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Greening The Festival Industry: Using the Triple Bottom Line Approach to Promote Sustainability in Music Events

Matthew Glassett
University of Colorado Boulder

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By
Matt Glassett
University of Colorado

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Thesis Advisors:

Dale Miller, Environmental Studies, Committee Chair
Dave Newport, Environmental Studies
Keith Stockton, Leeds School of Business

Abstract

The purpose of this paper is to explore initiatives in the festival industry that could promote sustainability. As the festival industry continues to grow, steps need to be made to ensure that these events are not detrimental to the environment. This paper analyzed several changes in festival operations to see if they could save the festival money while reducing its environmental impact. Through personal interviews, Internet polling, and outside research, I looked at four possible proposals in the sectors of waste management and transportation. My analyses proved difficult to confidently suggest any of these proposals, as price variability and differences in festivalgoers' attitudes affected the success of each project. Ultimately, the decision to promote sustainability relies on the personal values of the company throwing the festival, though a "greener" festival generally enhances the event's image.

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Part 1: Introduction

As the makeup of the music industry has changed remarkably since the advent of the Internet, many musicians are finding a greater source of revenue from live performances than from record sales. While the last decade has shown a drop in record sales by 50%, the concert industry has increased its profits by 40% (Phoenix New Times). Increased sales have brought increased production values and greater income for sponsorships, which further draw crowds to these events. As more festivals successfully enter the market, it appears that this industry will continue to grow.

As the number of events continues to grow, however, the environmental impacts will increase as well. These events can draw tens of thousands of people, leading to harmful carbon emissions due to waste, transportation, land degradation and a multitude of other factors. With greater audience numbers and more of these events occurring, these impacts need to be monitored and internalized into an event planning company's model. This paper aims to explore the possibilities of accounting for the environmental impacts of music festivals, and will examine ideas for change to see if they are feasible using the Triple Bottom-Line approach.

This paper will primarily focus on changes that can be made to the waste management and transportation methods of event planning operations. These two fields were chosen because waste management has the most direct impact on the surrounding environment following a festival, and transportation is the biggest contributor to an event's carbon footprint. The changes will be analyzed by looking

at the triple bottom line, or its impact on profit, people and planet. These changes will be looked at holistically; every aspect will be considered before giving a recommendation. If a proposal does not save money but can significantly reduce the festival's environmental impact and improve its branding, it will be recommended. If a proposal will not affect the environment but can significantly benefit the festival economically, it is just as feasible.

The paper will first have a background, explaining the current state of the festival industry and the academic thought on sustainability in it. Next, the methods for conducting this research are discussed. It then moves on to analyzing each of the four proposed changes to the festival industry, and discuss their impacts on the triple bottom line. There is a discussion of findings after the analysis, and finally the paper ends with my recommendations for festival managers and future researchers.

Part 2: Background

This section aims to look at the research and initiatives already in place in the festival industry. It will begin with an economic look at the industry, and its recent growth. It will then move on to examining the two types of philosophy used to account for sustainability. After that, it will explore the current initiatives to reduce environmental impacts in the waste management and transportation sectors of festival logistics.

Music Festivals: A Lucrative Industry

Special Events refers to festivals and music events that draw a large audience of people for a brief period of time, usually for a weekend or three days. Events can draw a wide range of audience members, from local events with a dozen attendees to mega-events, such as the Olympics, that draw millions of people internationally. This paper aims to focus on large-scale music festivals that draw crowds from 10,000 to 100,000 people annually. The music festivals discussed are annual events, which set up stages, concessions and waste management temporarily for their three-day durations.

The Festival industry has been unquestionably growing in the 15 years. While little official research has been published on the growth, certain numbers prove this to be true. Mair (2011) showed that an estimated 15 million people attended events in Australia in 2009-2010, which was an increase of over 20% from 1999. In 2010, Coachella Music and Arts festival in Indio, California set a record turnout for a music festival, with over 225,000 people cumulatively attending over the two-weekend long event (Billboard). The event now averages about 100,000

people per weekend per year, for a total of 200,00 festival passes sold. This growth has obvious economic implications through a series of income sources. First is the revenue from ticket sales. Along with more people purchasing tickets, many festivals have been able to raise their prices without losing customers. The 2013 Coachella ticket cost $349 dollars for the three-day wristband, which increased $34 dollars from its previous year (LA Times). Because of this, Coachella was able to make an enormous $47.3 million in ticket sales (Phoenix New Times). While Coachella is an established festival in the industry, the success of several new events has made music festivals an attractive enterprise for investors. The Firefly Music Festival, which debuted for its first time in Delaware in 2012, was still able to bring in 30,000 attendees per day and make $9 million in ticket sales during its first year (Phoenix New Times). Aside from ticket sales, sponsorships are an important part economic factor in the music festival industry. Sponsorships at concerts and music festivals have grown remarkably in the last decade, doubling from $547 million to $1.17 billion from 2003 to 2010. This amount has helped subsidize the cost of tickets, and allowed festivals to bring larger acts and further draw audiences.

Sustainability in Music Festivals – The Stakeholder Approach

Despite the amount of research that has been done in the festival industry, very little research has been done about the role of sustainability in music festivals. Virtually no academic research has been conducted in the United States about the topic, but some scholars in the United Kingdom and Australia have examined this phenomenon. Because these countries are similar to the United States in both their

economic stability and demographics, I will accept the statements made in this research as applicable to the United States as well.

Mair and Lang (2010) conducted one of the most encompassing studies, which used the "Mair and Jago" model to examine the use of sustainability in music festivals. After interviewing representatives from a number of festivals known for their environmental consciousness, they found that the largest drivers for greening festivals was for competitive advantage, image enhancement, supply chain or corporate social responsibility policies and consumer demand (Mair et al 2010). Yet the greatest motivation was the personal values of the company.

Mair and Jago appeared to be approaching the issue of sustainability in festivals through something called the "Stakeholder Theory." This model has been the major lens through which this topic has been viewed, and has been echoed in most of the other literature on this topic. The Stakeholder Theory can best be described as the motivation to perform certain actions based on the pressures of stakeholders. Hede (2007) defines stakeholders as "groups or individuals who can affect, or are affected by, the achievement of the organization's objectives." Some research has been conducted to identify who these stakeholders are in the festival industry. Reid and Arcordia (2002) found that employees, volunteers, sponsors and participants have the greatest effect on the operations of festivals, and thus can be seen as the primary stakeholders. The stakeholder theory is an effective way to look at the role of sustainability in the industry, as the decisions of these stakeholders can affect the success of an event through endorsement, sponsorship and capital. As previously stated, the financial role of sponsorship in concerts and festivals is

enormous, and growing rapidly. The image of an event sponsored by a company can directly be transferred to the company itself, so if a company wants to market itself as "green" it is more likely to finance a festival that promotes sustainable practices (Hede 2007). This works on the other end of the spectrum as well – if a festival is known for environmentally unfriendly practices, or for disrupting and damaging the land of local residents (who are another important stakeholder), a company is more likely to pull out sponsorship, resulting in a potentially huge loss of revenue. While there is certainly a grey area between environmentally beneficial and environmentally detrimental, it is still an important factor to consider. Furthermore, the participants (or musicians in the case of music festivals) can have a big impact on the public image and subsequent ticket sales of an event. Since the participants performing at the festival are one of the biggest motivations behind ticket purchases, their environmental views can become a driver for event planners to adapt more sustainable practices.

However, there are some boundaries to this approach. While stakeholders may pressure more environmentally friendly approaches, event planners interviewed by Mair and Lang (2010) stated that one of the biggest barriers to implementing environmental sustainability is the lack of financial or other support from stakeholders. If stakeholders (particularly investors or sponsors) are more interested in profit than the planet or their image, it is difficult to convince them otherwise.

The Triple Bottom Line Method

This paper will thus aim to take a slightly different approach by using the triple bottom line (or TBL) to investigate sustainable changes instead of the Stakeholder Theory. The TBL approach was first introduced by Elkington in 1997, when he brought the idea of "People, Planet, Profit" to the academia. Since then, it has been used as a new framework for businesses to gauge its financial lucrativeness, its public image, and its impacts beyond the good or service provided. While this suggests that it would be a very effective way to look at sustainability in the festival industry, few academics have used this approach. Fredline, Raybould, Jago and Deery were first to write about event planning through the triple bottom line approach, where they said, "the rationale behind triple bottom line reporting [within the context of special events] is to illuminate the externalities associated with business activities and therefore to promote sustainability through planning and management practices that ameliorate negative outcomes and promote positive ones" (Fredline et al. 2005; quoted in Hede 2007). This is an effective approach to making environmentally friendly business decisions, since it allows event planners to consider factors other than the hard numbers of cost and profit. Most event planners understand the difficulties that one of the biggest boundaries to "greening" festivals is the cost. Mair and Jago (2010) state that "most interviewees were also realistic and accepted that festivals generally have to be run as a business," and that while cost-benefit analyses could help influence decisions, "they are unlikely to represent a major influence on the decision to be more sustainable." Approaching

from the TBL approach will thus allow a wider field of thought about implementing these changes, even if it does not necessarily yield the greatest economic benefit.

