant (as well as several campus buildings) still purchases electricity from the utility. The emissions due to the net export of electricity are calculated and credited (subtracted) from the emissions inventory.

We calculated the emissions credit with two different sets of assumptions. One methodology is to assume that the net sales from the cogeneration plant are displacing electricity production that would have been produced at the average fuel mix of PSCO - overwhelmingly coal. Under this assumption, total emissions from CU actually drop from 1990-1999 due to the fact that our relatively low emissions cogeneration plant is displacing relatively dirty coal burning.

The other approach is to assume that the net exports are replacing electricity that would have been produced by PSCO in natural gas turbines. The argument for this assumption is that while the bulk of power production by PSCO is coal, the *marginal* production is in natural gas turbines. That is, the bulk of their new capacity, and the plants whose ouput can rapidly vary in response to load fluctuations are natural gas power plants. Under this assumption, total emissions have gone up over the last decade.

Fleet Vehicles. Emissions from campus fleet vehicles were calculated by multiplying the total number of gallons of gasoline used (obtained from the Transportation Center) by an emissions coefficient for gasoline.

March 8, 2001 **54 Legislative Council Resolution #3**

University of Colorado
Student Union

Sponsored by:	Juana Rosa Cavero	Representative
Authored by:	Ghita Levenstein	Program Coordinator Environmental Center
	Carina Bernard-Walker	UCSU Env. Director

A RESOLUTION

RESOLUTION HISTORY

The University of Colorado at Boulder serves as a leader in environmental issues. Currently, Facilities Management is considering a lighting upgrade for several campus buildings. Last spring students voted by a 5:1 margin in support of raising their student fees to purchase clean and renewable energy produced by wind power to provide for part of the University's energy needs. Additionally, last spring the UCSU Environmental Center created a Blueprint for a Green Campus, which included the goal of creating a climate friendly campus. The Blueprint suggests the University commit to meeting the emissions reduction targets of the Kyoto Protocol that would reduce University of Colorado's greenhouse gas emissions by seven percent below 1990 levels by the year 2010.

RESOLUTION SUMMARY

Whereas: The Intergovernmental Panel on Climate Change (IPCC) recently came out with a report saying human-caused emissions contribute substantially to global warming.

Whereas: The IPCC report also suggests that if greenhouse emissions are not decreased, average surface temperatures could be expected to increase between 2.5 and 10.4 degrees Fahrenheit (1.4 to 5.8 degrees Celsius) by the end of this century.

Whereas: The cost of natural gas has been steadily increasing which will, in turn, raise energy costs for campus.

Whereas: Energy use on campus has been increasing by 5% a year for the past ten years.

Whereas: The University of Colorado-Boulder has been, and continues to be an environmental leader.

Whereas: Students have demonstrated their commitment to clean energy by voting to purchase wind power by a 5:1 margin.

Whereas: The survey conducted by Aspen Research Associates in 1999 shows that over 88% of students support CU investing in energy efficiency throughout campus to delay the possible need for a new power plant.

BE IT RESOLVED by the Legislative Council of the University of Colorado Student Union, THAT:

Section 1: UCSU calls on the Boulder campus to reduce energy use.

Section 2: UCSU strongly supports the reduction of campus emissions through a campus-wide lighting upgrade and other efficiency measures.

Section 3: UCSU urges the University to follow the students' leadership and expand campus use of clean renewable energy such as wind generated electricity.

Section 4: UCSU urges the University to begin replacing fleet vehicles with hybrid electric ultra-low emission vehicles.

Section 5: UCSU urges the campus to maintain the existing strong energy standards for new construction and strengthen them where possible.

March 8, 2001

Growing Without Increasing Traffic

The Vision:

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

There has been some discussion in the Blueprint Committee about adopting a modified version of this vision, such as "CU will increase the percentage of trips taken in modes other than single occupant vehicles." There are two key components that would be required to accomplish either of these visions. First, we need to define what "today's levels" are and how they are to be measured. We need to design and implement a process to monitor single occupant vehicle trips and the overall modal split on an ongoing basis. Second, we need to design and implement an integrated travel demand management (TDM) program for the Boulder Campus.

Several studies have been conducted over the years looking at CU Boulder's transportation patterns. In most cases these studies have used different methodologies, leaving us with results that are not comparable over time. The one transportation monitoring instrument that has been used consistently is the survey of faculty/staff Eco Pass use from 1998 to the present.

Progress Towards the Goal

Over the years, CU Boulder has been one of the leading campuses in the area of travel demand management programs. We have many of the pieces needed for a maximum effectiveness TDM program. What is now needed is an assessment of what more can be done and how best to integrate the different aspects. Following is what is currently in place:

Pedestrian

- An extensive network of pedestrian pathways on campus and connecting campus with adjacent areas.
- A workday pedestrian-transit mall in the center of campus to limit conflicts between automobiles and pedestrians, buses and cyclists in the campus core.
- A Night Ride / Night Walk program to provide night-time security for faculty, staff and students walking on campus after dark.
- Thirty-one emergency phones on campus.

Bicycle

- Bicycle dismount areas to reduce conflicts between pedestrians and cyclists in areas of high pedestrian traffic.
- Multi-use paths with separate lanes for bicyclists and pedestrians to reduce modal conflicts.
- Seventeen underpasses on the periphery of campus separate bicyclists and pedestrians from cars.
- Thirty bicycle paths, lanes and routes[1] connect the campus with the community.

[1] Bike paths, lanes and routes Bike facilities serving the CU vicinity include bike paths: 1) Broadway Boogie, 2) Pleasant to Colorado, 3) Folsom to 28th, 4) Old Folsom from Kittredge to Colorado, 5) Boulder Creek, 6) Kittredge to Aurora, 7) Kittredge to 28th along Baseline, 8) Baseline to Apache along US 36, 9) US 36 to Baseline along Bear Creek, 10) 30th to Foothills Parkway along Colorado, 11) Colorado to Arapahoe along

- Approximately 7,000 bicycle parking spaces on campus.
- A bicycle registration program designed to assist in returning recovered stolen bicycles to their owners.

