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Waste Management in California Jails and Prisons

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Waste Management in California Jails and Prisons

A Dissertation by

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Doctor of Education in Organizational Leadership

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“The case for recycling is strong. The bottom line is clear. Recycling requires a trivial amount of our time. Recycling saves money and reduces pollution. Recycling creates more jobs than landfilling or incineration. And a largely ignored but very important consideration, recycling reduces our need to dump our garbage in someone else’s backyard.”
ABSTRACT

Waste Management in California Jails and Prisons

by Antoinette Bland

The focus of this mixed-methods study was to identify waste reduction strategies that reduced the impact of California jails and prisons on the environment through waste diversion and reduction. This study also sought to identify barriers that hindered jail and prison personnel from developing such strategies, and pursued recommendations on how those barriers could be overcome.

Traditionally, California county jails and state prisons are resource intensive, overcrowded housing locations for about 200,000 adult men and women (Glaze & Herberman, 2013). California jails and prisons operate 24 hours a day, seven days a week and utilize resources such as electricity, personnel, food, and other products. Accordingly, they generated significant waste (California Department of Resources and Recovery [CalRecycle], 2012). The prisoners alone generated about four pounds of waste per person each day, consistent with societal averages (CalRecycle, 2012; Corrections Corporation of America, 2007; Environmental Protection Agency [EPA], 2012a). Because of this, jails and prison must do more to reduce waste.

This study provided examples of organizations currently reducing waste through strategic initiatives and highlighted areas where jails and prisons could begin or further improve waste diversion practices. The study utilized archival data, a web-based survey, and interviews for data collection and analysis. The data from California jails and prisons were analyzed to identify strategies, barriers, and ways to eliminate or reduce barriers to waste reduction programs in California jails and prisons.
The findings conclude, California state-operated prisons and sheriff-operated county jails are using two primary strategies to divert waste from landfills. The number one strategy is recycling. The second strategy being used is waste prevention and material reuse. The barriers identified by California state-operated prisons and sheriff-operated county jails include finding vendors to collect certain materials as well as finding vendors to travel to remote locations. Other barriers include a lack of personnel and in some instances a lack of knowledge. Sheriff-operated jails and state-operated prisons in California identified waste management program support from leadership as a primary method to eliminate or reduce barriers to implementing a waste reduction program. Implications for action and future research are also discussed as part of this study.
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CHAPTER I: INTRODUCTION

The United States Environmental Protection Agency (EPA) was founded in 1970 with a mission to “protect human health and the environment” (EPA, 2012b, para. 1). Since its inception, the EPA has worked for a cleaner, healthier environment for the American people. Over the last four decades, the EPA has been effective in achieving goals that benefited humanity and the environment. For example, the EPA ordered the removal of lead from gasoline, which has been described as one of the greatest public health achievements of the 20th century (Bridbord & Hanson, 2009; Knapp, 2013). Further, the EPA banned widespread use of pesticides after some were found to be harmful to the environment and humans (Casida, 2012; EPA, 2012a; Schultz & Ferraro, 2013). Additionally, the EPA (2012a) set regulations that managed toxins and improved national waste management practices. While the EPA has been effective over the past four decades, there is still work to do.

Environmental concerns have become increasingly relevant over the years. Understanding issues such as the cause of greenhouse gases, the dangers of landfills, and how to manage solid waste gained significant momentum in society. This was evident in a variety of changes to societal values, the corporate world, and governments at the federal, state, and local levels (Gottschalk, 2011; Hitchcock & Willard, 2008; Saha & Darnton, 2005). Society interacts with the environment in ways that are sometimes sustainable, such as planting trees, removing oil from the ocean, and recycling.

Conversely, the public also interacts with the environment in ways not considered sustainable, such as polluting the air, polluting open waters, and placing recyclable waste into landfills.
Regardless of the interaction humans have with the environment, there is a growing awareness of the need to better manage practices which negatively impact the environment (Knapp, 2013; Saha & Darnton, 2005; Brundtland, 1987).

**Background**

**Sustainable Waste Management Programs**

One of the primary objectives of the EPA is to protect the environment from harm. The EPA defines harm as “any impact on the environment resulting from human activity which has a degrading effect on the environment, whether temporarily or permanently” (2012b). Although several regulations and policies are in place to manage the harm caused to the environment, it can sometimes be a challenge.

International organizations like Nike, Coke, Sony, and General Mills certainly lend themselves toward environmental sustainability, given their products and focused areas of interest (Coca-Cola, 2014; Espinoza, 2013; General Mills, 2014; Nike, 2013). Leaders of these organizations incorporated sustainability practices or green initiatives into many aspects of their business operation, from the products themselves to manufacturing processes, in-house recycling, social activism, and energy conservation practices (Coca-Cola, 2014; Espinoza, 2013; General Mills, 2014; Nike, 2013). Whereas these companies understand what it takes to manage an environmentally friendly organization, not all businesses fit into this organizational model.

The fundamental issue behind the notion that organizations behave in an environmentally sustainable manner was the societal impact of non-sustainable practices. Non-sustainable practices such as air pollution, poor solid waste management, and chemical use can negatively impact the environment (Birch & Wachter, 2011; Hitchcock
Meeting societal expectations can be a challenge for organizations that do not have the resources or leadership to take on such an endeavor.

Many organizations based their success on their market value and were considered successful when they achieved identified market gain. However, the manner in which an organization achieved success may include the mass degradation of land, polluting massive amounts of water, air pollution, and consuming energy inefficiently (Berrone, Fosfuri, Gelabert, & Gomez-Mejia, 2013; Birch & Wachter, 2011). Although economically successful, an organization operating in this manner would not be considered environmentally sustainable based on the definition. In addition, the organization could suffer sanctions from oversight agencies such as the EPA, which could affect the financial bottom line.

Businesses worry about the bottom line, especially in a time of economic crisis. California county jails and state prison facilities are no different. Both entities compete for money from the California state budget and each budgetary cut has a trickle-down effect. One way jails and prisons can improve their bottom line is by implementing sustainable organizational practices such as a waste management strategic initiative.

**Waste Management as a Strategic Initiative**

In the United States, environmental sustainability is at the forefront of many business plans. National organizations including the Sierra Club, Nature Conservancy, and the Natural Resource Defense Counsel, as well as California state nonprofits such as Heal the Bay and Surfrider Foundation work toward sustaining all aspects of the environment (Berrone et al., 2013; Espinoza, 2013; National Waste and Recycling Association, 2014).
Even with national and international business participation in waste management programs, Americans generated 250 million tons of garbage in 2011, nearly double the amount in 1970 (National Waste and Recycling Association, 2014). In essence, Americans wasted several millions of dollars on trash, sending waste products to landfills when they could have been recycled to reduce waste and generate money (EPA, 2013; National Waste and Recycling Association, 2014). People do not recycle for a number of reasons. It was easier not to recycle. There were minimal monetary incentives to practice recycling in the residence or office. Recycling was confusing because of separation of products such as plastics, paper, glass, and aluminum. The need to separate products made recycling inconvenient, taking both time and space. Finally, the feeling that recycling did not make a difference to the environment may have impeded participation (EPA, 2013; Louis & Shih, 2007; National Waste and Recycling Association, 2014).

Implementing a comprehensive, sustainable waste management initiative may not be easy. It entails making a series of minor and major changes to an organization (Hitchcock & Willard, 2008; McKenzie-Mohr, 2011). In some cases, existing policies and practices may need to be evaluated and changed for an environmental sustainability initiative to be successfully implemented. The challenge stems from getting organizations in all sectors to emulate those organizations who already successfully implemented such programs.

**Correctional Facilities**

One area where environmentally sustainable behavior can help to improve the environment involved waste management at correctional facilities. At any given time, two million individuals nationwide called a prison, jail, or detention center their home
(Glaze & Herberman, 2013). Just like people on the outside, those in correctional facilities interacted with the environment by generating various types of waste during their confinement. Correctional facilities are unique in that these living spaces can essentially be viewed as small cities (Multnomah County Sheriff’s Office [MSCO], 2012). Most correctional facilities operate 24 hours a day, seven days a week. From living quarters and food services to educational programs and correctional industries, these facilities can be extremely costly and utilized excessive resources such as paper products, material packaging, and personnel (Feldbaum, Greene, Kirschenbaum, Mukamal, & Pinderhughes, 2011; MCSO, 2012; Ulrich & Nadkarni, 2008).

Based on the number of individuals living in correctional facilities and the continuous hours of operation, waste generated by correctional facilities can be large scale and diverse (Feldbaum et al., 2011; MCSO, 2012; Ulrich & Nadkarni; 2008). In an analysis of Florida waste state-wide, Kessler Consulting reported two correctional facilities alone averaged about four pounds of waste per inmate per day, or 1,450 pounds per year (Florida Center for Solid and Hazardous Waste, 1997). Based on this report, State and Federal correctional facilities in Florida generated about 70,000 tons of solid waste annually, which did not include county or privately operated facilities. The Florida Department of Environmental Protection asserted facilities could lessen the impact of waste to landfills by becoming more sustainable (2004).

By better managing solid waste, correctional facilities have the potential to save money, reduce waste, and help the environment (Feldbaum et al., 2011; Florida Department of Environmental Protection, 2004; MCSO, 2012). In addition, it was theorized these types of facilities could set the example for other residential institutions
such as universities, military bases, assisted living centers, and summer camps (Feldbaum et al., 2011; Ulrich & Nadkarni, 2008).

**Waste Management in Correctional Facilities**

A waste management initiative can work in a correctional environment (Feldbaum et al., 2011; MCSO, 2012; Ulrich & Nadkarni, 2008). The need is there. In California, correctional facilities were the second largest contributor of waste to landfills (California Department of Resources Recycling and Recovery [CalRecycle], 2012; Storm-Martin, 1999). The inmates housed in these facilities generated four to four and a half pounds of waste per inmate per day (CalRecycle, 2012, Corrections Corporation of America, 2007). In a facility of 1,500 inmates, this equated to about 232,000 pounds of solid waste per month headed to California landfills.

Although there may be support for waste management programs in correctional facilities, it can be challenging for leaders to implement comprehensive sustainability initiatives (CalRecycle, 2012; MCSO, 2012). Most correctional facilities have fixed resources because their budgets were part of a larger governing body. In California, the Department of Corrections and Rehabilitation managed prison budgets whereas the budgets for sheriff operated jails were handled at the county level, both of which faced financial challenges from about 2009. The correctional environment was further challenged by operational design and aging facilities.

The American Correctional Association Policy on Environmentally Responsible and Sustainability-Oriented Practices (2012) stated in part,

Public and private agencies at the federal, state, and local levels should:

Promote and engage in recycling efforts… Each facility and program
should pursue all reasonable alternatives that have the effect of an overall
reduction in the waste stream. (p. 97)

California prisons work toward this goal through mandated reform. Assembly
Bill (AB) 75, authored by Strom-Martin (1999), required state agencies and large
facilities to divert at least 25% of their solid waste from landfills by January 1, 2002. Per
this statute, large facilities included prisons (CalRecycle, 2012). AB 341, which directed
CalRecycle to develop and adopt additional regulations for mandatory commercial
recycling, encouraged jails, prisons, and other businesses to divert 50% of their solid
waste from landfills and required them to implement a recycling program. The goal of
this recycling program was to divert 75% of waste from landfills by 2020 (CalRecycle,
2012; Chesbro, 2011). The first steps to implement waste management programs in
California jails and prisons have already began.

Statement of the Research Problem

California jails and prisons had long been able to implement waste management
programs designed to recycle, reduce, or reuse unwanted materials. Whereas the research
showed organizations implemented programs of this nature regularly, the research did not
show jails and prisons in California had the same success. Even with state mandates,
many prisons met the minimum required and literature for jails was limited (California
Department of Corrections and Rehabilitation [CDCR], 2013; CalRecycle, 2012).

Jail and prison administrators had not fully recognized environmental
sustainability as an organizational practice and took minimal steps to reduce the waste
generated and contributed to the environment. Advocates and scholars suggested the
current practice of ignoring the problem must change to prevent further harm to the
environment (CalRecycle, 2012; Feldbaum et al., 2011; McKenzie-Mohr, 2011; Ulrich & Nadkarni, 2008).

Organizations such as jails and prisons continually face challenges when implementing sustainable programs. Several mandates in California were developed to assist in these areas, but more could be done (CalRecycle, 2012; Feldbaum et al., 2011). The environment will not remain viable for future generations unless organizations such as California jails and prisons move toward sustainable waste management practices. California jails and prisons could contribute to environmental sustainability by implementing waste management programs to recycle, reduce, and reuse solid waste materials, thereby reducing their contribution of waste to landfills which in turn would reduce the harm to the environment caused by greenhouse gases (Feldbaum et al., 2011; Florida Department of Environmental Protection, 2004; MCSO, 2012).

**Purpose Statement**

The purpose of this study was to identify waste reduction strategies that reduce the impact of jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. Further, it was the purpose of this study to identify the barriers that hinder jail and prison personnel from developing such strategies, and to recommend how those barriers might be reduced or eliminated.

**Research Questions**

The research questions are the guide for any research project. As noted by Creswell (2003), research questions and hypotheses help shape the focus of the research. The research questions for the current study were as follows:
1. What strategies were utilized to divert waste generated by jails and prisons away from landfills?