Transportation and Sustainability

This paper will primarily focus on changes that can be made in two fields: transportation and waste management. Like most of the research in this paper, scholars have only begun paying attention to the environmental impacts of transportation to festivals in recent years. As such, there is little published information on this topic. Robbins, Dickinson and Calver produced the landmark paper in 2007, which aimed to look at the greenhouse gas emissions produced from transportation and offer suggestions for improvement. They found that travel to and from events is problematic, both due to carbon emissions and from the social externalities that occur (Robbins et al. 2007). It appears that car traffic, which makes up a vast majority of transportation to festivals, is a main issue for consideration. Due to its convenience, most festival attendees travel by car to these events. This was exemplified in a 2004 study, which calculated that 94% of the visitors to the Sidmouth Folk festival travelled by car (Mason and Beaumont-Kerridge, 2004). The need for cars is further exacerbated by the locations of these festivals – most festivals are placed in rural areas with a large amount of land. These locations are picked for a number of reasons, most notably for the amount of space, the ability to construct temporary structures easily, and something called the "Woodstock Effect," where the festivals of the 1960's and 70's culturally influence planners (Robbins et al. 2007). However, picking these remote locations only further pushes cars as the mandatory form of transportation, as these areas very

rarely have access to public transportation. Creating public transportation infrastructures to these areas also proves impractical, as these events occur so infrequently and for such short periods of time that the construction would not be reasonable. Robbins explains, "Even very large-scale festival events such as Glastonbury cannot justify, either on economic or environmental grounds, permanent infrastructure enhancement such as new public transport facilities or road construction, with the exception of the largest mega-events" (Robbins 2007). This large influx of cars, however, is dangerous as well as environmentally detrimental. Drawing thousands of cars into a single, remote area is a cause of serious traffic and increased chances of accidents, which are not accounted for by event planning businesses. The disadvantages of increased traffic impair not only festival attendees, but the locals as well. Laing (2011) found that "congestion, noise, visual intrusion and deterioration of local air quality are all important externalities" when considering the impacts of car traffic on local towns where festivals are held.

Academics propose a few options for changes in infrastructure, some of which have already been applied to the festival scene. The stakeholder theory has proven to be an effective measure for pushing forms of sustainable transportation to festivals. This was seen again when Radiohead publicly criticized Glastonbury for its high level of carbon emissions due to their high car volume to and from the festival (Robbins et al. 2007). Because of this public relations embarrassment, Glastonbury Festival has taken steps to encourage festival-goers to travel in car-shares by helping people find carpool options through their website. Because of this initiative, it has been estimated that 15,000 car trips were saved in 2006 (O'Neill 2006).

However, this number has been contested for being overly optimistic (Robbins et al. 2007). Regardless, the pressure from cultural figureheads effectively pressured event planners to shift their views of transportation from an externality to something that could be improved to a more efficient, more sustainable system. As Mair and Jago alluded to previously, image improvement and branding can also cause festivals to adopt stricter regulations on driving. Lightning in a Bottle, an event that occurs in Southern California every summer, has prided itself with its brand of promoting environmental initiatives. Because of this, they try to discourage wasteful car trips by imposing a $30 fine on any cars that have only one passenger (Lightning in a Bottle). Robbins (2007) suggests that changing the location can subsequently change the method of transportation, thus reducing the amount of emissions. They have outlined six criteria for finding an ideal location and time for transportation. The location should have a previous experience hosting events; it should be where transport infrastructure already exists; it should be placed where there has been previous use of car alternatives (such as park and ride locations); it should be in an area accommodating longer stays, so attendees can stay for more than just the duration of the festival (Robbins 2007). According to Robbins, the timing should be when other traffic flows are low, and when public transportation is operating most efficiently (Robbins 2007). Moving the festival to a location closer to an urban area would probably cost more to rent, but could bring in revenue from increased attendance and would remove the externalities previously mentioned.

Waste Management and Sustainability

Another approach to reducing the environmental and economic impacts of events is through the increased efficiency of waste management. While few studies have been conducted on this topic for the music festival industry, a lot of progress has been made in the sports sector. Since the two industries deal with a large-audience influx over a brief period of time, we can apply the steps made in sporting arenas to festivals.

The most successful example of a waste management overhaul leading to environmental benefits can be seen at Safeco Field, home of the Seattle Mariners. The Mariners decided to switch their products at concession stands to compostable and recyclable products, and placed several recycling and compost bins around to encourage attendees to dispose of their products more wisely. This showed staggering results, as the Mariners diverted over three million pounds of waste from landfills in 2013 (mariners.mlb.com). The baseball field now recycles and composts over 90% of its waste, which was a significant increase from its recycling rate of 12% in 2005. While this was an ecologically beneficial decision, it also benefitted the company financially. After recycling and composting, the Mariners saved $114,000 in waste disposal costs during the 2013 season. Because these seasons are a much longer duration and consequentially draw larger crowds than Festivals, the savings would not be as great. Regardless, however, this example proves that approaching the problem of waste using the TBL method can end up benefitting the company in multiple ways.

Another successful implementation of waste management occurred at the University of Colorado, when they implemented their "zero waste" program in Folsom Field, the school's football stadium (Henly 2013). The school worked with their concessions vendors to only use refillable, recyclable or compostable materials. Since everything being sold in the stadium was either recyclable or compostable, they replaced the public trash bins with smart waste "stations" that only had recycling or compost bins. To ensure attendees were using the bins correctly and understood how to properly dispose of waste, student volunteers were positioned at the 30 stations to instruct the crowds on proper disposal. This was a huge success, and allowed Folsom Field to achieve a 78.5% diversion rate across their home games, an increase of 48.5% from 2008 (Henly 2013). In the last four years, the program saved over 394,000 pounds of materials from being wasted, and is predicted based on the trends from 2008 to 2013 that the Zero Waste initiative can save over 455 million British Thermal Units of energy.

Despite the success of compostable materials in the sports industry, it appears that this approach can also be used in the festival industry. Outside Lands Music Festival, an independent music festival in San Francisco, appears to be one of the few large-scale music festivals to adopt this shift to sustainable concessions. Since 2008, the company has paired up with company Clean Vibes to transition to 100% biodegradable cups, plates, bowls and utensils ("Ecolands"). This change in materials allowed the event to divert over 75% of its waste from landfills and save over 87 tons of reusable, recyclable or sustainable materials in 2012 (cleanvibes.com). Clean Vibes also worked with several other events in 2012,

including the Bonnaroo Music and Arts festival, where it recycled over 327,000 pounds of waste (cleanvibes.com).

While these examples showed that a change to sustainable materials could save both money and unnecessary waste, an important thing to consider is that most festivals and sporting events outsource their concessions to other companies. Thus, this shift requires cooperation between the event planners and the concession vendors to push towards sustainability together. To prepare for that, some festivals and nonprofits that attend these festivals have come up with their own solutions. To prevent recycled materials from being wasted, the All Points Music Festival set up their "TRASHed Recycling Store." This popup store took aluminum cans and plastic bottles as currency, and would accept the recyclable materials in exchange for merchandise (Laing 2011). This gave festival attendees an incentive to recycle, and even recycle the materials discarded by other attendees. Volunteers ran the store to minimize the cost (Lang 2011). The nonprofit group Global Inheritance was the brains behind the TRASHed store, which has expanded to set up stores at most major American music festivals, including VooDoo Fest, Treasure Island, Pitchfork and Coachella. Since 2004, the organization estimates that they have saved over 13 million bottles, cans and biodegradable cups at these locations (globalinheritance.org). This recyclables-for-goods model was repeated by the Clean Vibes Company, which set up a similar trading post at the Outside Lands Music Festival ("EcoLands").

Part 3: Methods

This paper will aim to examine changes that can be made to the planning and operations of the festival industry through the triple bottom line philosophy. The changes we investigate include: changing the concessions materials to compostable ones; changing the concessions materials to reusable plastic and metal with a refundable deposit; changing the location of an event to encourage public transportation instead of car travel; and internalizing carbon offsets into the cost of an admission ticket to neutralize the emissions from transportation. Because the TBL approach incorporates profit, people and planet, I will use different methods to calculate each of these values for the respective changes.

Profit will primarily be looked at through cost-benefit analyses, which will be calculated by calculating the total cost of implementation of the proposed projects and then extrapolating the savings or increased revenue that will come from their execution. Getting these numbers will come from several different sources. Sources for project costs include personal interviews with program organizers and product suppliers, research on previous implementations, and calculations pulled from outside sources, which will be explained in their respective sections. Data for the benefits and return on investments will be synthesized from many of the sources for the cost data, but will also use projections from the questionnaire given to festivalgoers (discussed in the following paragraphs).

