Proactive Sustainability Strategies and Capability Development: Insights from the Public Transportation Industry

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Abstract

Proactive sustainability strategies and capability development: Insights from the public transportation industry

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In this thesis I examine the link between proactive sustainability strategies and organizational capabilities and contribute to the resource-based view of the firm and the growing research on organizations and the natural environment.

While the relationship between proactive sustainable strategies and organizational capabilities is established in the strategic management literature, a deeper understanding of how capabilities are developed in this context remains a challenge. My aim is to investigate this relationship and understand the processes involved in developing valuable, organization-specific capabilities.

The study addresses the following research questions: What explains the link between proactive sustainability strategy and capability development? How do organizations develop generic capabilities once they formulate a proactive sustainability strategic intent? What are the mechanisms and processes of capability development?

Using multiple case studies of public transit authorities in North America, I investigate the role of sustainability initiatives in capability development, through mechanisms of selection and implementation. Findings point to the need for organizations to adopt strategic structures and processes as part of a deliberate intent to develop capabilities and build advantages in a complex and competitive environment.

The thesis contributes to the resource-based view and the dynamic capabilities perspective by explaining how organizations that implement proactive sustainability strategies develop valuable capabilities. Second, the thesis extends the applicability of the resource-based view to the public sector, where competition emerges as a sophisticated and critical force, which further underscores the importance of capabilities to gaining competitive advantage. Finally, the thesis validates public transit as a research setting relevant to sustainability scholars, by explaining the tension between a green industry and its own substantial impact on the environment.

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Chapter 1. Introduction

This thesis focuses on the link between proactive sustainability strategies and organizational capabilities and contributes to scholarly thinking on the resource-based view, dynamic capabilities and the growing research on organizations and the natural environment. While the relationship between proactive sustainable strategies and organizational capabilities is established in the strategic management literature, we know less about the mechanisms that make this link possible. The purpose of this research is to examine the processes used by organizations to develop valuable capabilities once they formulate a proactive sustainability intent.

Research on capabilities has been significantly enhanced with the addition of the natural environment as a necessary component of the resource toolkit. Since Hart's (1995) seminal work on the natural resource based view, researchers have discovered many applications and refinements in the context of environmental and social issues (Christmann, 2000; Clarke & Roome, 1999; Figge, Hahn, Schaltegger, & Wagner, 2002; Hull & Rothenberg, 2008; Judge & Douglas, 2002; Kassinis & Vafeas, 2002; Russo & Fouts, 1997; Sharma & Vredenburg, 1998). What has emerged is a clearer idea of circumstances in which firms can change not only their performance, but also their competitive landscape based on the capabilities they build and manage. Furthermore, we now understand that sustainability strategies can enhance an organization's ability to compete, through the

development of valuable capabilities. Nevertheless, a deeper understanding of how valuable and inimitable capabilities are developed and managed remains a challenge. In this thesis I research the link between sustainability and capability development and propose a model that underscores the processes involved in developing valuable, organization-specific capabilities.

In this work I address the following research questions: What explains the link between proactive sustainability strategy and capability development? How do organizations develop generic capabilities once they formulate a proactive sustainability intent? What are the mechanisms and processes of capability development?

1.1 Theoretical grounding

The resource-based view (RBV) has often been criticized for its lack of operational validity (Lawrence, 1997; Priem & Butler, 2001; Whetten, 1989). Scholars have often found difficulty grounding their research solely on this perspective, and have used other theories to complement its shortcomings. Despite the apparent issues inherent to the RBV, a number of refinements have enriched its validity and applicability to the strategic management research. These refinements include the inclusion of the natural environment (Hart, 1995), the development of a contingent RBV (Aragon-Correa & Sharma, 2003; Miller & Shamsie, 1996), and the development of the dynamic capabilities perspective (Helfat & Peteraf, 2003; Teece, Pisano, & Shuen, 1997). Moreover, the RBV has been fruitfully used in

related corporate sustainability disciplines, such as international management (Chan, 2005), and corporate social responsibility (Greenwood, 2007). While to a certain extent even Barney (2001) agrees that the critique of the RBV may be founded, there is an evident paradox between the critique and the continued application of this perspective by scholars.

To contribute to this theory, I focus on how capabilities are developed, and draw from the RBV, the dynamic capabilities perspective and the natural RBV. To understand how organizations develop capabilities, I propose three broad, dynamic, and interconnected mechanisms: anticipation, actor involvement and change. I define and justify these concepts and explain their attributes. In its quintessential form, the model suggests that organizational actors have the ability to deliberately develop valuable capabilities based on a proactive sustainability strategic intent.

1.2 Methodology

In search of evidence and support for the discussions developed in the theoretical section, this thesis uses a case study research strategy, in the context of the public transport industry. This methodology is defensible given that the research problem and questions addressed are of a process nature, where context plays an important role, the extent of control over behavioral events is minimal, and the problematic targeted by this investigation is of a contemporary nature (Pettigrew, 1992). These conditions are not quantifiable enough at the outset to

allow for survey methods. At the same time, due to circumstances briefly outlined, case study methods out-focus other research strategies, such as experiments or historical analysis. These conditions align with the criteria indicated by researchers as appropriate to employ case study methodology (Eisenhardt, 1989, 1991; Hamel, 1993; Langley, 1999; Stake, 1995; Yin, 2003).

From a theoretical and practical point of view, the public transit industry is an appealing setting, because organizations in this sector experience some imbalances due to their attributed role in the climate change debate, on one hand, and their inherent environmental and social impact, on the other. This industry is distinct from other fieldwork undertaken by scholars, such as chemical (Hoffman, 1999), forestry (Sharma & Henriques, 2005), oil and gas (Sharma, 2000) and mining (Günther, Hoppe, & Poser, 2007), in that (a) it is not naturally associated with unsustainable behavior, (b) is often seen as the solution to environmental crises caused by other industries, and as a result (c) there is no urgency to find sustainable solutions. At the same time, the industry has an undeniable ecological and social impact, due to continued use of nonrenewable sources of energy (Kennedy, 2002), which creates conditions for innovation by industry players.

The public transit industry is also theoretically interesting because it does not compete in a conventional way. Constructs such as competitive advantage are not intuitively applicable in this industry, as in most urban areas, public transit organizations benefit from substantial government support and a lack of direct competition. At the same time, public documentation issued by industry actors

reveals a competitive rhetoric, where organizations define their industry broadly as transportation, and see themselves as competing with other modes of transportation, especially private car ownership. This suggests that private transportation actors understand the importance of financial feasibility and strive to be economically competitive.

1.3 Conclusions and organization of the thesis

The chief contribution of this thesis is to show when and how proactive sustainability strategies lead to the development of valuable capabilities. I do this by describing a process framework, which explains the conditions that lead organizations to develop valuable capabilities once they formulate a proactive sustainability strategy. I justify sustainability initiatives as a proxy for implementation of strategy, explain the mechanisms of initiative selection and development, and explain how initiatives lead to the development of capabilities. Findings from this work also reveal the role of initiatives to substantiate and valuate abstract policy, and also lead to the development of broad organizational capabilities. Sustainability initiatives are understood as new acts intended to resolve emerging problems of a socio-environmental nature. As such, initiatives take the form of specific projects, with defined timelines. Initiatives are distinguished from *routines*, which do not necessarily abide to a delimited timeline, and from *organizations*, which are generally bound to a survival motive.

The framework I propose is multidimensional, and includes an extension of dynamic processes developed by Teece and colleagues (1997), along with a set of moderating mechanisms, which influence the capability development process. The model shows how knowledge diffusion is aided by mechanisms of anticipation, actor involvement and change, where ideas are captured by organizations from virtually any source, internalized and developed through the use of strategic activities and actors. The model is further enriched by a discussion of mismatches in the process, which may lead to unsuccessful initiatives. Moreover, it suggests that the presence of proactive sustainability strategies notwithstanding, some initiatives succeed, others don't. Understanding that the lack of success is often due to the inappropriate use of capability development mechanisms is an important step to improve our understanding of how organizations develop valuable capabilities. The model suggests that discontinued or unsuccessful initiatives do not lead to any significant capabilities.

Finally, the thesis contributes to the RBV of the firm by outlining effective strategies organizations may use to diminish rivalry. Findings show that sustainability strategies provide the basis for competing organizations to build platforms of shared values and develop collaborative arrangements to accomplish shared objectives of a socio-environmental nature.

The thesis proceeds as follows: chapter two surveys the strategic management and sustainability literatures, with the objective of understanding how the two inform each other. I explore various perspectives on organizations and

sustainability, their epistemology, role in strategic management, and emerging views. The chapter shows that scholars of these two fields are engaged in conversations around many of the same questions, yet there are still areas of divergence. Using a few of the most important constructs in these fields, I show how they are semantically distinct, and offer solutions for convergence.

Chapter three outlines a theoretical framework, grounded in the natural resource based view. The aim of this chapter is to build some boundaries around the capability development questions. I review and explain the existing and proven relationship between proactive sustainability strategies and capabilities. Building on broad questions asked by strategy scholars, I develop a discussion that highlights the role of three mechanisms of capability development.

Chapter four outlines the methods used in this thesis, the research context, data sources, and analytical methods. In chapter five I show findings from the study and construct the emerging framework. Finally, the last chapter discusses the implications for theory, practice, along with limitations and further questions scholars can build on.

Chapter 2. Paths to convergence: A review of corporate sustainability and the strategic management process

2.1 Introduction

In this chapter, I review and organize the scholarly literature on how organizations absorb and employ sustainability dimensions, using the strategic management process as guiding framework. The objectives are to (a) show how the scholarly research on corporate sustainability fits with and informs the field of strategic management and (b) identify elements in the current state of extant knowledge which are critical to the inclusion of sustainability at the center of strategic thought. Towards that end, I propose four reasons why convergence on definitions of corporate sustainability is delayed, and show areas where scholars have reached convergence. The works cited cover a broad area, informed by classic pieces for strategic management scholarship, as well as more recent developments, where the last fifteen years have seen an increased interest in issues at the intersection of organizations and society. The primary objective of this review is to understand how research on corporate sustainability fits with and informs the field of strategic management. This objective fits with existing scholarly work that considers sustainability as a strategic opportunity, and not a remote set of external pressures. Within the thesis, this chapter provides a review of the main literatures and explains the points of intersection between them.

The approach taken in this chapter differs from and therefore adds to recent reviews (Etzion, 2007; Margolis & Walsh, 2003; Sharma, 2002) by showing a continuity of thought from the early strategic management works and their connection to current interests, thereby throwing a wider net over the literature. In this way, timeless and resilient themes are identified in conversations among strategy scholars, with the persuasion that many of the present contributions are rooted in and are evolving from thoughts expressed previously.

Nevertheless the literatures on strategic management and sustainability are not fully synchronized, with much work still needed to provide a strong communication platform between sustainability and core strategy scholars. In this chapter, I argue that this platform can be strengthened if we understand the epistemological divergence, and the opportunities for convergence. Convergence is beneficial because it allows research to advance on a shared scientific platform where scholars can develop on clearly defined and operationalized constructs. In a broader sense, this chapter closes the gap by showing specific ways in which the two literatures inform each other.

2.2 Organizations and society

The role of organizations in society has been at the center of research in strategic management ever since scientists became interested in organizational phenomena. The topic captured more interest during the industrialization period, when corporations were growing, beginning to resemble less and less the human

systems conceived and controlled cooperatively. Large organizations evolved beyond the imagination of their founders and soon their complex coordination systems became the object of fascination of the brightest minds of the times. The conditions for this fascination were met: large organizations displayed characteristics as elusive and intriguing as the phenomena studied by physicists and their impact on society is just as resilient as that of gravity.

As early as 1948, Barnard, for instance thought of organizations as cooperative systems. Cooperation—fundamentally a social process because it requires the achievement of a cooperative purpose, and not a personal one—requires interaction and coordination. To what extent the cooperative purpose embodies the personal goals of the members of the cooperation is a matter of dissent, and lead Barnard to conclude that cooperation is very difficult to achieve. In fact, he attributes organizational mortality to the lack of cooperation. In theory and practice, however, cooperation links individuals or groups with similar goals and objectives. Individuals or groups then organize resources in order to achieve their shared goals. Barnard highlights efficiency and effectiveness as central elements of cooperation. Effectiveness is when the cooperation achieves its objectives. Efficiency is the surplus generated by the system to satisfy individual aims and ensure cooperation. The notion of effectiveness supports the argument that organizations are conceived as social systems. This argument is also built upon by researchers of environmental management, who show that business will not exist when the environment deteriorates and does not support human life anymore.

Below, the literature on organizations in the natural environment is reviewed using the strategic management process as guiding framework. Choosing the strategic management process as guiding framework through the comprehensive scholarship on organizations and the natural environment is not a random choice. This approach fits within the broader research question in this thesis, which is aimed at studying strategic capability development through a process lens. While clearly, this framework has certain shortcomings, (e.g., the difficulty to assign clear categories to some studies) it does provide a recognized guiding path to understand how natural environment research fits in and converses with strategic management scholarship.

The chapter develops according to the following sections. The first section looks at works relevant to strategic evaluation. Research on strategic intent, outcomes, and the external and internal environment of the firm is reported on, along with relevant attributes for each. The second section discusses works that contribute to issues of strategic formulation, such as the formulation of business or corporate-level strategies, cooperation and international strategies. The third section focuses on works answering questions of relevance to the strategic implementation steam, including organizational design, structure, and control, corporate governance, leadership, entrepreneurship and innovation. The chapter then continues with a discussion integrating the state of extant knowledge, along with specific areas of potential future contributions. In this chapter I also propose

four reasons why convergence on definitions of corporate sustainability is delayed, and show areas where scholars have reached convergence.

2.3 Strategy evaluation

The strategy evaluation, also referred to as diagnosis, is a stage in the strategic management process in which organizational strategists perform situation analyses with the purpose of identifying critical issues outside and inside the firm. The elements of strategic evaluation examined here include strategic inputs, the internal and external environment, and outcomes.

2.3.1 Inputs to strategic processes

Inputs to strategic processes include strategic intent, organizational values, objectives, culture and mission. Over the evolution of the field, scholars have emphasized different elements at different times. For instance, Drucker (1954) often stressed the importance of objectives for effective management; Selznick (1957) discussed values as a way for organizations to become institutions; while Ackoff (1970) underlined planning aspects. Selznick argued that organizations are dispensable, not critical for society, unless they assume the values of society. He also argued that organizations are socially responsible when they embody the values of the communities they operate in, and become institutions when they symbolize the community's desires and distinctiveness. Similarly, sustainability

researchers have looked at strategic intentions (Pinske, 2007), organizational values (Bansal, 2003; Egri & Herman, 2000), and organizational culture (Clarke & Roome, 1999; Howard-Grenville, 2006) as elements that play a notable role in the strategic management process, especially at the time of strategic evaluation and before formulation.

