

SUSTAINABILITY OF THE 2007 WAKARUSA MUSIC AND CAMPING FESTIVAL
An Assessment of Environmental, Social, and Economic Impacts



Joe Nickels, Moses Nkhoma, and Jeff Severin
The University of Kansas

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EXECUTIVE SUMMARY

“Sustainability” – the idea of meeting the needs of the current generation without compromising the needs of the future – has become a standard by which businesses, institutions, and even large venue events are evaluated. This includes an assessment of not only environmental impacts, but economic and social impacts as well. Although no formal review process is available to measure the sustainability of single events, festivals worldwide are beginning to examine their impacts in order to develop more responsible operation.

To assist the Wakarusa Music and Camping Festival in moving towards a more sustainable future, we completed an assessment of the operations and activities that take place during this four-day event at Clinton Lake State Park. Through observations, interviews, and data collection, we were able to provide a baseline assessment of 8 major functions at the festival: Energy Use, Transportation, Water Use, Waste & Recycling, Goods & Services, Physical Impact, Public Awareness/Education, and Business Practices.

The Wakarusa Music and Camping Festival has made considerable efforts to reduce its environmental impact through an established recycling program, reducing the amount of space and energy used, and educating festival attendees (festivarians) about attending the event in a more sustainable way. We found indicators of sustainable practices in each of the 8 areas. Examples include:

- The festival using 20% biodiesel in generators to reduce the reliance on fossil fuels, and “offset” carbon emissions from generators;
- Vendors (especially arts & crafts vendors) providing natural, recycled, and organic products and reducing impacts further through minimal energy use and waste generation;
- Water being sourced and treated on site using organic bacteria, thus eliminating significant transportation and industrial waste;
- Using golf carts running on 80 percent diesel/ethanol blend for operational purposes including the fact that over 250 travelers were able to green their travel by purchasing carbon offsets amounting to 153,000 pounds of carbon;
- The festival recycling 43% of total waste created, totaling approximately 16,000 pounds of recyclables;
- Cleanup efforts following the festival removing 100% of significant physical waste from the site;
- Reducing paper use through emphasis on the exclusive use of electronic mail, recycling waste paper, and delivering electronic contracts; and
- Organizers’ aggressively utilizing the internet to disseminate information on Wakarusa festival’s sustainability efforts.

Despite these positive efforts, considerable improvements can still be made to move the festival in a sustainable direction.

- Focus on efforts to further conserve energy, replace energy produced by fossil fuels with renewable sources such as solar power generation, and offset all remaining emissions associated with the event.
- Encourage participation of local vendors with sustainable products and practices.
- Provide opportunities for education and discussion among vendors and bands regarding sustainable practices
- Reduce dependence on bottled water by promoting watering stations on site, as well as reusable containers and cups.
- Reduce festivarians’ heavy reliance on the private automobile to commute to and from the festival by promoting other modes of transportation such as introducing mass transit from the festival grounds to off-site venues around the City of Lawrence.

- Introduce remote or off-site parking facilities to reduce degradation of the greenery in the parking area of the festival grounds.
- Continue to divert waste from landfills by providing composting options and cardboard recycling for vendors and festivarrians.
- Apart from providing entertainment to festivarrians, make the Wakarusa music and camping festival an ideal platform for dissemination of information relating to social, economic, and environmental sustainability.
- Monitor vendors, exhibitors, contractors, and artists on a daily basis to ensure that their operations are in compliance with agreed contractual and sustainability requirements.

This report summarizes efforts to assess the impacts of the Wakarusa Camping & Music Festival and provides recommendations for establishing more sustainable practices. While some recommendations can easily be implemented in the near future, others will require additional time, research, and financial commitment. This assessment is not entirely comprehensive as some data was not available or accessible. To assist with future assessments and provide a mechanism for tracking progress, we have created a list of indicators that should guide the festival toward sustainable development. These are intended to be simple measurements of complex issues. Ideally, these hard numbers will expedite annual evaluations and provide a foundation for public dialogue on event sustainability.

INTRODUCTION

Background

“Sustainability” is a term that is quickly becoming commonplace in business, development, and higher education with regard to human impact on the environment. As defined by the World Commission on Environment and Development in 1987, sustainable development is that which “seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future”.¹ Those needs have come to include material goods, nourishment, energy inputs, clean air and water, and a diverse ecology. Sustainability also incorporates a stable economy and a sense of social justice.

With such a broad range of factors, sustainability itself can be difficult to measure. Human activity is so interconnected with our environment that even small decisions and actions can have broad-reaching effects. For example, purchasing an item of cotton clothing can have impacts on land use, water use, water and air pollution, local economies, and social issues related to where and how the item is manufactured and the labor conditions involved. Despite these difficulties, the concept of “sustainability” is now being used to assess business practices, community development, and a range of human activities that impact not only the environmental but the economy and social well-being.

In higher education, sustainability audits have been conducted to measure and chart the progress of college and university campuses. Campus assessments typically identify both positive actions being taken and sources of resistance in order to guide future policy and practices that will improve the overall operations of the institution with regard to social, economic, and environmental capital². Similarly, businesses have begun assessing sustainability to provide a vehicle for accountability between companies and their stakeholders.³ The Pew Center on Global Climate Change lists over 30 major corporations as members of their Business Environmental Leadership Council that have compiled sustainability reports⁴. Specific assessment tools, such as the Travel Green Wisconsin Checklist⁵, have been created to certify businesses as meeting an established standard for sustainability. Businesses and non-profit organizations such as Village Green Environmental Solutions and Reverb Rock, are even sprouting up to aid others in assessing sustainability and “going green”.

While such assessments are becoming more common, there are few examples of assessments for large venue events. A number of guides for “greening” events are available, but most focus on meetings or conferences. Conferences such as the Greenbuild International Conference and Expo⁶ and the 2005 United Nations Climate Change Conference⁷ have published reports documenting efforts to make their events more sustainable, including assessments of carbon output, energy use, transportation, waste reduction, and water conservation.

Outdoor festivals and fairs have also begun to promote “green” practices on their websites and other promotional materials. The Sustainable Living Festival in downtown Melbourne, Australia, lists its practices to make the festival more sustainable online, and a number of music festivals including the Peats Ridge Music and Art Festival in Australia, and Bonnaroo Music and Arts Festival and Telluride Bluegrass Festival in the United States tout environmentally friendly practices and tips for festival goers. However, formal assessment tools for such events are not readily available.

The Wakarusa Music and Camping Festival is another outdoor event that has taken steps in recent years to reduce its environmental impact. Wakarusa is a 4-day festival held at Clinton State Park at Reservoir, just west of Lawrence, Kansas. First held in 2004, Wakarusa has established itself as a “premiere,

grassroots event in the nationwide outdoor music scene”⁸. Now in its fourth year, the festival features over 100 bands playing on 6 stages and attracts over 12,000 attendees each day.

Methods

In 2007, the authors conducted a sustainability audit of the Wakarusa Music & Camping Festival. The three-person audit team examined common factors that have been considered in evaluating sustainable practices in business, higher education, and event venues. As noted above, many of these reports focus on specific indicators of sustainability such as energy and resource use, waste reduction and recycling, and economic impacts. Although any number of factors could be included, those that were most applicable to the operations and activities of a large venue event such as Wakarusa were chosen for this assessment. They include: Energy Use, Transportation, Water Use, Waste & Recycling, Goods & Services, Physical Impact, Public Awareness/Education, and Business Practices.

For each factor, both positive and negative impacts were evaluated, including efforts that have already been made to mitigate environmental harm. Data was collected through observations, interviews with vendors and festivarians, and through personal communication with festival staff. Interviews with festivarians were conducted throughout the day by randomly visiting campsites and approaching groups or individuals in the festival area. Efforts were made to conduct interviews in each major campground. Vendor interviews were conducted during slower business hours - generally mid-morning - by visiting each booth in the vending area of the Revival Village and Campground Village. The audit team attended the event each day, followed up with organizers and artists, and made pre- and post-event site visits to develop conclusions about the sustainability of the event with regard to each assessment factor. Because this study was completed over a relatively short period of time, there were a number of limitations to collecting data. Many of these are identified within each section to establish a framework for the reader and note possible improvements for future assessments.

Following this analysis, recommendations for moving toward a more sustainable future for the festival are provided for each factor. These were developed by the audit team through evaluating current practices, researching examples of sustainable events, and gathering information from artists and festivarians that participated in the event. Some sections include resources to assist event organizers with further examining and/or implementing recommended actions. While some of these recommendations will

Additionally, measurable indicators have been identified for each factor. While the recommendations provided are relatively specific, the sustainability indicators serve as a broad measurement of progress towards sustainability. They identify specific methods for collecting and comparing data in future assessments of the festival, providing a replicable tool for tracking improvements over time.

ENERGY

Energy use serves as an indicator of sustainability relative to the resources used to produce energy and the environmental degradation that can occur due to production. The use of renewable energy sources such as wind, solar, low-impact hydroelectric power, geothermal power, and renewable biomass indicate a move towards sustainability as they do not rely on the combustion of finite resources. The use of nonrenewable resources such as coal, petroleum, natural gas, and other fossil fuels, on the other hand, is not sustainable as these resources can not be replaced within our lifetime.

Additionally, the combustion of fossil fuels releases sulphur dioxide (SO₂), nitrogen oxides (NO_x), carbon dioxide (CO₂) and other greenhouse gases and particulate matter that contribute to air pollution, water pollution, acid rain, and global warming. While not entirely devoid of environmental impacts (e.g. toxic materials are used in the manufacture of some solar panels), the generation of power from renewable sources (other than biomass combustion) produces no emissions, outside of those pollutants generated in the manufacture of generation equipment.

In the United States, a majority of power is generated from non-renewable resources. In 2005, nearly 72% of energy generated in the US came from coal, petroleum, natural gas, and other fossil fuels, while only 9% was generated from renewable sources.⁹ This imbalance presents a considerable challenge when attempting to progress towards sustainability with regard to energy use.

