

SUSTAINABILITY MASTER PLAN

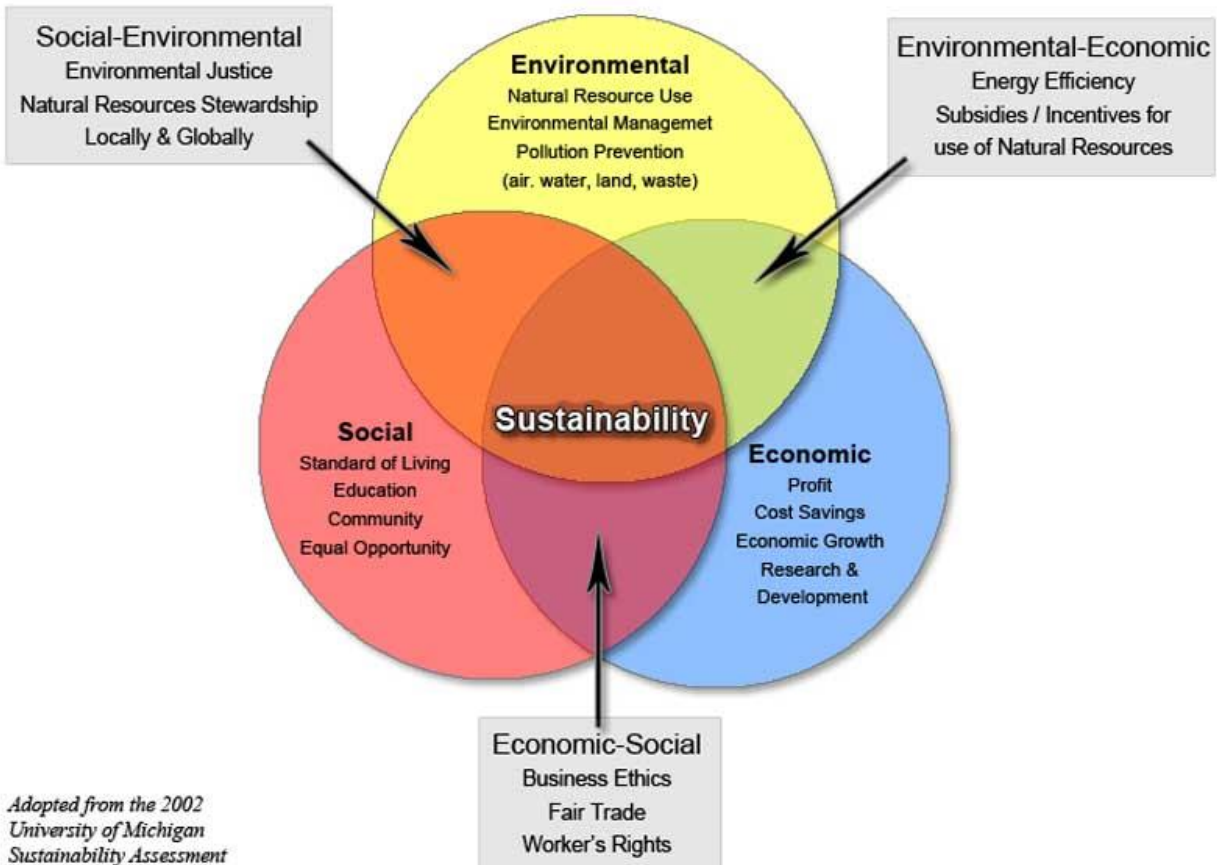
INTRODUCTION

The Sustainability Master Plan (SMP) is a comprehensive framework of the strategic measures Chaffey Community College District uses to meet its core value of environmental responsibility. Board Policy 1400.6, adopted March 28, 2013, states, “Chaffey College commits to the preservation, conservation, and responsible use of its natural resources.” Ends Policy III, 8.3.1B, revised February 25, 2010, likewise states, “Chaffey College will practice and pursue environmental responsibility.” The SMP identifies key goal areas and targets for achieving sustainability within the District and will assess progress on an annual basis. Through regular assessment and continual improvement, this evidence will be used to transform Chaffey College into a sustainable institution. (Ends Policy III, 8.3.1B)

The District is part of the Rancho Cucamonga Sustainability/Climate Action Plan Task Force and is currently working with city staff, consultants, and other regional stakeholders to develop a strategic ten year plan for the city. The plan is expected to be completed by the end of 2016, at which time the college will bring this Sustainability Master Plan in alignment with that of the city. This current version of the SMP documents the progress made in achieving the goals identified in the Sustainability Strategic Plan (2011) and the Facilities Master Plan (2014), the ongoing sustainable practices and protocols employed by the District, and areas requiring further commitment of resources.

VISION FOR A SUSTAINABLE CHAFFEY DISTRICT

Sustainability is a complex ideal that requires the balancing of environmental responsibility with social and economic responsibility. The “triple bottom line” serves as a guideline for sustainable decisions. The Venn diagram below illustrates the three overlapping areas of responsibility and how true sustainability is the merger of all three.



Sustainability in these three areas leads to multiple benefits by aligning expenses and revenue by lowering operating costs, improving environmental health and reducing the carbon footprint of the District, and demonstrating leadership in sustainability to the community. This vision of sustainability is rooted in the charge of the Green Earth Movement (GEM) Committee, “to take specific actions for the progress and good of the college with respect to...

- *our moral imperative as an institution of higher learning to take a leadership role in building and nurturing a sustainable and healthy environment for the future of our planet,*
- *the tangible economic benefits of sustainability with respect to energy consumption, conservation, and renewable energy generation,*
- *The significant learning benefits for our students and our community with respect to new curriculum and programs focused on sustainability and alternative energy.”*

BACKGROUND

Chaffey College's commitment to sustainability officially began in late 2007, when Superintendent/President Dr. Henry Shannon convened the Green Earth Movement (GEM) Committee. The GEM Committee reports directly to the Superintendent/President, advising on issues of sustainability and environmental responsibility.

In 2008, Superintendent/President Shannon signed the American College and University President's Climate Commitment (ACUPCC). As required by the ACUPCC, the GEM Committee completed and submitted detailed greenhouse gas inventories in 2008 and 2011. A Climate Action Plan was also required, and a subcommittee of GEM worked with Michael Shea, an architect and sustainable design manager, to create the Sustainability Strategic Plan (SSP) in 2011. This Sustainability Master Plan is modelled after the SSP.

Since 2008, Chaffey College has made considerable progress toward sustainability and environmental responsibility. All new construction is built to state mandated green building standards standards. Native plants and drought tolerant landscaping designs are utilized on all campuses. Green purchasing policies have been adopted. Recycling programs are in effect and hazardous material usage has been reduced. The District is in the third year of the Proposition 39 Energy Optimization Program, making HVAC, lighting, and heating more efficient. Proposals are currently under review for solar carports on all three campuses.

