4

SUSTAINABILITY

OVERVIEW

In keeping with the District's long history of successful efforts to build and operated sustainable campus facilities, the *AHJCCD Energy and Sustainability Plan* describes an approach to broaden these efforts by integrating sustainability holistically into its culture and role in the community. To this end, the *AHJCCD Energy and Sustainability Plan* sets goals and strategic paths for the development of both an environmentally conscious college culture and sustainable physical environment.

The first section of this chapter describes the purpose of the plan and the highly participatory process through which it was created. The next section documents the *AHJCCD Energy and Sustainability Plan,* which is organized around six dimensions or focused areas of interest. Following the plan is the analysis of district environmental data which was included in the 2011-2012 sustainability planning process and was updated for the facilities master planning process. The chapter concludes with sustainability recommendations for the Santa Maria Campus and Lompoc Valley Center. This section provides campus- and location-specific recommendations to implement the strategic paths of the *Energy and Sustainability Plan*.

SUSTAINABILITY

WHY SUSTAINABILITY?

The Board of Governors of the California Community Colleges' Energy and Sustainability Policy recommends energy efficiency and sustainability goals for California community colleges. One of these goals recommends community colleges develop an energy and sustainability plan to provide their campuses with strategic direction. Allan Hancock College's 2009-2013 Strategic Plan, Objective 3.4.3, outlines a goal "to define and clarify the college's commitment to developing an environmentally conscious physical environment."

The development of an Energy and Sustainability Plan is an institutional goal also identified in the Facilities Council and Vice President, Facilities and Operations goals. The plan is an approach to establish institutional sustainability goals in all areas of the institution including instruction, operations, construction, facilities, energy conservation, energy production, and environmental integrity. In addition, the plan proposes strategic paths for implementation of goals and identifies alternative funding sources.

Development of the plan started in fall 2012. As a first step in the planning process, Vice President of Facilities and Operations, Felix Hernandez and Co-chairs Kathy Buckey and Margaret Lau recruited taskforce members and worked with the facilitation team to plan the workshop series. The newly established Sustainability Taskforce, whose members constituted a broad representation of the college constituencies, participated in a series of three visioning workshops that served as platforms for sharing, research, discussion, and further collaboration on diverse sustainability issues. The workshops were held on March 2, 16, and 30, 2012. Through the valued participation of the taskforce members and college partners and guests, the Energy and Sustainability Plan was drafted. In fulfillment of their charge, the taskforce recommended the plan to the Facilities Council, for review and recommendation to the College Council. As an integral part of the 2014-2024 AHJCCD Facilities Master Plan, the Energy and Sustainability Plan was adopted into the District's institutional planning structures and will guide efforts to integrate sustainability in every aspect of college life.

SUSTAINABILITY BOARD POLICY

In addition to the Energy and Sustainability Plan, the Sustainability Taskforce drafted a sustainability board policy. The charge for the taskforce did not include providing a draft board policy, however, during development of the sustainability plan, it became evident a board policy was needed. The policy is seen as an opportunity for the board of trustees to articulate Allan Hancock College's environment stewardship commitment. The draft policy was developed further and constituency feedback was sought during the 2012-2013 academic year. BP 3950 was adopted by the Board of Trustees on August 20, 2013.

"

Sustainability is defined as meeting our needs today while ensuring that future generations can continue to meet their needs. Sustainability means long-term cultural, ecological and economic health and vitality. Environmental Sustainability is a process that maintains and enhances economic opportunity and community well-being for every segment of society while protecting and restoring the natural and social environment upon which people and economies depend.

As a member of the greater Santa Barbara County community, the Allan Hancock Joint Community College District plays a critical role in the educational and economic health of the region. As part of this responsibility, the district recognizes the importance of addressing sustainability in its daily operations to provide stewardship of the environment, and to provide students, employees, and visitors with knowledge that is intended to promote environmentally responsible behavior.

In order to continue the legacy of leadership in sustainability in all areas of the college, including instruction, operations, construction, facilities, land use, energy conservation, and environmental integrity; the board delegates to the superintendent/president the authority to develop practices and an Energy and Sustainability plan as part of the district's educational and facilities master plan.

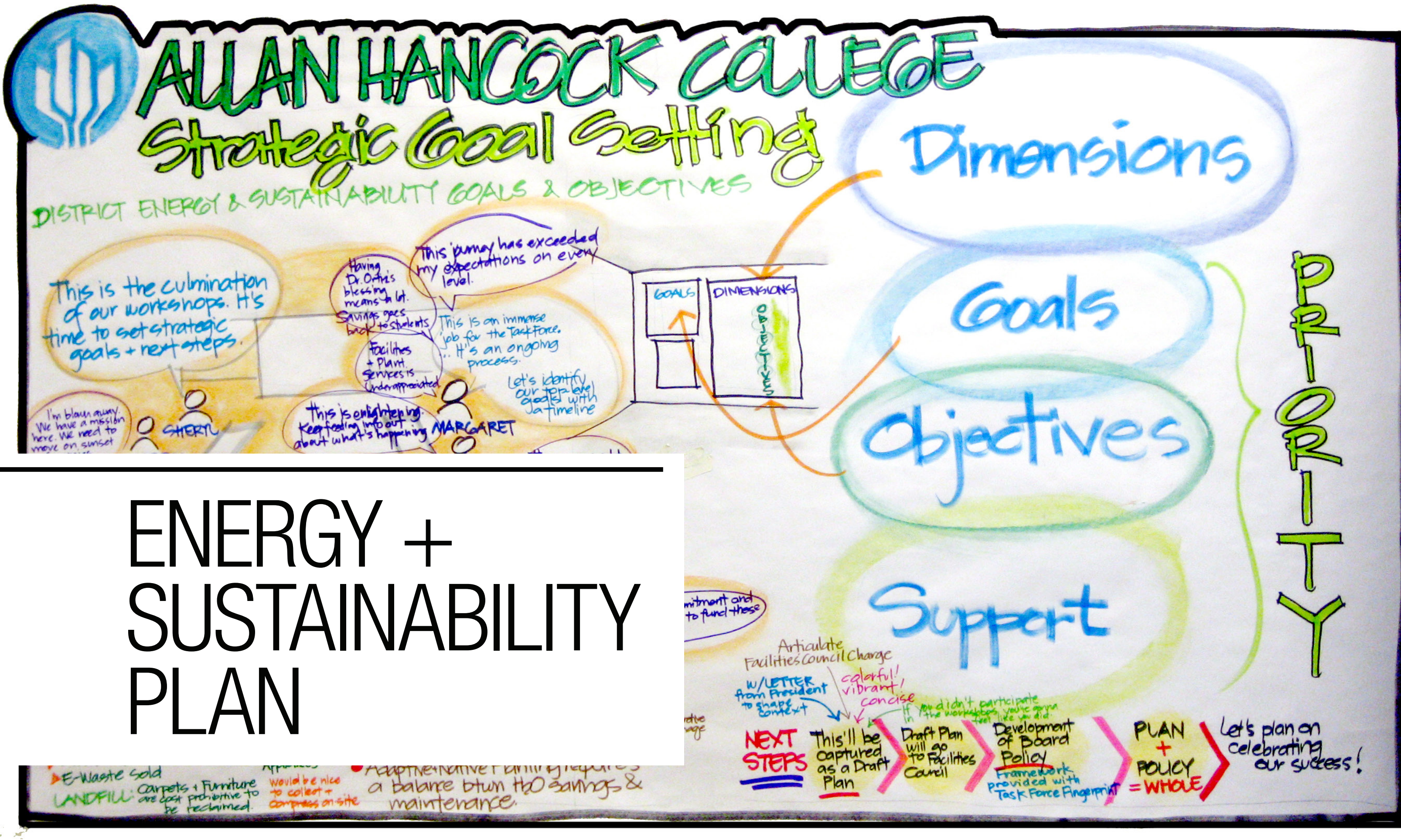
"

- Board Policy 3950, adopted August 20, 2013

*CONCEPT BY **BOB NICHOLS**, CERAMICS/ART INSTRUCTOR & FACILITIES COUNCIL CO-CHAIR*

SUSTAINABILITY

ENERGY + SUSTAINABILITY PLAN



ENERGY + SUSTAINABILITY PLAN

OVERVIEW

The Energy and Sustainability Plan is intended as the District's guide for the integration of sustainability into all areas of Allan Hancock College. The plan is organized around six dimensions, on which the college intends to focus its efforts. The goal for each dimension is stated and is followed by the objective(s) and activities that will support its achievement.

ENERGY + SUSTAINABILITY PLAN

DIMENSION 1: LEADERSHIP IN SUSTAINABILITY

GOAL

Establish and promote campus-wide sustainability awareness that supports Allan Hancock College students and employees to be global citizens and stewards of the environment.

OBJECTIVE 1.1

To provide students, employees, and volunteers with a shared vision of sustainability at Allan Hancock College

ACTIVITY 1.1.1:

Draft and recommend a Sustainability Policy for approval by the Board of Trustees.

ACTIVITY 1.1.2:

Recommend adoption of sustainability as a core value of the college.

ACTIVITY 1.1.3:

Recommend that the Superintendent/President becomes a signatory to the American College and University President Climate Commitment (ACUPCC).

OBJECTIVE 1.2

To have centralized support and resources for sustainability efforts at Allan Hancock College

ACTIVITY 1.2.1:

Establish an Allan Hancock College Office of Sustainability (an online presence as well as a consistent physical location) to provide coordination and serve as a resource center.

OBJECTIVE 1.3

To have an Allan Hancock College cyber-location for disseminating sustainability information, news, and resources

ACTIVITY 1.3.1:

Develop, maintain, and publicize an easily accessed college Sustainability website.

ACTIVITY 1.3.2:

Create an Allan Hancock College "green" logo by which to identify, document, celebrate, and publicize sustainability efforts and achievements.

OBJECTIVE 1.4

To support, facilitate, and build capacity for sustainability implementation

ACTIVITY 1.4.1:

Collaborate with local, regional, state, national, and international efforts in the government and education sectors.

ACTIVITY 1.4.2:

Partner with local industry, utilities, and community-based organizations to share and leverage resources in addressing sustainability issues.

ACTIVITY 1.4.3:

Develop robust networks and coalitions among sustainability stakeholders to enhance diversity and promote efficiencies in collaboration and best practices.

ACTIVITY 1.4.4:

Aggressively research and pursue all possible sources of funding and leveraged human and financial resources to develop, implement, and promote sustainability initiatives.

DIMENSION 2: INFORMED, INCLUSIVE, + DYNAMIC PLANNING

GOAL

Incorporate sustainability into the financial, facilities, and operational aspects of the master planning process.

OBJECTIVE 2.1

To provide students and employees the opportunity to collaborate for positive change related to the implementation of the College sustainability initiative

ACTIVITY 2.1.1:

Establish and recruit membership for a Sustainability Committee as part of the shared governance system.

ACTIVITY 2.1.2:

Emphasize transparency and openness in sustainability planning and related professional development by posting all information on the Sustainability website and designate sustainability liaisons on each of the college committees.