Strategic management research often includes discussions on the time orientation of strategies, where short-term plans are contrasted with long term ones. The classic works point to the importance of long-term coordinated strategies (Ackoff, 1970; Chandler, 1962). The theme of long-term strategies is also mirrored in the sustainability literature, which embeds the concern for the welfare of future generations and is positioned against the short-term performance approach delineated by short-term financial reporting (Kolk, 2008a; Nieuwenhuys, 2006).

The nature of the strategic process is an important theme in strategy. For some, this process is formal, with planning activities at the forefront (Ackoff, 1970; Allison & Zelikow, 1999; Crozier, 1964). For others, the nature of the strategic process is often intuitive and informal (Barnard, 1948) requiring ad-hoc, flexible, dynamic, and implicit strategizing (Mintzberg, 1973). These notions are picked-up by sustainability research in the form of learning (Allan & Curtis, 2003; Clarke & Roome, 1999) and know-how (Helfat, 1997). Both of these streams suggest that managing sustainability is of strategic importance, whether information is transmitted formally (Lenox & King, 2004) or informally (Boiral, 2002; Geffen & Rothenberg, 2000; Lenox, King, & Ehrenfeld, 2000) and can lead to potentially

lucrative outcomes through innovative approaches (Arora & Cason, 1996; Sharma, Pablo, & Vredenburg, 1999).

Research on corporate sustainability has not made vigorous attempts to unravel the role of inputs to the strategic process in the development of environmental strategies (Etzion, 2007; McGee, 1998). But this research is permeated by a sense that values and intents are relevant to the domain of sustainability (Bansal, 2003; Egri & Herman, 2000). More research could look at how a strong sustainable orientation at the level of strategic intent could change the direction, discovery, and destiny (Hamel & Prahalad, 1994) of organizations.

2.3.2 Internal environment

The internal environment of the firm refers to the unique bundle of resources and capabilities that allow organizations to operate and obtain competitive advantage. Prior to the formal enouncement of the resource-based-view (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984, 1995), a number of attempts were made to understand the role of the internal environment in the organizational landscape. As early as 1959, Penrose tried to understand what influenced the growth of the firm and suggested that firms differed based on a number of tangible and intangible capabilities, such as managerial activities, organizational routines, and knowledge creation.

An important theme for research on corporate sustainability is that of fit or match between the internal strengths to external opportunities. The internal

environment embodies the notion of match between internal factors and external circumstances (Selznick, 1957), or internal capabilities to outside environment (Ansoff, 1965). Because at the core of research on internal environment rests the notion of fit or match between capabilities and external environment, it is problematic to categorize some studies as contributing to the internal environment literature, while others, to that on the external environment. This is especially true for research that focuses on capabilities built as response to outside pressures. For example, stakeholder engagement is a capability built as response to stakeholder pressures. To see to this issue, I favored categorizing studies in the internal environment section, because the research program proposed here develops around the notion of capability building, which fits in the realm of internal environment research.

Corporate sustainability research informs the strategic management process relative to the internal environment in terms of extensions to the resource-based view to the natural environment and natural resources (Aragon-Correa & Sharma, 2003; Hart, 1995; Russo & Fouts, 1997). First, several works establish connections between capabilities and organizational strategy (Darnall & Edwards, 2006; King & Zeithaml, 2001; Sharma & Vredenburg, 1998; Winn & Angell, 2000). Second, scholars have generated lists of capabilities developed by organizations to manage their corporate sustainability strategies (Barr, 1998; Bowen, Cousings, Lamming, & Faruk, 2001; Helfat, 1997; King & Tucci, 2002; King & Zeithaml, 2001; Sharma, 2000; Sharma & Nguan, 1999). Third, scholars developed contingency models,

showing how contextual variables impact theoretical models (Aragon-Correa & Sharma, 2003; Brush & Artz, 1999; Grant, Bergesen, & Jones, 2002; Love & Nohria, 2005). These three themes are expanded upon in the paragraphs below.

The stream looking at relationships between organizational capabilities and strategies is grounded in the resource-based view. Using corporate strategy as dependent variable helps in dealing with the sometimes-elusive connection between capability building and competitive advantage. Articles looking at these relationships have found that organizational capabilities for sustainability are associated with proactive environmental strategies (Darnall & Edwards, 2006; King & Zeithaml, 2001; Sharma & Vredenburg, 1998), and with strategic choice (Winn & Angell, 2000).

Regarding the generation of capabilities, scholars have found that organizations can develop corporate environmental strategies by developing and managing different portfolios of capabilities. Several scholars have explored the advantages derived from exploring the dynamic nature of capabilities (Helfat, 1997; King & Tucci, 2002), in the course of assessing core competencies (King & Zeithaml, 2001). Influential resources and capabilities that were found to support sustainable strategies include know-how (Helfat, 1997), complimentary assets (Christmann, 2000), internal processes for greening (Winn & Angell, 2000), supply management capabilities (Bowen et al., 2001), learning-action networks (Clarke & Roome, 1999), stakeholder engagement (Greenwood, 2007; Hart & Sharma, 2004), adaptive management practices (Norton, 2005), managerial issue interpretations

(Barr, 1998; Sharma, 2000; Sharma & Nguan, 1999; Sharma et al., 1999), and the ability to conduct effective internal environmental audits (Nieuwlands, 2007).

Regarding contingency models impacting the relationship between capabilities and strategies, authors have found support for a number of variables. These include organizational size (Bowen, 2002; Grant et al., 2002), where large firms display different patterns of adaptation than small firms (Tilley, 1999); organizational slack (Bowen, 2002; Love & Nohria, 2005), where authors found that slack was positively associated with environmental strategies; organizational visibility (Bowen, 2000, 2002), a related concept, where organizations in the spotlight are more likely to adopt environmental initiatives, due to perceived pressure; and a role for organizational experience (King & Tucci, 2002).

2.3.3 External environment

The external environment of the firm refers to the general and industry components surrounding organizations. Traditionally, scholars of strategic management differentiate the general environment made up of non-industry segments, from the industry or competitive environment (Andrews, 1980; Porter, 1980). The two streams produced a wide array of theoretical contributions and have contributed to a deeper understanding of how organizations interact with elements outside of their technical core, and often outside their control or influence. Research looking at the external environment of the firm underscores the importance of adaptation. For instance, Cyert and March (1963) viewed

organizations as adaptive systems. Their external environment is assumed as constantly changing. Thus, in order to ensure survival, organizations have to adapt to the environment. Cyert and March understood that sometimes adaptation means not being concerned with social or environmental issues.

Another theme of interest to strategic management research looking at the role of the external environment refers to decision-making and choice. In relationships with stakeholders firms are often seen engaging in non-rational actor choice. For instance, in the governmental politics model Allison and Zelikow (1999) evaluated decision making as a consequence of bargaining through formal means between the various interest groups with a stake in the operation. For Allison and Zelikow, the organization is a forum where the various actors or interest groups are legitimate to bring their concerns, intentions, interests, and positions to an open debate, and are granted a voice in the decision making process. Similarly, Homans (1950) suggested that the challenge for managers and researchers is to understand the interconnectedness between the societal and organizational small groups. The following step for managers is to promote strategies that allow for the various voices of small groups to be heard in the decision making process. For researchers the challenge is to examine the hierarchical relationships between the various societal and organizational groups.

The literature on corporate sustainability informs these themes by looking at specific ways in which organizations deal with environmental pressures and industry dynamics. At the level of the general environment, authors look at

regulatory aspects (Khanna & Anton, 2002; Rugman & Verbeke, 1998; Rugman & Verbeke, 2000; Russo, 2001), stakeholder management (Buysse & Verbeke, 2003; Kolk & Pinske, 2007), and global challenges (Christmann, 2004; Christmann & Taylor, 2001; Hart & Milstein, 1999; Kolk & van Tulder, 2005; Nieuwenhuys, 2006). Alternatively, at the industry level, scholars are concerned with understanding determinants for diffusion of practices (Hoffman, 2001a), industry institutional dynamics (Delmas & Toffel, 2004; Hoffman, 1999; Lawrence, Winn, & Devereaux Jennings, 2001; Pinske & Kolk, 2007; Scott, Cordano, & Silverman, 2005; Wittneben, 2007), and determinants of voluntary (Clemens, 2006; Darnall & Carmin, 2005; Darnall & Sides, 2008) adoption of environmental strategies.

At the regulatory level of analysis, some scholars reveal that organizations respond to stakeholder pressures (Zhu & Sarkis, 2007), while others show the mixed effects of coercion on firms' adaptation of environmental practices (Clemens, 2006; Rugman & Verbeke, 1998). Researchers also looked at reasons why firms might adapt voluntary environmental management, and found that a number of issues are at play, including firms' existing resources (Clemens, 2006), signaling accuracy (Darnall & Carmin, 2005), ambiguity regarding interests served (Steelman & Rivera, 2006), and financial incentives (Hoffman, 2005).

A steady body of literature has also been looking at the constant influence and pressures of stakeholders on corporate strategies (Frooman, 1999), the ways in which organizations manage or mismanage their diverse stakeholder groups (Buysse & Verbeke, 2003; Delmas & Toffel, 2004; Kolk & Pinske, 2006, 2007;

Winn, 2001), engage or interact with stakeholder groups (Greenwood, 2007), or look for opportunities by considering stakeholders as potential strategic resources (Hart & Sharma, 2004).

There is also concern for institutional dynamics and global impacts of corporate environmental strategies. Adopting various dimensions of the institutional models, scholars evaluated changes in the institutional environments of firms (Hoffman, 2001b; Hoffman & Ocasio, 2001), the evolution of institutional fields (Russo, 2001), and potential for adaptability (Rammel & van den Bergh, 2003). At the global level, researchers examine institutional differences between regions showing, for instance how organizations in Europe and North American regulators provide different definitions and expectations in their environmental policies (Levy & Newell, 2000). Other researchers prefer to focus on the importance of creating a global framework for environmental policy-making (Nieuwenhuys, 2006).

Scholars are also concerned about the industry environment of the firm. Themes of interest include, the diffusion of practices (Hoffman, 2001a; Roome, 1998), determinants of proactive environmentalism at the industry level (Scott et al., 2005), practices of impression management (Bansal & Clelland, 2004), and adaptation (Barr, 1998; Bowen, 2000).

2.3.4 Outcomes

Outcomes allow strategists to quantify the effectiveness of implemented strategies, and are the primary inputs to reevaluation. Traditionally, outcomes are

measured in terms of firm performance, but the measures of firm performance have become very diverse, and not always cohesive. For instance, strategies based solely on accounting indicators would look differently from strategies based on financial or marketing measures. The balanced scorecard, in strategy is an attempt at reconciling the differences between these diverse performance measures, by incorporating elements from most of them.

But researchers have been critical of the lack of cohesiveness among measures of performance for much longer. For instance, Chandler (1966) and Bower (1970) were both critical of the capital budgeting model. In their view, the financial models do not allow for concern with society. Particularly, Bower argues that the resource allocation process is much more complex that than what is taught by portfolio management problems. Ansoff (1965) also warns against an exclusive focus on resource allocation based on the investment perspective, arguing that it may lead managers to think that anything is usable resource, without caring for societal concerns. Ansoff argues that organizations need to have both economic and social objectives to avoid becoming impersonal investment tools. Often, organizations use financial models as yardsticks of performance and as ways to plan their activity. As shown by Chandler, by Bower, and by Ansoff, if organizations are overly seduced by the mechanics of financial models, their focus will not be on the bigger picture, which involves environmental and societal concerns.

On a slightly different note, Ackoff (1970) argues that the monetary scale is useful in resolving conflicts between performance measures. This approach is widely used by governments and regulatory agencies for environmental issues, in addressing oil spillovers and other environmental accidents. The accident receives a price tag, usually comprising of any cleaning efforts plus a moral tax, meant to caution organizations to exercise more care when operating in sensitive environmental activities. Ackoff's persuasion has become a basis of contemporary environmental law, which is attempting to assign economic value to non-economic systems impacted by human activities.

The corporate sustainability scholarship has, for a long time, been interested in understanding relationships with organizational outcomes such as performance (Bragdon & Marlin, 1972; Judge & Douglas, 2002; Wood, 1991). A still vigorous stream of research looks at relationships between corporate financial performance and corporate social or environmental performance (Darnall, Jolley, & Ytterhus, 2007; Griffin & Mahon, 1997; Hart & Ahuja, 1996; McGuire, Sundgren, & Schneeweis, 1988; Orlitzky, Schmidt, & Rynes, 2003), with mixed results, underscored by methodological inconsistencies, data accuracy and availability (Griffin & Mahon, 1997).

There are various themes of interest spanning corporate sustainability scholarship relative to performance. An important topic has been constructing the business case for adopting environmental initiatives with authors drawing theoretical insights from economics (Willard, 2002) and institutional approaches

(Hoffman, 2005). In constructing the business case authors have relied on cost-benefit analyses of environmental initiatives (Barbier, Markandya, & Pearce, 1990). Others have proposed new conceptualizations of how firms should measure outcomes, including total cost measures (Curkovic & Sroufe, 2007), or the adaptation of the balanced scorecard approach (Figge, Hahn, Schaltegger, & Wagner, 2002). Still others made the point that corporate sustainability should become a strategic imperative beyond efficiency (Figge & Hahn, 2004) and beyond a strictly business case (Dyllick & Hockerts, 2002).

2.4 Strategy formulation

Strategy formulation is the stage in the strategic management process where suitable courses of action are sought to achieve the organizational intent. Strategy is formulated to reflect processes conducted during the evaluation stages, using internal and environmental analyses, and a cohesive connection with the organizational mission. Specifically, research on strategy formulation deals with business-level strategy, concerned with specific ways to compete in each business unit and corporate-level strategy, concerned with the broad direction and scope of operations. Relevant themes from the corporate sustainability literature are discussed below.

2.4.1 Business-level strategies

In the area of business strategy, researchers have addressed the issues of resource and development strategies (Christmann, 2000; Hart & Milstein, 1999; Senge & Carstedt, 2001; Sroufe, Curkovic, Montabon, & Melnyk, 2000), managerial perceptions (Bansal, 2003; Jiang & Bansal, 2003; Sharma, 2000; Sharma et al., 1999), and multi-stakeholder perspectives (Marcus & Anderson, 2006; Russo & Fouts, 1997; Sharma & Vredenburg, 1998).

Targeting core areas of business strategies, researchers have examined the relationship between sustainability practices and cost efficiencies, and differentiation opportunities. Regarding cost strategies, researchers have been interested to provide evidence for relationships between environmental practices and their cost implications. For example, Christmann (2000) showed that existing complementary assets could effectively moderate a firm's competitiveness in the industry. The role of resources and capabilities was also explored with similar results by other scholars (Darnall & Edwards, 2006; Günther & Kaulich, 2005). More recently, authors have focused on more specific ways in which firms might extract cost benefits from environmental strategies, such as implementing total quality environmental practices (Curkovic & Sroufe, 2007) or adopting management systems that account for the cost of sustainability capital (Figge & Hahn, 2005).