Approach

To document progress towards sustainability, electrical energy use can be measured by the total use for the event, as well as the daily per capita use to compare to typical use in this area. Because energy for the event was provided both by the park and through a series of diesel fueled generators, it is difficult to calculate the overall energy used. Neither source was metered during the process to provide an overall accounting. It is possible, however, to make some general assumptions regarding the type of energy used as well as to assess specific uses of energy to identify opportunities for conservation. Additionally, 32 vendors were interviewed (see *Goods & Services*), providing some information about energy use in the vending area.

Findings

Energy is used to power stages, vending areas and light towers. And although primitive camping is available onsite (no electrical services), campers do have the option of purchasing upgraded camping passes, providing access to standard camping sites with electrical outlets. Power for these locations and a proportion of the main stage is powered by electricity provided through ground lines. This power is generated at the Lawrence Energy Center operated by Westar, which is a coal-fired plant and not a sustainable source of electricity. Although technologies exist to reduce the impacts of burning coal, this source of energy contributes greatly to levels of carbon dioxide, sulfur dioxide, nitrogen oxides, and mercury, as well as water pollution and damage of land associated with mining this resource¹⁰.

The remainder of the power is provided by diesel engine generators. The festival employs a total of 20 generators ranging from 30 to 200 kW as well as approximately 12 light towers with integrated generators.¹¹ Most generators run between 12 and 24 hours, while some are available only for backup. This year, all generators were fueled by a blend of 80% petroleum diesel and 20% biodiesel known as B20. Biodiesel is a fuel made from vegetable sources, usually soy oil. Because biodiesel is generated from renewable biomass, this reflects a move towards sustainability. However, a large portion of the diesel is a fossil fuel, contributing to environmental impacts as noted above.

Total fuel use overall for the event was 4,639 gallons, all but 31 gallons of which was a biodiesel blend. In 2006, 5,348 gallons of petroleum diesel was used¹². This reflects an overall reduction of fuel consumption of approximately 15%. By using B20 in 2007, the festival reduced petroleum diesel use by more than 32%. A portion of this decrease can be attributed to eliminating one of the large stages at the festival. However, attendance at this year's event was lower than in 2006 and a new ground line for electricity was installed to supply power from the park, increasing the use of coal-powered energy. Without data on energy use from the park, it is not possible to determine the overall reduction in energy use.

The fuel used in generators was entirely "offset" through the purchase of green energy offsets. Offsets are a way of investing in projects that reduce or avoid green house gas emissions in one place to offset emissions occurring somewhere else.¹³ In this case, the festival worked with Zephyr Energy to purchase carbon offsets for emissions created on-site through burning fossil fuels in generators. Based on the estimated use of 6,955 gallons of fuel (which was considerably more than the actual amount used), 111 "Green Tags" were purchased to offset 155,681 lbs of carbon. According to Sarah Hill-Nelson of Zephyr Energy, approximately 20% of that purchase will help fund an installation of solar panels at Southwest Junior High School in Lawrence. The remainder of the purchase goes to Renewable Energy Credits (RECs) that support the Bowersock Mills and Power Company and regional wind energy projects, and funds other green tag programs sponsored by the Bonneville Environmental Foundation.¹⁴ Such an investment also reflects sustainable practices through the support of local efforts to use renewable energy.

Although there is an ongoing debate about the effectiveness of carbon offsets and RECs regarding where the offsets occur and the type of projects invested in,¹⁵ until alternative energy sources are more widely available and can be used to power all operations (e.g. solar and wind power available on-site) offsets may be the best solution for achieving "carbon neutrality" at events such as this.

In evaluating sustainable practices of vendors at the festival, it was evident that energy use was minimal among arts and crafts vendors. Most vendors only used electricity for a few light fixtures, and typically only at night. Although some vendors used low energy compact fluorescent lamps (CFL) or light emitting diode (LED) rope lights, most used incandescent bulbs or spotlights. Some vendors indicated that they had used CFLs in the past, but noticed that they attracted more insects at night than incandescent bulbs. Other uses include refrigeration and warming, although most cooking and warming used burners fueled by propane, which generates lower levels of emissions than other fuel sources.

Recommendations

Moving towards sustainability will require a transition to more sustainable sources of energy and away from fossil fuels. This is a tremendous challenge at this site considering the current power supply. There are opportunities available, however, to incorporate more renewable sources and reduce overall consumption:

- Encourage vendors to reduce energy consumption by reducing the number of lights used and/or use more energy efficient lighting technology.
- Incentivize vendor energy reduction by offering discounted fees or prime locations near the main foot traffic routes to those that meet an established standard (e.g. a maximum wattage, use of energy efficient bulbs or appliances, providing own renewable energy source).
- Increase the proportion of biodiesel used in generators to utilize a greater overall proportion of fuels produced from renewable biomass.
- Explore opportunities to use biofuels generated from waste vegetable or other frying oils, potentially from vendors at the festival.

- Employ solar generators or other portable sources of renewable energy to power areas of the festival. With appropriate energy conservation measures in place, stored energy or solar powered generators would be capable of powering some areas of the festival.
- Employ solar powered stages (see Resources below). Examples of events that successfully support solar powered stages include Bonnaroo Music & Arts Festival in Manchester, Tennessee; Telluride Bluegrass Festival in Telluride, CO; and the Vans Warped Tour.
- Offset all remaining electrical use generated from non-renewable sources. Currently, only the fuel used in generators is offset. By metering or estimating energy provided by the park, all power generated from fossil fuels would be offset with investments in renewable energy.

Resources

- SolarOne®, a company that manufactures solar generators and lights, produces a generator with a solar array of 80 to 240 watts. For more information see www.solarone.net
- Oak Grove Fabrication, a local business focusing on designing and installing solar and wind equipment. Contact David Sampson at dsam@tctelco.net.
- Sustainable Waves, a solar powered generator and sound and stage provider headquartered in Austin, Texas, offers complete stage systems as well as a solar trailer that is capable of producing 5,600 amp hours. Equipment comes fully charged, and stages can be operated for up to 30 hours without recharging. More information is available at www.sustainablewaves.com.



Figure 1.1: Examples of Solar Powered Stages
(Source: Sustainable Waves)

Limitations

Without specific measurements of energy used - including the proportion of fossil fuels, non-fossil fuels and biomass - it is difficult to effectively assess energy use. Gathering this data would allow the festival to monitor progress towards reducing energy consumption and using more renewable sources of power. In order to effectively monitor progress, the festival should consider methods for metering electricity provided by the park. Energy produced by generators could be estimated by recording the amount of fuel used in each generator and the number of hours operated, or by estimating the energy used by the equipment on site (stages, vendor lights, etc.).

Additionally, considerable financial investment would be required as renewable and stored sources are currently more expensive than energy generated through fossil fuels. For example, stages available through Sustainable Waves are more expensive to operate than standard equipment. Currently, the main stage at Wakarusa costs an estimated \$25,000 to operate and smaller stages cost between \$3000 and \$10,000 for the weekend event. The stages provided by Sustainable Waves, with outputs appropriate for

crowds between 6,000 and 15,000 people, rent from \$3,000 to \$7,000 per day including set-up and operation.

Energy Use Indicators

In order to track progress towards sustainability, the following indicators should be used for future festivals:

- Total energy consumption (or replicable estimate) for the event from set-up to break-down
- Proportion of energy generated from renewable vs. non-renewable sources

TRANSPORTATION IMPACTS

Reduction of greenhouse gas emissions that are considered responsible for global warming is the driving force behind sustainability efforts in the transportation sector. Private automobiles and airplanes are two modes of transportation that are considered particularly damaging to the environment¹⁶. In America, the private automobile is, undoubtedly, the preferred mode of transportation for the majority of the citizenry. A number of factors combine to make the private automobile such a popular toy. Chief among these factors is the abundant supply of cheap fossil fuels that make it economically feasible for most Americans to drive single-occupancy vehicles. However, the uncertainty of oil prices after 9/11 coupled with the current political instability in the Middle East (major fossil fuel suppliers), is generating substantial debate on the need to resort to renewable energy sources such as biodiesel, ethanol etc. The purpose of these initiatives is to reduce America's dependence on fossil fuels and mitigate the negative environmental impacts associated with the combustion of fossil fuels noted above (see Energy).

The quest for sustainability in the transportation sector becomes even more crucial at huge events such as the Wakarusa Music and Camping Festival. The popularity of the festival and its heavy reliance on the private automobile all conspire to make transport one of the major pollutants. The carbon footprint of the festival is thus astronomical especially considering that alternative modes of transport are not aggressively promoted. However, it is extremely difficult to change people's entrenched attitudes on the use of the private automobile as driving is traditionally considered part of the American dream (*or nightmare?*). Nevertheless, effective strategies are required to mitigate the negative environmental impacts of private automobiles, i.e., noise pollution, visual intrusion, traffic congestion, and carbon dioxide emissions.

Approach

The purpose of the transport sustainability audit conducted at the festival was threefold. The first was to observe the modes of transportation currently used by campers, festival goers, vendors, the police, festival organizers, artists, and contractors. The second was to identify which of the current transportation modes could be considered more environmentally friendly and as such replicated in future events. The third was to recommend areas that the festival organizers could work on so as to reduce the festival's overall carbon footprint in future.

To gather information on transportation impacts, auditors solicited for views and comments from festivalarians on the following transport sustainability issues:

- Origin of festivalarians i.e., where they traveled from to attend the festival
- Mode of transportation used by festivalarians to get to the festival
- Prevalence of single-occupancy vehicles, rift sharing, carpooling, and vanpooling

- Place of lodging of festivarrians while attending the festival (e.g. camping on-site, commuting daily to the festival from home, etc)
- Frequency of festivarrians’ travel off-site and the reason for such travel; an
- Mode of transportation used during these off-site visits

In addition, observational were made regarding the different modes of transportation used by the police, vendors, exhibitors, artists, contractors, and event organizers, and data was requested from Zephyr Energy regarding participation in their transportation offset program.

