

Sustainable Transportation *On Campus and in the Community*

Proceedings from the 2005 Conference



Integrating Sustainability into the Curriculum

By

Karen Faunce

Dr. Don Crawford

Workshop Track 3: September 22-23, 2005

Our Common Charge: Sustainable Transportation on Campus and in the Community

Recent global events have brought into sharp focus our nation's transportation system and the energy system that underlies it. Conflict overseas and natural disasters in the U.S. have spotlighted our dependence upon foreign oil; the vulnerability of the Gulf Coast to environmental impacts; the implications of our resource dependence and land use investments in war-torn and hurricane-prone areas; issues of security and transportation with regards to emergency evacuation strategies; and the social inequities pertaining to access to resources. We are compelled to ask: Can our tightly-woven transportation-land use-energy-environmental system be sustained over the long run?

We can and should continue to examine the issues of technology, resource use and the role of education in fostering a system of sustainable transportation both locally and nationally. One chapter in this process took place in September, 2005 on the University of Idaho campus where 200 interested individuals from the community and the university addressed topics relating to sustainable transportation; including campus and local transportation, research facilities, educational programs, land use and sustainable development, and alternative fuels. These issues have relevance for universities, local communities, and the national landscape.

Many important insights emerged from the two day conference:

- ***The creation of a sustainable, multi-modal transportation system in Moscow, Idaho that links the University of Idaho to the greater community is possible through a cooperative approach between entities.*** In Workshop Track 1, national transportation experts outlined steps toward a positive shift from single occupancy vehicle dependence to a multi-modal sustainable and equitable transportation system developed in cooperation between local governments and universities.
- ***The University of Idaho has the opportunity to be a leader in research, and a model for the application of renewable energy sources.*** In Workshop Track 2, University of Idaho Architecture students facilitated a design charette, which yielded several designs for a sustainable energy lab and transit facility on campus.
- ***Student involvement is essential in the discussion of sustainable transportation.*** In Workshop Track 3, participants discussed how service learning projects can provide both university students and faculty with a more effective way to collaborate with community leaders in addressing land use and environmental issues, and engender a sense of stewardship in future generations.
- ***Community values must be brought into the discussion of land use and transportation.*** In Workshop Track 4, experts in the field of transportation helped participants identify community values, and then translate those values into attributes that the transportation system should have.
- ***Rising petroleum fuel prices and the increasing need for a decentralized fuel source make the time ripe for research and development of alternative fuels, such as Biodiesel.*** In Workshop Track 5, a group discussion took place about the advantages and impediments to producing feedstocks, to creating a Biodiesel fuel production facility, and to creating a market for the fuels on the Palouse.

The time is right for the university to embrace a spirit of community and interdisciplinary cooperation, in order to address today's transportation, energy, and environmental problems. UI President Tim White's signature on the Talloires Declaration, a commitment to environmental sustainability in higher education, behooves faculty, students, and staff to seek innovative solutions for common problems facing the university, and inevitably, the community as a whole.

Former Mayor Comstock and current Mayor Chaney both came to the conference, and affirmed the positive relationship that exists between the city and the university, as well as our common challenges. I trust that we can accept the charge to face these challenges together.



Michael Kyte
Director, National Institute of Advanced Transportation Technology
University of Idaho

WORKSHOP TRACK 3:



**Dr. Mark Stemen,
professor of
Environmental
Studies at
California State
University, Chico**

**Highlights from his
Keynote Speech**

- Sustainability can be taught to students while integrating the concept into campus life.
- A campus wide environmental assessment generates interest in sustainability at all levels.
- Campus elections are an excellent vehicle for creating positive change on campus.
- Student driven initiatives can be used to implement sustainability on campus while empowering students.
- Sustainability on campus is a rallying point for students and faculty across disciplines.
- Service learning fosters a sense of citizenship in students and creates a culture of life long learning.

