Abstract

This study explores the organizational culture of the Vancouver Airport Authority as it relates to environmental values and practices. The intent of this research was to investigate the effects of a particular work climate and culture on decision-making related to pro-environmental behaviours. A mixed-methods approach was taken, including a multiple regression survey of employees exploring connectivity with nature, environmental values, and environmental behaviours, and a series of grounded theory interviews probing the obstacles and opportunities to effective environmental management. The results indicate that while age and connectivity with nature were the most significant predictors of general environmental values and behaviours, work-related behaviours were best predicted by human-resource factors such as top management support, training, empowerment, teamwork, and reward programs. Obstacles and opportunities to successful environmental management, garnered from employee interviews, fit into these human resource categories. Recommendations are made both for future research and for the Vancouver Airport Authority.
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Chapter One: Introduction

Background

The International Civil Aviation Organization predicts that scheduled airline passenger traffic will grow at a rate of five to six percent per year (International Civil Aviation Organization, 2006). In 2005, the world’s scheduled airlines transported more than two billion passengers for the first time, despite a nearly 50 percent rise in the cost of jet fuel during that same year (International Civil Aviation Organization, 2006). Vancouver International Airport (YVR), Canada’s second largest airport, has seen a steady rise in passenger traffic since late 2003, following the declines associated with the Severe Acute Respiratory Syndrome and September 11th incidents in 2003 and 2001 respectively (Vancouver Airport Authority, 2007). In 2006, YVR had a record-breaking year, serving 16.9 million passengers, 223,100 tonnes of cargo, and 271,000 take-off and landings (Vancouver Airport Authority, 2007). The Vancouver Airport Authority predicts that this growth will continue, and is in the midst of a $1.4 billion 10 year capital program to expand its facilities to meet the expected increased demand (Vancouver Airport Authority, 2007).

Rapid growth, while encouraging from an economic perspective, often comes with an environmental cost. According to Michael Prather, contributor to of the 1999 Intergovernmental Panel on Climate Change Special Report, Aviation and the Global Atmosphere (Penner, Lister, Griggs, Dokken, & McFarland, 1999), by 2050, the air transportation industry is “expected to contribute anywhere from six to ten percent of the gases and particles tied to global warming” (Wilber, 2007). The Vancouver Airport Authority faces its own host of environmental challenges, including reducing CO$_2$
emissions, managing hazardous materials and spill response, improving resource efficiency, managing de-icing fluid, minimizing the environmental impacts of an extensive construction program, avoiding aeronautical noise disturbance, and reducing waste (Vancouver Airport Authority, 2007).

The Vancouver Airport Authority is a community-based, not-for-profit organization that manages and operates YVR. The Airport Authority is governed by a board of directors, has no shareholders, and re-invests all excess of revenues over expenditures back into the operation of the airport (Vancouver Airport Authority, 2009). This places the Airport Authority in a unique position in regards to its social responsibility and the potential for environmental initiatives and leadership.

In order to manage its own environmental challenges, the Airport Authority has developed an Environmental Management Plan (EMP) (Vancouver Airport Authority, 2009). One of the central tenets of the Airport Authority’s Environmental Management Plan, and the associated Environmental Policy, is a dedication to continual improvement. While much has been written about sustainable aviation (see Amaeshi & Crane, 2006; Bishop, 2002; Graham, 2005; Kaszewski & Sheate, 2004; Lu & Morrell, 2006; Lynes & Dredge, 2006; Upham, 2001; Upham, Maughan, Raper, & Thomas, 2003; and Upham & Mills, 2005), many environmental challenges are still faced by the aviation industry and, for some of these challenges, few solutions currently exist beyond increasing technological and operational efficiencies. For example, unlike the automobile industry, there are presently no industry-accepted alternative fuel options available to jet engines. To maximize efficiency and develop alternatives to current high-impact practices, the aviation industry will need to employ creativity, adaptability, and a commitment to
environmental practices. The Airport Authority’s commitment to continual improvement is a dedication to creatively develop and implement beneficial environmental policies and practices.

Organizations such as the Airport Authority consist of a group of people that share a work climate and culture. Schneider, Brief, and Guzzo have stated that “organizational culture concerns the firmly implanted beliefs and values of organizational members” (1996, p. 12), while “thousands of things define a climate,” including “everyday policies, practices, procedures, and routines” (Ibid). Berrio (2003) has defined organizational culture as including “what is valued, the dominant leadership style, the language and symbols, the procedures and routines, and the definitions of success that characterize an organization” (p. 1).

A receptive, supportive, and creative organizational culture is integral to the successful operation of an environmentally responsible organization (Daily & Huang, 2001; Mallack & Kurstedt, 1996; Ramus, 2001; Ramus & Steger, 2000; Schneider, Brief, & Guzzo, 1996; Wilson, 1998). But how do organizational climate and culture relate to environmental values and practices? To what degree can an organization’s environmental practices be predicted by the climate and culture of its employees?

**Research Problem**

This thesis begins to bridge the gap between two existing bodies of academic study. Two areas of literature provide support to the Vancouver Airport Authority as an organization committed to sustainability in a challenging industry. The first is the well-explored area of organizational culture and corporate sustainability. These studies have typically focussed on environmental management systems, supervisory behaviours, and
employee training and recognition systems. For example Ramus (2001) has explored the impact supervisory behaviours and environmental policies have on employee environmental practices.

The second body of literature that can be of service to the Airport Authority explores determinants for environmental behaviours in individuals. An organization is of course composed of people; each person will bring his or her own environmental values and habits to their workplace. Therefore, it should be recognized that an individual’s personal values and behaviours will likely affect the organization’s performance as a whole. Several papers can provide insight and foundation for the present study. For example Dutcher, Finley, Luloff, and Johnson (2007) have suggested that connectivity with nature plays a more significant predictive role in environmental values and behaviours than age, gender, education, or income. Dutcher et al.’s work plays a foundational role in the present study.

Although these bodies of work do provide some context for an organization looking for insight into corporate culture and sustainability, as of yet there has been little effort to bridge the two subject areas. This study combines the two subject areas of corporate culture as it relates to sustainability and determinants towards environmental behaviours by examining these issues with members of the Vancouver Airport Authority.

*Research Question and Objectives*

The primary objective of this study is to describe the organizational climate and culture of the Vancouver Airport Authority as they relate to environmental practices. To this end, the research question is:
What is the relationship between the organizational climate and culture of the Vancouver Airport Authority and the environmental practices of its employees?

This thesis also complements the development and implementation of the Airport Authority’s latest Environmental Management Plan (2009) by fulfilling the following practical objectives:

1. Assess and describe the work climate and culture of the Airport Authority in regards to employee environmental values and behaviour.
2. Identify obstacles and opportunities to improving the environmental practices of the Airport Authority
3. Propose strategies to ensure the successful implementation of the Airport Authority’s Environmental Management Plan

To fulfill these objectives this study takes a mixed methods approach. I include both an intranet-based survey examining current values and behaviours of Airport Authority employees and one-on-one interviews expanding on these topics.

*Delimitations and Limitations*

A number of delimitations and limitations apply to this project. Delimitations are defined as restrictions purposefully applied to the project in advance. Delimitations, set out during the design of the study, mainly involved limiting the study population. This study relates only to Vancouver Airport Authority employees and was not intended to be generalized to the entire YVR community, which includes over 24,000 workers. This delimitation was applied for two reasons. Firstly, although the Airport operates as one large system, the Airport Authority is an organization separate from airlines, ground support companies, retailers, and other businesses. Therefore, I made the assumption that
the Airport Authority would have its own distinct organizational culture. Including other organizations in the study would likely have confused the results. Secondly, access to other businesses at the Airport would have been difficult. Engaging the employees of the countless tenants and partners operating within YVR would have involved obtaining complicated legal permissions, delaying the study.

Within the Airport Authority, the survey was designed to target all employees, including term and temporary workers, contract workers, and full time employees. No delimitations were set on gender, age, departments, length-of-employment, or any other such variables. Interview candidates, however, were chosen from my circle of acquaintances at the Airport Authority.

I selected interview candidates based on their department and the relative importance of their role in regards to environmental impacts. I made an effort to achieve departmental representation, selecting one interviewee from each of five key department areas: engineering services/maintenance, engineering, finance, parking and ground transportation, and operations. I selected individuals from within these departments based on my perception of their level of interest, either positive or negative, in environmental issues.

Although these selection criteria maximize the practical and functional benefits of the study, they possibly bias the qualitative results. The three initial interview candidates in this study likely had interaction with the Environment Department, to which I belong (see the section below titled Researcher’s Perspective) since I chose them from my existing acquaintances. Two subsequent interviewees were chosen from recommendations made by initial interviewees, using snowball sampling (Goodman,
1961), but were still acquaintances of mine and therefore subject to the described delimitation. Regular interaction with the Environment Department and a high level of environmental interest would be expected to bias interviewees towards knowledge and values related to environmental management at the Airport. However, because the qualitative component of the data collection was not intended to be generalized and was meant simply to explore organizational culture and environmental issues at the Airport Authority, these selection criteria were appropriate.

Limitations are defined as restrictions which arose during the course of the study but may not have been foreseen or expected. Limitations restrict the generalizability of the research findings. These were primarily related to the methods of data collection. Survey respondents were sought using the Airport Authority’s intranet. This internal website is used as a home page for all Airport Authority computers. Its functions include providing updates on company events, policies, and meetings, as well as being a central hub for commonly used documents and services. By soliciting survey responses over the intranet, the study was limited in two ways.

By posting over the intranet I targeted desk workers more than non-desk workers such as maintenance employees or employees with airfield duties. Although all Airport Authority employees have access to a computer and must use one at least occasionally, office workers were much more likely to see and respond to the survey. This presumably created a non-response bias for maintenance and operational employees.

By nature, this study is also likely to have a sample that is biased towards those that are passionate about environmental issues, either positively or negatively. The title of the survey, my position within the organization, and the intranet posting all made it clear
that the survey was environment-related. These indications, and the subject matter of the survey itself, likely created a non-response bias for those un-interested in environmental topics.

Finally, Green (1991) suggests a simplified calculation for researchers interested in testing individual predictors in a multiple regression analysis. The equation, \( 104 + k \), where \( k \) is the number of predictors, is recommended as a minimum number of total responses. The responses collected for this survey fall slightly short of that mark. This shortfall means that the analysis results presented here cannot be considered conclusive. In addition, the sample size was too small to run multiple regressions on sub-sets of the sample, which would have increased the reliability of the results.

Due to the limitations noted above, the results of the quantitative analysis presented in Chapter 4 should be considered indicative and not conclusive.

**Significance of this Study**

The relationship between organizational culture and environmental practices is examined using mixed methodologies as detailed in Chapter 3. This study is significant in three ways: to help bridge a gap in academic literature, to pilot a methodological tool by which other organizations can assess their own cultures as they relate to sustainable practices, and to propose strategies to improve the environmental performance of the Vancouver Airport Authority, including the implementation of its Environmental Management Plan. These components will each be discussed in turn.

As explained in the *Research Problem* section above, this study contributes to bridging a gap in academic literature between a body of research that examines corporate culture as it relates to organizational sustainability and a body of research that looks at
determinants for environmental values and behaviours. Bridging these two areas of research could prove quite valuable to those wishing to create a culture of sustainability within their organizations. Some insights into the structure of this bridge were discovered during the course of the study and a methodological tool was piloted which could lead to additional insights.

The methodological tool developed for this study, a combination of a survey instrument and an interview schedule, has the potential to lead to a validated instrument to assess organizational culture as it relates to environmental values and practices. Although the tools I have used in this project need to be evaluated and validated by further studies, this thesis and its methodology form the pilot of a much needed assessment tool. To create a culture of sustainability in an organization, managers and employees would benefit from an understanding of their workplace culture. This tool has the potential to add to that understanding.

Most practically, this study explores the obstacles and opportunities that the Vancouver Airport Authority faces in moving towards sustainability. Academic goals aside, the intention of this project is to improve the environmental practices at the Airport. Throughout the interview process and the analysis of the survey results, I searched for clues into the obstacles that are preventing environmentally beneficial behaviours and into the opportunities for new practices which would reduce the Airport’s environmental impact. These obstacles and opportunities are listed and discussed in Chapter 5.
Researcher’s Perspective

As a first-time researcher, I approached this project with a good deal of humility and hesitation. I learned and evolved as a researcher throughout the experience. Throughout the study, I avoided the lure of paradigmatic stances and instead drew from the rich tradition of the philosophy of pragmatism, as described by Maxcy (2003). As the purpose of this study is to characterize, describe, and infer meaning, I considered both positivist and constructivist approaches. I believe a greater understanding resulted from a diversity of paradigms, methods, data, and analyses.

Being an employee of the Airport Authority for over three years, I was presented with challenges related to self-reflexivity and illusions of objectivity. I have worked for the Vancouver Airport Authority since June of 2005; I started both the Environmental Education and Communication program with Royal Roads University and my work with the Vancouver Airport Authority within a few weeks of each other. During the past three and a half years, I have developed a great interest in the sustainability of the Airport, my own opinions regarding how to improve our practices, and many beliefs regarding barriers to sustainability in an airport context.

Denzin has suggested, in reference to ethnographic study but applicable here, that “the writer can no longer presume to present an objective, noncontested [sic] account of the other’s experiences” (1997, p. xiii). However, “the writer can become a co-author with the other, producing a joint document, which has long been the tradition in critical, participatory research” (Denzin, 1997, p. xiii). In all stages of this project, I made an effort to understand and hold true to my participants’ responses. I questioned my assumptions and considered as many points of view as possible in order to make my
interpretations reflect the shared experience of working at the Vancouver Airport Authority. However, it should be recognized that the results found during this study were the shared experiences of my participants and me. We are co-authors of this study.

The following chapter will present the literature review conducted during the design and implementation of this research project. The literature review focuses on two bodies of study: theories of environmental management within organizations and determinants of environmental values and behaviours.
Chapter Two: Literature Review

This chapter presents the literature review conducted during the development, proposal, and data collection phases of this study. The basis of what is presented in this chapter was literature gathered prior to developing a methodology. However, since the methodology I chose to employ included a grounded-theory data collection process (see Chapter Three: Methodology), this section also includes literature discovered during analysis and writing as unexpected themes arose. As the study progressed, the associated literature expanded into new areas and further detail.

Two areas of research inform my study: 1. Determinants of environmental values or behaviours, and 2. Theories of environmental management within organizations. The literature exploring these two subject areas is summarized below.

Determinants of Environmental Values and Behaviours

Hines, Hungerford, and Tomera (1987) summarized over 20 years of research regarding influential variables that motivate environmental behaviours. A meta-analysis of some 128 studies conducted between 1971 and 1987 revealed that the following variables were most often associated with responsible environmental behaviour: knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment, and an individual’s sense of responsibility. Since the publication of that review in the late 1980s, research into environmental values and behaviours has become increasingly sophisticated, borrowing from the traditions of psychology and sociology to create new theories of individual action.

Some theories treat environmental values and behaviours as a matter of worldview. The New Environmental Paradigm (NEP), a tool used to measure
environmental concern, was developed by Dunlap in the late 1970s (Dunlap & Van Liere, 2008) and has since blossomed into “the most widely used measure of environmental concern in the world” (Dunlap, 2008, p. 3). The New Environmental Paradigm, also called the New Ecological Paradigm, is a series of statements (originally 12 statements, revised into six and 15 statement versions), such as “plants and animals exist primarily to be used by humans” and “humans need not adapt to the natural environment because they can remake it to suit their needs” (Dunlap & Van Liere, 2008, p. 22). Respondents are asked for their reactions to these statements in a likert-scale multiple-choice format. These statements are intended to probe the respondent’s worldview as it relates to human-nature relationships.

