LANE COMMUNITY COLLEGE
CLIMATE ACTION PLAN

5 Strategies

Energy Efficiency
Renewable Energy
Transportation & Land Use
Reduced Waste & Purchasing
Adaptation-Education-Habituation

59 Actions

Actions we can all take to help reach our goal

1 Goal

Reduce Greenhouse Gas Emissions by 2050

Acknowledgements

Alen Bahret, Lane Community College
Sonya Christian, Lane Community College
Susie Cousar, Lane Community College
Jennifer Hayward, Lane Community College
Danielle Hendrickson, Lane Community College student
Cecilia Justina, Lane Community College student
Brian Kelly, Lane Community College
Zed Langston, Lane Community College student
Michael Levick, Lane Community College
Marcia Maffei, point2point Solutions
Anna Scott, Lane Community College
Michael Sims, Lane Community College
Mary Spilde, Lane Community College
Robert Thompson, Lane Community College
Andy Vobora, Lane Transit District
Lyndell Wilken, Lane Community College
David Willis, Lane Community College

Lane Community College SM

Office of the President

December 17, 2010

At Lane Community College, sustainability is not just a goal, it is a way of life. From our practices to our policies, Lane displays a high level of dedication to sustaining Earth's resources. So much so, in fact, that sustainability was adopted as one of the college's core values in 2007.

Over the past decade, Lane has expanded efforts toward sustainability in our classrooms with programs such as renewable energy technology, water conservation, and a sustainability coordinator degree. Sustainable practices in culinary services range from offering organic and local foods to composting kitchen and cafeteria waste. Lane's new Health & Wellness training facility will be LEED gold certified and use 42% less energy than a traditional building. In an endeavor to educate our peers, Lane has hosted three sustainability conferences for community colleges.

Lane has a strong commitment to becoming carbon neutral and to helping to educate the next generation of leaders about the importance of reducing greenhouse gases. As a signatory of the American College and University Presidents' Climate Commitment, the college has conducted a comprehensive greenhouse gas emission inventory and prepared the enclosed plan that provides fifty-nine actions that we will take towards becoming carbon neutral by 2050.

Sincerely,

Mary F.T. Spilde

Mary F.T. Spilde, Ph.D.
President

4000 East 30th Avenue ▪ Eugene, OR 97405-0640 ▪ Phone: (541) 463-5200 ▪ Fax: (541) 463-5201 ▪ Web: www.lanecc.edu

Table of Contents

Executive Summary

With this Climate Action Plan, Lane Community College commits to becoming carbon neutral by 2050. A team of experts from the college and community have compiled fifty-nine actions that will put Lane on a solid path toward carbon neutrality. This plan will be updated and refined as it is reviewed by more members of our community. As technologies, perceptions, and availability of resources change over the next forty years, the college will continue to improve the plan accordingly. This is a living document that will help the college navigate toward a more sustainable world while providing inspiration and information to help Lane's students to do the same.

In addition to the input from those listed in the acknowledgments, this plan was developed using existing institutional structures, a comprehensive greenhouse gas inventory, the American College and University Presidents' Climate Commitment, and climate action plans that have been developed by other colleges, universities, and cities.

Institutional Structures

Institutional structures that have supported this document include:

Sustainability Core Value

- Integrate practices that support and improve the health of systems that sustain life.
- Provide an interdisciplinary learning environment that builds understanding of sustainable ecological, social, and economic systems, concern for environmental justice, and the competence to act on such knowledge.
- Equip and encourage all students and staff to participate actively in building a socially diverse, just, and sustainable society, while cultivating connections to local, regional, and global communities.

Sustainability Strategic Direction

A Sustainable Learning and Working Environment

- Build understanding of sustainable ecological, social and economic systems and practices among the college communities.
- Apply principles of sustainable economics, resource use, and social institutions to Lane's learning and working environments.

Sustainability Policies and Procedures

- Sustainability: Design and Construction (http://www.lanecc.edu/cops/sustdsgn.htm).
- Sustainability: Energy Conservation (http://www.lanecc.edu/cops/sustenrg.htm).
- Sustainability: Recycling (http://www.lanecc.edu/cops/sustrecy.htm).
- Purchases: Recycled Paper (http://www.lanecc.edu/cops/purcycle.htm).

Committees Involved in Sustainability

- Sustainability Committee
- Sustainability in Learning Committee
- Facilities Council
- College Council
- Bond and Facilities Planning & Management Teams
- Bond Leadership Team
- Learning Garden Club

Greenhouse Gas Inventory

Lane's comprehensive greenhouse gas inventory can be viewed at http://acupcc.aashe.org/search/?institution_name=lane+community+college&carnegie_class=%3F%3F&state_or_province=%3F%3F. In summary, emissions are:

Greenhouse gas inventory (2008)

Total Emissions: 61,654 metric tons CO_2e

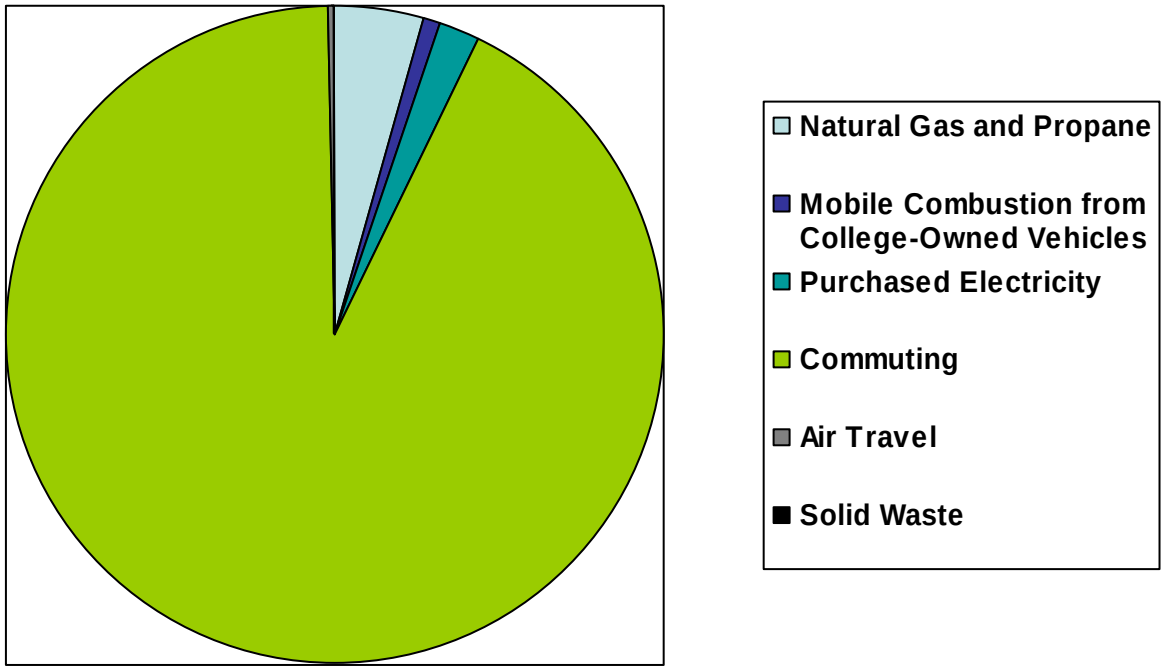
- Stationary combustion (natural gas and propane): 2,775 metric tons CO_2e
- Mobile combustion (college-owned vehicles & airplanes): 442 metric tons CO_2e
- Purchased electricity: 1,319 metric tons CO_2e
- Commuting: 56,935 metric tons CO_2e
- Air travel: 147 metric tons CO_2e
- Solid waste: 36 metric tons CO_2e

Total Mitigation: 1219 metric tons CO_2e

- Emissions reductions due to the purchase of RECs: 133 metric tons CO_2e
- Emissions reductions from on-site forest sequestration: 1086 metric tons CO_2e

Net Emissions: 60,435

Lane Community College Greenhouse Gas Emissions for 2008



American College and University Presidents' Climate Commitment

The American College & University Presidents' Climate Commitment (ACUPCC) is a high-visibility effort to address global climate disruption undertaken by a network of colleges and universities that have made institutional commitments to eliminate net greenhouse gas emissions from specified campus operations, and to promote the research and educational efforts of higher education to equip society to re-stabilize the earth's climate. Its mission is to accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, create solutions, and provide leadership-by-example for the rest of society.

The ACUPCC provides a framework and support for America's colleges and universities to implement comprehensive plans in pursuit of climate neutrality. The Commitment recognizes the unique responsibility that institutions of higher education have as role models for their communities and in educating the people who will develop the social, economic and technological solutions to reverse global warming and help create a thriving, civil and sustainable society.

ACUPCC institutions have agreed to:

- Complete an emissions inventory.
- Within two years, set a target date and interim milestones for becoming climate neutral.
- Take immediate steps to reduce greenhouse gas emissions by choosing from a list of short-term actions.
- Integrate sustainability into the curriculum and make it part of the educational experience.
- Make the action plan, inventory and progress reports publicly available.[1]

Lane has complied with this commitment by:

- Completing an emissions inventory for fiscal years 2008 and 2010.
- Developing this climate action plan that sets a target date and provides strategies for becoming climate neutral.
- Taking immediate steps to reduce greenhouse gas emissions by choosing from a list of short-term actions. The immediate steps that Lane took were:
  - Participating in Recyclemania (2008 & 2009).
  - Revising an existing Energy Conservation Policy to include a requirement to purchase ENERGY STAR products whenever practical.
- Integrating sustainability into the curriculum and making it part of the educational experience. See the Adaptation / Education / Habituation Strategy section of this document (page 17) for more information.
- Making the action plan and inventory publicly available. These documents are posted both on Lane's website at http://www.lanecc.edu/sustainability/climateactionplan.html and on the ACUPCC's reporting webpage at http://acupcc.aashe.org/search/?institution_name=lane+community+college&carnegie_class=%3F%3F&state_or_province=%3F%3F.