Findings

Origin of festivarrians by state

Survey results from a sample population of 94 respondents suggest that over 19 different states were represented at the festival. Over 40 percent of these respondents hailed from the state of Kansas. This could be attributed to the short distance to the festival that they had to travel as well as the ability to acquire information easily about the festival since they resided within the hosting state. Over 50 percent of the respondents reported that they came from other states. This not only gives an indication of the distance that festivarrians had to travel but also the national appeal of the Wakarusa Music and Camping Festival.

Mode of transportation used by festivarrians to get to the festival

Over 95 percent of the respondents interviewed reported that they used private automobiles to get to the Wakarusa Music and Camping Festival (Fig. 3.1). Such a large percentage of respondents traveling by private automobiles could be attributed to the fact that it is easier to carry camping gear in a private automobile than other forms of transportation. Over 3 percent of the respondents reported having flown in from their respective states. On the other hand, one percent of the respondents reported use of mass transit, i.e., train or public buses to get to the festival. It is clear from this scenario that the carbon footprint of the festival is huge as festivarrians preferred modes of transportation, i.e., private automobile and planes that are considered substantial sources of greenhouse gas emissions.

Mode of Transportation Used

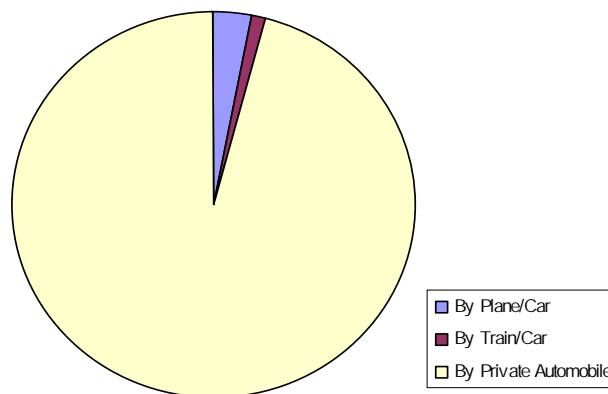


Fig. 3.1: Different Modes of Transportation Used by Festivarrians

(Source: Survey conducted by Audit Team, June 2007)

Prevalence of single-occupancy vehicles, rift sharing, carpooling, and vanpooling

Of the 85 respondents that reported using private automobiles to commute to the Wakarusa musical and camping festival, 12 percent drove single-occupancy vehicles while the rest carpoled or ride shared. The majority of the respondents, i.e. 39 percent reported driving a private automobile with one passenger in the car.

Table 3.1: Number of People in Private Automobile

Number of People in Car	Number of Respondents	Percentage
One	12	14.12
Two	39	45.88
Three	19	22.35
Four	12	14.12
Five	3	3.53
	85	100.00

(Source: Survey conducted by Audit Team, June 2007)

Lodging while at the festival

The majority of the respondents interviewed (87 percent) reported that they were camping on-site, i.e., they were lodging on the festival grounds (Table 3.2). This development significantly reduced the need to use the private automobile to commute off-site for accommodation or other purposes. However, the rest of the respondents had other lodging arrangements that made it necessary for them to commute daily to and from the festival grounds by private automobile.

Table 3.2: Type of Lodging Used by Festivarians During Festival

Type of Lodging	Number of Respondents	Percentage
Camping on-site	82	87.23
Camping off-site	0	0.00
Hotel/Motel in Lawrence	1	1.06
Home/Friends Home	7	7.45
Other Arrangements	4	4.26
TOTAL	94	100.00

(Source: Survey conducted by Audit Team, June 2007)

Frequency of travel off-site and reasons for such travel

Of the 94 respondents interviewed, over 64 percent reported that they felt no need to travel offsite during the duration of the entire festival. From an environmental perspective, this was a welcome development as it significantly reduced the festival's carbon footprint. The rest of the respondents, however, did see

the need to travel off-site. The major reasons for such travel, it was reported, were to sample entertainment and dining facilities that the City of Lawrence had to offer.

Table 3.3: Frequency of Travel Off-site

Frequency per day	Number of respondents.	Percentage
None	61	64.89
Once	26	27.66
Twice	6	6.38
Thrice or More	1	1.06
TOTAL	94	100.00

(Source: Survey conducted by Audit Team, June 2007)

Mode of transportation used for off-site visits

Of all the respondents that occasionally left the festival grounds to go and run errands off-site, more than 97 percent reported using the private automobile. None of the respondents used mass transit. This could be attributed to the fact that there was no public transit from festival grounds to off-site venues. Less than 3 percent of the respondents used other modes of transportation, i.e., bicycling/walking for their off-site visits.

Table 3.4: Mode of Transportation Used During Off-site Visits

Mode of Transport	Number of respondents	Percentage
Private Automobile	34	97.14
Mass Transit	0	0.00
Walking/Bicycling	1	2.86
TOTAL	35	100.00

(Source: Survey conducted by Audit Team, June 2007)

Additional Observations

A relatively huge carbon footprint was probably made by vendors, contractors, and artists. These groups of people had to transport their merchandise, and equipment in heavy-duty vehicles which, in most cases are not relatively fuel efficient. To make matters worse, a number of these heavy-duty vehicles were left idling for the better part of the day. This idling could be attributed to the need to use some of these vehicles to refrigerate foodstuffs and other perishables. It is, therefore, very clear that the need to refrigerate foodstuffs and perishables significantly added to the festival’s overall carbon footprint.

On the other hand, 130 golf carts each running on an 80% biodiesel/ethanol blend were employed by event organizers for security, supply, maintenance, administration, taxi, and shuttle services. The police also had a number of golf carts that they used for security purposes to patrol the festival grounds.

However, information on how many golf carts and the amount and type of fuel used was not made available to the audit team.

In terms of mass transit, four (4) Waka shuttle buses were used to ferry festivarrians around the festival grounds. The buses were running between the hours of 11:00am and 5:00pm during the entire event while another shuttle bus was running from 12:00pm to 8:00pm from the lake to the Hy-Vee Store. All the Waka shuttle buses were running on 80% diesel/ethanol blend. However, the Waka shuttle buses were never used to ferry festivarrians to off-site venues within the City of Lawrence.

There was indeed adequate parking space around the festival grounds for both campers and daily festivarrians. The volunteer parking attendants did a wonderful job of directing traffic to respective parking spaces and as such unnecessary traffic congestion and idling were avoided. However, the use of the green spaces around the festival grounds for parking purposes was environmentally damaging (Fig. 3.1). Therefore, off-site designated parking facilities should be considered as additional parking space for the festival. Additionally, there is need to reduce the occasional idling that was observed during peak periods (Fig. 3.2), thus reducing unnecessary emissions. This type of idling was due to the time drivers had to wait to find a parking spot, contributing unnecessary emissions.



Fig. 3.1: Vehicles Parked on Green Spaces in the Camping Area

(Source: Photograph taken by Audit Team, June 2007)



Fig. 3.2: Vehicles Idling as they Await Allocation of Parking Spot

(Source: Photograph taken by Audit Team, June 2007)

Green Travel and Carbon Offsets

The first logical step in making the Wakarusa music and camping festival green or environmentally-friendly is to reduce, substantially, greenhouse gas emissions (carbon footprint) from the festival's transportation sector. This can be done by aggressively promoting alternative modes of transportation, i.e., walking, cycling, use of energy-efficient vehicles, and vehicles powered by renewable energy sources. After substantially reducing the festival's greenhouse gas emissions, then the net resulting carbon dioxide emissions could be offset through the purchase of renewable energy credits.

Zephyr Energy, a green tag provider working in collaboration with Wakarusa organizers, sold travel offsets to festiviarians, compensating for emissions associated with travel to the event. Offsets were available for sale at the time of ticket purchase and in the festival vending area. Offsets were available for travel in 3 categories:

1. Driving Near - traveling within Kansas or from states bordering Kansas (except Colorado)
2. Driving Far – traveling from other states up to 1,300 miles round trip
3. Flying – traveling more than 1,300 miles round trip.

For each category, an average was calculated using distances traveled by festiviarians in 2005. Travel estimates are summarized in Table 3.5 below.

Table 3.5: Data on Estimated Per Traveler Carbon Emissions

GROUPS	Total Number of Travelers	Total Distance Traveled	Distance Per Traveler	Total CO2 Emissions	CO2 per Traveler
Group A (Driving Near)	6,611	2,049,996	310	1,873,697	283
Group B (Driving Afar)	5,805	5,572,830	960	5,093,567	877
Group C (Flying)	2,583	5,270,067	2,040	6,429,482	2,489

(Source: Compiled by Zephyr Energy, Bonneville Environmental Foundation, July 2007)

Zephyr Energy reported the following participation in the offset program:

- 156 festiviarians driving from "near". This group of travelers were able to green their travel to an estimated 44,148 pounds of carbon
- 88 festiviarians driving from "far" (i.e., not "near" and not flying). These travelers greened their travel by an estimated 77,176 pounds of carbon;
- 13 travelers flew to the festival and managed to green their travel by an estimated 32,357 pounds of carbon.

Recommendations

Generally, festiviarians employed the private automobile to commute to and from the festival grounds. It is therefore necessary to promote other modes of transportation that are more environmental friendly if the carbon footprint of the Wakarusa musical and camping festival has to be substantially reduced.

- Continue with the concept of purchasing carbon credits to offset musical artists' travel.