2. What were the primary barriers jails faced in implementing a waste reduction program?
   a) Lack of personnel to implement trash reduction
   b) Emphasis upon security
   c) Antiquated facilities
   d) Lack of concern for the environment by leadership
   e) Legislative mandates that interfere with trash reduction efforts
   f) Budget or cost concerns
   g) Other

3. How can barriers to waste reduction efforts in California jails and prisons be reduced or eliminated?

   **Significance of the Problem**

   Traditionally, jails and prisons were hidden or unobserved due to the nature of the business. Jails and prisons were designed to keep those who harmed members of society in some way incarcerated. Because of this, barring a dramatic change in social conditions, jails and prisons in California are not going away. Therefore, the amount of waste these facilities produce must be addressed. Although not easy, waste management could divert waste from landfills and potentially generate revenue for jails and prisons (Feldbaum et al., 2011; MSCO, 2012).
Jails and prisons generated waste in large volumes and could increase their efforts to divert waste from landfills by identifying the type and quantity of waste being generated at each facility. As waste was identified, recycling initiatives could be developed to divert waste away from landfills. Materials such as cardboard, paper, plastic, and metal are all recyclable and should not go to landfills. Solid waste such as food and grass should also be diverted through composting or other efforts (Feldbaum et al., 2011; MacDonald, 2013; MSCO, 2012).

Generally, sustainability programs that encouraged organizations such as jails and prisons to be part of the solution were an appropriate step to garner participation. The problem identified in this study was significant in that it questions the viability of jails and prisons to comply with California regulations such as AB 341, and the ability of jails and prisons over time to participate in a sustained waste reduction effort (Chesbro, 2011).

**Definitions of Terms**

**Environmental Sustainability.** Environmental sustainability includes polices and strategies that meet society’s present needs without compromising the ability of future generations to meet their needs (EPA, 2010).

**Greenhouse Gases.** Gases such as carbon dioxide, methane, and nitrous oxide that trap heat in the atmosphere. Each gas’ effect on the climate depends on three factors: how much gas, how long the gas remains in the atmosphere, and how strongly the gas impacts global temperatures (EPA, 2013).

**Jails.** Correctional facilities operated by county sheriff’s and considered locally-operated, short term facilities that hold inmates awaiting trial and or sentencing (Ferro, 2006).
**Landfills.** Areas engineered as waste disposal sites on land in which waste is spread in thin layers, compacted, and covered with a fresh layer of clay or plastic foam each day (EPA, 2013).

**Large State Facility.** State-funded facilities such as campuses of the California State University and California Community Colleges, prisons within the Department of Corrections, facilities of the State Department of Transportation, and facilities of other state agencies the Board determined as primary campuses, prisons, or facilities (CalRecycle, 2014).

**Leachate Liquid.** Mainly water that percolates through a landfill and picked up dissolved, suspended, and/or microbial contaminants from the waste (EPA, 2014).

**Prisons.** A confinement facility with custodial authority over adults sentenced to incarceration for one year or more for criminal offenses (Ferro, 2006).

**Recycle.** The process of collecting and processing materials such as paper, glass, plastic, and metals that would otherwise be thrown away as trash and turning them into new products (EPA, 2014).

**Solid Waste.** More commonly known as trash or garbage—consists of everyday items used and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries generated from homes, schools, hospitals, businesses and other facilities (EPA, 2014).

**State Agency.** Every office, department, division, board, commission, or other agency of the State of California, including prisons within the Department of Corrections and the California State Universities (CalRecycle, 2014).
The Brundtland Commission. Also known as the World Commission on Environment and Development, the Commission wrote a report titled *Our Common Future* for the United Nations, which outlined sustainability efforts into the 20th century (Brundtland, 1987).

Waste Reduction. Also known as waste prevention, designing products to reduce the amount of waste that will later need to be thrown away and also to make the resulting waste less toxic (EPA, 2014).

Delimitations

This study was delimited to sheriff-operated county jails in California, and to adult prisons operated by the California Department of Corrections and Rehabilitation (CDCR). Similar facilities within other jurisdictions exist under different state mandates and requirements for waste management. For the same reason, federal prisons, juvenile detention facilities, and privately operated prisons were not the focus of the study. Federal prisons are managed by the Bureau of Prisons, which is not a state entity. Juvenile detention facilities are managed at the state and local level; however, these facilities do not house adults. Privately operated prisons are for-profit corporations not managed by state departments of corrections.

Organization of the Study

The remainder of the study includes a review of literature in Chapter II, which delves deeper into waste management and diversion strategies in large organizations and how jails and prisons could benefit from a robust waste management program. Chapter III contains the methodology of the research study and includes the research design, research questions, population, and sample. Chapter IV provides an analysis of the data
collected, including a summary of research findings. Finally, chapter V reviews the major findings of the research and makes recommendation as well as conclusions from the information gathered.
CHAPTER II: LITERATURE REVIEW

Chapter I provided an overview of steps taken over the past four decades by the EPA to reduce harm to the environment and humanity. The chapter also examined greenhouse gases, which are those that trap heat in the atmosphere, and how waste management programs can help reduce waste to landfills. Waste management as a strategic initiative and how correctional facilities can better manage waste was also discussed. A statement of the research problem, the purpose of the study, and the research questions were also presented.

This chapter provides an examination of waste management practices and what strategies are used by various organizations to reduce waste. The chapter is organized into four sections. The first section evaluates waste management methods including recycling, landfills, and the effects of greenhouse gases on the environment. The second section reviews the practices of successful organizations that are currently reducing waste. The third section examines waste management programs in California, including recent legislation. The final section assesses waste management programs in jails and prisons at the national and local level.

Waste Management

The primary goal of managing waste is to protect society and the environment from possible harm (EPA, 2012b; McKenzie-Mohr, 2011; Shammas, Wang, & Hung, 2014). Formalized waste management programs date back to the 1800’s when New York City implemented a sanitation program that included street sweepers to manage discarded trash (History.com, 2010; Stanford, 2013; Waring, 1895). The New York City street cleaning program was managed by George E. Waring in the late 1800’s.
Waring was a visionary when it came to waste management. He developed the nation’s first public waste management system (Kalish, 2013; Louis, 2004; Waring, 1895). Waring’s team used several methods to collect waste, including separation of discarded products to ensure the items went to the most appropriate disposal destination (Louis, 2004; Standford, 2013; Waring, 1895). Once waste was collected, the trash was hauled off to various disposal facilities. New York City relied on a combination of reduction, ocean dumping, hog feeding, incinerators, and land dumps for solid waste disposal (History.com, 2010; Stanford, 2013; Waring, 1895). This method proved effective and portions of this waste management program are still in effect today.

Trash collection practices evolved over the years as the generation of waste increased on a regular basis across the nation. Although there are many types of waste collected, this research focused on solid waste, also known as trash or garbage. This type of waste cannot be eliminated, but it can be reduced through waste management.

Americans generate significant amounts of solid waste each day. Between 1960 and 2000, the daily waste generated by individuals increased by 70%, from 2.7 pounds per person to 4.5 pounds per person (EPA, 2012a; Louis, 2004). Since 2000, the EPA (2013) estimated the individual waste generation rate decreased to 4.38 pounds per person per day. This decrease was attributed to many state and local governments introducing recycling requirements as well as some recycling incentives (EPA, 2013).

**Recycling**

Recycling is the process of collecting and processing materials such as paper, glass, plastic, and metals that would otherwise be thrown away as trash and turning them into new products (EPA, 2014; Louis & Shih, 2007).
In 2012, “Americans generated about 251 million tons of trash and recycled and composted almost 87 million tons of this material, equivalent to a 34.5 percent recycling rate” (EPA, 2012a, p.1). Figure 1 below shows the breakdown of solid waste management in the United States.

![Figure 1: Management of solid waste in the United States (EPA, 2012a)](image)

Figure 1: Management of solid waste in the United States (EPA, 2012a)

On average, Americans recycled and composted 1.51 pounds out of the 4.38 pounds of solid waste generated per person (EPA, 2012). Although trash or solid waste production actually decreased per person since 2000, the amount of solid waste in tons increased, from 231.9 million tons in 2000 to 251 million tons of trash in 2012 (EPA, 2012a).
Society generates a substantial amount of waste each year and the breakdown of waste before recycling includes items such as paper, food waste, and plastics. Figure 2 below shows the breakdown of the various solid waste materials generated before recycling.

![Pie chart showing the breakdown of solid waste materials in 2012. Paper & Paperboard is the largest category at 27.4%, followed by Food Waste at 14.5%. Yard Trimmings come in at 13.5%, and Plastics make up 12.7% of the waste. Other categories include Rubber, Leather, & Textiles (8.7%), Metals (8.9%), Glass (4.6%), and Wood (6.3%).](image)

Figure 2: Types and amount of solid waste in 2012 (EPA, 2012a)

The items noted were recyclable in most instances, but 53.8% of the time these items were discarded and presumably transported to landfills. Whereas a substantial amount of waste continues to enter landfills, some recycling is occurring (EPA, 2012a).

Another method to reduce waste is reduction (or prevention). Waste reduction is the ideal approach to managing waste. Essentially, the waste was never created so there were no expenses associated with waste management or concerns about how to dispose of the unwanted material (EPA, 2014). One example of waste reduction was the
elimination of excess packaging from retail products and produce (CalRecycle, 2012; EPA, 2012b; Louis & Shih, 2007). The benefits of waste reduction included less waste to landfills and in turn a cleaner environment. Figure 3 below shows the various solid waste materials being recycled.

![Figure 3: Types and amount of solid waste recovered (EPA, 2012a)](image)

**Figure 3: Types and amount of solid waste recovered (EPA, 2012a)**

**Landfills**

A large area of land or an excavated land site was typically used for a sanitary landfill (EPA, 2012a). Landfills sites were designed or built to receive waste, including some hazardous material. Landfills were planned and developed using specific criteria and guidelines to ensure the safe operation of the facility (EPA, 2012a). To be clear, a landfill is not a dump. In 1976, congress passed a law prohibiting open refuse dumps,
which led to the landfill requirements and waste disposal system now in use (EPA, 2012a).

Landfills are the most common and most economical method of disposing of trash and other unwanted materials generated by individuals and organizations in the world (Molnar, 2010; Shammas et al., 2014). Landfills received between 54% and 56% of the 251 million tons of trash or solid waste generated in the United States annually (EPA, 2012a; Molnar, 2010; Shammas et al., 2014). Landfills are unique in many ways. They are well-engineered facilities designed to reduce harm to the environment. Landfills vary in items accepted, including what types of hazardous materials can be disposed of at a given site. Landfills also vary in size, operational functions, and proved to be an inexpensive yet effective method to dispose of solid waste (EPA, 2012a; Molnar, 2010; Shammas et al., 2014).

About 1,900 landfills exist nationally, with 278 in California, where waste is buried, converted to energy, recovered, and to a lesser extent burned (EPA, 2013). Although landfills are an effective way to dispose of waste, there are some down sides. Decomposing solid waste in landfills creates various greenhouse gases, which have a negative long-term impact on the environment because greenhouse gases trap heat in the atmosphere. The greenhouse gases primarily associated with solid waste are carbon dioxide, which is emitted through the burning of solid waste, and methane, which is emitted during the decay of organic waste found in landfills (EPA, 2013; Molnar, 2010). Each gas’ effect on the climate depends on three factors: the amount of gas, how long the gas remains in the atmosphere, and how strongly the gases impacts global temperatures.
Research suggested greenhouse gas emissions were slowly changing the Earth’s climate (Molnar, 2010; Perkins, 2001).

Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and other greenhouse gases increased over the 20th century due to human activities (Molnar, 2010; Perkins, 2001; Solomon et al., 2010). From 1990-2010, the total U.S. emissions increased by 8.4% whereas emissions decreased from 2010 to 2011 by 1.6%. The decrease from 2010 to 2011 was attributed to a decrease in carbon used to generate electricity (EPA, 2013; Solomon et al., 2010). The EPA (2013) reported that a warmer climate may cause more frequent and severe heat waves, damage agriculture, and cause droughts in some places and floods in others. Greenhouse gases created climate change at a slow rate and were continually being evaluated to assess global change (Molnar, 2010; Solomon et al., 2010).

Another unintended consequence of landfill use was leachate liquid. Many landfills are lined with plastic and clay. On occasion, the liner leaks and the underlying soil and ground water could become contaminated as leachate run-off from landfills seep into the ground (Cullers, 2013; Tonjes, 2013). These harmful landfill impacts led to alternative ways to mitigate the risk of landfills to the environment. One way to reduce gas emissions into the environment is through energy conversion, a process where the gas released as landfill waste decomposed was collected from the ground, treated and purified, and then burned to generate electricity that can be provided to the local power grid (Shammas et al., 2014). In addition, after a landfill is capped and a certain amount of time has passed, the land might be repurposed for new uses such as recreational areas,
The push for comprehensive diversion programs (i.e., recycling and source reduction) was often driven by multiple factors, such as a perceived or predicted shortage of landfill capacity combined with ever-increasing amounts of garbage. Consequently, the only feasible options remaining for waste management are waste prevention and recycling. If landfill space remains scarce, then recycling appears essential. If landfill space is abundant, then recycling may be perceived as unnecessary. However, the motivation for waste diversion goes far beyond the issue of landfills (EPA, 2013; Figueroa et al., 2009; Gerlat, 2013).

**Waste Management Programs in Organizations**

“About 75% of the largest organizations now produce a sustainability report or corporate social responsibility report and this trend has been accelerating” (Hitchcock & Willard, 2008, p. xx). Corporate social responsibility (CSR) is a series of voluntary organizational actions and concepts, beyond the normal activities of the company, designed to further social good (Gottschalk, 2011; Hitchcock & Willard, 2008). Many organizations now pay attention to the negative impact their business activities may have on the environment. On the national and global level, environmental burdens created by organizations from material extraction, manufacturing, and distribution was prevalent and in some industries showed no signs of fading (Berrone et al., 2013; McKenzie-Mohr, 2011; Saha & Darnton, 2005).