These are the first steps in a long term process. As stated in the SSP, "It will take many years and considerable advancements in knowledge and human perceptions to reach our goal of a fully sustainable college District... It is an ambitious goal but one that is necessary to ensure a prosperous and healthy college for future generations of Chaffey College students, alumni, staff, and faculty."

GOAL AREAS

The Sustainability Strategic Plan (SSP) identified thirteen goal areas to prioritize, organize, and coordinate many existing and new practices and programs in a strategic effort to increase sustainability within the District and the community. This plan incorporates the same goal areas outlined in the SSP. Many of the areas are interconnected and progress toward sustainability in one area will overlap with others. The thirteen goal areas are listed below.

1. Climate Change
2. Materials Resource Conservation
3. Curriculum and Learning Opportunities
4. Out-Reach and In-Reach Communication
5. Energy Conservation
6. Food and Agriculture
7. Green Building
8. Campus Operations
9. Purchasing
10. Transportation
11. Waste Management
12. Water Conservation
13. Implementation/Progress Assessment

1. CLIMATE CHANGE

Climate change is one of the greatest sustainability challenges human society faces today. It is a pollution problem with accelerating environmental impacts, and the potential to severely disrupt global ecosystems and threaten the very existence of civilization. This issue directly and indirectly impacts many of the included goal areas.

Eliminating harmful pollutants from our air, water, natural environment, and food supply is a crucial part of becoming a more sustainable community. The District has focused on reducing climate affecting pollution in two areas: greenhouse gas emissions, specifically carbon dioxide, and harmful refrigerants. Ideally, the District should strive for carbon neutrality. Simple changes in practices are often the most effective in combating pollution and climate change.

GREENHOUSE GAS EMISSIONS

Many activities and practices in the District create climate changing pollution, however, significant progress has been made in the following areas. HVAC systems and automated building controls have been upgraded through the Proposition 39 Energy Optimization Program. Maintenance and Operations has reduced off campus trips and adopted a more efficient mowing schedule. The Dining Commons contracts with local vendors to procure food and supplies, as well as, to recycle its used cooking oil. OmniTrans has partnered with local community colleges to implement the GoSmart program, which allows students with valid IDs to ride OmniTrans buses for free, resulting in significant reductions of vehicular pollution, discussed further in the Transportation section of this plan. Lastly, the Nature Preserve functions as a carbon sink. Carbon Dioxide is pulled from the atmosphere and sequestered in organic matter.

The District is in the process of reviewing proposals for solar voltaic systems. These systems will provide pollution free electricity to offset the electrical demands of the District and drastically reduce the indirect pollution caused by electrical power production. Furthermore, Maintenance and Operations has adopted a vehicle replacement plan that will transition District gas-powered vehicles to electric.

As required by the ACUPCC, the District submitted Greenhouse Gas (GHG) inventories for 2008 and 2011. The inventories document that the District reduced its greenhouse gas emissions from 5,263 metric tons of equivalent CO₂ in 2008, to 2,387 metric tons in 2011 (excluding transportation data such as staff and student commuting and District air travel). This represents a 55% reduction in overall carbon emissions, and a 76% reduction per 1,000 square feet of District space. Reducing the college's carbon footprint is one of the institutional goals of the District and a goal of the original Sustainability Strategic Plan.

REFRIGERANTS

As mentioned above, Proposition 39 has enabled the District to upgrade over 100 existing HVAC units to be more efficient and use less harmful refrigerants. The Sustainability Strategic Plan lists replacing harmful refrigerants with more benign substitutes as a goal. The Central Plant and Thermal Energy Storage (TES) tank efficiently heats and cools the majority of buildings on the main campus, significantly reducing the District's need for harmful, climate changing refrigerants. Further upgrades in HVAC efficiency and building automation will be included in subsequent years of Prop 39 projects.

FUTURE

The District should continue to improve operational efficiency and promote behavioral changes which reduce climate changing carbon emissions. Transportation has a major impact on carbon pollution and additional strategies to encourage ride sharing and public transportation use need to be explored. Achieving carbon neutrality is difficult but attainable, and will continue to be a major area of focus for sustainability efforts.

2. MATERIALS RESOURCE CONSERVATION

The protection and wise use of resources to meet the needs of today, while ensuring these resources are available in the future, is a vital element of sustainability. Consumer goods and organic materials are examples of resources that must be conserved. Many resources are produced elsewhere and brought to the District. Sustainability necessitates a holistic view of resources and requires the District and wider community to:

- Use resources more efficiently
- Recycle
- Consider the byproducts of production, transportation, and consumption

Choosing to consume less is often the most effective way to become more sustainable. The District must continue to become a better recycler by buying products that contain post-consumer recycled content, recycling more of what we currently discard, and avoiding the use of products and materials that are either non-recyclable or not yet being effectively recycled.

Two conservation goals outlined in the Sustainability Strategic Plan are using native and drought-tolerant plants and materials for District landscaping, and using environmentally sensitive materials, fixtures, and furniture during construction and renovations. The District has extensively utilized drought-tolerant plants and materials on all three campuses. Further drought-tolerant improvements are underway to meet mandated water reductions, including several “Sustainability Demonstration Gardens.”

The District has been committed to sustainable construction and renovation practices for many years. Since 2008, all new construction meets the state mandated green building standards. Sustainable construction includes water and energy efficiency, stormwater and construction waste management, low heat gain roofing, and natural lighting. Renovations have also included low heat gain roofs and HVAC efficiency upgrades. Carpeting made from recycled fishing nets has been installed in the Library.

Additionally, the District has made considerable progress in the following areas:

DINING COMMONS

The Dining Commons has undertaken many efforts to conserve resources and reduce consumption. Styrofoam products have been replaced with recycled sugar fiber plates and other earth-friendly, biodegradable catering supplies. “To go” boxes have been eliminated to reduce waste in landfills. Food waste is separated for composting, in partnership with Burrtec Waste Company, and used coffee grounds are available for use in home gardens. Bottles, cans, and cardboard boxes are separated for recycling. The Dining Commons uses only local vendors to lower carbon emissions from the

transportation of food and supplies. Lastly, used cooking oil is picked up for recycling by a local vendor. The Dining Commons is an outstanding example of resource conservation.

BOOKSTORES

The bookstores have incorporated many conservation practices into their operations. The textbook rental program has proven extremely successful, helping to reduce new book purchases and simultaneously providing an affordable alternative for students. Reusable totes and refillable cups are available for purchase, and beverage refills are available for 99 cents to support reusing the cups. Plastic bags have been replaced with bags made from compostable materials. Blue books have been replaced with green books. Green merchandise is promoted and sold in the bookstores. Finally, cardboard is being recycled.