- Continue to offer offsets for festivarians. Consider incorporating the cost of offsets into the price of the ticket based on an average calculated from the previous year's attendance.
- Provide off-site parking to mitigate the impact of vehicles on the greenery that was used as parking space at the festival. Event organizers could, for example, solicit KU for help in providing these remote parking spaces. After parking in these remote parking spaces, festivarians could then be shuttled by hydrogen or biodiesel powered buses to the festival. This could significantly reduce idling tendencies that were visibly evident at the festival (see Fig. 3.2).
- Provide a shuttle service with multiple pick-up points for festivarians living in Lawrence but camping on site. Such a service would require use of a trailer or touring bus to transport camping equipment from the pick-up site to the campground.
- Encourage increased utilization of bicycles by the police, event organizers, vendors/exhibitors, and festivarians. Encourage people to walk or ride bikes during the festival especially when weather conditions permit.
- Provide a bike rental service for festivarians to commute around the festival grounds.

Limitations

The audit team encountered a number of limitations/constraints when undertaking a transport sustainability audit at the Wakarusa music and camping festival. Obviously, the first major constraint was the limited time available to the audit team to conduct a thorough transport sustainability audit. There is need for a detailed audit of the carbon footprint made by contractors and artists, and vendors. It is the hypothesis of the auditing team that the activities of these three groups had a significant contribution to carbon emissions.

In the future, further information must be gathered on vehicle types used by festivarians, as well as staff and volunteers who travel to work at the event. Depending on the fuel efficiency of these vehicles, environmental impacts could vary significantly.

Transportation Indicators

For purposes of tracking progress towards transport sustainability, the following sustainability indicators should be used for future festivals:

- Proportion of festivarians participating in carbon offset programs
- Total number of cars on-site
- Total amount of fuel used for transportation on-site (golf carts, buses, and other festival vehicles).
- Proportion of vehicles (golf carts, shuttles, contractors and artists trucks) using renewable energy such as biodiesel.

WATER

Water is one of Earth's most abundant resources, covering nearly $\frac{3}{4}$ of its surface. Sustainability becomes an issue when treatment methods and water use are excessive or harmful for the surrounding ecosystem. Wakarusa boasts an abundant water source, so overuse is unlikely. However, contamination of natural water sources through chemical or trash infiltration is always a serious risk. Modern society creates massive amounts of waste that can seep into ground water, aquifers and reservoirs. Sustainable water use requires two things: 1) reducing water use to levels that do not deplete area resources, and 2) ensuring that human development and water treatment do not contaminate resources.

Approach

Water use was evaluated by examining quantity of use and issues of water quality. Water facilities were audited by visual inspection throughout the course of the weekend. This included inspecting water stations, shower facilities and port-a-potties for general use rates and cleanliness. Primarily central, high traffic areas were observed. Following the festival, Clinton Lake State Park was contacted for information on their water treatment procedures and facilities.

Findings

This year's festival used approximately 120,000 gallons of water. According to the festival, 12,000 people attended while around 2,000 volunteers and crew were also on site. It is difficult to estimate per capita water use with these numbers, as many people likely brought water from home or purchased it on-site. In addition, some festivarrians attended for a day or less, while others spent five or more days on site. However, we do know enough about water use to draw broad conclusions. According to Todd Clark of the US Department of Energy, average personal water use in the US is between 52 and 79 gallons per day.¹⁷ By these numbers, 120,000 gallons would accommodate a maximum of 2,307 people for one day. Wakarusa managed to support six times that number for at least one day, and often more.

It is clear that Wakarusa's water usage is very, very low for such a large scale event. There are many reasons for this. First and foremost, the majority of festivarrians were camping. This eliminated most daily water use, including sinks, toilets, laundry, air conditioning, and for many people, showering. Water use was therefore limited to a few hand washing stations, drinking water and vending/backstage use. The extremely low demand for water made sustainable use a much simpler task.

Another reason water use remained low was the sale of bottled water on site. This was not included in water usage estimates for the festival. In addition, it indicated a negative environmental impact as containers were recycled or thrown away. Reuse is always more sustainable and efficient than recycling or trash.

Reducing overall water use quantity is the ideal first step to reduce impacts. However, as the community already consumes a minimal amount, sustainable treatment of the water quality become priorities. The Clinton Lake State Park operates its own suspended growth treatment process on site. This process uses aerobic biological processes, via bacteria and protozoa, to biodegrade effluent. According to park manager Jerry Schecher, used water empties into the park's sewage system, which flows into oxidation ponds. These ponds are rich in bacteria that digest solid waste into sludge. This creates a blanket layer in the retention pool. Water is released into the air through evaporation. If the pools become too full, fluid is vented into the air.¹⁸ It is important to note that this form of treatment uses organic biological processes in an efficient amount of space.

The treatment system is inclusive of all water use at the park. Any waste water that does not flow initially through the park's sewer system is collected in holding tanks or port-a-potty vaults. These are emptied by the port-a-potty company and dumped into the oxidation ponds on site.

Recommendations

Sustainability of water use is difficult to determine without additional evaluation of water sources. Overall, Wakarusa does an excellent job with sustainable water use. Usage is remarkably low, the process is environmentally sound and there is little to no transportation or energy use impact. However, steps can be taken to further minimize impacts:

- Ensure that port-a-potty companies do not use harmful chemicals in their vaults.

- Protect the existing suspended growth treatment process. While the park's isolated location makes contamination less likely, the festival should work with the park to guarantee the facility's quality.
- Promote use of non-disposable, reusable containers (see: Waste & Recycling, Goods & Services).
- Avoid the use of bottled water to reduce impacts of transportation and packaging.

Resources

Jerry Schecher, Park Manager at Clinton Lake, is an immeasurable resource with regards to water treatment. Because the facility is contained on site, there is ample opportunity for the festival to work with him in securing sustainable action.

Limitations

The biggest limitation was an inability to audit the waste being deposited in retention ponds. There was no way to determine if trash or recyclables found their way into retention ponds, or how this could affect the sustainability of the treatment process. Likewise, there is no data for exactly how much waste was deposited or from what source it came (showers, toilets, etc). These factors could have a long-term effect on water quality and potential contamination.

Future audits must include visual inspections of water sources and treatment facilities before and after the event. This will allow the festival to determine its physical impact on the water system itself. In addition, a systematic approach to visual inspections on site must be developed. Thorough inspection of all water stations, port-a-potties and shower facilities during the festival would provide more insight into potential contamination and overuse of water systems. Any other water dispensation on site should also be evaluated (i.e. hoses, sinks in trailers/busses, etc.)

Another limitation was the dearth of information available on chemicals used by the Johnny-on-the-Spot company. E-mails to their website resulted in a product catalog, but little could be found about the "deodorant liquid" used in holding tanks.

Finally, without more information on the source of bottled water, as well as the sustainability of water treatment systems within the watershed (water treated locally and treated on-site), it is difficult to draw conclusions about the quantity of water used.

Water Use Indicators

- Total water use per capita
- Proportion of bottled water sold and/or used on site vs. water used from a sustainable local source
- Total raw sewage emptied into oxidation pools

WASTE & RECYCLING

Solid waste is one of the most obvious environmental impacts of any event. The environmental impact of waste includes greenhouse gas emissions from material manufacture, transportation, use and disposal. Harmful emissions are particularly severe during industrial production and disposal of non-recyclable plastics, Styrofoam, and other products. Even recyclable materials require energy to be transported, cleaned, broken down, remade into new products, and delivered for use.

Recyclable materials are more sustainable because of material reuse, but true sustainable action requires the reduction of all harmful commercial and industrial processes. Reducing use of all materials is the first

step. Next, efforts should be made to further reduce waste by utilizing reusable products. Recycling is the last step. The festival should maximize recyclable materials that reduce trash output. Any or all of these steps can be used to reduce the event's ecological footprint.

For festival organizers, sustainable action enables festivarrians to make sustainable choices. This requires manpower as well as an efficient system for people to reduce, reuse and recycle. The easier it is on each festivarrian, the more likely they will be to behave sustainably. In addition, the festival organizers should dispose of waste in the most efficient manner possible, as landfills and incinerators contaminate the environments they occupy and fuel emissions from transporting waste are also harmful to the environment.

Approach

Waste and recycling tonnage produced and removed by the festival is recorded each year. Materials used and provided by the festival and vendors were also analyzed through interviews and general observation. Recycling centers and dumpsters were monitored in an informal waste audit. This helped identify recyclable materials that were thrown away, as well as how effectively recycling centers were used by festivarrians.

Interviews were another essential component of data collection. Dozens of vendors and festivarrians provided insight with their personal experience. Suggestions for improvement were also recorded from both groups. To measure awareness and waste generation, festivarrians were asked to rank the following factors:

- Effort to reduce impact (including examples)
- Non-recyclable waste created
- Availability of recycling bins

Vendors were asked similar questions regarding their trash use:

- Waste generated by each booth
- Use of biodegradable and sustainable products

Several hours were also spent traveling around the site with members of the Recycalusa program. This included formal interviews with Recycalusa coordinator Rylan Ortiz, as well as members of his staff. Recycalusa's primary tent, recycling centers, equipment, facilities and operations were also explained and demonstrated, resulting in additional informal interviews and observational data.

Findings

The Festival produced just over 37,000 pounds of total waste. Of this amount, approximately 16,000 pounds were diverted from landfills, totaling 43% of the festival's waste. This is an increase from 34% last year, although those numbers did not include glass recycling.¹⁹

The success of Wakarusa's recycling was made possible by the Recycalusa Program. This program is coordinated by the Students for Environmental Action group at Kansas State University. Over 120 volunteers managed and sorted the dozens of recycling centers throughout the park, which included containers for plastic, glass and aluminum, as well as trash. Their efforts included morning cleanup in the festival grounds, providing trash and recycle bags for each campsite, and creating awareness through the festival pamphlet and their presence on the grounds. During the day, Recycalusa members also offered free prizes at their tent, including raffles for a New Belgium bicycle, as incentive to bring in recycle. Their commitment to sustainability extended to color-coding recycling areas and personally

assisting people with sorting their waste.²⁰ Following the festival, the group spent four days cleaning up the site to reduce the direct physical impact of the event and ensure that all waste materials were collected.