Integrating Sustainability into the Curriculum

Introduction

Workshop Track 3: *Integrating Sustainability into the Curriculum*, was facilitated by Dr. Don Crawford, professor in the Microbiology Molecular Biology & Biochemistry Department and director of the Environmental Science Program at the University of Idaho. The session leader was Dr. Mark Stemen, professor of Environmental Science and coordinator of the Environmental Studies program at California State University, Chico. Also present were approximately 17 staff, faculty, administrators and students from the University of Idaho. During the two days together, participants in this track discussed not only how the concept of sustainability might be integrated into university curriculum across disciplines, but also what sustainability means to different people, why it has application for us currently and for future generations, and finally, how the university might partner with the community in its efforts to promote sustainability.

Defining Sustainability

Sustainability is a broad concept with diverse criteria and applications. It is fraught with subjectivity, as one person may have a completely different idea of a “sustainable” plan for growth, for example, than another. In the conversation about teaching sustainability, therefore, a multidisciplinary discussion of values needed to take place. Terminology differs from discipline to discipline, but themes, based on commonalities and shared values or visions, can emerge and pave the way for an evolving definition, and an ever-increasing agreement on the core meaning of this complex term.

Dr. Fritz Fiedler, assistant professor of Civil Engineering asked the group to define sustainability in a single word. The



**Dr. Don Crawford
facilitates the
curriculum workshop.**



Dr. Fritz Fiedler, PhD, PE
Civil Engineering Department

group suggested several terms, including: protection, endurance, permanence, change, efficiency, health, and fairness. Dr. Fiedler used the term “balance” for his discussion of a class project that he assigned to his civil engineering students, in which teams of student were to develop a solar powered de-salinization chamber that could be used to purify water after a hurricane or tsunami. Fiedler said that student projects that teach scientific balance of mass and energy, and simultaneously address issues of balance in economics or ecology, instill concepts of sustainability without overtly using the term.

Participants discussed terminology at length, and whether it was important to use an agreed upon definition and vocabulary when teaching sustainability across disciplines. Questions of temporal scale, and the emotional reactions that people have to the language of environmentalism were two factors that participants felt could hinder the promotion of sustainability as a concept with universal application and immediate exigency. The group sought broader definitions, therefore, such as Fiedler’s “balance.” Also, people thought that disciplines could come up with their own applicable terminology that carries the essential message: our plans and our actions must always consider quality of life for future generations of people and other living things. As Dr. Von Walden, assistant professor in the Department of Geography pointed out, “Nobody wants to stick it to their kids. Very few people could oppose a (strategy) that is about providing continuity for future generations.”



Simba Tirima, graduate student in Environmental Science, participated in the multidisciplinary panel on defining sustainability.
Tirima stated:

“Definitions and interpretations of sustainability or sustainable development are skewed toward institutional and national prerogatives.... Any discourse surrounding sustainability or sustainable development...should contemplate a global view.”

The dialogue continued with the assistance of a multidisciplinary panel, and the workshop participants explored some of the criteria for sustainability. Using a series of published definitions from various sources, members of the panel, representing the departments of Philosophy, Environmental Science, and Plant, Soils, and Entomological Sciences, led a discussion about the criteria for, and conflicts with, creating a unified definition for the purpose of teaching the concept as part of a curriculum. Through the course of this dialogue, the team identified several key principles. First, definitions of sustainability contain the notion of a self-supporting system, and both an ethical imperative and a temporal context, though the strength of the ethical mandate and the breadth of the temporal window vary greatly. Second, there is difficulty with determining the criteria for a sustainable practice, in terms of time (i.e. a 50 year plan versus a 300 year plan) and efficacy (i.e. does the solution merely slow, or does it stop or reverse a detrimental situation?) Third, any discussion of sustainability must contain a global perspective. An institution of higher education must look beyond its own local and national borders, especially in its efforts to meet the educational mandate of teaching students to become *citizens* of the world. Finally, in creating a sustainability curriculum, people must consider their goals for the curriculum, the plans for sustainable operation of the university’s facilities, how the curriculum shall be assessed, and what institutional measures can be taken to provide incentives to achieve these goals.