OBJECTIVE 2.2

To ensure that college plans give students, employees, and the community a clear picture of the Allan Hancock College commitment to sustainability

ACTIVITY 2.2.1:

As appropriate, include the commitment to sustainability in the college's Mission Statement, college-wide plans, and annual reports to internal and external communities.

ACTIVITY 2.2.2:

Make sustainability planning an inclusive process by providing the opportunity to provide and/or post feedback.

ACTIVITY 2.2.3:

Ensure that college plans are integrated with one another and, when printed, are formatted in ways that minimize waste and maintain legibility.

ACTIVITY 2.2.4:

Broadly communicate measurable and time-specific sustainability targets; gather, measure, and evaluate progress; and celebrate milestone achievements.

ACTIVITY 2.2.5:

Review and evaluate existing policies and update (as appropriate) to reflect sustainability values.

OBJECTIVE 2.3

To keep Allan Hancock College up to date on sustainability issues and technologies

ACTIVITY 2.3.1:

Design and implement staff/ professional development activities relating to sustainability that are fun, inclusive, and educational.

ACTIVITY 2.3.2:

Actively encourage participation by employees from diverse parts of the college in sustainability conferences where they can network with other universities, colleges, and community-based organizations to exchange knowledge and best practices on sustainability issues.

DIMENSION 3: SUSTAINABILITY IN EDUCATION + TRAINING

GOAL

Promote informed citizenry and ecological literacy by incorporating and modeling sustainability practices in educational programs.

OBJECTIVE 3.1

To infuse environmental, social, and economic sustainability throughout curricula

ACTIVITY 3.1.1:

Utilize existing resources to develop and implement career and technical education related to new technologies for sustainability, including entrepreneurship.

ACTIVITY 3.1.2:

Explore creation of a global sustainability awareness course and assess feasibility as a requirement for graduation.

ACTIVITY 3.1.3:

Develop and implement a variety of courses that target audiences from "pre-K through grey" to educate the community on sustainability issues.

ACTIVITY 3.1.4:

Incorporate bilingual (Spanish-English) communications wherever appropriate and practical.

OBJECTIVE 3.2

To minimize energy use and generation of solid waste associated with traditional classroom methodology

ACTIVITY 3.2.1:

Encourage instructors to develop web pages as a resource for their classes.

ACTIVITY 3.2.2:

Offer distance learning alternatives.

OBJECTIVE 3.3

To promote awareness of campus facilities as informal "learning labs" to link curricula with campus operations

ACTIVITY 3.3.1:

Install "Did You Know…." signage to promote responsible behavior.

ACTIVITY 3.3.2:

Install "Did You Know…" signage that showcases sustainability features on campus.

ACTIVITY 3.3.3:

Develop outdoor classroom curricula.

ACTIVITY 3.3.4:

Create a campus garden for organic produce.

OBJECTIVE 3.4

To provide service learning opportunities related to sustainability

ACTIVITY 3.4.1:

Encourage and acknowledge volunteer work with organizations promoting environmental, social, and/or economic sustainability.

ACTIVITY 3.4.2:

Develop service learning projects for students.

ENERGY + SUSTAINABILITY PLAN

DIMENSION 4: SUSTAINABLE OPERATIONS

GOAL

Develop and employ sustainable operations, standards, and best practices at Allan Hancock College.

OBJECTIVE 4.1

To motivate students, employees, volunteers, and visitors to engage in positive environmentally-friendly practices

ACTIVITY 4.1.1:

Promote behavior-based environmental responsibility.

ACTIVITY 4.1.2:

Promote behavior-based energy conservation.

ACTIVITY 4.1.3:

Schedule classes and hours of operation to maximize conservation of energy.

ACTIVITY 4.1.4:

Promote awareness of global and local sustainability issues and best practices.

OBJECTIVE 4.2

To minimize the generation of solid waste by reducing, recycling, and reusing

ACTIVITY 4.2.1:
Work toward a target goal of reducing pounds per person per year on campus.

ACTIVITY 4.2.2:
Increase composting efforts.

ACTIVITY 4.2.3:
Encourage paperless offices and communication strategies.

ACTIVITY 4.2.4:
Install water bottle refilling stations at targeted campus locations.

ACTIVITY 4.2.5:
Institute quality controls for environmentally safe waste disposal.

OBJECTIVE 4.3

To institute environmentally preferable investment, purchasing, and procurement strategies

ACTIVITY 4.3.1:
Create a community garden for organic produce.

ACTIVITY 4.3.2:
Purchase locally-sourced supplies, materials, and organic produce when feasible.

ACTIVITY 4.3.3:
Celebrate current 85% utilization of green cleaning methods and work toward 100% attainment.

ACTIVITY 4.3.4:
Purchase green electricity.

ACTIVITY 4.3.5:
Research and encourage development of a policy on environmentally and socially responsible investing.

ENERGY + SUSTAINABILITY PLAN

DIMENSION 5: SUSTAINABLE FACILITIES

GOAL

Practice sustainable design and construction for existing and new facilities.

OBJECTIVE 5.1

To attain a Leadership In Energy and Environmental Design (LEED) silver rating for new construction, major renovation projects, existing building operations, and upgrades

ACTIVITY 5.1.1:

Achieve energy efficiency through the use of efficient systems, equipment, controls, and building design.

ACTIVITY 5.1.2:

Build with environmentally preferable materials.

ACTIVITY 5.1.3:

Employ water conservation strategies in plumbing, landscape design and installation, and irrigation.

ACTIVITY 5.1.4:

Uphold storm water quality and quantity standards on campuses.

OBJECTIVE 5.2

To employ environmentally preferable, clean air strategies

ACTIVITY 5.2.1:

Encourage landscape design clean air strategies.

ACTIVITY 5.2.2:

Implement retrofit projects to minimize air pollution.

OBJECTIVE 5.3

To attain net-zero or net-positive energy use

ACTIVITY 5.3.1:

Explore the potential of generating power with solar shade structures and wind turbines.

ACTIVITY 5.3.2:

Explore the potential of using landfill methane to fuel a co-gen plant.

ACTIVITY 5.3.3:

Explore the potential of fuel cell, biofuel, and other emerging technologies.

ENERGY + SUSTAINABILITY PLAN

DIMENSION 6: TRANSPORTATION

GOAL

Reduce carbon emissions resulting from Allan Hancock College traffic.

OBJECTIVE 6.1

To develop and implement a comprehensive system of transportation management

ACTIVITY 6.1.1:

Promote and accommodate use of alternative transportation to campus.

ACTIVITY 6.1.2:

Promote use of and increase access to public transit.

ACTIVITY 6.1.3:

Consider strategies to support environmentally beneficial transportation.

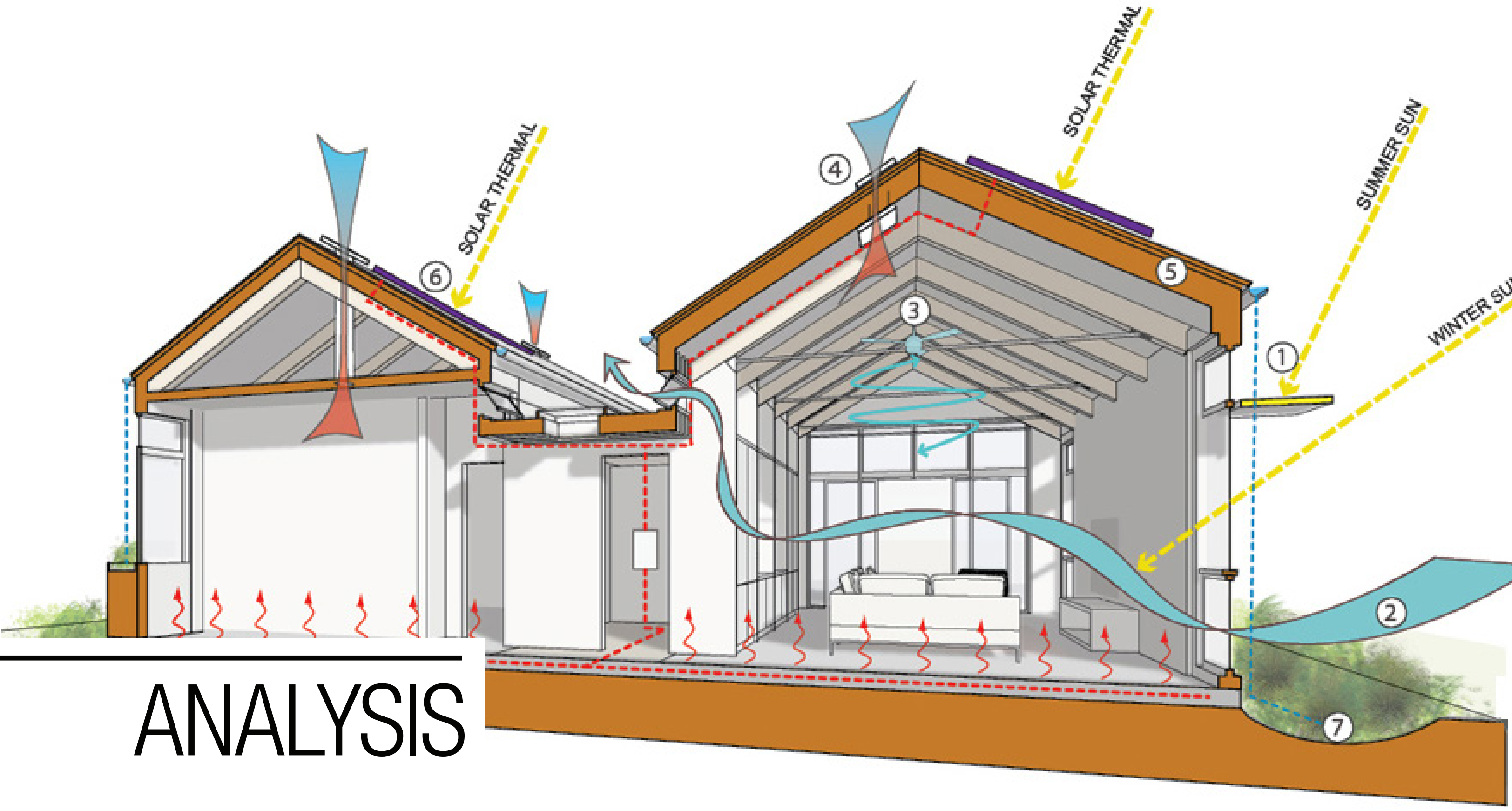
ACTIVITY 6.1.4:

Promote and accommodate use of low and zero emission vehicles.

ACTIVITY 6.1.5:

Replace existing district vehicle fleet with low and zero emission, high mileage vehicles with consideration for alternative fuels and electric vehicles.

SUSTAINABILITY ANALYSIS



ANALYSIS

OVERVIEW

In order to plan for the District's sustainable future, it was necessary to first assess its existing state. Data on historic and current water and energy use, waste production, and transportation utilization for both sites was collected, analyzed and compared to industry benchmarks. This criteria was then converted into a total carbon footprint. This analysis empowered the District to understand their existing natural resource use and subsequent environmental impact. Most importantly, this also provided the District with an opportunity to identify a path towards a reduced carbon footprint and create an environmentally positive impact for the region as a whole.