On the topic of differentiation strategies, research has been interested to see in what way sustainability practices can be used to obtain an advantage over

competitors. For example, King (1995) found that organizational innovation focused on pollution control was an effective differentiation strategy for firms. Similarly Hull and Rothenberg (2008) have found support for the assertion that innovation leads to effective differentiation strategies. Industry deregulation in is also an important catalyst for companies to innovate, as evidenced by a recent study in the electric utility industry (Delmas, Russo, & Montes-Sancho, 2007). Strategic management research shows that firms can differentiate by providing unique services that are perceived as valuable by customers. Firms sensitive to customers' perceptions of value have been shown to benefit from environmental strategies, such as product take-back, as a form of recycling (Toffel, 2003).

In summary, research on business-level strategies has shown that including environmental and social sustainability concerns is of interest to organizations as initial cost implications are positive. Cost efficiencies however, are increasingly associated with the image of the low-hanging fruit, available to most, and consequently provide less opportunity for sustained advantage. With this image in mind, scholarship generates a number of different scenarios. First, a case is made for firms to move beyond efficiency and alter their performance measures to assess effectiveness of business level strategies (Dyllick & Hockerts, 2002; Figge & Hahn, 2004). Second, scholars are looking for evidence to support differentiation through innovation of practices, in ways that environmental concerns are accounted for and offer opportunities (Hull & Rothenberg, 2008). Through the second case, sustained competitive advantage is possible, especially if differentiation is attained through

proactive pursuit of differentiating environmental strategies (Sharma & Vredenburg, 1998).

2.4.2 Corporate-level strategies

Research on corporate strategy covers a broad area, answering questions regarding the types of businesses or industries the firm should be competing in, and how the business units should be managed. Ansoff (1965) has dedicated a great part of his work to understand how corporate strategies are formulated, especially as organizations consider growth and expansion. The gap analysis is a strategic tool still largely, because of its effectiveness in assessing whether the firm is still engaged in the desired course of action.

In the domain of corporate-level environmental strategy, existing studies have examined the issue of firm size and scope (Bowen, 2000; Bowen, 2002; Grant, Bergessen & Jones, 2002; Jiang & Bansal, 2003; Sharma & Henriques, 2005; Tilley, 1999), slack (Bowen & Sharma, 2005; Love & Nohria, 2005; Orlizky, Schmidt & Rynes, 2003), and international scope (Bansal & Roth, 2000; Buysee & Verbeke, 2003; Levy & Newell, 2000; Rugman & Verbeke, 1998). Regarding collaborative strategies, some studies have examined firms' collaboration with nongovernment environmental groups (Arts, 2002; Dutton, 1996; Crane, 1998; Tombs, 1993; Fischer & Schot, 1993; Mendelson & Polonksy, 1995; Hartman & Stafford, 1997, 1998; King, 2007; Livesey, 1999; Rondinelli & London, 2003; Stafford & Hartman, 1996).

The corporate-level strategy literature in the environmental sustainability domain can be generally categorized around two themes: multinational scope and cooperation. Both of these themes are core to the strategic management domain, and they both allow for a strategic gap assessment (Ansoff, 1965). On the first point, scholars look at a number of subjects, such as globalization effects and sustainability (Christmann & Taylor, 2001; Nieuwenhuys, 2006), sustainability in multinationals, and what determines their environmental policies and differences among location of subsidiaries (Christmann, 2004), the codes of conduct of multinationals (Kolk & van Tulder, 2005), reporting practices in international operations of firms (Kolk, 2008a), the regime of organizations' international operations in the context of multilateral agreements (Rugman & Kirton, 1999), and the distinctive role of multinationals to improve the environmental and social fortune of the emerging or developing countries they operate in (Chan, 2005; Kolk & van Tulder, 2006).

The literature on international scope and sustainability has been concerned with issues central to strategic and international management literature. For instance, scholars have questioned location choice, by asking whether firms favor countries with less constrictive environmental regulations (Rugman & Verbeke, 1998), or examined how firms manage environmental strategies through self-regulation, perhaps by assuming a standardized approach across their global operations (Christmann & Taylor, 2001). Some studies are also looking at strategic responses to the emergent issue of carbon or emissions trading (Busch & Hoffman,

2007; Pinske, 2007; Pinske & Kolk, 2007). Another interesting, though still emerging path is looking at how foreign firms, especially those originating in emerging economies organize their environmental policy when operating abroad. An isolated study on foreign firms operating in the U.S. was conducted by King and Shaver (2001), though it contributes to a growing literature on the behavior of firms originating in emerging countries.

On the theme of cooperation, a number of issues are discussed, including alliances and partnerships. Authors focusing on cooperation strategies have been interested in finding why firms would engage in partnerships as part of their corporate strategies (Arts, 2002; Stafford & Hartman, 1996), what types of partnerships firms engage in (Crane, 1998; Dutton, 1996; Rondinelli & London, 2003), and what are the outcomes of these partnerships (Arts, 2002; Mendleson & Polonsky, 1995). The principal theme revolves around green partnerships, defined by Hartman and Stafford (1997) as associations between business firms and environmental groups.

The argument put forward by scholars is underscored by the notion that cooperative strategies can be effective ways to integrate environmental intentions with market goals. The implicit assumption, based on the transaction cost perspective, is that firms can achieve their environmental goals more effectively through partnerships than by building environmental capabilities internally (King, 2007). For example, green alliances benefit firms by helping them rebuild or modify the value chain in ways that represent internal commitment to

environmental concerns (Hartman & Stafford, 1998), or simply by improving their public image in ways that are important to customers (Livesey, 1999; Mendleson & Polonsky, 1995).

In summation, corporate-level strategy is informed by sustainability research particularly on the themes of internationalization and cooperation, where scholars have answered some important questions, central to these literatures. There are still a number of opportunities left for sustainability researchers wishing to contribute to this expansive body of work. For instance, regarding the strategies of multinationals, there is a lack of work on how practices are shared or diffused among business units, and the role of subsidiaries and head offices in the process.

Also, there is a lack of research on diversification into sustainable industries, though it seems that new opportunities are springing in this direction, especially pushed forward by the work on proactive environmental management. Some authors have started to look at industry dynamics such as industry recreation or creative destruction (Hart & Milstein, 1999) and the emergence of new sustainable industries (Russo, 2003). There is still a feeble understanding of the extent to which firms can diversify operations by either radically changing their own industry using sustainable practices, or entering or creating new sustainable industries.

2.5 Strategy Implementation

Strategic implementation is concerned with the means used by organizations to carry through the objectives formulated during the earlier stages.

Extant work in the field identifies a number of relevant themes, including organizational design and structure, governance, leadership, entrepreneurship and innovation (Galbraith & Kazanjian, 1986). At the level of implementation, sustainability practices come into focus, and suitable mechanisms are sought to act upon formulated strategies, and manage contingencies. The ways in which corporate sustainability informs the strategy implementation stream are discussed in terms of the four main themes identified above.

2.5.1 Organizational design and structure

Research on organizational design is concerned with issues such as knowledge and information flows, reporting relationships, actor involvement and participation, and vehicles of organizational learning. Since Chandler's (1966) inquiry into the relationship between structure and strategy, scholars have been interested in understanding just how important structures are to attaining organizational objectives. Earlier work by Drucker (1954) predicted that knowledge workers would arise, working in non-hierarchical teams, where the person most knowledgeable of the task would take on a temporary leadership role. Although it would take decades for these types of informal arrangements to become effective, many firms have begun to adopt structures resembling Drucker's prediction. In a different register, Crozier (1964) tackled the structure question by looking at formal arrangements that facilitate cooperation.

Senge (1990) developed on Drucker's collaborative ideas through the concept of the learning organization, which is defined by structures allowing organizational actors to expand their learning capacity. In a more recent chapter, Senge and colleagues (2008) build on earlier notions of organizational learning and dedicate a chapter on how structures within organizations and reporting relationships can be used to improve chances of effective implementation of sustainable strategies. They suggest that environmental strategies are more likely to be effective if the sustainable structures—whether represented by individual officers or by departments—are granted authority to implement strategies, are accountable directly to executive function, have access to capital, and the resources necessary to provoke innovation. If organizations score low on these four factors, the authors argue that environmental adaptation will be compliance oriented. These four conditions, echo Homans' (1950) leitmotif relative to small groups, especially his proposal that the effectiveness of strategy implementation depends on the ability to preserve the characteristics of small groups at higher levels of the organization.

Corporate sustainability scholars have examined organizational structure relationships with environmental strategies from other angles as well. For instance, recent work has shown that reporting relationships have an effect on the environmental performance (Russo & Harrison, 2005), that the level of worker participation in environmental practices is also a factor in effective implementation (Rothenberg, 2004), that individual concerns (Bansal, 2003) and interpretations

(Sharma et al., 1999) of organizational actors influence environmental responsiveness.

Another relevant theme in this stream regards the management of information and knowledge. This is of relevance to understand how environmental practices are transmitted through the organization. The research builds on the assumption that firms are more likely to achieve competitiveness if they adopt practices quickly. Swift adoption ensures not only cost savings ahead of the competition, but also early entrant or first-mover advantage (Tetrault Sirsly & Lamertz, 2008). Scholars have examined this theme by looking at specific issues such as internal information provision (Lenox & King, 2004), organizational learning for adaptive management (Allan & Curtis, 2003), and learning-action networks (Clarke & Roome, 1999).

2.5.2 Governance and reporting

Corporate governance, as means for strategy implementation, has gained significant visibility in the last ten years, as markets have begun to pay more attention to and increasingly monitor functions previously less visible to the public. As a result researchers have started to look at issues such as executive compensation, top management teams and upper executive echelons, corporate reporting and accounting, and the role of boards of directors. Core themes of corporate governance interest are also discussed in the broad sustainability literature, especially the role of the boards (Kassinis & Vafeas, 2002; Molz, 1995),

issues of agency and shareholder activism (O'Rourke, 2003), the impact of different governance systems (Russell, Haigh, & Griffiths, 2007), and environmental reporting (Günther et al., 2007; Kolk, 2008b, 2008a; Schaltegger, Bennett, & Burritt, 2006).

Of significant concern to sustainability scholars is the extent to which organizations account for the environmental cost of their operations in their statements (Kolk, 2008b) and what is their form (Schaltegger et al., 2006). With still few countries providing legal requirements for organizations to account for their environmental and social impact, and still fewer accepted standards for such reporting, research in the area is advancing slowly, and is plagued with questions of validity, due to inaccurate, incomplete, or biased data. Under these methodological constraints, several scholars are committed to reveal aspects of environmental reporting and their relationships with environmental performance through other means such as signaling (Darnall & Carmin, 2005), labeling (Pedersen & Neergaard, 2006), or greenwashing (Ramus & Montiel, 2005).

Regarding research on boards of directors scholars are mostly concerned with the composition and demographic characteristics of boards. Drawing form political sciences, the theory of pluralism developed by Molz (1995) builds on the notion that the social performance of firms increases when boards of directors represent a diverse demographic. Westphal (1999) looks at instances of collaboration between executives and outside directors, and builds theory regarding specific circumstance in which CEOs would seek the advice of outside

directors. Kassinis and Vafeas (2002) use environmental litigation as proxy for performance, on the assumption that higher incidence of litigation increases transaction costs, and test a model that includes measures of board composition, and outside stakeholder representation. The role of the boards is an emerging theme, with many facets still unexplored, such as individual values of board members and adoption of environmental strategies.

2.5.3 Leadership

Leadership as means for strategy implementation has been widely discussed in the early works of strategic management, from Barnard (1948) to Andrews (1980), Simon (1949), and Selznick (1957). Barnard—himself a chief executive at a large corporation—saw the executive function at the center of the organizations, where leadership is the process of "sensing the organization as a whole and the total situation relevant to it", transcending "the capacity of merely intellectual methods, and the techniques of discriminating the factors of the situation" (1948: 235). Adopting this perspective, the leaders' central role in the implementation process, guided by his or her values, drives the environmental and social orientation of the organizations. In this vein, Andrews (1980) acknowledges that in large organizations ethics are not always at the center of the decision making process. The role of executives, then, is to establish clear reference points that state the values by which organizations function.

Simon (1949) adds by suggesting that, when the premises of values are clear, and the individuals identify with them, the decisions can become predictable, and implementing sustainable strategies—a manageable process. He further notes that operative employees have an important role in ensuring organization-society fit, as employees function on the basis of values and premises. If they accept the values and if the premises are set, the employees are bound to reach similar conclusions as their superiors. In Simon's organization, leaders, managers and employees are interconnected in their effort to provide a fit with society. Leaders are concerned with creating values, managers translate values into premises, and employees make operational decisions within their zone of acceptance.

The recent literature on corporate sustainability acknowledges some of these themes and develops on them. For instance, the role of values and leadership style is related to environmental management (Egri & Herman, 2000), with findings indicating that these variables have an important impact on the social and environmental performance of the firm. Other research looks at the place environmental officers should hold in firms, arguing for role centrality as critical to effective implementation of environmental strategies (Percy, 2000).

2.5.4 Entrepreneurship and innovation

Entrepreneurship in organizations is an important driver for corporate sustainability. Drucker (1954) saw entrepreneurial thinking as an important

strategic tool, embodying the notion that even large organizations can become more flexible if they give employees authority to take initiatives. For sustainable firms, entrepreneurial initiatives are particularly relevant when they lead to innovative approaches, processes and practices (Schaper, 2005).

Research on corporate sustainability has also been keen to understand the role of innovation in firms' environmental performance. The concept of innovation has been of interest to scholars of organizations for quite a while. For example, Burns and Stalker (1961) have made an important contribution with their work focusing on Scottish electronics companies operating in innovative technological environments. In the area of sustainability, most scholars are optimistic about the instrumental role of innovation in helping organizations evolve sustainably. Some have a moderate approach, suggesting functional improvements through innovative approaches (Henriques & Sadorsky, 2007), or setting the foundation for sustainable development (Carrilo-Hermosilla & Konnola, 2007), while others offer radically transformative outcomes leading to the creative destruction of industries (Hart & Milstein, 1999), or a new industrial revolution (Senge & Carstedt, 2001).

The themes of entrepreneurship and innovation are joined in the literature by research focusing on how entrepreneurial activities can lead to innovations potentially influential to industries. This research runs parallel to that looking at green investments, but follows a similar argument, looking at the emergence of a new breed of investors—green investors—interested in pursuing business ventures in future high growth industries, motivated by causing minimal or no

environmental harm. The emergence of green venture capital was documented by Randjelovic and colleagues (2003). A separate stream examines the role of venture capital investments in developing innovative sustainable technologies (Moore & Wüstenhagen, 2004).

2.6 Discussion

Noticeably, early strategic management literature discusses sustainability-related issues inclusively, where organizations and societies appear closely intertwined, based on the notion that organizations are forms of collaborative human endeavor. The overarching theme is not the survival of the firm, but the accomplishment of collaborative objectives. To prove the point that survival of organizational form was not a priority, commercial and civil procedures in many countries (especially those using the Napoleonic code) require that firms' incorporation documents provide for terms and conditions of dissolution. If these terms are even included today, they are usually a formality left to one paragraph stating that firms will dissolve at the (indefinite time) when objectives are met.