Other efforts by Wakarusa to reduce and control solid waste included:

- Contractually requiring vendors to use compostable materials
- Providing street side garbage pickup each morning
- Providing incentives (via New Belgium) to reuse plastic cups
- Cell Phone recycling services

An informal waste audit suggested that a majority of people, with help from Recycalusa volunteers, were sorting their trash properly. However, the audit also raised several red flags. The dumpster outside of the Hy-Vee store was filled with Styrofoam and plastic containers. They were clearly not held to the compostable products standard. The same was true for the VIP area, where Styrofoam coffee cups and dishes were prevalent. Cardboard and chipboard were also found in numerous trash sites. In fact, several vendors reported having to throw away large amounts of cardboard because no recycling option was available. Bottles and cans were visible in multiple trash sites, but these were few and far between when compared to the number being recycled. Finally, it should be noted that very few recycling/trash areas were found overflowing. Only a few high traffic areas became inundated later on in the nights.

Interviews with vendors revealed that many produced little or no trash. Most non-food vendors claimed to create zero trash. Many reported reusing, recycling or composting 100% of their waste. One vendor claimed two bags of trash for the weekend because of their children. Food vendors varied greatly in their trash production. Five food vendors used less than one bag of trash for the weekend, with all other waste being compostable or recyclable. Meanwhile, three other food vendors estimated trash output of 3-4 bags per day. None of the vending numbers included trash produced by patrons of the booths. On average, however, all vendors, including food providers, created far more compostable items and recycling than trash.

Interviews with festivarrians made it clear that recycling stations were the primary means for sustainable action. In response to the statement "I have made an effort to reduce my impact while at this event", the average response was 3.453, right between agree and strongly agree. The majority of respondents cited recycling and using trash cans as their example. Other responses included reusables and riding bicycles rather than driving. In response to the statement "I am creating very little waste that cannot be reused or recycled", the average was 2.961, just short of agreement. This indicates that festivarrians are conscious of their waste, but could improve in reducing it. Several people recommended composting and increased number of water stations as potential improvements. Less frequent requests included more port-a-potties, more recycle bins and reduced Styrofoam in festival areas.

Recommendations

Numerous sustainable practices are in place at Wakarusa, but there is also room for improvement. Many of these would be relatively simple tasks. They would expand the positive impact of systems that are already in use. Increasing the number of recycling stations, particularly near dumpsters, is one option. This would discourage festivarrians from taking the easy way out. For example, on the main walking path from the campgrounds to the festival grounds, there was only one recycling center set up along the street. In this high traffic area, many people were content to throw their trash on the ground or in the weeds, intensifying cleanup after the event.

Another possibility is to actively coordinate Recycalusa volunteers with festival volunteers. At the front gate, this would expedite trash/recycle bag distribution. Having one volunteer at each entry lane could allow the festival and Recycalusa to distribute information to each vehicle, ideally with 24 hour service. On the festival grounds, increased coordination would strengthen use of recycling and reusables among festivarrians. All festival workers, including St. Bernard's and other event staff, should be informed about sustainable goals. As the festival's eyes and ears, they should feel empowered to promote sustainable action and assist people with recycling efforts.

Improved signage and lighting at recycling stations is yet another option. Consider taping bottles and cans to the proper containers or posting signs with examples of various recyclables. Expanding on the color coding with physical examples would aid festivarrians. It is impossible to make things too simple. Recycling centers should be placed near 24 hour lights whenever possible.

Finally, reducing glass container use would have many positive benefits. Although it is recyclable, glass is heavy, bulky and energy intensive to produce and reuse. It also creates a safety hazard and serious physical pollution as broken glass is nearly impossible to clean up. It is unnecessary to prohibit glass entirely, but it is also unnecessary to advertise its use on the website. Vendors and stores within the festival should not sell glass. Encouraging people not to bring glass would help make recycling more efficient. Despite its weaknesses as a recyclable material, however, it is important to note that recycling glass is still much more sustainable than throwing it away.²¹

Other changes would involve more extensive planning and coordination. The most essential of these, is to provide composting options. Many vendors, as well as some festivarrians, lamented its absence. This is a strong indication that composting efforts would show significant results. Particularly food service vendors claimed large amounts of compost that had to be thrown away. Coordinated composting would also allow the festival to capitalize on their policy of requiring biodegradable plates and utensils in vending areas. This requirement was poorly enforced and blatantly violated by some vendors, but the groundwork has been laid for a massive breakthrough in reducing waste. The first step forward would be to aggressively enforce compostable guidelines. The festival should be prepared to shut down operation for vendors that don't comply. This precedent has been set at other festivals, including Bonnaroo, which exclusively uses a company named EcoProducts.

EcoProducts is a Boulder, CO based company that offers environmentally and sustainable products ranging from plates and spoons to industrial paint and tile. They set up accounts for festivals that allow vendors to pre-order supplies. These supplies are then shipped to the festival and are available for vendors when they arrive. Additional products can be purchased throughout the weekend. Without a doubt, these biodegradable products are more expensive, which may be a deterrent for some vendors. There is also no doubt that it would greatly reduce the environmental impact of the event.

After ensuring enforcement, the next step is to locate a facility for composting. According to Jami Sweeney, composting has been pursued without success, although there is hope for the future. Several facilities offer composting in Douglas and Johnson County, with some restrictions. The City of Lawrence's composting service, for example, is restricted by permit for "city use only". Multiple attempts to contact program director Bob Yoos were unsuccessful. Facilities operated by the City of Olathe and the Johnson County landfill are other options, although phone calls to these facilities could not be connected either. Perhaps these roadblocks were deterrents for the festival as well. Regardless, composting would significantly reduce the waste impact of this event. Expanding composting to festivarrians would magnify this positive effect.

Cardboard recycling is another way to make a positive impact in vending areas. Volunteers should collect cardboard and chipboard when they pick up other waste and recyclable products. Expanding both cardboard and composting to festiviarians would be an additional step in reducing waste impact. Finally, several festiviarians and vendors noted that they never received trash or recycling bags and that their efforts to locate bags proved futile. It may be advantageous to have a single person to coordinate recycling and waste efforts in vending areas. This position could encompass enforcement of composting guidelines, as well as collecting and facilitating vendor recycling.

All of the above options utilize recycling to minimize environmental impact. However, reducing the total amount of waste created via reusables is even more desirable. The New Belgium sticker incentive was an excellent concept that failed to reach its potential. This incentive persuaded festiviarians to reuse their beer cups each of the event's four days, collecting a new sticker each day. By presenting the cup with all four stickers on Sunday, raffle prizes and giveaways were awarded. While good-intentioned, the incentive was poorly publicized, and the benefits were minimal for the amount of effort required by participants. Another idea would be to offer reusable cups at each beverage station. The first drink would be full price, but subsequent drinks could be discounted if original cups were brought back. Ideally, this incentive would apply to alcoholic and non-alcoholic beverages.

Another way to encourage reusables is through the watering stations. Offering reusable containers at these locations would encourage festiviarians to reuse. Furthermore, improved marking of water stations would increase usage and ideally cut down on bottled water. Attaching balloons would be a simple way to advertise location. Finally, Wakarusa should provide as many watering stations as possible to discourage bottled water and enable reusable containers.

Resources

- EcoProducts can be located at EcoProducts.com. The contact for Bonnaroo's account is Jim Lamancusa, who can be reached at (303) 449-1876x103. His e-mail is jim@ecoproducts.com. Jim has the experience and the knowledge to set up an ordering program for Wakarusa vendors.
- Bombay Station, one of the vendors at Wakarusa who come close to 100% compostable waste, is run by Ashlie Beckham. She has a wealth of knowledge on composting, as well as festival coordination and vending. She can be reached at BombayStation@yahoo.com. Her phone number is (720) 339-3310.
- Numerous resources for both festival coordinators and attendees are available at www.agreenerfestival.com/waste.htm. There are links to sustainable camping resources, as well as composting programs that have been used at other festivals.
- Planet Bluegrass coordinates multiple festivals over the course of each summer, including Telluride Bluegrass festival. These events are considered among the most sustainable in the music industry. Their site, www.agreenerfestival.com/waste.htm, details efforts made since 2002 to reduce waste and provide composting/recycling options for festiviarians.
- Composting services within the state are listed at the Kansas Solid Waste Facilities Database: <http://public1.kdhe.state.ks.us/Landfills/Landfills.nsf?Opendatabase>. This is a searchable database that provides listings of licensed composters in Kansas, as well as information about their permits.

Limitations

The major limitation with auditing waste and recycling was a lack of manpower. A formal waste audit of each recycling center would be ideal for measuring missed opportunities. Increased manpower would also allow festiviarian surveys to multiply. The vendors were manageable for a three man team, but with 12,000 attendees, more help was needed to get significant statistics from festiviarians.

Additional information on the mass of each type of recycling is essential to a full audit. For example, glass requires more energy to recycle than aluminum. If the majority of recycling tonnage was aluminum, the environmental impact would be reduced compared to an abundance of glass recycling. It is also important to know where and how recyclables were disposed. If they were being transported to distant locations for recycling, the positive effects of recycling would be reduced. The means of transportation has a very meaningful impact. Biodiesel trucks or train transport would reduce the impact of transporting materials. Finally, the sustainability of processing facilities would be a factor in the ecological impact of recycling efforts.

Waste & Recycling Indicators

- Total landfill waste produced
- Total waste recycled
- Proportion of landfill waste to recycled waste
- Proportion of each type of recyclable to total recycled
- Proportion of festivalgoers that utilize recycling

GOODS & SERVICES

The goods and services available on-site can impact a range of social, economic, and environmental factors. Moving towards sustainability requires the inclusion of goods and services that promote the use of natural and recycled content, incorporate organic and local foods, and reduce waste and energy consumption, as well as sponsorship from organizations that promote and exhibit sustainable practices.