ANALYSIS

- Climate Zone
- Stormwater
- Energy Use
- Water Use
- Waste Management
- Transportation
- Carbon Footprint

ANALYSIS

CLIMATE ZONE

The Allan Hancock College campuses experience a cool, Mediterranean climate typical of northern Californian coastal areas north of Point Conception. The climate is mostly sunny and is refreshed by cool breezes. Summers are warm with afternoon winds blowing until sunset, which naturally cools the region. The air is usually moist and fog or cloud cover commonly block the sun in the morning and evenings. Winters are cold but not severe enough to frost. The coolest parts of this region are the valley floors, canyons, and land troughs.

The further inland the location, the fewer heating degree days (HDD) and more cooling degree days (CDD) can be expected. Climate Zone 5 comes close to comfort standards, meaning little cooling is needed and heat is only necessary for part of the day, even in the winter. The mildness of the weather in Zone 5 is reflected by the fact that it is one of the lowest energy consuming climates.

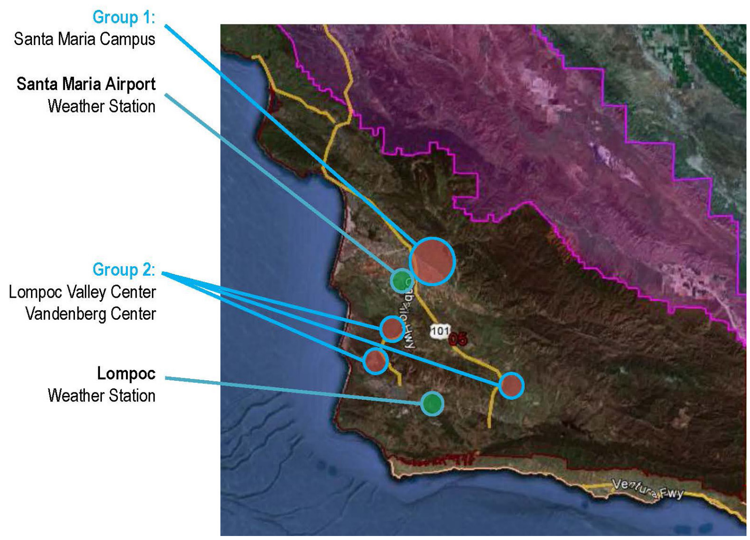
Although both campuses are located within Climate Zone 5 each campus experiences unique climatic conditions. For the purpose of conducting the environmental analysis and in order to obtain an accurate depiction of the environmental conditions for each site, weather data from nearby weather stations for each location was used. Weather data was imported into Climate Consultant v5.4, Ecotect, WeatherTool and Vasari weather analytics software and was then graphed within a series of climatic charts.

Allan Hancock's dry bulb temperature, (indicated by the red line undulating up and down on the chart), remains relatively consistent throughout the course of the year relative to the comfort zone, (indicated by the grey bar which moves across the grid and which marks a temperature range of 70-75 degrees Fahrenheit). During the fall and winter seasons (November-March), temperatures tend to stay well below the comfort zone, and range between 40-60 degrees Fahrenheit; however, temperatures can dip as low as 28 degrees and can spike as high as 80 degrees. During the spring and summer months (April to September), temperatures continue to stay below the comfort zone, and range between 55-70 degrees, but can dip as low as 43 degrees and can spike as high as 84 degrees.

The area receives primarily northwest winds at an average of 6-9 mph with gusts up to 25 miles per hour. The winds maintain a cooling effect across the region at 51 degrees during the day. Winds cool down by 15-20 degrees at night. Precipitation usually falls during late autumn, through the winter, and into the early spring, with the majority of rain occurring from November to April. The summer is generally dry, however, some precipitation may occur from fog, which is common during the summer months. The average annual precipitation is 14 inches. In recent years, this area, as much of California, has been subjected to drought conditions.

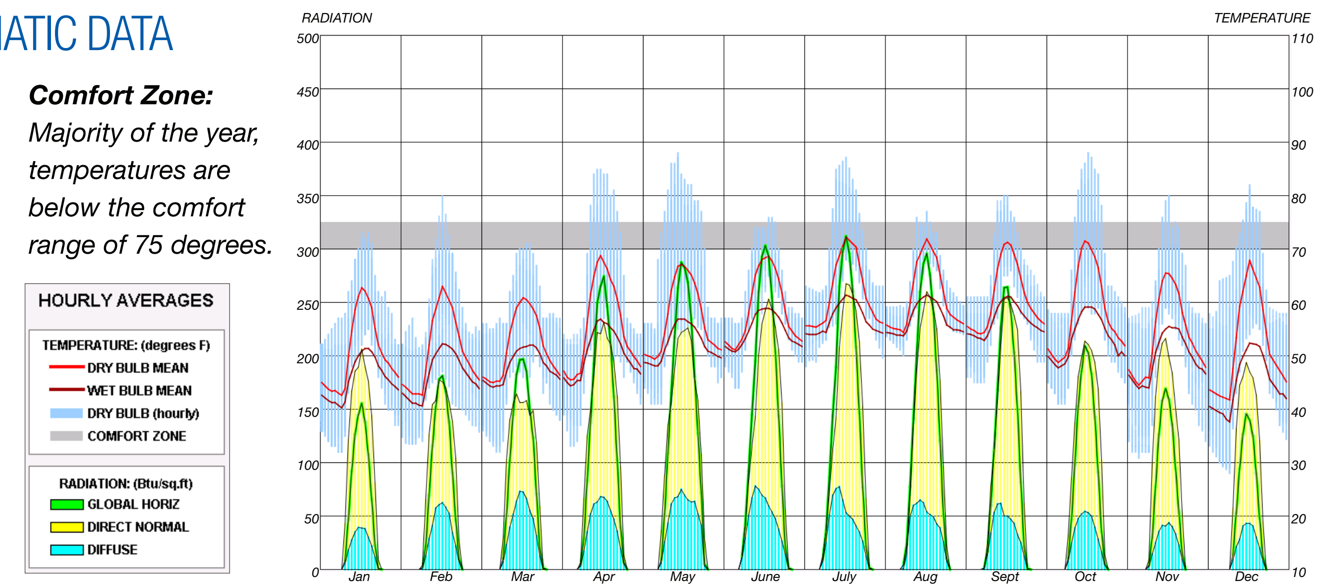
The cool temperature trend and wind patterns are characteristic of the northern Santa Barbara county area. The profile provides an ideal setting for solar passive design strategies such as natural ventilation and thermal mass. These strategies are detailed further in the sustainability recommendations section.

CLIMATE ZONE 5

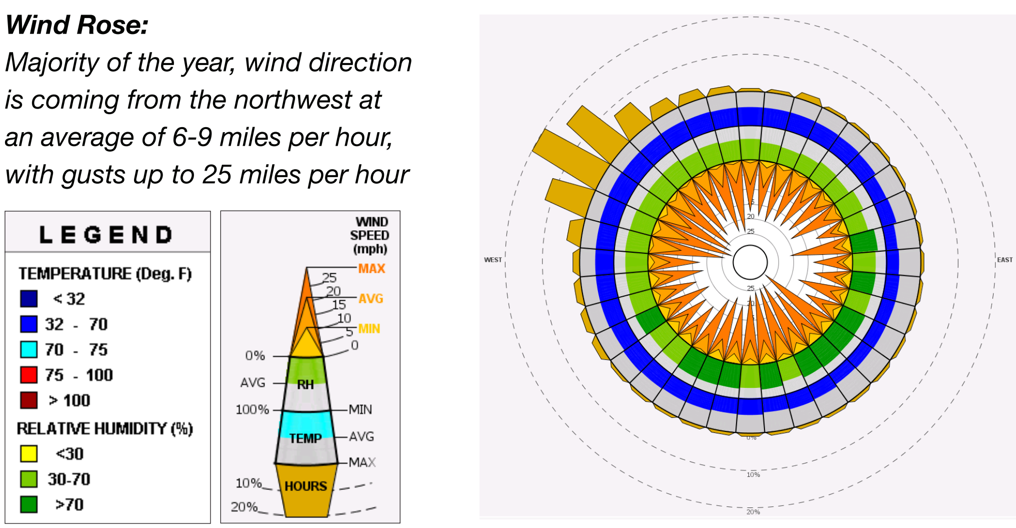


CLIMATIC DATA

Comfort Zone:
Majority of the year, temperatures are below the comfort range of 75 degrees.



Wind Rose:
Majority of the year, wind direction is coming from the northwest at an average of 6-9 miles per hour, with gusts up to 25 miles per hour



ANALYSIS

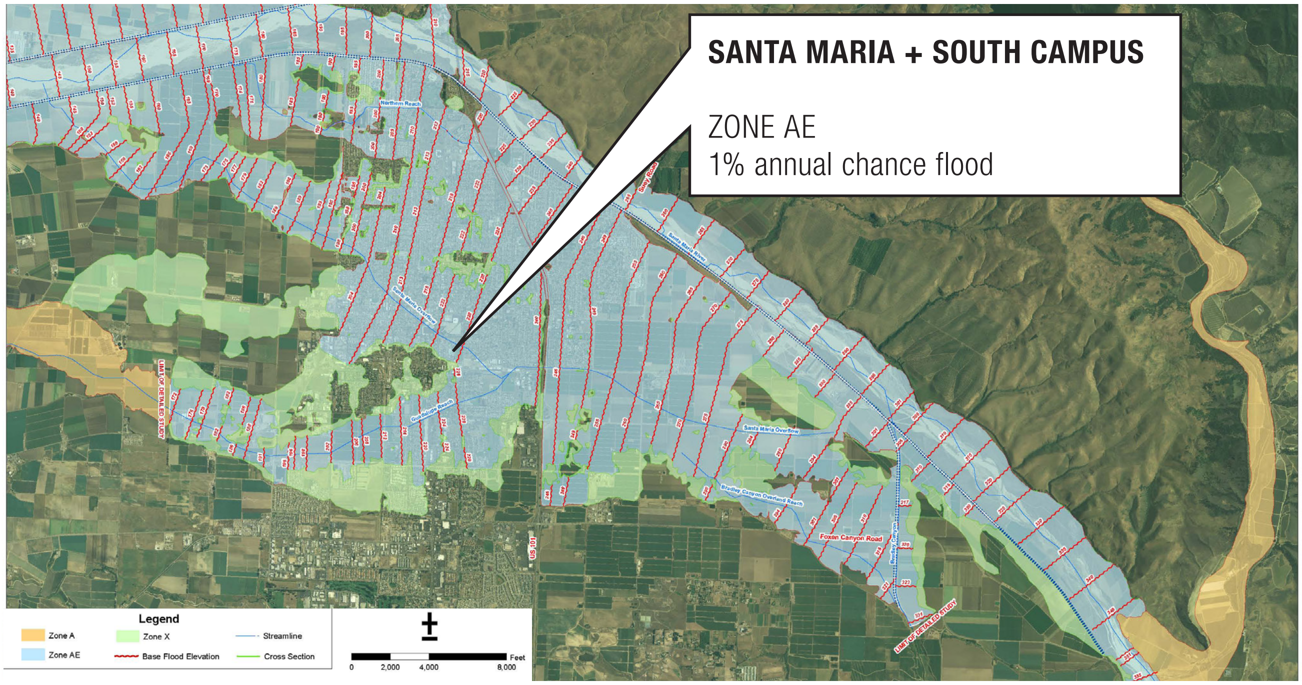
STORMWATER

The City of Santa Maria is located in the Santa Maria River Hydrologic Unit as identified by the Federal Register, which includes all areas tributary to the Cuyama River, Sisquoc River, and the Santa Maria River. The Santa Maria River Watershed is approximately 1,880 square miles (1.2 million acres) in size and is one of the largest coastal drainage basins in California. Agriculture and open space (undeveloped land) are the primary land uses in the Santa Maria River Watershed. Urban land use comprises about 3 percent of the watershed in the area, which includes the Santa Maria campus. The campus is located in Zone AE, which is characterized by a 1% chance of an annual flood event.