At the same time, scholarship published starting with the early 1990s notes significant divergence between the goals of firms and those of society (McGee, 1998; Shrivastava, 1995), and a sense of urgency is created through emphasis on the degeneration of human and natural systems (Hoffman, 2001b; Tombs, 1993). While initially isolated to certain natural sciences or ethics, the corporate

sustainability literature gained predominance, as evidence has shown direct detrimental impact on natural systems from human activities.

The increasing interest in sustainability research closes the loop of the strategic management process, started with the classic works, and the gap in perceived divergent goals of organizations and society, as evidence is showing how closely intertwined organizations, society, and the natural environment are. An important shift in the treatment of the environment in organizations has been from looking at sustainability as distinct sets of issues to be dealt with separately by specialists (King, 1995), to an intrinsic organizational responsibility that permeates into many of its operational decisions (Norton, 2005; Staib, 2005), and requires centrality, authority, and accountability (Percy, 2000; Senge et al., 2008).

2.6.1 Convergence

Defining the domain of corporate sustainability is an ambitious task, one which is to be approached with care and concern for the proper representation of scholarship in the domain. Research converges on a number of important elements that make up the current and evolving definition of corporate sustainability.

First, the discussion of sustainability in business converges around ideas of survival. Not the survival of the firm in isolation, as seen in organization theories of two decades ago, but the survival of firms in the context of human and environmental thriving. Consequently, theories of organizations and the natural

environment, promote the survival of human collaborative and organized forms in a context of interdependencies.

Second, while the survival of the planet seems of concern, the discussion is dominated by an underlying assumption of resource dependence, as concerns for the natural environment are only relevant if harvesting resources is possible. Indeed, when sorting the diverse views on organizations and the natural environment, it becomes clearer that the common theme is resource dependence. For instance, resources require protection because of perceived dependence on them as inputs to production processes (Darnall & Edwards, 2006). As such, the various approaches presented in this review of the literature can be analyzed in terms of efforts to ensure access to resources (renewable or non-renewable) on which humanity depends for survival. With implicit convergence on these terms, what remains to be seen is whether corporate sustainability theories can evolve outside of a resource dependence argument.

2.6.2 Divergence

While there is some agreement regarding high level defining elements, such as responsibility for the environment and society, scholars do not always converge on how corporate sustainability is defined. Some argue that there is no clear, uncontested definition (McGee, 1998; Rugman & Verbeke, 1998), while others show that there is still lack of cohesiveness (Etzion, 2007). In order to organize this literature and to guide future contributions, a number of issues should be

considered. I argue below that four related reasons underlie lack of convergence in the literature and these are: (1) ambiguity, (2) composite, (3) dynamism, and (4) obsolescence.

Ambiguity. This is the attribute of concepts that carry more than one meaning. Ambiguity of constructs obstructs theory development when meanings are dissimilar in important ways. For instance, terms such as environment or sustainability are foundation concepts of both strategic management and natural environment literatures. Understanding their meanings in the context of each stream necessitates disambiguation, as they have been used in different, if not opposing, contexts.

For instance, the notion of environment in strategic management refers to systems outside the technical core of the organization. While this notion includes the natural environment, it was not initially used exclusively for that depiction. To date, strategy scholars regard a firm's external environment to broadly include segments such as demographics, sociocultural, economic, political/legal, technological, and global. Conversely, the environment for scholars of sustainability refers to the natural environment, as distinct segment eliciting priority over the others, simply because of high dependency for survival of the other segments on the natural environment. Partial convergence in this matter has been achieved through the natural resource-based-view, which proposes the inclusion of the natural environment in this discussion, but diffusion of the concept is delayed.

Sustainability is another ambiguous term at the intersection of strategy and corporate sustainability literatures. In strategic management sustainability refers to a firm's ability to extract rents from its core competencies such that competitive advantage is maintained (Barney, 1991; Penrose, 1959; Peteraf, 1993). Sustainability in this context isolates the firm within its general environment with the purpose of ensuring it not only survives, but thrives. Alternatively, sustainability in the more recent and more generic understanding advanced by environmental management scholars refers to humanity's ability to survive and thrive. Organizational survival is subsumed within this larger landscape, and only as means to collaboratively achieve human or societal goals. From this perspective, firm survival is incidental upon its ability to achieve effective fulfillment of societal objectives. Convergence of this concept may be achieved if scholars agree that the sustainability of competitive advantage is only possible in a context of socio-environmental sustainability.

Addressing these ambiguities is decisive for the advancement of enduring scholarship as meanings contribute to the validation of constructs. It becomes that much more urgent as these and other terms are cornerstone to the literature on organizations and the natural environment.

Composite. This attribute refers to concepts consisting of separate interconnected parts as defined and illustrated by the work of Boas (2007). Composite concepts (such as sustainability), are made up of a number of component constructs, which,

in turn, also contain a number of subcomponent elements. Corporate sustainability, as composite concept defining organizational interaction with the natural environment and society, is sustained by three component pillars, recognized widely as: environmental protection, social equity, and economic development. While a certain level of interdependence exists between these pillars, ongoing changes in their composition and meanings are often independent. For instance, insuring suppliers from low-income countries are paid a fair price for their labor is independent of policies regarding waste management.

The independence of these pillars leaves room for unbalanced understanding of corporate sustainability depending on the relative importance placed on one pillar over the other two. This issue has implications for research, as much of the literature places a disproportionate focus on the environmental against other issues, possibly explained by the increased importance and impact of this topic to organizations.

Dynamic. Convergence is difficult as new findings and empirical results alter previous theories and often generate shifts in meaning. The dynamic nature of theories refers to almost continuous movement in the understanding of concepts and the evidence provided in their argumentation. For instance, sustainability advocates argue for the use of renewable sources of energy (Hester & Harrison, 2003). Bio-fuels from sources such corn or palm oil have been touted as some of the more feasible alternatives to conventional oil-based alternatives. Seizing

opportunities for competitive advantage, several countries have plunged into production of corn-based ethanol, to the exclusion of other, relatively less profitable food corps. These policies have resulted in unexpected, but significant social unrest due to decreased food supply (Mooney, 2008), and high costs to biodiversity resulting in decreased local flora and fauna populations (White, 2008). This illustration shows how feeble the balance of sustainability is, and even the keen pursuit of sustainable initiatives may generate unsustainable situations.

Obsolescence. A final proposed reason for lack of convergence is the emergence of new forms, which render others obsolete. Obsolescence refers to loss of meaning or importance due to factors that have become less useful. For instance, some research looking at why organizations may choose environmentally friendly strategies plotted initiatives as reactive or proactive. Much of the recent research, however, is showing fewer incentives for reactive organizations, and more research is being conducted on proactive strategies. This is because researchers associate reactive strategies with a low hanging fruit, and many of these fruits have been picked by most companies. As a result reactive strategies are less likely to lead to sustained competitive advantage.

2.7 Conclusion

To conclude, this review of the extant literature on corporate sustainability was motivated by an interest to show how recent research fits within the greater

themes of strategic management scholarship. In the process, I also indicated areas in which the last fifteen years have brought more clarity to ideas and concepts theoretically developed by the early works.

Although still fragmented, the literature on sustainability has made important contributions to the field of strategic management. After covering the most important areas of strategic management literature in this review, it is apparent that sustainability scholarship has made contributions to each of these areas. More importantly, having established that sustainability has a critical role in organizations, this literature is leading the way to new developments in strategy research, as organizational paradigms are changing towards the inclusion of environmental and social concerns in the organizational daily landscape.

While the role of this review was to present a general integration of sustainability themes within the greater strategy literature, a different approach is needed to develop theory. Building on these developments, a focused literature review is presented in the next section, to support theoretical development.

Chapter 3. Proactive sustainability strategies and capability development: Theoretical agenda

3.1 Introduction

This chapter examines the link between proactive sustainability strategies and capability development. Building on the natural resource-based view I propose that organizations develop valuable capabilities based on three dynamic, interconnected and multi-level mechanisms: anticipation, actor involvement and change. These mechanisms and the questions they answer were inspired by Pettigrew's (1992) suggestions for scholars who include process elements in their research. I selected these mechanisms as responses to existing inquiries of scholars theorizing along the resource-based view and the dynamic capabilities perspective. Thus, I suggest *anticipation* as a composite construct to lead questions regarding *what* considerations come to play when organizations select a new initiative. Then, to understand *who* are the responsible actors for initiative development and what is their interaction, I propose *processes of actor involvement*. Finally, to investigate *how* initiatives developed, I propose *processes of change*. Note that the three mechanisms have in common the assumption that there are deliberate elements within the organization's control.

I concede that the three mechanisms, as theorized in this chapter, are akin to an impressionistic painting, where large and broad-brush strokes suggest an

image rather than immerse the viewer in fine detail, the way a pointillist technique would. As a result, the nature of these guiding mechanisms is exploratory. Nevertheless, I proceeded to theorize around them in order to define some boundaries around the investigation capabilities, which have often been criticized as a tautological and convoluted (Priem & Butler, 2001).

This theoretical framework begins a discussion around the mechanisms within a process perspective on how organizations build dynamic capabilities when they consider the strategic role of the natural environment. This chapter contributes to the overall thesis by laying the foundation on which the research study is built.

With increasing applications and developments to the natural resource based view (Hart, 1995), scholars are confirming that sustainability strategies play an important role in the development of firm capabilities (Darnall & Edwards, 2006; Sharma & Vredenburg, 1998). But there is a lack of research on the mechanisms that strengthen the link between sustainability strategies and the development of capabilities. In this chapter I start with a focused review of the literature on the natural resource based view of the firm, develop a case for the importance of proactive sustainability strategies, and propose mechanisms that provides some explanations of the link between proactive sustainability strategies and the development of valuable organization-specific capabilities.

As shown in the previous chapter, existing scholarly work on sustainable strategic management has dealt with a number of prominent domains such as

business level strategy, corporate level strategy, international strategy, acquisition strategy, collaborative strategy, as well as the internal and external environment. Researchers have tackled the issue of how strategic management incorporates adaptation to climate change from a broad range of perspectives, using different theories and methodological approaches. The research proposed in this chapter builds on elements of the resource-based view of the firm (Barney, 1991; Galbraith & Kazanjian, 1986; Peters & Waterman, 1982; Prahalad & Hamel, 1990; Wernerfelt, 1984) and the natural-resource-based view (Hart, 1995), with insights sought from the theories of dynamic capabilities (Eisenhardt, & Martin, 2000; Helfat, 1997; Helfat & Peteraf, 2003; Makadok, 2001; Teece, Pisano, & Shuen, 1997; Winter, 2003), the contingent resource based view (Aragón-Correa & Sharma, 2003), and theories of change (Amburguey, Kelly, & Barnett, 1993; Astley & Van de Ven, 1983; Cyert & March, 1963; Hannan & Freeman, 1984; Leroy & Ramanantsoa, 1996).

Research on the natural resource based view has been pioneered by the influential work of Hart (1995), who suggested that environmental strategies can lead to valuable capabilities. This literature benefits from contributions and refinements from a broad range of organizational scholars interested in environmental and social issues (Barr, 1988; Christmann, 2000; Clarke & Roome, 1999; Figge, Hahn, Schaltegger, & Wagner, 2002; Hull & Rothenberg, 2008; Judge & Douglas, 2002; Kassinis & Vafeas, 2002; Russo & Fouts, 1997; Sharma & Vredenburg, 1998). As a result, scholars have collectively delivered significant

advances on circumstances in which firms can change not only their performance, but also their competitive landscape by formulating substantive environmental strategies.

What still remains a challenge in this area is a clear understanding of how corporate sustainability strategies actually lead to capabilities. The objective of this chapter is to identify mechanisms that explain the relationship between sustainability strategies and capability development. I therefore address the following research questions: What explains the link between proactive sustainability strategy and capability development? How do organizations develop generic capabilities once they formulate a proactive sustainability strategic intent? What are the mechanisms of capability development? These questions are in line with those asked by the thesis. The answers provided here are theoretical and exploratory in their nature and they serve to create some boundaries around a very broad research question, and to guide the empirical work.

3.2 The natural resource based view of the firm

Organizational scholars have long believed that the internal environment of the firm contains many of the keys to its potential for success. The notion that a firm's superior performance depends on its ability to acquire or develop valuable resources can be traced back to Penrose's (1959) theory of growth, both internal and external. She argued that firms' ability to grow was directly related to their ability to deploy firm-specific resources. With roots in economics, the resource-

based view formally originates with the work of Wernerfelt (1984), who was among the first to describe firms as bundles of resources.

The theory was further developed by Prahalad and Hamel (1990), who described means to identify core competencies of corporations, and then conceptualized as a comprehensive theory by Barney (1991), who argued that firms could attain temporary advantage by acquiring valuable and rare resources, and could sustain their advantage by protecting these resources from imitation or substitution. The resource-based view was further refined and enriched by scholars looking at issues such as dynamic capabilities (Eisenhardt & Martin, 2000; Helfat, 1997; Helfat & Peteraf, 2003; Makadok, 2001; Teece et al., 1998; Winter, 2003), the sustainability of competitive advantage (Peteraf, 1993), knowledge as resource (Conner & Prahalad, 1996), and the natural environment (Aragon-Correa & Sharma, 2003; Hart, 1995; Litz, 1996; Russo & Fouts, 1997).

As environmental issues have gained prominence, it was foresighted and timely of Hart (1995) to theorize on the importance of resources with an awareness of the natural environment. He pointed to additional characteristics of resources, suggesting that they are finite, irreplaceable, and most importantly, that they play a critical role in humanity's potential for survival. Hart's theory of natural resources of the firm has produced the important effect of allowing firms to see the strategic benefits of incorporating the natural environment in their processes.

The resource-based view has been used by scholars studying corporate sustainability contexts and organizations and the natural environment. Within this

literature, a number of streams have become relevant, including the contingent resource-based view (Aragon-Correa & Sharma, 2003; Brush & Artz, 1999), dynamic capabilities (Marcus & Anderson, 2006), international resource-based view (Chan, 2005), and the resource-based view of corporate social responsibility (Litz, 1996). Furthermore, the theory has been useful in understanding why firms adopt environmental strategies, at what cost (Darnall & Edwards, 2006; Russo & Fouts, 1997), and at what junctures (Aragon-Correa & Sharma, 2003).

Scholars also found that organizations implementing sustainability strategies are prone to develop valuable capabilities. A number of capabilities were advanced over the years, either leading from the formulation of environmental strategies (Sharma & Vredenburg, 1998), or contingent on proactive environmental strategies (Sharma, Aragon-Correa, & Rueda-Manzanares, 2007). Capabilities developed include adaptive flexibility (Rammel & van den Bergh, 2003), continuous innovation (Sharma et al., 2007), stakeholder interdependence and ethical awareness (Litz, 1996), or stakeholder engagement (Greenwood, 2007). In general, authors posit that sustainability strategies allow firms to build these capabilities because they reevaluate and improve product processes, business models, core technologies, reporting practices, and ultimately, their reputation. The natural resource-based view assumes that firm-specific capabilities are built along this process of self-analysis.