Other Climate Action Plans

Special thanks to all of the colleges, universities, cities, and other organizations that have helped pave the road by being early adopters of climate action plans, including the University of Oregon, Portland Community College, the City of Eugene, and the City of Chicago. The work of these organizations and others has helped to make this plan better than it would have been without their visionary leadership.

[1] American College and University Presidents' Climate Commitment, About Site, available from http://www.presidentsclimatecommitment.org/about/mission-history; Internet; accessed 15 December 2010.

Commitment - 2050

The fifty-nine actions presented in the next section of this document represent many of current and next steps on Lane's road to becoming carbon neutral. More will need to be done. Becoming carbon neutral will require input and effort from every member of our community. We will all need to learn, plan, and act together to achieve this challenging goal that is so critically important to the survival of millions of plants and animals – including humans.

To learn more about the science and impacts of greenhouse gas emissions and climate change, see:

- *Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia*, Committee on Stabilization Targets for Atmospheric Greenhouse Gas Concentrations, Board on Atmospheric Sciences and Climate, National Research Council of the National Academies (Washington, D.C.: The National Academies Press, 2010)
- National Oceanic and Atmospheric Administration's Office of Oceanic and Atmospheric Research on Climate Change - http://www.oar.noaa.gov/research/2007/climatechange.shtml
- National Oceanic and Atmospheric Administration Climate Service - http://www.noaa.gov/climate.html
- U.S. Environmental Protection Agency climate change site - http://www.epa.gov/climatechange/
- Intergovernmental Panel on Climate Change - http://www.ipcc.ch/

5 Strategies
59 Actions

Energy Efficiency – 12 Actions
Renewable Energy – 9 Actions
Transportation & Land Use – 14 Actions
Reduced Waste & Purchasing – 12 Actions
Adaptation / Education / Habituation – 12 Actions

Energy Efficiency

Emissions from natural gas for heating represent the second largest contributor to Lane's greenhouse gas inventory. The college has a revolving loan fund for energy conservation projects and a full time Energy Analyst who is tasked with developing and implementing energy conservation and renewable energy projects using the money in the fund. Energy efficiency projects have also been funded by a recent local bond levy and a state economic stimulus allocation.

Lane has a goal to decrease energy use by two percent per year while increasing on-site renewable energy generation until all energy needs are met with on-site renewables.

Highlights of Recent & Current Initiatives

1. Projects Funded by the Bond and a State Economic Stimulus Allocation

- The Center Building was re-roofed with a single white membrane long-life roof system and additional insulation.
- A remodel of Building 2 decreased energy use with:
  - A new roof with increased insulation.
  - Lighting efficiency improvements.
  - A heat recovery system that uses excess heat from the data center to heat the rest of the building.
- Building 4 and Building 5 remodels decreased energy use with:
  - New roofs with increased insulation.
  - Lighting efficiency improvements.
  - Natural ventilation strategies that decrease the need to mechanically heat and cool the buildings.
  - Improved efficiency in the heating, ventilation and air conditioning units.
- A laundry dryer heat recovery system for the college's commercial laundry.
- Exterior lighting controls were upgraded on the main campus to help ensure that exterior lights are not on during daylight hours. Perimeter parking lot lights also operate with a motion sensor to reduce the amount of light in the parking lot areas that are not occupied during operational hours. Over 365 compact fluorescent fixtures located in the soffits of main campus buildings were replaced with high-efficiency LED fixtures. At least ninety-five percent of all exterior lighting at the main campus was also converted to LED.
- Building-level utility sub-metering for electricity, natural gas, domestic hot water, domestic cold water, irrigation, heating water, and chilled water is being installed. This sub-metering will help the college monitor and develop energy and water conservation projects.

2. Health and Wellness Building

A new Health and Wellness Building (Building 30) was designed to operate using 42% less energy than a traditional building. The college expects the building to receive LEED Gold certification. This project was constructed using state capital construction funds and donations.

3. Building Automation System Strategic Upgrades

Building automation system upgrades are being phased in from 2010 through approximately 2015 using the general fund major maintenance budget. These upgrades will help the college better control heating, ventilation and air conditioning systems for energy conservation and occupant comfort.

4. Temperature Set-Points

Seasonal indoor temperature set-point standards are used that optimize energy efficiency while maintaining comfort and quality learning environments. Employees are encouraged to dress in layers during cooler months of the year to optimize individual comfort. Winter set points are 68°F to 72°F. Summer set points are 72°F to 76°F.

5. Green Standard Checklist

Lane's green standard checklist (Appendix C) provides a tool for project coordinators and design teams to use to ensure that energy efficiency and sustainability practices are implemented in construction projects.

Plan

1. Training and Education

In order for Lane to be able to capture all of the benefits from the new cutting-edge efficient technology described above, it is essential for maintenance personnel to receive comprehensive training on operating and maintaining this equipment. Building users must also receive training on how to operate user controls.

2. Roof Replacements

The college plans to fund one roof replacement per year for the next several years that will include increased insulation and subsequent reductions in heating and cooling. The roof replacements will be funded by the general fund major maintenance budget. The current plan for roof replacements is:

- Replace the Building 11 roof in 2011
- Replace the Building 6 roof in 2013
- Replace the Building 17 roof in 2014 (Note: Future plans for Building 17 may eliminate the need for a new roof in 2014)
- Replace the Building 15 roof in 2015

3. Central Plant Equipment Upgrade

An upgrade to the main campus central plant controls and boiler and chiller equipment is scheduled for 2011 and 2012. This project will be funded by the most recent bond levy. It will include energy conservation measures and replacement of chlorofluorocarbons in the chiller system with a more climate-friendly refrigerant. The old hot water boilers will also be replaced with high efficiency state of the art equipment.

4. Improve Building-Level Utility Sub-Metering

Lane will connect building-level utility sub-meters to a supervisory control and data acquisition (SCADA) system using the revolving loan fund for energy conservation. The SCADA system is a web-based graphical interface that helps users better understand and work with the data that are being collected by the sub-meters.

5. Retro-Commission Building 1 and Building 19

Building 1 was constructed in 2001 and Building 19 had a major remodel and large addition in 2003. Both projects were funded by Lane's 1995 bond levy. Both of these buildings were constructed before the college implemented commissioning as a standard practice. Lane plans to use the revolving loan fund to retro-commission both of these buildings. According to the document, *Commissioning for Better Buildings in Oregon*[1], commissioning can save up to $0.35/ft^2/year in energy costs. Retro-commissioning Building 1 alone may result in energy savings of up to $13,000 per year.

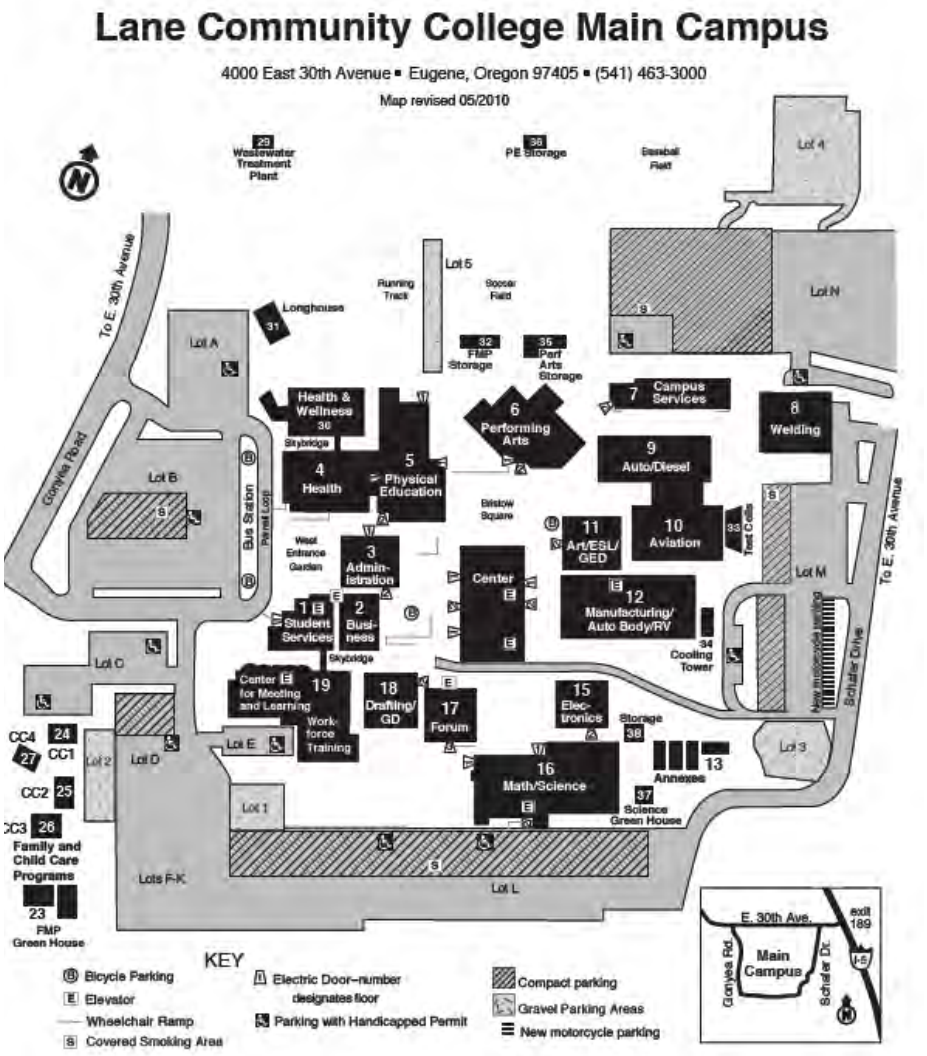
[1] PECI, State of Oregon, Oregon Department of Energy Site, March 1997, available from http://www.oregon.gov/ENERGY/CONS/BUS/comm/docs/commintr.pdf?ga=t; Internet; accessed 15 December 2010.