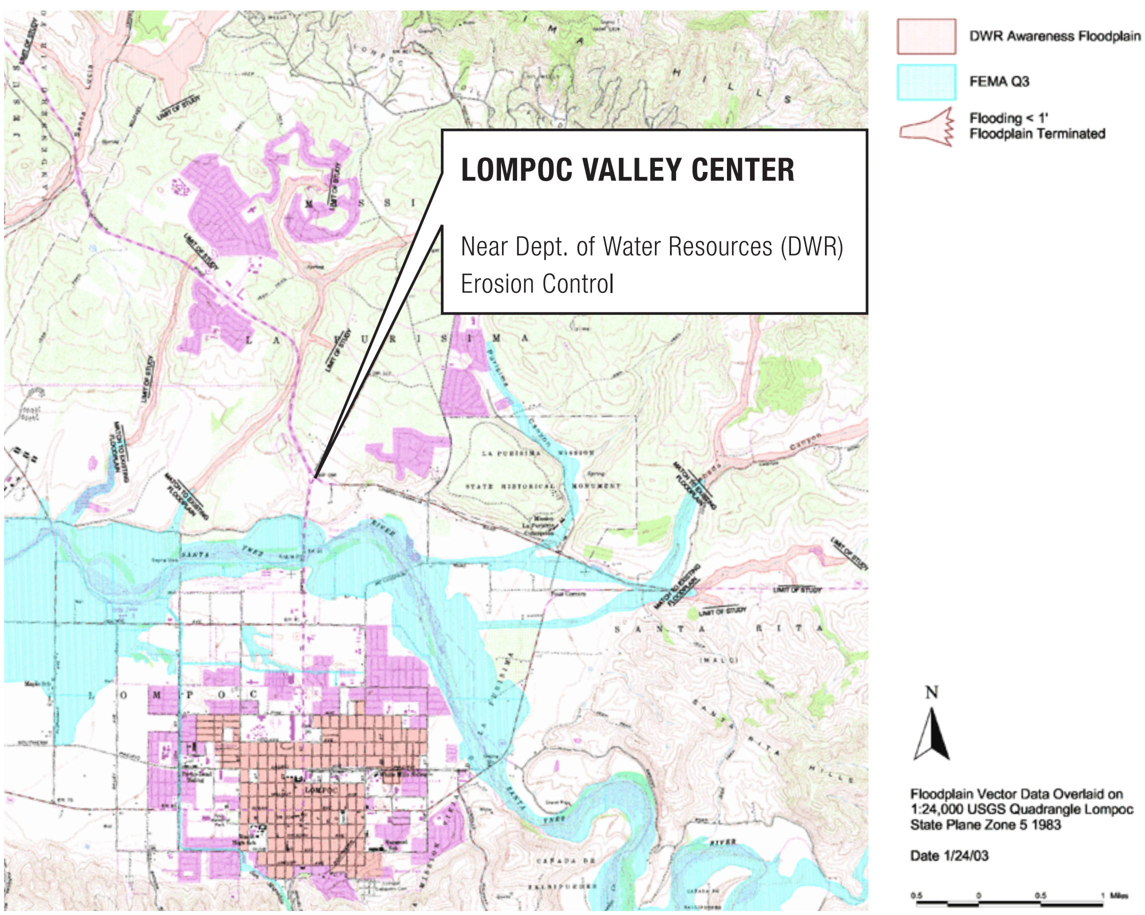
Lompoc receives flow from the upstream watersheds of the Santa Ynez River and from San Miguelito Creek, which drains from unincorporated Santa Barbara County lands, south of town. After reaching a detention basin, San Miguelito Creek travels through the City of Lompoc in a deep concrete channel, before it enters the Santa Ynez River in the northwest section of the City. The City is located at the lower end of the Santa Ynez River Watershed. In times of heavy flow, the Santa Ynez River reaches flood stage and water flows onto agricultural fields west of town. The City's lowest laying areas are flooded and the channels back up, as there is nowhere for the water to discharge. In this situation, the City's streets are designed to accommodate storm flows until the river level recedes. Lompoc Valley Center is located in a zone that does not occur within the 100-year floodplain of the Santa Ynez River. However, it is located in a zone designated as requiring erosion control measures to prevent excessive stormwater runoff and degradation of sediment from occurring. As such, Allan Hancock College has a prime role at both campuses of upholding stormwater quantity and quality through the implementation of best management practices of stormwater policy.

The City of Santa Maria and the City of Lompoc have formulated respective Storm Water Management Plans (SWMP) which can serve as a framework for identifying, assigning, and implementing control measures and Best Management Practices (BMPs) intended to reduce the discharge of pollutants from the City's small municipal separate storm sewer system and protect downstream water quality.

SANTA MARIA AREA FLOODPLAIN MAP



LOMPOC AREA FLOODPLAIN MAP



ANALYSIS

ENERGY USE

An analysis of Allan Hancock College's energy use over the past 3 years (from 2011-2013) for the Santa Maria and Lompoc campuses was conducted. Electricity and gas use were compiled together in order to show total energy use.

Two energy metrics were used in order to provide the College with reference for performance. The first of these two metrics is the California Energy Commission's 2006 report on energy use in higher education buildings. This report specifically looked at energy use in 206 million square feet worth of higher education facilities. The CEC reference energy use for a higher education building is 76.6 kBTU/sf/year.

Energy Star utilizes the Energy Information Administration's Commercial Buildings Energy Consumption Survey (CBECS) to determine the type and scale of energy usage a building should meet in order to qualify as an Energy Star building. A building should perform 35% better than an average building of a similar building type in a similar climate zone to be considered an Energy Star building. A 35% more efficient higher education building would operate at 49.9 kBTU/sf/year and would be minimally compliant with EnergyStar requirements.

Santa Maria consumed about 81 kbtu/sf/year ion 2009 and increased to 86 kbtu/sf/year in 2012. Lompoc consumed approximately 117 kBtu/sf/year in 2009, which spiked up to 137 kBTU/sf/year in 2010, and then dipped down to 117 kBtu/sf/year again in 2012. Both campuses are above the California Energy Commission 2006 report of higher education facilities' energy use, (76.6 kBTU/sf/yr) as well as the Energystar higher education facility's energy use of 49.9/sf/yr. At Santa Maria, this maybe attributed to the fact that new facilities came online to the campus during this time period, which thereby resulted in additional energy demand. At Lompoc, the energy use increase could be attributed to an issue of testing, balancing and coordination of time of use with class scheduling.

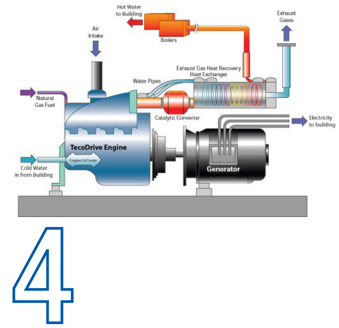
SUSTAINABLE STRATEGIES

WINTER STRATEGIES

1 Behavioral changes in building operations

2 Build a tight building envelope with high R value insulation in walls and roof.

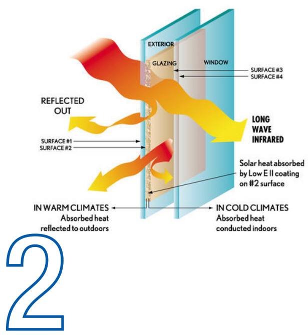
3 Thermal Mass (concrete, masonry, structurally insulated panel construction)



4 High Efficiency Mechanical Heating

SUMMER STRATEGIES

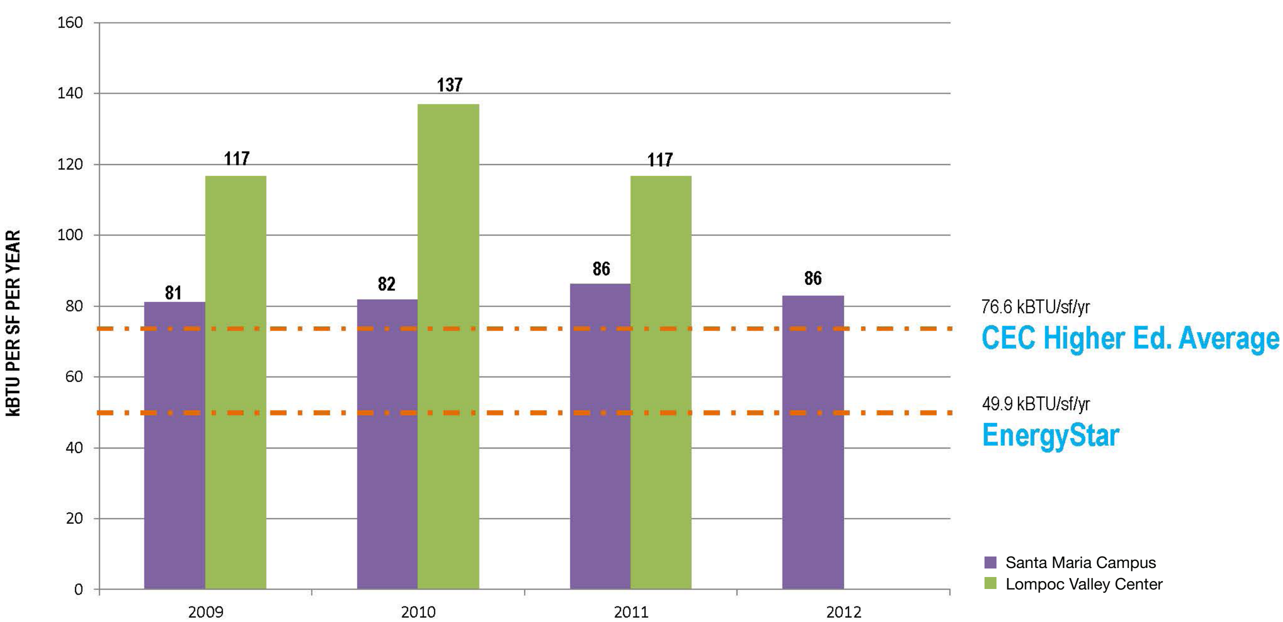
1 Behavioral changes in building operations