Transit

- Student Bus Pass Program. If "no free parking" is the stick, this is a big carrot. Students have twice voted in favor of a transportation fee to buy bus passes for every student: in 1991 by a 4 to 1 margin and again in 1997 by a 16.5 to 1 margin.
- Faculty/Staff Eco Pass Program. This is another big incentive. All our continuing faculty and staff members have access to a free, unlimited-access transit pass.
- A high frequency shuttle (the Buff Bus) between the Main Campus and the Smiley Court and Williams Village housing areas.
- A high frequency bi-directional shuttle (the HOP) linking campus with the Hill, Newton Court Housing, Downtown, and the Crossroads Mall.
- A new high-frequency shuttle (the BOUND) linking Williams Village, Smiley Court and much private student housing to the East Campus, Crossroads Mall, the Base Mar Shopping Center and many other transit services.
- A new high-frequency shuttle (the LEAP) linking CU's Pearl-East offices with downtown, Main Campus (via the HOP and SKIP) and East Campus (via the Bound).
- Thirteen transit information displays with bus schedules and maps in campus buildings in various locations.
- Eight transit information displays with transit maps in residence halls.
- A ski bus program providing low cost round trip weekend service to three ski resorts throughout the ski season.
- A campus parking map that also shows the location of the 75 bus stops on or near campus.
- A new employee orientation that explains the Eco Pass benefit to all new staff employees.
- A late night shuttle service (Night HOP I and II) providing service between campus and downtown until 3 AM on Thursday, Friday and Saturday nights.
- A changed habits in parking (CHIP) program to provide discounted one-day parking permits to regular parking permit holders who give up their unlimited access permits. This could be extended to all alt. mode users.

Automobile

- No free parking on campus. This is a vital, central component of a TDM program. The price level determines the strength of the incentive created.
- Effective parking enforcement. Without effective enforcement the incentive value of paid parking declines.
- A carpool parking permit that allows members of a carpool to share the cost of a single permit.

Bear Creek, 12) 38th to Foothills Parkway along Arapahoe, 13) Colorado to Arapahoe along Foothills Parkway; 14) 30th to Pearl East on Pearl Parkway; bike lanes: 15) 6th to 55th on Baseline, 16) Baseline to Arapahoe on 30th, 17) Baseline & 27th Way to South Campus along Moorhead, 18) Manhattan to South Campus along South Boulder Road, 19) 6th to 17th along University, 20) Jay to Colorado along Folsom, 21) Marine to University along Broadway; and designated bike routes: 22) Kittridge Loop, 23) Euclid, 18th and Colorado through campus, 24) 28th Frontage Road Baseline to Arapahoe, 25) 28th to Mohawk on Aurora, 26) Baseline to US 36 on 30th and Apache, 27) Pine to University on 17th, 28) Macky and Pleasant on campus, 29) 6th to Broadway on College, and 30) Baseline to Colorado on 35th.

General

- A Guaranteed Ride Home program providing faculty and staff who use alternate modes with a free taxi ride home in the event of an emergency.
- Commitment to a modal hierarchy. Two master plans, spanning eighteen years, have reinforced our intention that CU Boulder is designed first and foremost as a pedestrian campus. In order of priority after pedestrians, we are committed to supporting bicycling, transit and then automobiles. There is some question whether actual investment priorities follow the hierarchy.
- A campus transportation directory on the web and in the campus phone directory.

The above is quite an impressive list! All of the individuals, offices and departments that have worked to create and maintain these programs and facilities deserve a big hand.

Next Steps

In spite of the impressive list above, there are many more things that can be done to help reduce traffic and parking congestion on campus. Several are discrete programs that can be added or improved, but parking pricing is perhaps the most important element because it creates the market and mind-set within which most campus people make their transportation choices on a daily basis.

The Campus Master Plan links additional Main Campus parking development to three requirements.[2] One relevant here is:
"Additional Main Campus parking will be developed at one or both of the two identified parking structures sites … 2) if alternative mode programs do not provide adequate mobility".
This language, along with the modal hierarchy[3], seems to establish a priority for alternate mode development, over and/or in advance of, automobile parking development. The suggestion is that the university define what its alternative mode programs will be; fully implement those; and then determine if there is "adequate mobility". If yes, no additional parking is needed, if no, additional Main Campus parking is warranted under this requirement.

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[2] Goal

Additional Main Campus parking will be developed at one or both of the two identified parking structures sites 1) if parking demand warrants an additional structure or structures or there is a loss of existing parking, 2) if alternative mode programs do not provide adequate mobility, and 3) if parking can be developed at an affordable price.

Guidelines

- Recognize that permit demand and supply will change, although currently in balance given the charges for permit parking on the Main Campus.
- Add visitor parking, for which demand currently exceeds the supply. Consider doing this by reallocating existing spaces.

Goal

Parking demand on East Campus, Williams Village, and CU-Boulder South will be met with surface lots during the planning period (to 2008).

[3]

- Normally preferred modes of on-campus transportation are, in order: (1) walking, (2) bicycling, (3) transit, and lastly (4) driving. This encourages "environmentally friendly" transportation, meaning best use of land, minimizing air pollutants, and maximizing safety. A pedestrian-oriented environment for the heart of the campus enhances the total learning experience. Vehicular trips may be necessary for longer distances, time-urgent needs, and movement of materials.
- The order of preference for on-campus transportation does not apply for those persons who cannot viably walk the necessary distances due to health problems and/or mobility impairments. For people with disabilities, vehicular access and convenient parking may be especially important.