As firms navigate toward sustainability, they use various approaches, often guided by different worldviews. Building on previous literature on proactive versus

reactive responsiveness strategies (Sharma & Vredenburg, 1998; Sharma, Pablo & Vredenburg, 1999), and integrating core elements of the natural resource-based view, in the following section I examine an emerging view on how organizations acquire, develop, and manage capabilities.

The discussion in this section presented the role of sustainability strategies in the capability development discourse. It showed how the general environment of the firm has been extended to include the natural environment, as a basis for the other segments traditionally associated with the natural environment. It also discussed firm-specific resources and capabilities that are acquired, developed, and deployed by organizations to attain competitive advantage. Furthermore, I also presented a number of capabilities that have been identified in the scholarly research as distinctive capabilities developed as a result of firms engaging in proactive sustainability strategies.

3.3 Beyond reactive strategies: The importance of proactive strategies

The general environment of organizations is replete with stimuli regarding businesses and their sustainability. Regulators both at national and international levels are stepping up efforts to improve environmental and social behaviors of companies. Non-governmental agencies with environmental or social goals have consolidated their influence, and overall raised their bargaining power to a mainstream role in policy making. They are also influential in ensuring regulators

and their constituencies are informed about various concerns regarding the sustainability of business operations.

In this environment of apparent over stimulation and often unrealistic demands, firms are indeed hard pressed to react, comply, or perish, as any one concern can significantly tilt the balance against them. Even large corporations, such as Wal-Mart are not spared, and have had to react. In an attempt to explain strategies employed by organizations, Winn and Angell (2000) developed a typology of greening strategies that range from deliberate reactive, unrealized, emergent active, to deliberate proactive. But few firms are able to move ahead of compliance, or beyond efficiency and are playing a game of catching up (Young & Tilley, 2006). Fewer even are building capabilities that enable them to recreate business models, and possibly rewrite the rules of their industry. But more profound and stable increases of revenues may come to firms that manage to convert opportunities into capabilities (Sharma et al., 1999).

Research on reactive environmental strategies has confirmed that sustainability initiatives make cost efficiencies available to most organizations. Efficiencies can be obtained for example, by using less water, rationalizing the use of electricity, improving the supply chain to cut down on travel and waste, and by reducing dependence on scarce or non-renewable resources. Furthermore, firms can obtain advantages from value chain improvements, by fleshing out core competencies and outsourcing non-core activities to the optimal bidder. Organizations adopting sustainability efficiencies have been able to improve their

performance and obtain temporary advantage in the industry, without the necessity to increase revenues from sales.

Scholarship on proactive environmental strategies is becoming of increasing relevance as inquiring minds set their eyes on the next frontier: creating new opportunities, increasing revenue from sales through sustainable initiatives. Many firms are attempting to improve revenues by claiming an environmental profile, and hoping to align their reputation. Riding on a global wave of societal interest, companies hope that claiming a sustainability profile will increase the likelihood of customer preference over competitors who do not appear green. While there may have been a chance for first-mover advantage, it would seem that, with an increasing number of companies claiming green profiles (using often subjective, self-reported measures) differentiation is becoming very difficult, and first-mover advantages are eroding.

This research focuses on proactive sustainability strategies, whose attributes include, exceeding regulatory requirements (Hart & Ahuja, 1996; Khanna & Anton, 2002), voluntary adoption (Darnall & Carmin, 2005), deeper and broader stakeholder engagement (Buysse & Verbeke, 2003), environmental leadership (Egri & Herman, 2000). The focus on proactive sustainability strategies is defended by a number of reasons. First, the literature on corporate sustainability is increasingly showing consistent positive links between proactive strategies and firm performance (Judge & Douglas, 2002; Russo & Fouts, 1997). These results point to an increased need to understand what contributes to the firms' development of

proactive strategies. Second, building on the previous point, scholarship indicates a higher likelihood of competitive advantage derived from proactive than from reactive environmental strategies. Third, proactive sustainability strategy provides the basis for innovative and creative solutions, due to focus on developing new capabilities as opposed to diffusing or imitating existing practices. Finally, the current environment is such that new solutions are called for, therefore looking at proactive strategies is pushing firms to develop capabilities to implement these new solutions.

3.4 Mechanisms of capability development

Below I offer a more detailed discussion of the three components hypothesized as relevant in the development of capabilities, namely processes of (1) anticipation, (2) actor involvement, and (3) change. These three mechanisms represent observable processes that contribute to the development of organizational-specific capabilities. Each mechanism answers different questions regarding the development of a capability. For instance, anticipation helps understand what initiatives are selected; actor involvement helps answer who contributes to the selection and deployment of an initiative; and change processes shows how initiatives are implemented.

Processes of anticipation. I define anticipation as a process contributing to how the organization relates to its environment, whereby firms build educated foresight and

predictive ability regarding issues of potential impact on their activity in the near future. This construct builds on the idea that sustainability issues in the general environment are not monolithic constructs, rather, they represent a dynamic composite of concepts, some of which are prone to obsolescence with time. For instance, conservationism was at the top of the environmental agendas around the globe during the Earth Summit in Rio de Janeiro, in 1992. To attend to pressing environmental issues, the Summit created the Convention on Biological Diversity for conservation concerns, but also the United Nations Framework Convention on Climate Change, which was the basis for the Kyoto Protocol. Climate change has out-focused conservationism in the meantime, and became the most talked about issue in environmental forums. While conservationism did not affect businesses directly, climate change has been a core issue, revolutionizing the way organizations are perceived and react to environmental concerns. What is the next important environmental or social issue to impact organizations?

Understanding processes of anticipation as part of a mechanism used by organizations to build valuable capabilities is important and useful for at least two reasons. First, anticipating what issues from the general environment may have an impact in the near future, allows the organization to build capabilities and adaptation mechanisms before issues are institutionalized or regulated. Second, anticipating relevant issues provides organizations with the time needed to make decisions regarding the importance, cost-benefit and necessity to act on the anticipated issue. I postulate that both of these motives are part of the anticipative

processes, which contribute to understanding the link between proactive sustainability strategies and the development of capabilities.

The notion of anticipation is grounded in the logic that the level of importance of issues changes over time (as illustrated by Hoffman, 2001) and organizations stand to gain if they anticipate what will be of importance in the near future. The construct also builds on two notions from strategic management and corporate sustainability research: environmental scanning and monitoring, and issue interpretation (Sharma et al., 1999). Environmental scanning is a widely used concept in strategic management, and refers to the process of gathering factual information and analyzing it for tactical or strategic purposes. In strategy research, scanning and monitoring are activities performed by the firm ad-hoc, regularly, or continuously and through these activities, organizations seek insights on the business environments in which they are operating. The general environment is scanned and monitored to obtain clues about environmental concerns affecting production processes, buying habits, or customers' perception of the company. Issue interpretation is the subsequent step to scanning and monitoring, and involves the often subjective assessment of environmental clues as opportunities or threats.

As a management concept, anticipation is nestled in the strategic process serving as a tool to achieve fit between the internal and external environment of the firm. Through active scanning, monitoring, and interpreting of the external environment, organizations are motivated to reflect on their own activities, and audit them from the perspective of the issues of relevance or environmental

pressures. This process has the potential to allow firms a better environmental fit, and preparedness to deal with outside turbulence.

Organizations deal with numerous issues on a daily basis, and often have difficulty choosing the important ones to act upon, based on potential impact. I theorize that choices are made based on a shared understanding of issue relevance. Salient issues are defined in terms of pressures resulting from environmental regulation, government-mandated standards, consumer and community groups, industry and voluntary standards, and other trends in the industry. The most relevant issues are ones organizations have to act upon. The kinds of issues deemed relevant do not necessarily resemble the sweeping definition of climate change. Often, organizations may have to deal with much smaller issues, such as recycling of a core input to their production process.

There are numerous possible outcomes from the application of processes relative to anticipation. On the lower end of the spectrum, organizations that do not actively engage in issue anticipation are less prone to build valuable capabilities for proactive corporate sustainability. Similarly, organizations engaging in anticipation in an unintentional, non-integrated, and non-coordinated way are also less likely to build valuable capabilities, because they are not strategically involved in building and transmitting information across divisions. Conversely, on the higher end of the spectrum are organizations likely to develop valuable capabilities for sustainability and formulate proactive strategies, leading to nimble adaptation, and potential for first-mover advantages. During this process,

they also develop capabilities for cross-functional integration, as engaging in issue anticipation requires a high degree of integration and coordination among functional areas in the organization. Some firms that have been around for a while claim that they have been sustainable long before sustainability was in the frontispiece of public opinion. Examples include Patagonia, the outdoor equipment company, and Cascades, the Canadian paper manufacturer, both of which were founded with strong environmental values decades before regulators targeted business organizations. As a result of anticipating environmental issues relevant to their operations, both of these companies are able to maintain reputational advantages over their competitors.

Processes of actor involvement. The concept of actor involvement is developed here to examine who is responsible of the initiation of processes or initiatives that lead to the development of a firm-specific capability for sustainability. I intend to identify the locus of initiation of processes in the firm. This refers to understanding at what level an initiative started. Four levels are proposed: executive, managerial, non-managerial, and non-organizational.

The concept of actor involvement is an extension of the stakeholder view and pertains specifically to a process used by firms in the course of developing capabilities for proactive sustainability. Specifically, I describe actor involvement as the extent to which organizations engage their organizational and non-organizational stakeholders in the process and with the purpose of developing

sustainability initiatives. The importance of actor involvement is underscored by the organization's ability to replicate processes that can lead to valuable capabilities such as stakeholder management (Buysse & Verbeke, 2003; Hart, 1995), and managerial interpretation (Sharma, 2000).

On the dimension of actor involvement, I differentiate among the following broad types: (1) executive actors, (2) managerial actors, (3) non-managerial actors, and (4) non-organizational actors. The corporate sustainability literature provides evidence for all scenarios. For instance, the concept of managerial interpretation (Sharma, 2000) refers to organizational managerial actors and their interpretation of outside stimuli. Conversely, the notion of fringe stakeholder engagement (Hart & Sharma, 2004) assumes a broader actor involvement, where organizations essentially collaborate with non-organizational stakeholders to develop proactive sustainability strategies.

Furthermore, a review of the literature on sustainability contains adequate evidence that higher echelons of the organization have an important role in the development of organizational capabilities. In the context of this research, I argue that executives often initiate the development of capabilities for sustainability. I further assert that the kinds of capabilities initiated at the executive level differ from those initiated at other levels. As executives are concerned with corporate-level strategic issues, they are more interested in finding areas where the organization can grow strategically, which is why I expect the focus of their endeavours to be

around new approaches to conducting the business or innovations to the business model.

At the managerial level, sustainability poses different concerns, as managing sustainability assumes that most of the organization is involved at some level in the development of the capability. Organization-wide adaptation and diffusion of new practices is critical to support the effective development of the capability. Similarly, the organization relies on and draws from resources across the organization in the process. This approach allows for the explanation of initiatives implemented either bottom-up or top-down, with managers fulfilling an important role of coordination and integration among functional areas of the organization.

At the non-managerial level of the organizations, there is yet another set of challenges regarding the implementation of sustainability strategies. This level assumes that few departments are involved in the process, and that there is little need for organization-wide adaptation or diffusion of practices. Also, in this scenario, there is little need for executive involvement or monitoring. Capabilities developed at the non-managerial level are often built by specialized departments or staff. Capabilities developed through this kind of processes relate to the ability of an organization to innovate and learn.

Research has shown that collaboration with non-organizational stakeholders can be beneficial to organizations seeking proactive sustainability strategies (Buysse & Verbeke, 2003; Sharma & Henriques, 2005). Firms have been shown to benefit by reaching out to fringe stakeholders (Hart & Sharma, 2004), and other outside

stakeholders (Kassinis & Vafeas, 2002). In the context of this research, I propose that for valuable capabilities to be developed effectively, the involvement of non-organizational stakeholders can be lucrative. This process involves the active reaching out of organizational actors to either product or capital market stakeholders in order to help build valuable capabilities for proactive sustainability strategies.

Processes of change. In the context of this chapter, change processes represent the means by which organizations build firm-specific capabilities once engaged in proactive sustainability strategies. The notion of change in this context does not refer to the broader interpretation of organizational change in terms of strategy implementation. In this context, change processes provide insights on capability development, by indicating the type of change that is determinant in building valuable capabilities. Understanding what change processes are involved in capability building is important because different change processes require different strategic approaches. Incremental changes, for instance, are generally not as resource intensive and dramatic as radical changes. Knowing how to match change processes within phases of implementation allows organizations to more effectively create path dependencies that lead to valuable capabilities.

The literature does not always agree on the issues of change processes needed for organizations to adapt to climate change imperatives. Extant literature on organizations and the natural environment offers explanations of radical

changes in organizational approaches to sustainability (Hart & Milstein, 1999). Such radical changes in the literature refer to changes in strategy from reactive to proactive, from pollution control to pollution prevention, from eco-efficiency to clean technologies, and from product stewardship to sustainable business models for the base of the pyramid (Hart, 1995; Hart & Milstein, 1999; Hart & Sharma, 2004; Russo & Fouts, 1997). The extant literature of organizations in the natural environment also discusses incremental changes or greening processes (Schaefer & Harvey, 1998; Winn & Angell, 2000). Greening involves incorporating environmentally conscious principles into the activities of an organization. In a broader sense, it is associated with a sense of rejuvenation, and firms use greening as a strategy to embellish their corporate image. Critics of implementing sustainability strategies through greening processes question their effectiveness and argue that the climate change imperative necessitates radical action, with faster implementation.

The corporate sustainability scholarship presents a less developed case for continuous or evolutionary changes, which sum up to important aggregate transformations. The nature of these changes is explained by the evolutionary perspective (Barnett & Bugelman, 1996; Bruderer & Singh, 1996), which suggests that changes are rarely radical and short-lived. Rather, change happens over a long period of time, and is sometimes unnoticeable, unless the initial conditions are defined. The theory of punctuated equilibrium is a particular case of the evolutionary perspective, in that it assumes large and rare changes to be the norm.

Punctuated equilibrium contrasts long periods of stability with short but radical changes due to large shifts in the external environment. The evolutionary perspective—the focus of this research—differs from the punctuated equilibrium view in two ways. First, it does not assume stability, instead, it assumes a path dependent movement in a direction specified a priori, allowing for random environmental impacts from time to time. Second, it does not assume that radical changes will have to happen. Evolutionary change allows for such changes to occur, but it does not always anticipate them. To conclude, through this research, I aim to extend the evolutionary perspective into the area of organizations in the natural environment and add to a comprehensive framework that accounts for the missing link between radical and non-radical change.

3.5 Conclusion

Building on the natural resource based view of the firm I suggest a set of three broad mechanisms expected to have some bearing on the link between proactive sustainability strategies and capability development. The model explains the link with proactive sustainability strategies by relying on three sets of organizational processes: anticipation, actor involvement, and change. I defined these constructs and explained the attributes that make them relevant in the context of this work. The model crosses several layers within the organization, assumes a high degree of interconnectedness among these elements, and is dynamic. The model further suggests that organizational actors have the ability to deliberately

develop valuable firm-specific capabilities, and that the process can start at any level of the organization.