2 Use insulating glass plus thermal mass to naturally warm buildings, while preventing overheating through glass.

3 Mechanical cooling is rarely required, rely on natural ventilation.

ENERGY USE *(KBTU/SF/YEAR)*



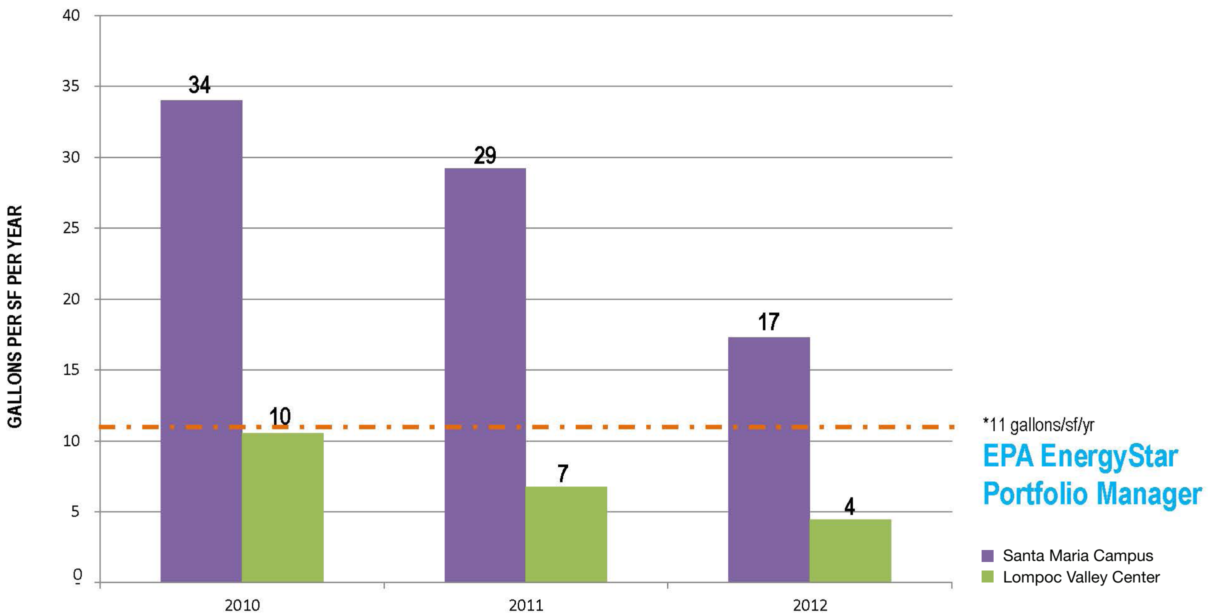
ANALYSIS

WATER USE

An analysis of Allan Hancock College's building water use over the past 3 years (from 2009-2012) was also conducted. The College has been able to reduce water use significantly over the last 2 years at both campuses. This is due to the upgrading of plumbing fixtures. The Environmental Protetection Agency's Data Trends Water Use Tracking study serves as reference baseline for water use in this analysis. The Santa Maria campus data shows that the water use is above the average (17 gallons per square foot), when compared to an average use of 11 gallons/sf/year per the EPA. Lompoc water data shows that the campus outperforms the EPA's water use benchmark, at 4 gallons/sf/year.

Analyzing the planting areas and materials reveals that the Santa Maria campus has a significant amount of landscaped area that is composed of turf, which requires substantially more irrigation than native, adaptive and drought tolerant plants. Over the last three years, irrigation use has increased from 15.1 gallons/sf of landscaping to 16.7 gallons/sf of landscaping.
At Lompoc, the majority of the landscaping is composed of native, adaptive and drought tolerant plant typologies. As a result, the campus's irrigation use has been relatively low, ranging from 10 gallons/sf in 2009 to 4 gallons/sf in 2012. Three irrigation figures have been used to provide a frame of reference: turf water use, shrubs water use and native/adaptive landscape water use. With the scarcity of water in the region, reduced water use is recommended at Santa Maria, and can be achieved through the incorporation of more native, adaptive, and drought tolerant landscaping.

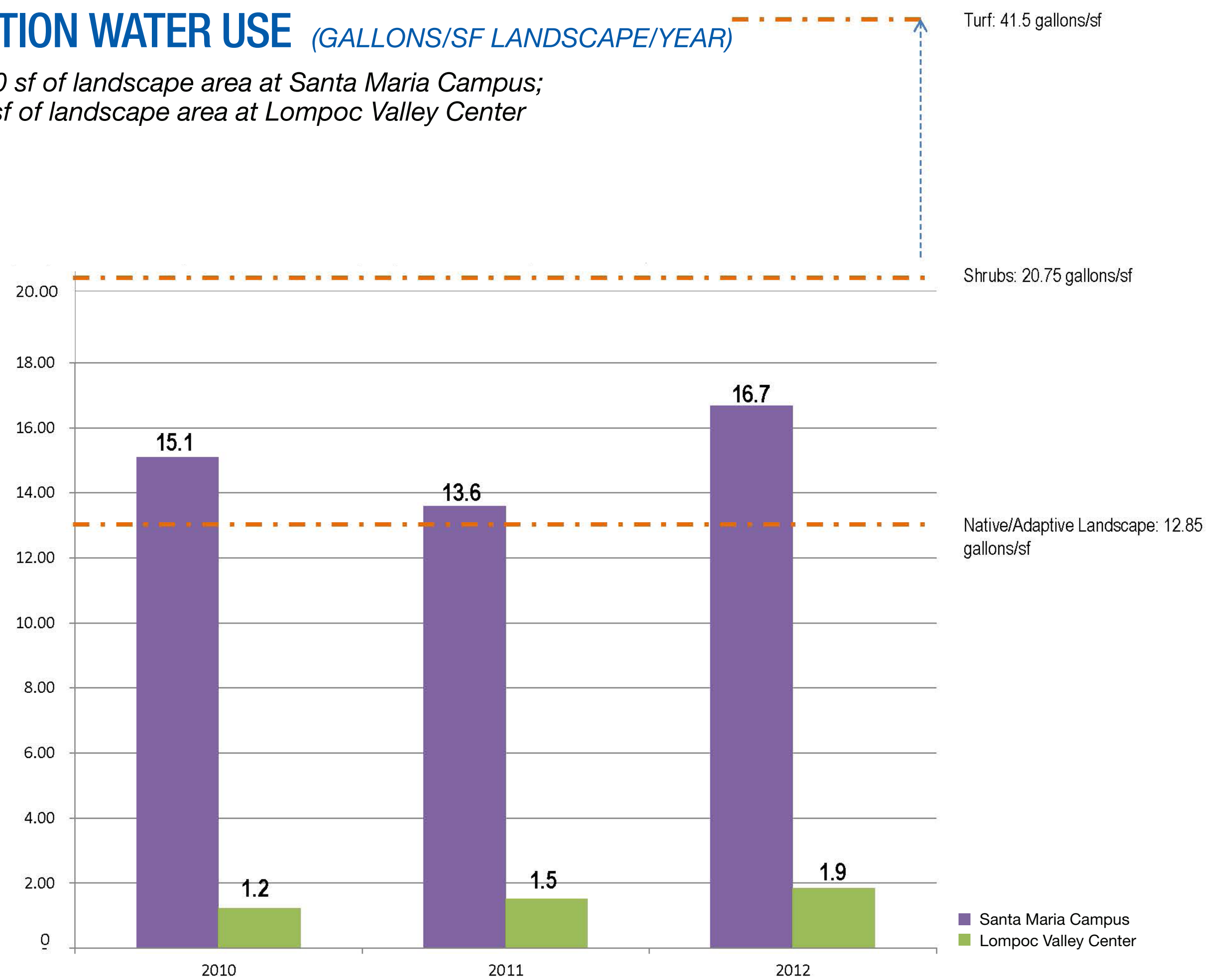
BUILDING INDOOR WATER USE *(GALLONS/SF/YEAR)*