An important cornerstone from this research comes from personal interviews with professionals in the industry. These interviews aimed to gain

perspective on all the parts of festival operation and supply chain. Thus, the interviewees selected were intended to come from as many different parts of the operations field as possible. The interviewees included: dishware manufacturers, waste managers, sustainability coordinators, festival planners and carbon offset sellers. These interviews were an hour long and were administered both in person and over the phone. To protect their professional identities, these interviewee's identities remain confidential. In an attempt to allow these conversations to flow organically, a list of questions was not strictly maintained. These answers were supplemented with online research to synthesize data and analyze my proposal analyses.

To examine the impact on people, I will use feedback from festivalgoers as expressed through our anonymous questionnaire. This survey consists of 10 questions that were administered online. The survey was promoted through social media, including Facebook pages and forums covering music festival threads. The questions asked about festivalgoers' demographics, their perceptions of sustainability, sustainability's role in the music festival industry, the willingness to pay (WTP) for certain services such as compostable cups or carbon offsets, what features of a music festival they find attractive, their transportation methods to such events and how a festival's image influences their buyer behavior. The results from this questionnaire were extrapolated to account for general consumer behavior, and were applied to the proposed changes to examine if the changes would lead to an increase in festivalgoers or revenue. Along with accounting for the profit section, we will be able to examine how festivalgoers' opinions on sustainability affect their

view on festivals. If making environmentally friendly changes increases the image of an event's brand or if it causes its attendees to be happier, it is recommended that event planners look into this change to improve their reputations.

Because this paper aims to examine both the economic and ecological impacts of these changes, however, we will aim to look at the greater implications on the planet as well. Impacts on the environment will be looked at holistically, with considerations in reduction of carbon and methane, as well as a reduction of landfill size. We will get this value by using a number of assumptions, depending on the project being proposed. Some of these calculations will come from values determined by the EPA, the department of transportation, and nonprofit carbon offset groups. The transportation section will use the accepted standards for amount of carbon emitted per gallon per passenger of gasoline, and compare the total amount emitted to the amount that would be emitted if biodiesel replaces gasoline. The carbon offsets section will look at several programs on the market, and will see what amount of carbon can be offset if a quantity of money is spent on each of these offset options. We will again look at the questionnaire responses to see how perceptions change if sustainability is promoted, and how this can affect the business overall.

Once all of these values are calculated, we will look at the benefits and disadvantages of these criteria to holistically assess whether or not this change is feasible or recommended.

Part 4: Analysis of Proposals

In this section, four proposals for sustainability will be outlined and analyzed. In each section, there will be background on what has been done so far, an outline of the proposal implemented, an environmental impact analysis and an economic analysis. The four proposals are switching to compost; switching to reusable; encouraging public transportation through strategic venue location; and using carbon offsets to create a carbon neutral event.

Analysis of Waste Proposals: Switching to Compost

Background

One of the most apparent and obvious sources of environmental degradation at music festivals comes from waste produced by garbage. An event with 40,000 people will surely produce a lot of waste through concessions and camping. One festival of comparable size that I spoke to reported a total of 6.89 tons of waste produced during its run (Waste Characterization). This waste looks bad, can be scattered to natural habitats, and can be a huge greenhouse gas emitter. While construction typically makes up the largest percentage of waste at festivals, another large part of the waste stream comes from the disposable cups, plates, napkins and utensils that are distributed in its concessions stands.

The operations of concessions packaging can be complicated depending on the event. Often, concessions at a venue or festival are handled through a separate

company, which is signed on through contracts. These companies receive their products through distributors such as Sysco, who in turn receive the packaging from manufacturers. Because of this, regulation of products can be difficult to do by the venue owner. Even when contracts with vendors explicitly state that packaging must be compostable or recyclable, vendors may not comply with these standards due to lack of information or greenwashing by product manufacturers.

Another problem with reducing waste comes from behavior of the festivalgoers, or as one professional called it, the "human element." People attending festivals may bring their own waste into the venue, which may not be recyclable or compostable. Additionally, festivalgoers may not comply with or understand the separately marked bins. Festivals have a controversial history of alcohol and drugs, so an intoxicated festival attendee will probably be less inclined to responsibly recycle their materials or pay attention to the posted signs or volunteers.

Proposal

The proposal for this garbage problem would be a complete switch in food packaging materials from disposable plastic to a compostable material. This would include the plates that food is served on, the cups that beverages are served in, the utensils and the napkins. For the sake of scope, this discussion will focus on shifting the cups from polypropylene plastic to polylactic acid.

To ensure that all vendors comply with the switch to compostables, the contract written up between vendors and the venue would require all packaging to be purchased on site when setting up for the festival. The event planning company

and the manufacturer of compostable packaging would interact directly, and the festival would buy wholesale directly from the manufacturer. This would cut out middlemen in the supply chain, which would hopefully keep prices down. Additionally, a contractual obligation by the vendors to purchase the same packaging will reduce competition that would favor plastic disposables. Since compostable cups cost more than disposable plastic cups, vendors would probably need to increase the price of their concessions to make up for the increase in materials cost. If every vendor increases their price to cover that extra cost, then there will not be a competitive advantage for the vendors who don't use environmentally friendly materials. Furthermore, selling the same products to the vendors ensures that the packaging can be certified compostable. Even well intentioned companies can purchase greenwashed products that are advertised as compostable when they are not. This is only further muddled when the supply chain has several links, where information can be lost or confused in between middlemen.

For waste management, there would need to be three bins at each garbage station – one for landfill, one for recycling, and one for compost. The bins would be clearly marked with colors (blue for recycling and green for compost), and would be labeled with easy-to-read signs explaining what can be disposed of in each bin. The impact of color-coding bins is an effective technique that can change a person's perception of waste management. An example of this comes from the 2013 X-Games. The event utilized the same crew to set up the venue for over a festival over the previous five years, and so by simply using the same color code for landfill, recycle and compost, the crew was able to naturally divert the waste stream without any

additional help (Personal Interview). If crowds grow accustomed to this idea, waste diversion could become second nature and thus a very lucrative practice. To further ensure that waste is properly managed, volunteers would be stationed at each waste station to educate guests on what is recyclable, compostable, and for the landfill. Volunteers would be compensated with a festival ticket or VIP upgrade for six hours of their time. The intention of this would be to reduce the amount of waste going to a landfill and instead divert it to the cheaper alternative of recycling and the more environmentally beneficial option of composting.

To calculate the cost and environmental impacts in this example, we will make the assumption that a three-day festival will be hosting 40,000 people. We will assume that concessions must purchase three cups per person per day; two plates per person per day; two sets of cutlery per person per day; and ten napkins per person per day. This will leave us with 360,000 cups, 240,000 plates and sets of cutlery and 1,200,000 napkins to purchase. In the next sections, we will attempt to determine the difference in price and the difference in environmental impact between this volume of packaging purchased from a typical manufacturer and a manufacturer that only makes products with compostable or post-consumer recycled materials.

Environmental Impact

To calculate the environmental impacts of switching from plastic packaging to compostable packaging, the entire life cycle of the materials must be considered.

The typical plastic cup mass produced by a company like Solo Cups is typically made of either polyethylene terephthalate (P.E.T.), which is a clear plastic,

or polypropylene (P.P.), which is a more translucent plastic (NRDC). Both of these plastics, however, are petroleum based, so they require oil as a main ingredient in their production process. The environmental and political concerns of oil are widespread, including fossil fuel emissions, limited resources and diplomatic issues with foreign traders. The dependence on oil to provide a product with as short of a life as a disposable cup already appears to be impractical. Furthermore, the production process of plastic cups is as concerning as the materials they are made out of. A report from 1996 stated that the plastics industry is responsible for 14% of the emissions of the most dangerous chemicals to the atmosphere (NRDC).

Compostable cups, on the other hand, are usually made from Polylactic Acid, or PLA (Ecocycles LCA). Polylactic Acid is a plastic-like substance, but instead of being made from petroleum, it is instead made from starchy plants. Most major compostable packaging manufacturers use corn as the source for PLA, since the United States is the greatest producer of corn in the world. By using corn, the amount of fossil fuels needed to produce the cup is decreased. While manufacturing and distributing the project still uses carbon emissions, the materials used in the cup would require none. The materials in the cup account for approximately 38% of the product's environmental footprint, more than anything else, so this already reduces the environmental impacts of the cups significantly (LCA). Since the United States is such a large manufacturer of corn, this would still support the American economy, an argument that is often brought up when discussing the reduction of oil use.

However, using corn as a resource still has its environmental concerns. America's huge production of corn is involved in its own controversies, including soil degradation due to monoculture and growing genetically modified organisms (GMO). GMO's make up 88% of the corn produced in the US, so a good portion of the PLA produced incorporates genetically modified organisms (LCA). The environmental issues associated with GMO's are still hotly debated, so it would behoove the compostable packaging companies to reduce the amount of genetically modified corn used in their production process.

In plates, most compostable manufacturing companies use bagasse or sugarcane instead of paper from trees (LCA). Sugarcane as a plant grows much faster than a typical tree, so it would be less of a danger to the deforestation issues that are starting to plague the world. Furthermore, the husks of the sugarcane, which are the parts that are blended up and used to make plates, are the part discarded after the sugarcane has been extracted. This makes it a reclaimed product, so it allows this waste to be reused, as opposed to further filling up landfills or cutting down more trees.