PURCHASING

Purchasing was awarded for the most green merchandise ordered from Office Depot/Office Max in 2014. This was state-wide for all schools. Sustainable purchasing practices are fully addressed in the Purchasing section of this plan.

MAINTENANCE AND OPERATIONS

Maintenance and Operations has adopted many conservation practices. In 2015, fuel usage by District vehicles was reduced nearly 7,000 gallons, a 24% decrease from the previous year. Upon recommendation from the GEM/Sustainability Committee, M&O switched from bleached to unbleached towels, thereby reducing chemical processing and saving approximately \$2,500 per year. Batteries, fluorescent tubes and light bulbs are picked up by a local vendor for recycling. M&O has also significantly reduced water usage throughout the District. Water savings are covered in-depth in the Water section of this plan. Lastly, the District has contracted to have Boer goats graze at the Chino campus to provide natural weed abatement and help protect the existing population of burrowing owls, a California listed species of special concern.

HAZARDOUS MATERIALS

The District has made a concerted effort to reduce and safely manage hazardous materials. All biohazards and medical waste is properly stored, transported, sterilized, and disposed in accordance with federal, state, and local regulations. The chemistry department has eliminated lead and benzene, and reduced mercury use in chemistry labs. All Introductory Chemistry lab activities are green, using

mostly household materials, and generate no hazardous waste. Unwanted and expired chemicals have been removed from inventory and properly disposed.

LIBRARY

The library has strategically transitioned to using e-books in place of traditional books. This helps to conserve precious resources and benefits students simultaneously. The impact of e-books is fully covered in the Purchasing section of this plan.

NATURE PRESERVE

The Nature Preserve on the Rancho Cucamonga campus serves many functions. First and foremost, it is a valuable educational resource for our students and faculty, providing a real world setting for biological science and a means of promoting ideals of conservation and sustainability. Additionally, it functions as a carbon sink as discussed in the previous section. The preserve also protects one of the ten most endangered habitats in the world, coastal sage scrub. Preservation is a natural extension of conservation. A preserve should be considered for the Chino campus to further protect the population of threatened borrowing owls and their habitat.

3. CURRICULUM AND LEARNING OPPORTUNITIES

Issues and practices of sustainability must be integrated into existing curriculum and industry-specific sustainability education, training, and services must be created to create a highly skilled and productive workforce. Notable examples of faculty adopting sustainability into their curriculum include: Mark Padilla, physics instructor, who has taken students on tours of the central plant and used this facility to demonstrate thermodynamics and other principles of physics; Bret McMurrin, economics instructor, who incorporates sustainability and environmental issues into class lectures and activities; and Robin Ikeda and Sandra Collins, biology instructors, who utilize the Nature Preserve to give students a real-world laboratory to perform biology and to demonstrate the value and challenges of ecosystem preservation.

Behavioral changes among students, staff, and faculty are critical to the success of any sustainability efforts and District-wide learning opportunities facilitate these changes. Many important changes have already been implemented including default two-sided printing, subsidized public transportation, recycling, light shut-off, heating and cooling set points, and teleconferencing. More education is needed, as will be discussed in the following section on Out-Reach and In-Reach Communication.

CAMPUS AS A LIVING LAB

The District has recently partnered with the statewide Sector Navigator for Energy Efficiency and Utilities to implement the Campus as a Living Lab Program at Chaffey College. The program aims to transform energy efficiency and sustainability efforts in the District into real-world applications for learning to enrich curriculum in a variety of disciplines. As mentioned above, Mark Padilla has incorporated the central plant system into his physics curriculum as part of this project. A Living Lab work group is in the process of creating a self-guided, web-based tour of District facilities and resources that demonstrate energy efficiency and sustainability, contracting the development of a digital map of these sites, and organizing a Faculty Success Symposium on Campus as a Living Lab in April. The symposium will feature Chaffey faculty, such as Mark Padilla; student presentations highlighting instructional use of Chaffey resources; and presenters from other institutions with successful Living Lab programs.

FUTURE

While progress has been and continues to be made, more work needs to be done to develop curriculum to support certificate, transfer, and degree programs in the energy efficiency and sustainability industries. The Sustainability Strategic Plan lists curriculum development as an important goal in our path to sustainability and our responsibility to provide students with the knowledge and experience to

succeed in these lucrative and growing fields. Significant commitments of human and physical resources are needed to meet these goals.

4. OUT-REACH AND IN-REACH COMMUNICATION

Out-reach and in-reach efforts are critical to improving the sustainability of the District. As stated above, education efforts facilitate behavior changes in the daily operations and decisions of the college. Out-reach and in-reach raises awareness of the negative impacts of many day-to-day activities and decisions, and promotes sustainable alternatives to these harmful practices. Timely and consistent information and strategies are needed to counteract the excess of outdated and conflicting information which leads to inaction.

GREEN EARTH MOVEMENT (GEM)/SUSTAINABILITY COMMITTEE

The Green Earth Movement (GEM)/Sustainability Committee has employed many out-reach and in-reach communication strategies since its formation in 2007. One of the most successful activities has been the Earth Day event, the fourth of which will be held in April, 2016. In addition to the information presented by GEM, many outside vendors and agencies have participated (including Cucamonga Valley Water District, Southern California Edison, SoCal Gas, OmniTrans, Burrtec Waste Industries, and Rancho Santa Ana Botanical Gardens), raising awareness of the sustainability issues in their areas and promoting environmentally responsible behavior changes.

GEM has also hosted screenings of films like *An Inconvenient Truth* and *Switch*, and offered speaker series and panel discussions, to increase awareness and engagement with the college and larger community. GEM has partnered with the Campus as a Living Lab work group to offer a symposium in April, 2016, on successful integration of the Living Lab model and sustainability into effective curriculum. The committee also maintains a website and posts a sustainability note, the "GEM of the Week" in the *Chaffey News*.

In January, 2016, GEM was invited to participate in the Rancho Cucamonga Sustainability/Climate Action Plan Task Force. Sustainability/Environmental Safety Officer and GEM Tri-Chair, Sam Gaddie, joined the task force and met with city staff, the consultant team, and other task force members to discuss the current status of sustainability efforts throughout the city and make recommendations for the action plan. Following the task force meeting, the Sustainability Management Aide for the city attended a GEM Committee meeting and presented an overview of the city's Sustainability/Climate Action Plan. GEM agreed to assist the city with gathering feedback and input from the college and larger community regarding the plan and sustainability issues in Rancho Cucamonga. The city will also be participating in the Earth Day event in April, 2016.