While the NEP is a widely-used measure of environmental concern and worldview, it has been criticized for its failure to incorporate the socio-psychological causes of the worldviews it explores (Stern, Dietz, & Guagnano, 1995). The NEP tool has also been criticized for failing to draw a connection between environmental values and environmental behaviours (Scott & Willis, 1994), a crucial link for those engaged in environmental education. Indeed, the NEP, while originally created under the presumption that “our nation’s ecological problems stem in large part from the traditional values, attitudes, and beliefs prevalent within our society” (Dunlap & Van Liere, 2008, p. 19), it was never intended as a method of exploring the socio-psychological roots of the environmental concern it was measuring, nor of the links between environmental concern and environmental behaviours (Dunlap, 2008).

Sociologists and psychologists have long investigated cognitive decision making models. Schwartz (1977) in particular has explored the notion of altruism and normative
influences. Schwartz summarized that typical explanations for beneficial behaviours include empathic arousal, activation of social expectations, activation of self expectations, and genetics. Using these determinants of beneficial behaviours, he constructed a processual model of altruistic behaviour involving the activation of a normative structure of moral obligation. In short, this Norm-Activation Theory proposed that the decision to enact a socially beneficial behaviour is an individual cost-benefit analysis involving the feeling of empathy, social expectations, self-perception, and genetics.

Similarly, Ajzen`s Theory of Planned Behaviour (Ajzen, 1991; Ajzen & Fishbein, 1972) “postulates three conceptually independent determinants of intention” (Ajzen, 1991, p. 188). These three determinants were attitude towards the behaviour, which referred to an individual’s favourable or unfavourable evaluation of the behaviour in question, subjective norm, which referred to an individual’s perception of social pressures related to the behaviour in question, and perceived behavioural control, which referred to an individual’s perceived ease or difficulty of performing the task. Like Schwartz’ model, the Theory of Planned Behaviour attempted to break the behaviour-related decision making process into sub-components in order to better understand a person’s behaviour choices.

These models of decision making have certainly been noted by researchers interested in the adoption of environmental behaviours. For example Thogersen (1996) applied Schwartz’ model to recycling behaviours and Wall, Devine-Wright, and Mill (2007) applied both models to commuting choices. Stern (2000) has even published a paper calling for a coherent theory of environmentally-significant behaviour, attempting
to combine the theories of norm-activation and planned behaviour, and including tools such as the NEP in the process. Several authors (Bamberg & Schmidt, 2003; Harland, Staats, & Wilke, 1999; Valle, Rebele, Reis, & Menezes, 2005; Wall, Devine-Wright, & Mill, 2007) have responded to Stern’s call, attempting to combine and alter the models in attempts to increase predictive capacity.

Montada, Kals, and Becker (2007), while building on the work of Schwartz and Ajzen, pointed out two limitations of the theories. First, both models used intentions as surrogates for behaviours. Second, the models failed to adequately account for “volitional aspects of behaviour, including means, aims, and contexts” (Montada, Kals, & Becker, 2007, p. 287). The authors presented an alternative model that they called Willingness for Continued Social Commitment, which attempted to eliminate these shortcomings. This model-tool included questionnaires intended to bridge the divide of cognitions and emotions with situational and social context in order to predict manifest behaviour.

All of these models and theories shared certain fundamental elements, notably that environmentally-significant behaviour choices are the result of a complex web of internal determinants, such as worldviews, attitudes, and knowledge, and external determinants, such as perceived social norms and situational variables. The complexity of these often subconscious decision-making processes makes predicting and influencing desired behaviours a challenging task.

To further explore internal determinants, Stern (1992) summarized the role of psychology in interpreting the relationship between human interaction and the global environment. This high-level psychological view of human-environment interaction confirmed the complexity of the knowledge-attitude-context-behaviour relationship. This
review also added an additional variable, which was the range of emotional, intellectual, and behavioural responses to global environmental change.

Where Stern took a generalized, high-level approach, Maiteney (2002) examined research exploring “experiences that have prompted individuals to reduce the environmental impact of their lifestyles through attitudinal and behavioural change, and … how these experiences relate to their wider beliefs, meanings, and convictions” (Maiteney, 2002, p. 299). This personal, individual-level approach provided insight into the experiential variables that create the internal values and worldviews which in turn act as determinants for environmentally-significant behaviours.

In attempts to generalize human-environment interactions, some researchers have looked to categorize worldviews, for example into ecocentric and anthropocentric attitudes (Thompson & Barton, 1994) or into ecological and spiritual connections (Ignatow, 2006). The myriad of potential categories is endless, however for practical purposes such as determining predictors of environmental behaviours, Maiteney’s (2002) approach of attempting to understand experiences that prompt emotional engagement and pro-environmental decision making is perhaps more practical.

Kals, Schumacher, and Montada (1999) suggested that emotional attachment plays an intermediary role between experiences in nature and environmentally significant behaviours, notably nature-protective behaviours. Through a multiple regression analysis, they showed that emotional affinity is a powerful predictor of environmentally-significant behaviour and that “39% of emotional affinity toward nature traces back to present and past experiences in natural environments” (Kals, Schumacher, & Montada, 1999, p. 178). Several other researchers (Dutcher, Finley, Luloff, & Johnson, 2007; Schultz, 2000;
Schultz, Shriver, Tabanico, & Khazian, 2004) have supported this theory, focussing on connectivity to nature and the degree to which people see themselves as part of, or distinct from, the natural environment.

Dutcher et al. (2007) went so far as to test the relative weight of connectivity to nature in relation to the more standard predictive variables of age, education, gender, and income. To accomplish this comparison, they developed “a sociometric scale to operationalize connectivity with nature” (Dutcher, Finley, Luloff, & Johnson, 2007, p. 474). Dutcher et al. assessed the connectivity with nature scale, along with the demographic variables, for their predictive power on environmental values and environmental behaviours. They discovered that connectivity with nature, as enumerated by their survey tool, often has more predictive weight than typical demographic variables. Dutcher et al.’s methodology and survey tool was adapted for the present study (see Chapter Three: Methodology) as it was the only methodology discovered that attempts to provide relative weights of potential determinants of environmental values and behaviours.

Several authors have explored the assumption that environmental values and behaviours can be predicted by socio-demographic variables such as gender, age, religion, ethnicity, education level, or income (Hunter, Hatch, & Johnson, 2004; Klineberg, McKeever, & Rothenbach, 1998; Schahn & Holzer, 1990; Stern, Dietz, & Kalof, 1993). These studies have shown mixed results. Indeed, Klineberg et al. (1998) demonstrated that inconsistent results could be explained by variations in methodology and data-collection tools. It could be conceived that socio-demographic variables connect the internal determinants (attitudes and worldviews) and external determinants (perceived
societal norms and situational context) of the decision-making models in that they connect individuals who share basic categories of experience and therefore share similar worldviews, including perspectives on societal norms, and situational contexts.

The social and situational contexts of environmental behaviours have been emphasized as determining factors by several studies (Barr, 2007; Guagnano, Stern, & Dietz, 1995). Blamey (1998) even extended Schwartz’s model to a specific situational context involving donations to public goods. At least two groups of authors have taken the argument one step further and suggested that strong feelings of moral obligation for pro-environmental behaviour are only determinant in favourable situational contexts (Corraliza & Berenguer, 2000; Derksen & Gartrell, 1993). These researchers argue that strong environmental values only result in corresponding environmental behaviours within favourable contextual situations.

*Theories of Environmental Management within Organizations*

Given the suggested importance of situational context to environmental behaviours, this section of the literature review explores management tools for promoting environmental practices. These management systems are, at their roots, theories of creating favourable situational contexts in a work environment. Shrivastava (1995) emphasized the crucial role that corporations play in achieving ecological sustainability as “primary engines of economic development” (p. 937) and focused on the environmental management strategies that serve the dual role of increasing the competitive advantage of a corporation and reducing environmental harm.

Two systems of environmental management within corporations are common in literature relating to ecological sustainability. These are Total Quality Management
(TQM) and the ISO 14000 standard. TQM emerged in the 1980s as a management framework focussed on quality at all stages of a business (Korukonda, Watson, & Rajkumar, 1999), and included the general principles of increasing efficiency and reducing waste of all types (Curkovic, Melnyk, Handfield, & Calantone, 2000). These principles were applied to environmental management and the movement bloomed into a sub-field dubbed Total Quality Environmental Management (TQEM) (Curkovic, Melnyk, Handfield, & Calantone, 2000). TQEM embodies four key principles: customer identification, continuous improvement, doing the job right the first time, and a systems approach (International Institute for Sustainable Development, 2007). This natural extension of business principles in Total Quality Management led to high adoption levels amongst corporations, most notably in the manufacturing sector (Harrington, Khanna, & Deltas, 2008).

The ISO 14000 Environmental Management System standards were created by the International Organization for Standardization, a group composed of representatives from 92 countries that creates voluntary adoption standards (Hersey, 1998). The ISO 14001 standard outlines five key principles of the 14000 series: commitment and policy, planning, implementation, measurement and evaluation, review and improvement (Hersey, 1998). As these principles indicate, the ISO standards do not dictate specific environmental targets or foci, but simply provide structure to an environmental management system.

This systems-focussed approach has led paradoxically both to high adoption rates and to a reticence to adopt amongst some companies. According to Lindhqvist (2007) more than 129,000 companies had been certified to ISO 14001 in 2007. However, “many
of the tools have not led to improvements that can be substantiated by current research” (Lindhqvist, 2007, p. 351). Additionally, Bansal (2002) has noted a reticence among managers to adopt the ISO standard “because the benefits of ISO 14001 did not outweigh the costs and because in-house environmental systems served the same purpose” (Bansal, 2002, p. 122).

Regardless of the particular environmental management system, Epstein and Roy have noted that “improvement in environmental performance and financial performance … can be accomplished only through significant changes in corporate culture, structure, and systems” (1997, p. 21). Similarly, Wilson (1998) emphasized that employee awareness of an environmental management system is crucial to its success. While the vital nature of corporate culture and employee awareness may seem obvious, the human factor in the success of an environmental management system is too often overlooked or over-simplified. Kotter, in an article identifying barriers to transformation efforts in organizations, indicated that a common mistake is “not anchoring changes in the corporation’s culture” (1995, p. 67).

Schneider, Brief, and Guzzo have stated outright that “if the people do not change, there is no organizational change” (1996, p. 7). These authors went on to emphasize the relationship and importance of climate and culture:

Climate and culture are interconnected. Employees’ values and beliefs (part of culture) influence their interpretations of organizational policies, practices, and procedures (climate). We assert that sustainable organizational change is most assured when both the climate – what the organization’s members experience –
and the culture – what members believe the organization values – change.

(Schneider, Brief, & Guzzo, 1996, p. 9)

These authors promoted change efforts which focus, at least partially, on the manipulation of organizational climate in order to change employees’ perception of their work culture. In this regard, Schneider, Brief, and Guzzo (1996) argued for the intentional creation of what could be considered favourable contextual situations. While some researchers, for example Harris and Ogbonna (1998), have noted that intentional alteration of organizational culture may be impossible, others have focused on human resource factors, those factors that create receptivity to transformation, as necessary conditions to organizational change (Daily & Huang, 2001).

Daily, with a variety of co-authors, has written several articles on the importance of human resource factors in successfully implementing an environmental management system (Daily, Bishop, & Steiner, 2007; Daily & Huang, 2001; Govindarajulu & Daily, 2004). These human resource factors, which help to create an organizational climate that is receptive to the adoption of an environmental management system, include top management support, environmental training, employee empowerment, teamwork, and reward systems (Daily & Huang, 2001). Daily believes that these human resource factors are necessary conditions to the successful implementation of TQM or ISO 14000 management systems. Other authors have postulated similar collections of success factors, for example Ramus (2001) presented six categories of supervisory behaviours that closely mirror Daily’s human resource factors. Additionally, many researchers have focussed on success factors individually, for example, managerial support (Finemen, 1996; Ramus & Steger, 2000; Schaubroeck, Lam, & Cha, 2007), employee empowerment
(Argyris, 1998; Lin, 1998; Mallack & Kurstedt, 1996; Smith, Anderson, & Brooking, 1993), reward systems (Rumpel & Medcof, 2006), and teamwork (Daily & Bishop, 2003; Hanna, Newman, & Johnson, 2000; May & Flannery, 1995). These human resource factors play a crucial role in the design of this study, as shown in the following chapter.

Summary

Models of decision making have emphasized the inter-connectedness of internal determinants, such as attitudes and worldviews, and external determinants, such as perceived societal norms and situational contexts. In addition to socio-demographics, connectivity with nature has been proposed as having a large influence over attitudes and worldviews that relate to environmentally significant behaviours. In the context of a workplace, human resource factors such as management support, environmental training, employee empowerment, teamwork, and reward systems are proposed as playing a pivotal role in creating a culture that is receptive to environmental behaviours. As shown in the following chapter, this study was designed to explore the determinants of environmental values and behaviours in the context of a particular organization, the Vancouver Airport Authority.
Chapter Three: Methodology

This chapter describes the research methodology used during the course of this study. The research design, data collection, and analysis process are outlined and described in detail. The process was designed and conducted to answer the research question: What is the relationship between the organizational climate and culture of the Vancouver Airport Authority and the environmental practices of its employees?

Research Design and Rationale

As pointed out by Schneider, Brief, and Guzzo (1996), organizational climate (i.e. meaning policies, practices, procedures, and routines) and culture (i.e. beliefs and values) can be quite difficult to characterize and describe. Adding determinants of environmental values and behaviours creates another dimension to an amorphous and complex situation. What factors determine or create environmental values or behaviours? Why is one person concerned about the environment and willing to act, while another does not care?

To adequately research such a multi-faceted problem, I chose to diversify the methods of study I employed. Teddlie and Tashakkori (2003) have suggested that the advantages of employing a mixed methods study are “in the quantity and quality of inferences that are made at the end of a series of phrases/strands of study” (p. 35). Specifically, this study was designed with two complementary data collection and analysis methodologies, one quantitative and one qualitative.

The quantitative portion of the study was an on-line survey sent out to the entire Airport Authority via the corporate intranet. This survey was based on the work of Dutcher et al. (2007), adapted to include the theories of Daily and Huang (2001), and then expanded to include environmental behaviours specifically related to a workplace
The survey was designed to be analyzed using three separate multiple regressions, one for each of three dependent variables (see details in Data Analysis section), patterned after the work of Dutcher et al. (2007).

The qualitative portion of this study consisted of five interviews conducted using a grounded theory approach as described by Charmaz (2006). Further methodological guidance was obtained from the originators of the approach, Glaser and Strauss (Glaser, 1992; Glaser & Strauss, 1967), and from select authors who have written about grounded theory in a business management context (see Goulding, 2002; Locke, 2001). I selected grounded theory in the hopes that the methodology would help me question my assumptions about the culture of my workplace. Charmaz writes that “grounded theory methods foster seeing your data in fresh ways” (2006, p. 2). I found this statement to be true in that several assumptions I had regarding employee beliefs were not significant themes in the interview data and several new themes I had not previously considered emerged.

Cohen, Manion, and Morrison (2000) have suggested that, through triangulation, the use of two or more methods of data collection in a study, a researcher can strengthen the validity of a study’s findings. Indeed, Cohen et al. (2000) suggested that “exclusive reliance on one method… may bias or distort the researcher’s picture of the particular slice of reality she is investigating” and that “the more methods contrast with each other, the greater the researcher’s confidence” (p. 112).

In order to fully take advantage of the benefits of triangulation, I applied constant comparison, a typical practice of grounded theorists (Glaser & Strauss, 1967), both to the interview data, the survey results, and between the two types of data. By looking for
similarities and differences in the themes resulting from each, I was able to identify consistencies and discrepancies in the data. Where similarities existed, this bolstered my confidence in the results. Where there were differences, this prevented the reporting of potentially false conclusions and encouraged further thought into causes of discrepant data.

Data Collection

Data collection took place in two overlapping phases, quantitative and qualitative. The quantitative phase consisted of designing, piloting, and publishing the survey, and then collecting survey data. The qualitative phase consisted of designing, piloting, and conducting interviews. Each phase will be discussed in the sub-sections below.