This trend could change if organizations committed to making a series of minor and major changes toward protecting the environment through waste management
(Berrone et al., 2013; McKenzie-Mohr, 2011). In some instances, existing policies and practices required evaluation and/or changes in order for a sustainable waste management initiative to be successfully implemented. In other cases, the challenge was getting organizations in all sectors to make the effort. Perhaps following the lead of those companies who successfully implemented such programs and documented outcomes in CSR reports may prove beneficial for organizations considering a waste management initiative (Berrone et al., 2013; Gottschalk, 2011; Hitchcock & Willard, 2008).

Organizations such as Apple, Walmart, Colgate-Palmolive, and General Mills all implemented successful waste management and emission reduction programs as part of their CSR focus areas. Each of these organizations made a commitment to strive toward waste diversion from landfills, lower emissions in manufacturing, and product reuse as part of their initiative to reduce harm to the environment (Apple, 2014; Colgate-Palmolive, 2014; General Mills, 2013; Walmart Inc., 2013).

Apple made a commitment to support the environment by reducing the size of product packaging. This allowed Apple to reduce its carbon footprint and preserve key resources. Lighter, thinner packages also allowed Apple to ship more products per trip. Fewer distribution trips reduced greenhouse gases produced during transportation (Apple, 2014). Apple also maintained a robust recycling and reuse program. This program provided incentives for recycling many of the electronic products distributed by Apple, kept hazardous waste from landfills, and reduced carbon emissions from transportation of recycled products. Recyclers utilized by Apple must comply with health and safety laws and Apple recyclers do not dispose of hazardous electronic waste into landfills (Apple, 2014).
Walmart initiated a “zero waste to landfill” program (Walmart, 2013). Although Walmart had not achieved this goal yet, the company was well on its way. In the U. S., 81% of the waste materials from stores, clubs, and distribution centers were diverted from landfills (Walmart, 2013). Walmart’s recycle, repurpose, reuse program included 50 separate categories to ensure items were sorted appropriately to reduce waste. Items such as paper, cardboard, aluminum, and more were diverted from landfills through Walmart’s waste management program. Walmart also used a robust food donation program and organic reuse program to assist in their efforts (Walmart, 2013).

In 2014, Colgate was named the EPA Energy Star partner for a 61% reduction in energy used at its manufacturing facilities. Colgate also set a goal for 2015 to reduce carbon emissions by 20%. The company developed manufacturing practices which resulted in a 17% reduction in waste to landfills compared to 2002 and a 16% reduction in greenhouse gas emissions in 2013 versus 2005 (Colgate, 2014). Colgate believed businesses play a major role in mitigating climate change. To that end, Colgate committed resources to ensure their organizations continue to show reductions in their carbon footprint (Colgate, 2014).

General Mills set an organizational goal to continue to reduce its environmental footprint by targeting areas where they could have the greatest impact (General Mills, 2013). Two areas of significance were reducing solid waste to landfills and greenhouse gas emissions. Since 2012, General Mills reduced greenhouse gas emissions by 12%, with a goal of a 20% reduction by 2015 (General Mills, 2013). General Mills also diverted 86% of solid waste from U.S. landfills in 2013, and reused or recycled the majority of its waste. This focus on waste reduction made waste
management a revenue generator for General Mills. In the U.S., General Mills received $9.7 million in revenue from waste recycling in 2013 (General Mills, 2013).

Each of these organizations developed effective strategies in the areas of waste management and emissions reduction during manufacturing and distribution. These organizations were just a few that made a commitment to reduce harm to the environment. Companies such as Coco Cola, Sony, and Adidas also maintain thriving environmental sustainability programs that include waste management components (Espinosa, 2013).

The CSR reports from Apple, Walmart, Colgate, and General Mills highlighted several initiatives that led to positive outcomes. Those organizational initiatives geared toward waste management included goal setting for continuous improvement, tracking and measuring performance, sharing findings, and developing an organizational mindset to leave the environment in good shape for the future (Apple, 2014; Colgate-Palmolive, 2014; General Mills, 2013; Walmart, 2013).

California Waste Management Programs

California’s Integrated Waste Management Act of 1989 required nearly every jurisdiction across the state to achieve a 50% reduction in waste disposal by 2004. Some cities and counties were more successful than others at minimizing waste and achieving this goal. As a part of California’s continued commitment to reduce the amount of solid waste entering landfills, state agencies and large state facilities including jails and prisons were required to meet waste diversion goals based on AB 75 (Strom-Martin, 1999).

Additionally, AB 341 established a commercial recycling program which required all businesses generating four cubic yards or more of trash each week to implement a
recycling program (Chesbro, 2011). In addition to businesses, other public agencies such as federal, state, local, and regional agencies or facilities, universities, and military facilities were included (CalRecycle, 2012; Chesbro, 2011). The requirements largely reflected what was mandated for cities, counties, and regional agencies, but do not affect local government obligations under the California Integrated Waste Management Act (CalRecycle, 2012).

State agencies and large state facilities were required to adopt comprehensive waste management programs to reduce waste disposal and to provide annual statistics for review to the California Department of Resources Recycling and Recovery (CalRecycle, 2012). In addition, state agencies and large state facilities were required to buy goods made from recycled materials (CalRecycle, 2012). Buying recycled goods was critical as it helped create market demand for recycled materials. This requirement complemented the efforts of the California Integrated Waste Management Act and other regulatory guidelines implemented over the last two decades (CalRecycle, 2012). CalRecycle also offered incentive programs to ensure success of programs and ongoing participation. While the guidelines for grants currently focus on state entities, at some point the grants may provide valuable and needed resources to agencies at the local level (CalRecycle, 2012).

**California Jails and Prisons**

In California, 33 state prisons and 58 county jails house approximately 215,000 inmates, 137,000 in state prisons and 78,000 in county jails (CDCR, 2013; Glaze & Herberman, 2013; Grattet & Hayes, 2013). Sheriff operated county jails are considered locally-operated, short term facilities that hold inmates awaiting trial and or sentencing.
California prison realignment extended the time individuals may serve in county jails and increased the population of these facilities. Prior to California prison realignment, those in county jails were typically sentenced to a term of less than one year and were considered misdemeanants. The 2014 passage of Proposition 47 redefined certain offenses from felonies to misdemeanors. The extent to which Proposition 47 will affect the number of incarcerated individuals over the long-term is yet to be known, and therefore not yet discussed in the literature. Since California prison realignment, the maximum stay in county jail can be longer than one year (Sullivan-Silbert, 2012). As of February 2013, county jails housed 1,155 inmates serving sentences of more than five years (Lofstrom & Martin, 2013; Sullivan-Silbert, 2012). State prisons are considered longer-term facilities. Prisons most often hold felons convicted of a crime who are serving a multiyear sentence (Ferro, 2006).

The men and women incarcerated in jails and prisons generated as much waste as those not in custody. Inmates generated between four and four and a half pounds of waste per person per day (Corrections Corporation of America, 2007; EPA, 2012a; Florida Department of Environmental Protection, 2004). The type of waste generated by California state prisoners and county jail inmates varied, but included solid waste materials such as metal, paper, styrofoam, electronics, food, plastics, glass, cardboard, green material, aluminum cans, foam, and other products needed for day-to-day operations (CalRecycle, 2012; Carr, 2012). Some waste generated by California state prisons was recycled depending on the location; however, waste collection at county jails remains a voluntary program. Waste not recycled ends up in a landfill. Although many landfills are well maintained, there are health concerns. The biggest health and
environmental concerns related to the uncontrolled surface emissions of landfill gas into the air.

Landfill gas contains carbon dioxide, methane, volatile organic compounds, hazardous air pollutants, and odorous compounds that can adversely affect public health and the environment (EPA 2013; Molnar, 2010; Solomon et al., 2010). Carbon dioxide and methane greenhouse gases contributed to global climate change. Methane was of particular concern because it is 23 times more effective at trapping heat in the atmosphere than carbon dioxide. This effect created global warming and posed health hazards (EPA, 2013; Molnar, 2010; Solomon et al., 2010).

Traditionally, jails and prisons were seen as 24-hour energy intensive operations focused on security. Prison building designs were not energy efficient and many buildings would require retrofitting to improve energy efficiency (CDCR, 2013). Although the task may seem daunting, even minor first steps could move waste management efforts forward. Implementing a solid waste management program could divert waste from landfills and potentially generate revenue for jails and prisons.

Jails and prisons generated waste in large volumes and could increase their efforts to divert waste from landfills by first identifying the type and quantity of waste generated at each facility. Once the type and quantity of waste are identified, recycling initiatives could be developed to mitigate waste. Solid waste materials such as cardboard, paper, plastic, and metal are all recyclable and should not go to landfills. Solid waste such as food and yard waste should also be diverted through composting or other efforts because these items contribute to greenhouse gas emissions during decomposition (MacDonald, 2013; Solomon et al., 2010).
Conclusions

Recycling and reduction as waste management practices proved to be effective. In addition to diverting waste from landfills, reducing the generation of waste and recycling waste helped to reduce pollution and greenhouse gases. Organizations of all sizes developed CSR reports to show their contribution to sustaining the environment in many areas, including waste reduction. The waste management practices of organizations could be emulated by those organizations not well-versed in waste reduction or diversion. By making major and minor changes, organizations such as state operated prisons and county jail facilities could successfully implement or maintain a waste management program (MacDonald, 2013; McKenzie-Mohr, 2011). In California, jails and prisons received support through the Integrated Waste Management Act of 1989, AB 75, and AB 341 (CalRecycle, 1997; Chesbro, 2011; Storm-Martin, 1999).

Even with these mandates, jails and prisons contributed each year to waste going into landfills. On average, each prisoner generated about four and a half pounds of waste per day, which was consistent with societal averages (Corrections Corporation of America, 2007; EPA, 2012a). The public sent about 54% of waste to landfills, much of which was largely recyclable because each year the U.S. produced millions of tons of waste (EPA, 2012a).

Managing waste had value and benefited organizations by helping make communities safe long term. By utilizing used, unwanted, or obsolete waste items for new or repurposed products, society as a whole could help make reusing waste materials a success.
In addition to reducing greenhouse gas emissions, which contributed to global warming, recycling and other repurposing methods could have a potential economic impact (Hitchcock & Willard, 2008). The EPA (2013) reported:

Paper and paperboard recovery at about 44 million tons resulted in a reduction of greenhouse gas product in 2012. This is equivalent to removing 27 million cars from the road in one year...In 2012, nationally, individuals recycled and composted almost 87 million tons of solid waste. This provides an annual benefit of more than 168 million metric tons of carbon dioxide equivalent emissions reduced, comparable to removing the emissions from over 33 million passenger vehicles from the road in one year. (p. 10)

This was significant for the environment and communities, which highlighted the need to develop and implement robust waste management efforts.

Chapter III provides the overall methodology for the research study. The chapter opens with the purpose statement and research questions for the study. A detailed description of the mixed-method research design follows. The study population and sample, the data collection process, and data analysis are also described. The chapter concludes with a summary of the research methodology.
CHAPTER III: METHODOLOGY

The literature review discussed the context of environmental sustainability in organizations, how waste in California is managed, and the impact of landfill waste on the environment. Chapter II also highlighted some of the benefits of waste management, including a reduction in greenhouse gas emissions because less solid waste goes to landfills. Although challenging, solid waste management practices diverted a significant amount of waste from landfills, potentially generated revenue and saved costs through recycling and reuse.

This chapter presents the overall methodology for the research study. It begins with the purpose statement and research questions. A detailed description of the mixed-method research design follows. The study population and sample are included as well as the data collection process and the data analysis. The study instrumentation is described and the limitations of the study are presented. The chapter concludes with a summary of the research methodology.

Purpose Statement

The purpose of this study was to identify waste reduction strategies that reduce the impact of jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. Further, it was the purpose of this study to identify the barriers that hinder jail and prison personnel from developing such strategies, and to recommend how those barriers might be reduced or eliminated.
Research Questions

The research questions for the current study were as follows:

1. What strategies were utilized to divert waste generated by jails and prisons away from landfills?

2. What were the primary barriers jails faced in implementing a waste reduction program?
   a) Lack of personnel to implement trash reduction
   b) Emphasis upon security
   c) Antiquated facilities
   d) Lack of concern for the environment by leadership
   e) Legislative mandates that interfere with trash reduction efforts
   f) Budget or cost concerns
   g) Other

3. How can barriers to waste reduction efforts in California jails and prisons be reduced or eliminated?

Research Design

To address the research questions, the study employed a mixed-methods research design using extant/archival data, a survey, and interviews (McMillan & Schumacher, 2010; Patten, 2012). Researchers such as Patten (2012) compared the decision-making process of research design to art, in that there is no single standard. Creswell (2003) added, “A mixed-methods design is useful to capture the best of both quantitative and qualitative approaches” (p. 22).
A mixed-methods approach is appropriate when a researcher wants to generalize findings to a population and develop a detailed view of what was occurring or understand concepts related to a specific population (Creswell, 2003; McMillian & Schumacher, 2010). For example, a researcher may choose to first survey a group, and then follow-up with selected individuals to understand their specific language and hear representative accounts about the topic (Patton, 2002).

In such situations, the benefit to collecting both quantitative and qualitative data proves advantageous to understanding the research problem (Creswell, 2003; McMillian & Schumacher, 2010). The mixed-methods approach utilizes a sequential, explanatory design with the primary emphasis on quantitative methods and qualitative methods as a follow-up analysis (McMillan & Schumacher, 2010). Using multiple sources of data allows for triangulation and enriches the understanding of the findings. Patten (2012) stated that “Triangulation strengthens a study by combining methods” (p. 247).