OTHER IN-REACH AND OUT-REACH COMMUNICATION

Sam Gaddie, Sustainability Officer and GEM Tri-Chair, attended the Green California College Summit at the Pasadena Convention Center in October, 2015. Presentation topics included LED technology, water saving strategies, and funding sources for sustainability measures. Many vendors were on-site to demonstrate environmentally friendly and sustainable products and services.

Other communication efforts include the recycling signs affixed to the blue recycling bins and a student recycling video streamed in the Panther Café. Also, the Dining Commons published a flyer outlining the many sustainable practices incorporated in their daily operations. Lastly, the Living Lab work group is currently developing a self-guided tour and map of sustainable facilities and resources throughout the District to raise awareness and promote engagement.

5. ENERGY CONSERVATION

Energy conservation is vital to the success of achieving sustainability. Currently, most of the energy used by the District is from non-renewable energy sources which contribute to climate change and deplete natural resources. In-reach and out-reach communication has successfully changed energy wasting habits in many areas, but more work is needed to promote energy conservation in all District operations and decisions.

ALTERNATIVE ENERGY

The Alternative Energy Subcommittee, comprised of members of the GEM Committee and District management, was formed in 2009 to explore sustainable energy. The subcommittee sent out a Request for Information (RFI) and met with representatives from several energy companies, including Chevron, Siemens, and Borrego Solar. All of the companies the subcommittee met with recommended achieving maximum energy efficiency before installing any type of alternative energy. The District has been working continually to improve efficiency, for example with the Proposition 39 Energy Optimization Program, building to LEED standards, and other measures outlined below.

A solar feasibility study has been completed by NAM Engineering and approved by the Governing Board in October 2015. The study determined that the District can benefit from installation of solar panels, with millions of dollars expected to be saved over the lifetime of the panels. Solar covered carports were identified as the best system to install, making the best use of available space while simultaneously providing shaded parking for selected lots. A Request for Proposals (RFP) is in progress. In February 2016, the Governing Board approved Professional Engineering Consulting Services to assist the District in reviewing the submitted proposals. Installation of solar carports is anticipated by the end of 2016.

CENTRAL PLANT

As the college grew and facilities were constructed and upgraded with the Measure "L" bond, a central plant was installed in 2006 to more efficiently meet the current and future heating and cooling needs of the District. The central plant is expected to save at least \$12 million over 20 years. Upgrades to the hot water systems were performed in 2001. In 2016, six new boilers were installed, infrastructure was upgraded, and a Thermal Energy Storage (TES) tank was constructed. The TES will enable the District to chill water at night when electricity rates are lowest, store the water in the tank, and use the stored water to cool the campus during the day without operating the chillers during peak rate times. While not saving energy, the TES is an important component of energy management, shifting electricity demand to low use times and helping to prevent brown-outs during the hot summer months. Monetary incentives for the project are approximately \$700,000 and estimated annual savings on electricity billing is estimated at \$250,000. The return on investment (ROI) for the TES project is 8 years.

OTHER ENERGY CONSERVATION MEASURES

As mentioned above, the District has made significant progress in energy efficiency and management in many areas. The Proposition 39 Energy Optimization Program has had a major impact on energy efficiency within the District, increasing electrical energy savings and providing monetary incentives for participation in the program. Over 100 HVAC systems have been brought up to acceptable ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) 180 standards, a baseline of energy efficiency in HVAC systems. Interior and exterior lighting has been improved, with interior T-12 lamps being replaced with new, more efficient T-8 electronic ballasts, and exterior HID fixtures and T-12 and incandescent lighting upgraded for efficiency. Pool boilers and related infrastructure have been upgraded, and new LED lighting has been installed for the pool deck.

Under the oversight of Maintenance and Operations, Southern California Edison provided and installed Occupancy Sensor Power Strips throughout the Rancho Cucamonga campus (Fontana and Chino??). These power strips will reduce the District's electricity bill by approximately \$25,000 per year and lower the amount of climate changing pollution produced by non-renewable electricity generation. Motion sensors have also been installed for lighting in classrooms and offices. Similarly, vending misers have been installed on all vending machines throughout the District, enabling vending machines to switch to low power mode when not in use.

The Facilities Master Plan-Vision 2025 examined energy efficiency on all three campuses using Energy Use Intensity (EUI), a recognized standard for measuring electricity and gas used in a building. The EUIs for all three campuses exceeds the baselines established by the California Energy Commission and ENERGY STAR, indicating the District can benefit from additional energy efficiency measures. The Fontana campus was the most efficient overall and the Rancho Cucamonga campus the least.

FUTURE

As was indicated by the EUI measures in the Facilities Master Plan, the District can benefit from undertaking additional energy efficiency programs. Additional in-reach communication and learning opportunities are needed to raise awareness and curtail energy wasting behaviors. The Proposition 39 Energy Optimization Program will continue to improve the energy efficiency of District facilities and infrastructure.

6. FOOD AND AGRICULTURE

Food is another major factor in the health and sustainability of the college and larger community. The availability of healthy food directly affects eating habits and therefore physical health. Organic foods use fewer toxic chemicals that can damage human health and the natural environment. Local foods are generally fresher and more nutritious than foods that are transported long distances. Consuming local foods is an important element in reducing climate-changing greenhouse gas emissions. Local foods are transported shorter distances and require less processing and cold storage (refrigeration or freezing), which further reduces greenhouse gas emissions.

DINING COMMONS

The Dining Commons has fully embraced the GEM/Sustainability Committee's philosophy of "because it's the right thing to do," and have taken the lead in a number of sustainability efforts at the College. Food and supplies are completely provided by local vendors, ensuring foods are fresher and more nutritious, while simultaneously lowering the greenhouse gas emissions associated with processing, transporting, and storing food and supplies. Used cooking oils are picked up for recycling by a local vendor. Food waste is separated for composting, in partnership with Burrtec Waste Company. Lastly, the Dining Commons offers used coffee grounds to anyone who brings their own container, for use in their home gardens.

COMMUNITY GARDEN

A hanging community garden was initially funded and installed at the Wignall Museum in 2012, by a team of volunteers including faculty, staff, and community members. There were many challenges to creating a successful community garden. The location was hot and sunny, the plants each had differing watering needs, and employees worked a 4/10 schedule during the hottest summer months. The following year, there were challenges to effectively using volunteers to manage the garden. As a result, the community garden transitioned from vegetables to succulents, which require minimal maintenance and watering.

The GEM Committee is currently working with a group of interested students on developing and implementing a more permanent community garden on the Rancho Cucamonga campus or in partnership with the city.