This suggests that we need to define our view of CU Boulder's fully developed alternative mode programs and develop a timeline for their implementation. Once implemented, if we find that there is unmet demand, that we have the ability to provide additional parking affordably, and that we do not have adequate mobility, we will have satisfied the Master Plan requirements and be in the position to build additional Main Campus parking.

Recommended/Planned TDM additions:

- Increase flexibility, convenience and cost incentives of part-time parking options for UCB alternate mode users.
- Addition of regional bus service on 28th St. with stops at Bear Creek/Williams Village, and 28th and College by 2002/03.
- High frequency STAMPEDE shuttle between Main and East Campus on Colorado. Expected 08/2002.
- High frequency DASH shuttles from Boulder Walnut St. Station, along Broadway and South Boulder Road to Lafayette park-n-Ride. expected 09/2002.
- Increase park-n-Ride parking along transit routes serving UCB 2001 & 2002
- Target outlying communities for UCB alternate modes commuting outreach events.
- Provide housing on campus and within Boulder on high frequency transit routes for a higher proportion of students, faculty and staff. The Board of Regents has approved a plan to develop 1900 student beds at Williams Village by 2008.

Overall Planning Recommendations:

- Develop a parking and transportation micro-master plan for UCB.
- Develop a TDM plan for UCB.
- Conduct a survey on approaches to address a potential disparity between parking demand and parking supply. The circumstances around this issue have changed in light of both 1) elevated confirmation rates and more students than either Housing or PTS can accommodate, and, 2) proposals to further increase enrollments while removing additional parking supply and well in advance of our ability to address resulting parking supply/demand mismatch through TDM programs and/or parking construction. Participation from Housing and Admissions desired here.
- Develop a range of parking and transportation scenarios examining the interaction of a variety of parking supply and travel demand management/modal shift options for UCB.
- Consider joining the US 36 Transportation Management Organization.
- Continue development of CU Inter-modal Transportation and Information Center project, with bus station, bike station, Broadway and Euclid underpasses and TEA-21 TIP funding request.
- Examine the incentive structure created by the current parking pricing relationships.
- Develop a clearer sense of what it costs the University to have a pedestrian, a cyclist, a transit rider, a car-pooler and an SOV user. If we set our pricing to reflect real costs to the University, to the extent that people respond to price signals, their choices will yield a more rational outcome for them and for the University.

Recommended/Planned Bicycle Improvements:

- Create dedicated bicycle program with:

A) a $2/semester student fee for accelerated rack replacement/expansion and other bicycle capital improvements.
B) a dedicated campus bicycle program coordinator staff position funded with contributions from Parking, Housing and Facilities to match the capital funds provided by the students.
C) coordination of bicycle education/outreach/marketing, registration, enforcement and station services.

- Implement long-discussed E - W bicycle corridor along Pleasant Street through to Colorado.
- Work with City to extend bike lanes/paths from 18th to 30th on Colorado.
- Promotion of legislation to clarify and improve the status of bicyclists' right of way.
- Develop a bicycle master plan for UCB.

F/S Eco Pass/Student Bus Pass Recommendations:

- Combine faculty/staff Eco Pass marketing and outreach with Student Bus Pass Program marketing and outreach within the existing F/S Eco Pass Services Coordinator PDQ -- with Environmental Center budget support.

Automobile-Related Recommendations:

- Increase UCB carpooling through enhanced incentives for car-poolers and improved ride-matching services.
- Develop on-campus rental car services for UCB students -- to reduce the need to bring cars to campus and store them here full-time.
- We need to take a hard look at the incentive structure created by the current pricing relationships. We need to develop a clearer sense of what it costs the University to have a pedestrian, a cyclist, a transit rider, a car-pooler and an SOV user. If we set our pricing to reflect real costs to the University, to the extent that people respond to price signals, their choices will yield a more rational outcome for them and for the University.

Emerging Issues

- The Colorado Commission on Higher Education has proposed a set of guidelines for the creation of campus master plans which emphasizes the provision of parking, with almost no mention of transit, bicycles, or pedestrian access. This could affect campus planning in the long term.

- As part of the development of Williams Village, CU will need to determine the amount of land to allocate to parking. The draft program plan suggested 0.75 parking space/person. There is a wide range at other schools, ranging from the University of California-Berkeley, which provides essentially no parking for residence halls, to Cornell University, which provides 0.15-0.25 spaces, up to some schools which provide 1 space/person. There is also an open question on whether students will be charged separately to cover the costs of providing parking, which could be very substantial, or whether all student residents there will subsidize parking through their rents.

Transportation Trends

The following are taken from the February 2001 "Modal Shift in the Boulder Valley" report, issued by the National Research Center and the City of Boulder.

Modal split of the student commute to campus: 1990-2000

	Private Car	Walk	Bicycle	Transit	Williams Village Bus
1990	13.4%	53.8%	24.0%	2.1%	6.9%
2000	10.9%	54.7%	22.6%	6.5%	3.8%

Modal split for all student trips

	Private Car	Walk	Bicycle	Transit
1990	54.9%	22.4%	19.7%	2.0%
2000	37.9%	18.9%	31.1%	12.1%

This modal split is dramatically different from the rest of the Boulder population, and even more different from national average modal splits (taken from the National Personal Transportation Survey conducted by the US Department of Transportation). For comparison,

	Private Car	Walk	Bicycle	Transit
Boulder	65.3%	19.8%	10.0%	4.9%
National	86.1%	5.4%	0.7%	3.5%

The following information is taken from the May 2000 Faculty/Staff Bus Pass Tracking Survey conducted by RTD

• In May 2000, 31% of Buff OneCard holders used the bus at least one day per week to commute to work, unchanged from the prior year. For the equivalent base of respondents, 17% used the bus at least once a week prior to the introduction of the Buff OneCard.