The products available on-site have an impact on the sustainability of the event. The manufacture of merchandise can contribute to resource use, emissions through manufacturing and transport of goods, waste generation and other environmental impacts. The origin of materials sold contributes to factors associated with transportation, as well as economic and social impacts depending on where the merchandise is made and under what labor conditions. Similarly, food provided at the festival can serve as an indicator of sustainability based on these same criteria, with the additional impacts of agricultural practices. Food production can be resource intensive and contribute to water pollution through the use of chemical pesticides and fertilizers.

The impact of the artists performing at the festival must also be considered. Impacts can include transportation to and from the site, as well as energy and goods consumed while on-site and on tour. Many artists are attempting to reduce their impacts while on tour by purchasing eco-friendly products, employing reusable water bottles to reduce waste, fueling tour vehicles with biofuels, and purchasing offsets to balance their contribution to green house gas emissions with investments in renewable energy. Examples of bands participating in such programs include Guster, Dave Matthews Band, and a number of other artists associated with Reverb, a non profit organization that educates and engages musicians and their fans to promote environmental sustainability²².

Approach

Information regarding vendors in the main festival area and campground was gathered through interviews and observations. Thirty-two vendors were interviewed to gather additional information, including:

- Presence of an environmental/sustainability theme

- Availability of eco-friendly, recyclable, or reusable merchandise or locally/hand made products
- Purpose of electricity use
- Waste generated by the booth
- Use of plastic/paper bags upon sale of merchandise

Additional questions for food vendors determined if:

- Vendors used food that was locally grown or organically grown
- Vendors were following the policy of using biodegradable plates, cups, and utensils

Observational data was also recorded regarding products and services available from large displays (Jeep, MLS Authentic, and American Spirit) as well as services provided by Hy-Vee, a Lawrence grocery store and catering service.

Following the event, artists that performed at the festival were contacted to gather information about individual practices employed while on tour. An email containing a short survey was sent to 85 of 108 possible contacts, including band members, managers, and publicists. Only artists with readily available email contacts were included in the survey. Information was requested regarding:

- Use of biodiesel, ethanol, or other alternative fuels for tour vehicles and/or purchase carbon offsets
- Use reusable water bottles, dishes, utensils, etc. on tour and/or on stage
- Effort to reduce waste, recycle, or compost while on tour
- Requests for local, organic, or vegetarian food while on tour

Artists were also asked to comment on other sustainable practices they employ while on tour and offer suggestions for making this component of the festival more sustainable.

Findings

Of the 32 vendors surveyed, 14 claimed to have an “eco-friendly theme” and more than half offered products that were handmade, constructed of recycled or natural materials, or included organic food options. When festivarrians were asked to rank the availability of eco-friendly products, the most common score was 3 of a possible 4.

Many arts and crafts vendors offered a variety of products that were eco-friendly, made of recycled materials, or represented a durable, long lasting product. Examples included hand crafted artwork, jewelry made from hand crafted glass and natural materials, and products made from recycled or reclaimed fabric.

As noted above (see *Energy Use*), energy use was minimal among arts and crafts vendors, as was waste generation (not including disposable plates, napkins, and utensils generated by food vendors). Most noted that they repacked all unsold merchandise in the containers they arrived with and were not leaving any waste behind. Few sold items in excess packaging, nor did they place items in plastic or paper bags for customers. Some offered this as an option only when requested but used recycled plastic bags for this purpose. Employing such practices not only reduced the waste generated by vendors but eliminated additional waste that could have been left behind by festivarrians.

Examples of vendors that represent sustainable practices include:

- A clothing vendor from Michigan who sold hand made products from salvaged material, hemp, or organic cotton. Materials were dyed with non-toxic agents, some with organic dyes that were hand produced. The booth was lit at night by a string of low energy LED rope lights.

- A Kansas City jewelry maker who crafts pieces from handmade glass, reclaimed spoons and forks, and reclaimed denim.
- A vendor selling bags made from recycled billboards, tire inner tubes, and other reclaimed products and traveling in a van fueled by vegetable oil.

Despite these positives, there were a number of vendors providing imported goods (clothing, jewelry, artwork, etc.), mainly from China, Nepal, Pakistan, and Thailand. Although these items are popular among festival goers, the long distance involved in transporting these items contributes to fossil fuel use (see *Transport*). While some vendors mentioned that they sourced all materials from “fair trade” or “sweatshop free” sources, additional information is needed to ensure that economic and social components of sustainability are met regarding fair labor conditions, as well as environmental impacts to these regions due to the acquisition of resources and manufacture of goods.

Food vendors were less likely to meet criteria of sustainability, such as organic, vegetarian, local and healthy food options. Many of the vendors on site that provided information about the source of their ingredients listed US Foods or other centralized wholesalers, and not local sources.

Examples of food vendors that represent sustainable practices include:

- Local Burger, a Lawrence restaurant that supports local farms, and recycle and compost waste
- Bombay Station, a Boulder, CO restaurant that uses local organic food, composts and reuses all non-recyclable containers. (See: Waste/Recycling, Resources)

Vendor contracts contained language requiring the use of more environmentally-friendly products and provided suggestions possible sources for such products. Sustainability requirements were stated as follows:

1. Provide biodegradable (corn starch or sugar cane based) silverware and utensils to customers.
2. Do not provide single use condiment packs. Please provide bulk condiment dispensers.

Of 14 food vendors surveyed, 9 were using some biodegradable items, most often plates. Styrofoam cups and plastic utensils were commonplace, as were condiment packets (no data was recorded on this requirement). Comments received from vendors regarding these requirement included:

- Utensils were too expensive to purchase.
- It is not fair to vendors who are making this effort that not all vendors are following this requirement.
- An option to compost needs to be available on site.

In addition to the products sold by vendors, the impact of travel by these individuals to the festival must be considered. Information on travel was not recorded for all vendors; however, of the 24 vendors for which locations were recorded, only 3 were from Lawrence. Three additional vendors were from the Kansas City metro area and one traveled from Leavenworth. The remaining vendors traveled to the event from as far away as California, Oregon, Florida, and Vermont. The lack of local vendors not only indicates greater impacts due to transportation but does not support more sustainable development of local economies.

Hy-Vee, a Midwest grocery chain, provided a number of services including a general store and catering backstage and in the VIP area. The general store provided bottled and canned beverages; individual- or travel-sized personal and food items; conventionally grown apples, oranges, lemons, and limes; and camping supplies. Although reusable plastic coolers were available, disposable Styrofoam coolers were placed at a more convenient location in the general store, encouraging the purchase of a less

environmentally friendly product. Prepared breakfast items were also available at the general store. As with Hy-Vee catering services provided at other locations on the festival grounds, food was served from aluminum trays that were discarded after use. Styrofoam plates were also used at all locations.

Data on energy use and materials was not collected for large displays. However, activities at these displays indicated considerable use of energy.

- Jeep utilized multiple video displays, and track lighting.
- The American Spirit display, while advertising their use of all natural products, the totally enclosed display included large video screens, fans, and lighting.
- MLB Authentic used a trailer with multiple video game stations.

Of the 85 bands surveyed, only 15 (less than 18%) had responded at the printing of this report. Of those reporting on their sustainable activities:

- One band reported using biodiesel and another purchased offsets for travel.
- Most try to use reusable water bottles and/or other items, and two commented that our contact with them encouraged them to start using reusable containers.
- Most make effort to reduce waste, recycle, or compost while on tour when services are provided.
- Most prefer local, organic, or vegetarian food but do not always find it available.

Comments received from artists focused on the need to promote the use of reusable containers by providing more water stations and beverages on tap (as opposed to served in bottles or cans), as well as the presence of eco-friendly plates and cutlery at some locations and/or the lack of such items backstage.

Recommendations

- The festival should set a good example by selling merchandise that reflects a theme of sustainability. This includes organic cotton T-shirts and hats and recycled content paper posters. Consider offering downloads of albums purchased online as an option to shipping plastic compact disks.
- Seek participation from local vendors and businesses to reduce impacts associated with transportation while supporting local economies.
- Seek participation of vendors that use organic or local foods; sell merchandise with recycled, recyclable, natural or organic content, and employ other sustainable practices.
- Offer incentives for vendors that do promote sustainable practices. This includes offering discounted fees or prime locations near the main foot traffic routes to those that meet established criteria (e.g. natural, organic and non-toxic products; local, organic, and vegetarian foods, minimum use of energy, etc.).
- Consider a selection process for vendors to allow only vendors that meet established sustainability criteria.
- Require all serving ware to be biodegradable. One possible solution to enforcing this is to form a partnership with an eco-friendly manufacturer and require all paper products be ordered through the same company and delivered to the festival site.
- Explore the possibility of vendors serving food items on reusable plates provided at the gate or by individual festival goers (see Waste Reduction/Recycling)
- Provide a reusable cup to all festival attendees upon entry that can be used for any beverage served. Require vendors to offer price reductions for drinks purchased in reusable cups. An insulated cup would be preferable to allow use of both hot and cold beverages.
- Work with sponsors that support organic and local food to incorporate this into services provided by the festival, such as catered areas and beverages.

- Work with catering companies to incorporate more vegetarian, organic, and local foods; reduce waste by serving food from reusable serving dishes; and using eco-friendly plates, cups, and cutlery.
- Provide information prior to the event, as well as educational opportunities during the event, for all vendors and artists regarding sustainable practices. One possible approach is a discussion forum offering artists the opportunity to share experiences with each other and learn about eco-friendly touring practices.

Limitations

Additional research should be conducted into product sourcing and compliance with biodegradable serving ware and bulk condiment requirements. The majority of the information gathered on vendors was on a volunteer basis. In more than one case, a follow-up visit to vendor stations showed that practices identified in interviews were not being followed. For example, a clothing vendor claimed to sell organic cotton and hemp t-shirts, but neither were found during an inspection of merchandise. Due to time constraints, not all vendors were interviewed, so a complete representation is not available. We also did not record information on travel for each of the vendors so we were not able to fully assess the impact of traveling to the event.