7. GREEN BUILDING

Buildings in the U.S. account for 39% of total energy consumption; 71% of electricity consumption; 39% of CO2 emissions; 30% of raw materials used; 12% of water consumption; and 30% of waste outputs. Sustainable buildings are designed to be highly resource efficient and therefore minimize or eliminate these environmental impacts. These negative effects are further reduced by utilizing environmentally superior products such as recycled materials and lumber from certified sustainable forests. Additionally, sustainable buildings are designed to provide healthier indoor environments for the occupants. Construction materials that damage indoor air quality by releasing harmful chemicals such as formaldehyde and other volatile organic compounds (VOC's) are eliminated and high levels of natural lighting are included in the design.

The District has recognized the importance of sustainable building and all new construction and major renovations since 2008 has met or exceeded state mandated green building standards. Furthermore, sustainability has been incorporated in to the Vision 2025-Facilities Master Plan. A sustainability workshop was held to identify strategies and targets for the Facilities Master Plan. Targets identified include reducing energy and water use; decreasing transportation emission; increasing awareness, engagement, and stewardship; and becoming the model for energy efficiency in the state. Targets for green building include zero waste, maximizing recycled materials, reusing buildings and materials, and incorporating Living Lab components. Additionally, as part of the Facilities Master Plan, an environmental site analysis was conducted for the District. The analysis examined existing energy and water use and emissions, and recommended strategies to improve energy efficiency and conserve water.

GREEN CONSTRUCTION

The primary goal outlined in the Sustainability Strategic Plan Green Building section is to design all new buildings to achieve the highest feasible levels of sustainability mandated by California building code. The District has been extremely proactive in meeting or exceeding mandatory state green building codes for all new construction and renovations.

75% or more of construction waste has been diverted from landfills. Drought tolerant and native landscaping has been installed in all projects requiring landscaping. Bioswales have been designed and installed at the Rancho Cucamonga and Fontana campuses to capture storm and wastewater and provide natural filtration with less costs than a traditional connection to municipal storm drain systems. Cool roofs have been installed for all new construction and roofing renovations, reducing heat gain in the buildings and thereby lowering air conditioning demand and energy use. All projects took part in Edison's Savings by Design program, improving performance and minimizing operating costs. Natural lighting has been incorporated where appropriate. Lo-flow urinals, toilets, and faucets have been installed at all three campuses to reduce consumption of potable water. Solar-covered carport projects for all campuses are in progress.

PROPOSITION 39

The second Green Building goal strives to increase energy efficiency of all existing buildings. As discussed earlier in the Energy Conservation section of this plan, the Proposition 39 Energy Optimization Program has had significant impacts on energy efficiency within the District by increasing electrical energy savings and providing monetary incentives for participation in the program. Over 100 HVAC systems have been brought up to acceptable ASHRAE 180 standards, a benchmark of energy efficiency in HVAC systems. Interior and exterior lighting has been improved, with new, more efficient T-8 electronic ballasts replacing interior T-12 lamps, and efficiency upgrades for exterior HID fixtures and T-12 and incandescent lighting. Pool boilers and associated infrastructure were upgraded, and new LED lighting was installed for the pool deck.

Occupancy Sensor Power Strips were provided and installed by Southern California Edison, under the direction of Maintenance and Operations, throughout the all District facilities. These power strips reduce the District's electricity bill by approximately \$25,000 per year and lower the amount of climate changing pollution produced by non-renewable electricity generation. Motion sensors have also been installed for lighting in classrooms and offices. Similarly, vending misers have been installed on all vending machines throughout the District, enabling the machines to switch to low power mode when not in use.

FUTURE

Greater energy efficiency is possible throughout the District. More work needs to be done on out-reach and education to encourage behavioral changes and reduce energy use. Use natural shading and ventilation where appropriate should be incorporated into building design. Future construction and renovation needs to continue to meet state mandated green building standards and comply with the changing California Green Building Code. Sustainability and green building will be incorporated into the upcoming Measure L Build Out projects.

8. CAMPUS OPERATIONS

Operations involve every aspect of the day-to-day activities of the District and therefore overlap with all goal areas included in this plan. This section will focus specifically on protocols and practices in Maintenance and Operations and other key areas of operation. Many of the items discussed below are mentioned elsewhere in the SMP.

MAINTENANCE AND OPERATIONS

Maintenance and Operations is the backbone of the day-to-day activities throughout the District. Consequently, M&O has a huge impact on sustainability in campus operations. From improving efficiency to conserving resources, M&O has been proactive in transforming the college into a sustainable institution.

Beginning in 2013, Maintenance and Operations has taken measures to ensure facility water fixtures and irrigation systems were performing at optimal efficiencies and more recently to meet state and locally mandated water reductions. Frequent irrigation audits and leak reporting protocols have led to significant decreases in water consumption. Turf replacement with native/drought tolerant landscaping has also lowered usage. An indoor water efficiency survey and fixture inventory is currently in progress, and The District is exploring master irrigation controllers and sub-metering of individual buildings. These efforts have led to millions of gallons of water conserved, compliance with mandated reductions, and are fully discussed in the Water section of this plan.

M & O has made considerable progress in energy efficiency and conservation as discussed previously in the Energy Conservation section. Efforts include upgrades made through Prop 39 efficiency projects, installation of occupancy strips, and establishing heating and cooling set points. Also critical to energy management, was the Thermal Energy Storage Tank addition to the Central Plant system, allowing chillers to operate at non-peak hours, lessening the demand on the electrical grid and significantly reducing operating costs.

The recycling program has been largely coordinated and supported by Maintenance and Operations in partnership with Burrtec Waste. Furthermore, M & O contracts with local companies for the recycling of batteries, light bulbs, and fluorescent tubes. M & O has also overseen the safe and proper disposal of all laboratory and hazardous wastes.

Other campus operations contributing to sustainability include transitioning to unbleached paper towels and using 85% or greater green cleaning products for facility maintenance. Fuel usage by District vehicles was reduced by 24% in 2015 and plans are in place to transition to an electric vehicle fleet. M&O has also adopted an aggressive preventative maintenance schedule to keep District infrastructure operating at optimal efficiencies and reduce costly repairs and infrastructure failures. Lastly, the District has contacted to use Boer goats to provide natural weed abatement at the Chino campus. Many of

these sustainable operations are fully discussed in the Materials Resource Conservation section of this plan.

OTHER SUSTAINABLE CAMPUS OPERATIONS

Many areas of the college have adopted sustainable practices in their daily operations. Purchasing has put into effect sustainable purchasing practices and policies, as is fully outlined in the Purchasing section of this plan. Likewise, the Dining Commons and Bookstores have implemented many sustainable practices, which are thoroughly discussed in the Materials Resource Conservation and the Food & Agriculture sections of the SMP. The Warehouse has also adopted sustainable operations by limiting off-campus trips and recycling toners and pallets through local vendors, as explained in the Materials Resource Conservation section above.