** Median water use averaged between K-12 and office building types*

IRRIGATION WATER USE *(GALLONS/SF LANDSCAPE/YEAR)*

**1,445,320 sf of landscape area at Santa Maria Campus; 812,683 sf of landscape area at Lompoc Valley Center*

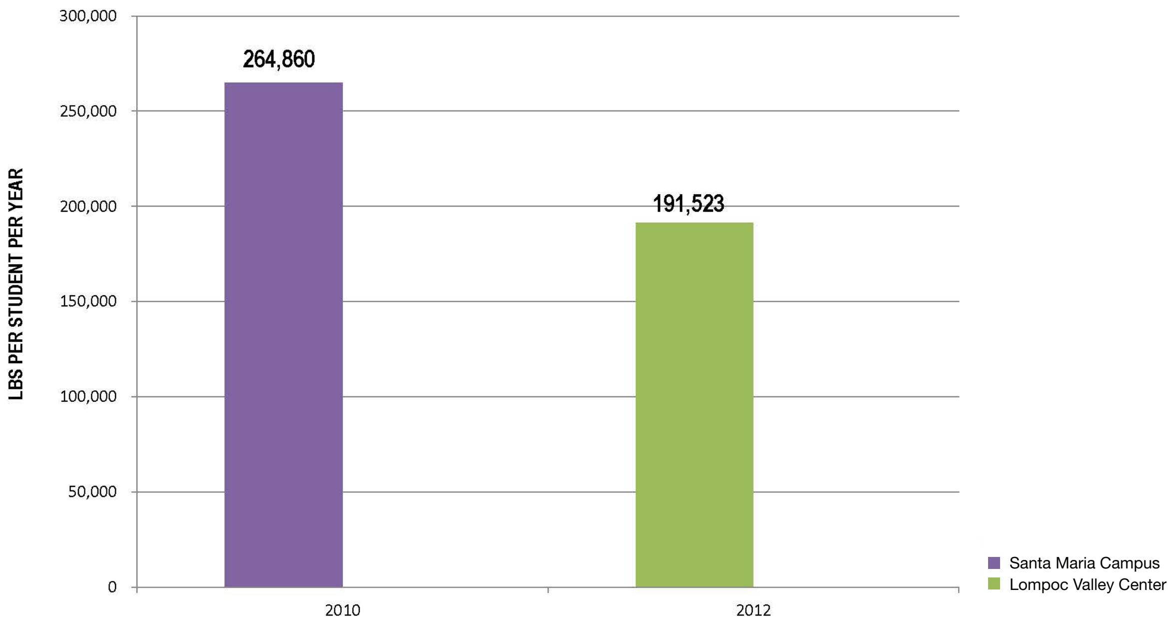


ANALYSIS

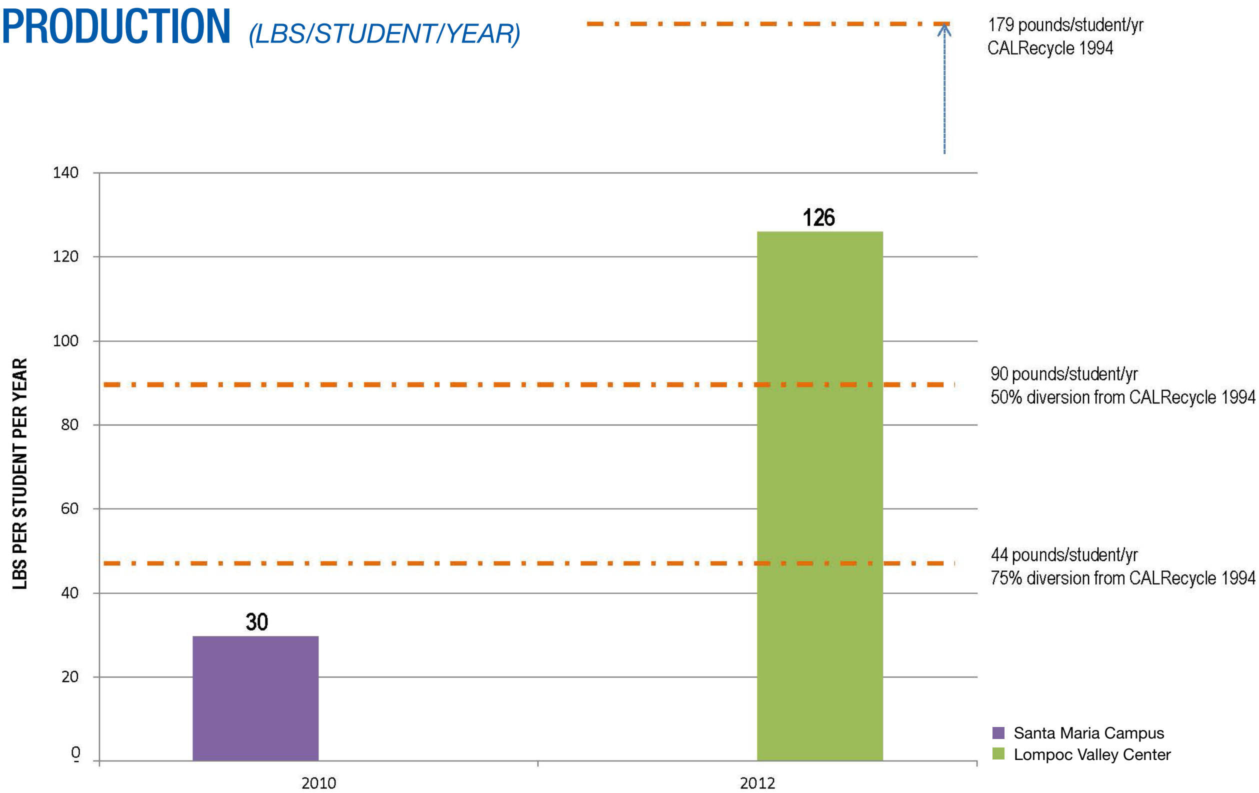
WASTE MANAGEMENT

Waste production was studied at both Santa Maria and Lompoc. In 2010, Santa Maria produced a total of 264,860 pounds of trash. In 2012, Lompoc produced a total of 191,523 pounds of trash. When considering the student population of each campus, the data shows that Santa Maria produced 30 pounds of trash/ student in 2010, while Lompoc produced 126 pounds of trash per student. When compared to a CalRecycle study of higher institutions' waste production, the Santa Maria campus outperformed a minimum benchmark of 44 pounds per student, whereas Lompoc was well above the maximum benchmark of 90 pounds per student. Through further campus wide recycling efforts such as green waste, composting, e-waste collection, construction waste diversion and involvement in student recycling campaigns such as Recyclemania, and with more detailed coordination with the campus's respective hauling agencies, a reduced waste production rate can be achieved.

WASTE PRODUCTION *(TOTAL POINTS OF WASTE)*



WASTE PRODUCTION *(LBS/STUDENT/YEAR)*

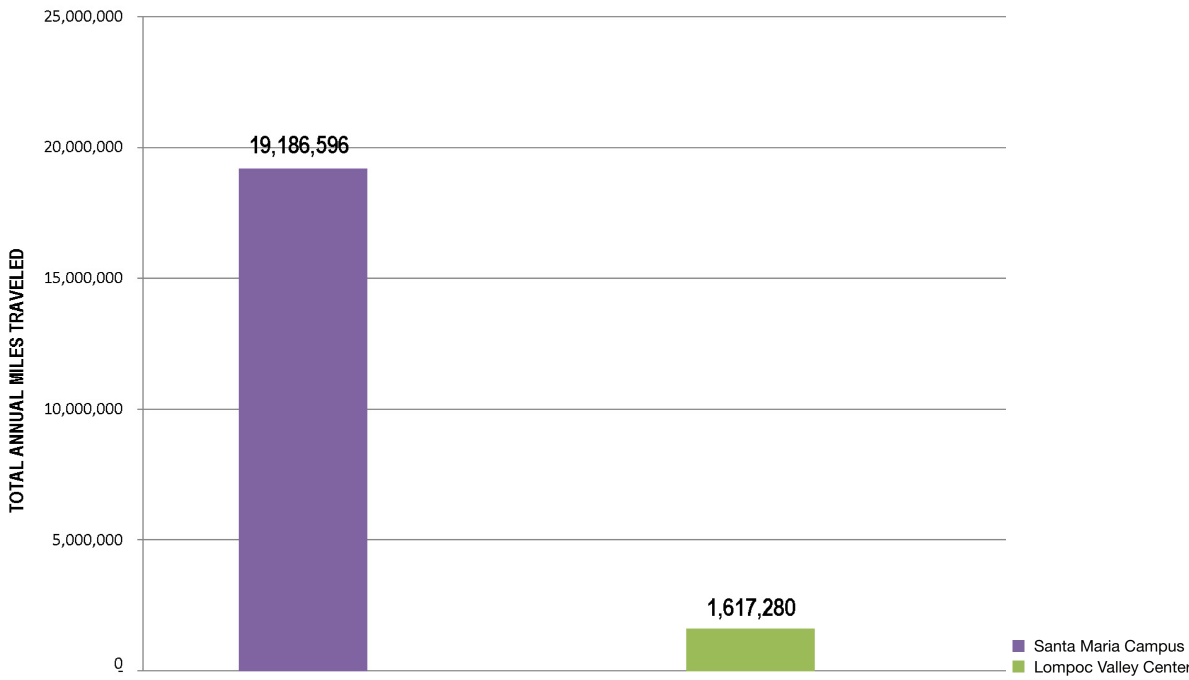


ANALYSIS

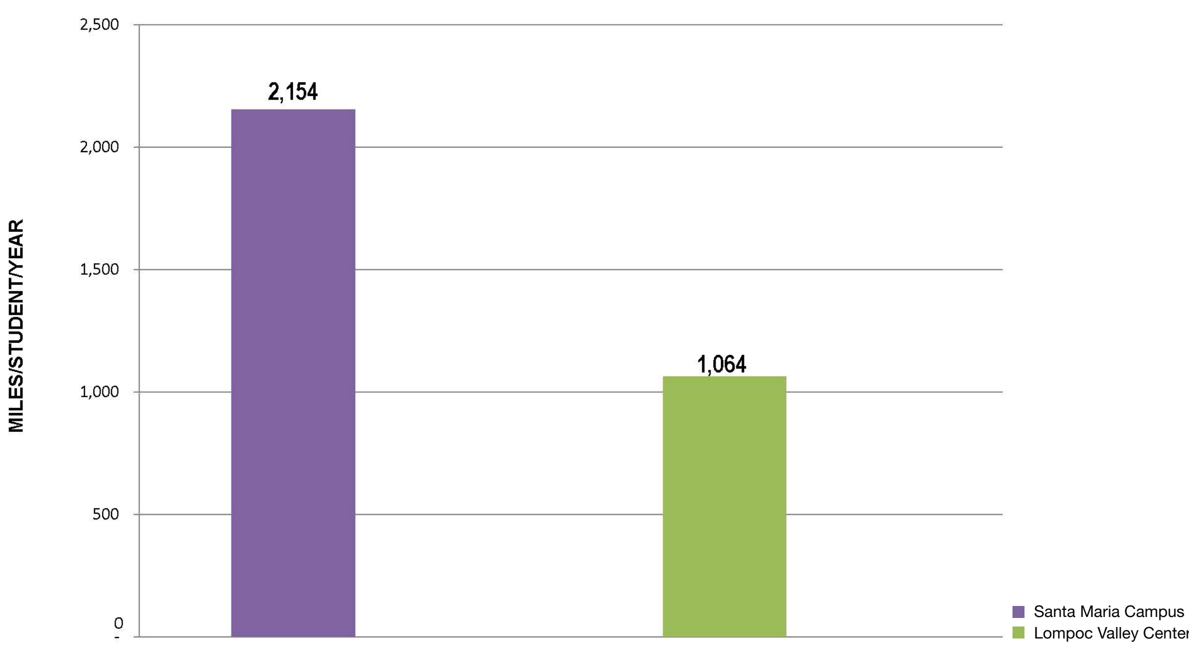
TRANSPORTATION

Transportation over the course of 2013 was analyzed in order to ascertain the frequency and intensity of automobile use at Allan Hancock College. Data was based upon the number of units attempted per enrolled student within a 50 mile radius. The study also took roundtrip miles per effective days per semester into account. A total of approximately 19.1 million miles were traveled in 2012 by students at Santa Maria. This equates to 2,154 miles per student. A total of approximately 1.6 million miles were traveled in 2012 by students at Lompoc. This equates to 1,064 miles per student. These relatively high figures can in part be attributed to the fact that the campuses are isolated educational community college resources in the region with matched limited mass transit resources.

TRANSPORTATION *(TOTAL MILES/YEAR 2012)*



TRANSPORTATION *(TOTAL MILES/STUDENT/YEAR 2012)*



ANALYSIS

CARBON FOOTPRINT

Energy, water, waste and transportation data for Allan Hancock College was combined and converted into a total carbon footprint, which is measured in pounds of carbon, or CO2e. CO2e stands for carbon dioxide equivalent, and is the standard unit used to measure the global warming potential (GWP) of greenhouse gases emitted into the earth's atmosphere. By using this unit of measurement, a carbon footprint consisting of various sources can be expressed as a single number. For the purposes of this analysis, the annual number of Kilowatt-hours of electricity, therms of fuel, gallons of water, pounds of waste, and miles driven has been converted into pounds of CO2e per square foot of building area. Energy (electricity and fuel), water, waste and transportation were chosen as the main criteria, as a solid set of data was available to provide a basis for the calculation.

The carbon footprint of Santa Maria and Lompoc with transportation and without transportation was studied. This allows for a better comprehension of each criteria's (energy, water, waste, transportation) contribution to the College's carbon emissions.