While the sourcing of compostable products is more environmentally beneficial than PET or PP, the waste management of these products must also be assessed. Both PET and PP cups are able to be recycled, but to two different extents. PET falls under the #1 category of recyclables, which is the easiest and most popular kind of plastic to be recycled (NRDC). Polypropylene is categorized as a #5 recyclable, which is a less widely recycled type. However, despite their recyclability, most of these cups still end up in the landfill. Garrido (2008) estimates that 80% of

the polypropylene cups at events end in a landfill, a number that is far too high for a recyclable object.

Profitability

Accurately calculating profitability in this field is difficult, since there are so many factors to consider that vary across the country. Several assumptions need to be made for each of these points, which will be described.

Due to the materials and process of making PLA cups, they are more expensive to make than a typical PET or Polypropylene cup. This is reflected in the price. After contacting two manufacturers, one that sold typical Polypropylene and PET cups and one that sold compostable PLA cups. Pricing found that in wholesale purchases, the 16-ounce PET cups cost 7 cents each, while Polypro cups cost approximately 8.7 cents each (CupDepot). For PLA cups, on the other hand, a 16-ounce cup made from cornstarch costs nearly 15 cents per unit (EcoProducts). If we continue to assume that 360,000 cups were needed for the event, then the PLA cups would cost $54,000 in total, while the PET cups would cost $25,200 and the Polypro would cost $31,320. This is a much greater cost for just a single part of a festival, but one must consider the logistics of this cost. If private vendors handle the concessions, and they are contractually obligated to purchase packaging from the event planning company directly, then the additional cost would be shared amongst the private vendors. If they agree to the conditions initially, then they should expect the higher cost of PLA cups. Furthermore, if every concession stand must purchase

the more expensive packaging, then they can all raise prices without causing a competitive disadvantage. The price of concessions at a music festival must be fairly inelastic, as they are the only source of food and drink for people attending. If there were to be a ten-cent increase in the price of a six-dollar beverage, it would cover the additional cost of PLA cups and would probably not affect buyer behavior, especially if every other concession stand increased prices by ten cents to subsidize the cost of compost.

While the cost of the front end of the supply chain for concessions is easier to calculate, comparing costs for hauling and dumping compost is more difficult. Hauling garbage comes in two stages – first is the hauling, where workers are paid to pick up waste and transport it to another site. Private companies, who are separate from the haulers, own the landfills, compost sites and recycling centers. Price volatility is a big issue when it comes to calculating costs in the landfills. Landfills usually charge companies a "tipping fee," which is the cost of unloading one ton of waste on the lot. In general, the more available space an area has, the cheaper the pricing fee will be (Biocycle). Thus, the tipping fees in the northeast are significantly greater than the more sparsely populated areas of the Midwest. For example, the state of New Jersey has a population of almost 9 million people, yet only has 13 landfills to hold waste. This gives it a high tipping fee of $68, according to a census in 2010 (Biocycle). In contrast, the sparsely populated state of New Mexico only has a population of 2 million people according to the most recent census, yet has 30 landfill locations. This gives it a much cheaper average tipping fee of approximately $28 dollars. Thus, to dump several tons of landfill waste would be

significantly cheaper in the west than it would be in New England or the rest of the east coast. Another thing to consider, however, is the distance travelled for the haulers. Even though New Jersey only has 13 landfills, these landfills are more centrally located due to the state's small size. While New Mexico has 30, they may require longer travel times to get to. A typical hauler charges $100 per hour for the truck, plus $50 per hour for the two drivers (personal interview). Thus, even when tipping fees are cheaper, the entire system may cost more due to the required travel times.

This variability is even greater when discussing composting. Since composting is a fairly new practice in mainstream, waste management, the infrastructure varies by location. Tipping costs for composting varies by location, but is approximately $45-50/ton (Food composting overview). Thus, this can be cheaper than landfills in the more crowded areas, such as the east coast, but significantly more expensive for less congested areas. Another thing to consider is the proximity of a composting location. Areas right outside of cities, particularly on the coasts have a fairly high congestion of compost sites; the numbers drop off pretty quickly when entering rural areas. Appendix 2 shows a map of composting locations across the country. For example, while New Jersey has seven composting sites, New Mexico doesn't have a single composting site, and would need to travel to Phoenix, Denver or Western Texas to drop off its compost (compostcouncil.org). This potentially long haul would cost a lot of money for composting, which would make this a bad decision.

Analysis of Waste Proposals: Switching to Reusable Materials

Background

While switching to compostable packaging is one option for the reduction of waste at a festival, another would be to rid concessions of any disposable packaging. Even when cups from PLA are distributed, their packaging as a "disposable" cup still gives festivalgoers the impression that the can be left as trash as opposed to properly discarded.

To deal with this, a recent trend in sustainability has been to switch from a disposable plastic cup to a cup made from a thicker plastic, which can be washed and used again. Latitude Festival in the United Kingdom implemented a project in 2007 where they gave a reusable cup out to festivalgoers for drinks (Jones 2008). The cups required a £2 deposit, which could be refunded if the cup was returned. The company found that about half of these cups were returned, while the other half were kept as souvenirs by the festivalgoers. These cups are decorated with the festival's logo, and are certified by the manufacturer to be reused up to 100 times (Jones 2008). Planet Bluegrass, the company behind the Telluride Bluegrass festival, has also partnered with New Belgium brewing company to come up with a reusable cup scheme. To drink at Telluride Festival, attendees must purchase a cup that will be reused throughout the festival. A lesson learned from the Planet Bluegrass experience with the reusable materials is that the quality of the drink can't be compromised for its container. One year Planet Bluegrass switched its cup design to a stainless steel cup, which produced the least amount of waste. However, both the

vendors and participants had grievances with this design. The stainless steel apparently was not conducive to how the beer was poured, and was more inclined to heat up in the sun. Furthermore, these cups were expensive, forcing festival participants to purchase an expensive cup on top of the cost of their beer (Personal Interview).

Because of this, Planet Bluegrass has decided to go back to the condensed polypropylene cups that they previously used before the stainless steel. While polypropylene is not the most environmentally friendly, being made from virgin petroleum, the amount of waste that this reduced still justified its inception.

Proposal

This proposal would have two aspects to it. First would be the replacement of all disposable cups by a reusable cup, which will be personalized for the festival. It would be made from heavy plastic, and hold 16 ounces. The cup would be on sale for a $3 deposit, but would be reusable for the entire three days of the festival. The cups could either be kept as a souvenir, or returned for a refund. Water stations would be present throughout the festival, providing free water to festivalgoers, and concessions stands would fill up the cups when a drink was purchased. Like with the compostable cups, the reusable cups would be purchased directly from the manufacturer and sold to vendors by the festival. The ones not sold to the vendor would be saved for the next years' event.

The next part of this proposal would be for reusable plates and utensils sold at concessions. Instead of disposable paper or plastic plates, meals would instead be

served on heavy plastic plates, with either heavy plastic or metal utensils. Instead of disposing of these materials into a landfill after eating, they would instead be returned to a central location, where volunteers would wash and return the dishes to vendors for other orders. To encourage this part of the plan, a $1 charge would be added on to the price of a meal at concessions. When festivalgoers return their plates to the designated area, they would be reimbursed the dollar for returning their plates. Dishwashing would be handled by a team of volunteers, who would be reimbursed by a VIP upgrade to their ticket for eight hours of labor. Appropriate signs would be displayed at vendor booths and tables to direct festivalgoers to the dish area. After the event, the dishware and cutlery would either be retained by the festival for use in next year's event, or would be sold by the festival to other events in need of reusable cutlery.

Due to the scope of this paper, the next two sections will only examine the environmental impacts and profitability of compostable cups.

Environmental Impact

While the idea of reusing cups is a good idea, it may not be as environmentally friendly as one would hope. The FDA requires that if any plastic is to touching food, it must be "virgin plastic," or not from recycled materials (Personal Interview). Thus, all of the cups purchased would need to be made from a plastic synthesized from petroleum. Most reusable cups are made from condensed Polypropylene, the same plastic used for many disposable cups (Garrido et al. 2007). To make these cups, renewable, however, the manufacturer must use more polypropylene than would be present in a disposable cup. Garrido (2007) aimed to

assess the environmental impacts of a disposable and reusable PP cup side-by-side. He found that a reusable cup uses ten times more polypropylene than a disposable cup, and required nearly five times the energy to manufacture. After the entire process is completed, the reusable PP cup would emit nearly ten times more carbon into the atmosphere. Additionally, further environmental complications come when considering that washing these cups requires energy as well. Garrido calculates that to clean 1500 cups, 405 liters of water would be required and 30 kWh of energy. Assuming all 40,000 cups need to be washed, this would require 800 kWh of energy and 10,800 liters of water per single use. With all of these factors considered, Garrido suggests that a reusable cup must be reused at least ten times to make its environmental impact less than a disposable cup also made of polypropylene. Hocking (1994) performed a similar survey and found that a reusable polypropylene cup could require anywhere from 10 to 70 uses to be comparable in energy use to a single-use cup. These numbers can get even larger when comparing reusable polypropylene cups to single-use cups made from other materials. The Institute for Lifecycle Energy Analysis conducted a study on the energy used on a PP cup compared to single-use paper and polystyrene foam cups. They found that to "break even" environmentally would require a plastic cup to be reused 17 times to be comparable to a paper disposable cup, and 450 times to use the same amount of energy as a foam cup (ILEA 1994).