• Twenty-seven percent of all respondents ride the bus to work at least one day during a typical week. This number remains unchanged from last year but has increased from 24% in March 1998. The percentage of faculty who use the bus at least one day per week continued to rise, from 18% in March to 23% last year and 30% this year.

• Fifty-nine percent of all respondents had a CU parking permit before the Buff OneCard was available to them. By this year, this percentage showed a significant decrease to 49%.

• The percentage of faculty respondents with a CU parking permit decreased slightly from prior to the Buff OneCard program until May 2000, from 71% to 64%. For staff respondents, it decreased significantly from 56% prior to the introduction of the Buff OneCard to 45% in May 2000.

• On average, respondents traveled 10.6 miles one-way on their commute to work, up from 9.0 miles a year ago. As in previous surveys, the commute was longer for respondents with a CU parking permit, with 12.7 miles on average, than for respondents without a parking permit, with 8.6 miles.

Prior to Buff OneCard	March 1998	October 1998	May 1999	May 2000
Number of eligible faculty/staff				
5,643	5,643	5,596	6,076	6,436
Percentage of Buff OneCard holders				
80.4%**	80.4%	86.2%	86.1%	87.3%
Number of Buff OneCard holders				
4,537	4,537	4,824	5,231	5,619
Percentage of bus commuters among Buff OneCard holders				
16.83%	28.24%	27.55%	31.12%	31.14%
Number of bus commuters among Buff OneCard holders				
764	1,281	1,329	1,628	1,750
Mean number of days/week above bus commuters with Buff OneCards traveled to work by bus				
3.23	3.45	3.42	3.58	3.37
Total number of days/week above bus commuters with Buff OneCards traveled to work by bus				
2,468	4,420	4,545	5,828	5,898
Total number of one-way bus trips/week (assumes 2 one-way trips/day)				
4,935	8,840	9,090	11,656	11,796

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 within the Past Year and Upcoming Plans

To augment CU Boulder's current waste minimization and pollution prevention programs, the Blueprint for a Green Campus proposed eight action steps towards minimizing hazardous wastes. For each step, the current status as of March 2001 is described.

Action Step: Based on a feasibility study, institute a central chemical procurement system which would allow for:

- More permanent and detailed labeling (possibly with barcodes)
- Better ability to redistribute surplus chemicals
- Competitive prices which may result in less bulk purchasing of large quantities of chemicals when only small amounts are necessary
- Information on the substitution of alternative, safer chemicals at time of purchase
- Information to track and inventory hazardous materials on campus

Current Status: Starting in fiscal year 2000-01, Chancellor Byyny funded a Chemical Management Specialist position within Environmental Health and Safety's (EHS) Environmental Compliance unit. This position is focused on collaborative efforts including the collection of chemical inventories, establishing a broader chemical redistribution system and exploring the feasibility and possible structure of a central chemical procurement program. Recruitment for this position was completed in February 2001 and that same month the Chemical Management Specialist met with staff from CU's Procurement Service Center to begin exploring a centralized system.

Action Step: Further advance 'Best Management Practices' already adopted by many laboratories and shops to maximize safety and minimize waste.

Current Status: This year CU-Boulder was asked to serve on a special commission sponsored and facilitated by the Howard Hughes Medical Institute. The commission is comprised of Federal/State regulators and representatives from each of the 10 EPA regions across the nation and will propose 'Consensus Best Practices,' for educational institutions.

Staff at CU-Boulder's Environmental Health and Safety division (representing EPA Region 8) hope this collaborative effort will result in better understanding of hazardous materials regulations, a fuller adoption of improved laboratory safety practices and more appropriately

focused environmental stewardship efforts. Plans for sharing and enforcing these best practices to campus labs and shops need to be prioritized.

Action Step: Investigate the feasibility of applying an 'advanced disposal fee' to discourage bulk purchasing of chemicals.

Current Status: No direct progress has been made on this step within the past year. If a centralized procurement system is implemented, it too would help to discourage bulk purchasing. The concept, structure, and applicability of an advanced disposal fee will be discussed at future procurement centralization meetings.

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: Many microscale experimentation efforts have proven successful and are in practice within Chemistry and other UCB departments. It is unknown how many labs currently practice microscaling and how many could do so. The Hazardous Materials Advisory Board should review areas of possible expansion at a meeting spring/summer 2001. A review of teaching labs that use chemicals should be conducted to determine the extent to which microscale experimentation is being used on campus.

Action Step: Install new treatment options and technology at new EH&S facility which will significantly decrease hazardous waste volumes.

Current Status: A new waste treatment area within the Environmental Health and Safety Center is currently being equipped with state of the art waste treatment facilities initially aimed at silver recovery and organic waste ozone/UV oxidization. It is expected that active waste treatment can begin in late spring/early summer of 2001.

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

Current Status: In fall 2000 a waste treatment specialist position was established within EH&S. That position has been filled and the staff member is currently overseeing the installation of treatment equipment at the Environmental Health and Safety Center.

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. However, because photographic wastes still represent approximately twenty percent of hazardous waste volumes collected, one of EH&S' key treatment programs specifically targets

these types of wastes and will render them non-hazardous. As noted above, we hope to see the treatment room completed and in operation by late Spring/early Summer of 2001.

Action Step: Establish a battery recycling program so that rechargeable and alkaline batteries are recovered for recycling.

Current Status: In March 2000 EH&S proposed a battery recycling program to Environmental Center and Recycling Department staff. Since then, EH&S and the Environmental Center have completed an initial concept program. The Hazardous Material Group are eager to pursue this program but are currently focused on establishing the treatment area and training two new staff members. We hope to see progress towards establishing a pilot program by December 2001. Funding for a battery program will need to be pursued in the meantime.

Additional Progress by Housing

In addition to the above progress on the proposed action steps, the Department of Housing has made the following progress toward the vision to minimize hazardous waste. Housing completed in 2000, and will complete by the end of June 2001, several projects aimed at pollution prevention. These projects are described below.