Taking transportation into account, the Santa Maria maintains a total of 59.7 pounds of Co2e. The greatest contributor to this carbon footprint is transportation, which accounts of 77% of the total. This can be attributed to the large number of miles traveled by students on an annual basis. Without transportation taken into account, the Santa Maria maintains a total of 14 pounds of Co2e. The greatest contributor to this version of the carbon footprint is energy, which accounts of 99% of the total.

At Lompoc the carbon footprint with transportation taken into account totals 42 pounds of Co2e. The greatest contributor to this carbon footprint is transportation, which accounts of 52% of the total. This can also be attributed to the large number of miles traveled by students on an annual basis. Without transportation taken into account, the Santa Maria maintains a total of 20 pounds of Co2e. The greatest contributor to this version of the carbon footprint is energy, which accounts of 99% of the total.

In order to provide the College with a frame of reference a comparative analysis of like institutions was conducted, the carbon footprints of several higher education institutions was calculated, based off of each institution's published carbon footprint data provided from the American College and University Climate Action Plan's Annual report. The carbon footprints for all institutions in the study are represented by pounds of CO2 per square foot of building space per year. When taking transportation into account, the Santa Maria and Lompoc maintain fairly large carbon footprints. Institutions with on campus housing are indicated in light blue, institutions with no housing are indicated in dark blue. This detail allows the College to ascertain the impact of transportation on the overall carbon footprint. Those institutions with on campus housing benefited from reduced reliance on student travel by single occupant vehicles, and as a result also achieved a lower carbon footprint.

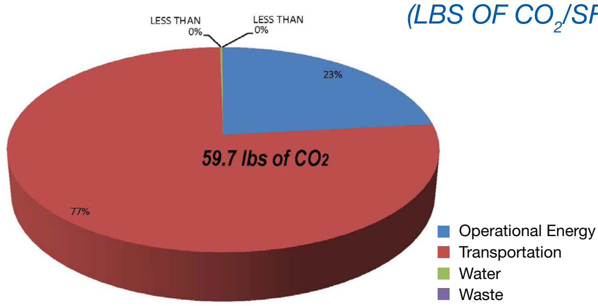
When omitting transportation from the carbon footprint equation, the Santa Maria and Lompoc maintain average carbon footprints. This further illustrates the impact of transportation on the carbon footprint of a higher education institution. Without transportation taken into consideration, Allan Hancock College maintains a significantly lower carbon footprint. This study indicates that relative to energy, Allan Hancock College is able to outperform several peer institutions.

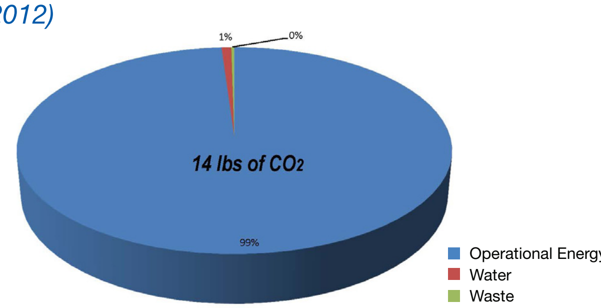
WITH TRANSPORTATION

WITHOUT TRANSPORTATION

SANTA MARIA CARBON FOOTPRINT

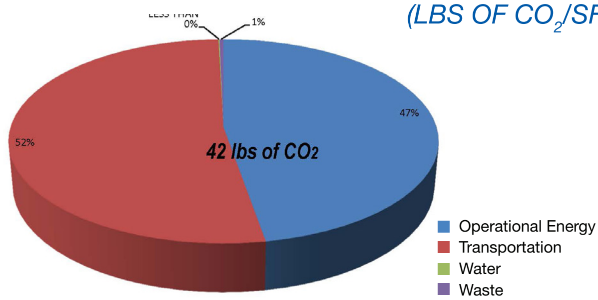
(LBS OF CO_2/SF/YEAR 2012)

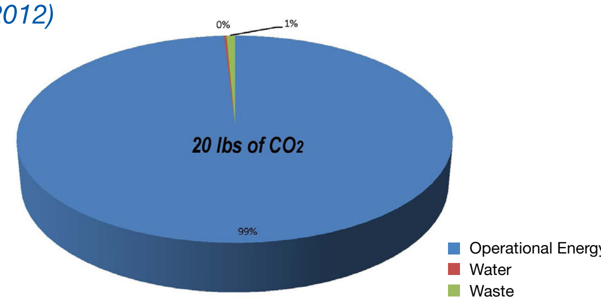




LOMPOC CARBON FOOTPRINT

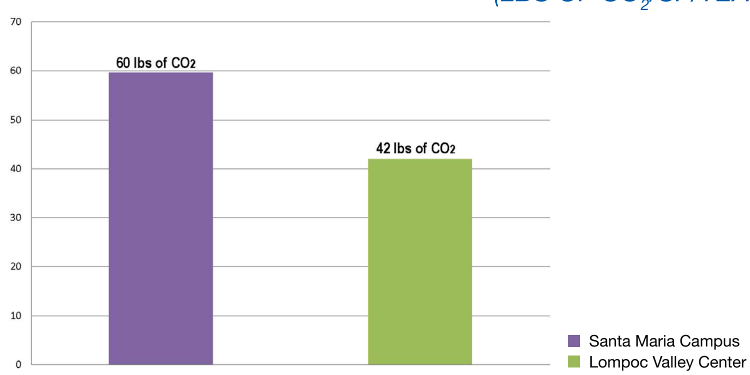
(LBS OF CO_2/SF/YEAR 2012)

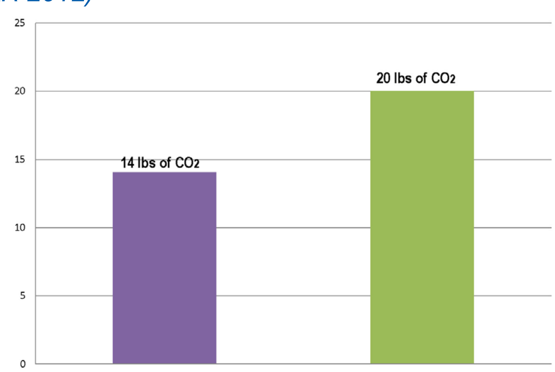




COMPARATIVE CARBON FOOTPRINT

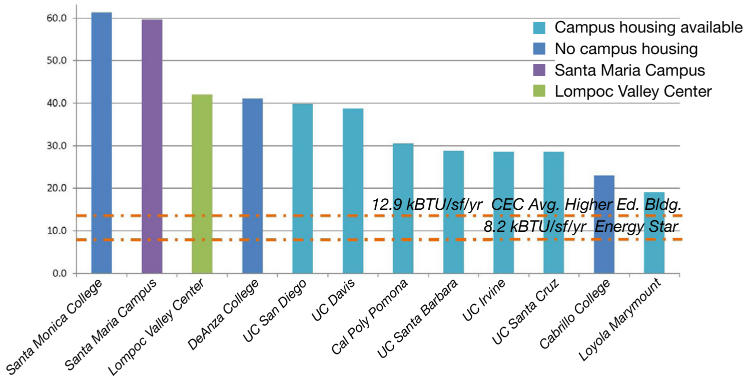
(LBS OF CO_2/SF/YEAR 2012)

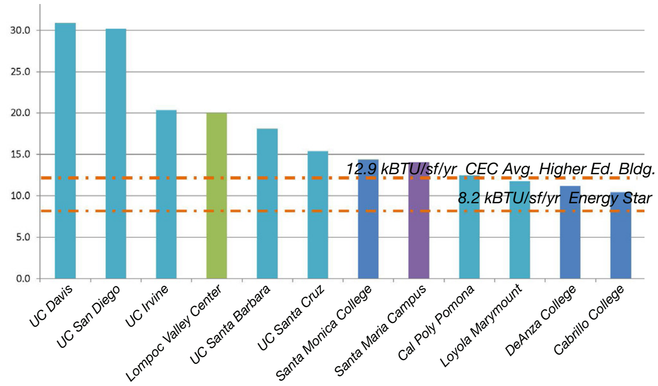




INSTITUTIONAL COMPARISON OF CARBON FOOTPRINTS

(LBS OF CO_2/SF/YEAR 2012)






TURN AND TILT
CASEMENT
AWNING
DOUBLE-HUNG OR SINGLE-HUNG, VERTICAL SLIDER
HORIZONTAL SLIDER
HOPPER
OFF

SUSTAINABILITY RECOMMENDATIONS

RECOMMENDATIONS

OVERVIEW

The recommendations for sustainable campus facilities and site improvements are integrated into the overall recommendations for the future development of both college campuses. The focus of these recommendations was guided by the goals established by district stakeholders in the sustainability workshops and the opportunities that were brought to light through the environmental analysis process.

RECOMMENDATIONS

/ Santa Maria Campus + South Campus

/ Lompoc Valley Center

RECOMMENDATIONS

SANTA MARIA CAMPUS + SOUTH CAMPUS

ENERGY USE + RENEWABLES

To optimize energy efficiency for new buildings and in existing buildings, the following recommended strategies are provided for consideration. New building projects should strive to achieve a Leadership in Energy and Environmental Design (LEED) of Silver. The recommendation below will aid in this effort, and most importantly will allow the campus to becomes a living laboratory for sustainability.

NATURAL VENTILATION

Natural ventilation combined with operable windows is an effective way of making use of the abundant and cooling breezes to allow building occupants to rely less on mechanical cooling systems.This strategy can be combined with HVAC interlocks, which, through the use of a sensor, ensures that when a window or door is propped open, mechanical heating or cooling is shut off. This will result in increased occupancy comfort and reduced energy consumption.

BUILDING INSULATION

Building insulation is recommended for all new construction via the use of high performance insulated glass units (SHGC of 0.27 and visible transmittance of 63%) and superior building envelope insulation (R30 roof, R21 walls). These strategies could also be effective if incorporated in the scope of building renovations.