While these studies show the environmental impacts on the front-end of the supply chain analysis, they don't consider what happens with the waste of these cups. While a polypropylene cup requires more energy, it is much less likely to be

thrown in the landfill. Polypropylene is one of the easier plastics to recycle, unlike polystyrene foam, which is unable to be recycled and never decomposes. Landfills are dangerous to the environment in a couple of ways. First, their size degrades the land around it, takes away from ecosystem habitats and ruins areas with its unattractive looks and smells. Furthermore, the emissions from landfills can be very dangerous to the atmosphere. The two most abundant gases emitted from landfills are methane, which consists of about 40-60% of emissions, and carbon dioxide, which virtually consists of the remaining emissions (EPA). Both of these are greenhouse gases, with carbon dioxide often in the news as a main source of anthropogenic climate change. In this instance however, methane should be paid attention to in particular due to its potency. The EPA states that methane is 20 times more potent of a greenhouse gas by weight than carbon, meaning that it could amplify the atmospheric greenhouse effect significantly if enough is emitted in the atmosphere. Anthropogenic methane is at an all-time high, and landfills are partially responsible for that. As of 2011, landfills were the third-largest human-made source of methane in the US, generating 17.5% of the gas emitted (LMOP). With so much methane being emitted from landfills, the push to reduce landfill waste is at a critical point. Thus, while reusable cups still require oil to make, their diversion can reduce greenhouse gas emissions. While it is difficult to calculate just how much each cup will save, Garrido (2007) has calculated that less than 5% of the condensed polypropylene cups will end up in the landfill. Compared to nearly 80% of the disposable polypropylene, this is a great reduction, and a step towards zero-waste.

Profitability

Several factors must be considered to assess the profitability of this project. First, we must look at the reusable cup initiative. Reusable cups made from heavy plastic cost more per unit than a basic disposable cup would cost. However, since switching to a reusable cup would reduce the quantity of cups needed for the event, there is potential that the prices would be comparable or even more cost-efficient. If we take the same assumption that a 16-ounce Polypropylene cup costs 8.7 cents per unit, it would cost $31,857 for the 360,000 calculated earlier. I found a manufacturer from Asia that would make reusable cups form 10 to 30 cents per unit (Alibaba). These cups are made from condensed Polypropylene, and are able to have a logo printed on them and be reused. If we assume that for a crowd of 40,000 we would only need to purchase 50,000 units (accounting for lost, stolen and discarded cups). Even if we take the high end of the estimate at 30 cents per unit, the total cost of manufacturing these cups would be $15,000. This is less expensive than the disposable alternative, but there are other costs that should be accounted for with this. It is uncertain whether or not this cost accounts for the cost of printing, which could increase the price. Furthermore, this is a large assumption of numbers, so there is a chance that fewer disposable cups would be needed or more reusable cups would be required. Something to consider for the number of cups ordered is the type of festival that is being held. A festival such as Telluride Bluegrass Festival, which features folk and bluegrass music, allows for attendees to sit and enjoy the music. In this sort of environment, attendees are more likely to hold on to their cups. In a festival that features dance music, however, most attendees would probably feel

burdened to carry their cup around while dancing in large crowds. In these scenarios, more cups would probably need to be purchased to account for the greater number of cups discarded.

Another thing to consider is the buyer behavior for this plan. When we polled festivalgoers to find pricing for a reusable, souvenir cup, we found that 35% of respondents would be willing to spend $1-4 on this product. Only 1% of the respondents said that they would not be willing to spend any amount of money on a reusable cup. If we take this data to assume that the festival would charge a $3 deposit for this reusable cup, there is a chance that money could be made from this plan. While the $3 is refundable upon the return of the cup, if a festivalgoer does not return the cup there is a profit of $2.7 made off of the cup. Since they would be decorated with the festival's logo, this would increase the odds for festivalgoers to keep it as a souvenir. The Latitude Festival found that approximately half of their cups were kept as souvenirs, while the other half were returned. With this in mind, we will make the assumption that 20,000 cups will not be returned for their deposit refund. If this is the case, then the cups could make a profit of $54,000.

For the plates, the quantity ordered and the price per unit must also be examined to assess its profitability. Assuming again an audience of 40,000 people, vendors should be prepared to serve two meals per person per day. This would account for 80,000 plates per day, and thus 240,000 plates for the entire event. Looking at wholesale sites, the typical paper plate will cost approximately 3.5 cents per unit (Alibaba). This would lead to a total cost of $8,400 for plates for the entire three-day event. Meanwhile, reusable plates made from condensed Polypropylene

sold for approximately 13 cents per unit from the same wholesale distributor. If these reusable plates were used, however, only about 50,000 plates would need to be purchased (assuming one plate per person per meal, with 10,000 extra to account for lost or ruined pieces). This purchase would only cost $6,500 for the materials. Considering that these plates could be reused for the next festival, this switch has the potential to save a lot of money in the long run.

Some things to consider with these numbers, however, are the logistics and labor that come with a reusable system. To reuse the plates requires that they be properly returned so they can be washed. To incentivize this, a deposit would be put on every plate given out at concessions. Vendors would include the extra dollar in the price of their food, with the understanding that when the plate was returned to the dish washing station they would be reimbursed that money. Like the plan to switch to compostable materials, each vendor would be required to purchase these plates and raise their prices, so there would not be a competitive disadvantage for adopting the system. The dollar back gives people a reason to clean up after themselves, as well as gives others a reason to pick up a plate and return it if it is improperly discarded. If, for whatever reason, the dish is not returned, the dollar would not be reimbursed and a profit of approximately 87 cents would be made on the lost plate. When polling festivalgoers about this system, 70% of respondents said that they would participate in this program. 5% said they would not, and 13% said that they would need to be paid more money than $1 to be willing to return the dishware. The remaining 12% said that they don't typically purchase food while attending festivals. Even if 18% of people are not interested in returning it,

however, it is safe to assume that some of the 70% willing in participating in the program would return the discarded plates for additional money. Behind the counter, we need to account for the laborers that accept plates and wash them for reuse. To handle a crowd of 40,000, at least 10 volunteers would need to be on shift at a time. If these volunteers were expected to work 6 hours to receive a VIP upgrade on their ticket, and the festival is assumed to run for 12 hours each day, then approximately 60 volunteers would be needed over the course of three days for this endeavor. Additionally, infrastructure would need to be added to make the dishwashing area. The area would need to be up to health food codes, and several sinks with water hookups would need to be provided. While the cost of adding these things are uncertain, they would add to the $6,500 cost of plates and close the profit margin.

Analysis of Transportation Proposals: Encouraging Public Transportation Through Strategic Venue Location

Background

Transportation to and from music festivals is an enormous contributor to the carbon footprint of festivals. Of the festivalgoers surveyed, 66% responded that car was their preferred method of transportation (see figure 1). Thus, if 40,000 people are attending a festival, it can be assumed that 26,000 people are travelling by car. A report by the Department of Transportation said that a general trip in a car emits .59 pounds of CO2 emissions every mile for each passenger. If 26,000 people are travelling by car and we assume that they are travelling 60 miles round trip to the festival, then a total of 920,000 pounds of CO2 are emitted by car traffic to and from the festival.

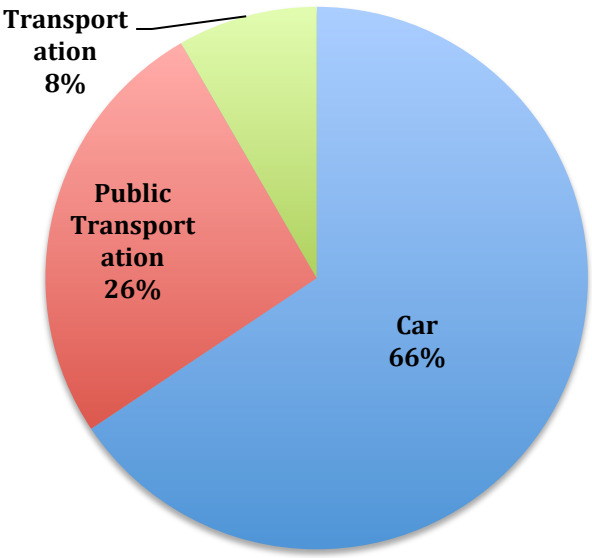


Figure 1. Preferred methods of transportation

This is a large number already, and a very conservative guess at the total number of emissions from cars. Other factors that would increase this value include emissions from flights, a lower number of carpoolers and a greater distance needed to travel per passenger to the festival.