The natural resource-based view has provided solid evidence to substantiate the claim that proactive sustainability strategies lead to the development of valuable firm-specific capabilities, which in turn have been shown to increase a firm's ability to compete and gain an advantage. At the same time, this theory has often been criticized for its static nature, and lack of insight on what might explain the development of valuable capabilities (Lawrence, 1997; Priem & Butler, 2001). The model proposed in this chapter aims to correct this shortcoming, by providing specific insights on organizational processes that contribute to the development of capabilities.

Chapter 4. Method

4.1 Research design

The research design most appropriate to answer the research questions in this thesis is that of holistic multiple case studies. This design is instrumental and justified by the types of questions asked, the level of theoretical development of the field, and the units of analysis (Eisenhardt, 1989; Hamel, 1993; Yin, 1994). As a brief recall, the research examines how organizations develop capabilities in conjunction with their proactive sustainability strategies. 'How' questions are not typically amenable to cross-sectional quantitative analyses (Yin, 2003). Moreover, a multiple case study approach is justified when looking at a broad and complex question. The question requires an examination of global, in-depth and longitudinal phenomena, rather than a cross section. Yin contends that 'How' questions are best paired with case methodology, because the answers sought require a global, in-depth and longitudinal understanding of the phenomena. In addition, multiple case studies represent a better research choice because measures to examine capability development are not yet established.

4.2 Research context

The empirical setting of this study is the public transit industry in North America. The relevance and suitability of this setting is underscored by a number

of factors, including the growing importance of public transportation as solution to climate change problems, social issues associated with traffic congestion and the affordability of and access to transportation in urban and rural areas. With increasing constraints on fossil fuel, the environmental challenge of global warming and the significant impact that public transit has on these issues, it is an opportune time to investigate how capabilities come into shape in this industry and understand their role in innovation towards solutions for environmental and social challenges.

From a theoretical standpoint, public transportation provides an interesting venue to study the link between sustainability and capability development, because at the core of this industry lies a tension between its standing as a solution to environmental and social problems and its own already significant environmental and social impact. As a result, many organizations in this industry find themselves in the delicate position of improving environmental practices and pioneering processes, while at the same time striving to compete against private means of transportation (May, Shepherd, & Timms, 2000) and against other government agencies, funded from the public purse. The balancing act of public transportation organizations is between managing perceptions regarding the social benefit and the environmental desirability of their core activity, and the substantial environmental and social impact of operating bus and light rail fleets.

Uncertainty in the public transit industry is driven by several factors at the intersection of these tensions. On one hand, there is intense stakeholder

manifestation and need for stakeholder engagement (Bickerstaff, Tolley, & Walker, 2002), increasing pressure for operational efficiencies and profitability (Cullinane, 2002), and increasing pressures for environmental sustainability (Kemp, Hoogma, Truffer, & Schot, 2002). On the other hand, public transportation is perceived as a key solution to climate change, given that an increase in the use of public transit has been shown to improve land use planning (Herala, 2003), decongest suburban traffic (Bontje, 2004), and reduce green house gas emissions (Kennedy, 2002).

4.2.1 Transit authorities, the public sector, and competition

Scholars of corporate responsibility have noted the distinctive role of non-shareholder-centric organizations to push forward a sustainability agenda (Russo & Fouts, 1997). In this context, the study of public transit authorities becomes a compelling reference point. In general, transit authorities in North America are public organizations, usually under a federal, state, provincial, or municipal jurisdiction, governed by elected officials, or directors appointed by elected officials. Recognizing that urban transport accomplishes an inherently social objective, these organizations are not held accountable solely by financial objectives. To illustrate, the sample in this study showed that revenue of transit authorities is typically split half-way between internal sources (e.g., sales of tickets, advertising, parking) and government subsidies (i.e., federal, state, municipal and other grants).

How can public transit serve as a setting to understand issues pertaining to the RBV of the firm? Scholars contributing to this theory work under the assumption that the organization's goal is to obtain competitive advantage. Historically, scholars have avoided discussing competitiveness in public sector organizations, because their primary mode of operation is not determined by profit objectives. Indeed, public transit organizations do not function to achieve economic profit, although they are under some pressure to achieve economic efficiency. However, the profit motive is but one reason for firms to become more competitive. In accordance with sustainability principles, firms can compete on other metrics, such as environmental and social performance. In fact, nongovernmental organizations often compete with each other to fulfill a social need. Many competitive strategies apply to their functioning just as well as they do to profit seeking corporations.

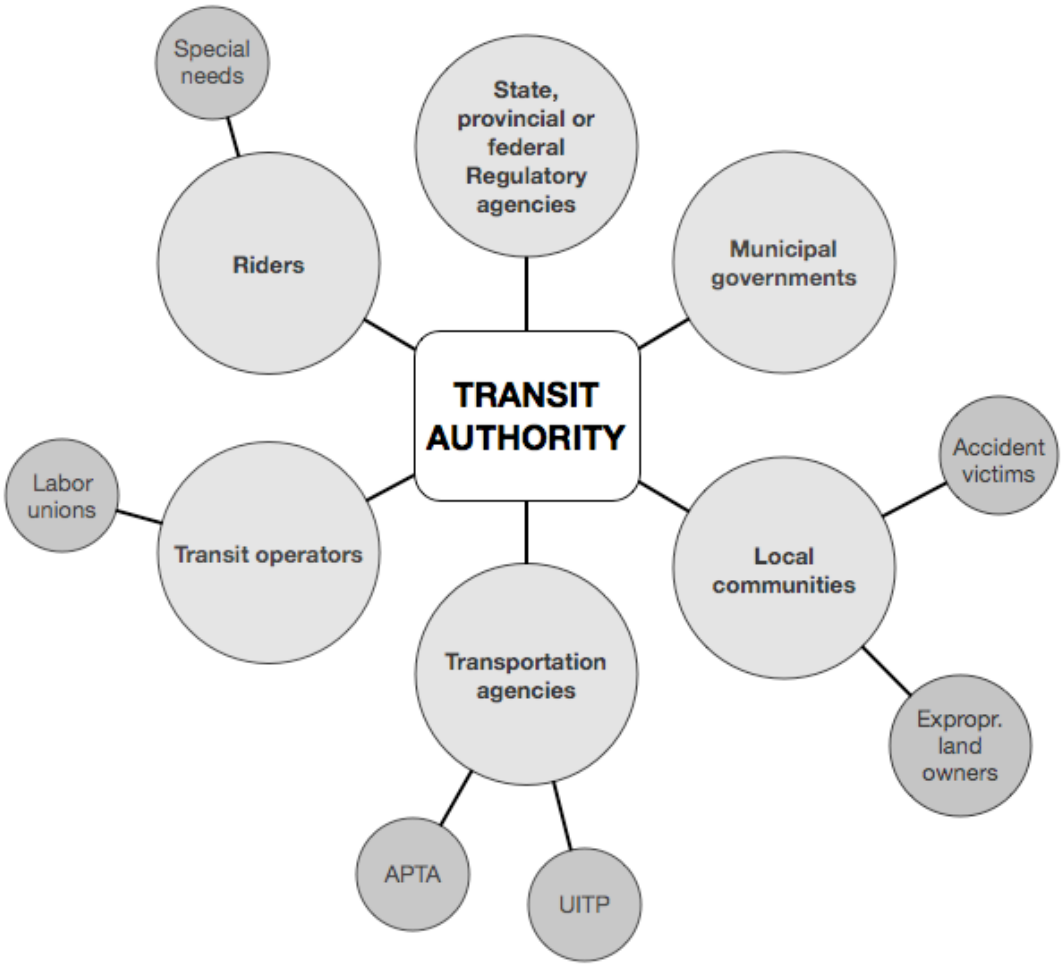
Similarly, public transit authorities are well aware of their competitive environment. Their rivals are found in two fields: the demand for service and the supply of capital. On the service side, they share high market commonality with other modes of transportation, primarily automobiles. On the supply side, they share high resource similarity with other public agencies, which compete for government funding. Therefore, public transit agencies are in a position to formulate strategies that build on their competencies for the deliberate purpose of achieving competitive advantage. This argument justifies and underscores the

importance of capability development in public transit organizations, given that they too function in a competitive environment.

4.2.2 Public transit agencies and their stakeholders

Figure 4.1 illustrates a cartography of the primary stakeholders of public transit organizations. In their operations, transit agencies interface with host cities and their representatives on issues ranging from planning of routes to management of special services. Often, transit agencies are seen as working under the tutelage of a municipal administration, and their planning has to find coherence under the urbanization of these regions. Various governance structures and control mechanisms are used to track common objectives between host cities and public transit agencies. A related category of stakeholders is represented by regulatory agencies. The primary regulatory body for public transit in the US is the Department of Transportation, and in Canada it is Transport Canada. These are responsible for transportation policies and programs. They ensure that transit is safe, efficient and responsible.

FIGURE 4.1
A GENERAL CARTOGRAPHY OF PRINCIPAL STAKEHOLDERS OF PUBLIC TRANSIT AUTHORITIES



Local communities represent another category of stakeholders. Their stakes are often more dispersed, depending on the type of impact caused by transit. Public meetings of transit authorities provide a stage to effectively observe the interaction between various local community actors and groups, as well as agents of transit authorities. Local communities are represented by, among others, families of victims of transit accidents, residents of areas affected by future line

extensions, construction projects, or existing transit operations, or disadvantaged groups requesting various accessibility measures.

Other stakeholders more visible and more directly involved in the daily functioning of these organizations are transit operators (i.e., drivers) and customers or riders. Their demands are generally institutionalized and protected under fairly elaborate contracts, where transactions clearly operationalize and validate these relationships. Labor unions and customer groups represent these categories of stakeholders, and the mechanisms to mediate claims are legally structured.

Understanding the cartography of stakeholders is an important aspect of this research because organizations often respond to pressures from stakeholders, but also have opportunities to engage with stakeholders for competitive advantage. From the perspective of this research, stakeholders have offered opportunities to inform the questions asked and helped validate statements and data generated by organizations, which allowed for triangulation in the analysis stages.

4.2.3 Socio-environmental concerns in public transit

The tension between public transit as solution and culprit is illustrated in Table 4.1 below, where I summarize the most important concerns and benefits associated with the environmental and social impact of this industry. There are many benefits we associate with the existence and use of public transportation. Almost all of the benefits reported here have to be observed in the context of public transit being an alternative to other, more polluting means of transportation. As

such, while the image associated with public transit is generally a positive one with regards to environmental sustainability, it is worth noting that public transit has a significant impact on a number of sustainability issues. Some public transit authorities acknowledge this tension. One executive at a Canadian organization, interviewed as part of this research study, stated that:

> "It's true that we are seen as the solution to sustainable transportation, but if we look at public transit across the board, it is one of the primary emitters of carbon dioxide; so there is much more work to be done on our end, to ensure that we get better about our environmental footprint."
> (Interview, November 15, 2010)

About two-thirds of U.S. oil consumption is generated by the transportation sector, of which public transit makes up a large portion. In terms of emissions, public transit modes contribute less carbon dioxide per passenger mile than other means, but their aggregate contribution is still sizeable. Moreover, public transit organizations are also major consumers of energy, mostly from nonrenewable sources. Public transit activities also interfere with and generate concerns in other areas. Table 4.1 shows the primary concerns in this sector. First, many organizations in North America, burdened by years of decreasing budgets, have been operating old fleets and technology. This situation has environmental implications, because older technology was not built with emission and energy reduction in mind. In addition, operating a fleet beyond its intended useful life presents safety concerns as well. Public transit organizations often have to deal with the aftermath of accidents caused by faulty equipment, or operator error.

TABLE 4.1
PRIMARY SUSTAINABILITY CONCERNS AND BENEFITS IN PUBLIC TRANSIT

Concerns	Benefits
Land use due to rail line extensions	Traffic decongestion
Aging fleet and technology	More efficient land use
Construction practices & impact	Right to travel & accessibility
Pollution & waste	Stimulate local economy
Accidents involving pedestrians	Reduction of automobile dependency
Dependency on non-renewable energy	Aggregate urban GHG reductions

Source: Summarized from reports and communications issued by industry associations, general press articles, and reported by transit authorities

In addition to operating a complex fleet and other equipment on a daily basis, transit organizations also commission or manage the largest construction projects in their jurisdictions. Projects can range from multi-year line extensions to facility improvements. The socio-environmental impacts of these projects are sizeable. As a result, transit agencies must navigate legislation and mitigation surrounding land use and urban planning issues, and are often reliant on other actors, such as local and federal governments, or stakeholders made up of affected citizens or other entities.

As a result of their significant social and environmental impact, public transit authorities have been among the organizations required to produce environmental reports for new projects, before sustainability became a regulatory concern. In the process of conducting this research, I came across environmental reports produced by all organizations in the sample, with some reports dating back to the 1960s. While these reports rarely required organizations to provide

pollution data regarding their operations, they did contain substantial sections on energy consumption and reduction opportunities and considerations of social impact.

4.2.4 Why Public transit and why North America?

As research context, public transit in North America is suitable because it is less susceptible to symbolic environmental stances (i.e., greenwashing). Given the predominantly car-centric culture built over the last century, public transit is receiving positive attention because it is recognized as a solution to social needs as well as emissions and congestion problems caused by automobile transportation.

There is also the issue of sociocultural pressures on innovation. In North America, public transit culture is not as dense as in other parts of the world (e.g, Europe), and not as embedded in the current sociocultural fabric. With that in mind, there are generally fewer innovations in this sector, especially since there aren't pressures for environmental performance in general. While there may be some exceptions, where customer groups are powerful and impose some pressures in communities characterized by existing commitments to sustainability, in general, the overarching theme is one where public transit organizations should do more of what they are already doing, which is to increase the number of riders. As such, any concerns of environmental performance are diverted to more important issues of operational performance.

A lack of external pressures to generate environmental innovations in public transit, can lead either to complacency or to a fertile ground for organizations to develop ideas unencumbered by outside pressures. Thus, substantive innovations can develop more organically than reactively. This is less so the case in other parts of the world, where the public transit culture is denser, characterized by a multitude of expectations regarding the environmental performance of public transit. This makes transit authorities more reactive or policy driven and far less likely to have innovation spur organically. An executive at a major transit agency interviewed for this project illustrates the relative freedom to choose what sustainability aspects to develop:

> "But as far as sustainability goes, we're working cooperatively with the other agencies. I think there are nine agencies across the U.S. that participated in the Sustainability Guidelines. We were a leader in that, and there are leaders in different aspects. For example, New York has the greenest maintenance shop. So there are different levels of what people are doing. Some people are putting plants, or using natural lighting, use door openers for ventilation; there's all sorts of different initiatives which lead to some environmental outcomes."
> (Interview, February 24, 2011)

In addition, due to the underdevelopment of public transit, the sector is now experiencing a new period of growth. The current executive administration has spearheaded a vision for rail development in major urban areas of the US. This indicates that public transit is likely to increase in importance in the next decade. I speculate that public transit developments in the US are likely to include projects in Canada as a result of proposals for high-speed rail that would link US and Canadian cities. Although there are budgetary constraints relative to the economic

situation of these countries, the commitment to improve the transportation infrastructure appears to be built on a solid platform.