6. Heating Ventilation and Air Conditioning Mechanical System Upgrades

Upgrades to Lane's heating ventilation and air conditioning mechanical systems are planned to be implemented in 2011 and 2012 with funds from Lane's current bond levy. The upgrades will include sealing ducts and increasing motor efficiencies to reduce energy use.

7. Continue to Improve Lighting and Lighting Control Systems

- Improve the interior lighting automation systems in Buildings 1 and 16 to enable the college to achieve more consistent energy efficient daylight controls. This project will be a continuation of lighting commissioning projects that were funded from the revolving loan fund.
- Complete the interior and exterior lighting control panel upgrades at Buildings 6, 19, and 24 to interface with a campus lighting control network. Lane plans to use the structure of the HVAC building automation system interface as a starting point for navigation.
- Fine tune and commission the exterior lighting controls for the recent LED lighting upgrades for the exterior and parking lot lights on main campus. The goal is to be able to interface the exterior lighting controls with the campus lighting control network.



Renewable Energy

Lane has a strong commitment to on-site generation of renewable energy as exemplified by its Solar Energy Master Plan (Appendix D). The college created this document in 2006 and updated it in 2008. The plan includes goals, priorities, and objectives.

Funding renewable energy projects can be challenging because of high first costs and long pay back periods. Strategies that Lane uses include a revolving loan fund for energy conservation and renewable energy. Money from this fund comes from energy savings. Funds for renewable energy projects have also come from a low-interest loan, a local bond levy, a grant, and state incentives. A state business energy tax credit helps reduce the cost of renewable energy projects, but this program is slated to sunset in 2012. The State of Oregon is helping to decrease the cost of solar installations by requiring that all new publicly funded buildings and major remodels spend 1.5% of the cost of construction on solar energy[2].

Summary of Current Portfolio

1. On-Site Generation – Solar Electric

- The college has approximately 43 kW of solar electric installations. The installations include:
  - A 36 kW solar station in the west parking lot that powers eleven electric vehicle charging stations with excess power feeding into Lane's electric grid. The solar station was funded by a Greenpower grant from Lane's main campus utility provider, the Eugene Water and Electric Board, and from a local bond levy.
  - 3 kW of photovoltaic panels have been installed on the roof of Building 16. These installations were funded by the Energy Trust of Oregon and from Lane's revolving loan fund.
  - 3.6 kW of pole mounted photovoltaic panels have been installed to the east of Building 24. These pole mounted projects were funded by the revolving loan fund.
  - Several other small solar electric installations power individual systems such as gate motors and emergency telephones.

Lane typically adds a new solar electric installation annually as a training project for Renewable Energy Technician students.

2. On-Site Generation – Solar Thermal

A multiple building solar thermal installation on Building 30 provides domestic hot water for Building 5 (which includes PE showers), Building 7 (which includes a commercial laundry), and Building 30. Excess hot water circulates into the heating water for the campus. This project was funded by the bond levy as well as a state capital construction allocation and a fundraising campaign.

3. On-Site Generation – Geothermal

A geothermal system is used to heat and cool Buildings 24, 25, 26, & 27. This system was funded by a low-interest loan from Lane's electric utility, the Eugene Water and Electric Board.

4. Purchased Resources

Approximately 10% of Lane's electricity is purchased as Greenpower.

---

[2] State of Oregon, Oregon Department of Energy Site, 1 January 2008, available from http://www.oregon.gov/ENERGY/CONS/docs/Solar_Public_Buildings_Final.pdf?ga=t; Internet; accessed 15 December 2010.

Plan

1. Update Solar Energy Master Plan

2. On-site Generation – Main Campus
   - Continue with small annual solar installations that are funded by Lane's revolving loan fund.
   - Include solar thermal in the upgrade to the main campus central plant. Lane's central plant uses natural gas fired boilers for campus heating water. The central plant will be upgraded in 2011 using funds from the local bond levy.
   - Invest funds from business energy tax credits into a solar station for the east parking lot.

3. On-site Generation – Downtown Campus
   Lane's Downtown Center was donated to the college in 1977. It is a 56,503 square foot building that was constructed in 1926 and it is no longer able to provide for present day instructional needs. Lane is currently designing a new downtown campus that is partially funded by a local bond levy and partially funded by several other sources. The downtown campus plan includes a 76,432 square foot LEED Gold certified campus housing structure and a 90,016 square foot LEED Platinum certified educational building. This high performance campus that will provide a large portion of heating, cooling and electric needs through solar thermal, geothermal, and solar electric.

4. Finish Connecting Solar Electric at Building 24
   Due to the great demands on the Energy Analyst's and other college facilities personnel's time, the pole mounted solar installations that are east of Building 24 have not been fully connected. This project will be funded by the revolving loan fund.

5. Carbon Neutral Energy Purchased from Utility Providers
   As Lane begins to save more and more money on electricity and natural gas through energy conservation and on-site renewable energy projects, the college will be able to invest more into purchasing renewable energy from our electricity and natural gas providers. Lane County is fortunate to have electric utility providers with very climate-friendly resource portfolios. Only 3% of electricity from the Eugene Water and Electric Board is from coal and 2% from natural gas. The remaining 95% of EWEB's electric resources are from climate-neutral sources.[3] Lane's climate action plan includes purchasing more and more electricity and natural gas from climate neutral sources.
   - Develop a short-term strategy for purchasing 25% of electricity as Greenpower for Lane's Eugene campuses from the Eugene Water and Electric Board[4].
   - Develop a short-term strategy for funding 10% of natural gas purchases as Smart Energy from NW Natural. Smart Energy is a renewable form of natural gas that is considered to be climate neutral. It is produced from cow waste[5].
   - Develop long-term strategies for having 100% of Lane's purchased electricity and natural gas be carbon neutral. Lane's general strategy is to continue funding energy conservation and renewable energy projects with energy savings. As the amount of energy that Lane needs to purchase from utilities decreases, the college will be able to invest more of our utility budget on the increased cost of purchasing carbon neutral energy.

---

[3] Eugene Water and Electric Board, Electric Resource Portfolio Site, available from http://www.eweb.org/resources/portfolio; Internet; accessed 15 December 2010.
[4] Eugene Water and Electric Board, Greenpower Site, available from http://www.eweb.org/greenpower; Internet; accessed 15 December 2010.
[5] Northwest Natural, Smart Energy Site, available from http://www.smartenergynw.com/; Internet; accessed 15 December 2010.

Transportation & Land Use

Emissions from daily commuting represent the largest contributor to Lane's greenhouse gas inventory and they will be the most difficult to mitigate. The main campus is a commuter campus with very limited nearby housing. Access is from a highway and freeway, making commuting by biking or walking difficult. The college developed a Long-Range Transportation Plan (Appendix E) in 2006 that provides many strategies that will help reduce emissions from commuting. This plan should be updated to incorporate strategies from the climate action plan.

In order to significantly reduce emissions from commuting, major changes will need to occur including:

- Development of on-campus housing.
- Expanded mass transit.
- Improved bike routes to the college.

Because eliminating emissions from daily commuting is unlikely to occur by 2050, the college will need to develop a plan for purchasing, designating, or creating offsets to mitigate transportation emissions.

Summary of Current Initiatives

1. Reducing Emissions from Daily Commuting

- Public transit is provided by Lane Transit District (LTD).
- Lane Community College assesses a mandatory transportation fee for all credit and English as a Second Language students on the main and downtown campuses. Students who pay this fee may get an unlimited bus pass at no additional charge.
- An "Emergency Ride Home" program provides a free taxi ride to employees who commute to work by carpooling, vanpooling, riding the bus, walking, or bicycling.
- A carpool matching service is provided by point2point Solutions.
- Lane's main campus has fourteen bike racks that can accommodate up to 111 bicycles.
- A solar station provides solar powered charging for eleven electric vehicles.

2. Reducing Emissions from Fleet Vehicles

- Four out of twelve motorpool vehicles are gasoline-electric hybrids.
- Several inner-campus maintenance carts are electric.

3. Preserving Forested and Wetland Properties

The college owns approximately 181 acres of undeveloped forested and wetland property around the 152 acre core area of main campus. 162 acres are forested. Using the U.S. Department of Energy Information Administration's "Voluntary Reporting of Greenhouse Gases" carbon sequestration workbook, the college calculated that those 162 acres sequester approximately 1086 $mtCO_2e$ per year (Appendix F).

Plan

1. Improve Methods for Measuring Emissions from Transportation
   Review methodologies from other colleges and universities to develop an improved method for Lane.

2. Improve Access for Bicyclists
   - Improve campus roads and parking lots for bicycle safety.
     - Paint bike lanes and maintain them with regular sweeping and repair.
     - Remove traffic control grooves from bike lanes.
   - Increase covered, secure bike parking with the goal of providing bike parking for 10% of students and employees.
   - Develop and implement a simple procedure to request bike racks in specific spots.
   - Advocate for more secure bike parking at LTD stations or at bus stops.
     - Promote the development of a large, secure, covered bike locking station in the vicinity of 30th Avenue and Hilyard.
   - Promote the use of folding bikes that can be carried into an LTD bus.
   - Advocate for improved bike paths from Eugene and Springfield to Lane.