Survey – Organizational Culture and Environmental Practices

The survey I designed for this study is based on one used by Dutcher et al. (2007). It was used to test the relative predictive weights of age, gender, education, income level, and connectivity with nature on the dependent variables of environmental concern and environmental behaviours. Their study consisted of a series of questions, including scales for connectivity with nature, environmental concern, and environmental behaviours, which fed into a multiple regression analysis to test relative weights of predictive factors. Their study found that connectivity with nature, at least in some instances, plays a larger predictive role than the other independent variables.

I modified the Dutcher et al. (2007) survey to meet the specific requirements of this study. First, I developed a series of questions meant to assess work-related environmental behaviours. These questions were created based on the general
environmental behaviour questions used by Dutcher et al. and using my own knowledge of activities at the Airport that have positive environmental implications. This series of questions creates a third dependent variable to the study. Dutcher et al. used environmental concern and environmental behaviours as dependent variables; to these I added work-related environmental behaviours.

Second, I added an independent variable of human resource factors based on the work of Daily and Huang (2001). Daily and Huang have theorized that five key human-resource factors are necessary conditions to achieving sustainability in an organization. These conditions are top management support, environmental training, employee empowerment, teamwork, and rewards systems. I created a series of six questions to assess these human resource factors. These questions add an additional independent variable to the equation.

I removed one of Dutcher et al.’s (2007) independent variables, income level, as this study targeted a specific organization whose members are all part of the same union and pay-scale. I replaced this independent variable with one of my own which asked for the participant’s department, recognizing that there may be sub-cultures within the Airport Authority that are more or less inclined towards environmental values or behaviours.

In addition, I removed one question from the connectivity with nature scale for practical reasons. Dutcher et al. (2007) had participants choose from a series of Venn diagrams representing their role in nature. This exercise proved difficult in the Royal Roads survey tool, a web-based software program offered to students of Royal Roads University, and was unnecessary for my study, so it was removed from the survey.
In total, the survey tool I used consisted of thirty-three questions designed to examine six independent variables and three dependent variables (see Appendix One for a copy of the published version of the survey). Four of the questions were categorical relating to department, age, education level, and gender. Twelve questions were yes/no responses relating to behaviours, both general and work-related. Sixteen questions were Likert scale responses relating to connectivity with nature, human resource factors, and environmental concern (see Table 3 in Chapter 4 for a list of questions organized by variable-category). Lastly, one question was an open-ended text box asking for any comments on the survey, environmental issues at the airport, or the Airport Authority’s environmental performance.

The study had three separate alternate and null hypotheses, one for each dependent variable, as shown in Table 1. Each hypothesis related to the greatest predictive independent variable for the associated dependent variable. It was understood that more than one independent variable could be statistically significant for each dependent variable.
Table One: Null and Alternate Hypotheses for the Organizational Culture and Environmental Practices at the Vancouver Airport Authority Survey

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Environmental Concern</th>
<th>Environmental Behaviours</th>
<th>Work-Related Environmental Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null Hypothesis ($H_0$)</td>
<td>Connectivity with nature is not the greatest significant predictor of environmental concern</td>
<td>Connectivity with nature is not the greatest significant predictor of environmental behaviours</td>
<td>Human resource factors are not the greatest significant predictor of work-related environmental behaviours</td>
</tr>
<tr>
<td>Alternate Hypothesis ($H_1$)</td>
<td>The greatest significant predictor of environmental concern is connectivity with nature</td>
<td>The greatest significant predictor of environmental behaviours is connectivity with nature</td>
<td>The greatest significant predictor of work-related environmental behaviours are human resource factors</td>
</tr>
</tbody>
</table>

The Organizational Culture and Environmental Practices at the Vancouver Airport Authority Survey was published using the Royal Roads University on-line survey tool. Questions, which were originally grouped by category, were randomly mixed to prevent prompting survey respondents.

The survey was piloted outside the Airport Authority before being released to the organization. Twelve people selected from friends, family, and fellow students took the survey and provided detailed feedback on confusing questions, typing and grammatical errors, and concern about leading questions. Most comments resulted in beneficial changes to the survey; however some questions, related to those derived from the Dutcher et al. survey, were left with their original wording to maintain as much consistency between studies as possible.

Following the pilot, the survey was advertised to the Vancouver Airport Authority using the corporate intranet. This internal web-service is the start-up page for all Airport Authority computers and serves as a daily alert and news service for the organization. A
brief explanation and invitation to complete the survey accompanied the link to the survey web page. The invitation was visible for one business week, from February 25th to February 29th, 2008. The survey itself was available until March 9th, 2008, however only three additional responses were received once the intranet invitation was no longer visible.

Throughout the data collection process considerable attention was given to the rights and comfort of respondents. Both in the invitation to the survey and in the preamble of the survey itself, respondents were assured that all data would be collected and reported anonymously, that they would not be compelled to participate in any way, and that only myself and my thesis supervisors would have access to the raw data. I also included my work phone number in the preamble and encouraged respondents to call me if they had any questions or concerns.

Data were collected by downloading them from the Royal Roads University on-line survey tool into Microsoft Excel. All users were kept completely anonymous throughout the process; the downloaded report simply stated “Anon #” for each participant. All responses were automatically coded by the on-line survey tool. The excel data were then organized and transformed into a useable format for analysis.

*Interviews – The Experience of Working at the Vancouver Airport Authority*

The interview process was guided by the grounded theory methodology detailed by Charmaz (2006). Grounded theory, a qualitative research method developed by Glaser and Strauss (1967), is described by Strauss and Corbin (1994) as:

A general methodology for developing theory that is grounded in data systematically gathered and analyzed. Theory evolves during actual research, and
it does this through continuous interplay between analysis and data collection. A central feature of this analytic approach is ‘a general method of [constant] comparative analysis’ (Glaser & Strauss, 1967, p.vii); hence the approach is often referred to as the constant comparison method. (p. 273)

In grounded theory methodology, hypotheses or themes emerge from the data, instead of being conceived in advance. Therefore, the design stage of the interview process was kept minimal and as open as possible.

The interviews followed an “interview guide approach” as described by Patton in Cohen et al. (2000, p. 270). This is a type of exploratory interview, which is “designed to be essentially heuristic and seek[s] to develop hypotheses rather than to collect facts and numbers” (Cohen, Manion, & Morrison, 2000, p. 270). I developed a simple interview guide consisting of a series of open ended questions (see Appendix Two). The questions were intended to open up discussion on topics relating to environmental values and behaviours in the workplace, the human resource factors identified by Daily and Huang (2001), and potential obstacles and opportunities that the Airport Authority faces in its journey towards sustainability. This interview guide was fluidly adapted during and following each interview to suit the interviewee’s inclinations and to explore emerging themes.

I chose the initial three interviewees from the people I knew at the Airport who were interested in environmental topics, but not necessarily those that displayed strong environmental values or behaviours. I made an effort to represent different age groups, departments, genders, and experience levels in the interviewees. The five interviewees consisted of two women and three men, ranged in age from late twenties to late fifties,
came from five different departments, and had worked at the airport for between five and thirty years. Using snowball sampling (Goodman, 1961), I asked each of the three initial interviewees for their recommendations for other participants. I chose two further participants from these recommendations.

Initially, I had planned on conducting up to eight interviews, but following the analysis of interviews four and five, I found that my themes were well defined and, in my estimate, had been saturated to a point where I could confidently explain them using my interviewees own words. I decided that little additional insight would be gained from further interviews. Charmaz (2006) describes the concept of saturation as “when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of your core theoretical categories” (p. 113). In my opinion, themes such as those explored in this study can never be fully saturated; there is always more that can be added. However, for the purpose of this study, five interviews with opinionated employees from a variety of areas in the Airport Authority provided considerable additional insight to the survey results.

I made every attempt to make the interviewees feel comfortable with the research project. This included a specific attempt to ensure a balance of power during the interview. As I am only a junior member of the Airport Authority, it was unlikely that interviewees would feel threatened or self-conscious about responding honestly. This did seem to be the case during interviews as several participants were openly critical about the Airport Authority and its management. I also re-iterated at the beginning of each interview that responses would be reported anonymously, so there should be no negative consequences to answering honestly. Furthermore, I informed participants that any
statements they made that could indicate their identities would be withheld from transcripts or quotes provided to the Airport Authority, unless the interviewee specifically consented in writing to have his or her identity or position revealed. In spite of these precautions, interviewees were aware that the results of the interviews would be shared with upper management in anonymous format. While this knowledge may have prompted participants to censor their responses, I saw no indication that they were doing so. Many were openly critical of upper management decisions.

I consciously attempted to minimize my own bias during the interview phase of the research. These efforts included recognizing and resisting any attitudes or opinions I had on the subject matter, any tendencies to see the subject in pre-determined images, any tendencies to seek answers in line with pre-conceived notions, and any misperceptions or misunderstandings between interviewer and respondent (Cohen, Manion, & Morrison, 2000). I sought these inconsistencies by being attentive to my participants and to my own often opinionated thoughts. Finally, I tried to maintain an awareness of leading questions during the interviews, knowing that they would reduce the validity of the research if used without specific purpose and forethought. These measures, in combination with the strong ethics of “honesty, depth, richness and scope of data” (Cohen, Manion, & Morrison, 2000, p. 105) augmented the validity of my study.

Interviews took place at the Vancouver Airport Authority. I allowed the participants to choose the locations for the interviews. Three chose their own office, one a conference room, and one a meeting room in the Environment Department offices. Locations kept distractions to a minimum and ensured the comfort of participants.
At the beginning of each interview, I informed the participant of the general subject area I was interested in (environmental values and behaviours at the Airport Authority), that all information would be kept strictly confidential, that the interview would take about one hour, and that they were free to leave or not to respond to any questions at any time. The participant then signed the Research Consent Form included in Appendix Two. I then asked permission to record the interview before we began. All participants signed the consent form and agreed that the conversation could be recorded.

The interviews were recorded on an Olympus Digital Voice Recorder, Model VN-240PC. The sound files were transferred onto my personal computer, password protected for safety, and verified for sound quality and intelligibility. Copies of all data for this study were kept on a USB portable drive and in my personal webmail, in addition to my personal computer.

**Participants and Site**

During the data collection phase of this study, the Airport Authority consisted of 379 employees, including members of YVR Project Management (a subsidiary company of the Airport Authority), term and temporary workers, and students (Alibi, 2008). These employees worked from at least six different locations spread out on Sea Island, in Richmond, British Columbia. Airport Authority employees at the time of the study worked in the following departments: Airport Operations, Maintenance, Engineering, Human Resources, IT and Simplified Passenger Travel, Community and Environmental Affairs, Marketing and Commercial Development, Finance, and Strategic Planning and Legal Services. Within each of these departments, several sub-categories existed, which employees may have identified as their department.
The survey included in this study targeted all 379 employees. All employees had access to a computer and were expected to visit the corporate intranet regularly. However, as indicated in the Delimitations and Limitations section of Chapter One, some categories of workers were much more likely to see and respond to an intranet-based survey than others. For example, a communications specialist whose tasks are primarily on the computer was more likely to respond than an auto mechanic who only checks his or her email once per day.

Interviewees were selected individually to represent a wide range of departments, ages, education levels, genders, and environmental predilections. This process should not be considered representative of the whole, nor is it meant to be. Interview data are exploratory, not confirmatory.

Data Analysis

Data analysis took place in two complimentary phases, one for survey data and one for interview data. The survey analysis consisted of organizing, summarizing using descriptive statistics, and running a multiple regression analysis on the numerical data. The interview analysis consisted of transcribing, line-by-line coding, focused coding, and memo writing according to the process outlined by Charmaz (2006). Each phase will be discussed in the sub-sections below.

Survey Analysis – Conducting a Multiple Regression

To conduct the analysis of my survey data, I used the book Discovering Statistics Using SPSS (Field, 2005) as a guide. In addition, I consulted with the Simon Fraser University Statistical Consulting Service, who reviewed my processes, results, and
interpretations, and recommended improvements where appropriate. The final process is described below.

The data derived from the Royal Roads University survey tool required formatting before any analysis could begin. I titled each question properly and added a row with explanations of coding (e.g. for the Department question, a row was added with text explaining 1=Operations, 2=Maintenance, etc). Rows and columns were formatted to a legible size and data were double checked for consistency to ensure no errors took place. I then removed the text box comments field and saved these comments for a later date. Finally, I removed the first twelve respondents, who were from the pilot survey.

Once this clean-up was complete, I used excel functions to calculate descriptive statistics, including total number of responses, percentage of employees who responded, and breakdowns by department, age, education level, and gender. I saved these in a separate worksheet. I also used excel functions to calculate summaries for each yes/no question, including actual numbers of yes/no and percentages of the whole for each. I then used excel to calculate the mean averages and standard deviations for likert scale questions. These data will all be reported in Chapter Four: Results.

Following this initial summary analysis, I saved the worksheet with the above information, copied the data to a new worksheet, and began preparations for the multiple regressions. This began with reversing the codes for all the inverted questions so that results were comparable. For example, one of the Likert scale questions asked respondents for their reaction to the statement “I am not a natural part of the environment”. This question puts the positive environmental response on the disagree end of the Likert scale. All questions were re-coded so that the positive environmental
response was on the high end of the Likert scale or the yes side of the yes/no equation. I then eliminated six responses because respondents chose not to report their gender, bringing the total number of responses down to 98. As this was a key independent variable for all three multiple regressions, I chose not to use their data.

I then turned to calculating overall scores for each of the key categories of variables in this study: connectivity with nature, environmental concern, human resource factors, environmental behaviour, and work-related environmental behaviours. The first three categories above, connectivity with nature, environmental concern, and human resource factors, were based on Likert-scale responses. Therefore the data were ordinal and it was appropriate to simply take a mean and median of the responses for the six questions in each category. This was completed using the respective functions in Excel 2007. The latter two categories listed above, environmental behaviours and work-related environmental behaviours, were yes/no response questions. Therefore mean and median were not appropriate. Instead, I simply added the number of positive responses and used the whole number.

By using a total number of positive responses as a score for environmental behaviour and work-behaviour, however, I was forced to eliminate any participants who elected not to answer one or more behaviour-related questions. By adding only positive scores, failing to include a question registers as a negative response, skewing results towards the negative. Because of this, the total N (number of responses) for each multiple regression is different. The N for environmental behaviours became 86 and the N for work-related environmental behaviours became 88. The N for environmental values remained 98 as this dependent variable consisted of Likert scale responses.
With these new summary scores, I then created a new worksheet in Excel 2007 with the following variables for each participant: department, age, level of education, gender, connectivity with nature score, human resource factor score, environmental concern score, environmental behaviours score, and work-related environmental behaviours score. The first six numbers were independent variables and the last three were dependent variables.

The next step was to convert the categorical data, which were department, age, education level, and gender, into continuous data suitable for the regressions. Age data were simply converted into a number in the exact middle of the age category (e.g. 30-39 became 35). The Excel spreadsheet was then imported into SPSS v13 to complete the categorical data conversions.

The remainder of the categorical data were converted using dummy coding for each category. In simple terms, this involved creating a new variable for each category of the existing variables with the only possible responses being 1 for true and 0 for false. For example, using department as a variable, nine dummy variables were created, one less than the total number of options. Using dummy variables, one category must be used as a baseline. Field (2005) suggested that the baseline “should usually be a control group, or, if you don’t have a specific hypothesis, it should be a group that represents the majority of people” (p. 208). In this example, Operations was used as a baseline as they were the largest group of respondents. The nine other department categories were each turned into a variable column in and of themselves with a simple yes=1, no=0 code. The same system was used for education level using “College or University Degree” as the baseline as it was the most commonly selected category. Lastly, gender was simply
converted to a single column Male=0 and Female=1 category, making males the baseline and females the only categorical variable. These transformations were all completed using the “Recode” function in SPSS as described by Field (2005, p. 210).

The data were now in a format suitable for multiple regression analyses. Three separate stepwise multiple regressions were performed in SPSS v.13, one for each of the dependent variables: environmental concern, environmental behaviours, and work-related environmental behaviours. Due to the large number of independent variables, now totaling eighteen following the dummy coding, stepwise regression was selected to factor in the independent variables one at a time, from most significant to least, and to eliminate from the equation all variables that had a p>.05, a common threshold for statistical significance. Once the significant independent variables were identified, I reran the multiple regressions using only those independent variables. This produced an output report that was more manageable and readable. This editing process resulted in the exclusion of statistically insignificant independent variables from the final model; therefore, the excluded variables are not viewable for other researchers and interested parties in this paper. However, these exclusions did not affect the results of the analysis.