Dr. Stemen added that his experience in Chico is that the dialogue among the disciplines and also among the university groups: staff, faculty, administration, and students, provides a vehicle for building trust, and sharing new concepts and applications for sustainability. Stemen discouraged the group from getting too bogged down in the language, and instead encouraged the group to set out right away to create a

multidisciplinary team of people that is interested in continuing the work started in this workshop. Participants showed enthusiasm for innovative programming centered on sustainability, and were motivated by Stemen's successes at California State University, Chico.

Integrating Sustainability into the Curriculum

In Dr. Mark Stemen's presentation, he illustrated how he and his colleagues advanced interdisciplinary dialogue, student empowerment, and service learning to build sustainability into the curriculum and infrastructure at Chico. Stemen's capstone course in Environmental Studies: *Environmental Thought and Action* uses readings and student projects to promote sustainability on campus. He said that the biggest challenge is to get a campus-wide dialogue on sustainability at the forefront of university life. Stemen suggested using existing means of communication and campus action, such as university elections and service learning projects. These two vehicles have a high level of student involvement and engage students and faculty of all disciplines.

Each year, Stemen's class develops a list of campus-wide initiatives, and then selects one to be put on the ballot at the upcoming election. His students then promote the initiative through research, drafting the measure in acceptable language, campaigning for votes, designing logos and slogans, and collecting signatures. Through this process, his students learn lessons in civic responsibility, teamwork, conflict resolution, and empowerment. They also have the satisfaction of knowing that their initiative will improve quality of life on campus. One example of a campus wide sustainability initiative developed by Stemen's students stated that the campus would reduce its energy consumption by 10% over the next five years. Because sustainability is now built into the university's strategic plan, and there is a sense of "green" pride on campus, the administration was quick to endorse the student driven initiative, as well as the economic advantages offered by savings on energy consumption.

Stemen said that service learning is the means by which his students mature in their critical thinking. In the workshop, he described several components of high quality service learning (See Figure 1). Students in Stemen's classes engage in interdisciplinary dialogue with other students, become impassioned about campus life, develop leadership skills, and leave behind a legacy of student driven improvements to the quality of life on campus. Stemen encouraged participants at the curriculum workshop to look at existing means of interdisciplinary communication and student empowerment, such as elections, senior projects, freshman CORE and capstone courses. He also suggested that interested students, faculty, staff and administrators engage in informal interdisciplinary dialogues around sustainability, brainstorm at brownbag lunches, share reading materials, and take a team approach to curriculum development.

Dr. Maxine Dakins, Assistant Professor of Environmental Science at the University of Idaho in Idaho Falls, gave a presentation on her class, *Pollution Prevention*. This class provided an inspiring model for teaching sustainability concepts through examining people's homes, university campuses, businesses, and society. This distance education program uses internet technology to build relationships among students over

Figure 1: Seven Elements of High Quality Service Learning

- **Integrated Learning**
- **High Quality Service**
- **Collaboration**
- **Student Voice**
- **Civic Responsibility**
- **Reflection**
- **Evaluation**

[Service Learning 2000 Center]



**Dr. Maxine Dakins,
Assistant Professor of
Environmental Science at
the University of Idaho in
Idaho Falls.**

(Photo credit— UI website)