THERMAL MASS AND SOLAR SHADING

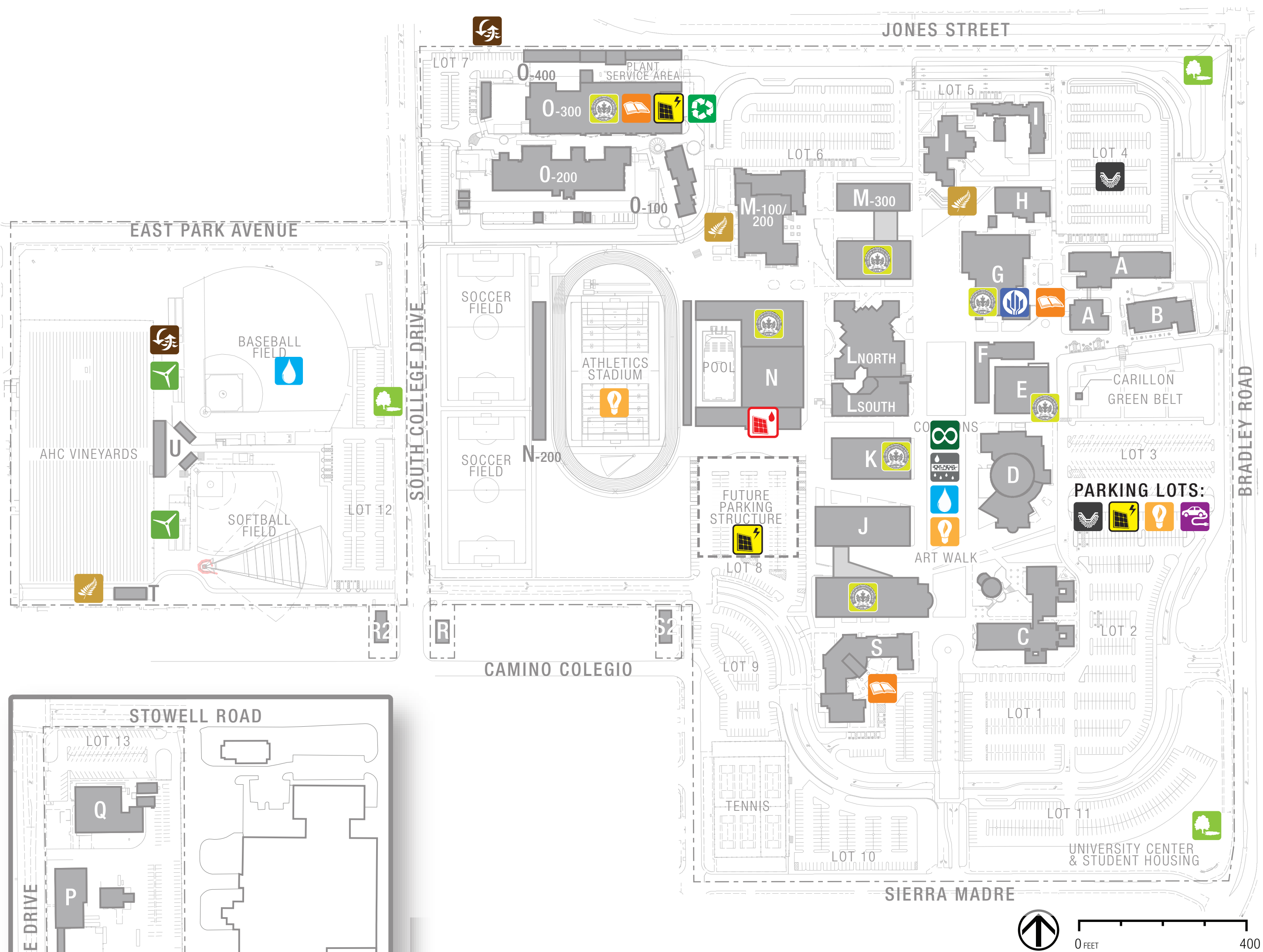
Using thermal mass building materials such as concrete masonry units (CMU) or high density concrete can block out the sun, absorb solar radiation progressively over the course of the day, and then emit the heat back into spaces when the warmth is needed. By allowing the sun to penetrate glazing and then warm the interior floor slab of spaces, for example, the thermal mass of the floor will be able to absorb the warmth of the sun and then radiate it back into the interior.

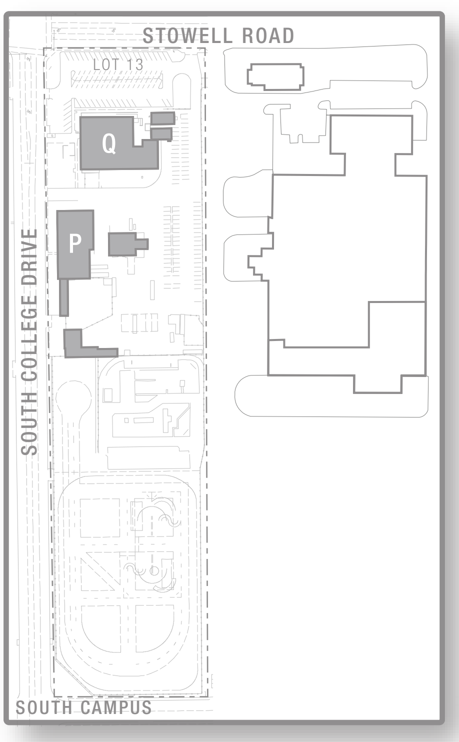
DAYLIGHT HARVESTING

Daylight Harvesting via the use of skylights and solar tubes are an efficient and effective way of providing natural light, which reduces reliance on electrical lighting.

LED SITE LIGHTING

It is recommended that all street, parking, and walkway lighting be replaced with wind and solar powered LED.





BUILDING LEGEND

A	STUDENT SERVICES
B	ADMINISTRATION
C	SOCIAL SCIENCES COMPLEX
D	PERFORMING ARTS CENTER
E&F	THEATRE ARTS COMPLEX
G	STUDENT CENTER
H	STUDENT HEALTH SERVICES
I	EARLY CHILDHOOD STUDIES
J	FINE ARTS COMPLEX
K	BUSINESS/HUMANITIES
L NORTH	LIBRARY
L SOUTH	ACADEMIC RESOURCE CENTER
M	MATH & SCIENCE COMPLEX
N	SPORTS PAVILION & STADIUM SUPPORT
O	INDUSTRIAL TECHNOLOGY COMPLEX
P	PLANT SERVICES, WAREHOUSE, MAILROOM
Q	TO BE DETERMINED
R	AHC FOUNDATION
R2	TO BE DETERMINED
S	COMMUNITY EDUCATION
S2	CAMPUS POLICE
T	VINEYARD CENTER
U	BASEBALL/SOFTBALL SUPPORT

RECOMMENDED ENERGY + SUSTAINABILITY PLAN

- PROPERTY LINES
- FACILITIES
- LED SITE LIGHTING
- SHADE TREES
- SOLAR HOT WATER
- PHOTOVOLTAICS
- DRIP IRRIGATION
- NATIVE/ADAPTIVE VEGETATION
- PRESERVATION
- BIOSWALE
- PERVIOUS PAVING
- COMPOSTING
- RECYCLING CENTER
- HYBRID VEHICLE PARKING OR CHARGING STATIONS
- SUSTAINABLE EDUCATION
- WIND TURBINE
- LEED SILVER
- OFFICE OF SUSTAINABILITY

RECOMMENDATIONS

SANTA MARIA CAMPUS + SOUTH CAMPUS *(cont.)*

PHOTOVOLTAIC PANELS

Photovoltaic panels, which double as shading devices in parking lots, would provide the campus with reliable sources of renewable energy and greatly offset the energy use of the campus. This strategy is recommended as an enhancement to energy conservation methods described above.

WIND TURBINES

The campus receives significant wind which could generate some renewable energy. This technology, if implemented, is recommended at the agricultural fields to promote a clear air path and to prevent any visual obstructions.

EFFICIENT BUILDING PLUMBING FIXTURES

New buildings should include water fixtures to provide, at a minimum, 40% below the Energy Policy Act water usage baseline at the time of construction. A 40% water savings can be maintained and exceeded through the use of 1.28 gallon per flush (gpf) water closets, 0.125 gpf urinals, 0.5 gallon per minute (gpm) lavatories that operate on a 10 second metered cycle, 1.0 gpm sinks, and 1.5 gpm shower heads. Both campuses have phased out most older plumbing fixtures. Any remaining older plumbing fixtures should be replaced with new low-flow fixtures as well.

SOLAR HOT WATER

Provide solar domestic hot water at facilities with high hot water use for energy-efficient heating of water for food service in Student Center G and showers in Sports Pavilion N.

PLANTING DESIGN

Planting design, when possible, should follow a palette of California native plant varieties, low-water use Mediterranean or succulents. All plants would be grouped appropriately by hydrozones, by plant community, or according to Water Use Classifications of Landscape Species (WUCOLS) water use. Limit turf to places where it is needed and used. All planting areas should be mulched with bark or rock mulch to reduce water loss through evaporation.

SHADE TREES

Shade trees are an important part of the college's image and provide relief from the sun. Trees also prevent overheating of the campus hardscape, thereby reducing heat island effect.

IRRIGATION

Connect new irrigation systems to a campuswide irrigation monitoring system which relies on weather station data to adjust irrigation levels. Spray irrigation is preferred for equipment visibility and lower maintenance needs. When necessary, utilize a subsurface drip system, which is less susceptible to damage by animals or prone to typical maintenance issues. Plants shall be grouped according to hydrozones for more efficient irrigation system design.

POROUS PAVEMENT

Permeable hardscape alternatives should be used whenever possible: permeable pavers, porous concrete, porous asphalt, grasscrete/turf block are recommended for parking stalls, fire lanes, and pedestrian walkways and plazas. High albedo permeable or open-grid hardscape surfaces are preferred to reduce the heat island effect. Permeable surfaces can be used in conjunction with underground storage such as cisterns, pipes, tanks, or cells, for groundwater recharge or reuse in the irrigation system.

BIOSWALES

Vegetated swales are already incorporated into areas of the campus, but additional swales may be provided at parking areas and around new buildings. Swales should be planted with appropriate plant material, non-invasive California native riparian type species only. Deliberate use of boulders and rocks are encouraged to slow water and prevent bank and channel bed erosion. Overflow drains/catch basins located in bioswales and retention basins should be raised above finished grade to allow small amounts of water to infiltrate naturally before overflow is discharged to the storm drain system.

RAINWATER HARVESTING

Modestly-scaled rainwater harvesting can be an effective, albeit seasonal, way to provide water to localized vegetated areas, while providing a valuable sustainable education component, such as near the Early Childhood Education and Student Center. The water capturing devices can be retrofitted onto existing buildings, near the downspouts of roof drains, and can either blend into the surroundings or be designed as purposeful icons of sustainability.

COMPOSTING

Composting areas located near food services and the Plant Services facilities will provide a means of diverting food waste from landfills, as well as a means of reusing refuse onsite as amendments for campus landscaping and the campus organic vegetable garden.

RECYCLING CENTER

A recycling center at the Plant Services facilities will provide the campus with a dedicated area for the collection and sorting of recyclable materials. The recycling center activities can be coordinated with local hauling agencies to maximize construction waste management and daily waste collection.

RECOMMENDATIONS

SANTA MARIA CAMPUS + SOUTH CAMPUS *(cont)*

CHARGING STATIONS AND PREFERRED PARKING FOR FUEL EFFICIENT VEHICLES/CARPOOLING

Electric vehicle charging stations and preferred parking spaces for LEVs, FEVs, and carpoolers should be placed in convenient locations throughout the campus, as determined through implementation studies. This will encourage students, staff and faculty to consider more ecologically aware modes of transportation, and will help to reduce the overall carbon footprint of the campus.

EDUCATION

Sustainable education can be provided throughout the campus by highlighting the green building and site strategies used. Sustainable "Did you know...?" signage that displays the College green logo will encourage students and visitors to stop and learn more about incorporating sustainability into their daily routines.

OFFICE OF SUSTAINABILITY

An Office of Sustainability is recommended near or at Student Center G to provide coordination and serve as a resource center for sustainable action on campus.