**Quantitative Design**

The quantitative portion of this study used archival data available to the public and an internet-based survey for original data collection. California-operated prisons were required to report waste generation and management practices annually to the State Agency Reporting Center, which is part of CalRecycle (CalRecycle, 2012). The annual responses for each of the 33 state-operated prisons were completed via survey by the facility recycling coordinator. The survey responses for 2013 were reviewed and data from this information compiled to answer Research Questions 1 and 2. The archival data were intended to optimize the connection between the research questions and the data being utilized (Elder, Pavalko, & Clipp, 1993).
A validated survey developed by CalRecycle and administered to the state-operated prisons (CalRecycle, 2012) was obtained and administered to all 58 sheriff-operated county jail recycling coordinators or designees. The survey, in use since 2004 and administered annually to the prisons, provided consistent results related to waste diversion practices, thereby assuring reliability (CalRecycle, 2012). Currently, sheriff-operated county jail facilities are not mandated to report recycling efforts, but may voluntarily practice waste management strategies. The survey instrument allowed sheriff-operated county jails to report their practices. Participation in the survey was voluntary, and the data garnered from the survey was analyzed and compiled to answer Research Questions 1 and 2.

**Qualitative Design**

The qualitative portion of the study consisted of interviews. Telephone interviews were conducted with the recycling coordinator or designees at selected prisons and jails. Facilities with a 50% reduction in waste through diversion efforts were eligible to participate in the interview process. Assembly Bill (AB) 75 required state agencies to divert 50% of all waste by January 1, 2004 through source reduction, recycling, and composting (CalRecycle, 2012). The participants in this study either achieved that goal or made significant progress toward achieving it. Additionally, AB 341 required businesses, which included county agencies, to divert waste through recycling (CalRecycle, 2012; Chesbro, 2011). To enhance validity, the interviews were recorded and participants had the opportunity to review the summary of information. Both mechanically recorded data and participant review increased the accuracy of reporting (McMillan & Schumacher, 2010). The respondents were made aware of the recording
and its purpose prior to the start of the interview. The data garnered from the interviews were analyzed and compiled to answer Research Question 3.

**Population**

The population for any research study is the total group a researcher wants to better understand or draw an inference (Litt, 2010). A population can consist of a group of people, objects, or events from which a researcher plans to generalize research results (Litt, 2010; McMillan & Schumacher, 2010; Patton, 2002). The population for this study consisted of the recycling coordinators of the 33 adult state-operated prisons operated by the California Department of Corrections and Rehabilitation, and the recycling coordinator or designees of the 58 adult county-operated jail facilities operated by sheriff departments in California.

**Sample**

“In quantitative studies, the group of subjects or participants from whom the data are collected is referred to as the sample” (McMillan & Schumacher, 2010, p.129). The sample for this study consisted of the recycling coordinator or designee of the 33 California adult state prison facilities operated by the Department of Corrections and Rehabilitation and 33 of the 58 sheriff operated county jail facilities. An important aspect of selecting a sample is the size of the sample to ensure credible results (McMillan & Schumacher, 2010).

The Sheriff-operated county jail participants who responded to the web based survey represented various size jail facilities based on their inmate population. Additionally, each Sheriff-operated jail facility is located in a different county in California. Counties in California are located throughout the state in rural, urban, and
suburban areas. Based on the 56.8% response rate, the varying size jail facilities and county locations, the participants for the sheriff-operated jail facilities are characteristic of the population. For a complete list of California state-operated prisons (see Appendix B) and for a complete list of sheriff-operated county jails (see Appendix C). Jails and prisons in California vary in size, population, and location over the entire state, which contributes to the diversity among facilities and the various waste diversion requirements at each location.

The evaluation included some facility demographics, the strategies utilized to reduce waste, obstacles or barriers encountered related to waste reduction, and how reduction efforts can be enhanced. From this evaluation purposeful sampling was utilized to select interview participants. Purposeful sampling allowed the researcher to select participants based on certain criteria or characteristics (McMillan & Schumacher, 2010). Participants for the qualitative area of this study were selected based on the California Integrated Waste Management Act of 1989 (Sher, 1989) and AB 75 which requires state agencies and large facilities to develop a plan and divert 50% or more of waste from landfills through recycling, reduction, and composting by January 1, 2004 (CalRecycle, 1997; CalRecycle, 2012).

Six recycling coordinators or designees diverting 50% or more of their waste and who volunteered, participated in interviews. Each facility has unique characteristics including building design, type of waste being generated, levels of security and waste participation levels (CDCR, 2013; Feldbaum, 2011; Ulrich & Nadkarni, 2008).
**Instrumentation**

The instruments used to collect data for this study are from three primary sources. The first source was an assessment of archival data. An online recycling survey developed by CalRecycle is administered to recycling coordinators for each state-operated prison annually. The complete responses to all surveys are placed on the CalRecycle, State Agency Reporting Center website. The archived responses for 2013 were utilized for this study. The survey data contains demographic information, types of recycling programs, annual waste diversion results, obstacles to recycling, and education and training to enhance recycling efforts.

The second source was a survey. A web-based survey was administered to sheriff-operated county jails. The survey developed by CalRecycle and administered to State-operated prisons since 2004 was utilized to survey the sheriff-operated county jails. The survey utilized for prisons has consistently collected reliable results from participants (CalRecycle, 2012). The survey was obtained from CalRecycle and formatted for web-based delivery. The recycling coordinator or designee at each jail was asked to complete the survey via survey monkey.

The third source of information was interviews. Based on the archival data and survey results the facilities diverting 50% of their waste participated in interviews. Six respondents were interviewed to identify how barriers to waste reduction efforts in California jails and prisons can be reduced or eliminated and to determine what strategies are being used to divert waste. The telephonic interviews were recorded and the recycling coordinator or designees advised of the recording prior to the start of the interview (Patton, 2002).
An audio file was made of the recording and each respondent was given the opportunity to review the transcription of the recording and make changes, prior to data analysis (Patton, 2002).

**Data Collection**

Archival data were collected from a web-based recycling survey administered by CalRecycle. The survey was completed by the recycling coordinator of each state-operated prison annually and submitted to the State Agency Reporting center. The data for 2013 were available and obtained from the CalRecycle website. The second method of data collection was a web-based recycling survey. The survey developed by CalRecycle for California-operated prisons was obtained and administered to sheriff-operated county jail recycling coordinators or designees. The recycling coordinator or designee at each jail was asked to complete the survey via Survey Monkey which is a web-based product. An interview process followed the survey. Based on the archival data and survey results, a selection of recycling coordinators from facilities diverting 50% or more of their waste were interviewed to identify strategies being utilized to manage waste. The interviews were conducted via telephone and questions were asked in an open-ended and consistent manner.

During the data collection process, participant information was kept confidential and no identifiable information will be shared or published. Responses to the survey and during the interview process were not linked to any participants. Although there was no foreseeable risk for participation in the study, the researcher took all reasonable precautions to prevent harm or risk of harm to the participants.
Data Analysis

Existing data and responses from the web-based survey were used to answer Research Questions 1 and 2. This portion of the data were analyzed using a non-experimental quantitative method. A quantitative research analysis was appropriate for this study because results can be used to describe or measure certain characteristics in a population (Kraska, 2010). The findings may be generalizable to similar situations and explain relationships (Kraska, 2010). Using quantitative research led to conclusions supported by the data presented. Descriptive statistics were conducted using the existing data and web-based survey data for each facility. This information was compiled and analyzed using SPSS data analysis software to determine differences, if any, between prisons and jails.

Research Question 3 was answered using qualitative data. Interview data were coded and analyzed using a grounded theory approach. Grounded theory was selected for this study because it focuses on the process of generating theory (Patton, 2002). With grounded theory, collected data are transcribed and reviewed for content shortly after collection and combines inductive and deductive coding (Patton, 2002). A set of initial codes such as solid waste, recycling, and training were derived based on the literature review. The coding system was expanded throughout the coding process, with additional codes being added as the data were reviewed and new themes or trends emerged. One person conducted all of the coding to ensure reliability and consistency of the coding and that similar responses were assigned the same code. The coded data were then analyzed for common themes. As appropriate, coded data were tallied to calculate a percentage or
proportion of participants who provided similar responses. Data were entered and analyzed using Atlas.ti qualitative coding software.

**Limitations**

The primary limitations of the study pertained to sheriff-operated jail facilities and state-operated prison facilities. The security protocols at certain jails and prisons may limit the availability of some information used in the study. In addition, jails were not mandated to divert waste; therefore, the activities related to waste management may differ significantly compared to prisons where waste diversion was mandatory.

**Summary**

The purpose of this study was to identify waste reduction strategies that reduce the impact of jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. Further, it was the purpose of this study to identify the barriers that hindered jail and prison personnel from developing such strategies, and to recommend how those barriers might be overcome. To answer the research questions, the study employed a mixed-methods research design using archival quantitative data (McMillan & Schumacher, 2010). The study also utilized qualitative interviews to triangulate and provide additional context for the finding of this mixed-method study (Patten, 2012). The population for the study consisted of all California state-operated prisons and sheriff-operated county jails. The study sample was comprehensive and included all 33 state-operated prisons and 33 of the 58 sheriff-operated county jails.
Chapter IV provides the findings of the data obtained from the CalRecycle website, the web-based survey, and the interviews. The chapter begins with a review of the purpose of the study, the research questions, the research methodology, and the data collection process. The population and sample are discussed as well as some demographic data. The chapter concludes with a summary of the overall findings.
Chapter III provided the research methodology along with a detailed explanation of the information utilized to complete this study. This chapter presents the quantitative analysis of all survey responses (archival and web based) and the qualitative analysis of the interview data. The chapter begins with a brief overview and restatement of the purpose statement as well as the research questions. A review of the research methodology and data collection follows. The chapter concludes with a presentation of the findings and a summary of the analyses.

**Purpose Statement**

The purpose of this study was to identify waste reduction strategies that reduce the impact of jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. Further, it was the purpose of this study to identify the barriers that hinder jail and prison personnel from developing such strategies, and to recommend how those barriers might be reduced or eliminated.

**Research Questions**

The following research questions guided this study.

1. What strategies are being utilized to divert waste generated by jails and prisons away from landfills?

2. What are the primary barriers jails and prisons face in implementing a waste reduction program?
   a) Lack of personnel to implement trash reduction
   b) Emphasis upon security
   c) Antiquated facilities
d) Lack of concern for the environment by leadership

e) Legislative mandates that interfere with trash reduction efforts

f) Cost or budget concerns

g) Other

3. How can barriers to waste reduction efforts in California jails and prisons be reduced or eliminated?

**Research Methods and Data Collection Procedures**

To address the research questions, the study utilized a mixed-method research design consisting of archival data, a web based survey, and interviews (McMillan & Schumacher, 2010; Patten, 2012). As noted by Patten (2012), there is an art to the decision making process of the research design. A single standard does not exist, but the design of the study plays a key role in the quality and quantity of collectable data. Creswell (2003) added, “A mixed-methods design is useful to capture the best of both quantitative and qualitative approaches” (p. 22).

The benefit of collecting both quantitative and qualitative data proves advantageous to understanding the research problem (Creswell, 2003; McMillan & Schumacher, 2010). The mixed-methods approach in this study utilized a sequential explanatory design with the primary emphasis on quantitative methods and qualitative methods as a follow-up analysis (McMillan & Schumacher, 2010). Using multiple sources of data assisted in triangulating the information gathered, which strengthened the study by combining methods (Patten, 2012).

Archival data were collected from a web-based recycling survey administered by CalRecycle. The survey was completed by the recycling coordinator of each state-
operated prison annually and submitted to the State Agency Reporting center. The data for 2013 were available for the 33 state-operated prisons and obtained from the CalRecycle website. The survey developed by CalRecycle for California state-operated prisons was obtained and administered to sheriff-operated county jail recycling coordinators or designees (see survey instrument in Appendix F). The recycling coordinator or designee at each sheriff-operated jail was asked to complete the survey via Survey Monkey.

The web-based survey was deployed for a period of two weeks after emails were sent inviting the recycling coordinator for each of the 58 sheriff-operated jails to participate in the study. During the open survey period, 26 sheriff-operated county jail staff members responded to the survey. In an effort to have maximum participation, telephone calls were made to all sheriff-operated jails. Recycling coordinator designees of seven sheriff-operated jails who did not complete the survey via the web agreed to complete the survey over the telephone resulting in data from 33 of the jails.

An interview process followed the survey. The interviewees were selected from the participants who indicated at the conclusion of the survey their willingness to participate in a follow-up interview. Six recycling coordinators or designees were selected to participate in the interview process. The interviewees confirmed their facility was diverting 50% or more of generated waste from landfills. The interviews were conducted via telephone and recorded with the permission of the interviewee. The recordings were transcribed by the researcher and provided to the participants to ensure accuracy. A comparative analysis was conducted of the quantitative data and utilized to answer Research Questions 1 and 2. A qualitative analysis was conducted and a
Grounded Theory approach was utilized to describe the emergent themes to address Research Question 3.

During the data collection process, all participants received written communication regarding the data collection procedure for this study. The communication covered three primary areas: (a) the nature of the information the researcher would collect; (b) the voluntary nature of participation in the study; (c) and the intended use of the study results. Environmental issues, similar to other areas of research, can be sensitive. Therefore, participants could feel apprehensive to participate because of possible adverse actions. As a result, confidentially and potential risk factors were also explained to participants.