Connecting Storm Sewer to Sanitary Sewer
Floor drains in mechanical rooms in Libby, Cheyenne-Arapaho, Arnett, and Buckingham were re-routed from the storm sewer to the City of Boulder's sanitary sewer as the first in a series of these types of connections. Six additional buildings are scheduled to be re-routed in 2001-02.

Snow Melt
Housing converted from a 100% sodium chloride-based snow melt to a less corrosive and lower alkaline blend of sodium, calcium, potassium, and magnesium chlorides. This new product—Meltdown Beneath Zero—also contains other minerals that buffer the effects of sodium chloride on vegetation.

Cleaning Agents
Housekeeping has converted to a new line of cleaning products, which are less toxic and corrosive. Additionally, the guesswork of estimating the correct dilution ratios has been eliminated through the installation of central mixing stations. This conversion was made in December of 2000, so data on how this system has reduced chemical usage arenot currently available. This system is, however, expected to significantly reduce the amount of cleaning agent purchased.

Housekeeping is experimenting with a new type of cleaning rag made by 3M, which, due to the fiber and the weave, cleans without needing any cleaning chemical—just water is needed. If Housekeeping tests and approves this rag, this will further reduce the amount of cleaning chemicals used.

Fluorescent Lamp Disposal
All spent fluorescent lamps containing mercury (those that are not green-tipped) are disposed of by Facilities Management through an EPA-approved lamp recycler.

Asbestos and Lead Paint Abatement
All projects are assessed for the potential of encountering asbestos and lead paint. Environmental Health and Safety is contracted when a project is identified as requiring abatement. In 2000-01, approximately 350 crawl spaces in Family Housing units were abated for asbestos-insulated pipe.

Additionally, 3 units with ceilings and floor tile containing asbestos were abated at Newton Court. In 2001-02, Housing will develop a five-year plan to abate all 292 units at Newton Court, at an estimated cost of $2,000,000.

All of the units at Family Housing, with the exception of the Extension Buildings (five older homes near Athens Court), are free of lead paint. It has not been determined that the Extension Buildings require abatement for lead. If, however, they do require abatement, they will most likely be torn down or deconstructed due to their ages, and new units built in their place.

Additional Progress by Facilities Management

Facilities Management has reported the following progress toward reducing hazardous waste and advancing pollution prevention on campus.

- Installation of state-of-the-art membrane filtration waste water treatment plant at Mountain Research Station. The $1 million system utilizes a combination of membrane filtration and U.V. decontamination. The plant will be commissioned May 2001.
- Continue to research and implement use of less toxic paints, finishes, and adhesives for use by the East and West zones as well as the paint and Carpentry Shops.
- Environmental Services currently reviewing and rating all cleaners and disinfectants used by custodians based on toxicity. Environmental Services is actively testing new, grain-based cleaners.
- 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.
- Continued progress on storm drain stenciling project.
- Currently working on more complete mapping of drain network and emergency contingency plans.

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

Integrated Pest Management (IPM) has become the main means of controlling indoor and outdoor pests on campus. From ants and cockroaches to dandelions and pigeons, CU is on the leading edge of reducing the use of harmful chemicals and volatile pesticides in buildings and grounds management through integrated pest management.

Facilities Management has made the following progress toward Integrated Pest Management:

- Environmental Services hired a permanent IPM technician in April 2000. Position focuses on least-toxic pest control with the least potential for exposure to humans and the environment.
- Eliminated spraying in all general fund spaces as well as auxiliary spaces using in-house IPM service.
- Grounds crew discontinued annual spring spraying of Elm trees for Elm Bark Beetle, the vector for Dutch elm disease. Moved to sanitation pruning and routine inspections of trees.
- Last spring, grounds did not routinely spray campus lawns to control dandelions. Instead, a more intensive mowing regime was used for weed control.
- Grounds currently developing Integrated Weed Management plan for noxious weeds.
- Grounds experimenting with use of Cashmere goats to graze noxious weeds on 12 acres at Research Park (4/00, 11/00).
- Facilities' Environmental Services took lead in drafting campus IPM Policy currently under review by the Administration.

Housing has contracted with Scott Harvey of Facilities Management to provide IPM services. This has enabled Housing to virtually eliminate the use of pesticides in all structural (indoor) applications. The "roach motel" type baits are the only form of pesticides that are still used. Initially, these baits were used to gain control over what was a moderate infestation. Now that control has been obtained, we will assess the possibility of removing some of the baits. It is important to note that despite the continued use of these baits, they are a vast improvement over freely migrating toxic sprays. Scott's typical arsenal includes non-toxic bait, caulk, mice and rat traps, live traps, and carbon dioxide.

In 1990, the residents at Family Housing voted to volunteer pulling dandelions by hand in favor of applying pesticides. Since then, Housing has eliminated all applications of pesticides outside.

Upcoming Plans

Facilities Management and Housing both utilize Integrated Pest Management (IPM). A program is in place for most of campus, but there is a need for a comprehensive, flexible and workable policy to formalize the program as well as to improve education, outreach and communication efforts.

A proposed policy on Integrated Pest Management is currently under review by the Administration. (The draft is included at the end of this section.) This policy has the support of campus departments currently using IPM services. It is likely that a policy will be approved this spring.

Progress toward Improving Indoor Air Quality

Facilities Management taken the following actions toward improving indoor air quality (IAQ):

- FM Planning and Physical Plant participating on IAQ Response Team to react to indoor air quality concerns and complaints.
- Performing minor upgrades to campus ventilation systems such as balancing and improving ventilation of fume hoods, removing obstructions, and improving make-up air.
- Performing 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).
- Current plans or funding requests include a 3-phase, $2.3 million project in Chemical Engineering, an additional $1.5 million for improvements to ENVD, as well as planned improvements to Ramaley, Chemistry/Biochemistry, and Engineering.
- Review and rating of custodial cleaning supplies.
- Purchase and use of low/no VOC paints, finishes, and adhesives.
- Environmental Services has begun the process of phasing 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.