3. Continue to Improve Accessibility and Convenience of Public Transit
   - Expand bus service as needed. Request that LTD analyze overload reports to help determine needs.
   - Expand LTD group bus pass program to include employees.
   - Advocate for keeping all Lane Community College bus lines operating over the summer.
   - Advocate for a dedicated rapid transit route to Lane.
   - Plan for a light rail. Work with local governments to establish easements or right-of-ways. Work with local governments to develop a Glenwood-to-LCC corridor for a light rail & bike path.
   - Promote bus riding to campus events.

4. Carpool
   Launch an aggressive carpool campaign to include rewards and priority parking.
   - Have a carpool presence on the Lane home page and myLane ("Carpool Lane").
   - Provide a ride share board (poster or electronic).
   - Designate a carpool coordinator.
   - Designate carpool only spaces in priority parking spots.
   - Seek opportunities to fund incentives for carpooling. Funding source could be parking fee.

5. Improve Access for Lower-Emitting Vehicles
   - Provide priority parking for motorcycles close to campus.
   - Provide information about electric vehicle charging opportunities and how to get an electric car.

6. Expand Outreach, Marketing and Education About Climate-Friendly Transportation Alternatives
   - Provide education and promotion for climate-friendly transportation.
     - Improve web, facebook, and twitter presence.
     - Ensure that there is both promotional messaging and more substantial educational opportunities about transportation.
     - Create a display that provides information such as the real cost of parking and driving.

    - Encourage instructors to put messages on syllabi and other handouts.
    - Include information about sustainable transportation options in curriculum infusion trainings for faculty.
- Allocate or obtain funding for incentives for people who make climate-friendly transportation choices. Funding opportunities include transportation fee, parking fee, business energy tax credit, and grants.

7. Greening the Fleet

- Continue replacing fleet and maintenance vehicles with more climate-friendly cars including hybrid and electric vehicles.
- Develop a green fleet purchasing policy.
- Convert the gasoline-electric vehicles that the college owns to plug in electric hybrids.
- Encourage employees to use the bus for work-day trips.
- Explore community-wide car share options.

8. Parking Fee/Financing of Climate-Friendly Transportation

- Seek opportunities for federal and state funding for transportation alternatives.
- Consider a parking fee system that optimizes accessibility and climate-friendly transportation using research on best transportation demand management practices at colleges and universities.

9. Integrate the Climate Action Plan with Other College Plans and Policies

- Update Lane's 2006 Transportation Plan. A sub-committee of the Facilities Council is currently working the update.
- Update the Perimeter Master Plan to incorporate the Climate Action Plan.
- Increase offerings of online and hybrid classes. Develop a system to monitor how these classes contribute to a smaller carbon footprint.
- Increase the use of satellite centers to reduce commuting distances for residents.
- Adopt a no idling policy.

10. Air Travel

- Develop a system to track miles of air travel funded by the college.
- Promote the use of web-based conferencing and training to reduce the use of air travel to meetings and trainings.

11. Offsets

Develop a plan for purchasing or documenting offsets that will mitigate remaining emissions from transportation.

Reduced Waste & Purchasing

Recycling and waste prevention have been beacons for sustainability at Lane. The college's recycling program has received the following local, state, and national recognitions and awards:

- Recycler of the Year Award from the Association for Oregon Recyclers in 2005.
- College and University Recycler of the Year Award from the National Recycling Coalition in 2006.
- Lane County Trashbusters Award in 2006.
- 4th place in the waste minimization category of the national Recyclemania competition in 2008 in which over eighty other colleges and universities were competing.
- 9th place in the waste minimization category of the national Recyclemania competition in 2009 in which 148 other colleges and universities were competing.

For the past seven years, Lane Community College achieved an average diversion rate of approximately fifty-seven percent, preventing 1,717 tons of material from entering the landfill and 301 metric tons of CO_2e from entering the atmosphere (calculated using Clean Air Cool Planet v.6.6).

Highlights of Recent & Current Initiatives

1. Composting
   - In 2003, Lane began an in-vessel composting program, working with the three kitchens on campus to capture food preparation trimmings. From 2003 to 2008 the college captured approximately seventy-three tons with this program.
   - In 2009, the college began composting on a larger scale, seeking to capture not only food waste from the kitchens, but post-consumer food waste and service ware as well. Replacing disposable service ware with compostables resulted in increasing the amount of composted material to seventy-two tons in the 2009-2010 school year.

2. Surplus Property Reuse

   Lane reuses surplus property, such as furnishings and office supplies, internally and donates usable material to qualifying organizations. Since 2003, the college reused and donated 250 tons of material. This saved thousands of dollars in avoided purchases.

3. New Recycling Center

   A 10,000 square foot recycling and waste management center is currently under construction. It will allow for consolidation of recycling operations and significant increases in waste diversion. Lane expects to increase its diversion rate to approximately seventy-five percent within five years after occupancy. The new center will also create opportunities to integrate recycling operations into the curriculum of the Resource Conservation Manager Program, the Northwest Energy Education Institute, the Sustainability Coordinator Program, and the Culinary Program.

4. Built-In Recycling and Waste Collection in New Remodels

   In new buildings and remodels, the college is removing garbage containers from classrooms and placing conveniently located, permanent recycling and waste stations throughout each building. Previously, garbage cans were located in every classroom and larger recycling and garbage cans were centrally located. This new system puts recycling on equal footing with garbage by making them both equally convenient.

5. Energy Efficient Hand Dryers

   Approximately sixty energy-efficient hand-dryers have been installed in bathrooms throughout Lane's main campus. These hand-dryers use energy, but have a positive impact on the college's overall environmental impact because they reduce landfilled waste and eliminate the embodied energy from the extraction, manufacture, and transportation of paper towels. An additional ten energy efficient hand dryers are now purchased and will be installed in the near future. Each year, at least ten new hand dryers will be added until all restrooms that can accommodate hand dryers have them.

6. Green Purchasing Policies

   - Lane's policy "Sustainability: Energy Conservation (http://www.lanecc.edu/cops/sustenrg.htm)" includes a requirement to purchase ENERGY STAR products in all areas for which such ratings exist and which meet functional specifications and requirements, whenever practical.
   - Lane's policy "Purchases: Recycled Paper (http://www.lanecc.edu/cops/purcycle.htm)" requires the college to purchase and utilize recycled paper products in accordance with Oregon Administrative Rules 125-030 and OAR 137-030.

7. Green Cleaning Chemicals

   The college utilizes 100% environmentally friendly and safe cleaning chemicals as provided by Coastwide Laboratories. Lane was the first institution to work with Coastwide Laboratories in the development and application of green cleaning chemicals in the northwestern region of the United States. The use of green cleaning chemicals improves safety, is economically advantageous, and greatly reduces the emissions of volatiles and odors typically associated with cleaning processes. All chemicals are developed, produced, and distributed locally in Oregon by Coastwide Laboratories.

8. Bookstore, Library, and Student Learning Center

   The Bookstore is increasing the availability of electronic media such as books, manuals, and training aids. This option will reduce impacts from the extraction, manufacture, transport, and disposal of hardcopy books.

Plan

1. Expand Surplus Property

   Lane plans to reduce the purchasing of new furnishings on campus by using revenue from recycling activities to purchase high quality surplus furnishings from the State of Oregon Surplus Property Program and the Federal Services Administration Surplus Programs and distribute them to the college free of cost.

2. Expand the Reusable Office Supply Exchange

   The college plans to expand the popular Reusable Office Supply Exchange (ROSE) room. The ROSE room will triple in size and its close proximity to the new Recycling Center will allow for a better selection of lightly used or even new office supplies free to the campus community.

3. Provide Composting Collection Stations in More Locations

   Lane is currently exploring the potential of offering food and service ware composting in locations outside the cafeteria and kitchens.

4. Encourage Green Purchasing Practices

   Develop green purchasing guidelines that provide simple instructions for purchasing more sustainable materials such as items that are locally extracted or manufactured or contain recycled content.

Adaptation / Education / Habituation

Lane has an expansive array of opportunities for students to learn about climate change and sustainability.

Summary of Current Initiatives

1. Sustainability Degrees

   Lane has five two-year training programs in sustainability related fields:
   - Energy Management.
   - Renewable Energy Technician.
   - Resource Conservation Manager.
   - Water Conservation Technician.
   - Sustainability Coordinator.

2. Sustainability Suggested Course of Study

   The suggested course of study leads to a transfer degree for students interested in pursuing a bachelor's degree with a focus on sustainability.

3. Sustainability-Focused Courses

   Lane recently developed a mechanism for approving "sustainability-focused classes." So far, five classes have been designated as sustainability-focused. However, the college has many classes with sustainability content. The college expects the number of officially designated sustainability-focused classes to grow as more faculty submit applications for existing courses.

4. Sustainability-Infused Courses

   Many courses do not focus on sustainability, but they infuse sustainability content. Lane provided professional development training to 105 faculty members on incorporating sustainability concepts into curriculum in 2008 and 2009. The trainings were funded by an U.S. Environmental Protection Agency Environmental Education grant. The college documented that ten courses were modified with sustainability content after instructors took this training. These ten coursed are offered a total of sixty-two times per year reaching approximately 1860 students per year.