9. PURCHASING

Sustainable purchasing practices demonstrate a commitment to buying goods, materials, services, and capital improvements in a manner that reflects the District's core values of fiscal responsibility, social equity, community, and environmental stewardship. Sustainable purchasing should seek to save money, facilitate responsible environmental practices, and increase local and under-represented business participation in District contracts. Below are listed some areas currently implementing sustainable purchasing practices.

PURCHASING SERVICES

Purchasing Services has adopted a "path to sustainability." The department has committed to "help the College to minimize the environmental impact without an overall increase in cost." Sustainable practices will be carried out in two areas, buying and conservation.

In regards to buying: Purchasing Services will review current green purchases; identify environmentally preferable alternatives; select products and services to meet the objectives; and assess the process, incorporating industry best practices, methods, and updated standards. The department will conserve resources and cut waste by reducing, recycling and reusing paper; recycling cardboard packaging; and refilling or recycling ink and toner cartridges. Conservation practices also include reducing fuel consumption and greenhouse gas emissions by ordering in bulk, rather than daily, where feasible.

Purchasing Services was awarded a certificate of achievement for the most green merchandise ordered in 2014, from Office Depot/Office Max by the Foundation for California Community Colleges. This award was state-wide and included all schools.

PIC OF AWARD

DINING COMMONS

The Dining Commons has incorporated sustainability into its purchasing practices. Only local vendors are used to reduce carbon emissions associated with transporting food and supplies. Plates purchased for catering events are made from recycled sugar fiber or other earth-friendly, biodegradable materials. The Dining Commons no longer purchases Styrofoam products or "to go" boxes to reduce waste going to landfills.

MAINTENANCE AND OPERATIONS

Maintenance and Operations is currently purchasing 85% or greater green cleaning supplies through Waxie Sanitary Supply. This places Chaffey College well above other institutions in the region. Based on the cleaning chemicals and supplies needed to maintain District facilities, this represents the maximum level of green cleaning supplies achievable.

Upon recommendation from the GEM/Sustainability Committee, Maintenance and Operations recently transitioned to using unbleached paper towels throughout the District. This results in approximately \$2,500 in annual savings, while simultaneously helping reduce chemical processing of paper products. The collaboration between GEM and M&O is a perfect example of successful shared governance.

LIBRARY

Beginning in 2013, the library began making a strategic effort to increase the number of e-books. The Fontana and Chino campuses do not have physical collections, so electronic resources, like e-books, enable student access to research and learning materials at these sites, while also increasing access for students at the Rancho Cucamonga campus. Recently, fewer dollars have been invested in physical books because e-books provide greater flexibility for library patrons with fewer costs and materials associated with losses, repairs and replacements. The Library has purchased a database package which allowed the e-book collection to expand from just over 20,000 to 200,000. This is an excellent example of using current technology to better meet student needs while simultaneously preserving precious resources, lowering costs, and reducing pollution and waste.

BOOKSTORES

The bookstores have adopted many sustainable purchasing practices and offer a variety of environmentally responsible products and services. Refillable mugs and reusable totes are sold, with beverage refills offered at 99 cents to encourage use. Biodegradable bags have replaced less sustainable plastic bags. Textbooks are available for rental, offering students an affordable alternative to purchasing books, while reducing the amount of textbooks purchased overall.

FUTURE

Green purchasing practices for the District can be standardized and applied across all departments. An energy-efficient computer equipment and appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist should be adopted.

10. TRANSPORTATION

Transportation is a key sustainability issue for the District and Southern California. The ability to easily and affordably move about the region is essential for a healthy economy and productive society. Unfortunately, studies have shown that transportation related emissions are responsible for 65% of photochemical smog and one third of all greenhouse gases. The greenhouse gas emissions data for the college that was provided to the ACUPCC for 2011, reveals that over 80% of GHG emissions are related to District air/other travel and employee and staff commuting.

At the local level, vehicular traffic threatens the safety of pedestrians and bicyclists. Parking occupies large portions of prime land on each campus. Each of these negative impacts from transportation is due in large part to an overdependence on single occupant, gas-powered vehicles. Behavioral changes and infrastructure improvements are needed to make transportation more sustainable at the District and throughout Southern California.

OMNITRANS

Chaffey Community College District partnered with OmniTrans in the fall of 2011, to bring the *GoSmart* program to the college. Students currently enrolled with valid Chaffey ID can ride anytime, anywhere OmniTrans serves for free. A small transportation fee is charged when students enroll for classes in the spring and fall semesters.

Since the pilot program began in 2011, ridership has doubled for Chaffey students. The *GoSmart* program results in reduced emissions from vehicles, reduced traffic congestion near the college campuses, decreased parking demand, and reduced transportation costs for students. Data provided by IR shows a small decrease in ridership and overall trips since 2014; additional outreach efforts and education are needed to boost participation.

MAINTENANCE & OPERATION

Maintenance and Operations has made considerable progress in making District vehicle use more sustainable. Scheduling off-campus trips and implementing a two-day mowing regime have reduced fuel usage by over 7,000 gallons in 2015, a 24% decrease from the previous year. Using less fuel not only saves resources and money, it reduces climate changing greenhouse gas emissions. A Vehicle Replacement Plan is currently being developed to transition District vehicles to all electric.

FUTURE

Outreach and education about the OmniTrans GoSmart program is needed to increase use of public transportation. Incentives for carpooling are an option to increase ridesharing. Students who can demonstrate ridesharing could receive special parking permits and utilize reserved parking stalls. Funding for the replacement of District vehicles with an electric fleet needs to be identified.

11. WASTE MANAGEMENT

Waste management is the reciprocal facet of conservation and a critical component of sustainability. By employing the philosophy of “Reduce, Reuse, and Recycle,” the District can conserve valuable material and fiscal resources, while responsibly managing its waste streams. First and foremost is adopting behavioral changes and utilizing sustainable alternatives to reduce the amount of materials and resources the college consumes. Additionally, whenever possible, materials and resources should be reused. Lastly, only products which contain post-consumer recycled content and/or are easily recycled should be purchased by the District. Significant progress has been made in the areas described below, however additional improvements in waste management are needed and continuous outreach and education are necessary to successfully maintain a sustainable waste management program.

MAINTENANCE & OPERATIONS

Maintenance and Operations has been proactive in responsible waste management. All biohazards and hazardous waste are processed, stored, treated, and disposed in compliance with local, state, and federal regulations. Unwanted paints, stains, and varnishes are recycled by local paint suppliers through the PaintCare program.

Annually, over 50 tons of green waste is recycled through Burrtec Waste. In 2016, the Grounds Department began trimming trees and chipping wood to generate mulch in-house for the Rancho Cucamonga campus. The state has mandated that as of 2016, all organic waste generated by the District needs to be diverted from landfills for recycling.