Additionally, Housing has made the following progress toward improving indoor air quality: Many products that Housing Services uses in new projects and remodels—paints, glues, carpeting, cabinets, and furniture—can outgas volatile organic compounds (VOC's) for many years. In 2001-02, Housing will develop a plan to familiarize project managers with "green" products and will develop a system for incorporating green products into project specifications.

At Family Housing, carbon monoxide detectors have been installed in every unit with a gas furnace. In 2000, approximately 260 detectors were installed.

DRAFT FOR REVIEW
Last updated 3/09/01

UCB CAMPUS POLICY

Topic: Integrated Pest Management

Date: April 4, 2001

Original_____ Rev _____

Approved by: _____
Richard L. Byyny, M.D.
Chancellor

Source: Vice Chancellor for Administration

Prepared by: IPM Committee

Distribution: VCA, VCAA, VCSA, all Deans, Department Chairs and Directors

Sections:

I. SCOPE

This policy applies to University of Colorado at Boulder. The University of Colorado will provide in-house pest control services in addition to the option of using contractors.

Departments with an IPM liaison or managing contractors who monitor or treat pest problems will receive a copy of the campus Integrated Pest Management policy and IPM Manual. The liaison or contractor will return a signed statement to the IPM Coordinator certifying they have read and understand the policy and will comply, prior to any work being done for the University.

II. POLICY

A. It shall be the policy of the University to actively manage pests to:

1. Reduce any potential human health hazards;
2. Prevent loss or damage to University structures or property;
3. Maintain environments needed to conduct world-class research;
4. Enhance the quality of life for students, faculty, and staff;
5. Prevent pests from spreading in the community;
6. Prevent the spread of noxious weeds within natural landscapes.

A. For the purpose of reducing the use of toxic pesticides, it shall be the policy of the University to employ Integrated Pest Management (IPM) techniques, in the management of both structural and landscape pests.

C. For the purpose of this policy, IPM shall be defined as a coordinated decision-making process for managing pests that focuses on long-term prevention or suppression of pest populations while minimizing the impact to human health, the environment and non-target organisms, through the use of the least toxic control methods.

1. IPM is a cycle of monitoring, control and evaluation, and is a system of controlling pests that does not depend on automatic application of pesticides.

2. Where more than one pest control technique is available, the least toxic will be selected. Furthermore, priority will be given to non-chemical pest management techniques.

III. DESIGNATION OF CAMPUS I.P.M. COORDINATOR

The Department of Facilities Management Environmental Operations Manager has been designated the Integrated Pest Management (IPM) Coordinator. Duties are as follows:

- Determine cost of implementing and maintaining the IPM program
- Develop funding strategies/resources for the program
- Serve as campus resource to other departments on IPM techniques
- Promotion and Education of IPM practices on campus
- Create a template for a standard IPM plan and distribute to departments
- Collect and review department plans for compliance with campus policy
- Prepare annual report for Chancellor's office on status of the IPM program

IV. IMPLEMENTATION OF I.P.M. POLICY

A. Departments shall participate in the University's program by:

(1) Designating departmental IPM liaisons
(2) Identifying the types of pest problems specific to the Department
(3) Identifying types and quantities of pesticides currently in use by the department

(4) Providing annual reports on the department's efforts to implement the University IPM Policy.

B. Department IPM liaisons shall also oversee the adoption of a departmental IPM plan and the scheduling of pest control services for their sites.

C. The Department of Facilities Management IPM technicians shall be responsible for developing implementation plans for all general fund areas and those auxiliaries enlisting campus in-house services. The IPM Coordinator shall also review pest control plans proposed by contractors. **Furthermore, any department that contracts with Facilities Management for their pest control services will not be required to do a separate annual report. This report will be included as part of the in-house service.**

D. The IPM Coordinator shall assist the University by developing an IPM education and training program to educate the public and campus users about the IPM policy and principles of IPM. The education program will consist of individual and group staff trainings, working with campus and local newspapers, newsletters, campus e-memos, and an annual public presentation on campus IPM efforts.

V. IPM METHODS TO BE INCORPORATED

A. The IPM Coordinator shall oversee the creation of a campus IPM Manual.

B. IPM methods vary depending on each pest and the conditions. IPM programs place emphasis on preventive measures.

C. Pesticides will sometimes be used, but they will be used more safely, responsibly and effectively. Preferable applications of pesticides are in the form of baits, lures, injections, gels, and some granular forms.

D. Spraying will be considered as a last resort to controlling pests in emergency cases only. When necessary, the least toxic and relatively non-toxic alternatives will be used.

E. The three primary non-chemical methods used in IPM are cultural, biological, and mechanical, or physical, controls.

VI. NOTIFICATION OF PESTICIDE USAGE

A. Any University department that uses any pesticide should comply with the following notification procedures:

1. Signs shall be posted at all entrances at least four days before application of the pesticide product and remain posted at least four days after application of the pesticide.

2. Standardized Signs shall contain the name and active ingredient of the pesticide product and a departmental contact person.

3. University departments using approved pesticidal baits shall not be required to post signs.

B. In the event of a perceived public health emergency, or to comply with worker safety requirements, and after consultation with Environmental Health & Safety and the IPM Coordinator, University departments may be allowed to apply a pesticide without providing a four-day advance notice.

C. Environmental Health and Safety shall maintain a website containing all pesticide application notifications.

VII. RECORDKEEPING OF PESTICIDE APPLICATION

A. Each University department or contractor that uses pesticides shall provide a clean, legible record as required by the Colorado Department of Agriculture for any pesticide application, and supply this information to the IPM Coordinator.