Having produced the three output reports, I turned to assessing the fit of each model as described by Field (2005). This was accomplished in six steps. First, I ensured the ANOVA test showed an F above 1 and an F significance of <.05; these measures were to ensure that the multiple regression significantly improved the predictive capability of the model over a simple means estimation (e.g. whether the model was a significant fit for the data over-all). Second, I ensured that the change in R² at each step of the stepwise regressions was significant by looking for Significant F Changes <.05;
this was to assess the improvement of the model at each step in the stepwise regression. Third, I checked the model’s assumption that errors in regression are independent by ensuring the Durbin-Watson statistic was close to 2 and at least between 1 and 3. Fourth, I checked the model’s assumption that there is no multicollinearity by examining the coefficient’s VIF values and ensuring that the averages were not substantially greater than 1. Fifth, I examined the *ZRESID vs ZPRED plot to look for signs of heteroscedasticity in the data. Finally, I examined residual distributions in both histograms and normal probability plots for each model to ensure the residuals were normally distributed. All three models were good fits to the data according to the above parameters.

Once I knew that the models were well suited to the data, I examined the results. I first looked at the $R^2$ value for each model to see the proportion of variance explained by the model. I then looked at each significant predictor variable for relative predictive importance. For the purposes of this study, I focused on the Betas, which indicate positive or negative associations, the Significance values, which indicate the strength of the relationship between independent and dependent variables, and the Standardized Betas, which are used to assess the relative importance of each predictor variable.

I then took the final step of writing short memos in my academic journal to ensure I understood what the data were telling me. These focused on summarizing the proportion of variance explained by the model, the significant predictor variables, and the relative importance of each significant predictor.
Interview Analysis – Developing Grounded Theories

To conduct the analysis of my interview data, I used Charmaz’s book *Constructing Grounded Theory* (2006) as a guide. Specifically, I worked through the process she described for transcribing, line-by-line coding, focused coding, and memo-writing. The process is described in detail below.

Following each interview, I transcribed the voice recordings using Windows Media Player and Microsoft Word 2000. I simply played the recorded interviews through my computer, using the pause and play buttons to slow down the playback enough to type up the comments word for word. The names of the interviewees were coded to protect their identity. During and following each transcription, I made hand-written notes in an academic journal of possible themes that may be emerging from the data. I used these potentially emergent themes to alter the interview schedule, if necessary, and to explore similar statements made by subsequent interviewees. By keeping notes and ideas handy in a journal, I was able to explore themes as they emerged and keep an attentive eye to repetitive elements interview-to-interview.

Following the last of the five interviews, with almost one hundred and forty pages of transcribed text (single spaced), I turned my attention to focused coding. Charmaz (2006) wrote that “fresh data and line-by-line coding prompt you to remain open to the data and to see nuances in it” (p. 50). During the initial coding process, I made efforts to remain open to emerging themes, to ask questions of the data, to keep the codes active, and to look for in vivo codes (Charmaz, 2006). I also continued to add to my journal entries regarding potential themes.
Once the initial coding was complete, I reviewed the line-by-line codes a second and third time to look for potential themes that I had overlooked. During these reviews I compared codes between interviews and looked for statements on similar themes by more than one interviewee. Where I found these multi-interview themes, I compared the perspectives of each participant, looking for similarities and differences.

I then took what was a long list of over thirty potential themes and created a rough mind-map of how they might all fit together. The sketch of a mind-map I created served as a rudimentary Axial Coding process (Strauss & Corbin, 1998). It allowed me to see where groupings of potential themes could come together and what the types of relationships between these sub-categories of codes might be. Using this mind-map, I then focused my attention on eight composite themes, many of which were amalgamations of themes from the original list.

Moving forward with the eight themes, I returned to the original data and read through the transcripts again. During this read-through, I copied all relevant quotes from the transcripts into individual Word 2007 files. By cutting and pasting the original transcripts into the potential codes that I intended to move forward with, I was able to return to the data and justify the codes I had noted during initial coding. This focused coding showed the relative strengths of each code and the number of participants who made statements referring to these themes. It also created a basis from which to write memos. During focused coding, it became obvious that one of the potential themes, which I called “Foreseeing Environmental Problems and Regulations” came primarily from only one participant and from my own inclination towards this theme. I decided to
eliminate this theme as I could not justify it strictly from the statements of my participants.

The seven remaining themes were well-rooted in the words of my interviewees and related directly to the relationship between the organizational climate and culture of the Vancouver Airport Authority and the associated environmental practices. On each of these themes I wrote memos integrating my participants’ quotes and creating connections between sub-themes. I also noted any antithetical statements made by participants to ensure that alternate views were not lost.

During each stage of coding, and following memo-writing, I returned to the library to research the academic literature surrounding the emerging themes. This enabled me to explore facets of the themes commonly held in literature that my participants raised during the interviews. I discovered that each of the themes fit quite nicely into one of the two areas of literature I had intended to explore at the beginning of this process: organizational culture as it relates to environmental management and determinants of environmental values and behaviours. This solidified my position within the research tradition and created the skeleton from which I wrote the literature review found in Chapter Two.

Mixing Methods – Bringing the Research Together

The last component of analysis in this study was to look for connections between the results of the multiple regressions and the emergent grounded theories. I asked the question of all the data, what is this telling me? This provided two distinct benefits to the study. Firstly, there were some instances where the shared opinions of my interviewees did not seem to be supported by the survey data, which represents approximately one
quarter of the Airport Authority. Secondly, there were several instances where the
interviewees provided some indications, clarifications, or explanations of what was
apparent in the statistical results. In short, the qualitative data provided some insight into
the survey data, adding the “why” to the “what”.
Chapter Four: Results

The results of this study are presented in two parts. The results of the survey analysis are first presented with a focus on the hypotheses discussed in Chapter Three. The grounded theories that emerged from the interview data analysis are then described and related back to the survey results. In each section I flag potential obstacles and opportunities for the Airport Authority’s journey towards sustainability. Throughout this chapter, results are presented in reference to the research question: What is the relationship between the organizational climate and culture of the Vancouver Airport Authority and the environmental practices of its employees?

Survey Results

The “Organizational Culture and Environmental Practices at the Vancouver Airport Authority” survey was open to employees of the Vancouver Airport Authority from February 25th to March 9th, 2008. The published version of the survey can be found in Appendix 1 of this document. During the fourteen days the survey was available to employees, 104 responses were received. All but three of the responses were received in the first week during the time the survey was advertised on the corporate intranet. All of these responses were used to calculate summary statistics as reported in the subsection below. Six respondents were removed from the multiple regression analyses because they chose not to report their gender. In addition, as explained in Chapter 3, small numbers of other respondents were removed from each multiple regression for failing to respond to one or more questions. Therefore, the total number of respondents included in each multiple regression varies. The numbers of respondents are included with each table in the Multiple Regression Results section later in this chapter.
At the time the survey was published, the Airport Authority consisted of 379 employees, including full time, term position, casual employees, contract workers, and employees of a subsidiary called YVR Project Management. This total does not include the employees of the Airport Authority’s partner for-profit company, YVR Airport Services. Of those 379 employees, 104 responded to the intranet-advertised survey, representing a 27% response rate.

Given the limitations presented in Chapter 1, namely the likelihood of a response bias towards computer-based workers and those interested in environmental issues, and given a response rate of only 27%, the summary results presented here should be considered indicative but not representative of the entire Airport Authority population. As for the multiple regression results presented in the subsequent sub-section, the same possible responder biases apply. Additionally, Green (1991) suggests if one wants to test individual predictors in a regression model that a formula of 104 + k be applied, where k is the number of predictors. The multiple regressions in this study fall slightly short of this standard, and so should also be considered indicative and not conclusive.
### Table Two: Survey response summaries

<table>
<thead>
<tr>
<th>Totals</th>
<th>Number (N)</th>
<th>% of total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Airport Authority Employees</td>
<td>379</td>
<td></td>
</tr>
<tr>
<td>Total Responses</td>
<td>104</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey Responses by Department</th>
<th>Number (N)</th>
<th>% of total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>25</td>
<td>24%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>21</td>
<td>20%</td>
</tr>
<tr>
<td>Engineering</td>
<td>9</td>
<td>9%</td>
</tr>
<tr>
<td>Human Resources</td>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td>IT and Simplified Passenger Travel</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>Community and Environmental Affairs</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td>Marketing and Commercial Development</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>Finance</td>
<td>9</td>
<td>9%</td>
</tr>
<tr>
<td>Strategic Planning and Legal Services</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>9%</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Survey Responses by Age Groups</th>
<th>Number (N)</th>
<th>% of total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>12</td>
<td>12%</td>
</tr>
<tr>
<td>30-39</td>
<td>39</td>
<td>38%</td>
</tr>
<tr>
<td>40-49</td>
<td>33</td>
<td>32%</td>
</tr>
<tr>
<td>50-59</td>
<td>15</td>
<td>14%</td>
</tr>
<tr>
<td>60+</td>
<td>5</td>
<td>5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey Responses by Education Level</th>
<th>Number (N)</th>
<th>% of total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not complete high school</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>4</td>
<td>4%</td>
</tr>
<tr>
<td>Some college or Post-Secondary Training</td>
<td>23</td>
<td>22%</td>
</tr>
<tr>
<td>College or University Degree</td>
<td>42</td>
<td>40%</td>
</tr>
<tr>
<td>Trade Certificate</td>
<td>18</td>
<td>17%</td>
</tr>
<tr>
<td>Graduate Degree or Post-Baccalaureate Diploma</td>
<td>16</td>
<td>15%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survey Responses by Reported Gender</th>
<th>Number (N)</th>
<th>% of total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>58</td>
<td>56%</td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>38%</td>
</tr>
<tr>
<td>Chose not to respond</td>
<td>6</td>
<td>6%</td>
</tr>
</tbody>
</table>

Twenty-four percent of survey respondents were from the Operations department and 20% from the Maintenance department. The remainder of the departments were
represented by fewer people. This does not necessarily demonstrate a response bias as these two departments are considerably larger than the other department categories. The most prominent education level amongst respondents with the Airport Authority is a college or university degree, followed by some college or post-secondary training, trade certificate, and advanced degree.

Summary Statistics

The results of the Organizational Culture and Environmental Practices at the Vancouver Airport Authority Survey are summarized in Table 3. The first three sections, comprising the Connectivity with Nature Scale, the Human Resource Factors Scale, and the Environmental Concern Scale, are based on five-point Likert-scale questions. To summarize these responses, the associated columns show mean, standard deviation, and median. The last two sections, the Environmental Behaviours Scale and the Work-Related Environmental Behaviours Scale, are based on yes/no questions. To summarize these responses, the associated columns simply show the percentage of respondents who answered no or yes.

Table Three: Summary Statistics for the "Organizational Culture and Environmental Practices at the Vancouver Airport Authority" Survey

<table>
<thead>
<tr>
<th>Connectivity With Nature Scale&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>I see myself as part of a larger whole in which everything is connected.</td>
<td>4.14</td>
<td>1.03</td>
<td>4.00</td>
</tr>
<tr>
<td>I feel a sense of oneness with nature.</td>
<td>3.52</td>
<td>1.00</td>
<td>4.00</td>
</tr>
<tr>
<td>The world is not merely around us, but within us.</td>
<td>3.55</td>
<td>1.13</td>
<td>4.00</td>
</tr>
<tr>
<td>I am not a natural part of the environment.</td>
<td>1.92</td>
<td>1.15</td>
<td>1.00</td>
</tr>
<tr>
<td>I never feel a personal bond with things like trees, streams, wildlife, or a view on the horizon.</td>
<td>1.72</td>
<td>1.04</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Human Resource Factors Scale&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Mean</th>
<th>Standard</th>
<th>Median</th>
</tr>
</thead>
</table>
Deviation

Management at the Airport Authority is unwilling to spend money on initiatives that would improve the airport's environmental performance. 2.69 1.18 3.00

Management at the Airport Authority supports and encourages responsible environmental practices. 3.75 .99 4.00

I am part of a team of workers at the Airport Authority who strive to reduce their environmental impact. 3.26 1.12 3.00

If I alter my work practices to benefit the environment, I will be rewarded. 2.99 1.18 3.00

Airport Authority employees receive regular education and training on environmental issues. 2.8 1.13 3.00

I do not feel like I have the ability to reduce the negative environmental impact of my work. 2.64 1.13 2.00

Environmental Concern Scale^a

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>If things continue on their present course, we will soon experience a major ecological catastrophe.</td>
<td>3.7</td>
<td>1.14</td>
<td>4.00</td>
</tr>
<tr>
<td>The problems of the environment are not as bad as most people think.</td>
<td>2.14</td>
<td>1.13</td>
<td>2.00</td>
</tr>
<tr>
<td>We (humans in general) are fast using up the world's natural resources.</td>
<td>4.27</td>
<td>.99</td>
<td>4.50</td>
</tr>
<tr>
<td>People worry too much about human progress harming the environment.</td>
<td>2.23</td>
<td>1.26</td>
<td>2.00</td>
</tr>
<tr>
<td>We (humans in general) are spending too little money on improving and protecting the environment.</td>
<td>3.61</td>
<td>1.13</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Environmental Behaviour Scale^b

<table>
<thead>
<tr>
<th>Question</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the past year, have you contributed time or money to an environmental or wildlife conservation group?</td>
<td>73%</td>
<td>27%</td>
</tr>
<tr>
<td>In the past year, have you stopped buying a product because it caused environmental problems?</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>In the past year, have you attended a public hearing or meeting about an environmental issue?</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>In the past year, have you contacted a government agency to get information or complain about an environmental problem?</td>
<td>88%</td>
<td>12%</td>
</tr>
</tbody>
</table>
In the past five years, have you voted for or against a political candidate because of his or her position on environmental issues?  
78% 22%

In the past year, have you changed your behaviour in any way because of your concern for the environment?  
20% 80%

<table>
<thead>
<tr>
<th>Work-Related Environmental Behaviour Scale(^b)</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the past year, have you requested training related to the environmental impacts and/or opportunities of your job?</td>
<td>88%</td>
<td>12%</td>
</tr>
<tr>
<td>In the past year, have you approached your supervisor with an idea that would improve the environmental performance of the airport?</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>In the past year, have you had an idea that would improve the environmental performance of the airport?</td>
<td>61%</td>
<td>39%</td>
</tr>
<tr>
<td>In the past year, have you changed your work practices in any way because of your concern for the environment?</td>
<td>35%</td>
<td>65%</td>
</tr>
<tr>
<td>In the past year, have you encouraged your coworkers to reduce the environmental impacts of their jobs?</td>
<td>38%</td>
<td>62%</td>
</tr>
<tr>
<td>In the past year, have you witnessed any environmentally destructive behaviour at work that you did not report?</td>
<td>79%</td>
<td>21%</td>
</tr>
</tbody>
</table>

a. Response categories for likert-scale questions were 1 – strongly disagree, 2 – moderately disagree, 3 – neither agree nor disagree, 4 – moderately agree, 5 – strongly agree.

b. Yes/No question results are expressed in percentage of respondents.

c. If there is an even number of responses in the set, then MEDIAN calculates the average of the two numbers in the middle.

Two of the strongest reactions to the survey questions relate to the Connectivity with Nature Scale. The mean score for the statement “I see myself as part of a larger whole in which everything is connected” is 4.14, showing that, on average, respondents moderately to strongly agree with that statement. Similarly, the mean scores for the statements “I am not a natural part of the environment” and “I never feel a personal bond with things like trees, streams, wildlife, or a view on the horizon” are 1.92 and 1.72 respectively, indicating moderate to strong disagreement. These scores indicate that respondents, on average, do articulate a connection with nature.
Additionally, the strongest response in the survey relates to the statement “We (humans in general) are fast using up the world's natural resources” in the Environmental Concern Scale. The mean score for this response is 4.27 with a relatively low standard deviation of 0.99. While the responses for all of the questions in the Environmental Concern Scale lean towards being concerned about the environment, this statement evokes particularly strong agreement.