Because so many people travel by car, the location of a festival is very important in determining its carbon footprint. For example, the Bonnaroo Music and Arts Festival, which is located in the small town of Manchester Tennessee, is nearly impossible to get to any way except by car (Bonnaroo). The city is located 64 miles away from the state capital of Nashville, which is also the location of the closest airport. Although Bonnaroo has created initiatives to help reduce the number of cars travelling to the area, such as implementing a shuttle from the Nashville Airport and offering incentives for high occupancy vehicles, this location still encourages car travel as the most convenient method of transportation to the event.

Hosting events at rural locations can have benefits, such as the ability to accommodate more people, cost cheaper to rent and stimulate rural economies. However, getting to such a remote location can also be a difficult and expensive task for festivalgoers, perhaps leading to a more expensive trip and further discouraging potential attendees to purchase a pass.

Proposal

The proposal would be to support public transportation initiatives by relocating the venue of the festival to a location that is near an accessible stop. Examples would be the Electric Daisy Carnival's New Jersey location at Giant's Stadium (located with convenience to the New Jersey Transit station and the New York PATH station), or the Made in America festival (located in Philadelphia conveniently near a major SEPTA station). The intention of this would be to make public transportation the most convenient route, which would reduce people's reliance on cars. The number of cars would be further discouraged with the festival

enacting a rule similar to Bonnaroo's, where cars with a single passenger would be charged an extra $20 and cars with two passengers charged an extra $10. If the location were in an urban environment, there would also be a free bike parking lot to encourage energy-free transportation.

Environmental Impact

To gauge the environmental impact of this initiative, we must look at the amount of carbon that would be reduced by replacing cars with buses or trains. As previously stated, if 26,000 people travel by car to the festival, a total of 920,000 pounds of CO2 will be emitted by traffic.

If the venue were changed to a more central area instead, more people would be able to travel by public transportation. When polled, 88% of respondents said that if public transportation was easily accessible to the festival, that they would use it as their mode of transportation (see Figure 2). Assuming that 88% of the car travellers are now using public transportation to attend the festival, this would mean that 22,880 people are reducing their carbon footprint. For the sake of convenience we'll assume that one-third of festivalgoers travel by bus, one-third switch to heavy rail system and the

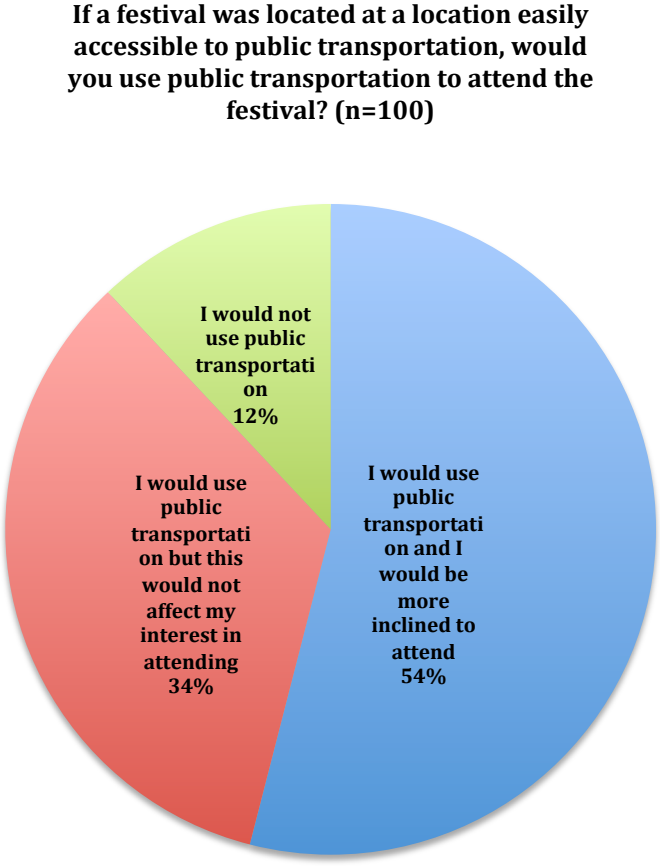


Figure 2. Reaction to Public Transportation in Festivals

last third now travel by a light rail system. This leaves 7,626 new passengers traveling by each of these methods. The department of transportation has calculated that the average CO2 emissions per person mile for bus, heavy rail and light rail are .16, .11 and .15, respectively. Keeping the assumption that these passengers will still be travelling 60 miles round trip, passengers traveling by bus will emit a total of 73,209 pounds of CO2, passengers traveling by heavy rail will emit 50,331 pounds and passengers travelling by light rail will emit 68,634 pounds. This leaves the remaining 3,120 festivalgoers who will still travel by car. If these drivers emit 110,448 pounds of CO2, then the total emissions for all four of these forms of transportation would be 302,622 pounds of CO2. Compared to the 920,000 pounds emitted, this is a huge savings of 617,378 pounds, over two-thirds of the original emissions.

Profitability

To gauge the profitability of this event, a few aspects need to be considered. First is how this change in location would affect festivalgoers' buying behavior. In the survey we administered, we asked "If a festival was located at a location easily accessible to public transportation, would you use public transportation to attend the festival?" 88% of people polled responded that they would use the public transportation, and 54% of respondents said that they would use the public transportation and that this convenience would make them more inclined to attend the music festival.

With that in mind, we can assume that this added convenience could increase the number of people who would like to purchase a ticket. If we take the 40,000-

person festival from our earlier analyses, we can use this to generate numbers from these survey responses. Since 54% of people said they would be more inclined to attend the festival, we can take a conservative estimate that 20% more people would actually purchase tickets to the festival. This would increase a 40,000-person festival to one with 48,000 attendees. If we charged $225 for a three-day pass, this would generate over $1.8 million extra in ticket sales. If the festival drew a larger crowd, additional money could possibly be made with sponsorships as well, since this would ensure more exposure to the sponsoring companies. Factors to consider with this, however, include the fact that a larger crowd may not be logistically beneficial or even possible. A larger festival would require more staff, materials and amenities (such as bathrooms and concessions), which would all be extra costs to consider. Additionally, a location closer to public transportation stops would probably be in a more urban setting, which may not have the size to hold 8,000 additional people. A paradox arises that while the new venue may attract more people, it may not be able to fit all of them.

If more people want to attend but the venue will not allow growth of audience, this still can be economically beneficial. Basic economics dictates that an increase in demand consequentially brings about an increase in equilibrium selling price (Econ). If a festival has no issue selling 40,000 tickets and more people are willing to purchase admission, then they can be sold at a higher price to account for this. Since festival tickets are already sold at a high price point, a price increase of only a few dollars should not affect customers' willingness to pay. For example, if the event planning company decided to increase the price of a three-day pass from

$225 to $230, these five dollars would not deter people from attending. Since so many units are being sold, however, this can cause a big profit for the company. A $5 increase in ticket prices, which appears to be pretty conservative given the increased interest would provide $200,000 extra dollars in sales without needing to add any additional costs or infrastructure.

There are some economic downsides to changing the location, however. As stated before, moving the festival to a location that is accessible to public transportation implies that the festival will be moved to an urban setting. While this allows for better access, this may end up costing more money to lease the place. Most festivals held in rural locations are on farms or other large plots of land. These are inexpensive to lease compared to a professional sporting events stadium, which would be the most attractive location for an urban festival due to its already existing infrastructure. While I was unable to procure an exact difference in rental fees between a rural location and a metropolitan location, every person that I interviewed said that there would be a significant increase in price with this switch.

Another thing to consider is the lost revenue from parking fees. If we follow the assumptions that a 40,000-person festival draws 8,667 cars, then charging festivalgoers to park their cars can make easy money. A festival can charge $10 per car per day, which would make them $260,000 in parking revenue over the course of three days. Moving the location to a spot with better public transportation but perhaps worse parking options can reduce the number of cars in the lots, and thus the amount of money made.

Furthermore, positioning a venue in an urban location will make camping virtually impossible. Although lodging would not be an issue due to the closer proximity of more hotels, the festival will not be making money off of these accommodations. Camping can be a very lucrative option for a festival in a rural location, as this is one of the few options for festivalgoers and requires minimal amenities to be provided. For example, the Coachella Music Festival in 2014 provided 30-by-10-foot camping plots to visitors for $85 dollars for the weekend (2014 Camping Info). While they do not specify the number of lots provided, every plot was sold out for both weekends. Assuming that there were 15,000 plots, this would be $1,275,000 in revenue each weekend. This is not including the money gained from the campground's "General Store," which sells necessities such as toiletries, tents, and medicine. This gives Coachella a monopoly over the goods sold, which further allows for profits. This would not be nearly as successful if the festival was located in a city, where room for camping would be scarce, traffic would cause excess noise, and ample lodging alternatives were available. One possibility would be to coordinate a package with local hotels. In this sort of deal, the festival would allow attendees to book their hotel while purchasing their pass. This would benefit the hotel by ensuring a large amount of business for that weekend, and in exchange the festival would receive a small percentage of the profits. While the scope of this paper will not go through the finances of travel and hotel packages, it is an idea already used by urban festivals such as Miami's Ultra Music Festival (Ultra).