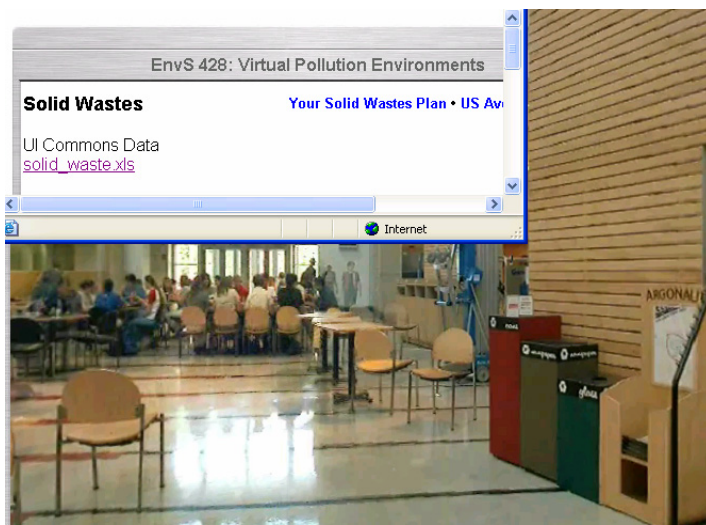


Figure 2:
Dr. Maxine Dakins' virtual tour of the UI Commons building allows Environmental Science students to learn about energy consumption on campus through a visual format.

cyberspace, and asks them to find solutions to current problems with pollution and energy consumption. Dr. Dakins gave a demonstration of a computer program that gives students the opportunity to view the University of Idaho Commons Building through a computer simulation that gives data on energy consumption, utility costs, and pollution statistics with the click of a mouse. A student guides himself through a 360 degree simulated tour of

the campus area, and can click on a car and learn about emissions, or a trash can, and learn about waste product volume (See Figure 2.) Dakins said that this type of innovative teaching tool is not only simple to develop, but gives students a real-life picture of the issues facing the campus in terms of its sustainability.

The subsequent brainstorming session outlined several ideas for developing a sustainability curriculum on campus. The group decided that it would be important to develop an archival record of initiatives, such as the environmental assessment done on campus several years ago; and building projects, such as the eco-dormitory. They wanted to document student projects and club efforts, such as the Environmental Club's coffee cup project and the organic farm. People also felt strongly that new class syllabi, innovative learning opportunities, projects, and initiatives, should be archived so that the history of sustainability on campus can be documented and validated as an asset to the vitality of campus and community life.

Participants suggested several concrete means for raising the students' working knowledge of sustainability. Dr. Karen Humes from the Geography department suggested that sustainability themes be integrated into the CORE classes. And Dr. Michael O'Rourke, from Philosophy concurred that the CORE courses offer an excellent vehicle because they are skill-focused on certain criteria, such as critical thinking. CORE courses have a compatible structure for developing a new literacy. Dr. Rula Awwad Rafferty, an associate professor of Architecture, thought sustainability could also be built into capstone courses. Dr. Margrit von Braun, Dean of Graduate Studies, thought that the International Studies program would be an obvious candidate for developing sustainability projects. Students would be exposed to the global perspective of sustainability, as stressed in the morning's panel presentation, and the opportunities for study abroad would be an asset to students' learning. Dr. Von Walden, of Geography, added that the Borah Symposium could be utilized as an educational tool for teaching sustainability. And one of the environmental science students suggested that there be a published "Forum for Awareness"- a newsletter that promoted campus-wide efforts toward sustainability, including class syllabi, student projects, community outreach, and improvements to campus infrastructure.

One facet of developing a campus wide interest in sustainability is developing a viable avenue for funding and incentives. The group thought that it was essential to achieve sufficient administrative support for teaching sustainability. They hoped to fund curriculum development internally, and through grants; and proposed that faculty be offered incentives through the tenure and promotion program for developing new courses and teaching innovations that promote sustainability.

President White's signature of the Talloires Declaration last year was seen to be one asset to the effort. By this action, President White committed the university to the declaration's ten-point action plan, which outlines ways that institutions of higher education play an integral role in making positive changes for welfare of the earth and future generations (See Figure 3.) As a result, the group hoped that sustainability could become part of the university's strategic mission. They proposed that a sustainability committee be put into action, and that a sustainability coordinator position be created to head campus-wide efforts.

Figure 3: The Ten Points of the Talloires Declaration

1) Increase Awareness of Environmentally Sustainable Development

Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.

2) Create an Institutional Culture of Sustainability

Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward global sustainability.

3) Educate for Environmentally Responsible Citizenship

Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.

4) Foster Environmental Literacy For All

Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.

5) Practice Institutional Ecology

Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.

