

Abstract

This report outlines the findings of a large team of experts who explored ways to make the challenge of sustainability a founding, core principle in the planning, design, and daily life of the proposed UC Merced campus. The project was commissioned by the University of California Merced, and paid for with funds from an EPA grant.

Project Methods and Goals

Academics, A/E professionals and their consultants, UC Merced and UC Office of the President representatives, and members of government agencies (collectively the "project team") all met at UC Berkeley over the course of the five months from September 2001 to January 2002. In our meetings, we discussed the following issues related to the sustainable development of this campus: local and regional transportation, climate, land use planning, landscape and drainage, building design, energy, water, financing, personnel, and policy. This report summarizes practical opportunities for implementing measures of sustainability identified during those meetings. The opportunities range from simple responses to the climate and landscape on the site to very complex and integrated practices that the campus can phase in over time.

We presented our findings in the "Conference on Building and Operating Sustainable College and University Campuses in the 21st Century" on April 29, 2003.

What is Sustainability?

In the introduction, we describe three basic approaches to what is commonly referred to as "sustainable development". Ranging from most ambitious to modest, these approaches are 1) to enhance Earth's carrying capacity through development and human activity, 2) to work within Earth's carrying capacity by establishing how much human degradation Earth's natural systems can withstand before quality of life is diminished, and 3) to mitigate against degradation of earth's carrying capacity by reducing our impacts incrementally. Any of these three approaches can provide improvements in lifestyle, comfort, satisfaction, and health along with protecting animal habitat and saving energy and resources.

To achieve more sustainable development, planners should pursue an integrated design strategy that harnesses nature's free services both during and after construction.

In economic terms, there are three general types of sustainable development measures. The first and easiest to implement are practices that cost less immediately, but still offer at least the "typical" level of performance. Other measures have payback periods ranging from several months to many years; these are justifiable for those who plan to own and operate a facility for longer than the payback period. (It is worth noting that economic forecasting is not always accurate, that changes in energy prices, technology, use of the facility, etc. might speed up or slow down the predicted payback.) Finally, some sustainability measures may never pay the facility owner back economically. In many cases, however, these practices are still worth pursuing because of their associated quality of life improvements.

Why Sustainability at UC Merced?

There are many reasons why UC Merced is pursuing sustainable campus development. While many institutions are not well positioned to pursue sustainability, UC Merced is. Not only is the time right for sustainable development, but the campus has several future phases that have not been specifically designed yet, is to be built on a mostly vacant site, and will come about in an era in which people understand and embrace ecological stewardship as a way to improve our quality of life, health, and future security.

As society becomes more and more aware of the benefits that sustainable practices can provide, more and more leaders are including the concept of sustainability in their vision. Chancellor Tomlinson-Keasey is the first UC chancellor to explicitly consider sustainability in the initial goals for a campus. Her goals are to employ cutting-edge technology, to "set standards for sustainable use of energy and other scarce resources, and be a model of development in the great San Joaquin Valley."¹ Unlike many institutions of the past, when UC Merced planners and developers try to integrate sustainable practices during the design process for this campus, they will be supported from the top.

Chancellor Tomlinson-Keasey's goals not only describe sound economics and strong ecological policy; they represent the best tradition of public education in the United States and California. They recognize that there is a public trust for institutions of this caliber to pursue the highest levels of intellectual investigation, to invest in the highest ideals of community, and to embody the highest aspirations for the future. They address the fact that one of the biggest challenges facing our way of life in this century will be learning how to sustain the standard of

living to which we have become accustomed and still meet the challenges posed by global climate change, resource depletion, and the degradation of our life support system through development and pollution. It is fitting that one of the first new major research universities of the twenty-first century should both pursue knowledge and lead by example in these areas.

Enhancing Sustainability

Campus planners and developers have already taken major steps toward Chancellor Tomlinson-Keasey's stated goals, especially in building energy efficiency and the infrastructure design that supports it. Some of these efforts are unique and important enough to be considered models for further development anywhere in the world.