B. The Environmental Services division of Facilities Management will serve as the record keeper for the program. Records will be maintained for a minimum of five years.

VIII. PESTICIDE PURCHASE, STORAGE AND DISPOSAL

A. Only Qualified Supervisors licensed with the State Department of Agriculture shall have authority to purchase pesticides

B. All pesticides shall be stored in accordance with Title 35, Article 10, Part 11 of the Colorado Department of Agriculture Rules & Regulations.

IX. CONTRACTS

A. As of the effective date of this policy, when a University department enters into a new pest control contract or extends the term of an existing contract, the contract shall obligate the contractor to comply with provisions of this Section IX. This section shall not be construed to violate the terms of any existing University contracts as of its date of enactment.

B. The IPM Coordinator shall prepare a request for qualifications (RFQ) for all University pest control contracts. All potential bidders shall be required to respond to the RFQ.

C. Within one (1) year of the effective date of this policy, all University contracts with pesticide applicators shall be reopened for bidding, unless the terms of existing contracts dictate otherwise.

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 Within the Past Year

It has become clear through discussions with purchasing agents at the Procurement Center, that in order to change what products we receive in various contracts, there needs to be a consumer demand for the product. Hence, we have created a Green Products Guide, which is intended to give buyers an idea of what types of "greener" products are available, and what they should be looking for and asking for when shopping for these products.

Students and staff identified the following six categories of products that are commonly purchased for use at CU: paper products, office supplies, office equipment, small remodels, cleaning products and office furniture. Research was conducted on what qualities make a product in a certain category green, and what "green" alternatives are currently being offered through the Book Store, Printing Services, the Distribution Center, contracts through Procurement Services and some outside sources. In all of the categories except office furniture, there seem to be several green alternatives offered through the university.

The information was then taken to put together the Green Products Guide. In order to extend the shelf life of the Guide, it does not concentrate on specific products or contracts, as both of these are apt to change on a yearly basis. Rather, the format consists of the following:
- Category (six categories mentioned above)
- Components (what specific products are in each category)
- Green Attributes (what qualifies products in the category as environmentally friendly);
- Questions to Ask (direction for buyers when looking for these products)
- Current Availability (can these products be found on campus)
- Proven Products (these are specific products that are comparable in price and quality to other non-green products of similar nature).

The guide will be distributed to purchasing contacts all across campus.

A few departments have already begun or continue to change their purchasing habits and work towards a campus policy for green purchasing:
- Facilities Management purchases low or no VOC paints, finishes and adhesives.
- Transportation has identified six areas where there is room for improvement in this area.
- Housing purchases most of the recycled products in the paper products category.
- Between 1995-2000, Housing invested $200,000 in recycled plastic playground equipment and picnic tables for Family Housing.
- Housing will be developing a system for including green products in construction projects and remodels. This system will include a series of triggers for performing project review to

assess the practicality of including green materials; developing product specifications that will be included in front-end documents used in bidding projects; assisting project managers and contractors with procurement, installation, and verification; and maintaining records of customer- and maintenance staff-satisfaction.

- The Environmental Center has done some preliminary work to find out what green products people are already purchasing through a survey given out on America Recycles Day.
- The Environmental Center also conducted a blind toilet paper test, in which participants were given two unmarked rolls of toilet paper to test for a week. One roll was made with virgin tissue (marked A), and the other with 100% recycled tissue with 30% post-consumer content (marked B). At the end of the week, participants were called, and asked which roll they preferred. 64% of the participants preferred the recycled roll.
- UCSU began a survey of UCSU departments to determine their green purchasing habits, specifically for paper products.
- Wardenburg has a centralized policy for paper and uses only Eureka 100% Post-Consumer Recycled paper.
- The Copy Center continues to be a campus leader in offering several styles of recycled paper for copies.

This past year, CU negotiated a new beverage contract which included environmental considerations in the bid process. The contract that was awarded commits funding to campus waste reduction and recycling efforts.

Plans for Upcoming Year

The Environmental Center will actively promote the Green Products Guide. The goal will be to make everyone on campus who buys significant quantities of materials aware of both the guide, and the fact that there are products available that are more environmentally friendly.

When the Blueprint Committee met to discuss green purchasing, they suggested continued research on Price, Quality and Availability (PQA) of specific products in order to get a clear idea of where a purchasing policy would be supporting high quality products. The Committee also devoted some members to research which vendor contracts could be revised to include environmentally-preferable alternatives.

There should also be continued work on determining what green products departments are already purchasing, and creating and adopting reporting requirements which allow the campus to track progress and identify areas of improvement.

Once all of this information is collected, it should be easier to implement a purchasing policy that supports peoples' current purchasing habits as well as the environmental products that are equivalent in Price, Quality and Availability to their counterparts.

Shortcomings

The Blueprint Committee was unable to discuss this topic until late February. In order to proceed with many of the action items listed in the Blueprint, strong administrative support is necessary. The development of a green products purchasing policy hinges on further research. Progress on this goal may require that such a policy be drafted, and adopted by the Chancellor.

The centralization of purchasing at the Procurement Center also presents challenges to approaching this issue limited to the Boulder campus. It may make sense to consider a system wide green procurement policy.

Discussion Topics

- What are departments doing now to promote green products?
- How can we track the amount of green products being purchased?
- Who can help determine PQA of the more environmentally friendly products?
- How can we combine efforts and make this a campus-wide movement?
- What would be an appropriate "green" procurement policy?
- Should this issue also be addressed system-wide for all campuses?

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 Within the Past Year

A number of improvements were recommended in order to reach a sixty percent diversion goal for recycling. Over the past year, the following measures were planned or implemented.

UCSU approved a four-year capital expansion plan. Funding has been alloacted for the first two years of this plan and the following improvements have occurred in 2000-01.