6) Involve All Stakeholders

Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.

7) Collaborate for Interdisciplinary Approaches

Convene university faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.

8) Enhance Capacity of Primary and Secondary Schools

Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development.

9) Broaden Service and Outreach Nationally and Internationally

Work with national and international organizations to promote a worldwide university effort toward a sustainable future.

10) Maintain the Movement

Establish a Secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.

Source: http://www.ulsf.org/programs_talloires.html



Dr. von Braun is the Associate Dean of the College of Graduate Studies



Tom Lamar is the Executive Director of the Palouse Clearwater Environmental Institute



Paul McCawley is the Associate Director of Idaho Cooperative Extension

The Community Component

On the second day of the workshop, several presenters addressed the group about specific community based projects they have been involved in that promote sustainability. These speakers endorsed community outreach as a means to:

- promote environmental preservation,
- revitalize community vision,
- utilize the local workforce and expertise,
- provide education to its citizens,
- bolster economic growth,
- strengthen infrastructure
- and encourage collaboration between the local government, the university, and the private sector.

Environmental preservation is an integral facet of sustainability. In the 1970's, Dr. Margrit von Braun and her husband, owners of the environmental firm TerraGraphics, began reclamation work in Kellogg, Idaho. Here, they took a large waste dump area, and converted it into a park and bike trail. Through coordination with the city government, the local workforce was employed to remove contaminated soil and replace it with clean soil. The local people received a good wage, participated in their community's improvement, and learned lessons in stewardship. Similarly, Tom Lamar, from the Palouse Clearwater Environmental Institute, has led grass roots efforts to clean up local watersheds for twenty years. PCEI has utilized thousands of volunteers in local cleanup efforts. The agency also has an internship program, coordinates a ride-share program in north Idaho communities, and collaborates with the University of Idaho college of Natural Resources to operate the McCall Outdoor Science School, an experiential learning camp for elementary school classes that teaches the scientific method, and principles of environmental stewardship. TerraGraphics and PCEI have both provided a model for service learning and outreach to promote sustainability in ecology and local communities.

Dr. Paul McCawley, from the University of Idaho Extension Office, spoke about university extension, and its role in communities. The university extension office provides services to 42 counties. These services include agricultural education, community programs for adults and youth, leadership training, and statistical data that can be used in community decision making. McCawley stated that he uses four initiatives when talking about community education:

Dr. Rula Awwad Rafferty, and graduate student James Logan contribute to the discussion on sustainability.



- 1) Development of local leadership in order to foster collaborative decision making in communities.
- 2) Economic development, through employing local workforces.
- 3) Building community infrastructure, by helping to set a new vision for Main Street, parks, and centers; and through cultivating a local identity.
- 4) Providing knowledge, such as statistical data, employment data, and information on trends, to assist in the visioning process.

Through these services, the university collaborates with local communities to build strong families, economic vibrancy, quality of life improvements, leadership development, civic responsibility, and informed decision-making. These assets are key components to community sustainability.

Dr. Mark Stemen closed the session that morning by commending the panelists on their contributions to the sustainability of local communities. He stressed that one consideration for developing a coordinated sustainability program on campuses, is to consider the health of the group that is working so hard to implement these new programs and ideas. Stemen asked, “How are we going to keep our own activism sustainable?” He said, “(You must) build and nourish your group intentionally.”

Action Items

The group was committed to developing action items that integrated sustainability into the campus curriculum. They also sought to dovetail their efforts with an overall strategy to implement sustainability into the campus infrastructure and strategic mission, and to partner with the community to address common issues pertaining to environmental preservation, economic health, and quality of life for the community. The following action items were identified in a synthesizing session led by Chris Dixon, academic coordinator of Environmental Science, and presented to the large group by four students participating in the workshop track:

Goal: Bring sustainability to the forefront of University life.

Method 1: Increase communication across the disciplines at all levels about sustainability.