5. Campus Learning Laboratory

   - Many Lane students participate in campus projects that give them hands-on experience with implementing the sustainability ideas they are learning in the classroom. Service learning, class projects, and internships have all been valuable vehicles for providing students with hands-on learning opportunities that also benefit campus sustainability. Examples of student projects are:
     - Creating and maintaining an organic garden.
     - Retrofitting water faucets with low-flow aerators.
     - Installing photovoltaic panels.
     - Auditing campus water and energy use.
     - Collecting and sorting recycling and compost.
     - Developing and distributing educational materials.
     - Planning and implementing sustainability events.
     - Restoring native habitat and educational nature trails.
     - Building a biodiesel processor and making biodiesel.
   - Lane uses sustainable, native landscaping to reduce the use of watering and has eliminated the use of herbicides and pesticides on grounds. Planting signs with Latin names, descriptions, and other information are being installed across the campus to create a learning lab outside the classroom.

6. Events and Marketing
    - Lane holds several sustainability events per year that are open to students, employees, and the community. Typical annual events include:
        - National Teach-in on Global Warming Solutions.
        - Focus the Nation.
        - Earth Day.
        - Harvest Festival.
        - Global Awareness Movie Day.
        - 100-Mile Meal.
        - Bioneers Conference.
        - Peace Conference.
    - Lane uses a variety of media to promote sustainability messages including video, newsletters, and facebook.
    - Lane's sustainability webpage (http://www.lanecc.edu/sustainability/) provides information such as a detailed description of sustainability at Lane and indicator reports on college energy use, water use, and recycling rates.

Plan

In order to equip and encourage all students and staff to participate actively in building a socially diverse, just, and sustainable society much more must be done. All of Lane's current sustainability in learning initiatives should be expanded and improved, while a plan for ensuring that all students and employees build an understanding of sustainable ecological, social, and economic systems, concern for environmental justice, and a sense of personal responsibility for affecting change should be implemented.

Current goals for improving sustainability in learning at Lane are:

1. Infusion of Sustainability Across the Curriculum
    - Professional Development: Develop methods for promoting sustainability professional development opportunities that employees may access using existing professional development funds. Develop methods for rewarding and tracking employees who participate.
    - Course modification: Develop methods for encouraging faculty who have participated in sustainability professional development to modify courses to include sustainability content. Develop methods for encouraging academic divisions to apply for curriculum development funds for sustainability infusion in annual unit plans. Apply for grants and seek other opportunities to fund sustainability curriculum development. [Note: Lane applied for a federal "FIPSE" (Fund for the Improvement of Postsecondary Education) grant for curriculum infusion. Approval of the grant proposal is pending.]

2. Sustainability-Focused Courses
    - Increase the number of sustainability-focused courses: Develop methods for encouraging faculty to submit applications for sustainability course status.
    - Improve visibility of courses: Designate sustainability-focused courses in print and online catalogues.

3. Sustainability Education in Targeted Areas

    Develop methods to increase the number of sustainability-infused and sustainability-focused courses in the following specific areas:
    - Economic sustainability.

- Social sustainability.
- Permaculture/sustainable agriculture.
- Climate change impacts.
- Activism.

4. Campus Learning Laboratory

- Install a solar training lab on the main campus.
- Construct a new downtown campus that acts as an energy efficiency and renewable energy training laboratory.
- Improve the use of campus buildings as learning laboratories.
  - Install a building automation system that students can view online.
  - Install a web-based front end to the building level sub-metering system so that students can view real-time energy use.

5. Events and Marketing

- Offer two to four events per year that are open to students, employees, and the community.
- Improve sustainability website and update it frequently.
- Hold a one day conference for Lane employees focused on implementing Lane's sustainability strategic direction and climate action plan in 2011.
- Utilize a wide variety of communication mechanisms to promote and celebrate sustainable and climate friendly activities.

6. Graduation Requirement

Explicitly include sustainability in the core ability outcomes for all graduating students.

Conclusion

Establishing goals, forming strategies, and measuring greenhouse gasses form an important part of our work at Lane. The next and crucial step is the implementation of the fifty-nine actions outlined in this report. This will require administration, faculty, staff and students to make sacrifices and accept the challenges outlined in this document. Working together, the family of Lane Community College can make a powerful impact on the future of our institution, our children and the planet we all share.

This document will continue to live, grow, adapt and change over the years. Technologies, policies, and our relationship with the environment will change. This is a living document that will be improved by current and future members of our college community. New visions will emerge with new ideas and energy. We welcome the challenge and encourage others to join us in our journey to 2050.

Appendix A: Acronyms

ACUPCC: American College and University Presidents' Climate Commitment

BAS: Building automation system

CO_2: Carbon dioxide

CO_2e: Carbon dioxide equivalent

CFC: Chlorofluorocarbon

EWEB: Eugene Water and Electric Board

GHG: Greenhouse gas

HVAC: Heating, ventilation, and air conditioning

LCC: Lane Community College

LED: Light-emitting diode

LEED: Leadership in Energy and Environmental Design

LTD: Lane Transit District

$mtCO_2e$: Metric tons carbon dioxide equivalent

PV: Photovoltaic

REC: Renewable Energy Certificate

ROSE: Reusable Office Supply Exchange

SCADA: Supervisory control and data acquisition

Appendix B: Definitions

Adaptation: Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.

American College and University Presidents' Climate Commitment (ACUPCC): A high-visibility effort to address global climate disruption undertaken by a network of colleges and universities that have made institutional commitments to eliminate net greenhouse gas emissions from specified campus operations, and to promote the research and educational efforts of higher education to equip society to re-stabilize the earth's climate. Its mission is to accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, create solutions, and provide leadership-by-example for the rest of society.

Building automation system (BAS): A computerized network of electronic devices, designed to monitor and control the heating, ventilation, air conditioning, and lighting systems in a building.

Business energy tax credits (BETC): Tax deductions that businesses can use to help offset the costs of certain types of projects. Currently in Oregon, BETCs are allowed for renewable energy, energy conservation, recycling, and transportation demand management projects. Organizations that do not have a tax liability (like Lane Community College) can partner with an individual or business that has a tax liability that will pass-through most of its deduction to its partner.

Biodiesel: A renewable fuel for diesel engines derived from natural oils like soybean oil or waste grease.

Bioneers Conference: The Bioneers Conference is a leading-edge forum presenting breakthrough solutions for people and planet.

Bond: An interest-bearing certificate of public or private indebtedness. Voters in the Lane Community College district approved a 15-year, $83 million bond in November 2008 to renovate, upgrade and remodel workforce training and education facilities at the college.

Carbon dioxide equivalent (CO_2e): A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMTCO2Eq)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP.

Carbon neutral: The elimination of carbon emissions from carbon dioxide or other greenhouse gasses which is achieved through matching carbon emissions with carbon sequestration or offsets.

Carbon sequestration: A process to remove carbon from the atmosphere. This process is naturally occurs in trees and other plants.

Chlorofluorocarbon (CFC): Nontoxic, nonflammable chemicals containing atoms of carbon, chlorine, and fluorine. They are used in the manufacture of aerosol sprays, blowing agents for foams and packing materials, as solvents, and as refrigerants. CFCs are greenhouse gases. Since they are not destroyed in the lower atmosphere, CFCs drift into the upper atmosphere where, given suitable conditions, they break

down ozone. These gases are being replaced by other compounds, including hydrochlorofluorocarbons and hydrofluorocarbons.

Climate change: Any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun.
- Natural processes within the climate system (e.g. changes in ocean circulation).
- Human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.).

Commissioning: A systematic process of ensuring, through documented verification, that all building systems perform interactively according to the documented design intent and the owner's operational needs.

Composting: Producing a natural organic material from leaves, plant residue, grass clippings, other landscaping or gardening waste, food waste, and "compostable" service ware. These materials decompose into compost and can be used to feed soil and make it healthy.

Conservation: Efforts made to minimize consumption.

Efficiency: 1) Efforts to reduce the amount of energy required to provide services. 2) The ratio between the output and input of energy conversion. 3) Improving on the current energy code by at least 10%.

Energy: The ability to do work or power multiplied by time; units include kilowatt-hours.

Environmental justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Greenhouse gas (GHG): Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O_3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Greenpower: The EWEB Greenpower program focuses on generation facilities including the Stateline Wind Energy Center that straddles the Oregon-Washington border and solar photovoltaic electric generation projects in Eugene.

Heat recovery: A system implemented to recover and reuse heat energy that would normally be lost.

Heating, Ventilation, Air Conditioning (HVAC): The science/technology for conditioning a building or space.

Interdisciplinary: Combining or involving two or more academic disciplines or fields of study.

Leadership in Energy and Environmental Design (LEED): A green building certification system, providing third-party verification that a building was designed and built using strategies aimed at improving performance in the areas of energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators

a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

Light-emitting diode (LED): Electronic device that emits light when electric current flows through it. LED-based lighting bulbs consume less energy and last longer than other current lighting technologies.

MyLane: Is a secure web portal that on which students and staff can take care of college business.

Native habitat: A habitat area that provides for numerous inhabitants that were established prior to human settlement.

Offset: A unit of carbon dioxide-equivalent (CO_2e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere.
.

Permaculture: An approach to designing human settlements and agricultural systems that mimic the relationships found in natural ecologies through sustainable land use design and practices.

Photovoltaic (PV) **panel:** A panel made up of solar cells (amorphous, monocrystalline) connected via a substrate encapsulated in glass which utilizes the sun's photons to generate electricity. Panels are connected in variations of series or parallel (grid tied/battery-based) to create arrays. Thin film is considered third generation.