Alternatively, some of the weakest reactions to survey questions are in the Human Resource Factors scale. These questions, including questions such as “I do not feel like I have the ability to reduce the negative environmental impact of my work,” “I am part of a team of workers at the Airport Authority who strive to reduce their environmental impact,” and “Management at the Airport Authority supports and encourages responsible environmental practices,” vary from 2.64 to 3.75. Standard deviations range from 0.99 to 1.18. These results indicate that employee respondents, on the subjects of management support, reward programs, and employee empowerment, do not strongly agree or disagree with the above statements. This could indicate either a lack of strong feeling on the subject matter or a distinctly middle-of-the-road perception of the Airport Authority’s performance in these areas.

In regards to the environmental behaviours, less than 30% of respondents have contributed time or money to an environmental or wildlife conservation group, attended a public hearing or meeting about an environmental issue, contacted a government agency to get information or complain about an environmental problem, or voted for or against a political candidate because of his or her position on environmental issues in the timeframes given. However, 65% of respondents report that they have stopped buying a
product because it caused environmental problems and 80% report changing their
behaviour in some way because of their concern for the environment.

Interestingly, although 80% of respondents report changing their behaviour in
some way because of their concern for the environment, only 65% report changing their
work behaviour. Of course, the first category of 80% encompasses the second, so it does
seem logical that reported work-related behaviour change would be lower than the
general behaviour change. For future studies, it would be useful to reword these questions
to be mutually exclusive.

Another potentially insightful note is that although 39% of employees had an idea
that would improve the environmental performance of the airport, only 19% reported an
idea to their supervisor. I explored this issue with my interviewees and several indicated
that they did not believe their immediate supervisor was the correct person to approach
with such an idea. In this instance, the role of the Environment Department of the Airport
Authority could prove crucial to the environmental initiatives of the organization.

Twenty-one percent of respondents indicate that they have witnessed
environmentally destructive behaviour at work and did not report it. This may seem like
an unusually high percentage for a behaviour as fundamental as reporting destructive
activities. However, I did realize after the survey data were collected that the wording in
this question is ambiguous. Asking if respondents had or had not reported the behaviour
does not account for the many other possible reactions to witnessing a destructive act.
Respondents could have confronted the offender directly, prevented the environmental
impact themselves, or managed the problem in some other way. Unfortunately, there is
no way to determine whether the 21% of respondents who answered “Yes” actually
turned a blind eye and ignored the problem or dealt with it in an alternative way. There is also ambiguity as to what consists of an “environmentally destructive act” as this could be interpreted as a host of everyday activities such as driving or flying a plane.

While it is tempting to begin to draw relationships among the five scales simply by looking at the results of each grouping of questions, the Multiple Regression Results sub-section below provides a more thorough analysis of the relative weights of predictive relationships. However, the survey summary results in Table Three do contain a wealth of potentially insightful data and should prove useful to the Vancouver Airport Authority.

*Multiple Regression Results*

As explained in the previous chapter, three distinct multiple regressions were conducted during this study in order to investigate the primary research question: What is the relationship between the organizational climate and culture of the Vancouver Airport Authority and the environmental practices of its employees? Schneider, Brief, and Guzzo (1996) stated that “organizational culture concerns the firmly implanted beliefs and values of organizational members” (p. 11). The multiple regressions were designed to test potential links between the environmental values and concerns of the Airport Authority’s organizational members and their practices, both at home and at work.

The hypotheses used for these multiple regressions are listed below, organized by dependent variable. The independent variables for each regression included age, work department, education level, gender, connectivity with nature score, and human resource factors score.
Table Four: Alternate and Null Hypotheses for the Organizational Culture and Environmental Practices at the Vancouver Airport Authority Survey

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Environmental Concern</th>
<th>Environmental Behaviours</th>
<th>Work-Related Environmental Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null Hypothesis (H0)</td>
<td>Connectivity with nature is not the greatest significant predictor of environmental concern</td>
<td>Connectivity with nature is not the greatest significant predictor of environmental behaviours</td>
<td>Human resource factors are not the greatest significant predictor of work-related environmental behaviours</td>
</tr>
<tr>
<td>Alternate Hypothesis (H1)</td>
<td>The greatest significant predictor of environmental concern is connectivity with nature</td>
<td>The greatest significant predictor of environmental behaviours is connectivity with nature</td>
<td>The greatest significant predictor of work-related environmental behaviours are human resource factors</td>
</tr>
</tbody>
</table>

Each of the three multiple regressions have low $R^2$ values. $R^2$ values in multiple regression analysis indicate the percentage of the dependent variable score that can be attributed to the independent variables tested. They indicate to the researcher how well the independent variables can be used to predict the dependent variable (for a more detailed explanation, see Field (2005, p. 159)). The $R^2$ for the three complete models below are all below 0.3, indicating that the independent variables analyzed (age, education, department, gender, and connectivity with nature) account for less than 30% of the prediction capability of the dependent variables (environmental concern, behaviour, and work-related behaviour). Note that the $R^2$ listed below each table must be added to the change in $R^2$ for each subsequent step to achieve the total $R^2$ for the model.

Although a good predictive model would achieve an $R^2$ over 0.8 (accounting for over 80% of the variation in the dependent variable), given the amorphous nature of dependent variables such as environmental concern, it is no surprise that the $R^2$ values are
low in this case. These $R^2$ values are similar to those found by Dutcher et al (2007), who reported their models’ accounted for 22% and 20% of the variation in environmental concern and environmental behaviours respectively. While the models here could never be used to predict the concern or behaviour of a target population, they still serve their purpose to indicate relative weights of predictive capability of age, gender, education level, department, connectivity with nature, and human resource factors on environmental concern, behaviours, and work-related behaviours.

The first set of multiple regression results, found in Table 5, relate to the dependent variable environmental concern. The alternate hypothesis for this model was that the connectivity with nature score would be the greatest significant predictor of the environmental concern score. The table does not list all insignificant independent variables (using $p < .05$), but only those that play a significant predictive role. Of those that are listed and significant, the independent variables are introduced by order of relative significance in each step of the model. Unstandardized betas ($B$), standard errors ($SE B$) and standardized betas ($\beta$) are listed in the tables for reference.

In the case of environmental concern, the null hypothesis is rejected and the alternate hypothesis accepted. Connectivity with nature is the most significant independent variable to the dependent variable environmental concern, with a significance value of 0.0001. The model indicates that the more connected an employee feels to nature, the more likely that employee is to be concerned for the environment. Age is the only other significant independent variable with a negative standardized beta of -0.02, indicating an inverse relationship between age and environmental concern, and a
significance value of 0.012. Therefore, the model indicates that the younger an employee is, the more likely they are to be concerned about the environment.

Table Five: Multiple Regression Results of the Relationship of Age, Education, Department, Gender, Environmental Connectivity and Human Resource Factors to Environmental Concern

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.32</td>
<td>0.485</td>
<td></td>
</tr>
<tr>
<td>Connectivity with Nature</td>
<td>0.65</td>
<td>0.12</td>
<td>0.48*</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.853</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Connectivity with Nature</td>
<td>0.714</td>
<td>0.12</td>
<td>0.53*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.23*</td>
</tr>
</tbody>
</table>

*Note: \( R^2 = .23 \) for Step 1; \( \Delta R^2 = 0.05 \) for Step 2 (\( ps < .05 \)) \( *p < .05 \)

The next set of results, found in Table Six, relate to the dependent variable environmental behaviours. The alternate hypothesis for this model was that connectivity with nature would be the greatest significant predictor of environmental behaviours. Again, the significant independent variables were added according to their relative significance, from most to least significant, in each step of the model. The null hypothesis is rejected and the alternate hypothesis is accepted in this model. Connectivity with nature is the most significant independent variable on environmental behaviours, with a significance value of 0.005. Age is also significant with another inverse relationship and a significance value of 0.042.
Table Six: Multiple Regression Results of the Relationship of Age, Education, Department, Gender, Environmental Connectivity, and Human Resource Factors to Environmental Behaviours

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.13</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Connectivity with Nature</td>
<td>0.56</td>
<td>0.23</td>
<td>.26*</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.99</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>Connectivity with Nature</td>
<td>0.65</td>
<td>0.23</td>
<td>.30*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.03</td>
<td>0.01</td>
<td>-.22*</td>
</tr>
</tbody>
</table>

Note: $R^2 = .07$ for Step 1; $\Delta R^2 = 0.05$ for Step 2 ($p < .05$) *$p < .05$

The final set of multiple regression results, summarized in Table Seven, relate to the dependent variable work-related environmental behaviours. The alternate hypothesis for this dependent variable was that human resource factors would be the most significant predictor of work-related environmental behaviours. This alternate hypothesis is also accepted; the null hypothesis, that any other independent variable would be more significant, is rejected. In this case, the human resource factor score had a significance of 0.013.

The department in which an employee works also plays a significant predictive role in work-related environmental behaviours. All departments were compared to Operations, the most common department response. The results in Table 7 show that respondents from Community and Environmental Affairs (CEA) and Maintenance are more likely to score higher on the work-related environmental behaviours questions than respondents from Operations. The significance results were 0.014 and 0.037 for CEA and Maintenance respectively.
Table Seven: Multiple Regression Results of the Relationship of Age, Education, Department, Gender, Environmental Connectivity and Human Resource Factors to Work-Related Environmental Behaviours

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Constant</td>
<td>1.40</td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human Resource Factors</td>
<td>0.42</td>
<td>0.20</td>
<td>.22*</td>
</tr>
<tr>
<td>Step 2</td>
<td>Constant</td>
<td>1.24</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human Resource Factors</td>
<td>0.44</td>
<td>0.20</td>
<td>.23*</td>
</tr>
<tr>
<td></td>
<td>CEA</td>
<td>1.24</td>
<td>0.56</td>
<td>.23*</td>
</tr>
<tr>
<td>Step 3</td>
<td>Constant</td>
<td>0.94</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human Resource Factors</td>
<td>0.49</td>
<td>0.19</td>
<td>.26*</td>
</tr>
<tr>
<td></td>
<td>CEA</td>
<td>1.41</td>
<td>0.56</td>
<td>.26*</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
<td>0.76</td>
<td>0.36</td>
<td>.22*</td>
</tr>
</tbody>
</table>

Note: $R^2 = .05$ for Step 1; $\Delta R^2 = 0.05$ for Step 2 ($p < .05$); $\Delta R^2 = 0.05$ for Step 3 ($p < .05$) *$p < .05$

Returning to the research question of this study, the relationship between the organizational climate and culture of the Vancouver Airport Authority and the environmental practices of its employees, the multiple regression analyses provide some insight into this relationship. The models indicate that while connectivity with nature is the most significant predictive variable of environmental concern and general environmental behaviours, connectivity does not play a significant role in work-related environmental behaviours. Human resource factors, meaning management support, teamwork, reward systems, education and training, and employee empowerment, are the most significant predictor of work-related environmental practices. These results therefore support both the work of Dutcher et al (2007), suggesting connectivity with nature plays a highly significant role in environmental concern and behaviours, and Daily and Huang (2001), suggesting that human resource factors are vital to the implementation of sustainable environmental practices within organizations.
Given that respondents’ scores on questions relating to human resource factors do not show strong agreement or disagreement (see Table Three), and given the high scores in connectivity with nature and environmental concern questions, the Airport Authority seems to have a distinct opportunity. By working to improve the key human resource factors, such as management support, reward systems, education and training, and employee empowerment, the Airport Authority can help to move collective individual values into organizational behaviours.

*Interview Results*

Five interviews were conducted with chosen Airport Authority employees. The interviews focussed on the culture of the Airport Authority as it relates to environmental values and practices. Interview transcripts were analysed using a grounded theory approach as detailed by Charmaz (2006). From the analysis, seven themes emerged. I have titled the themes *The Business Case, Inter-Departmental Collaboration, Aesthetics and Efficiencies, Integrating Recognition, Awareness and Behavioural Change, Not Having Control,* and *The Outdoor Lifestyle.* Each of these themes is explained below.

Many of the themes were raised from opposite perspectives; while not all interviewees shared the same opinions, the themes themselves were raised multiple times, providing a framework for environmental and organizational perspectives amongst employees of the Airport Authority. In writing the summaries below, I have attempted to represent the diversity of opinions I encountered under each theme.
The Business Case

The term “business case” came up in every interview without prompting. In terms of in-vivo codes (codes defined by the participants’ own words), this was the most common code I encountered during the interview process. The term was most often raised in discussions about approval or rejection of environmentally beneficial projects. While talking about potential energy-saving initiatives that were not approved by the executive or capital committees at the airport, one participant said that “the reason most of them failed is because of the business case, yeah. It’s, you know, we have to have a guideline, if you wish, to what we’re going to look at, what we’re accepting and what we’re not.”

The business case of a project, how the project affects the organization financially, appears to be a universally accepted guideline to the assessment of any given initiative. This guideline is heavily affected by two inter-related variables: technology and pay-back period (often referred to by employees as “life-cycle costing”). The availability of technology, in many cases, determines whether a project’s business-case is viable. As explained by one interviewee, “we’re still waiting for technology to catch up in certain areas and we’re still waiting for technology to be developed in others, but, you know, we know those things are out there... It’s coming. It’s going to happen”. Of the areas where technology is readily available, the adoption of projects seems largely dependent on life-cycle costing.

The term life-cycle costing is used by many employees of the Airport Authority to mean the length of time a project or piece of infrastructure will take to pay for itself. One participant explained “we’ve basically based that costing at 25 years and we’ll look at it
over a 25 year period to see whether we can make a business case, whether or not the project pays for itself.” The length of time a project takes to pay for itself is what dictates whether it will be adopted or not. That length of time, what is acceptable and what is not, has been becoming longer for a number of years. As explained by one participant,

Initially, in ’99, anything that had a three year got sort of automatic approval. It was like, “get it done”, right? Anything that was five years was “iffy”. The line then moved from three to five year... Now the line is sort of edging up on the six, seven year.

While the business case provides the backbone to any potential initiative, not all projects that don’t pay for themselves are rejected. One employee stated quite succinctly, “there has to be a business case. Everything has to have a business case for it, right? But sometimes a business case isn’t a money thing. Sometimes a business case is a public perception.” Another employee described that “sometimes we do projects that are more of a strategic benefit to the authority than a financial benefit... It’s not purely quantified... It’s more qualitative, and taking into account numerous factors when making a decision or recommending a decision.”

Several interviewees recognized that the decisions made on projects which do not have an acceptable payback time, or no payback at all, are dependent on the composition and values of the people making the decision. One participant stated

I think there are some that look at things purely from a cost perspective and I think there are some that don’t. I think that, depending on what the numbers are, for people that are looking at just the costs, in the kind of “cost business case” if you will, versus the people that are a little bit more interested in spending money
that doesn’t necessarily earn you a profit per say, or is the right thing to do from the money perspective, but has other benefits. Depending on what that balance is in the room, dictates what happens in the actual outcome.

The same participant went on to explain that he did not think environmental benefits alone would be enough to have a project accepted. He seemed to perceive environmental benefits as a subset of social values, and suggested that environmental projects would be best sold in terms of social marketing.

I don’t know that I could simply say, “yeah, this is the right thing for the fish” or “this is the right thing for the birds” or for our lungs... yeah, those are the benefits, but to sell it, I would play up things more like, again, being a good neighbour, being a leader in the area of environment. I guess environmental savvy is getting to be kind of sexy, right, it’s the next thing. So I would play up this is the right thing to do for the community as people.

Indeed, being a good neighbour, a member of the community, seems a key value at the Airport Authority. As one interviewee stated, “I think we keep the community in focus as much as we can.” However, shifting the environmental benefits of any given project to a subset of these community values does present some interesting opportunities and obstacles. While environmental practices are currently a fairly widely-held value of the community (if media attention is any indication), and proponents of environmental initiatives could use this as a stepping block to implementing positive environmental projects, this also puts environmental performance at the mercy of potentially fleeting public attention.
Inter-Departmental Collaboration

Several participants, in discussions regarding characteristics of successful environmental projects at the Airport Authority, mentioned the crucial role of interdepartmental collaboration. One interviewee, who participated in an energy-reduction committee, explained the process.