Means:

- o Operationalize the term “sustainability” and apply the concept across disciplines
- o Hold regular meetings
- o Increase educational support
- o Create incentives for faculty
- o Provide tools to help faculty teach the concept
- o Provide continuing educational support

Method 2: Increase awareness of sustainability

Means:

- o Offer awards to faculty and students at graduation
- o Create an ad campaign to promote sustainability
- o Create a pledge card

Method 3: Create a dedicated space for students and interdisciplinary committee.

Means:

- o Include a library of past and current work
- o Include sustainability resources
- o Make it user friendly for students and faculty to meet and share information.

Method 4: Create a truly interdisciplinary group focused on sustainability in academics

Means:

- o Draft a strategic initiative to provide incentives
- o Coordinate with ASUI to organize student support
- o Create a means to help Pres. White implement the Talloires Declaration
- o Encourage the administration to create a charge for a sustainable plan.

Method 5: Assess the current curriculum and consider ways to incorporate sustainability.

Means:

- o Do an assessment
- o Re-design courses using a team approach
- o Get faculty/student involvement in curricular decision making.

Since the conference took place in September, over forty faculty, staff, students, and administrators have met on different occasions to brainstorm ideas and develop a strategic initiative proposal for funding sustainability efforts on campus.

Conclusions

“One thing about sustainability is that the problems we face are huge. The needs are constant, immediate, and in unlimited demand,” said Mark Stemen, at the workshop’s close. At the university level, there are myriad opportunities to teach the values of stewardship, citizenship, and leadership. There are many ways to engage students in a transformational system of life-long learning. The campus itself could become a model of sustainability through its building design, transportation system, waste management, and educational programs. And finally, the campus and the community can ally themselves to achieve common goals for creating a sustainable future for generations to come.

Since the conference took place in September, over forty faculty, staff, students, and administrators have met on different occasions to brainstorm ideas and develop a strategic initiative proposal for funding sustainability efforts on campus. The team listed one hundred and sixty ideas for increasing sustainability - in the curriculum, in management areas, and in facilities. These ideas are being grouped and synthesized for the purpose of the proposal. Funding this initiative would be a huge step in having the means to implement action items set forth in the workshop, and make positive changes in the curriculum, infrastructure, and physical campus. As the Talloires Declaration acknowledges, environmental changes “caused by inequitable and unsustainable production and consumption patterns” threaten “the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations.” The declaration further acknowledges the role of universities in providing “education, research, policy formation, and information exchange,” so that solutions to these problems may be found. The call to action is clear: The university has a profound role in educating students to be stewards and citizens. It has a vested interest in the future of the earth’s resources and the health of future generations. And, it has the means to be a principal player in creating a sustainable future for our global village.

Recommended Reading

The complete text of the Talloires Declaration at http://www.ulsf.org/programs_talloires.html

Joshua Skov, *Sustainability Pathways: Toolkit for Universities and Colleges*

Cammie Kirk, *Sustainability: Take the Long View*

Rappaport and Creighton, *Effective Campus Environmental Assessment*

David Orr, *Planning to Learn*

Christopher Uhl, *Process and Practice, Creating the Sustainable University*

David Orr, *What is Education For?*

David Orr, *The Problem of Education*

We appreciate the support of these conference sponsors!

US DOT University Transportation Centers Grant DTRS98-G-0027

Green Sponsors

President's Office, University of Idaho

National Institute for Advanced Transportation Technology

University of Idaho Parking and Transportation Services

Gold Sponsors

University of Idaho College of Engineering

University of Idaho Finance and Administration

Idaho Transportation Department

City of Moscow, Idaho

University of Idaho College of Natural Resources

Silver Sponsors

Federal Highway Administration, Boise, Idaho

Idaho National Laboratory

Bronze Sponsors

Valley Transit—non-profit public transportation

University of Idaho Environmental Science Program

University of Idaho Environmental Biotechnology Institute

Shelley L. Bennett, Commercial Broker/Developer; Moscow, Idaho

University of Idaho College of Science

Gem Valley Appraisal (gem@moscow.com)