In 2012, over 550 blue recycling bins were purchased and distributed throughout the three campuses. The GEM Committee and M&O worked together to incorporate signage and education/in-reach regarding recycling. M&O has successfully managed to standardize protocols for diverting recyclable waste. Additionally, in 2015, the District recycled 300 pounds of batteries (through Stericycle) and over 870 light tubes and bulbs (through Lighting Resources).

All new construction since 2008 has meet LEED standards, with greater than 75% of waste being diverted from landfills, as was addressed earlier in the Green Building section of this plan.

PURCHASING/WAREHOUSE

The Purchasing Department and Warehouse have integrated the “Reduce, Reuse, and Recycle” philosophy into practices and policies. All copier paper is sourced from sustainably farmed trees and/or contains post-consumer recycled content. Campus-wide emails are used for the inter-office exchange of supplies, furniture, and equipment. The District has contracted with Shred-It to recycle over 35 tons of office paper per year. Likewise, the college has partnered with AdCamp to recycle newspapers at 5

campus newsstands. Finally, the Warehouse recycles over 300 toner cartridges, through Recycling Solution, and over 400 pallets, through a small local company, on an annual basis.

DINING COMMONS

The Dining Commons has been extremely proactive in sustainable managing waste. The Dining Commons has completely eliminated all Styrofoam products and to-go boxes. Styrofoam products have been replaced with biodegradable alternatives. In partnership with Burrtec Waste, over 9 tons of food waste is diverted for composting. Used cooking oil is picked up by a local vendor and recycled. The Dining Commons and Bookstores segregate all cardboard packaging for recycling.

FUTURE

Beginning in 2017, the District is required to submit an annual report to the state regarding tracking of solid waste diversion for the previous year. The Sustainability Officer and M&O are beginning to compile the information needed for this report.

A “Stop Junk Mail” campaign was initiated in 2012 by the GEM committee. The District can benefit from revitalizing this program. The recycling program needs ongoing education and in-reach to increase waste diversion from landfills. Lastly, a comprehensive Integrated Pest Management (IPM) program should be investigated by the college. Successful IPM’s reduce the amount of chemical pesticides and herbicides in use.

12. WATER

Water conservation is a critical component of the SMP. California is entering its fifth year of drought. Governor Brown declared a State of Emergency in January 2015, mandating water restrictions across the state. The three Chaffey campuses are located in different water districts and are subject to mandated water reductions as listed below. Additional restrictions for all three campuses include only watering on designated days between the hours of 4 p.m. and 9 a.m. and no watering within 48 hours of a rain event.

Mandated Water Reductions

Location	Water Agency	Mandated Reduction	Baseline Year
Rancho Cucamonga	Cucamonga Valley Water District	35%	2014
Fontana	Fontana Water Company	28%	2013
Chino	Chino Water Company	24%	2013

Since 2009, the District has committed to conserving water. Projects include installation of low-flow urinals, native/drought-tolerant landscaping, and bio-swales. Future projects will focus on replacing designated turf areas with native/drought resistant landscaping. Below is a list of completed, on-going, and new water conservation measures Maintenance and Operations have recently undertaken.

MAINTENANCE AND OPERATIONS

Beginning in 2013, Maintenance and Operations established objectives to ensure water is being prudently used and that all facility water fixtures and irrigation systems are operating at optimal efficiency. A two-person irrigation audit team was established to monitor sprinkler head performance, run times, and coverage, and perform needed infrastructure repairs. Campus Police was engaged to report and tag any observed irrigation leaks or breaks which occur during overnight watering cycles for immediate repair. An aerial qualitative infrared (IR) thermographic survey was conducted for the Rancho Cucamonga campus to verify no underground leaks exist in the Central Plant closed loop hot water system. A survey of indoor water efficiency and inventory of water fixtures is currently in progress. Individual water sub-metering systems are being installed on all campus buildings, to track consumption by building and identify areas for further water conservation efforts.

Numerous turf areas have been identified for replacement with drought-tolerant landscaping. M&O is currently removing turf in these locations and water-efficient landscaping will be installed as budgets

allow. The Tree, Plants, and Grounds Committee is developing a plant list to assist with plant choices for drought-tolerant landscape designs for these areas and future landscaping projects. M&O is also pursuing advanced landscape irrigation clock control/monitoring systems to further improve irrigation system efficiency.

Irrigation infrastructure for recycled water has been installed at the Rancho Cucamonga campus; unfortunately, the campus is situated at too high an elevation to receive recycled water. At this time, there is no source for recycled water above the campus.

BIOSWALES

Storm and waste water management is another component of water sustainability. The District currently has bio-swales on the Rancho Cucamonga (2005) and Fontana (2009) campuses. Bio-swales are landscape elements designed to capture storm water run-off, providing surge retention and natural filtration. Additionally, the bio-swale at the Rancho Cucamonga campus naturally filters waste water discharged from the pools. Bio-swales are significantly cheaper than connecting to municipal storm drain systems.

FUTURE

Turf replacement and installation of drought tolerant landscaping will continue as budgeting allows. A collection system for capturing gray water and using it in the recycled water irrigation systems at the Rancho Cucamonga campus is possible, but would require significant funding and infrastructure redesign. Other potential water saving ideas are condensate collectors on air-conditioning units, rain water collection, and use of waste water from water purification systems for irrigation.

13. IMPLEMENTATION-PROGRESS ASSESSMENT

Implementation and progress assessment is crucial to integration and documentation of sustainability throughout the District. This update of the SMP documents the progress made in achieving the goals and required actions identified in the Sustainability Strategic Plan (2011) and the Facilities Master Plan (2014), the ongoing sustainable practices and protocols employed by the District, and efforts requiring further commitment of resources. Each section of this plan outlines a specific goal area and required actions from the SSP and documents the progress the District has made in achieving those goals. A simple assessment system has been developed to document current and future progress for each of the goals and actions.

Some of the goals and actions listed below will be revised, consolidated, or eliminated as the District refines its vision of sustainability. Additionally, some of the progress the District has made in sustainability did not fit within the existing SSP framework and were documented within the previous sections but not in this assessment. This plan and its goals will be further updated as the cities within our District develop and implement their own Sustainability Plans and we bring our plan into alignment.