Recyclemania: A friendly competition and benchmarking tool for college and university recycling programs to promote waste reduction activities to their campus communities.

Renewable energy: Energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).

Renewable energy certificate: A documented record of the right to claim the attributes and benefits of a renewable energy generation source.

Retro-commissioning: An event in the life of a building that applies a systematic investigation process for improving or optimizing a building's operation and maintenance. Retro-commissioning is similar to commissioning, but applied to existing rather than new buildings.

Retrofit: The improvement of an existing system or fixture with newer and more efficient equipment.

Supervisory control and data acquisition (SCADA): Systems used to monitor and control a plant or equipment in industries such as telecommunications, water and waste control, energy, oil and gas refining and transportation. These systems encompass the transfer of data between a SCADA central host computer and a number of remote terminal units and/or programmable logic controllers, and the central host and the operator terminals. At Lane Community College, the SCADA system will be used to transfer data from utility sub-meters to a graphical interface at an operator terminal.

Sub-metering: The implementation of a metering system that allows an individual to determine usage in smaller subsets. For example, if there is an electric meter on a building, sub-meters could be installed to collect data on specific contributors to the total electrical usage, such as lighting and plug loads.

Sustainability: Sustainability is the potential for long-term maintenance of well being, which has environmental, economic, and social dimensions. According to United Nations "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Appendix C: Green Standard Checklist

GREEN STANDARD CHECKLIST – v.5-2010

Minimum Sustainability Specifications for Lane Community College Construction Project

*If Lane Community College chooses **not to** certify a project per the LEED/SEED method, it shall adhere to the following* ***GREEN STANDARD CHECKLIST:***

- ✓ A construction Indoor Environmental Quality (IEQ) management plan shall be created during the preliminary design phase, inserted into the bid documents, and executed during the construction phase.
- ✓ Energy efficiency standards to be above Oregon Energy Code. >10% for Shell improvements, > 10% for HVAC systems and equipment, and >25% for lighting.
- ✓ All buildings to include Building Automation Systems (**BAS**) controls.
- ✓ Hazardous gas and chemical exhaust areas will be negatively pressurized with respect to adjacent spaces.
- ✓ All projects shall use low emitting materials.
- ✓ Install permanent building entryway systems.
- ✓ All buildings shall be designed for optimal water savings including low flush toilets, urinals, lavatories, and native landscaping.
- ✓ All buildings shall include an outdoor Waste Management Area.
- ✓ Recycling, composting, and garbage collection and storage will be designed into each building interior. Garbage collection will not be placed separately from recycling.
- ✓ Restrooms to include electric hand dryers and no paper towels.
- ✓ All buildings must include Essential Commissioning.

If a project will be LEED/SEED certified go directly to Incentive/Timing Flow Chart → on the next page.

Decision Points – Energy Modeling and Commissioning –

LEED – Projects must register with LEED - *Purpose* – Provides Project Coordinator, A& E firms, General Contractors, & College Staff access to practical documentation.
Required when –

- ✓ Large Scope Projects - Additions **> 12,000** square feet.
- ✓ Major remodels with space/type changes.

Energy Modeling – Dependent on the size/scope of the project.
Required when –

- ✓ Large Scope Projects - Additions **> 12,000** square feet
- ✓ Major remodels with space/type changes
- ✓ Opportunity for major shell improvements
- ✓ *Explore with A&E firm using free energy modeling through EWEB partner*

Essential Commissioning –In house by LCC staff and students
Required when -

- ✓ Technical projects; BAS, sub-metering
- ✓ Projects with limited scope, i.e. one building system
- ✓ All new additions < or = 12,000 square feet with limited scope.

Essential Commissioning – 3rd Party- Engineering Firm –

- ✓ Major remodels with space/type changes and/or involving more than one building system.
- ✓ **All new additions** > or = 12,000 square feet

GREEN STANDARD CHECKLIST – v.5-2010

Minimum Sustainability Specifications for Lane Community College Construction Project

Incentives for Energy Efficiency /Innovation/Education/Renewable Energy Technology –

UTILITY INCENTIVES – Eugene Water & Electric Board (**EWEB**), Emerald People's Utility District (**EPUD**), Central Lane Public Utility District (**Central Lane PUD**)

STATE INCENTIVES – Oregon Department of Energy (**ODOE**) – Business Energy Tax Credit (**BETC**), Energy Trust of Oregon (**ETO**)

FEDERAL TAX CREDITS/GRANTS/INCENTIVES – Tax Incentives Assistance Project (**TIAP**), American Recovery & Reinvestment Act (**ARRA**)

Where do incentives apply?

- ✓ Utility Incentives: apply directly to reduce project costs.
- ✓ State (ODOE) Incentives: apply a tax credit (BETC) to a pass through partner whom then pays the college directly; thereby reducing project costs
- ✓ Federal Incentives: reduce design costs by passing a tax credit through to the A&E Firms

Incentive/Timing Flowchart

1) Preliminary Design Phase →
   a) Consult with EWEB
   b) Make decision on incentives with greatest value to time and money spent ratio
   c) Perform essential energy modeling
   d) Perform Solar Site Assessment assessing passive/active solar potential of building
   e) A&E firms will be required to work with TIAP (Tax Incentive Assistance Program) through their tax professionals

2) Design and Development Phase→
   a) BETC Preliminary Application Submitted **!! Critical Deadline before construction services are purchased !!**
   b) A&E firms to consult with EWEB
   c) Assure that LEED/SEED met or Lane Community College's Green Standard

3) Bid Phase →
   a) Require Essential Commissioning for **ALL** projects in bid documents
   b) Begin to prep data for final BETC

4) Construction/Warranty/Commissioning Phase→
   a) Complete and submit Final BETC
   b) Measurement and verification
   c) A&E firm to submit final TIAP
   d) Submit final report to utility/and other incentives

References –

1) **LCC College Online Policy & Procedure: Sustainability Design & construction** - http://www.lanecc.edu/cops/sustdsgn.htm
2) **LEED Reference Guide for Green Building Design & Construction:** For the Design, Construction & Major Renovations of Commercial & Institutional Buildings Including Core & Shell & K-12 School Projects - 2009 Edition
3) **ASHRAE/USGBC/IESNA Standard 189.1P:** Standard for the Design of High-Performance Green Buildings

Appendix D: Solar Energy Master Plan

Lane Community College
Solar Energy Master Plan – rev. 11/20/08

Goals

- 1 KW of PV per year for student installation training.
  - 1 KW of installed PV solar energy is equivalent to Approx. 1300 kwh/year
  - To date we have helped to install approximately 6 KW of PV.
- Carbon Neutrality by 2050.
- Install solar thermal (hydronic) system by 2010.
- Participate in state/local solar energy initiatives.
- Offset
  - Approx. 1%, (150,000 kwh), of total facility electric use from 2003/2004 baseline year = 115 KW of PV. (For Bond)
- Build a solar demonstration area for the public.
- Future buildings will have solar capacity.

Priorities

1. Student Training
   - BLD 24 pole mounted PV public demonstration
   - BLD 16
   - Breezeway roof between 15 &16.
2. Plan for solar thermal system
   - Laundry Boiler
   - BLD 5 – PE showers
   - Health and Wellness BLD
3. Re-roofing projects and integrated PV
   - Canopies around the perimeter of Bld 11.
   - Flat roofs of Bld 5.
   - Other opportunities with 3 tab roofing. EX: Blds 2,4,15,16,18.
4. As needed small projects1-5 KW of PV or 36 MMBTU of solar thermal
   - Green house plant bed hydronic system. Construction is 60% complete and will use propane to heat water.
   - Security Gates
   - Other public demonstrations
5. Large Scale Projects
   - Blds 5, 9,10,11,12
   - DTC and Bld 17 remodels

Objectives

1. Energy analyst to assist annual NEEI PV installation class.
2. Do solar site analysis to determine total appropriate roof area for solar installations
3. Research flat roof membranes.
4. Start calculating capital costs for solar energy on a large scale.

Appendix E: Transportation Plan

(Appendices to the Transportation Plan are not included)

Lane Community College
Long-Range Transportation Planning Group

Final Report
May 13, 2006

Table of Contents

Group Purpose

Develop a long-range plan for setting direction and goals for transportation mechanisms to and from the Lane Community College Main Campus including planning for vehicle parking.

Executive Summary

The Lane Community College main campus vehicle parking areas are frequently near capacity and during the first week of fall, winter and spring terms congestion is problematic. Lane Transit District continues to make improvements to their mass transit system; however, currently approximately ten percent of the campus community utilizes the system for regular commuting. Few people utilize alternative energy means of commuting.

The Central Lane Metropolitan Planning Organization (MPO) anticipates the metro population to grow by 30% during the next 20 years. Assuming the college population grows by a similar percentage, there will not be adequate available parking if current commuting habits continue. The college's commuting population must make several significant adjustments.

The group offers both short and long term recommendations to reduce single person vehicle commuting and offers ideas for economically viable alternatives. Short term is defined as 1-5 years and long term is defined as 6-20 years.
Recommendations include providing incentives to encourage mass transit commuting, carpooling and rideshare, improving transit routes to the main campus for bicyclists, improving bicycle and motorcycle parking, and moving towards fee based parking for single occupant vehicles. Also addressed are suggestions regarding modifications to the current main campus transportation fee plan.

Chapter 1

Historical and Current Perspective

Lane Community College's main campus was opened in 1968 when fuel was inexpensive and the college commuter population was easily accommodated by newly constructed parking lots and freeway/highway access. Over the years vehicle traffic has increased so that existing parking spaces are completely utilized during peak daytime hours of the first week of fall, winter and spring terms. Furthermore, during these peak periods of use morning college vehicle traffic exiting southbound I-5 creates congestion along McVay Highway, even backing up onto the right lane of I-5 resulting in delays and potential safety hazards.