Goods & Services Indicators

In order to track progress towards sustainability, the following indicators should be used for future festivals:

- Proportion of vendors using environmentally and socially responsible products and ingredients or meeting minimum sustainability criteria established by event organizers
- Energy consumption within the vending area (see *Energy* for measurement suggestions)
- Proportion of local vendors as defined by event organizers (e.g. from within 100 miles)
- Proportion of bands employing sustainable practices on tour or meeting minimum sustainability criteria established by event organizers
- Proportion of funding from sponsors that support and exhibit sustainable practices

PHYSICAL IMPACT

The physical impact of thousands of visitors to a normally isolated site can be devastating. Ruts from heavy machinery, trash left by festival goers and crew, and dead grass from tents and trampling are just a few examples of potential harm. In addition, wildlife is sure to be displaced for the weekend as both crowds and noise prevent them from using their natural habitat. Minimizing the short-term impact on the site and eliminating any long-term effects are essential goals.

Approach

Site visits before, during, immediately after and one month after the event provided perspective on the physical condition of the site. Interviews with Park Manager Jerry Schecher and Recycalusa Coordinator Rylan Ortiz brought additional perspective and observation. Photographs were used to document conditions and affirm the effect on the landscape.

Findings

Despite 12,000 festivarrians and over 2,000 volunteers and crew members descending for 5 days, the overall physical impact of the event was surprisingly limited. This was due to several factors. First and foremost, the extensive efforts of Recycalusa volunteers for four days following the festival reduced

leftover waste to almost nothing. Notable exceptions to this were cigarette butts and broken glass, which proved nearly impossible to remove in some places.

The festival's ability to use existing roadways was another major benefit. With the exception of stage setup and take down, heavy machinery and trucks were able to be kept on asphalt and gravel roads, which eliminated ruts and other soil damage. The lack of heavy rain during the festival also helped reduce this impact, as smaller vehicles (golf carts, cars, etc.) had little effect on grassy areas. Stage and vending areas, with heavy foot traffic, also benefited from dry conditions that limited ruts and soil erosion.

The most significant factor minimizing long-term damage was the natural resiliency of the prairie ecosystem. According to Jerry Schecher of Clinton Lake State Park, the predominant grasses on site are brome K-31 tall fescue and red fescue. While there were signs of soil compaction and many dead patches were visible, the grass began to reclaim territory within a few weeks. The short-term, intensive impact of the festival did only minor damage to the grass, which evolved under massive herds of grazing buffalo. This caused prairie grass to develop into a robust plant with a rapid recovery rate.

The festival took several additional steps to reduce the physical impact of the event. Many of these involved spreading out impacts to capitalize on the natural resiliency of the landscape. These were highly effective in aiding the quick recovery of primary grasses:

- Adding gravel, mulch and straw in areas of high traffic
- Building wooden crosswalks in low-lying, high traffic areas
- Mowing large amounts of space to allow festivarians to spread out
- Providing multiple traffic lanes for vehicles entering the festival

Mr. Schecher did note one definite negative impact. Secondary plant communities in the area are losing ground to undesirable plants. Native broadleaf plants that suffered damage are much less resilient than the primary grasses. These communities are difficult to replace and often lose ground to "nuisance broadleaf plants" that encroach on the damaged areas.²³ This is a diversion from the natural ecosystem caused by the festival and other events at the park.

Recommendations

Wakarusa does an excellent job of reducing its impact on the physical environment of Clinton Lake State Park. There is no way to avoid some negative impacts during the festival, but efforts to mitigate those impacts afterwards are very successful. The festival should continue to pursue its extensive cleanup, while expanding efforts to mitigate the effects on native plant life.

A few ways to continue successful management include:

- Expanding website publicity of sustainability efforts. This could be done with a direct link displayed prominently on the main page or with sustainability information placed right on the home page.
- Continuing efforts to create multiple transportation lanes for both vehicles and pedestrians. This is necessary to mitigate the long-term effects of soil compaction.
- Providing resources to ensure that natural grasses maintain predominance. Post-event efforts to promote natural growth of desirable primary and secondary plants would eliminate negative physical impacts cause by encroaching nuisance plants.

It is important to note that individuals will always make choices that have a negative impact, such as throwing trash into the lake or breaking branches and uprooting trees along trails. In the long-term,

however, such incidents have a minimal impact if they are controlled and repaired. Wakarusa must work diligently to educate and maintain a culture of respect toward nature. This is already done on the website and in the festival pamphlet, as well as through Recycalusa and other sources. Wakarusa can only strive to increase the information available and make sustainability a priority on the website as well as on site at the festival.

Physical Impact Indicators

- Total surface area used by festival activities
- Surface coverage of desirable secondary plants vs. nuisance secondary plants
- Surface area of compacted soil on site

PUBLIC AWARENESS/EDUCATION

Just like major sporting events, musical and camping festivals present an ideal platform for dissemination of information relating to social, economic, and environmental issues. In the recent past, for example, “[s]ports events have been used [as platforms] to raise awareness on issues such as child labor, children’s welfare, racial discrimination and environmental protection”²⁴. It is in this regard that the Wakarusa musical and camping festival should be viewed as an ideal platform for public awareness and educational efforts aimed at disseminating information to festivarrians, vendors, exhibitors and artists on sustainability issues.

The journey towards sustainability requires active participation of festivarrians by involving them in both the planning and implementation of sustainability strategies. In this regard, public awareness and education on sustainability are seen as critical to achieving sustainability at the Wakarusa musical and camping festival. Without such public awareness and education efforts that are targeted specifically at festivarrians, strategies at achieving sustainability are less likely to succeed. Though event organizers have in the past used these festivals to highlight a number of important messages, there has been no concerted effort to use the platform to popularize the concept of sustainability. Consequently, a wonderful opportunity to effectuate desired change in sustainability practices among festivarrians is usually lost. The audit team is of the view that the Wakarusa musical and camping festival could be used to popularize sustainability issues such as recycling, energy conservation, alternative modes of transportation etc.

Approach

As noted above, a total of 94 festivarrians were randomly selected for interviews regarding sustainable behaviors while attending the festival (see *Transportation* and *Waste & Recycling*). Interviewees were asked about their prior knowledge of efforts by the festival to make the event more environmentally friendly, as well as where they typically get information about the event. Members of the audit team attended the Sustainability Symposium and Sustainability Press Conference, visited information booths, and reviewed information available online and in the event program.

Findings

Survey results indicate that 95 percent of the respondents interviewed had prior knowledge of sustainability efforts being pursued by organizers of the 2007 Wakarusa Musical and Camping Festival. The survey results further reveal that the majority of these respondents found out about the sustainability efforts from the Wakarusa website. It is therefore clear that the internet is a powerful tool for dissemination of information on sustainability. Festival organizers should aggressively utilize the internet

for public awareness and education efforts whose purpose is to bring about desired environmental behavior.

Additionally, most of the vendors, exhibitors, and artists interviewed reported that they had prior knowledge of sustainability efforts undertaken by organizers prior to the festival. This information was probably availed to them through the contracts they signed with the organizers. Some exhibitors, including New Belgium, Zephyr Energy, and the Conscious Alliance were specifically providing information on environmental and social issues. They displayed exhibits, for example, on better ways of reducing the carbon footprint of the festival through use of renewable energy sources and alternative modes of transport. Despite these efforts, informational/educational booths were lacking at the festival and seemed separated from the rest of the festival area.

The Sustainability Symposium was held on Saturday morning and featured rancher Pete Ferrell; Land Institute director Wes Jackson; author Jeff Goodell; New Belgium representative Nic Thiessen; Zephyr Energy representative Sarah Hill-Nelson; and Wakarusa organizer Jami Sweeney. The symposium focused on renewable energy and provided an opportunity to highlight efforts to make the festival more environmentally friendly. However, attendance at the symposium was relatively low (less than 25), possibly due in part to the early start time of 10 AM.

Furthermore, while the panelists provided good information about their area of expertise, some of the presentations were perhaps too “scholarly” and narrowly focused for a festival setting. In order for the seminar to be well-attended and well-received by the audience, speakers should be receptive, charismatic, and positive. Charisma is a very important factor, particularly when appealing to a young population. Panelists like Nic Thiessen, as well as the discussion leader, Simran Sethi, exuded all three of these necessary traits. Their youthful energy and clear focus on solutions could inspire festivarrians and make the Symposium a positive vehicle for change. Furthermore, it may be more effective to have multiple sessions that focus on particular issues (water, carbon emissions, food sources, etc.) instead of focusing on a single topic. Although the symposium is a welcome addition to the festival, an opportunity to educate festivarrians about how to reduce their impact at the festival may have been missed.

Information about sustainable practices and efforts to “green” the festival was readily available on the website and the event program. Information provided on recycling at the event was especially notable, with an overview listed near the front of the program and a detailed description online. Both sources also suggested reusing New Belgium cups for beverage refills and packing a water bottle to fill at water stations. However, general guidelines for reducing impacts while attending the event were lacking.

Recommendations

Festivarrians do not always appreciate the connection between the two seemingly unrelated issues of attending a musical and camping festival and the need for environmental sustainability. This is where public awareness/education efforts become extremely important. The following recommendations are an attempt to further improve on the public awareness and education efforts currently in place:

- Train volunteers on matters relating to environmental sustainability so they can assist with educating festivarrians about recycling and other key issues.
- Provide volunteers on site with t-shirts that have messages written on them advertising desired changes in environmental behavior, i.e., recycling, carpooling, bicycling etc.
- Educate and use artists to promote sustainable practices before, during, or after their performances.