It’s made up of everybody, from environment, maintenance, engineering, engineering services... you know, finance, leasing, everybody sort of gets involved in it. And we, that committee, ran for years and was to look at ways to try and reduce energy consumption here at the airport. We came up with an awful lot of very good recommendations, saved the airport a tremendous amount of money, millions of dollars to be, as a matter of fact.

The formation of committees seems integral to the success of many projects. One participant, referring to the same energy reduction committee, identified the need to engage several departments before seeking project approval. “You know I think it’s been just the collaboration amongst all the groups, BLD, Environment, Maintenance, and sort of just, you know, coming together and putting in their different points of views and building one unified front.”

When asked whether they had ever approached their immediate supervisor with an environmental initiative, all interviewees indicated that they had not. Many believed that this was not the appropriate avenue to pursue an environmental initiative. One participant believed the appropriate avenue would be to garner support laterally before proposing such an idea (in this case regarding reducing paper use).
That one wouldn’t go to my supervisor because my supervisor would have no say in that directly. So that one would kind of go to an external department, per se. I would also approach you guys [the Environment Department], because I know you guys would help push that.

The role of the Environment Department of the Airport Authority does seem to play a crucial role in the promotion of environmental initiatives and behaviours. One participant noted,

Every time we start, let’s say, a new procedure, because the previous ones haven’t been working, we deal closely with Environment as to what we’re planning to do and what we’re planning to discharge. Most of the Environment people are fairly knowledgeable in what we can, in what they expect to see in the end product. It’s up to us to deliver it.

Another interviewee stated,

I get involved at a high level, not always the day to day, because our environment group, like yourself, will usually deal with the kind of day to day, making sure it’s set up properly so that the full environmental impact is dealt with properly and tracked.

A few statements, such as the one above, may indicate an over-reliance on the Airport Authority’s Environment Department. As a member of the Environment Department, my understanding is that while the Environment Department exists to provide advice, expertise, and encouragement, the environmental performance of the organization cannot and should not fall on one department’s shoulders.
Each department working independently from the others, or working in “silos” as Airport Authority employees commonly refer to it, is an oft-mentioned obstacle to success. As explained by one interviewee,

Some people can get in their silos... I think once a project, like a department gets on an idea for a project, they might just really not think about contacting anyone else about what the possible impacts are and maybe finding out about that until a decision needs to be made. And then it could get rejected, and then they might take it a bit personally, and, you know, that could be certainly avoided by maybe a little bit more contact.

Another participant believed that working in “silos” was the result of the overwhelming breadth of work undertaken by the Airport Authority. After describing each department as a “big planet”, each with its own business, the interviewee noted, “and silos to me, really, that’s the, it’s not the intent to me, it’s the by-product of having these giant planets now.”

Again, this re-occurring theme presents both opportunities and obstacles. Clearly the interview subjects agree that working in inter-departmental committees is a strong opportunity to achieve success in any given project. In contrast, when an individual or a department falls into working in isolation, in silos, they risk having their initiative or program rejected. Additionally, having and maintaining an Environment Department presents the rest of the Airport Authority with an avenue to express and pursue environmentally beneficial change. However, having an Environment Department also presents the risk of over-reliance on a small group of employees and divesting key staff of environmental responsibility.
Aesthetics and Efficiencies

Four of the five employees I interviewed suggested that they believed the Airport Authority management’s priorities in regards to aesthetics and efficiencies were misplaced. These perceptions about misplaced priorities fell largely into two key topics: prioritizing aesthetics over safety or operations, and lean staffing. One interviewee simply said, “I don’t necessarily think their priorities are in the right spot. I feel it’s a, in a lot of cases, it’s too political.” The same employee went on to explain,

There are certain things that should be done on Sea Island to keep Sea Island operational and to keep our operation efficient and smooth-running and so on and so forth. And, at times those issues will take a back seat to aesthetic issues. Like, I appreciate that we want the airport to look good and I appreciate that there’s a lot of benefit to the aesthetics around the airport and we win lots of awards for it. But I also feel like we ride the edge too much of not dealing with our high-priority issues as soon as we should. We seem to take it right up to the wall. You know, one of these years we’re going to end up with problems and it’s going to end up biting us in the...

Another interviewee related concerns about the safety of passengers,

With the environment stuff, I guess I’m just sort of relating it more to landscaping stuff and making that, you know, not only make it look pretty, but it improves the environment with the trees and all that other stuff they want to put in... they’re willing to really put money into that no matter how much it costs, which I’ve seen from the projects that have been approved, as opposed to safety issues curb-side [curb-side refers to the public pick-up and drop off areas of the airport]
Additionally, two interviewees noted key environmental tasks that are not being completed as a direct result of staff cutbacks. One participant noted, in reference to maintaining roadway drainage, “but then, you know what staffing issues have been like. They’ve been depleted. Over the years it’s gotten worse and worse.” Another interviewee, in discussing vehicle idling and emissions, explained,

Partly our desire to run a lean organization and/or our inability to backfill vacancies, we don’t have the same amount of staff located where the heavy equipment is. So sometimes the staff will start up the heavy equipment and then have to leave and go do their jobs somewhere else, rather than being able either to do their job in the area or have enough staff to stay, to leave a staff member in the area for say half an hour to go around and shut down the vehicles.

On the positive side, however, two of the interviewees believed that management at the Airport Authority was improving and that the Airport Authority itself has a strong capacity to embrace change. One noted a perspective change amongst management that is resulting in choosing infrastructure projects for their longevity, Our senior management realized that, “hey, this isn’t the way we want to do business because we’re going to be around here longer than that.” So there’s no sense taking something that’s going to last for ten years until it screws up, because we’re still going to be here in ten years.

Another participant, when asked if he saw environmental issues as a high priority, said, It’s not a high priority... but if it were to become number one priority or a high priority, I think the committee would go to great lengths to facilitate it, facilitate positive changes. It’s interesting the decision making process, it can be good, it
can be slow. It’s just funny, you know, like this taser incident galvanized this group to make all these huge changes overnight, right?

Although not all employees agree with the priorities that senior management has chosen, it does appear that the employees of the Airport Authority recognize the organization’s ability to quickly adapt to changes in our business environment. This belief is a great opportunity for the organization. However, there are indications that the employees of the Airport Authority do not strongly feel that environmental issues are a priority for senior management. This is a key obstacle impeding positive work-related environmental behaviours.

*Integrating Recognition*

Another consistent theme, or perhaps an anti-theme, came in response to a question I posed to every interviewee, “have you ever received a reward for an environmentally beneficial behaviour?” Universally, participants answered that they have never received a formal reward. Several, however, have received informal recognition:

As far as individual rewards, if you wish, no. No, the committee, not to my knowledge, the committee has not received anything like that. As far as a general, over-all, well-done appreciation, I think that is out there and it has been acknowledged in some of our AGMs for example, general meetings and what-not, where we’ve got a chance to explain to people what we do. And I think it’s sort of appreciated or acknowledged that, you know, our efforts are there. But as far as an actual reward, no. No, not that I’m aware of.

When participants were asked what an environmental recognition system might look like, many suggested integrating an environmental theme into existing reward
programs. “Well, you know, obviously there’s got to be some monetary component. So, for instance... maybe you have the program in place already, the Suggestions That Achieve Results program, the STAR program?” Another suggested,

I think to start, it would be kind of like the totem awards, kind of recommend somebody for blah blah blah [sic]... it’s kind of funny, it’s pretty sad in a way, but if there’s a reward associated with something, sometimes they’re more inclined to push something, right?

However, one interviewee disagreed with the idea of a reward system. He believed that reward systems were not the way to engrain beneficial behaviours into employee culture:

What we want, Patrick, is for people to be self-motivated to put that glass bottle in the recycling container, not to throw it in the garbage. I shouldn’t have to give you a YVR buck every time you do that. Like whatever it is that gets in your head that that’s the right thing to do, I feel bad if I don’t, that’s where we want to be. It’s like wearing a yellow safety vest airside. I shouldn’t have to give you a YVR buck if you do it. You should be scared if you’re out there without it. You just don’t, like wearing your seatbelt home from work, you just don’t feel comfortable anymore. Riding your bike, why do you put a helmet on? Because now, after a little while, I get uncomfortable if I don’t have my helmet on... How do you get there? It’s not, I don’t think it’s through rewards necessarily.

While the consensus that the Airport Authority does not have a formal reward program exists amongst the five interviewees, there is disagreement over how functional such a system might be. Yet even the individual who did not believe rewards would
engender the desired behaviour did not appear to believe they would cause any harm. I would suggest that implementing a reward system would at the very least communicate an upper management value to the employees. This is a potential opportunity for Airport Authority management to outwardly demonstrate the organization’s commitment to environmentally-sound practices.

*Awareness and Behavioural Change*

Another interesting theme that arose during the interview process is the disconnect between environmental awareness and behavioural change. Interviewees expressed hope that environmental awareness was on the rise, but several did not see a parallel in behavioural change. “I don’t know that our business has changed that much, but we’re just more aware so I feel like that’s a good sign.” Another participant said, “I don’t know if I’ve changed... just been, I’m aware of it. You know?” A third interviewee expressed with some level of distaste, “Environmentally aware or not, they’re ignoring. They’re choosing not to support the environmental concern, right?”

When asked why they thought this disconnect existed, at least one participant seemed confused by the apparent paradox, “I think generally people want to do it and there’s not a lot of people that don’t want to do it, is what I’m trying to say.” Others had more concrete ideas and pointed to obstacles in the options available:

I think in my mind, it’s, people are aware of it. They’re aware of what they should do but there’s not always the means to do that. I think from the Airport Authority’s point of view, if they gave people the means to do something, they will do it.
The same participant pointed to an assumption of increased cost to behave in an environmentally beneficial manner:

I’d say we’re fairly aware. I think that sometimes it kind of takes second fiddle a little, in some instances, in some cases, depending on situations. I think that there’s a definite awareness and a definite desire to move in a direction, but sometimes there’s other things, like costs and various things that kind of have an impact on going to that extreme.

One participant did have encouraging things to say about how the recycling system, in particular, at YVR has changed the way they behave in general, including at their homes:

It’s even got to the point where it’s rubbed off on me and I’ve started to do it at home... I’m recycling here at the airport and you say, “well geez, I might as well do this at home...” Then everything starts changing. So it has an impact and it carries over... The way the environment things are handled here at the airport has had an impact on what I do, for example, in my personal life.

These comments indicate that there is great potential for change on which the Airport Authority could capitalize. According to these employees, the organization is quite aware of environmental issues and is simply looking for the obstacles that exist to be removed in order to adopt environmentally-beneficial behaviours such as recycling. In addition, at least one of the organization’s employees sees the potential for work-related behaviours to be carried home, causing a ripple effect of positive behaviour.

*Not Having Control*

Several interviewees appeared to feel a lack of control in regards to the environmental impact of the airport. In terms of airport operations, the Airport Authority
does not own or operate airplanes, which account for a large portion of the environmental impact of the airport. One participant expressed:

It’s a tough position that we’re in because we can only do so much as the Airport because the fact is the planes are coming in... They’re going to keep coming and going... There’s a lot that we can control, or add to the environment. It’s basically up to, you know, it is the manufacturers of the, like Boeing and Airbuses, that to look at maybe different ways of propulsion or something like that. I know I’m getting grand here.

Another participant, during a discussion on airplane noise regulations, stated:

They’re supposed to get rid of all the Chapter Two’s [a class of noisy aircraft] by a certain date. I don’t know if that’s happened or not, but that’s reliant on airlines, that’s reliant on regulations, there’s all sorts of things. It’s not just us right?... So, air pollution, I mean, what do we really do about that? We’re an airport, we need to facilitate aircraft. So what do you really do about that?

Additionally, one participant expressed uncertainty about locus of control. Not only did this participant feel that the issues were not within her sphere of influence, but the interviewee also did not know who did have control, even within the Airport Authority:

Things that are out of my control, like globally speaking, like the recycling and getting various recycling things. Who makes that decision? I don’t necessarily know. I would hazard a guess that it’s so-and-so, but is so-and-so actually the right person? Are they actually going to do anything about it?
While it is true that the Airport Authority does not have direct control over a number of the environmental impacts associated with the airport, a few of the interviewees recognized that the organization does have considerable influence:

I think that a lot of our executive committee, like locally-speaking, our EXO [executive] offices, I think that a lot of them have a handle on the fact that we’re not just our own entity, we have an impact on the things around us. A very, very good handle actually.

One participant raised a potential leverage point the Airport Authority could manipulate to help reduce the environmental impacts of airline activity:

Maybe that’s an idea, is that we translate that into some, into our fee structure, trying to incent airlines to use more fuel-efficient planes to land here. I know other airports around the world use, sort of, noise, they charge different rates based on the noise that a plane generates.

This type of variable fee structure is already in use by the Airport Authority to incent taxi companies to employ green technology. As explained by an interviewee:

Another thing that just jumped in my mind in terms of what the Authority is doing is sort of coercing the cab companies to move to more fuel efficient vehicles or hybrids. They receive a credit from Parking and Ground Transportation for fuel-efficient vehicles.

Finally, one participant articulated that the Airport Authority is not just a node in the air transportation system, but also in our community at large. This interviewee believed that the Airport Authority should lead by example:
I think we should start with our company and then any opportunity to share it, we should share it. Push it out into the community and to our business partners. Again, we can start enabling our business partners to start making good environmental choices too, right?

While perceived and actual locus of control are certainly an obstacle for the Airport Authority’s journey towards sustainability, several opportunities do exist to influence the larger systems around the organization. These include variable fee structures based on the environmental impact of airplane technology, sharing Airport Authority successes with the community at large, and clarifying loci of control for Airport Authority employees.

The Outdoor Lifestyle

The last theme that arose during the interviews was one that several participants felt was particular to the Vancouver area: “well, that’s why I live in Vancouver, right? I’ve had lots of opportunity to move out of Vancouver and career choices take me out of Vancouver. I love Vancouver because it provides year-round recreation for me.” Another participant said,

I think it’s, you know, ever since I’ve lived here really. You know, just the environment that’s around us in terms of having the mountains and all the parks around, and the golf courses. You know, it’s almost engrained in our lifestyle I guess, a respect for the environment.

As this theme developed, I tried to probe what it was about the outdoors that attracted my participants. One common theme seemed to be the relative isolation of natural places, “I mean, when I go camping, I love that. When I go up into the mountains
in any kind like, there’s nothing around you and all you see is landscape. That’s fantastic.” Another common response was the dual attraction of quiet and beauty:

I love the quiet of the morning. I love being on the ocean fishing. I love being on the river fishing. A little peace and quiet... I get to see a lot of beautiful country.

And I love the peace and quiet of being out there... I live in an area that’s covered in beautiful snow-capped mountains. The scenery is absolutely magnificent.

Another participant referred not to the quiet, but to a different type of noise,

It’s the fresh air, you know, the different type of noise. I think the noises there are more relaxing than the city noises that become almost background noise to you but I think they have some kind of impact on you.

Two participants seemed to intuitively believe that enjoying the quiet and beauty of the outdoors creates a connection to nature. One said, “I guess that’s a connection to nature, where you feel kind of like all this other stuff is blocked out, right?” Another expressed a realization that enjoying the outdoors is somehow connected to lifestyle and work practices: “I realize that to maintain that kind of beauty you have to make some changes in your personal lifestyle and your corporate lifestyle as well and make sure that you’re preserving that for the future as well.”

I did try to explore this theme with interviewees by directly asking if their outdoor experiences affected their work practices. Universally, all participants answered that their outdoor experiences did not directly impact their work, but those experiences may play a subconscious role.