The last thing to consider with changing the location is the intangible value of certain locations. In my qualitative interviews, people revealed that at times, the

venue is half of the festival's excitement. An example includes the Electric Forest Festival, which uses a Michigan forest as a venue decorated with neon lights and hammocks to create a surreal experience for the attendees' pleasure (Electric Forest). While 54% of festivalgoers said that they were more inclined to attend a festival accessible by public transportation, this may not be true if the venue holds a special appeal. This could be seen in 2014, when Colorado's Snowball Music Festival moved from its mountain location in Winter Park to a new location in downtown Denver (Snowball). While this location is closer to public transportation and the amenities of the city, the festival saw a steep decline in ticket sales after the announcement. The festival's founder even published a letter to previous ticketholders apologizing for the change in location and asking for people to purchase passes.

With all of these considerations, it is difficult to financially justify moving the venue. One possibility would be for the festival to create its own public transportation through a bus system, but to create the infrastructure for this would be difficult. The average Greyhound-size bus only carries about 55 people, so to effectively transport thousands of people would require dozens of buses. This could prove to be a very expensive endeavor to undertake, but should be looked into further, especially if festivalgoers are willing to purchase tickets for transportation to the rural location.

Analysis of Transportation Proposals: Using Carbon Offsets

Background

Much like the music festival industry, the carbon-offset market is a rapidly growing one. While there were only a couple dozen of global providers for carbon offsets in 2006, the number quickly grew to over 170 in 2008 (Dhanda 2008). The industry is growing in profits as well as size, as over $700 million were traded in 2008, twice as much as 2007's value (Hamilton et al. 2009). The carbon-offset market in essence is paying a third party to perform an environmentally friendly action to offset the pollution caused by the business or individual. While some have argued that the carbon market is merely turning sustainability into a commodity instead of promoting sustainable actions, others applaud the idea as an easy and convenient way for businesses to reduce their carbon footprint while spreading awareness for conservation thought.

Proposal

The proposal for this project would be to add a surcharge to the cost of a festival pass to raise money to donate to a carbon offset program. The cost would automatically be added into the price of the event, and customers would be told that a portion of their ticket purchase is going to saving the planet. Information would be provided to the ticketholders about their initiative, and resources about how else to help the environment.

A third-party company that specializes in carbon markets would handle the actual carbon offset program. These companies can audit the amount of carbon emitted from the transportation and operations of the event, or the event can calculate it itself and purchase the amount of carbon it wants offset independently. Once purchased, the carbon offset company can use this money for a number of initiatives, including planting trees, reducing methane and even donating to humanitarian efforts to allow developing countries to grow sustainably (REVERB).

Environmental Impact

The environmental possibilities of this initiative could be the most successful out of all the other initiatives investigated in this paper. If a surcharge of $10 were added to each wristband for a festival attended by 40,000 people, this would raise $400,000 for carbon-offset charges. The carbon offset company chosen for this project offers a deal of $13.12 for each metric ton of carbon offset, so a purchase of $400,000 can offset 30,488 metric tons. This same carbon offset company calculates a round-trip flight from JFK airport in New York to LAX in Los Angeles to use .873 metric tons of carbon. With this in mind, the credit purchase would be able to offset 34,923 flights from New York to Los Angeles. This means that enough carbon would be offset from this purchase to cover the travel of all festival attendees, even if 90% of the attendees travelled across the country to attend. This, however, does not account for the shipping and hauling of supplies and waste, the waste generated, or the energy used for sound and lighting at the festival. Still, to be able to nullify the CO2 emitted by attendee and participant transportation is an impressive feat by a festival, and one that should significantly help their branding as a green festival.

These pounds of carbon would be offset would be through a couple of different initiatives. First is a landfill gas capture program. As stated previously, methane emissions from landfills are a serious threat to the environment, accounting for a third of total methane emissions. This program would set up infrastructure to control the methane and destroy it, or burn it to generate clean, renewable energy (Terrabill). This plan can also be used to reduce the methane in

abandoned coal mining facilities. Another similar program involves the collection of farm animal waste, which is another large emitter of methane. This plan uses anaerobic digesters to break down the waste, and then allows the remainder to be burned for energy. The last project that this carbon offset company supports is the funding of clean energy projects, such as solar and wind farms (Terrabill).

While I picked what I could find to be a trustworthy company to work through, the carbon-offset program is not perfect. Since the carbon offset market is a fairly new industry, there has not been a cohesive move for regulation or transparency in the field. Because of this, the information presented by carbon-offset companies may be muddled or misleading. For example, while the company I chose to go with for the hypothetical donation calculated a flight from JFK as .89 metric tones per flight, another company calculated this same flight as .7 metric tons. While this discrepancy seems pretty small, placed over a quantity as large as 40,000 people it can make a big difference between being a carbon-neutral event and not. Furthermore, the risk of greenwashing is high in this industry. One particular controversy comes from the carbon-offset initiative of planting trees for every number of dollars spent. While this plan sounds great in theory, it is not as effective in practice as the concept would suggest. It has been uncovered that some of these carbon-offset programs plant the trees without ensuring that they are protected for their life. If a tree is cut down in its growing phase, then it will not sequester the amount of carbon promised by the company selling the carbon offset.

One particularly controversial example of this came in 2002, when Coldplay encouraged fans to purchase carbon offsets for their tour. For approximately £17,

fans could purchase a sapling for a tree in India, which would provide food for rural villagers as well as reduce carbon in the atmosphere. While this was originally a great initiative that gave Coldplay positive PR, it was later revealed that 40% of the saplings donated had died within the first four years (Smith 2007). There is currently a lack of accountability in the carbon-offset industry, so a festival must be careful in picking a program to donate to.

Profitability

While this initiative does not make the company any profit, it should not hinder the festival's success. When polled about this initiative, more than 65% of festival attendees would be willing to spend 5 or more dollars on a carbon offset program (see Figure 3). 26% of people even volunteered to spend more than $10 on the initiative. This is twice as much as the 13% of people who said that they would not be willing to spend money on carbon offsets.

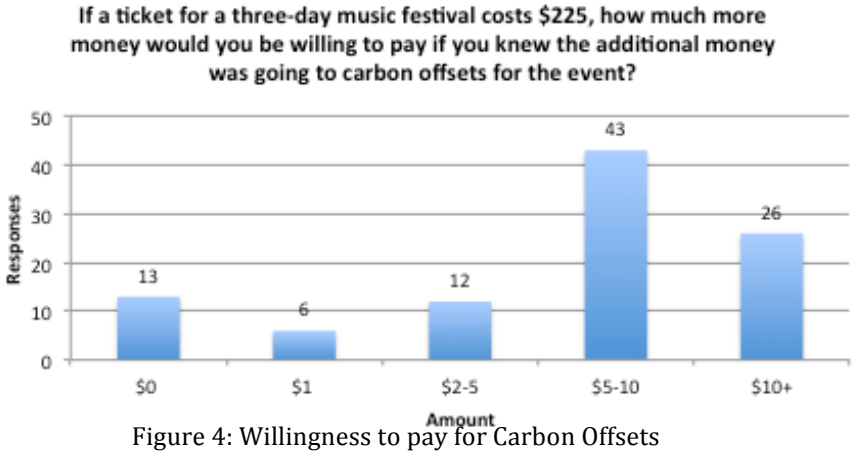


Figure 4: Willingness to pay for Carbon Offsets

There is ability to make money through carbon offsets through green branding and image enhancement. Being able to label an event as a carbon neutral event is an impressive feat, and can attract new sponsorships from companies that also encourage sustainability. However, with the carbon offset industry in as

controversial of a state as it is, some more astute environmentalists and sponsors may be skeptical of the branding as carbon neutral.