**Population**

A population can consist of a group of people, objects, and or events from which a researcher plans to generalize research results (Litt, 2010; McMillan & Schumacher, 2010; Patton, 2002). The population for this study consisted of the recycling coordinators of the 33 adult state-operated prisons run by California Department of Corrections and Rehabilitation, and the recycling coordinators or designees of the 58 adult sheriff-operated county jail facilities in California.

**Sample**

The sample for this study included archival data from the recycling coordinators of the 33 adult state-operated prisons operated by the California Department of Corrections and Rehabilitation, and the recycling coordinators or designees from 33 of the 58 sheriff-operated county jail facilities in California who completed the survey. The sheriff-operated county jail participants who responded to the survey represented various
size jail facilities based on their inmate population. Additionally, each sheriff-operated jail facility was located in a different county in California. Counties in California are located throughout the state in rural, urban, and suburban areas. Based on the 56.8% response rate, the varying size jail facilities and county locations, the participants for the sheriff-operated jail facilities were representative of the population (Litt, 2010; McMillan & Schumacher, 2010; Patton, 2002). For a complete list of California state-operated prisons see Appendix B and for a complete list of sheriff-operated county jails see Appendix C.

Presentation and Analysis of Data

This research examined waste management practices in California adult state-operated prisons run by the Department of Corrections and Rehabilitation, and the sheriff-operated county jail facilities in California. The findings represent a comparative analysis of archival data from surveys completed by the recycling coordinators of California state-operated prisons and survey responses from recycling coordinators or designees of sheriff-operated county jails. The interview responses from recycling coordinators or designees at California state-operated prisons and sheriff-operated county jails were also analyzed.

The findings from the data analysis follow.

The Findings for Research Question 1

Research Question 1 was designed to identify strategies sheriff-operated county jails and state-operated adult prisons in California were employing to divert waste from landfills. The focus was to provide a description of practices currently in use. The recycling of general materials was the primary strategy being used by state-operated
prisons and sheriff-operated jails in California to divert waste from landfills. Recycling is the process of collecting and processing materials such as paper, glass, plastic, and metals that would otherwise be thrown away as trash and turning them into new products (EPA, 2014, Louis & Shih, 2007).

Based on the archival data provided by state-operated prisons in California, all 33 prisons (100%) were recycling six general materials, which were beverage containers, cardboard, plastics, white office paper, mixed office paper, and confidential shredded paper. In comparison, fewer of the sheriff-operated jails were recycling the same six general materials, with the highest percentage for recycling cardboard (75.7%), followed by recycling beverage containers (69.6%), and recycling plastics (63.6%). The remaining 13 general materials examined, which included scrap metal, copier/toner cartridges, wood, newspapers, tires, textiles, construction materials, glass, white goods, rendering, sludge, carpet, and ash, were being diverted from landfills by one or more of the California state prisons. Sheriff-operated county jails were diverting waste from landfills in eight of these other areas: scrap metal, copier/toner cartridges, wood, newspapers, tires, textiles, glass, and white goods. Table 1 compares the recycling efforts of California state-operated prisons and sheriff-operated county jails for their general material recycling.
Of note for sheriff-operated county jails was zero diversion for construction material compared to 75.8% for state-operated prisons. This may be reasonably attributed to the different contract processes utilized by jails and prisons.

### Table 1

**Prisons and Jails Engaged in Recycling of General Materials**

<table>
<thead>
<tr>
<th>Material</th>
<th>Prisons</th>
<th>Jails</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 33</td>
<td>%</td>
</tr>
<tr>
<td>Beverage containers</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Cardboard</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Plastics</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>White Office Paper</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Mixed Office Paper</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Confidential shredded paper</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>Scrap metal</td>
<td>32</td>
<td>97.0</td>
</tr>
<tr>
<td>Copier/Toner Cartridges</td>
<td>31</td>
<td>93.9</td>
</tr>
<tr>
<td>Wood</td>
<td>30</td>
<td>90.9</td>
</tr>
<tr>
<td>Newspapers</td>
<td>28</td>
<td>84.8</td>
</tr>
<tr>
<td>Tires</td>
<td>27</td>
<td>81.8</td>
</tr>
<tr>
<td>Textiles</td>
<td>25</td>
<td>75.8</td>
</tr>
<tr>
<td>Construction Materials</td>
<td>25</td>
<td>75.8</td>
</tr>
<tr>
<td>Glass</td>
<td>18</td>
<td>54.5</td>
</tr>
<tr>
<td>White goods</td>
<td>20</td>
<td>60.6</td>
</tr>
<tr>
<td>Rendering</td>
<td>19</td>
<td>57.6</td>
</tr>
<tr>
<td>Sludge</td>
<td>14</td>
<td>42.4</td>
</tr>
<tr>
<td>Carpet</td>
<td>4</td>
<td>12.1</td>
</tr>
<tr>
<td>Ash</td>
<td>1</td>
<td>3.0</td>
</tr>
</tbody>
</table>
California state prisons employ a Facility Planning, Construction Management (FPCM) process (CDCR, 2013). FPCM was created to allow the California Department of Corrections and Rehabilitation to effectively manage its real estate requirements in a comprehensive manner (CDCR, 2013). This coordinated construction effort, utilized by prisons statewide, allows prisons to better track and identify diverted construction material. In comparison, sheriff-operated construction projects are generally coordinated in partnership with the respective counties. Sheriff personnel involvement in the construction aspect of projects is generally limited. In most counties, construction materials are removed by the vendor and once the material is removed from the premises, it is unknown whether diversion from landfills occurs.

A second strategy used by California state-operated prisons and sheriff-operated county jails to divert waste from landfills was waste prevention and material reuse. Waste reduction or prevention is the ideal approach to managing waste. Essentially, the waste was never created so there were no expenses associated with waste management or concerns about how to dispose of the unwanted material (EPA, 2014). Reuse allows materials to be used in the same manner or repurposed so they can be used for something other than the original purpose (EPA, 2010).

California state-operated prisons and sheriff-operated county jails were preventing the generation of waste and/or reusing materials to divert waste from landfills. Thirty-two state-operated prisons (97.0%) prevented waste and reused materials by utilizing online forms versus printed forms or paper, reusing pallets, and utilizing email rather than paper memos.
Additionally, 30 state-operated prisons (90.0%) prevented waste and reused materials by remanufacturing toner cartridges and utilizing the intranet for internal communications. Other materials reported being reused by most state-operated prisons included rags (87.9%), packing materials (81.8%), and boxes (75.8%). Additional prevention efforts reported by most state-operated prisons included electronic document storage (78.8%) and bulletin boards for communications (69.7%).

In comparison, a lower number of sheriff-operated county jail respondents reported using prevention efforts such as utilizing online forms (69.6%), using email rather than paper memos (75.7%), and utilizing electronic document storage (63.6%). Sheriff-operated county jails also reused materials. Thirteen sheriff-operated county jails (39.3%) reuse rags and 16 (48.4%) reuse washable items such as cups, service ware, and towels. It should be noted that three (9.1%) state-operated prisons and three (9.1%) sheriff-operated county jails prevented waste through food donations.

Whereas state-operated prisons prevented the generation of waste and or reused materials in 20 of the 22 categories, sheriff-operated county jails only prevented waste or reused materials in 7 of the categories, showing some sheriff-operated county jails were making an effort to prevent waste and reuse materials. Table 2 compares the prevention and reuse of items by California state-operated prisons and sheriff-operated county jails.
A third strategy California state-operated prisons used to divert waste from landfills was training and education. Existing data showed California state-operated

<table>
<thead>
<tr>
<th>Item</th>
<th>Prisons</th>
<th>Jails</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper reduction - online forms</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td>Reusable pallets</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td>Email vs. paper memos</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>Remanufactured toner cartridges</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Intranet</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>Rags made from waste cloth or reusable rags</td>
<td>29</td>
<td>13</td>
</tr>
<tr>
<td>Double-sided copies</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Reuse of packing materials</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Washable/Reusable cups, service ware, towels</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>Electronic document storage</td>
<td>26</td>
<td>23</td>
</tr>
<tr>
<td>Reusable boxes</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Bulletin boards</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Reuse of construction materials</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>Reusable slip sheets</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Used vehicle parts</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Remanufactured equipment</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Retreaded/Recapped tires</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Used Tires</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Food Donation</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Electric air hand-dryers</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Reuse of office furniture, equipment, supplies</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Preventative maintenance</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Prisons and Jails Engaged in Waste Prevention and Reuse
prisons used a variety of methods to train and educate employees and non-employees in waste management. The data revealed 31 state-operated prisons (93.9%) used various documents as the primary method of education. Twenty-four state-operated prisons (72.7%) were training employees and 22 (66.7%) used brochures and other publications as a method to educate. Additional items being used to train and educate employees were web pages, waste audits reports, and new employee packages. Table 3 identifies the training and education activities utilized by state-operated prisons.

Table 3

*Prisons Engaged in Recycling Training and Education*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Prisons</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signage (signs, posters, labels for recycling bins)</td>
<td></td>
<td>31</td>
<td>93.9%</td>
</tr>
<tr>
<td>Employee training</td>
<td></td>
<td>24</td>
<td>72.7%</td>
</tr>
<tr>
<td>Brochures, flyers, newsletters, publications, newspaper</td>
<td></td>
<td>22</td>
<td>66.7%</td>
</tr>
<tr>
<td>Web page (intranet or internet)</td>
<td></td>
<td>17</td>
<td>51.5%</td>
</tr>
<tr>
<td>Office recycling guide, fact sheets</td>
<td></td>
<td>17</td>
<td>51.5%</td>
</tr>
<tr>
<td>Waste audits, waste evaluations/surveys</td>
<td></td>
<td>9</td>
<td>27.3%</td>
</tr>
<tr>
<td>New employee package</td>
<td></td>
<td>8</td>
<td>24.2%</td>
</tr>
<tr>
<td>Outreach (internal/external) e.g. environmental fairs</td>
<td></td>
<td>6</td>
<td>18.2%</td>
</tr>
<tr>
<td>Special recycling/reuse events</td>
<td></td>
<td>4</td>
<td>12.1%</td>
</tr>
<tr>
<td>Seminars, workshops, special speakers</td>
<td></td>
<td>2</td>
<td>6.1%</td>
</tr>
<tr>
<td>Employee incentives, competitions/prizes</td>
<td></td>
<td>2</td>
<td>6.1%</td>
</tr>
<tr>
<td>Press releases</td>
<td></td>
<td>2</td>
<td>6.1%</td>
</tr>
<tr>
<td>Awards program</td>
<td></td>
<td>1</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

California state-operated prisons and sheriff-operated county jails used two primary strategies to divert waste from landfills. The number one strategy was recycling.
The second strategy used was waste prevention and material reuse. California state-operated prisons also utilized training and education as a strategy to divert waste from landfills. Comparable training and education information was not available for sheriff-operated county jails.

The Findings for Research Question 2

The focus of Research Question 2 was the identification of primary barriers California sheriff-operated county jails and state-operated prisons faced in implementing a waste reduction program. Seven options were presented to participants.

a) Lack of personnel to implement trash reduction
b) Emphasis upon security
c) Antiquated facilities
d) Lack of concern for the environment by leadership
e) Legislative mandates that interfere with trash reduction efforts
f) Cost or budget concerns
g) Other

Twenty-one of the 33 state-operated prisons (63.6%) identified the “other” category as a primary barrier. Within the “other” category, an area not presented as an option, per se, but described in the data as a barrier, was finding vendors. Of the 21 state-operated prisons who selected the “other” category 14 (66.7%) identified finding vendors as the most common barrier prisons faced when trying to implement waste reduction programs. This included finding vendors to collect certain materials as well as finding vendors to travel to remote locations. Two additional barriers identified in the “other” category were lack of education and area limitations. Four of the 21 state-operated
prisons (19.0%) selecting the other category identified a lack of education as a barrier and three state-operated prisons (14.2%) identified area limitations as a barrier.

Five of the 33 state-operated prisons (15.2%) identified a lack of personnel as a barrier whereas seven (21.2%) indicated no barriers existed in implementing a waste reduction program. The 33 sheriff-operated county jail participants identified four primary barriers. The most common, barrier identified by 23 sheriff-operated county jail (69.7%) participants, was a lack of personnel. Table 4 provides a comparison of barriers perceived by state-operated prisons and sheriff-operated county jails.

Table 4

*Other is 21 of 33 responses, within other the responses are a percentage of 21.

<table>
<thead>
<tr>
<th>Barriers to Prisons and Jails Engaging in Recycling, Prevention, or Reuse</th>
<th>Prisons</th>
<th>Jails</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 33</td>
<td>%</td>
</tr>
<tr>
<td>*Other</td>
<td>21</td>
<td>63.6</td>
</tr>
<tr>
<td>Finding Vendors</td>
<td>14</td>
<td>66.7</td>
</tr>
<tr>
<td>Lack of Education</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td>Area Limitations</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>Poor Procedures</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>None</td>
<td>7</td>
<td>21.2</td>
</tr>
<tr>
<td>Lack of Personnel</td>
<td>5</td>
<td>15.2</td>
</tr>
<tr>
<td>Emphasis on Security</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Antiquated Facilities</td>
<td>2</td>
<td>6.1</td>
</tr>
<tr>
<td>Legislative Mandates Interfere</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Cost or Budget Concern</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Lack of Concern for</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
The four primary barriers identified by sheriff-operated county jail participants were consistent with the presented options. The “other” category was selected by six of the sheriff-operated county jails (18.2%), and responses described operational priorities, commitment from staff to change, and local resources as barriers.