The apparent inclination of Vancouverites to see outdoor activities as part of their lifestyle presents an opportunity for the Airport Authority. Should the Airport Authority bridge the gap between the availability of outdoor experiences and work practices at the
airport, there could be a powerful motivation for employees to behave in an environmentally beneficial manner. However, both the results of the multiple regression on work-related environmental behaviours and the anecdotal information from interviewees indicate that there is a strong disconnect between connection to nature and work practices.
Chapter Five: Discussion

The research question of this study was: What is the relationship between the organizational climate and culture of the Vancouver Airport Authority and the environmental practices of its employees? To this end, Chapter One introduced the context of the Vancouver Airport Authority as a not-for-profit organization consisting of slightly less than 400 people and as a node in the large and complex global aviation system. The research question and objectives were presented, the delimitations and limitations disclosed, and my position clarified as an employee of the Airport Authority and as a researcher interested in improving the environmental practices of a private organizations.

Chapter Two explored two bodies of literature which illuminate this study and the particular situation of the Vancouver Airport Authority as an organization interested in improving its environmental practices. The first of these two fields was the exploration of determinants of environmental values and behaviours. This field of study largely focuses on the conditions, experiences, and processes which engender environmental values and foster pro-environmental behaviours. The second field of study focuses on environmental management systems and the cultural conditions which aid in the successful implementation of environmental practices. These studies examine characteristics of organizations that lead to environmentally responsible practices.

Chapter Three detailed the methodology of the present study. This research took a mixed-methods approach to characterizing and describing the organizational culture of the Vancouver Airport Authority as it relates to environmental values and practices. Specifically, a survey was conducted on the topics of connectivity to nature,
environmental values, environmental behaviours, and work-related environmental behaviours. Five interviews were also conducted with the intent of exploring the subject areas of the survey to greater detail and, additionally, searching out obstacles and opportunities that to environmental practices at the Airport Authority. These quantitative and qualitative data were analyzed using multiple regression and grounded theory analyses, respectively.

Chapter Four presented the results of this study. The multiple regression results indicated that while connectivity with nature and age were the only significant predictors of environmental values and environmental behaviours, environmental behaviours at work were best predicted by human resource factors and work department. The human resource factors included managerial support, teamwork, empowerment, training, and reward systems. Seven themes emerged from the interview data, including the business case, inter-departmental collaboration, aesthetics and efficiencies, not having control, integrating recognition, awareness and behaviour change, and the outdoor lifestyle. Comparisons between quantitative and qualitative results and identification of obstacles and opportunities were noted.

This final chapter, Chapter Five: Discussion, expands on the results presented in Chapter Four and relates the results back to the significance of the study as presented in Chapter One. Recommendations are also made to two target audiences: researchers with interest in determinants of environmental behaviours within organizations and senior management at the Vancouver Airport Authority. To those ends, this chapter consists of three parts: Bridging a Gap in the Literature, Piloting a Methodological Tool, and
Obstacles and Opportunities for the Vancouver Airport Authority. Each sub-section includes recommendations for researchers or for management at the Airport Authority.

*Bridging a Gap in the Literature*

Chapter Two presented works related to my study in two sections: those exploring determinants of individual decisions for or against pro-environmental behaviours, and those exploring success-factors for organizations attempting to promote environmental practices. One of the goals of this study was to draw connections between these two research areas, to see how the climate and culture of a workplace might factor into the decision-making process of an employee in regards to environmental behaviours. The results of my research do suggest some interesting interaction between these two research areas.

As presented in Chapter Two, researchers have taken a variety of approaches to answering the question, what makes a person behave in an environmentally beneficial way? Schwartz (1977), Ajzen (1991), and Montada, Kals, and Becker (2007) have all presented decision-making models that include perceived individual, social, and sometimes situational variables. Other authors (Corraliza & Berenguer, 2000; Derksen & Gartrell, 1993) have emphasized the strong influence of situational context on the decision maker. Mainteny (2002) shows the effective power of individuals’ past experiences, Kals et al (1999) describe the vital role of emotional attachment to nature, and Dutcher et al (Dutcher, Finley, Luloff, & Johnson, 2007) show that connectivity to nature can be a better predictor of environmental behaviour than socio-demographic variables. In taking a broad perspective of this body of research, the complexity of the
interplay between past experience with nature, environmental values, and situational context becomes apparent, all within some form of decision-making model.

There is also a great variety of research on the topic of successful environmental management in an organization. Regardless of the type of environmental management system an organization adopts, several authors (Epstein & Roy, 1997; Kotter, 1995; Schneider, Brief, & Guzzo, 1996; Wilson, 1998) have emphasized the crucial human element of any successful environmental management system. An organization must have an engaged and supportive member-base to be successful in implementing any environmental program. Daily and several co-authors (Daily & Bishop, 2003; Daily, Bishop, & Steiner, 2007; Daily & Huang, 2001) have related employee engagement to five human resource factors affecting the success of any environmental management program: top management support, training, empowerment, teamwork, and rewards. These human resource factors are further supported by many authors, as shown in Chapter Two.

The present study suggests, through a series of multiple regressions, that the most significant predictors of pro-environmental behaviour in a workplace are the above human resource factors and the department to which the individual belongs. This markedly contrasts with previous findings about the most significant predictors of general (not workplace specific) pro-environmental behaviours, which are connectivity to nature and age. While this study is only one brief snapshot of one group of people in one organization, the implications are none-the-less intriguing.

The research presented in this thesis indicates that there may be different determinants of environmental behaviour in a work environment than in an individual’s
outside-of-work environment. One could, therefore, hypothesize that the human resource factors Daily and Huang (2001) propose are used by employees as indicators of their at-work situational context. More specifically, management support, the offering of training, employee empowerment, facilitation of teamwork, and the implementation of reward systems are perceived by employees as indications that their organization is concerned with environmental issues. This then allows individuals who are concerned with the environment and/or feel connected with nature the perceived permission and additional motivation they require to make pro-environmental decisions.

If the hypothesis presented above is feasible, that decision-makers embedded in an organizational culture interpret that culture (their social and situational context) based on message cues received from human resource factors, then the following generic recommendations could be made to any organization interested in creating and enhancing an environmentally-responsible work culture:

1. Encourage environmental values and connectivity with nature by facilitating experiences with nature; draw connections between experiences with nature and work-related decisions

2. Create a conducive situational context for pro-environmental behaviours by demonstrating top management support, employee training, employee empowerment, teamwork, and reward systems

3. Make pro-environmental decisions easy for organization members by eliminating obstacles and exploiting opportunities for desired behaviours

This nonspecific approach to creating an organizational culture that is conducive to pro-environmental behaviours is highly congruous to the decision-making models
presented in Chapter Two. In relation to Schwartz’s Norm Activation Theory (1977), facilitating connectivity with nature provides a foundation from which individuals may build a self expectation; the human resource factors provide indication of the social expectation; and reducing obstacles increases the likelihood that an individual’s cost-benefit analysis of the given behaviour will end up in favor of that behaviour.

In relation to the three factors of decision-making presented by Ajzen’s Theory of Planned Behavior (1991), attitude towards the behaviour, subjective norm, and perceived behavioural control, the three recommendations presented above are highly congruent as well. Attitude towards the behaviour is at least partially determined by environmental concern and connectivity to nature. The construction of subjective norms by the decision-maker is guided by the human resource factors presented in step number two. Lastly, perceived behavioural control is partially determined by the ease of which that behaviour can be accomplished (also by the decision-maker’s sense of empowerment encouraged in recommendation number two).

Regardless of the decision-making model adopted, the general categories of self perception, social or situational perception, and perceived ease of action are accounted for in the above hypothesis and model. However, this study is clearly not enough to determine the validity of the hypothesis that human resource factors are indicators of situational context to decision-makers embedded in an organization. Further research is required to explore how employees or members of organizations create perceptions of their work-culture as it relates to environmental values and behaviours.

Future research focus should be placed on the determinants of pro-environmental behaviour in a workplace environment. At a most basic level, this study calls into
question the relative weights of environmental values, connectivity to nature, and work-related situational variables such as perception of managerial priorities. Further research into the effectiveness and the nature of human resource factors in a workplace context is necessary. Perhaps most fascinating, research into the “determined environmentalist’s” behavioural change in the face of an unsupportive work atmosphere could provide considerable insight.

I would recommend to any researchers interested in this topic that studying a single organization at a single time is not sufficient to test theories of decision-making within organizations. Larger studies involving many organizations and a diversity of methods are required. As I will explain in the following section, however, the mixed methodology I adopted for this study did garner several interesting insights regarding the Vancouver Airport Authority. If researchers are interested in exploring a single organization in detail, a mixed methodology involving multiple regression surveys and grounded theory interviews can be quite informative.

*Piloting a Methodological Tool*

Exploring a topic as amorphous as organizational culture requires an open and exploratory approach. To allow for a variety of perspectives on the topic, I purposefully diversified the methodologies used. By conducting both a quantitative survey, analyzed using a combination of multiple regression analyses, and a series of qualitative interviews, guided by a grounded theory structure, I was able to glimpse the culture of the Vancouver Airport Authority from both a very high and general perspective and from the detailed perspective of several members of the organization. This methodology, while not without its challenges, proved insightful to me both as a researcher and an employee of
the Airport Authority. However, there were several complications in piloting a new methodology.

First and foremost, the survey tool used in this study does not easily lend itself to multiple regression analysis. I would recommend to any researchers interested in my methodology that they adjust the survey to avoid categorical data wherever possible. Designing a survey to collect continuous data avoids the need to create dummy variables, which can greatly increase the independent variable count. Additionally, I recommend that researchers avoid questions that result in answers which are ambiguous, such as the one included in this study regarding informing a supervisor of an environmentally destructive task. Ensure that any answer given provides a clear indication of the information sought. Wherever possible, keep data comparable and easy to work with.

The grounded theory framework is an excellent way to approach a topic such as work culture and environmental practices. While I would recommend that any interview schedule in a mixed-methods study be focused on expanding upon the topics included in the quantitative survey, I would also caution the researcher to be open to the participants’ diversions and tangents. During this study I found that the framework through which I see my workplace was not entirely shared by my participants. They of course had their own way of viewing their workplace; it helped tremendously to allow them to rephrase my questions into a structure that they understood. The interviewees often repeated my questions, changing the words and meanings slightly. Allowing this to take place and refraining from clarifying my intent resulted in several interesting conversations.

During the analysis portion of this study, it was helpful to have written guides to each analysis technique. However, combining and cross-checking the two sets of data,
quantitative and qualitative, was often challenging. It was helpful to create large graphical representations of interlacing and emerging themes, one of the tools suggested by Charmaz (2006). This allowed for frequent reference between the two sets of results to look for similarities and differences, which enriched both my understanding of the Airport Authority and the results and discussion of this thesis.

The methodology used for this study, which attempted to create a tool for understanding organizational culture as it relates to environmental practices, was in many ways a success. The seminal notion of combining methods, including multiple regression surveys and grounded theory interviews, provides the researcher a good deal of insight. However, for this tool to be manageable, useful, valid, and reliable, much work is needed. The methodology was tailored to a specific organization; the multiple regression results had low $R^2$ values; several survey questions returned ambiguous results; the survey sample size was not large enough to run sub-samples to increase reliability; and the interviews, perhaps by nature, only captured a very small portion of the hundreds of perspectives held by employees. Researchers interested in this methodology are encouraged to improve upon the survey tool and interview schedules presented in Appendices Two and Three.

**Obstacles and Opportunities for the Vancouver Airport Authority**

The results of this study indicate that the members of the Vancouver Airport Authority feel quite highly connected to nature. Responses to statements such as “I see myself as part of a larger whole in which everything is connected”, “I am not a natural part of the environment”, and “I never feel a personal bond with things like trees, streams, wildlife, or a view on the horizon” all show a high level of connectivity.
Similarly, the strongest response of any likert-scale question on the survey is to the statement “We (humans in general) are fast using up the world's natural resources”, in which participants strongly agreed, showing a high level of environmental concern. To provide further detail to this connectivity and concern, several participants explained their love of the outdoors during interviews; I have tried to summarize and share their love of the outdoors in Chapter Four, under the theme of *The Outdoor Lifestyle*.

Despite these apparent feelings of connectivity and concern, there are indications that these feelings and opinions are not being translated generally into behavioural changes and specifically into behavioural changes at work. In the timeframes given, less than 30% of respondents had contributed time or money to an environmental or wildlife conservation group, attended a public hearing or meeting about an environmental issue, contacted a government agency to get information or complain about an environmental problem, or voted for or against a political candidate because of his or her position on environmental issues. However 80% of respondents indicate that they have changed their behaviour in some way because of an environmental issue.

It could be that the list of environmental behaviours, borrowed from Dutcher et al. (2007), is not an appropriate measure of environmental behaviours in the context of the present study. The behaviours used by Dutcher et al. (2007) focus on actions such as voting, shopping, contributing to not-for-profits, and contacting public agencies instead of practical reductions in environmental impact such as driving less, using less energy, or conserving water. Future researchers would benefit from asking respondents what changes they have made in an open ended question.
However, the discrepancy between environmental concern and behavioural change responses can also be an indication that there is in fact a strong disconnect between environmental concern and environmental behaviours. Some of the literature presented in Chapter Three suggests that pro-environmental attitudes only manifest into environmental behaviours in favorable situational contexts (Corraliza & Berenguer, 2000; Derksen & Gartrell, 1993). As previously noted throughout this thesis, Daily (2001) suggested that in order to create a culture that is receptive to environmental practices (an environmental management system), organizations should focus on human resource factors such as managerial support, teamwork, empowerment, training, and reward programs. Survey responses relating to human resource factors average near the middle of the possible scale, indicating that employees are not receiving strong cues in these areas.

The quantitative results are for the most part reinforced and expanded upon by the qualitative interviews. All interviewees stated that they had never approached their supervisor with an idea for an environmental improvement. Several believe that this is an inappropriate avenue and believe it would be more appropriate to move laterally, most likely approaching the Environment Department first. This idea is reinforced by the discrepancy discovered in the survey results that showed 39% of respondents had had an idea that would improve the environmental performance of the Airport Authority but only 19% had reported such an idea to their supervisor. The importance of teamwork was also emphasized by interviewees; however a reoccurring barrier that several interviewees mentioned was the tendency for people to work in silos and see their projects fail.
Given signs of high levels of connectivity with nature and environmental concern and the apparently ambivalent feelings employees have regarding human resource factors as they relate to environmental management, it appears likely that the organizational culture of the Airport Authority, as the situational context within which employees make decisions, is impacting and perhaps limiting the pro-environmental behaviours of its employees.

This situation, a work-force highly connected to nature and concerned about the environment within an organization that is not effectively communicating the value of pro-environmental behaviours, presents an enormous opportunity. This study suggests that, should the Airport Authority focus on achieving a pro-environmental message by consistently pursuing positive reinforcement of Daily’s (2001) human resource factors (top management support, training, empowerment, teamwork, and rewards), employees may become highly motivated to initiate pro-environmental behaviours.

Therefore, my recommendation to the Board of Directors and to the Executive Committee of the Vancouver Airport Authority is to engage its employees in environmental management of the Vancouver International Airport, by:

1. Facilitating experiences that create a connection to the natural world,
2. Supporting and demonstrating the five key human resource factors of top management support, training, empowerment, teamwork, and rewards, and
3. Continuing to reduce obstacles and create opportunities for desired environmental behaviours.