- Include tips for reducing environmental impact on the website and festival. This could include encouraging alternative transportation and car-pooling, packing reusable dishes and beverage containers, packing eco-friendly products, and purchasing bulk food items to generate less waste.
- Send environmentally-informative emails to festivarians, vendors/exhibitors, artists, and contractors prior to the hosting of the festival.
- Provide an information booth on-site for dissemination of environmentally-informative materials to festivarians as they enter the festival grounds.
- Develop an “eco-village” with vendors and non-profit organizations that support sustainable practices and activities. This would be a prime location for a solar powered stage and/or the use of solar/stored energy to power vending areas.
- Continue to host sustainability symposiums, but at more convenient times of the day. Invite dynamic speakers that would appeal to a broader audience.
- Display and communicate unwavering commitment to hosting a sustainable musical and camping festival to potential sponsors, funders, presenters, participants and contractors.
- Develop a mailing list of festival attendees so that you could follow up with them on sustainability issues at the festival once it is over.
- Provide opportunities for bands and vendors to discuss issues of sustainability in their respective industries.
- Introduce an award for bands that show commitment to reducing their environmental impact.
- Introduce an award honoring vendors whose businesses show a strong and consistent commitment to sound sustainability practices.

Limitations

A number of limitations/constraints were encountered by the audit team when auditing public awareness and educational efforts at the Wakarusa musical and camping festival. The first major constraint was time. It was difficult to physically audit public awareness and education efforts undertaken by festival organizers due to time limitations. Secondly, it was not possible within the time frame of this audit to thoroughly assess the effectiveness of current public awareness and educational efforts. A more detailed questionnaire gauging awareness needs to be developed to better measure this parameter.

Public Awareness/Education Indicators

- Number of organizations providing information on sustainability/environmental issues
- Proportion of festivarians with knowledge of sustainable efforts on site (as indicated by surveys)
- Proportion of festivarians participating in sustainable behaviors (as indicated by surveys)
- Annual number of hits on the Wakarusa sustainability webpage

BUSINESS OPERATIONS

Hosting a sustainable musical and camping festival is a daunting task that places an enormous amount of responsibility on the shoulders of organizers. Greening such huge events entails an increase in operational costs, in the short run, as well as the necessity for festival organizers to change their modus operandi to conform to proven sustainability practices. In hosting a green event, it is important that the organizers set an example by operating their business in an environmentally and socially responsible manner. Event organizers should strive to mitigate impacts by evaluating and improving upon the previous seven sustainability factors not only during the event but in daily operations while organizing the festival.

Approach

Event organizers at Pipeline Productions were asked to self-report on environmentally responsible practices employed at the central office, including efforts to reduce waste or conserve energy and other resources. Observations of business operations at the festival site were also recorded.

Findings

Organizers of the Wakarusa musical and camping festival have adopted green or environmentally sound business practices at their central office. At their central office which houses its full-time staff, a number of best business practices are used. These include the use of electronic mail almost exclusively, recycling waste paper, and delivering contracts electronically. Additionally, Wakarusa Music and Camping Festival helped sponsor a Sustainability Town Hall forum in Lawrence in May 2007.

Recommendations

The event organizers are committed to making the Wakarusa musical and camping festival more sustainable by making improvements to the festival and operate their business in a more environmentally friendly manner. Additional measures can be taken to reflect this commitment:

- Complete a sustainability audit of practices and facilities that attempts to measure the environmental “footprint” of Pipeline Productions that includes the seven factors measured above
- Educate all employees and volunteers on sustainable practices and operations
- Engage contractors, artists, and vendors that show a strong commitment to sustainability practices
- Monitor actions of vendors, exhibitors, contractors, and artists to ensure that their operations meet established expectations with regard to sustainable practices
- Continue to promote sustainable behaviors at other sponsored and community events.

Limitations

Because this audit focused on the festival event, insufficient time was allotted to examining the day-to-day business operations of the central office. However, the measure has been included in this report to draw attention to the importance of further evaluating this critical aspect of conducting a sustainable event. An audit tool specific to business practices should be researched and/or developed to track progress in this area in the future.

Business Operations Indicators

- Annual energy use at the Pipeline Productions home office
- Annual water use at the Pipeline Productions home office
- Proportion of landfill waste to recycled waste
- Proportion of environmentally/socially responsible products purchased for office use
- Proportion of contracts with artists and vendors that support sustainable practices and productions

CONCLUSION

Achieving a socially, economically, and environmentally sustainable musical and camping festival requires leadership and commitment on the part of event organizers. It is a gradual process that demands considerable investment of time and resources not only to make necessary operational changes but to educate festiversians about their responsibilities in making the festival more sustainable. However, it is a process that realizes multiple benefits including improved environmental conditions, a stronger local economy, cost savings for the organizers, and positive publicity surrounding the festival.

The Wakarusa Music & Camping Festival is well on its way to becoming a more sustainable event. Organizers of the festival have taken important steps to reduce energy use and offset a large portion of the carbon emissions. Recycalusa has developed into an effective and well-run recycling program, with a diversion rate of over 40%. Relationships with vendors are also moving in a more sustainable direction by including sustainability requirements in the vendor contract. Beyond these operational aspects, organizers have shown a commitment to sustainability by featuring environmental speakers at the festival and supporting the Sustainability Town Hall in Lawrence. These efforts certainly have a positive effect on both a local and global scale and serve as an example for other large-venue event organizers to follow.

Event organizers can continue on this path towards a sustainable festival by improving upon successes and implementing recommendations outlined above. While some recommendations can be effected with little effort, others will require considerable time, research, and financial commitment. Ultimately, the festival should begin working towards a basic set of goals for achieving a sustainable state, keeping in mind that sustainability requires slow but steady progress over time:

- Reduce and eventually eliminate greenhouse gas emissions from energy generation and transportation. Offset any remaining emissions until more effective alternatives are available.
- Reduce and eventually eliminate the use of bottled water, relying instead on a locally sustainable source of drinking water.
- Reduce and eventually eliminate waste by increasing opportunities for recycling and composting and requiring all “waste” generated on site to be reusable, recyclable, or compostable.
- Minimize the physical impact on the site through a “leave no trace” philosophy.
- Use the festival as a platform for dissemination of information relating to social, economic, and environmental sustainability on a local and global scale.
- Adopt green business practices to mitigate environmental impacts of the festival and overall business operation as well as reduce overall operational costs.

Event organizers have taken action towards achieving these goals for sustainability. As the event continues to grow, it will be important to keep these standards in mind while implementing sustainability recommendations and introducing new components to the festival. With a firm commitment and additional investment from festival organizers, the Wakarusa Music and Camping Festival can continue to develop into a more sustainable operation, affording new benefits to festiversians, event organizers, and the global community.

Notes

- ¹ Bruntland, G. (ed.), (1987). *Our Common Future: The World Commission on Environment and Development.*, Oxford, Oxford University Press.
- ² Schriberg, M. (2002). Institutional assessment tools for sustainability in higher education: strengths, weaknesses, and implications for practice and theory. *Higher Education Policy*, 15, 153-167.
- ³ Grafé-Buckens, A. & Beloe, S. (1999). Auditing and communicating business sustainability. *Eco-Management and Auditing*, 5, 101-111.
- ⁴ Pew Center on Global Climate Change. "Business and Climate Reports". Accessed July 13, 2007. <http://www.pewclimate.org/companies_leading_the_way_belc/business_resource_portal/business_reports_res.cfm>
- ⁵ Travel Green Wisconsin. (2006). Accessed July 13, 2007. <<http://www.travelgreenwisconsin.com>>.
- ⁶ Greenbuild International Conference and Expo. (2006) Greening the Conference. Accessed July 13, 2007. <http://2006.greenbuildexpo.org/Exhibitor/about_greening.asp>.
- ⁷ Environment Canada. (2006). The Path Toward Making the Montréal 2005 United Nations Climate Change Conference (COP11/MOP1) a Carbon Neutral and Green Conference". Government of Canada.
- ⁸ Wakarusa Music & Camping Festival (2007). Access August 20, 2007. <<http://www.wakarusa.com/2007/about.asp>>.
- ⁹ Energy Information Administration. (2006). Electric Power Annual 2005 Revised Data. Accessed July 13, 2007. <http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html>.
- ¹⁰ Noguee, A., Clemmer, S., Paulos, B. & Haddad, B. (1999) *Powerful Solutions*. Union of Concerned Scientists, January 1999.
- ¹¹ Schaffer, D. Martin Engine Systems. Personal communication. July 13, 2007.
- ¹² Prenger, N. Wakarusa Music & Camping Festival. Personal communication. July 23, 2007.
- ¹³ Clean Air–Cool Planet. (2006). *A Consumers' Guide to Retail Carbon Offset Providers*.
- ¹⁴ Hill-Nelson, Sarah. Zephyr Energy. Personal communication. July 20, 2007.
- ¹⁵ Kollmuss, A. (2007). Carbon offsets 101: a primer on the hottest--and trickiest--topic in climate change. *World Watch* 20.4, 9(6).
- ¹⁶ Vigar, Geoff. (2002). *The Politics of Mobility: Transport, the Environment, and Public Policy*. New York: Spon Press
- ¹⁷ Qtd. From Fetter, C. W. (1994). *Applied hydrogeology*. New York: Macmillan.
- ¹⁸ Schecher, Jerry. Personal communication. July 20, 2007.
- ¹⁹ Sweeney, Jami. Personal communication. July 10, 2007
- ²⁰ Ortiz, Rylan. Interview. June 9, 2007
- ²¹ "The Truth About Recycling", *The Economist*. June 7, 2007. http://www.economist.com/displaystory.cfm?story_id=9249262#top
- ²² Allenby, Brian. Reverb. Personal communication. June 6, 2007.
- ²³ Schecher, Jerry. Personal communication. July 20, 2007.
- ²⁴ United Nations Environmental Program and Global Sports Alliance (2006). *Mainstreaming the Environment in Major Sports Events, Global Forum for Sport and the Environment*. 30 November-1 December 2006, Lausanne, Switzerland.