In 2006 the college main campus serves approximately 10,000 credit students each term and has a staff of about 800 full-time employees and 1,100 part-time staff.

There are approximately 3,500 parking spaces available. The main campus does not have additional land available to add parking spaces, nor are funds available to consider adding multi-level parking garages. Reserved disability parking is available but frequently the spaces are fully occupied.

In 2005-2006 LTD makes 105 roundtrips to and from the main campus daily. The average weekday LTD ridership is about 1,200. With the group bus pass program, approximately 2,200 students obtain a sticker each term. Occasionally, LTD buses are completely full and must pass by potential riders.

Limited incentives exist to promote alternatives to single occupant vehicle commuting. Parking is free and available on a first come, first served basis. No preferential parking is available for carpool or energy efficient vehicles. The current transportation fee, paid by each credit student, generates revenue for the college to subsidize bus passes and maintain parking facilities. The fee is not based, in any way, on commuter usage.

Bicycle access to the main campus is inconvenient for those commuting over the 30th Avenue hill and southbound bicycle commuters from Eugene/Springfield via Glenwood and McVay Highway face hazards due to a narrow roadway with no shoulders, a poorly maintained road surface, and debris that contributes to hazards and tire punctures. Northbound cyclists face similar hazards in the Goshen, Hwy. 99 area. Street sweeping does not occur often enough to make biking safe. Secure, well lit, and covered bicycle parking is limited on main campus.

With the college focus on sustainability, reducing vehicle use in general and particularly on campus helps to support the sustainability effort with reduced carbon emissions. Since every 124 surface parking spaces requires about an acre of land (Toor, Will and Havlick, Spenser W. *Transportation & Sustainable Campus Communities*), reducing paved acreage would reduce runoff, reduce the desire to drive and look for parking on campus, and provide open space for other uses.

Chapter 2

Carpool and Rideshare

Overview

Carpooling or use of alternative energy vehicles is a practice that can reduce costs to the college by reducing the need for more parking spaces and is a more sustainable commuting practice since less fossil fuel is consumed by these types of commuters.

Access

The Student Resource Center supports a ride share board that can be accessed by going to the SRC and reviewing and posting information. Minimal use of this board occurs. No formal incentives or other coordination is currently provided at the college.

Current Incentives

There are currently no formal incentives or coordination by the college for using rideshare or carpooling. No priority parking is currently available to carpool or rideshare commuters.

Recommendations

Set up programs to educate and encourage students and staff to use rideshare and carpooling resources to promote personal and college savings as well as promoting the positive aspects of using sustainable practices.

Short Term (0-5 years)

- Set up a data base website for staff and students who have a current L number to help connect drivers and riders with similar schedules, home-origins, and destinations, to communicate and coordinate their rides.
- Advertise and educate the college population to change existing commuting habits: ads and articles in the Torch and Daily, Rallies, radio public service announcements, etc.
- Establish Carpool priority parking spaces, issue window stickers, and have monitors to regulate compliance.
- Establish “pilot” paid parking program in prime area for single occupant vehicles.

Long Term (6-20 years)

- Provide small incentives (i.e. free bus pass, free lunch) to those who can demonstrate their ride share practice by documenting use through descriptive applications and signed statements.
- Provide other larger incentives (i.e. 10 free lunches at the Renaissance Room, Bookstore coupons, etc.) the first week of fall term, handed out to car pool riders as they arrive on campus to motivate staff and returning students to set up car pooling plans.
- Establish paid parking for single occupant vehicles in all lots.

Chapter 3

Public Transit

Overview
Public transit is provided by Lane Transit District (LTD). LTD offers several programs for increasing use of bus travel and alternative means of transportation.

Access
Current student transportation fees provide a bus pass to credit students on main campus and ESL students on main campus and Downtown Center. LTD offers various passes for individuals.

Current Incentives
Currently the primary incentive to use public transportation is the low cost compared with vehicle ownership. The $16 transportation fee provides students who use LTD with a low cost bus pass.

Recommendations
Lane Community College (LCC) and Lane Transit District (LTD) will work cooperatively along with any appropriate governmental jurisdictions (city, county, or state) to develop and support a goal of an increasing modal split share of the LCC community using public transit. Strategies may include faster, more direct routes to the LCC campus, carpooling incentives, affordable bus passes, parking fees and other incentives.

Short Term (0-5 years)
- Identify key cluster points with a high concentration of students. Work with LTD to provide faster service from these areas.
- Work with LTD on a marketing strategy for Lane staff and students to make them aware of the River Road/LCC enhanced service slated to begin operation in the fall of 2007.
- Use disincentives for single occupant vehicle commuting such as a parking pass fee to subsidize bus passes in lieu of the current fee plan.

Long Term (6-20 years)
- Develop a comprehensive plan to increase access to mass transportation, forming a coalition with the city, LTD and college.
- Propose to LTD and Lane County a low-maintenance ERT (Eugene Rapid Transit) bus/bike only road to Lane.

Chapter 4

Alternative Means of Commuting (Motorcycles, Bicycles, Alternative Energy Vehicles)

Overview

In 2006 an insignificant number of staff/students utilize alternative means of commuting to the college main campus. Numerous impediments keep others from this form of commuting. Inclement weather reduces the numbers of motorcyclists. Alternative energy vehicles are too expensive for the average commuter, and weather or hazardous road conditions keep bicyclists numbers to an intrepid few. Upgrades to campus facilities and nearby routes to campus could significantly increase the numbers of commuters using alternative methods of commuting.

Access

Current motorcycle parking is adequate and convenient; however, no covered or well-lit parking is available.

Alternative energy vehicles utilize and compete for existing parking spaces.

Bicyclists lack secure parking facilities; campus and county roadways lack bike lanes; routes remain littered with hazardous debris; and, street sweeping is infrequent or non-existent.

Current Incentives

No incentives to use alternative means of transportation exist, with the exception of self-imposed incentives such as saving money, reducing energy consumption, being socially responsible by using less energy, or the rewards of being outdoors and getting exercise.

Recommendations

Educate, promote and re-educate the staff and students about the financial and environmental benefits of using alternative fuel vehicles.

Implement low cost actions by the college and county/city to increase the numbers of staff/students using alternative means of commuting.

Short Term (0-5 years)

- Provide lighted, shed covering for existing motorcycle parking areas.
- Provide priority, no-cost, convenient parking designated for alternative energy powered vehicles.
- Stripe bike lanes on campus and maintain them with regular sweeping and pavement repair.
- Improve bicycle parking with lit, covered, highly visible, and secure inner campus facilities.

- Make shower/locker facilities available to bicycle commuters at no cost.
- Provide a bike-rental program and possible rental of bike trailers.
- Develop a marketing program with local bicycle shops to sell discounted commuting gear to Lane staff/students.
- Advertise incentives to use alternative commuting methods.
- Seek grant funding to promote alternative transportation commuting methods.
- Have the college form an agreement with Lane County and the Cities of Eugene and Springfield to regularly sweep roadway shoulders and sidewalks on routes to campus frequented by bicyclists.
- Form an ongoing relationship with federal, state, county, and city agencies that will promote improvements to bicycle commuting routes to the main campus. These efforts should focus on improving roadway shoulders, designing dedicated bike routes to campus which connect with existing routes along the Willamette River and from the south of campus, and develop an alternative, less challenging bicycle route to campus from Eugene.

Long Term (6-20 years)

- Revise the current transportation fee structure to include an incentive to use alternative methods of commuting.
- Provide a waiver of transportation fees, and/or other financial incentives, to students and staff who provide documentation of alternative fuel vehicles at the beginning of each term.
- Provide special and conveniently located parking spaces for vehicles that are hybrids or use alternatives to fossil fuels.
- Implement paid parking for staff/faculty as a disincentive to commute in a single occupant vehicle.
- Implement paid parking for students as a disincentive to commute in a single occupant vehicle.
- If paid parking is implemented, do not charge those using alternative means of commuting.
- Work with County officials to improve the roadway shoulders to campus from the Glenwood and Goshen areas. These shoulders should include striped bike lanes.
- Work with Springfield officials to promote installation of a pedestrian/bike bridge south to connect with the Seavey Loop/Mt. Pisgah roadways.
- Use advertising and marketing promotions to continually encourage use of alternative commuting methods.

Chapter 5

Transportation Fee Review and Parking

Overview

In 2002 a Parking Committee was formed to develop a proposal for a parking fee on main campus to generate revenue. The outcome of that committee was a $15 Transportation Fee to be assessed credit students on main campus who would be eligible for a bus pass, and a Transportation Fee of $5 to all other students. The fee was first assessed fall term 2003. The fee was to provide a group bus pass to eligible credit students and $150,000 each fiscal year for parking lot maintenance, and reduce vehicle traffic on campus. In 2004, the Interim Transportation Fee Assessment Team was formed to assess the first year implementation and make recommendations for the second year. One recommendation that was implemented was adding ESL students to the group bus pass program starting fall 2004. A second recommendation was to increase the fee to $16. Facilities Management & Planning administers the group bus pass program and the Transportation Fee.

The college has used the $150,000 allocated each year to complete many projects that improve or maintain parking lots. The largest project, paving the southwest parking lot, provided at least 75 additional parking spaces. This year, the Florence parking lot will be re-sealed, striped and handicap parking signs posted. Other projects included upgrading the accessible parking around Building 5 for easier access to programs in that building, replacing parking lot signs, re-sealing and striping the northeast parking lot and the Flight Tech Center parking lot, improving the access road to Building 5, and installing speed bumps to slow traffic.