ASSESSMENT BELOW

GOAL AREA	GOAL	ACTION	CURRENT STATUS	FUTURE STATUS
Climate Change	1) Reduce greenhouse gas emissions and move towards carbon neutrality by means of energy and resource conservation	1) Reduce electrical power consumption		
“	“	2) Reduce commuter trips to/from Chaffey campuses		
“	2) Utilize energy efficient/alternative means of cooling & heating buildings	1) Minimize use of air conditioning by using exterior window shading and mechanically assisted ventilation		
Materials Resource Conservation	1) Use environmentally sensitive construction materials, fixtures, & furniture for all campus construction	1) Develop a life-cycle assessment for construction materials, fixtures, & furniture considering cost, longevity, and recyclability		
“	2) Use native and drought-tolerant plant material for campus landscaping	1) Develop a native & drought-tolerant plant replacement schedule for campus landscaping		
“	“	2) Develop a campus landscape master plan that increases the amount of habitat suitable for indigenous plants and animals		
Curriculum & Learning Opportunities	1) Create learning & teaching environments that promote sustainability awareness and expertise	1) Develop & implement a Vocational Certificate curricula		
“	“	2) Develop & implement AA/AS Degree curricula		
“	“	3) Develop & implement Transfer Degree curricula		
“	“	4) Initiate development of Interdisciplinary curriculum		
“	“	5) Develop training facilities to support sustainability instruction		
“	2) Encourage behavioral changes for students, faculty, & staff regarding	1) Implement orientation training & signage program that educates students, faculty, and staff re: indoor temperatures &		

	adopting an environmentally sensitive lifestyle	use of air conditioning		
“	“	2) Require computer shutdown after use		
Out-Reach & In-Reach Communication	1) Create communication tools to proliferate the message about campus sustainability opportunities	1) Create a Communication Plan that identifies best methods for getting the message out and receiving feedback from campus community		
“	“	2) Embed Chaffey SMP documentation into website		
“	“	3) Create Chaffey Sustainable Newsletter available from the website		
“	“	4) Create guest speaker forums and symposiums focused on sustainability		
“	“	5) Develop workshops for sustainable programs and projects		
“	“	6) Write and publish a sustainability column for the local newspaper		
“	“	7) Incorporate sustainability awareness into Chaffey Marketing Plan		
“	“	8) Create a teleconferencing center to reduce travel/commuting		
Energy Conservation	Reduce electricity use in all campus facilities and buildings	1) Conduct and implement an alternative energy assessment of the campus to better understand which types of renewable energy systems are most feasible and beneficial to the campus		
“	“	2) Install most feasible and beneficial alternative energy system on campus		
“	“	3) Increase on-campus generation of electricity from alternative renewable sources: wind and photovoltaic panels		
“	“	4) Conduct Level 2 Energy Analysis. Perform building		

		envelope and systems assessment to determine energy performance of all existing buildings (retro-commissioning)		
“	“	5) Implement conservation measures as recommended in the Level 2 Energy Analysis		
“	“	6) Create a priority improvement schedule for energy efficiency building modifications		
“	“	7) Install power sub-meters on all buildings to monitor usage		
“	“	8) Encourage behavioral changes for students, faculty, & staff including a “lights off” program and use of air conditioning on mild days		
“	“	9) Minimize use of air conditioning by strategic placement of deciduous shade trees on south side of campus buildings to reduce daytime solar heat gain during summer months		
“	“	10) Investigate & use more energy efficient methods for cooling building interiors such as geothermal exchange, exterior building shading, natural ventilation, and fan ventilation		
“	2) Reduce natural gas use in all campus facilities and buildings	1) Investigate the feasibility of solar heating for domestic/process hot water generation		
“	3) Reduce use of fossil fuels for energy generation & transportation	1) Provide incentives for carpooling		
Food and Agriculture	1) Support & encourage use of sustainable farming, food production and procurement	1) Create a priority listing of preferred suppliers & vendors of locally grown & organic foods		
“	“	2) Create an “organic farm” demonstration site to support academic programs for fruit,		

		vegetable & herb cultivation & harvest by students & community		
“	“	3) Create a composting station at the organic farm to harvest & process kitchen waste scraps into organic fertilizer		
“	“	4) Develop & implement “edible landscaping” design throughout the campus coordinated with campus master landscaping plan		
“	“	5) Create a vermiculture demonstration site		
“	“	6) Compost green waste		
Green Building	1) Design all new buildings to achieve the highest levels of sustainability mandated by state building codes	1) Provide summer shading for building facades with trees & shrubs		
“	“	2) Incorporate sustainable practices into existing Chaffey Building Guide to be used by architects & engineers for the renovation of existing facilities and design of new buildings		
Campus Operations	**Goals identified in other areas**	--	--	--
Purchasing	**Goals identified in other areas**	--	--	--
Transportation	1) Reduce greenhouse gas emissions and move towards carbon neutrality by reducing vehicular trips	1) Create parking & transportation policies that encourage reduction of vehicular commuter trips and increased use of public transit		
“	“	2) Compile & update annual transportation data indicating commuter miles traveled, methods of travel, & tons of CO2 generated by vehicles		
Waste Management	1) Reduce all forms of waste	1) Create a robust recycling program that includes paper, cardboard, plastic, metal, glass, batteries, tires, computers, & fluorescent lights		
“	“	2) Maximize collection by making recycling easy and		

		convenient-placed in high traffic areas & co-located with trash receptacles		
Water Conservation	1) Reduce water consumption	1) Develop a lawn replacement schedule for campus landscaping to native & drought tolerant plants		
Implementation-Progress Assessment	1) Develop an implementation plan that integrates best sustainable practices into the everyday actions of the entire Chaffey organization	1) Establish a decision-making process for campus sustainability issues that includes a conflict resolution methodology		
“	“	2) Create a director of sustainability staff position to carry out sustainability mandates and programs		

ENDS POLICY 8.3.1B Environmental Sustainability

Chaffey College will practice and pursue environmental responsibility. Faculty, staff, and students will investigate and implement the concepts of environmental sustainability.

Curriculum/Learning Opportunities

To prepare students for the future, the district will develop courses and programs that reflect heightened awareness and commitment to sustainability.

Stewardship/Conservation

The district will make continual improvement in conserving natural resources by adopting feasible best practices such as recycling, purchasing renewable materials, and sustainable technology.

Outreach

The district will lead by example and continue to encourage and foster positive relationships with its surrounding communities by adopting, promoting, and advocating sustainable practices and policies on its campuses and within the communities it serves.

Teamwork

Students, staff, faculty, administration, and the board of trustees will continue to work together and encourage one another to implement sustainability practices.

Accountability

Progress will be assessed on an annual basis, and evidence will be used to transform Chaffey College into a sustainable institution.

Monitoring report: Environmental Sustainability Report
(Accred. Standard III B)

BP 1400 Core Values

The Governing Board, administrators, faculty and staff of the Chaffey Community College District fulfill the organization's purpose through the application of these core values:

6. Environmental Responsibility Chaffey College commits to the preservation, conservation, and responsible use of its resources.

References: No specific references

Adopted: 3/28/13