Additional barriers for state-operated prisons and sheriff-operated county jails were identified in comments from participants, such as being in a rural location which was connected to finding vendors. Participants explained that due to their location in the state of California, vendors would not travel the distance to collect recyclables. A lack of space to sort and or implement potential recycling projects was also identified as a barrier. One participant stated the state-operated facility was unable to compost due to a lack of space and another described the impact of a lack of space stating the close proximity to rural areas attracted unwanted animals. One sheriff-operated jail participant believed reusing materials such as utensil and cups was an unsanitary practice, thus creating a barrier.

The Findings for Research Question 3

A qualitative method was used to answer Research Question 3. The interview participants were selected from those individuals who indicated at the conclusion of the survey their willingness to participate in a follow-up interview. Six recycling coordinators or designees were selected to participate in the interview process. Each interviewee confirmed their facility was diverting 50% or more of generated waste from landfills.

The goal of the interview was for each participant to identify or describe how barriers to waste reduction efforts in California jails and prisons could be reduced or
eliminated. A grounded theory approach was used to analyze the interviews. Grounded theory is a method appropriate for qualitative, exploratory work in which claims and hypotheses are generated and examined for fit and consistency within the data (Strauss & Corbin, 1998). John Creswell (2003) noted, “Qualitative analysis begins with coding the data, dividing the text into small units (phrases, sentences, paragraphs), and assigning a label to each unit” (p. 131).

An open-coding technique was used to identify concepts and core categories. Using this method, emergent themes were identified, especially as they related to eliminating specific barriers. While analyzing data, both recorded and written, similarities between answers became apparent. Data were entered and analyzed using Atlas.ti qualitative coding software. To ensure reliability and consistency of the coding, including verification that similar responses were assigned the same code, data were reviewed and coded by one person.

From the analyses, six themes emerged: leadership support, finding vendors, training and education, waste identification, costs benefits, and the need for model programs emerged as the most salient and meaningful areas shared across the interviews of the recycling coordinators or designees.

**Leadership Support**

Five participants from California state-operated prisons and sheriff-operated county jails (83.3%) identified waste management program support from leadership as a primary method to eliminate or reduce barriers to implementing a waste reduction program. Waste management program support from leadership included making waste reduction an agency operational priority and taking a direct interest in waste management
practices. The five participants reported program support also included identifying designated personnel to coordinate waste management efforts and informing all employees and non-employees that waste management was a priority and a supported practice.

One participant noted at her facility specific steps, such as hiring a sustainability analyst and making waste management a strategic initiative, were taken to ensure program success. Another participant stated that waste management efforts could not succeed if they were not supported by leadership. A third participant highlighted that the only way barriers can be eliminated is if the support for a waste management program comes from leadership. Generally, participants stated that leadership must support the waste management effort publicly so staff at all levels recognize waste management as a priority. The interview participants stated the success of their programs were a result of support and direction from supervisors, managers, and executive leadership who made waste management a focus in the organization.

Finding Vendors

Participants indicated more vendor participation would assist in eliminating barriers. Consistent with quantitative data, five of the six (83.3%) sheriff-operated county jail coordinators and state-operated prisons coordinators indicated that vendors for some products and locations were not readily available. Each participant identified a product that should be recycled but was not being diverted from landfills due to a lack of vendors or facility resources to divert the material. The products included non-serviceable mattresses and footwear utilized by inmates, food waste, milk cartons, and some inmate clothing. Generally, the participants believed if more vendors were
available to accept difficult to recycle items, more recyclable materials would be diverted from landfills. Two participants indicated their rural locations as a hindrance. One participant explained her facility does self-hauling of all recyclable materials to eliminate this barrier. Although self-hauling does not generate revenue, it does allow the facility to save money by completing this task and managing waste in an appropriate manner.

Two participants stated they had no problem locating and working with vendors. These participants identified vendors as a valuable resource that supported recycling efforts by pointing out areas where practices could be altered to improve diversion efforts. For example, one participant explained when a vendor picking up cardboard saw the areas used for sorting materials, the vendor showed the recycling coordinator how to better organize the sorting areas to increase production. Whereas this was a benefit to the vendor who was collecting recyclables at the facility, the advice was also a benefit to the facility. The participant explained that as a result of implementing the changes recommended by the vendor, the facility was diverting about 73% of their generated waste by utilizing the strategies noted in research question one.

**Training and Education**

All six participants (100%) from state-operated prisons and sheriff-operated county jails indicated training and education as the best way to eliminate barriers to implementing a waste reduction program. Participants explained raising the awareness of personnel and others was necessary to ensure sustainability of a waste management program. Participants stated their programs improved when they trained employees and non-employees in the identification of waste and the steps necessary to reduce waste. Training supported by leadership would help every facility to at least understand the
basics, explained one participant. Additionally, the why of recycling would be clear and potentially assist in garnering support for the many facets of a robust waste diversion program. Although quantitative data were not available for sheriff-operated jails, state-operated prisons used training and education as a way to eliminate barriers.

**Waste Management Identification**

Five participants (83.3%) stated the most meaningful way to eliminate barriers to implementing a waste reduction program was to identify the waste types generated at each location. Participants explained the first step to implementing a waste reduction program was to identify what waste goes into the trash and whether it was a recyclable product. Participants identified waste such as inmate shoes, food items, and paper products as easy to identify recyclable items. Participants also noted simple steps, such as using electronic forms, intranets, and bulletin boards, as ways to prevent waste generation and garner support for the program. One participant explained a waste reduction program cannot begin until the type of waste generated is known and discussions occurred to determine how waste will be diverted. Consistent with the literature review, identifying waste helps reduce expenditures on raw materials, office supplies, and equipment. Additionally, streamlining operations to reduce waste often can enhance overall efficiency and productivity as well (EPA, 2012). Furthermore, waste reduction measures help demonstrate a concern for the environment and community while enhancing community relations through shared interest.

**Learning from Successful Programs**

Learning from other successful recycling programs was noted by three participants (50.0%). Emulating jails and prisons that were successful in reducing waste
through waste management practices was another method cited to eliminate barriers. Participants stated meeting with other agencies and emulating policies and procedures was an important part of implementing a waste reduction program. This also led to relationship building and ongoing partnerships between facilities.

**Costs Benefits**

Cost benefit was mentioned by two participants (33.3%) in the context of cost savings from diverting generated waste. Both respondents explained that since their waste management program was implemented, the revenue generated by recycling made the programs cost neutral. One of the participants also highlighted the cost savings from not bringing in private vendors and the revenue generated was significant. The difference in savings was shown to facility leadership who allowed the funds to be used as an offset for staffing. These types of cost offsets allow innovative waste management programs to continue.

Another area related to cost noted during the interview process was administrative red tape or outdated methods to buy products and select vendors necessary to assist in diverting waste. This red tape delayed selections and prevented purchases which may have benefited waste management efforts. Additionally, one participant noted red tape made it harder to develop or follow through with ideas because the delays from the bureaucracy and paperwork made participation in waste management efforts undesirable. This participant noted eliminating the red tape and streamlining paperwork would reduce barriers to implementing a waste management program. Table 5 represents the emerging trends and participant response frequency.
Table 5

Emerging Trends and Participant Response frequency

<table>
<thead>
<tr>
<th></th>
<th>Prisons and Jails</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 6</td>
</tr>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Finding Vendors</td>
<td>5</td>
</tr>
<tr>
<td>Training and Education</td>
<td>6</td>
</tr>
<tr>
<td>Leadership Support</td>
<td>5</td>
</tr>
<tr>
<td>Waste Identification</td>
<td>5</td>
</tr>
<tr>
<td>Learn from other Successful Programs</td>
<td>3</td>
</tr>
<tr>
<td>Cost Benefit</td>
<td>2</td>
</tr>
</tbody>
</table>

Summary

The primary strategies for waste diversion were recycling, waste prevention, material reuse, and training and education. It was also important to know the primary waste items generated and diverted from landfills. This was accomplished through waste identification and training. Each state-operated prison and sheriff-operated county jail is different. These facility differences include lay-out, security measures, staffing, inmate population, and capacity to divert waste.

Capacity to divert waste includes support from leadership, resources to sort and remove waste, and knowledge of basic waste management practices. Based on the data collected, state-operated prisons are well situated to continue and/or improve their efforts in many areas of recycling, prevention, and reuse.

Although some sheriff-operated county jails recycled and participated in waste prevention and reuse efforts, their programs were not as well developed.
CHAPTER V: FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Jails and prisons are a unique living environment. Although they do not have all the comforts of home, jails and prisons provide inmates with more than the essentials. Supplying prisons and jails requires large quantities of products, equipment, and energy, all of which create waste (Feldbaum et al., 2011). Whether it is the product packaging, end of use items, or food waste, jails and prisons inherently generate large volume and varied waste materials (CalRecycle, 2012; Feldbaum et al., 2011).

The goal of California jails and prisons is to protect society by confining offenders in controlled environments that are safe, secure, and provide programs to assist those incarcerated in becoming law-abiding citizens. Jails and prisons are twenty-four hour, seven day a week operations traditionally not considered mainstream business, and the function of these facilities are not typically in public view. The prison and jail population nationally is about 2.2 million. Based on the large number of men and women housed in state and local facilities and absent a change in social circumstance, jails and prisons are not going away.

In 1998, prisons in California were the second largest contributor of waste to landfills (Storm-Martin, 1999). The inmate population of California prisons at that time was 158,742 (Beck & Mumola, 1999). In California currently, 33 state prisons and 58 county jails house approximately 215,000 inmates, 137,000 in state prisons and 78,000 in county jails (CDCR, 2013; Glaze & Herberman, 2013; Grattet & Hayes, 2013). Whereas the population of California’s 33 adult prison facilities declined from 158,742 in 1998 to 137,000 in 2013, the inmate population of county jails increased since October 2011.
when California’s historic public safety realignment legislation (AB 109) went into effect (CDCR, 2013; Glaze & Herberman, 2013; Grattet & Hayes, 2013).

Although the number of inmates in California prisons and county jails fluctuated over the years, both prisons and jails produced significant waste because of the size of the facilities and the number of personnel and inmates. The solution to reducing waste generated in California jails and prisons is the use of recycling and waste prevention methods to assist with managing solid waste materials. Recycling and reduction programs have been in place since 2004 for large facilities such as prisons, so waste management is underway at these facilities. California sheriff-operated jails were not consistently following the same state mandates and their waste management efforts were not as well known.

The purpose of this study was to identify waste reduction strategies that reduced the impact of jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. Further, it was the purpose of this study to identify barriers that hinder jail and prison personnel from developing such strategies, and to recommend how barriers might be reduced or eliminated.

The study was guided by three primary research questions:

1. What strategies are being utilized to divert waste generated by jails and prisons away from landfills?

2. What are the primary barriers jails and prisons face in implementing a waste reduction program?
   a) Lack of personnel to implement trash reduction
   b) Emphasis upon security
c) Antiquated facilities

d) Lack of concern for the environment by leadership

e) Legislative mandates that interfere with trash reduction efforts

f) Cost or budget concerns

g) Other

3. How can barriers to waste reduction efforts in California jails and prisons be reduced or eliminated?

To address the research questions, a mixed-method study was utilized. Data were collected from three primary sources: archival data utilized for California state-operated prisons, a web based survey deployed to obtain data from sheriff-operated county jails, and interviews of six recycling coordinators or designees to further refine the analysis. The total population for the study was 91, which included the 58 sheriff-operated county jails and 33 state-operated adult prisons in California. The sample size consisted of the 33 state-operated adult prisons and 33 of the 58 sheriff-operated county jails.

**Major Findings**

The intent of Research Question 1 was to identify specific strategies used by California jails and prisons to divert waste from landfills. The findings showed California state-operated prisons and sheriff-operated county jails used two primary strategies to divert waste from landfills. The most common strategy used by state-operated prisons and sheriff-operated jails was recycling. The second most common strategy was waste prevention and material reuse. California state-operated prisons also utilized training and education as a strategy to divert waste from landfills.
These strategies were successful and meet the intended purpose to divert waste from landfills. Although waste reduction is not easy, strategies used by state-operated prisons and sheriff-operated jails can be expanded to increase waste diversion practices. Additionally, facilities situated in proximity to one another could partner to further share strategies and identify ways to enhance waste reduction efforts.

The focus of Research Question 2 was to describe primary barriers California sheriff-operated jails and state-operated prisons face in implementing waste reduction programs. The findings showed the most significant barrier for sheriff-operated jails was lack of personnel to implement waste reduction, followed by an emphasis on security which described the safety of staff and inmates as facility priority. Costs or budget concerns were also identified by sheriff-operated jails as a barrier. State-operated prisons identified finding vendors to collect certain materials and finding vendors to travel to remote locations as the most significant barriers faced in their recycling programs.

The intent of Research Question 3 was to determine how barriers to waste reduction efforts in California jails and prisons could be reduced or eliminated. The interviewees described five primary focus areas where barriers could be removed or eliminated from sheriff-operated jails and state-operated prisons. The best way for sheriff-operated jails to reduce or eliminate barriers was through training and education followed by waste management program support. Waste management program support can be generally described as support from leadership, which included making waste reduction an agency operational priority and taking a direct interest in waste management practices. California state-operated prisons described finding vendors as the best way to eliminate or reduce barriers at those facilities.
Participants indicated that vendors for some products and locations were not readily available and thus hindered recycling and prevention efforts.

**Unexpected Findings**

The most unexpected finding was the lack of training and education data for sheriff-operated jails. The biggest challenge for sheriff-operated jails addressing waste prevention and recycling was their lack of knowledge. Understanding the regulations that apply at each level and educating facility managers about legislative requirements was an important aspect of implementing or expanding a waste reduction program. Additionally California state prisons are situated inside counties where sheriff operated jails are located. Some of the issues raised regarding vendors and training could be improved through local collaboration. Resource sharing and partnerships between sheriffs-operates county jails and stated-operated prisons has the potential to improve waste management efforts for both jails, prisons, and the communities they serve.