In conclusion, public transit in North America is a justified context to examine questions of capability development in conjunction with proactive sustainability strategies. First, the industry functions on competitive pressures where organizational-specific competencies are relevant and required. Second, their stakeholders have explicit and compelling claims regarding their operations, but rarely put pressure on their environmental performance. In fact, transit authorities are seen as solutions to most socio-environmental concerns. At the same time, the socio-environmental impact of the industry is significant and authorities are in a position to proactively improve their performance on these metrics ahead of regulation. Finally, because of lack of pressure, and because the industry is in growth stages, North American transit organizations are more likely to be innovative in the kinds of initiatives they develop, and do so more organically than their counterparts in other countries where public transit has a longer and denser history of stakeholder claims.

4.3 Sample and measures

4.3.1 Sampling and variance

The cases were selected theoretically based on their likely contribution to the questions asked at the outset. The strategic importance of cases is judged on the types of initiatives developed by these organizations. It is in the best interest of the study to understand the development of capabilities in the context of an already existing sustainability strategy. Replication was sought at various levels of stakeholder involvement in specific environmental initiatives, using a case study protocol (Yin, 2003).

The driving theoretical criteria to determine the sampling procedure was the existence of proactive sustainability strategies operationalized through implemented sustainability initiatives. It was in this manner that I sought to align the methodology with the questions asked at the outset of this research. Where the questions asked about the link between proactive sustainability strategies and capability development, sampling procedures looked to identify the existence of these strategies and related initiatives. Furthermore, the research is geared towards understanding best practices in the industry, which is why organizations without a proactive sustainability strategy, or without signs of implementation of such policy through specific initiatives, were excluded.

Variance is obtained at the level of the initiative and not the organization. As I show below, three organizations were selected on the basis of having implemented a variety of proactive sustainability initiatives. Below, I explain the

procedures used to test proactivity at the level of the organization as well as at the level of the initiatives selected. Variance at the initiative level was obtained by selecting a representative sample of investments in sustainability projects, in broad categories of interest. I confirmed that the choice of initiatives presented sufficient variance by consulting with industry experts and triangulating with documentation such as industry reports. After a set of preliminary interviews with the target organizations, the resulting 32 initiatives emerged as the final sample.

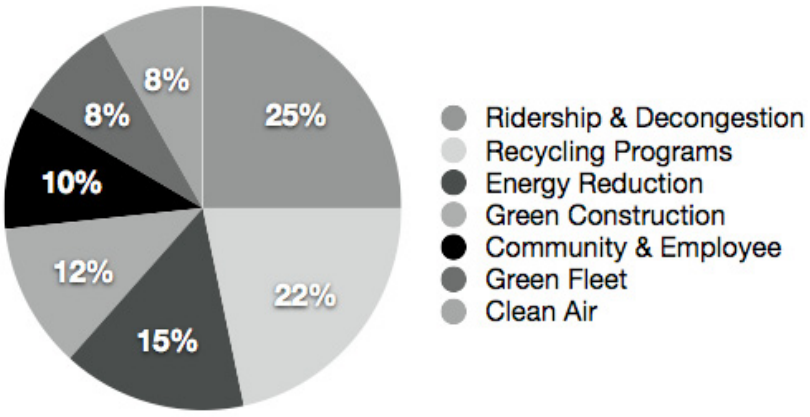
4.3.2. Measuring proactive sustainability strategies and theoretical sampling

First, I assessed the population of large public transit authorities within 60 metropolitan areas with populations over one million. I developed a database identifying these authorities and their sustainability approaches. Appendix A shows a sample of identifying data that was collected about these authorities, including data about budget composition, ridership, and sustainability metrics.

Second, I extracted from published documents the sustainability initiatives developed by these organizations. As initially expected, there was great variety in the types of initiatives developed, and, also as initially expected, there were many original and innovative approaches to operationalizing sustainability strategies in the organization, driven by a lack of standardization in the industry on this issue. Although some overlaps exist, most initiatives can be categorized according to the motive of their development, in one of the seven categories shown in Figure 4.2 below. Appendix B provides more detailed examples of specific initiatives for each

of the categories shown in the figure. Notice that initiatives relative to ridership and decongestion and recycling programs make up almost half of the total initiatives developed. Ridership and decongestion is a natural area for transit authorities to focus on, because initiatives in this area support the core mission of the organization.

FIGURE 4.2
SUSTAINABILITY INITIATIVES BY MAJOR CATEGORY



Source: Summarized from public reports and communications of North American transit authorities

Third, I had to determine whether an organization formulated a proactive strategy regarding the environment. In the absence of a proactive strategy, organizations were found to either have formulated reactive strategies, built around compliance, or simply display no evidence of a strategic intent relative to sustainability. In table 4.2 below, I show the criteria used to determine the level of proactivity based on formulated strategies. I also show the scholarly sources that inform and justify the selection of these criteria.

TABLE 4.2
CRITERIA FOR ASSESSING PROACTIVE SUSTAINABILITY STRATEGIES

Criteria	Primary citation
Exceed regulatory requirements	Hart & Ahuja, 1996; Khanna & Anton, 2002
Voluntary adoption	Darnall & Carmin, 2005
Deep and broad stakeholder engagement	Buysse & Verbeke, 2003
Environmental leadership intent	Egri & Herman, 2000
Intent to convert opportunities into capabilities	Sharma et al., 1999

Based on these criteria, I rated all the organizations in the database, with the objective of separating those that used proactive strategies from the ones that did not. To increase the reliability of the rating, I provided a graduate (MSc) student with the descriptions of policies developed by each organization along with explanations of the criteria for proactivity shown above. There was significant agreement between the two ratings regarding which organizations developed proactive policies.

Based on initial analysis at this stage, the sample pointed to eight organizations, which employed proactive sustainability initiatives and had developed several initiatives internally. To further narrow down the sample, I asked an expert panel consisting of a transportation-sustainability scholar, a former transportation manager, and a policy maker with the US Department of Transportation, to separately rank the 8 organizations based on their sustainability performance and proactive strategies. The experts converged on four organizations, which were contacted. Three organizations responded positively,

and they are: Bay Area Rapid Transit in San Francisco (BART), Societé de Transport de Montréal (STM), and TriMet Portland (TRIMET).

4.3.3 Measuring sustainability initiatives

As described earlier, the unit of analysis in this research is represented by individual sustainability initiatives within the sampled organizations. Cases were developed around initiatives rather than around organizations. While organization-wide processes are outlined, the setting for these processes was analytically limited to individual initiatives. Appendix C provides a list of the 32 initiatives examined at the three organizations, along with a description of what they entail and an explanation of the socio-environmental aims behind their undertaking. Note that I assigned each initiative a code, from I-1 to I-32. I use these codes to refer to the cases as necessary throughout the thesis.

To investigate whether the initiatives conformed to principles of proactivity, I relied on the work of Buysse and Verbeke (2003), who extend the framework developed by Hart (1995), by focusing on five specific resource domains. Within their conceptualization, an organization investing in one of these resource domains manifests some level of proactivity. Investments that take into account more than one resource domain as defined by Buysse and Verbeke demonstrate an even deeper commitment to sustainability.

Table 4.3 below illustrates how I applied this framework to the 32 initiatives I focus on in this study with the aim of providing a relative measure of proactivity.

As expected, proactive sustainability strategies at these leading organizations drive investments in projects with a high degree of commitment to sustainability. To obtain a relative quantification of their level of proactivity, I develop and calculate a coefficient of socio-environmental proactivity. The coefficient can be interpreted to mean the extent to which, based on the initiatives examined, the organization is investing proactively in sustainability initiatives, relative to the potential resource domains available. A coefficient of 0.50 or above can be understood to represent a decidedly proactive organization. Naturally, the aggregate coefficient of the three organizations is fairly high, which confirms the sampling procedure and organizational choice.

TABLE 4.3
LEVEL OF SOCIO-ENVIRONMENTAL PROACTIVITY OF INITIATIVES BY RESOURCE DOMAINS (BUYSSE & VERBEKE, 2003)

Initiative		Resource Domains					
		RD 1	RD 2	RD 3	RD 4	RD 5	SUM
BART	I-1	1	1	1	1	1	5
	I-2	1	1	1			3
	I-3	1	1	1			3
	I-4	1	1	1			3
	I-5	1	1	1			3
	I-6	1	1	1			3
	I-7	1	1	1		1	4
	I-8	1	1	1	1	1	5
	I-9	1	1	1			3
	I-10	1	1	1	1	1	5
	I-11	1	1	1	1	1	5
	I-12	1	1				2
	þ	0.2	0.2	0.1833	0.0667	0.0833	**0.73**
STM	I-13		1				1
	I-14	1	1	1	1	1	5
	I-15	1	1	1	1		4
	I-16	1	1	1	1		4
	I-17	1	1	1	1		4
	I-18	1	1	1	1		4
	I-19	1	1	1	1	1	5
	I-20	1	1	1	1	1	5
	I-21	1	1	1			3
	I-22		1	1		1	3
	þ	0.16	0.2	0.18	0.14	0.08	**0.76**
TRIMET	I-23		1	1		1	3
	I-24		1	1	1	1	4
	I-25		1	1	1	1	4
	I-26	1	1	1			3
	I-27		1	1	1	1	4
	I-28	1	1	1	1	1	5
	I-29	1	1	1	1	1	5
	I-30		1	1			2
	I-31	1	1	1	1	1	5
	I-32	1	1	1			3
	þ	0.1	0.2	0.2	0.12	0.14	**0.76**

Legend

RD 1–5: Resource Domains

I-1 – I-32: List of sustainability initiatives

þ: Coefficient of socio-environmental proactivity. Calculated based on the sum of resource domains realized relative to the sum of possibilities for any given initiative.

Definitions of Resource Domains

RD 1: Investments in conventional green competencies related to green product and manufacturing

RD 2: Investments in employee skills

RD 3: Investments in organizational competencies (R&D, product design, finance, accounting, purchasing, storage, and other functional areas)

RD 4: Investments in formal management systems and procedures (e.g., life-cycle assessment, reporting)

RD 5: Efforts to reconfigure the strategic planning process by explicitly considering environmental issues

Source: Adapted from Buysse & Verbeke, 2003

4.3.4 Measuring capabilities and mechanisms of dynamic capability development

Chapter three establishes a broad guiding framework, which constitutes the foundation of the measurements employed in the study. Given the exploratory

nature of this research and the lack of measurements of the mechanisms proposed in the theoretical agenda, I conducted a pilot study to validate the constructs proposed. The setting for the pilot study was a small public transit authority located in the north-eastern United States, chosen because of its convenient location, and the fulfillment of criteria necessary to conduct the research (i.e., proactive sustainability strategy, existing initiatives underway, access to data).

Also, to improve reliability of the study, I developed a case study protocol (Yin, 2003) that connects the research questions with the empirical setting. The protocol was modified in light of its application and evaluation of suitability during the pilot study. The protocol (Appendix D) describes the major landmarks to be achieved during data collection and analysis.

Table 4.3 below shows the method of operationalization and validation of measures in the pilot study. Sample questions and representative statements are provided. A more comprehensive version of the instrument and measures was presented to a panel of three management scholars at Concordia University, of which one is a professor in strategy and two were at the time Ph.D. candidates in strategic management and organizational behavior respectively. Two of the three individuals have expert proficiency of qualitative research methodology. The members of the panel were familiarized with the objectives of the study and asked to validate the variables, method of operationalization, and sample questions, relative to the responses offered by informants. The panel was also asked to provide any feedback on the instrument. Consequently, the instrument was

validated unanimously, and feedback was incorporated into a refined study protocol, which I used moving forward in the other locations. Measurements derived from interview, archival and observational data include reports on variables such as, sustainability strategies and organizational capabilities. With the instrument displaying validity of constructs, the study proceeded forward.

TABLE 4.4 METHOD OF OPERATIONALIZATION AND VALIDATION OF MEASURES IN PILOT STUDY

Variables	Method of operationalization	Sample questions	Validation	Informant
Dependent: Capability	Direct organizational-level outcome	What is the impact of this initiative on the organization?	"The staff has confidence that we can achieve this. It allowed us to expand our opportunities as a leader in the local market."	General manager
	Creation of new capability	What were the benefits and risks?	"[...] organizational optimism in the ability to engage in the next big thing."	General manager
	Significant changes in existing capabilities	What are some of the capabilities that have been developed as a result of this initiative?	*Ability to generate successful initiatives:* "Our previous success has helped us create a structure in the organization that encourages people to work together and collaborate to quickly develop ideas that have potential for implementation."	Senior manager
		Can you provide a unique insight into what contributed to the implementation of this program?	"The success of our programs raised the profile of the agency and confidence in it, both externally and internally. If we apply for a grant to fill the roof with solar panels, even if we haven't done anything in solar panels before, success breeds success."	General manager
		Are there other areas of the organization where this initiative might be implemented?	"We have learned about our customers wants and needs. We are now building a passenger facility downtown, to cater to low winter temperatures. We expect this will increase ridership."	Marketing executive 1
Independent: Anticipation processes	Identifiable adjustment process to external or internal stimuli	How are choices about initiatives made?	"People in the city and state government like to see sustainability-related initiatives rolling out, and that is a criteria for us."	Marketing executive 2
		How does the organization decide which initiative to implement?	"Most business want to be sustainable, especially in Vermont. We build a business argument to deal with that and give them an opportunity to be sustainable."	General manager
		What criteria are used to make these decisions?	"If you reduce barriers to transit usage, you can increase ridership exponentially."	Senior manager
Independent: Actor involvement	Identifiable actor involved at various stages of initiative development	Who started this initiative?	"The board asked for this. We started doing research, and came up with a proposal for a program. The board approved it."	General manager
		Was there a champion?	"Not really. It was a collaboration among the board, GM, and organizational departments."	Marketing executive 2
		How was buy-in achieved?	"People will agree to do a deal if you give them something that is of perceived value to them."	Senior manager

Variables	Method of operationalization	Sample questions	Validation	Informant
		Who is involved in coming up with initiatives here?	"I look for trends (business, marketing, etc.), learn what customers want (both individuals and businesses), and come up with something that they can agree on."	General manager
Independent: Change processes	Identifiable change processes relative to implementation of initiative	How did the initiative move along the organization?	"The board asked for this. We started doing research, and came up with a proposal for a program. The board approved it."	General manager
		What type of changes have you seen?	"For the newest initiative, it took about 6 months form idea to implementation. We are getting faster at formulating ideas and implementing them quickly."	Marketing executive 1
		What were some challenges you came across while developing this program and how were they dealt with?	"We had technological issues. Counting people was a real problem at first. We needed software to recognize University of Vermont ID based on magnetic stripes. When we expanded the program, we needed the software to sort ridership based on college. It took some time to figure it out."	General manager

4.5 Data

4.5.1 Overview of the data collection process

Data was collected between December 2008 and March 2011. The evidence comes from several sources, including: documentation, archival records, a series of in-depth interviews, and direct observations. Three distinct phases of data collection can be identified. During the first phase (December 2008–September 2009) I collected data to construct the database of transit authorities, examined archival materials and industry reports, conducted the pilot study, and validated the instrument. During the second phase (July 2009–September 2010), I conducted telephone and in-person interviews. Finally, in the third phase (January–March 2011), I visited all three organizations, conducted follow-up interviews and direct observations.