There are also development and operations areas in which the campus can further reduce its ecological impact. Some of these areas require only small changes to bring about the benefits of sustainability, while others may require new planning or the re-thinking of current campus plans (perhaps with the input of various UC-wide faculty, staff, and/or other resources). The university can more thoroughly accomplish Chancellor Tomlinson-Keasey's goals by taking a second look at these areas, several of which we outline in this report.

As part of its educational mission, UC Merced can integrate sustainability into campus operations. By using the campus as a "living laboratory," UC Merced can get "double duty" out of sustainable measures. The founding deans can make it a point to include monitoring, analyzing, and reporting on campus systems in the curriculum. In such a framework, there are educational reasons to explore experimental systems, optimize the campus's performance,

provide curriculum opportunities for the school, and contribute to the field of sustainable design and development, all while enhancing UC Merced's sustainable performance. The energetic leadership of the founding deans can help sustainability become a founding core value for UC Merced.

With sustainability as a founding principle, its ongoing maintenance in a large public institution can become a challenge. For sustainable ideas to survive and grow, campus administrators, faculty, staff, and students should get involved and commit to continued implementation of sustainable measures: in mission statements, policy documents, individual practices, and evaluations.

Practical Considerations

Implementation of sustainable ideas can be difficult for a large public institution. In order to implement sustainable ideas, the campus must consider policy, financing, and personnel selection. If UC Merced is unable to implement what their design professionals and consultants propose, or are unable to pursue the recommendations of this report, the danger is that the principle of sustainability will become academic only, and UC Merced will have missed a remarkable leadership opportunity. We specifically address issues of implementation in this report.

The Greenfield Issue

From a sustainability perspective, the decision to locate the campus on a largely "greenfield" site, adjacent to a "buffer zone" of rural, one acre residences planned by the County of Merced, creates unusual challenges. Even though the campus is located two miles closer to Merced than originally planned, the risk is that most of the transportation to and from cam-

pus will be by car, creating a largely commuter campus, especially in the early phases. This will result in energy use and air pollution that will be larger than that of all the campus buildings. The single most important sustainability goal for the campus should be to limit the number of people who have to commute to campus by car and/or have to make car trips off campus to get daily services. This goal can be achieved in two ways: first, by creating an efficient public transportation system to provide an alternative to the car as the primary choice for trips to and from campus; and second, by creating a campus/community (a new town) which provides for daily needs and services in order to reduce the number of trips outside the community.

The main advantage of building on a greenfield site is the freedom to design a community from the outset to meet a variety of goals, including sustainability. Accordingly, a major objective of planning the University Community has been to develop a sustainable community. In an effort to promote the sustainability performance of the campus and community, the master plan should avoid the single use, sprawling suburban models that dominate the Central Valley. It should instead be organized around a simple, clear, compact transportation system with appropriate land uses (including mixed-uses) and densities that support walking, bicycling and public transportation ridership. For this to happen, the streets, infrastructure and open space must be designed specifically to encourage walking and bicycling within the community, not just automobile access.

There are two reasons to identify this issue in a sustainability report. The first and foremost is that there are decisions that can be made now and in the future to address the energy,

pollution, and agricultural issues that a largely greenfield development brings to the table. We lay out some ideas along those lines in this report. Second, we bring up this issue so that those looking to UC Merced as an example of development in the San Joaquin Valley will not use the campus as an excuse to abandon in-fill and brownfield development, which are preferred methods of developing sustainably.

This Report

During the generation of this report, we created a “top ten” list of action items for enhancing sustainability at UC Merced. After a brief background about sustainability and how it fits in with the UC Merced campus, each item in the top ten list is covered in its own chapter. In many cases, more research is required to determine whether a specific measure is appropriate for this campus. Recommendations in this report are therefore designed to stimulate investigation by the University, identify best practices, and open a dialogue on how UC Merced can become a leader in the field of sustainable development.