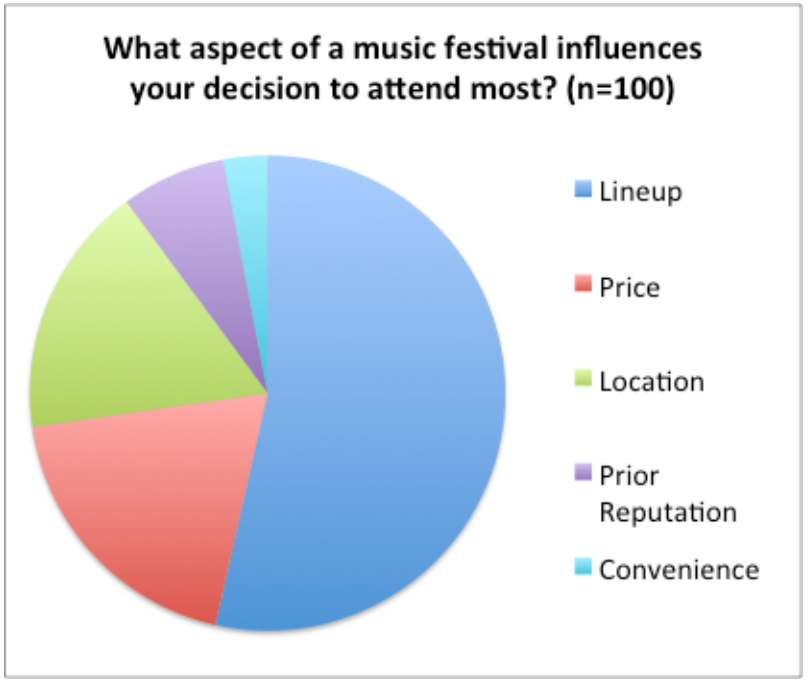
Part 5: Discussion of Results and Conclusions

In conclusion, the decision to promote environmentally friendly practices in the music festival industry is ultimately up to the ethical philosophies of the event planners organizing such events. Looking at these projects with a triple bottom line perspective, it is difficult to conclusively say that any of these projects will benefit the event both environmentally and economically. Switching to compostables can reduce the amount of landfill waste and its subsequent methane emissions, but costs more for PLA cups and can be more expensive to haul and dump at a compost center depending on its geographic location. Moving a festival to a venue accessible to public transportation can cut carbon emissions drastically, but the increased costs and lost revenue from camping and parking deter this plan financially. Carbon offsets are the quickest and easiest way to reduce carbon for a festival, but they don't have an apparent economic benefit other than positive branding for the company. The best plan from the triple bottom line perspective is the move to reusable dishware. If all of the numbers assumed in this paper are correct, then this plan can save thousands of dollars while diverting a lot of waste from the landfill. Even this plan is imperfect, however, since the implementation of reusable dishware still requires a lot of energy and oil to make condensed polypropylene. So while certain changes can make a large impact, overall there is little clear-cut economic incentive to switch to sustainable practices. This is further complicated by the price volatility of certain products as they change location. Because of this, I cannot say

with a high level of certainty that internalizing environmental costs is an economically beneficial idea.

I can say, however, that making changes to reduce environmental footprints yields a positive impact on customer perception, or the "people" aspect of the triple bottom line. 39.8% of people polled stated that a festival being environmentally responsible or "green" would increase their interest in going, and most were responsive to the ideas proposed in this paper.

Because of this, it is perhaps still the best idea to use the stakeholder model instead of the triple bottom line as the primary method to promote sustainability in the music festival industry. While researching the sustainability initiatives of festivals, an apparent trend arose with the genres of festivals that promoted sustainability, and those that did not. It appeared that Bluegrass festivals were the most conscientious of the environment, and many of the innovative ideas explored in this paper were already active in smaller bluegrass and country festivals. Electronic festivals that appeal to a younger crowd, meanwhile, appeared to have the fewest environmental initiatives.



The impact of the artists' attitudes is also important, as the survey administered revealed that 54% of polled festivalgoers claim that the lineup is their greatest motivation to attend a festival (see Figure 4). Thus, if a musician or band does not support the festival due to its environmental practices, then people are less inclined to attend. The most prominent example was in 2008, when rock band Radiohead announced that they would not be performing at the popular Glastonbury Music Festival in England due to its high carbon emissions (McLean 2008). As an embarrassment to its public relations, Glastonbury consequentially took steps to improve its sustainability practices. While this is an isolated incident, and while there are a number of reasons that may have motivated Radiohead to refrain from Glastonbury besides its environmental practices, it is still a factor to consider when planning for an event. If more musicians adhered to environmental responsibility, this may be an avenue to increase sustainability in the festival field. Another consideration comes from sponsorships. If an environmentally conscious company backs a festival, the festival is more inclined to promote sustainability. This can be seen in the Telluride Bluegrass Festival, which partners with New Belgium brewing company to innovate sustainable ideas every year.

There were some difficulties with conducting this study. Since the music festival industry is one that has grown prolifically in the last decade, there is a lack of academic research in this field. Thus, popular news sources were referenced at points to have the most up-to-date numbers on recent events. While every effort was made to ensure that these sources were legitimate (authors were contacted and

asked to share where they received their numbers), the lack of peer-reviewed resources proved to be a point of concern.

Another problem came when conducting our qualitative interviews with experts in the field. Many of the people we interviewed were unable to give specific information in the way that I was hoping. This happened for primarily two reasons - first, as professionals representing a company, there was a certain level of confidentiality that they needed to uphold. This made certain questions difficult to get answers on, especially when specific numbers and monetary values were discussed. Ideally, I was looking for a festival that would be willing to give its operations story from beginning to end. Many music festivals were contacted asking for personal interviews, most of them declined the offer. Since all major event-planning companies are privately held, they do not need to disclose any information about their operations practices to the public. This caused me to make several assumptions, and while all of those assumptions were explained thoroughly and kept consistent, their accuracy may be off.

The second reason why the data had so many holes was due to the fragmented nature of Festival supply chain. Since a music festival is needs to focus on many different aspects, most of these are outsourced to private contractors. While we attempted to contact and interview every part of the operations chain, it was difficult to get our hands on every professional in the field. This made it difficult to get specific quantities of festivals, as they varied from person to person.

The online survey was a large part of my research, but could be changed for the next time it is used. I used the online survey purveyor surveymonkey.com, but

only used a free account. This gave us a limited number of questions that we were allowed to put on the survey, something that proved to be a problem as I received responses. Although the survey was short by design to encourage participants in taking it, there were some key follow up questions that should have been included. Also, certain questions, such as "How is your interest in a festival affected if it has a reputation for being environmentally responsible or 'green'?" should have been on a scale, as opposed to a simple yes or no answer. This would have allowed us to gauge more precisely how invested festivalgoers are in an event's sustainability. Since it was an anonymous online survey, we also had limited control over the demographics that took it. The survey was posted on Music Festival forums pages to encourage the sample group to be festival attendees, but 41% of people answering the survey did not attend a festival in the last year. Furthermore, there was no question on the participants' country of origin. Since this study aimed to focus on festivals in the United States, receiving responses from other countries could have muddied our data further. These changes should be implemented next time a survey like this is conducted.

Overall, it is possible that the triple bottom line can one day promote sustainability, but in the current landscape of festivals it is up to the planners' personal morals and the morals of those attending to create an environmentally friendly event. However, if the trend in business continues towards sustainable branding, it will soon be essential that a festival needs to have environmentally conscious operations to ensure saving its branding potential.

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Appendix A: Survey Administered through SurveyMonkey.com

1. What is your age?

- ○ Under 18
- ○ 18-20
- ○ 21-25
- ○ 25-35
- ○ 35-45
- ○ Over 45

2. In the last year, how many music festivals have you attended? ("Music Festival" defined as at least one full day of performances with more than one stage)

- ○ 0
- ○ 1
- ○ 2-3
- ○ 4-5
- ○ More than 5

3. How much do you typically spend on tickets to concerts and music festivals in a year?

- ○ $0
- ○ $0-50
- ○ $50-100
- ○ $100-250
- ○ $250-500
- ○ $500-750
- ○ More than $750

4. What aspects of a music festival most influence your decision to attend?

- Price
- Location
- Lineup
- Prior Reputation
- Convenience

5. What is your preferred method of transportation to festivals?

- ○ Car
- ○ Public transportation (train, bus)
- ○ Private transportation company (i.e. Bus To Show, Taxi, Limo)
- ○ Other (please specify) _____

6. If a festival was located at a location easily accessible to public transportation, would you use public transportation to attend the festival?

- ○ I would use public transportation and I would be more inclined to attend
- ○ I would use public transportation but this would not affect my interest in attending
- ○ I would not use public transportation

7. How is your interest in a festival affected if it has a reputation for being environmentally responsible or "green"?

- ○ I am more inclined to attend
- ○ I am less inclined to attend
- ○ It does not affect my decision to attend

8. If a ticket for a three-day music festival costs $225, how much more money would you be willing to pay if you knew the additional money was going to carbon offsets for the event (for example, the money would be used to plant trees, provide clean water to an impoverished area or fund clean energy initiatives)?

- ○ $0
- ○ $1
- ○ $2-5
- ○ $5-10
- ○ More than $10

9. If concessions at a festival offered reduced price for drinks if you bought a reusable container (for example, $3 instead of $5 for 16 oz. drinks, or free water instead of $3 for a 16 oz. bottle), how much would you be willing to spend on the container?

- ○ $0
- ○ $1-4
- ○ $4-6
- ○ $6-8

- ○ $8-10
- ○ $10+

10. If concessions at a festival charged $10 for a meal, but served it with reusable plates and utensils and paid you $1 back for returning these items, would you participate in this program?

- ○ Yes
- ○ No
- ○ Only if they paid more than $1
- ○ I don't usually eat at music festivals

Appendix B: Map of Composting Centers in the United States

All points are composting centers; yellow points are centers certified by the Composting Council.
Data courtesy of the Composting Council.