**Conclusions and Implications for Action**

The process of implementing a comprehensive waste management program in a sheriff-operated jail or enhancing programs in state-operated prisons is complex and consists of many incremental steps. Institutional change, particularly in a jail or prison setting, tends to be slow and difficult. Nonetheless, change can occur within these environments, as evidenced by the significant changes in the waste management practices of state-operated prisons over the last 10 years.

**Value of Waste Diversion**

The value of waste diversion cannot be overstated. Through recycling, reduction, and reuse, waste is diverted from landfills and improves environmental sustainability.
If waste is not diverted through recycling, reduction, or reuse efforts, the negative impact on the environment will affect future generations. As this study indicated, the use of landfills is an economical way to dispose of solid waste. However, ramifications include hazardous gas emissions, water contamination, and energy consumption. The review of literature explained decomposing solid waste in landfills creates hazardous and greenhouse gas emissions, which are emitted through the burning of solid waste, and methane, which is emitted during the decay of organic waste found in landfills (EPA, 2013; Molnar, 2010).

The review of literature also described the long-term negative impacts greenhouse gases have on the environment. Water contamination is another unintended consequence of landfill use. The literature review explained many landfills are lined with plastic and clay and on occasion, but the liner may leak and the underlying soil and ground water could become contaminated as leachate run-off from landfills seep into the ground (Cullers, 2013; Tonjes, 2013). As the tolerance for landfills decreases in communities, landfills are moved farther from densely populated areas. This requires collection trucks to drive farther distances to unload. Also, the complexity of collection routes can affect energy consumption. This frequent and lengthy travel by gas-consuming vehicles is also detrimental to air quality and results in increased greenhouse gases (EPA, 2012; Molnar, 2010). The strategies noted in Research Question 1 can be expanded by state-operated prisons and sheriff-operated jails to further reduce waste to landfills.

**Implications for Action.** State and local agencies, such as state-operated prisons and sheriff-operated jails, have a civic duty to the community to extend their public service to sustained waste management practices. This includes utilizing strategies
identified in this study to divert waste and developing innovative strategies to enhance current programs. Another implication for action is responding to barriers noted in this study. Specifically, CalRecycle can confer with vendors to identify those who will collect hard to recycle items and those who will travel to rural areas to collect recyclables. This information can be compiled and shared with recycling coordinators and their designees.

Additionally, a waste diversion guidebook developed by subject matter experts from state-operated prisons outlining the steps needed to implement a basic waste management program would benefit sheriff-operated jails. Future research can examine the benefit of such a guidebook.

**Assistance from Professionals**

California state-operated prisons have a champion in CalRecycle for their waste management efforts. The California Department of Resources Recycling and Recovery, known as CalRecycle, is a department within the California Environmental Protection Agency (CalRecycle, 2014). CalRecycle administers and provides oversight for all of California’s state-managed waste handling and recycling programs, including those at state-operated prisons (CalRecycle, 2014).

Although the partnership between CalRecycle and state-operated prisons was developed through mandated legislation, the waste reduction outcomes noted in this study for state-operated prisons were significant. State-operated prisons developed multiple strategies to divert waste such as recycling, prevention, and reuse, and reduced barriers to implementation by implementing training programs.
Sheriff-operated county jails could benefit from a similar partnership with CalRecycle to assist in implementing the strategies identified in this study as well as eliminating the barriers identified in this study. Thanks to CalRecycle, California has some of the nation’s most successful recycling and product-reuse programs, and has diverted an estimated 65% of its solid waste from landfills in 2013 (CalRecycle, 2014).

**Implications for Action.** Sheriff-operated county jails would benefit from the expertise and support of CalRecycle. This study showed sheriff-operated county jails recycled, reduced, and reused general materials much less than state-operated prisons in some areas. A partnership between sheriff-operated county jails and CalRecycle could help in the development of initiatives and the identification of barriers such as costs. Another implication for action is offer incentives for waste diversion at the state and local level. Although revenue is generated from the recycling practices currently in place, grants may bolster waste management efforts. This study identified cost as a barrier. A grant or other incentive could catapult waste management into a strategic priority for facilities that need funding to move their program forward. California should find funding to support waste management at the local level through grants or other incentives. CalRecycle offers incentives such as grants to state entities. Providing an opportunity for local sheriff-operated jails to participate in grant programs would increase the likelihood of implementing or improving a waste reduction program. As shown in the literature, incentives such as grants can have positive impacts on programs of this nature.
Training and Education

This study found training and education were key components to successful waste management programs. This study can have far-reaching implications for organizational leadership, employees, and inmates. For organizations, based on the findings of this study, the implications for leadership training and education were clear. By providing better waste management training, leaders can support initiatives, identify funding sources, and increase an organization’s capacity to divert waste by making waste management a priority in the organization. For the employee, this study could lead to better training that could improve their understanding of waste management and provide tools to put into practice. Finally, this research indicated training and education were essential for those inmates housed at sheriff-operated jails and state-operated prisons. Inmates play an important role in the waste management process. Inmates generate the majority of trash at the facilities and could benefit from training. Additionally, training could provide inmates with job opportunities once they are released. Training and education for a specific skill can potentially lead to prospects for employment and/or additional learning based on the knowledge inmates gained related to waste management while incarcerated.

Implications for Action. Sheriff-operated county jails must identify training and education programs to improve their waste diversion efforts. This study identified training and education as an important component of successful waste diversion efforts. Although comparable data were not available for sheriff-operated jails, state-operated prisons benefited from training and education evident by their participation in the CalRecycle waste management program. Another implication for action is the need for collaboration between state-operated prisons and sheriff-operated jails.
California state-operated prisons are located within many California counties, so a partnership between facilities in proximity to one another would allow prisons and jails to share strategies, discuss innovations, coordinate with vendors, and potentially share resources. Additional research is required in this area because of varying budget and funding practices. Concession in this area would have a significant impact on prisons and jails as this study showed finding vendors was a barrier to waste management along with costs and a lack of staffing.

**Recommendations for Further Research**

This study set the stage for further research on waste management practices and their potential to improve or expand in California state-operated prisons and sheriff-operated jail facilities. Replication of this study with different state and county organizations would be useful. The researcher limited this study to organizations with inmate populations because of the significant waste generated by these types of facilities. Additionally, jails and prison are unique in how they are managed, funded, and their hours of operation. There are several areas related to this topic where future research could benefit the body of literature on this topic.

Future research could also benefit the environment now and into the future. To this end, future research could analyze the impact of waste management training on public safety personnel. This study showed 93.9% of state-operated prisons used training aids and 72.7% trained employees. Although comparable data were not available for sheriff-operated jails, training and education may have an impact on developing strategies for waste diversion.
Future research could evaluate the benefits of a partnership between the community and sheriff-operated jails to implement waste reduction efforts in facilities and residences. Another area for future research is a description of how legislative mandates related to waste management are enforced and the impact of non-enforcement. Assembly Bill (AB) 341 established a commercial recycling program that required all businesses generating four cubic yards or more of trash each week to implement a recycling program (Chesbro, 2011). In addition to businesses, other public agencies such as federal, state, local, and regional agencies, universities, and military facilities were included (CalRecycle, 2012; Chesbro, 2011). A study to determine the best method to raise awareness and provide resources on waste management practices would benefit organizations. This study identified waste management program support as a way to reduce or eliminate barriers to waste management and should be explored further.

**Concluding Remarks and Reflections**

The goal of waste management is to divert waste from landfills and mitigate other environmentally harmful practices such as incineration in a cost efficient and environmentally sound way. Waste management includes recycling, reduction, and reuse of materials that would otherwise be thrown away as trash. Inmates generated as much waste as those not in custody, between four and four and a half pounds of waste per person per day (Corrections Corporation of America, 2007; EPA, 2012a; Florida Department of Environmental Protection, 2004). The type of waste generated by California state prisoners and county jail inmates varied and can be large scale as well as diverse.
The opportunity exists for these facilities to improve their diversion efforts through recycling, reduction and reuse, and in the process generate revenue and decrease waste management costs. A successful waste reduction program could also create a positive or “green” public image of environmental stewardship, while still allowing jails and prisons to accomplish their operational responsibilities (Florida Department of Environmental Protection, 2004). In addition to the environmental and economic reasons for initiating a waste reduction program, state mandates such as AB 341 and AB 939 require such programs (CalRecycle, 1997; CalRecycle, 2012). The governor of California signed AB 341 into law in 2011. AB 341 will create green jobs by expanding recycling to every residence and business, including public entities. CalRecycle is responsible for ensuring the state is recycling at least 75% of the solid waste being generated by 2020 (CalRecycle, 2012; Chesbro, 2011).

More than half of the material disposed at these large office buildings and public entities consists of readily recyclable paper and cardboard (CalRecycle, 2012). “Every day that these materials go to landfills represents a wasted opportunity to conserve our natural resources, reduce greenhouse gases, and create local green jobs” (CalRecycle, 2012, n.p.). California sheriff-operated jails could leverage the requirements of AB 341 to improve recycling efforts by sharing the mandated requirements with leadership in an effort to expand or implement recycling programs. Additionally, inmates could benefit from this legislation through training and job development.

Transformational change is described as a radical shift of strategy, structure, systems, processes or technology, so significant that it requires a shift of culture, behavior, and mindset to implement successfully and sustain over time (Ackerman-
Anderson & Anderson, 2010). This type of leadership is needed to implement waste management programs in organizations that traditionally serve law enforcement functions such as sheriff-operated jails. The expectation now, specifically for sheriff-operated county jails and to a lesser degree state-operated prisons in California, is a new or improved effort to reduce the organizational waste being contributed to the environment. The most effective way to reduce waste is to not create it in the first place. This is not possible as a solution for sheriff-operated jails or state-operated prisons. As a result, reduction and reuse are the most effective ways to reduce the contribution of waste to the environment, save natural resources, and recognize a cost savings as well as a revenue source from repurposing materials from these entities. The urgency for doing so is well noted in the literature cited within this study. The means by which recycling can be accomplished within jails and prisons are suggested by the study’s findings. It requires awareness among those who administer such institutions to make it happen.
References


Bridbord, K., & Hanson, D. (2009). A personal perspective on the initial federal health based regulations to remove lead from gasoline. Environmental Health Perspectives, 117(8), 1195-1201. doi: 10.1289/ehp.0800534


Appendices
Appendix A – Brandman IRB Approval Letter

BRANDMAN UNIVERSITY INSTITUTIONAL REVIEW BOARD
IRB Application Action – Approval

Date: February 18, 2015

Name of Investigator/Researcher: Antoinette Bland

Faculty or Student ID Number: B00XXXXXX

Title of Research Project: Waste Management in California Jails and Prisons

Project Type: [✓] New [ ] Continuation [ ] Resubmission

Category that applies to your research:
[✓] Doctoral Dissertation EdD
[ ] UNP Clinical Project
[ ] Masters’ Thesis
[ ] Course Project
[ ] Faculty Professional/Academic Research
[ ] Other:

Funded: [✓] No [ ] Yes
(Funding Agency; Type of Funding; Grant Number)

Project Duration (cannot exceed 1 year): 90 days

Principal Investigator’s Address: Redacted

Email Address: Redacted Telephone Number: XXX-XXX-XXXX

Faculty Advisor/Sponsor/Chair Name: Marv Abrams, Ed.D.

Email Address: Redacted Telephone Number: XXX-XXX-XXXX

Category of Review:
[✓] Exempt Review [ ] Expedited Review [ ] Standard Review

I have completed the NIH Certification and included a copy with this proposal

☐ NIH Certificate currently on file in the office of the IRB Chair or Department Office

Signature of Principal Investigator: Antoinette Bland
Date: February 18, 2015

Signature of Faculty Advisor/ Sponsor/Dissertation Chair: Marv Abrams
Date: Feb. 23, 2015

Brandman University IRB Rev, 11.14.14
Adopted
November 2014
BRANDMAN UNIVERSITY INSTITUTIONAL REVIEW BOARD
IRB APPLICATION ACTION – APPROVAL
COMPLETED BY BUIRB

IRB ACTION/APPROVAL

☐ Returned without review. Insufficient detail to adequately assess risks, protections and benefits.

☐ Approved/Certified as Exempt form IRB Review.

☑ Approved as submitted.

☐ Approved, contingent on minor revisions (see attached)

☐ Requires significant modifications of the protocol before approval. Research must resubmit with modifications (see attached)

☐ Researcher must contact IRB member and discuss revisions to research proposal and protocol.

Level of Risk:  ☐ No Risk   ☑ Minimal Risk   ☐ More than Minimal Risk

IRB Comments:

The study presents an interesting review of waste management operations at local and state prisons. The application is complete and approved as submitted.

Timothy Perez
IRB Reviewer:

Telephone: XXX-XXX-XXXX Email: Redacted

BUIRB Chair: ___________________ Date: ___________________

REVISED IRB Application  ☐ Approved  ☐ Returned

Name: __________________________

Telephone: _____________________ Email: ___________________ Date: ________________

BUIRB Chair: ___________________

## Table 6

*California Department of Corrections and Rehabilitation State Prisons*

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<thead>
<tr>
<th>Facility</th>
<th>Description</th>
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<td>Deuel Vocational Institution</td>
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<td>California Institution for Men</td>
<td>Folsom State Prison</td>
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<td>California Institution for Women</td>
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### Appendix C - List of California Sheriff-operated County Jails

**Table 7**

*Sheriff-operated County Jails in California*

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Appendix D - Electronic Survey Informed Consent

**Background:**

The purpose of this study is to identify waste reduction strategies that reduce the impact of waste from jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. The study will also try to identify barriers that hinder jail and prison personnel from developing recycling and waste reduction strategies, and try to determine how those barriers might be overcome. This study is being performed for the purpose of research only.