While this may provide a guideline for successful environmental management at the airport, several additional specific recommendations can be made based on the
interviews conducted with Airport Authority staff. I have limited these recommendations
to those made or implied by survey respondents or interview subjects. These
recommendations originate from the obstacles and opportunities noted in Chapter Four of
this paper. Each obstacle, opportunity, and recommendation can also be categorized into
one or more of the five human resource factors referenced throughout this thesis. See
Table Eight for a complete matrix and Appendix Three for a summary of
recommendations.
Table Eight: Obstacles, Opportunities, and Recommendations for the Vancouver Airport Authority

<table>
<thead>
<tr>
<th>#</th>
<th>Human Resource Factor(s)</th>
<th>Obstacle</th>
<th>Opportunity</th>
<th>Recommendation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Management Support</td>
<td>Employees believe that only capital projects with short payback periods get approved; employees do not understand how capital decisions are made</td>
<td>Many employees have ideas for capital projects which could improve the environmental performance of the airport but may not meet their perception of an acceptable project</td>
<td>Create a transparent and documented capital project assessment process based on the three pillars of sustainability</td>
</tr>
<tr>
<td>2</td>
<td>Management Support</td>
<td>Employees do not believe environmental performance is a key priority for senior management</td>
<td>Employees are highly connected to nature and concerned about environmental issues</td>
<td>a. Have the president of the Airport Authority include environmental performance in every all-employee meeting update; b. Have all members of the executive committee present the environment, health and safety policy at an all-employee meeting</td>
</tr>
<tr>
<td>3</td>
<td>Training</td>
<td>Employees are not making a connection between love of nature and work practices</td>
<td>Focusing training on the relationship between natural places and airport practices could result in increased motivation for pro-environmental behaviour</td>
<td>Host lunchtime or after-work events in natural areas and draw connections to work practices (e.g. glycol management and the Fraser River, waste reduction and Burns Bog, etc)</td>
</tr>
<tr>
<td>4</td>
<td>Training and Empowerment</td>
<td>Many small barriers to environmental behaviours still exist at the airport, such as availability of recycling facilities, lean staffing during winter operations, etc</td>
<td>Employees are eager to perform in environmentally responsible ways, if given the opportunity; also, there is some evidence that responsible practices at work are transferred to employees’ homes</td>
<td>Set-up an intranet-based feedback forum on environmental topics so employees can identify barriers on an on-going basis; pose questions such as “what keeps you from recycling?” Include how-to’s and other training</td>
</tr>
<tr>
<td>5</td>
<td>Empowerment</td>
<td>Employees feel powerless to improve the environmental performance of the aviation industry</td>
<td>The Airport Authority, as a not-for-profit with a community mandate, is in a unique position to be a leader in the aviation industry</td>
<td>a. Implement variable landing fees for fuel-efficient planes or empty seat charges in order to send a message of sustainability to employees and the aviation industry; b. Encourage employees to pursue initiatives that position the Airport Authority as a catalyst for systemic environmental change</td>
</tr>
<tr>
<td>#</td>
<td>Human Resource Factor(s)</td>
<td>Obstacle</td>
<td>Opportunity</td>
<td>Recommendation(s)</td>
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<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>Empowerment and Teamwork</td>
<td>There appears to be an over-reliance on the Environment Department to implement environmental initiatives</td>
<td>Dispersing environmental performance responsibility throughout the organization will lead to better performance and increased employee engagement</td>
<td>Ensure all managerial level performance targets and reviews include environmental management. Encourage managers to include environmental performance in all employee reviews</td>
</tr>
<tr>
<td>7</td>
<td>Teamwork</td>
<td>Department ‘silos’, separation of departments, is an impediment to successful project implementation</td>
<td>Several inter-departmental committees have been highly successful in proposing and implementing various projects</td>
<td>Form an inter-departmental “Green Team” with a mandate to promote environmental practices throughout the airport; provide this team with the time and resources to effectively implement culture change</td>
</tr>
<tr>
<td>8</td>
<td>Rewards</td>
<td>There are currently no formal rewards or incentives for employees to make environmentally-responsible decisions</td>
<td>Employees recognize and recall reward programs such as STAR and the Totem Awards</td>
<td>Integrate or add environmental performance into existing recognition systems at managerial and employee levels</td>
</tr>
</tbody>
</table>
Final Thoughts

Through this exploration of the climate and culture of the Vancouver Airport Authority, the opportunities and obstacles of the journey towards effective environmental management have become increasingly clear to me. The generous participation of my co-workers at the Airport Authority, and their many insightful perspectives, has deepened my personal understanding of our workplace. This study aimed to represent the experiences, values, and perceptions of a group of people deeply engaged in the activity of running an airport, an occasionally difficult and often exhilarating task. Now we, the Vancouver Airport Authority, must act on our collective aspiration to see the industry of world travel become sustainable.

We are in a unique position to provide leadership in sustainability to an industry that exists to fulfill the desire of human beings to see the world. It is perhaps our business’ greatest irony that the luxury of air travel, which can build a love for our planet, comes at such a great environmental cost. It is our responsibility and opportunity to create an industry that allows global experience without harming the globe.

While this may seem like a daunting task, and one easily dismissed as beyond our control, I would argue that there are few organizations in a better position to demonstrate sustainability within aviation than the Vancouver Airport Authority. The culture of our company is remarkably capable of adapting to change, reacting to adverse situations, and working to achieve an exceptional level of service to our customers and to our industry. My final recommendation to the Airport Authority is to demand a higher level of performance from ourselves, to create a world where travel is available for all future generations.
References


Vancouver Airport Authority. (2007). *Beyond everyday: 2006 annual report online.* Retrieved August 1, 2007, from yvr.ca:
http://yvr.ca/authority/whoweare/annual_report_online_2006.asp

Vancouver Airport Authority. (2009). *yvr.ca.* Retrieved April 14, 2009, from Vancouver Airport Authority environmental management plan:


Appendices

Appendix A:

Published “Organizational Culture and Environmental Practices at the Vancouver Airport Authority” Survey

Survey Information:
Organizational Culture and Environmental Practices at the Vancouver Airport Authority

My name is Patrick McGuiness and this research project, entitled “Organizational Culture and Environmental Practices: A Mixed Methods Study of the Vancouver Airport Authority” is part of the requirement for a Master of Environmental Education and Communication from Royal Roads University. My credentials with Royal Roads University can be established by telephoning Dr. Richard Kool at (XXX) XXX-XXXX.

This survey is part of a research project that is looking into Airport Authority environmental values and initiatives and is expected to take 10 minutes to complete. Information will be recorded anonymously via the following on-line survey and kept only by myself in a password-protected file. Final reports will be submitted to the Vancouver Airport Authority and to my review panel at Royal Roads University. A copy of the final report will be housed at Royal Roads University with Dr. Kool and will be publicly accessible.

As an employee of the Airport Authority myself, I assure you that I will maintain your anonymity throughout the research process and that your responses here will not affect your job status or advancement opportunities. Survey results may also be used, in anonymous format, in journal articles, books, and other publications. Once the study is complete, the raw data, again in anonymous format, will be archived on my personal computer.

You are not compelled to participate in this research project. If you do choose to participate, you are free to withdraw at any time without prejudice. Should you withdraw before completing the survey, all of your responses will be destroyed. If you choose not to participate in this research project, this information will also be maintained in confidence. Should you have any questions before, during or after the survey, please call me at (XXX) XXX-XXXX.

Your completion of this survey will constitute your informed consent.

This Survey is anonymous

Helpful Information:
1. To complete this Survey form, you will need to use Internet Explorer 5 or greater. [Your Browser: Mozilla 5.0 ]
2. To complete this Survey form, you will need to have Javascript enabled. [view instructions]
3. Once you have completed this form, you will need to click the "Record Response" button. If you do not click this button, your response will not be recorded.
4. If you are using Internet Explorer 5 or greater with Javascript enabled and you have clicked the "Record Response" button, but you are still encountering problems, please note the steps you followed and what you saw on your screen. Providing this information to the Computer Service Desk will enable us to diagnose and resolve this problems faster.

If you have any questions about this questionnaire contact the Owner or, for technical
questions, the RRU Helpdesk.

Organizational Culture and Environmental Practices at the Vancouver Airport Authority—Survey Form

Background Information
This section includes general background information.
Please select your department from the following list: (Required)
- Airport Operations
- Maintenance
- Engineering
- Human Resources
- I.T. & Simplified Passenger Travel
- Community and Environmental Affairs
- Marketing and Commercial Development
- Finance
- Strategic Planning and Legal Services
- Other (please record your department in the comment space at the bottom of this survey)

Please select your age category (Required)
- 18 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60+

Please select your level of education (Required)
- Did Not Complete High School
- High School Diploma
- Some College or Post-Secondary Training
- College or University Degree
- Trade Certificate
- Graduate Degree or Post-Baccalaureate Diploma

Please select your gender (Required)
Organizational Culture and Environmental Practices
This section addresses "environmental" behaviors.
In the past year, have you changed your work practices in any way because of your concern for the environment?
- Yes
- No

In the past year, have you attended a public hearing or meeting about an environmental issue?
- Yes
- No

In the past year, have you encouraged your coworkers to reduce the environmental impacts of their jobs?
- Yes
- No

In the past year, have you contacted a government agency to get information or complain about an environmental problem?
- Yes
- No

In the past year, have you witnessed any environmentally destructive behavior at work that you did not report?
- Yes
- No

In the past five years, have you voted for or against a political candidate because of his or her position on environmental issues?
- Yes
- No

In the past year, have you requested training related to the environmental impacts and/or opportunities of your job?
- Yes
- No

In the past year, have you changed your behaviour in any way because of your concern for the environment?
- Yes
- No

In the past year, have you approached your supervisor with an idea that would improve the environmental performance of the airport?
- Yes
- No
In the past year, have you contributed time or money to an environmental or wildlife conservation group?

☐ Yes ☐ No

In the past year, have you had an idea that would improve the environmental performance of the airport?

☐ Yes ☐ No

In the past year, have you stopped buying a product because it caused environmental problems?

☐ Yes ☐ No

Environmental Values and Opinions
This section is about your opinions and values on environmental issues. For each question, please indicate whether you:

We (humans in general) are fast using up the world's natural resources.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

I am part of a team of workers at the Airport Authority who strive to reduce their environmental impact.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

I am not a natural part of the environment.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

If I alter my work practices to benefit the environment, I will be rewarded.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

People worry too much about human progress harming the environment.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

I never feel a personal bond with things like trees, streams, wildlife, or a view on the horizon.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Airport Authority employees receive regular education and training on environmental issues.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

I see myself as part of a larger whole in which everything is connected.

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

We (humans in general) are spending too little money on improving and protecting the
environment.

I do not feel like I have the ability to reduce the negative environmental impact of my work.

If things continue on their present course, we will soon experience a major ecological catastrophe.

I feel a sense of oneness with nature.

Management at the Airport Authority is unwilling to spend money on initiatives that would improve the airport's environmental performance.

The problems of the environment are not as bad as most people think.

The world is not merely around us, but within us.

Management at the Airport Authority supports and encourages responsible environmental practices.

Questions or Comments
This section is left open to any questions or comments you may have about this survey, environmental issues at the airport, or the Airport Authority's environmental performance.

Questions or Comments?
(Maximum 4000 characters)
Appendix B:

Research Consent Form and Interview Schedule

Research Consent Form

My name is Patrick McGuiness and this research project, entitled “Organizational Culture and Environmental Practices: A Mixed Methods Study of the Vancouver Airport Authority”, is part of the requirement for a Master of Environmental Education and Communication at Royal Roads University. My credentials with Royal Roads University can be established by telephoning Dr. Richard Kool at (XXX) XXX-XXXX.

This document constitutes an agreement to participate in my research project, the objective of which is to understand organizational culture at the Vancouver Airport Authority. The foreseen questions will refer to environmental values and practices at the Airport Authority. It is expected that your involvement will take up to 1 hour. Your interview will be recorded with a mechanical device, and I will be taking notes as well. I will keep all recordings and transcripts myself and destroy them once the project is complete.

I will only be submitting my final report to Dr. Kool, Anne Murray, V.P of Community and Environmental Affairs, Vancouver Airport Authority, and Dr. Murray Rutherford, my thesis supervisor. A copy of the final report will be housed at Royal Roads University with Dr. Kool and will be publicly accessible.

The information you provide will be summarized, in anonymous format, in the body of the final report and in articles written for books, academic journals, and other publications. At no time will any specific comments be attributed to any individual unless
specific agreement has been obtained beforehand. All documentation will be kept strictly
confidential. Your participation in this interview will in no way effect your job status or
advancement opportunities at the Airport Authority or elsewhere.

A copy of the final report will be published. A copy will be housed at Royal
Roads University, available online through UMI/Proquest and the Theses Canada portal
and will be publicly accessible. Access and distribution will be unrestricted.

As an employee of the Airport Authority myself, I assure you that I will maintain
your anonymity throughout the research process and during all professional interactions.

You are not compelled to participate in this research project. If you do choose to
participate, you are free to withdraw at any time without prejudice. Similarly, if you
choose not to participate in this research project, this information will also be maintained
in confidence.

If you have any questions before, during or after the interview, please feel free to
ask me. My phone number is (XXX) XXX-XXXX.

Please sign and date below to indicate your consent

Name (please print): ____________________________________________

Signed: ____________________________________________________________

Date: ______________________________________________________________

Interview Schedule

I’d like to thank you for agreeing to participate in this interview. You might
know that I work for the Airport Authority in the Environment Department. I’m also a
Masters student working on a thesis about work culture and environmental performance
at the Airport Authority. This interview will be very informal and casual; basically we’re
just going to talk. The Airport Authority and Royal Roads University will not be provided with the names of interviewees. Do you mind if I tape record our conversation? Let’s begin…

- Can you explain what you do at the Airport Authority?
- Is your job impacted by environmental issues? If so, how? Have you had to change your work practices to deal with environmental issues? If so, how?
- What do you think is the Airport Authority’s biggest environmental impact? What about the Airport as a whole, not the Authority?
- How “green” is the Airport Authority? Do employees care about environmental issues? If so, does that impact how the airport is run? If so, how?
- Going back a bit, from any point in your life, can you tell me about a time when you felt particularly connected with a “natural” place?
- Do those experiences or connections (or lack there of) like the one you just described effected the way you approach your work? If so, how?
- What do you think about the Airport Authority’s environmental performance or impacts?
- How far do you think the executive committee or the capital committee would go to support environmental initiatives? What do you think their decision making process is like?
- Have you ever approached your supervisor with an environmental initiative idea? If so, what was the project and what was his or her
reaction? If not, why not and what do you think your supervisor’s reaction would be?

- Can you describe any environmental training or education you’ve received at the airport? Was that training useful? What about the training worked or didn’t work for you?

- What kind of environmental training would be useful for you? Can you describe what that training would look like ideally?

- Let’s say you had an idea for an environmental initiative that was really brilliant, how would go about initiating it?

- Have you ever been rewarded for an environmentally beneficial behaviour? If so, what was the reward for? If not, what kind of reward program do you think we should have in place?

- Can you describe some environmental initiatives at the airport that you think have been the most successful or that you are particularly proud of? Why do you think those projects have been particularly successful?

- What are some initiatives that have not worked? Why do you think they failed and what could have been done to make them a success?

- What kind of initiatives could we do in the future that you would be proud to tell your kids about? How do you think we could improve the environmental performance of the airport?
Appendix C:

Summary of Recommendations for the Vancouver Airport Authority

The following recommendations are based on the opinions and comments of the survey respondents and interview participants of this study, all of whom are or were employees of the Vancouver Airport Authority.

1. Create a transparent and documented capital project assessment process based on the three pillars of sustainability.

2. See (a) and (b) below
   a. Have the president of the Airport Authority include environmental performance in every all-employee meeting update;
   b. Have all members of the executive committee collectively present the environment, health and safety policy at an all-employee meeting

3. Host lunchtime or after-work events in natural areas and draw connections to work practices (e.g. glycol management and the Fraser River, waste reduction and Burns Bog, etc)

4. Set-up an intranet-based feedback forum on environmental topics so employees can identify barriers on an on-going basis; pose questions such as “what keeps you from recycling?” Include how-to’s and other training

5. See (a) and (b) below
a. Implement variable landing fees for fuel-efficient planes or empty seat charges in order to send a message of sustainability to employees and the aviation industry;

b. Encourage employees to pursue initiatives that position the Airport Authority as a catalyst for systemic environmental change

6. Ensure all managerial level performance targets and reviews include environmental management. Encourage managers to include environmental performance in all employee reviews

7. Form an inter-departmental “Green Team” with a mandate to promote environmental practices throughout the airport; provide this team with the time and resources to effectively implement culture change

8. Integrate or add environmental performance into existing recognition systems at managerial and employee levels