- Seven outdoor recycling and waste management stations were sited in public spaces on campus. These attractive, durable containers have resulted in fairly high participation with nominal contamination. The Grounds department provides regular collection service at these locations.

- The cardboard recycling system for housing was designed and approved over the past year. The new program is operational as of March, 2001 and provides service to the six dining units and six locations at Family Housing. $45,300 was allocated by UCSU with an additional $9,800 in grant funding from the Boulder County Recycling and Composting Authority. Facilities Management and the Housing department approved a collection and billing structure that will deliver cost-effective service. UCSU will implement procedural training for students and Dining Service employees this spring semester. A plan is being developed to phase-in service for all of the Residence Halls, since some site improvements will be required. We expect the program to be fully implemented with service to the six dining halls, six Family Housing sites, and 11 Residence Hall sites by 2003.

- Another capital improvement is additional classroom recycling containers. UCSU provided funding for fifteen recycling cabinets to be stationed at the larger lecture halls. A short list of locations has been identified. Design and construction of attractive, code-compliant cabinets should be completed this spring semester.

- Funding for improvements to recycling educational materials was also prioritized. Informational stickers for each residence hall room, each family housing apartment, and each office deskside container were produced and distributed.

This fall, Housing created and filled a new “Environmental Coordinator” position which is primarily responsible for improving Housing’s waste reduction and recycling efforts as well as other environmental issues within the department. This is a major commitment towards the

Blueprint vision and is already leading to significant advancements, improved communications, and coordinated planning.

The Housing department implemented a "pay as you print" printing program in the computer labs. This is a major step towards sending the right market signals to students. Free printing encourages the over-consumption of paper. It will be important to evaluate the impact of this program on paper use, and to consider the possibility of expanding this to other computer labs on campus.

The UMC expansion and renovation project has served as the campus pilot program for recovering Construction and Demolition (C&D) waste for recycling and reuse. As of January 2001, over 2 million pounds of C&D waste was recovered from the UMC project. More is expected through this year. Materials have primarily consisted of steel, concrete, and stone. The pilot project will be evaluated for its success - both in terms of cost-effectiveness and diversion rate.

Efforts to formalize and expand Construction and Demolition (C&D) waste recovery as part of campus construction projects is underway. Recycling staff and project managers are in the process of determining the potential for C&D recovery in the Grandview area as well as in Housing's new construction and renovation projects.

As of November 2000, Housing's grounds crews have been taking organic waste (leaves, tree limbs, shrub trimmings, grass clippings, Christmas trees) to Facilities Management for composting. Housing supervisors will be working with grounds crews to develop a means for estimating and tracking the volume of organics that are diverted through this program.

A pilot program for Office Pak recycling in Family Housing courts was conducted. The pilot proved successful and Facilities Management has now formalized collections of Office Pak.

Facilities Management commenced back-hauling of reusable office supplies and paper to campus departments. This unique service adds no staff time as it is done as part of a routine collections.

Facilities Management added more magazine and catalog recycling locations on main campus.

Plans for Upcoming Year

UCSU recently approved its second year of a four year capital improvement plan for recycling. Equipment scheduled for purchase in FY 2001-2002 includes:

- enclosures for outdoor recycling stations,
- a binding shear and containers for textbook recycling, and
- additional containers for magazines, cardboard, and public locations.

Significant improvements in signage, displays, and other promotional materials are also planned.

The Environmental Center is also working on developing the academic opportunities for students around waste reduction and recycling. Although curricular development is outside the scope of the Blueprint, it is nonetheless an important aspect of the long-term development of recycling on

campus. As interest and funding opportunities in creating coursework increase, recycling staff will need to devote attention to this emerging area.

Planning is underway for two other operational improvements. Food waste composting and computer/electronics recovery require careful consideration and advance planning before funding and operational plans can be recommended.

The renovation of the Farrand dining facility may include the appropriate features and equipment to handle compostable waste. This could serve as the template for including food waste composting in the renovation of other dining facilities in the next few years.

Waste minimization efforts such as revising CU's construction/demolition process, soft drink and food service vendor contracts, and other revisions to limit the amount of waste imported to campus are a high priority. Commitment and assistance from CU's administration will be required for these improvements to occur.

The campus has begun improving the measurement and reporting of unit cost data from waste generation and disposal, as well as diversion and recovery rates. This cooperative effort between the Environmental Center, Facilities, and Housing will provide baseline data and information on trends, which will assist the administration in determining whether to support the proposed goal.

New Issues

In the Blueprint document, very little reference is made to the future of CU's recycling facility. The Athletic department's displacement of the Intermediate Processing Facility (IPF) is emerging as one of the most pressing issues the campus will face relative to the goal of capping solid waste going to landfills at 2000 levels. To date, an amendment to the Micro-Master Plan for Athletic department's expansion has been approved. This amendment calls for the Athletic department to: replace CU's recycling facility, enable space for planned expansion, site the facility within comparable access to student employees and class tours. The amendment states that these steps need to be taken by Athletics before their planned expansion closes the current IPF, so that there is no interruption in recycling service.

Shortcomings

- Budgetary constraints: For several years the recycling collections program within Facilities Management has seen budget cuts, while the volume of material collected has gone up. While they have been able to increase efficiency to accommodate this, in the long run expanded recycling and waste diversion efforts will likely require additional funding.

- Waste reduction: It is unlikely that the goal can be met without expanded waste reduction efforts, including market incentives for waste reduction.

Next Steps

Administrative commitment to future waste reduction and recycling efforts will be important in any meaningful planning discussion. In addition, the displacement of CU's recycling facility by the Athletic department will be a significant near-term issue that campus planners, the Athletic department, and UCSU must resolve. Funding must be allocated for a study to find a site capable of meeting the minimum conditions detailed in the amended Athletic department Master Plan.