LTD has increased the cost of the group bus pass program each January 1 to cover increases in their operating costs. The LTD charge per registered credit student has increased from $11.13 in 2003 to $12.84 in 2007. These increases have been passed on to students in the transportation fee.

Access

The group bus pass provides a low-cost way for students to commute to Lane.

Not all students are eligible for the group pass and staff is not eligible unless they take a credit class on main campus. Students taking a credit class on main campus, and ESL students taking classes at main campus or the DTC, pay a transportation fee of $16 per term. All other students pay a fee of $5 per term. Any increase in LTD's charge for the group bus pass service is passed on to the students so the fee will continue to rise.

New students who pay the $16 transportation fee must first get a bus pass photo ID card the first week of the term then wait until the second week to get a sticker for the term. Returning students who already have a pass must to get a new sticker each term.

Access to riding the bus is sometimes an issue with students who have a lost or stolen pass since they can't get another pass until the next term unless they purchase a monthly LTD pass.

Current Incentives

Current incentives to pay the transportation fee include:

- Bus pass for taking a credit class on main campus. This is a savings of $79 over buying a 3-month LTD bus pass (current 3-month pass costs $95).
- The $5 transportation fee assessed all other students helps fund parking lot maintenance and improvements.
- Parking is currently free at all campuses that have parking lots.

Recommendations

Implement more cost-efficient and timesaving ways for students to use public transit to increase use and reduce the number of vehicles coming onto campus. Minimize use of land around center of campus for parking.

Short Term (0-5 years)

- Continue restriction of vehicle traffic in inner campus.
- Conduct an analysis of parking lot use.
- Identify overflow-parking areas for use at the beginning of terms.
- Implement incentives to use park-n-ride lots.
- Identify and implement ways to increase the number of students riding the bus, especially during the first two weeks of the term.
- Encourage LTD to increase routes or implement shuttles during first two week of fall terms.
- Explore a group pass program for staff.
- Explore more aggressive marketing of the group bus pass.

Long Term (6-20 years)

- Conduct an updated analysis of the current fee compared to a parking fee.
- Implement a user-based parking fee that covers the cost for parking control, staffing and lot maintenance.
- When planning for any new facilities, the plan and design should consider transportation, parking and circulation.
- When funds are pursued for new buildings, costs should include funds to address transportation issues resulting from the new facilities.
- Explore underground and aboveground parking structures that could be revenue generating.

Chapter 6

Safety

Overview

Lane maintains 8 major parking lots located on three sides of campus containing approximately 3,500 parking spaces. Several smaller parking areas are also maintained and generally provide restricted parking. All lots are heavily used by staff, students and the community. A Lane Transit District (LTD) bus station is located at the front entrance to the college. Bike racks are located at several locations around campus.

All parking lots have overhead lighting. The college attempts to maintain a balance between light pollution, energy conservation and safety provided by lighting. Attention is given to higher light levels in the near rows of the lots that are more frequently used at night. Staff reductions have resulted in burned out lights being changed on a schedule, not as they occur. This creates darker areas for a month or more.

No emergency contact phones are located in the parking lots or at the bus station. In addition, no exterior emergency phones are located on the walking paths in the interior of campus which people use to access the parking lots.

Landscaping is designed and maintained to provide a full view of the parking areas and limited hiding spaces along walkways on campus.

Lane has enjoyed a lack of stranger-to-stranger assaults on campus and in the parking lots. However, past success does not guarantee future success in this area. In 2004/05 seven vehicles are stolen from Lane parking lots and 16 were broken into.

Several parking lots are multi-tiered and the stairs between tiers do not have handrails. In addition the South parking lot lacks handrails on the stairs going from the lot to campus. Persons also walk downhill on the grass which has led to several serious falls when the grass is wet or icy.

Limited video surveillance of some parking lots is scheduled to begin spring 2006.

Public Safety patrols the lots but staffing levels do not allow for constant coverage.

Cross walks are re-marked on schedule but fade out as the year progresses. There is a lack of marked pedestrian lanes from some parking areas to campus.

Traffic does not consistently maintain appropriate speeds in the parking area which creates a hazard to other vehicles and pedestrians.

Safety issues regarding bicycles and other alternative means of commuting are covered in Chapter 4 of this report.

Recommendations

Continue to improve safety features of the parking and walking areas of campus. Continue to explore ways to improve safety in this area.

Short Term (0-5years)

- Re-stripe all crosswalks and pedestrian walkways at increased frequency to maintain higher visibility.
- Repair handrails on all stairways.
- Explore concentrating night/evening classes in fewer buildings which would promote heavier usage of some lots and increase safety.
- Place emergency phones in all lots, at the bus station and on major walkways within campus.
- Increase video surveillance of parking lots
- Establish some video surveillance of major walkways on campus
- Increase personal safety education on campus to staff and students.
- Install additional speed bumps in parking lots.
- Maintain current lighting levels by changing burned out bulbs within one week.
- Landscape the South parking lot/grass junction to discourage people walking down hill. Consider additional walking paths in that area.

Long Term (6-20) years

- Bring all handrails up to code.
- Re-configure parking lots so that adequate pedestrian walkways are present.
- Provide consistent video monitoring of all parking areas and major walkways on campus.
- Expand emergency phone system further into the lots and on other walkways on campus.

Chapter 7

Summary of Funding Recommendation Implementation

Transportation fees paid by all enrolled students are used to subsidize LTD bus passes for credit students, subsidize parking at the Downtown Center and to maintain and improve existing parking facilities. College general funds are used to provide public safety officers that patrol the college roadways and parking areas.

Transportation Parking Projects Fund

	Revenue	Expenses
FY04	206,000.00	133,541.00
FY05	197,000.00	54,982.00
FY06	150,000.00	360,292.00
TOTALS	553,000.00	548,815.00

(Most expenses for FY06 due to repaving the south parking lot and are as of April 2006.)

Transportation fees collected and expenditures:

	FY 04	FY 05	FY 06 AS OF APRIL 2006	TOTALS
FEES/Revenue	484,865	478,164	462,761	1,425,790
Transfers to Parking Lot Improvement Fund	206,000	197,000	150,000	553,000
Transportation Fee Expenses	322,377	325,917	268,593	911,500
Amount of fees paid to LTD	284,682	295,400	242,557	822,639

Recommendations

Recommendations offered in earlier chapters and below imply tangible costs for implementation, both in staff time and capital outlay. Careful cost/benefit analysis by the College is required so that funds and staffing time are efficiently utilized in meaningful ways.

- Prioritize implementation strategies before allocation of funds.
- Prioritize allocation of funds based upon defined benefits to the college community.
- Define and promote incentives and disincentives with monetary value that encourage use of mass transit, car pooling, and other alternative means of

commuting. A clear rationale for each item's implementation should be formulated before action is taken.

- The college should consider an equitable transportation fee which builds a reasonable surplus set aside for specific future needs.
- The college should collaborate with local, state, federal, and private entities to improve and encourage use of alternative commuting methods.
- The college should consider modifying the transportation fee in a way that reduces the burden to part-time credit students and those using alternative means of commuting other than the subsidized LTD pass.
- The college should pilot a daily fee based parking system similar to that used by Portland Community College (see Appendix I, page A-9, for details).
- Explore other Transportation Demand Management strategies that provide easy and affordable access to campus.

APPENDICES

Appendix A.	**List of LRTG members**
Appendix B.	**Long Range Transportation Planning Group Charter**
Appendix C.	**Committee Meeting Minutes**
Appendix D.	**Spring 2006 Draft Survey (Not implemented)**
Appendix E.	**LTD Five-Year Development Plan (Draft 8/8/2005)**
Appendix F.	**Central Lane MPO Regional Transportation Plan – TMD Policies, Dec. 2004**
Appendix G.	**Excerpt from Transportation & Sustainable Campus Communities, Will Toor & Spenser W. Havlick (provided to the LRTPG by Margaret Robertson)**
Appendix H.	**Summary of Case Studies of Other Campus's TDM Programs by Jennifer Hayward**
Appendix I.	**Lane Community College Paid Parking Task Force Report, April/May 2002**

Web Links for Additional Information:

www.ltd.org Lane Transit District

www.lcog.org/transplan Lane Council of Governments

***www.vtpi.org/tdm* Victoria Transport Policy Institute TDM Encyclopedia**

***www.lanecounty.org/Transportation_Planning* Lane County**

***http://www.pcc.edu/resources/parking/permits.html* Portland CC**

Appendix F: Forest Sequestration Metrics

Forest Carbon Sequestration

Lane Community College used the "Voluntary Reporting of Greenhouse Gases" carbon sequestration workbook from the U.S. Department of Energy Information Administration to calculate the carbon sequestration for its forests. The college has three forest areas to the West, South and Southeast of the core campus area. The forest areas measure 162 acres in total and are identified as the:

- South East Forest – 127 acres
- West Forest – 20 acres
- South Forest – 15 acres

To calculate carbon sequestration, the assumptions made were:
1. The trees are fast growing conifers identified as Pseudotsuga menziesii, commonly known as Douglas fir trees.
2. There are 100 mature trees per acre equal to 16,200 trees total.
3. The mature fir trees are at least 60 years old.

Based on the workbook the numbers used are:
- Annual sequestration rate: 134.1 lbs/tree/year
- Survival rate: 1.0

The calculation used was:

(16,200 trees x 134.1 pounds/trees)/(2,000 lbs/ton) = 1,086.21 tons of CO_2 sequestration per year.