I would like you to complete an electronic survey about your jail facilities waste management practices. The survey will take 10 minutes to complete. If you agree to the survey please click agree at the bottom of the first page. The survey is completely voluntary and includes 10 questions which require multiple choice or open ended responses. **Please answer all of the questions prior to submittal, incomplete surveys cannot be used.**

**Confidentially:**

Your confidentiality is important. Your responses will be kept confidential and no identifiable information will be shared or published. Responses to the survey will not be linked to you and there is no foreseeable risk for your participation in the study. Results of the study will initially appear within the dissertation, and may later be shared through journal articles, for example. However, in every publication, the confidentiality of the source of information will be maintained.
Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. Language to protect your rights is below:

I understand that I may refuse to participate in or I may withdraw from this study at any time without any negative consequences. Also, the investigator may stop the study at any time. I also understand that no information that identifies me will be released without my separate consent and that all identifiable information will be protected to the limits allowed by law. If the study design or the use of the data is to be changed I will be so informed and my consent obtained. I understand that if I have any questions, comments, or concerns about the study or the informed consent process, I may write or call the Office of the Vice Chancellor Academic Affairs, Brandman University, 16355 Laguna Canyon Road, Irvine, CA 92618 Telephone (949) 341-7641. I acknowledge that I have received a copy of this form via the electronic survey and the Research participant’s Bill of Rights.

Contact Information:

If you have questions about the study itself, please contact the researcher Antoinette Bland at bland100@brandman.edu or 714-616-6221. Additionally, you may contact Dr. Marv Abrams, Dissertation Chair at mabrams@brandman.edu.
Appendix E - Interview Informed Consent

**Research Project:** Waste Management in California Jails and Prisons

**Responsible Investigator:** Antoinette Bland

Thank you for your willingness to participate in this research study, *Waste Management in California Jails and Prisons*. The purpose of this study is to identify waste reduction strategies that reduce the impact of waste from jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. The study will also try to identify barriers that hinder jail and prison personnel from developing recycling and waste reduction strategies, and try to determine how those barriers might be reduced or eliminated. This study is being performed for the purpose of research only. Your participation will assist in adding to the body of literature on this important topic. Conclusions drawn from the study could inform facility managers, policy makers, and others on how managing waste is beneficial to organizations and society.

If you agree to be part of the research study, you will be asked to participate in a one-on-one interview. The interview will last 30-60 minutes and will be conducted by phone. You will be asked during the survey if you are willing to participate in the interview process. If you agree you will be promoted to provide additional information.

Your confidentiality is important. Your responses will be kept confidential and no identifiable information will be shared or published. Data collected in connection with this research will be stored in a safe which only the investigator can access. Responses to the interview will not be linked to you and there is no foreseeable risk for your
participation in the study. Results of the study will initially appear within the dissertation, and may later be shared through journal articles, for example. However, in every publication, the confidentiality of the sources will be maintained.

Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. Language to protect your rights is below:

I understand that I may refuse to participate in or I may withdraw from this study at any time without any negative consequences. Also, the investigator may stop the study at any time. I also understand that no information that identifies me will be released without my separate consent and that all identifiable information will be protected to the limits allowed by law. If the study design or the use of the data is to be changed I will be so informed and my consent obtained. I understand that if I have any questions, comments, or concerns about the study or the informed consent process, I may write or call the Office of the Vice Chancellor Academic Affairs, Brandman University, 16355 Laguna Canyon Road, Irvine, CA 92618 Telephone (949) 341-7641. I acknowledge that I have received a copy of this form via the electronic survey and the Research participant’s Bill of Rights.

If you have questions about the study itself, please contact Antoinette Bland at [REDACTED]. Additionally, you may contact Dr. Marv Abrams, Dissertation Chair at [REDACTED].
By signing this document, you are agreeing to be part of the *Waste Management in California Jails and Prisons* study. Your participation is voluntary so you may change your mind and stop at any time. You may ask questions now and if you think of questions at a later time you can contact the researcher.

Thank you for your participation

Antoinette Bland

I agree to participate in the study.

______________________________
Signature of Participant and Date

I agree to be audiotaped as part of the study.

______________________________
Signature of Participant and Date

______________________________
Signature of Researcher and Date
Appendix F – CalRecycle Survey

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<td>The State Agency Waste Management Annual Report is based on the previous calendar year (January 1 through December 31). According to statute, employee data and disposal data is required in order to determine your agency/facility’s Annual Per Capita Disposal rate (expressed in pounds per person per day). Your agency/facility is responsible for retaining source documentation related to the data reported herein.</td>
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<tbody>
<tr>
<td>Explain who was included in this number and explain how this employee number was calculated:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-Employee Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Non-employees:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total amount Disposed:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-employee Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain who was included in this number and explain how this non-employee number was calculated:</td>
</tr>
</tbody>
</table>

Help us to understand your disposal so that we may assist you in finding ways to increase diversion.

What types of waste materials are still thrown away (not reused, recycled, or composted)?

What difficulties or obstacles have you had with finding ways to reuse, recycle, or compost these types of waste materials?
### Recycling

Recycling is the practice of collecting and diverting materials from the waste stream for remanufacturing into new products, such as recycled-content paper. The programs listed reflect this practice.

**Describe activities:**

<table>
<thead>
<tr>
<th>Activity Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverage containers</td>
</tr>
<tr>
<td>Glass</td>
</tr>
<tr>
<td>Plastics (#3-7)</td>
</tr>
<tr>
<td>Carpet</td>
</tr>
<tr>
<td>Cardboard</td>
</tr>
<tr>
<td>Newspaper</td>
</tr>
<tr>
<td>Office paper (white)</td>
</tr>
<tr>
<td>Office paper (mixed)</td>
</tr>
<tr>
<td>Confidential shredded paper</td>
</tr>
<tr>
<td>Copier/toner cartridges</td>
</tr>
<tr>
<td>Scrap metal</td>
</tr>
<tr>
<td>Wood waste</td>
</tr>
<tr>
<td>Textiles</td>
</tr>
<tr>
<td>Ash</td>
</tr>
<tr>
<td>Sludge (sewage/industrial)</td>
</tr>
<tr>
<td>Tires</td>
</tr>
<tr>
<td>White goods</td>
</tr>
<tr>
<td>Construction materials/debris</td>
</tr>
<tr>
<td>Rendering</td>
</tr>
<tr>
<td>Other (explain in Agency Program Notes below)</td>
</tr>
<tr>
<td>None</td>
</tr>
</tbody>
</table>

### Organics Recycling

Programs that increase diversion of organic materials from landfill disposal for beneficial uses such as compost, mulch, and energy production.

**Describe activities:**

<table>
<thead>
<tr>
<th>Activity Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xeriscaping (climate appropriate landscaping)</td>
</tr>
<tr>
<td>Grasscycling</td>
</tr>
<tr>
<td>Green Waste - On-site composting and mulching</td>
</tr>
<tr>
<td>Green Waste - Self-haul</td>
</tr>
<tr>
<td>Green Waste - Commercial pickup</td>
</tr>
<tr>
<td>Food scraps - On-site composting and mulching</td>
</tr>
<tr>
<td>Food scraps - Self-haul</td>
</tr>
<tr>
<td>Food scraps - Commercial pickup</td>
</tr>
<tr>
<td>Other (explain in Agency Program Notes below)</td>
</tr>
<tr>
<td>None</td>
</tr>
</tbody>
</table>

### Material Exchange
Programs that promote the exchange and reuse of unwanted or surplus materials. The reuse of materials/products results in the conservation of energy, raw resources, landfill space, and the reduction of greenhouse gas emissions, purchasing costs, and disposal costs.

Describe activities:

<table>
<thead>
<tr>
<th>Activity Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonprofit/school donations</td>
</tr>
<tr>
<td>Internal property reutilizations</td>
</tr>
<tr>
<td>State surplus (accepted by DGS)</td>
</tr>
<tr>
<td>Used book exchange/buy backs</td>
</tr>
<tr>
<td>Employee supplies exchange</td>
</tr>
<tr>
<td>Other (explain in Agency Program Notes below)</td>
</tr>
<tr>
<td>None</td>
</tr>
</tbody>
</table>

Waste Prevention/Re-use

Programs in this section support (a) Waste Prevention: actions or choices that reduce waste, and prevent the generation of waste in the first place; and (b) Re-use: using an object or material again, either for its original purpose or for a similar purpose, without significantly altering the physical form of the object or material.

Describe activities:

<table>
<thead>
<tr>
<th>Activity Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper forms reduction - online forms</td>
</tr>
<tr>
<td>Bulletin boards</td>
</tr>
<tr>
<td>Remanufactured toner cartridges</td>
</tr>
<tr>
<td>Retreaded/recapped tires</td>
</tr>
<tr>
<td>Washable/Reusable cups, service ware, towels</td>
</tr>
<tr>
<td>Reusable boxes</td>
</tr>
<tr>
<td>Reusable pallets</td>
</tr>
<tr>
<td>Reusable slip sheets</td>
</tr>
<tr>
<td>Electronic document storage</td>
</tr>
<tr>
<td>Intranet</td>
</tr>
<tr>
<td>Reuse of office furniture, equipment &amp; supplies</td>
</tr>
<tr>
<td>Reuse of packing materials</td>
</tr>
<tr>
<td>Reuse of construction/remodeling materials</td>
</tr>
<tr>
<td>Double-sided copies</td>
</tr>
<tr>
<td>Email vs. paper memos</td>
</tr>
<tr>
<td>Food Donation</td>
</tr>
<tr>
<td>Electric air hand-driers</td>
</tr>
<tr>
<td>Remanufactured equipment</td>
</tr>
<tr>
<td>Rags made from waste cloth or reusable rags</td>
</tr>
<tr>
<td>Preventative maintenance</td>
</tr>
<tr>
<td>Used vehicle parts</td>
</tr>
<tr>
<td>Used Tires</td>
</tr>
<tr>
<td>Other (explain in Agency Program Notes below)</td>
</tr>
<tr>
<td>None</td>
</tr>
</tbody>
</table>

Green Procurement
Programs that promote green purchasing practices, including the purchase of goods and materials that are made from recycled or less harmful ingredients such as, post-consumer recycled content copy paper or less ionic cleaning products. &lt;A href="http://www.calrecycle.ca.gov/BuyingGreen/Policies/?target=_blank"&gt;View sample policies&lt;/A&gt; and the &lt;A href="http://www.dgs.ca.gov/buyinggreen/" target="_blank"&gt;Department of General Services Buying Green website&lt;/A&gt;.

Describe activities:

**Activity Name**

- Recycled Content Product (RCP) procurement policy
- Environmentally Preferable Purchasing (EPP) procurement policy
- Staff procurement training regarding RCP/EPP policies
- RCP/EPP language included in procurement contracts for products and materials
- Other green procurement activities (explain in Agency Program Notes below)
- None

**Training and Education**

Programs to reduce trash, re-use, recycle, compost, and to buy green products are more effective when employees are aware, involved and motivated. How does your agency train and educate employees, and non-employees (if applicable) regarding existing and new waste management and recycling programs?

Describe activities:

**Activity Name**

- Web page (intranet or internet)
- Signage (signs, posters, including labels for recycling bins)
- Brochures, flyers, newsletters, publications, newspaper articles/ads
- Office recycling guide, fact sheets
- New employee package
- Outreach (internal/external) e.g., environmental fairs
- Seminars, workshops, special speakers
- Employee incentives, competitions/prizes
- Awards program
- Press releases
- Employee training
- Waste audits, waste evaluations/surveys
- Special recycling/reuse events
- Other (explain in Agency Program Notes below)
- None
Appendix G – Interview Questions

Date:

Researcher: Antoinette Bland

Opening Comments

I am a doctoral student interested in waste management in California county jails and state prisons. The purpose of my study is to identify waste reduction strategies that reduce the impact of waste from jails and prisons on county landfills, either through recycling or other efforts leading to greater environmental protection. The study will also try to identify barriers that hinder jail and prison personnel from developing recycling and waste reduction strategies, and try to determine how those barriers might be overcome. My questions are being asked for the purpose of research only.

Questions:

1. What strategies have you used to divert waste?

2. How can barriers to waste reduction efforts in California jails and prisons be reduced or eliminated?

Closing remarks

Thank you for participating in this study.
Table 8  
**Coded participant responses**

<table>
<thead>
<tr>
<th>Code</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
<th>P6</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assigned Personnel</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>66.7</td>
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<tr>
<td>Attitude toward recycling</td>
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<td></td>
<td></td>
<td>1</td>
<td>16.7</td>
<td></td>
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<tr>
<td>Cost benefit</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
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<tr>
<td>Finding vendors</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>83.3</td>
<td></td>
</tr>
<tr>
<td>Leadership support</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>83.3</td>
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<td>Training and Education</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>100</td>
<td></td>
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<tr>
<td>Waste Identification</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>83.3</td>
<td></td>
</tr>
<tr>
<td>Learn from other successful programs</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>3</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td>Legislative mandates</td>
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<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Clear policies/procedures</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Inmate job training approach</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>3</td>
<td>50.0</td>
<td></td>
</tr>
<tr>
<td>Community/Agency partnerships</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>16.7</td>
<td></td>
</tr>
</tbody>
</table>

P - Participant