Prior to undertaking this study, I did not have prior contact with the organizations or with any individuals associated with them. Strategies used to reach informants included networking within the transportation community at various events and on the Internet, through professional transportation groups on social networks such as LinkedIn. These strategies allowed me to reach industry experts who provided connections to potential informants qualified to participate in this study. Recruitment for interviews was conducted through personal contact by direct call or personal e-mail to six-to-ten candidates per organization. Candidates were selected from three areas of the organization: sustainability, corporate

communications and operations. I personally interviewed all candidates in either English or French. Where necessary, I followed up on the initial interview with a second interview. Informants were not paid for their participation. During the data collection phase, I kept a detailed chronological log of the research process.

The unit of analysis of this study is the initiative. Specifically, in approaching the data collection, my interest is to explain how capabilities are developed based on the organization's engagement in sustainability initiatives. As such, the level of analysis is the organization. While the theoretical framework approaches the development of capabilities from a multi-level perspective, allowing for influences from outside stakeholders and for the involvement of individual organizational actors, the findings are reported at the organizational and initiative levels. Below I provide some details regarding the three broad sources of data: documentation and archives, interviews, and observations.

4.5.2 Documentation and archival data

Documentation and archival records were obtained from public transit organizations, from libraries and databases of trade associations, such as the International Association of Public Transport (UITP), the American Public Transit Association (APTA), and the Metropolitan Transit Commission (MTC).

Documents represent an important source because the public nature of the industry affords access to significant historical material, either in the archives of the organization, online and on-site, as well as at non-affiliated public databases and

libraries, such as those of the International Association of Public Transport, the American Public Transportation Association, and the physical libraries of the Metropolitan Transit Commission (Oakland, CA), and the library of the Department of Transportation (Washington D.C). Table 4.5 shows the provenance of a sample of documents used in this study.

The overabundance of published data imposed challenges on selecting the most relevant information to include in the analysis. To guide data collection and analysis, I limited myself to documentation that related to specific sustainability initiatives implemented by the organizations or data that could be used in triangulation. From the organizations, I obtained and used annual reports, minutes of meetings, and environmental reports on specific projects (e.g., line extension, urban planning). From the industry associations, I used statistical information to construct the database of transit authorities in North America, as well as statistics specific to the three authorities and geographic regions, in conjunction with initiatives analyzed. From public and industry libraries, I obtained archival information on initiatives dating back to the 1960s. For example, I was able to familiarize myself with the characteristics of light rail fleet commissioned by the Bay Area Rapid Transit (BART) or with the characteristics and changes in the structure of the environmental reports prepared by the public transit authorities over the last several decades.

TABLE 4.5
SAMPLE OF DOCUMENTS USED

Type	Title	Published by	Date published	# Pages
Factbook	Statistical summary of Bay Area transit operators	MTC	May-10	120
Report	Quarterly service performance review, FY 2011	BART	Feb-11	37
Report	2010 Customer Satisfaction Study	BART	Feb-11	12
Resource Guide	Moving toward more community-oriented transportation strategies for the San Francisco Bay Area	MTC	Dec-96	84
Minutes	Public meeting minutes	BART	2009-2011	154
Report	Sustainability standard fact sheet	TriMet	Mar-10	2
Report	An environmental model: Interstate MAX construction	TriMet	Jul-08	2
Report	Sustainable practices on the MAX Green Line	TriMet	Jun-09	4
Report	Disadvantaged Business Enterprise Program- Continuing a legacy of innovation	TriMet	Aug-09	4
Report	Interstate max: DBE & Workforce Story. Overcoming Barriers to inclusion	TriMet	Jan-05	58
Minutes	Public meeting minutes	TriMet	2009-2011	131
Notice	Subway car procurement project	STM	Jan-10	5
Sustainable report	The STM in 2008. Sustainable development report	STM	Jan-09	48
Minutes	Public meeting minutes	STM	2009–2011	123
Report	Sustainable solutions for Montreal	Ville de Montreal	Feb-07	12
Report	Pratiques de durabilité pour les réseaux de transport en commun	CUTA	Jun-10	53
Factbook	Ridership report	APTA	Jan-11	32
Factbook	Public transportation factbook	APTA	Jan-11	41
Report	Public transportation's contribution to U.S. greenhouse gas reduction	APTA	Sep-07	43
Report	The broader connection between public transportation, energy conservation and greenhouse gas reduction	APTA	Feb-08	34
Report	The case for business investment in public transportation	APTA	Nov-09	12
Report	Impacts of recession on public transit authorities	APTA	Mar-10	8
Report	The route to carbon and energy savings	APTA	Nov-10	119
Report	The Case for Business Investment in High-Speed and Intercity Passenger Rail	APTA	Mar-11	12
Report	Annual report to the California State Legislature	MTC	Apr-09	20
Report to Congress	Transportation Investment: America's economic recovery engine	MTC	Mar-10	32
Strategic plan	Change in motion: Transportation 2035 plan for the SF Bay Area	MTC	Apr-09	142

4.5.3 Interviews

To learn about the industry, I conducted a set of preliminary interviews with industry experts and observers. In addition to providing expertise to aid the sampling of the cases, these interviews helped me (a) map the current issues in the

industry relative to sustainability and (b) develop an understanding of the operational idiosyncrasies of the sector. These preliminary interviews also supplemented my prior research on the transit industry by providing perspective on the industry-wide stance on environmental reporting, the state of standardization, and the emergence of an environmental conscience pioneered by a select group of organizations within the American Public Transportation Association.

I then conducted interviews based on the instrument validated in the pilot project, and, where possible, interviews were recorded and transcribed. Where this was not possible, I took notes during the interview, which I adjoined with research notes after the interview. Once transcribed, I asked informants to validate the content of the notes, and supplement it with any information they considered relevant. Given the salience of multiple stakeholders to the research question, in addition to board members, managers and staff at all three organizations, I also conducted shorter interviews with relevant stakeholders of the organizations, including users (i.e., riders) and operators (i.e., drivers). These interviews provided additional perspective on many of the issues presented by the organizational informants. Often, their perspective helped complete images not fully developed in interviews with managers. For example, one of the initiatives studied was targeted at improving the environmental awareness of bus operators. Data from documentation and interviews with senior managers indicated that initiative had been a success. Nevertheless, interviews with bus operators suggested that there was little consensus on the issue among the group most affected by this initiative,

and that many operators were not more informed after having gone through the process required of them to. This is but one example of where data from multiple stakeholders helped achieve a more complete understanding of issues.

Table 4.6 below describes the interviews conducted in support of this research. I include in this list the preliminary interviews conducted with industry experts, as well as interviews conducted with actors at other organizations, which informed this research and helped validate research instruments. Along with the name of the organization and the number of interviews conducted in each, I also show the organizational areas and ranks of the informants.

TABLE 4.6
DESCRIPTION OF INTERVIEWS

	San Francisco BART	Montreal STM	Portland TRIMET	Other organizations	Consultants and experts
# of interviews	9	8	8	7	4
Organizational area	Board of directors	Sustainable development team	Office of the General Manager	Sustainability executive team	Department of Transportation (US)
	Strategy	Strategic planning	Capital projects division	Marketing	Universities McGill & Concordia
	Operations	Marketing	Sustainable development core team		
		Operations			
Ranks	2 Directors	3 Senior managers	1 General manager	1 CEO	1 Deputy Administrator
	2 Senior managers	1 Manager	3 Senior managers	1 General manager	1 Industry consultant
	2 Operators	2 Operators	1 Manager	2 Senior managers	2 Transportation researchers
	3 Users	1 User	1 Operator	1 Operations employee	
			3 Users/ community	2 Users	

4.5.4 Observations

To further inform the research, I used direct observations at all three organizations. As noted in table 4.7 below, observations fall in two primary categories: (a) public meetings such as those held regularly by the board of directors as well as occasional planning consultations, and (b) observations of the functioning and utility of the public transit means in each area. Observations during public meetings were audio recorded, if allowed, and supplemented with research notes taken during and immediately after the meetings. Table 4.7 outlines

the types of observations conducted along with the times and places of those meetings.

I was motivated to conduct observations by the necessity to triangulate findings from interviews and documentation, and to moderate any social desirability effects from organizational discourses. I should note that the most informative arenas to conduct observations were the public board and planning meetings, where all stakeholders were invited to express their claims in a structured format. It was during these meetings where I could further validate to what extent environmental policy was a result of stakeholder pressures or internal to the organization. Overall, stakeholders were mostly concerned with operational aspects of transit, such as availability and timing, affordability, locations and appearance of stations and lines, along with accessibility of transit to disadvantaged populations.

TABLE 4.7
OBSERVATIONS CONDUCTED

OBSERVATIONS				
Organization	**Occasion**	**Documented on**	**Date**	**Duration**
TRIMET	BOD meeting	Research notes + recording	2011-02-23	180 minutes
	Light-rail ride	Research notes	2011-02-21	60 minutes
	Bus ride	Research notes	2011-02-02	30 minutes
BART	BOD meeting	Research notes + recording	2011-02-24	210 minutes
	Planning meeting	Research notes	2011-02-26	120 minutes
	Light-rail ride	Research notes	2011-02-23	40 minutes
	Light-rail ride	Research notes	2011-02-24	15 minutes
STM	Light-rail ride	Research notes	2011-02-12	60 minutes
	Bus ride	Research notes	2011-02-12	30 minutes
	BoD meeting	Research notes	2011-02-02	60 minutes
	BoD meeting	Research notes	2011-03-02	60 minutes
TOTAL				**865 minutes**

4.6 Analysis

The starting point of the analysis was a list of codes, which emerged from preliminary data collection in the first phase, matched with relevant terms prompted by the three mechanisms proposed in chapter three. To make sense of the data, I followed an iterative process of content analysis after each interview (Yin, 2003). I coded data for main themes and also looked for and examined any emerging themes. As I repeated data collection and analysis, the iterative process helped with revisions of the coding scheme and allowed for stronger construct definition, validity, and measurability (Miles & Huberman, 1994). At first, I

analyzed the data as a whole and refined the coding scheme. As data about each of the 32 cases emerged, I separated the cases and looked for distinct patterns in each, as well as common reference points. This allowed for a mapping of the initiatives onto the three phases of capability development proposed by Teece, Pisano and Shue (1997). Further inductive analysis of the initiatives revealed six stages, which I report on in the next chapter.

I further looked for interaction among variables on the aggregate as well as on the more granular, case level. This tactic allowed me to observe how the three mechanisms proposed interacted with the emerging stages of capability development. This approach was inspired by Langley's (1999) suggestion to use a *temporal bracketing strategy* when the form of sensemaking sought is to uncover mechanisms anchored in phases. Appendix E shows a mapping of the key mechanisms observed in the 32 initiatives at the three organizations. Appendix F further illustrates a coding tree used in the analysis of Anticipation processes. Note the first and second order themes that emerged from the data. Key words were interpreted as cognitive, behavioral, or affective in the context in which they were used.

As significant patterns emerged, I engaged in the third phase of data collection, when I conducted follow-up interviews and direct, on-site observations. These helped refine the emerging model and strengthen the core themes from the previous stages of analysis. Throughout, I used enfolding literature to ground emerging themes in existing theoretical concepts. During the last phase of data

collection, I confirmed any missing details from the previous rounds, checked facts and triangulated data as necessary. At this stage, many of the themes that had emerged in previous rounds of analysis appeared again. Moreover, the stories recorded on earlier data collection phases came up again, leading to the conclusion that, on the topics explored in this research, I had reached saturation of data.

4.7 Strategies for reliability and validity

Table 4.8 below shows the strategies I used in this study to improve reliability and validity of the measures and data. To ensure construct validity, I used multiple sources of evidence, as suggested by Yin (2003). I explained how data from several sources was gathered and employed in this study. The multiple sources of evidence also facilitated the specification of a chain of evidence, and matching with emerging patterns (Yin, 2003). Finally, to further enhance construct validity, I conducted a pilot study at another organization and validated the instrument before proceeding to utilize it at the three focal organizations. Finally, all informants have been assured anonymity and confidentiality for their participation in this study.

To enhance external validity of the study, I used a replication logic throughout the data collection process. This was aided by a case study protocol, which ensured consistency between the approaches at the three organizations (Yin, 2003). Finally, to improve reliability, I developed a case study database and also asked selected informants to validate a brief narrative of the emerging case.

TABLE 4.8
STRATEGIES FOR RELIABILITY AND VALIDITY

Tests	Strategy employed
Construct validity	Used multiple sources of evidence (Yin, 2003) Established chain of evidence (Yin, 2003) Matched patterns (Trochim, 2000) Conducted pilot study, assured anonymity and confidentiality
Internal validity	Pattern matching (Yin, 2003)
External validity	Used replication logic in multiple case studies (Yin, 2003)
Reliability	Used case study protocol (Yin, 2003) Developed case study database (Yin, 2003) Asked informants to validate case narrative

To conclude, the purpose of this chapter is to show that the questions asked at the outset are aligned with the most appropriate research tools. I provide details on the methodologies used to answer the questions of this study. I justify the choice of the research design, by explaining that multiple case studies method aligns with the aims of this thesis and is the most appropriate method to answer questions of the depth and complexity as those asked here. I then provide detail on the research context, sampling procedures, data collection, analysis and strategies for reliability and validity. In the next chapter I report the findings of the research.

Chapter 5. Results and emerging framework

5.1 Introduction

This thesis addresses the key areas of capability development and sustainability strategies. The primary research questions are: What explains the link between proactive sustainability strategy and capability development? How do organizations develop generic capabilities once they formulate a proactive sustainability intent? What are the mechanisms and processes of capability development? The primary interest of the study is to understand how capabilities are developed by organizations, and the foundation of this inquiry is the theoretically relevant and empirically proven link between capabilities and sustainability strategies. As shown in chapter two, extant scholarship establishes convincingly the link between capabilities and proactive sustainability strategies. The purpose of this thesis is to examine in depth and understand what makes this link possible. In this chapter, I report findings from three organizations and 32 sustainability initiatives in the public transit sector of North America.

To link this chapter with the theoretical considerations developed in chapter three, I should briefly explain that the model that emerges from the analysis of the data is more complex than what I had projected in the mapping of broad mechanisms of capability development. Specifically, while I found empirical support for the existence and importance of the three process mechanisms of

anticipation, actor involvement and change, the results show that these mechanisms are part of a broader process of capability development, and their role is to moderate the progression from one phase to another and the respective relationships along the way. The expansion of the theoretical considerations from chapter three was possible due to (a) the exploratory and broad nature of the constructs, and (b) the iterative nature of the analytical process, which allows the researcher to move between data and the existing literature.

The chapter proceeds as follows: results of analysis are presented in five sections below. First, I discuss the phases and stages that link strategy to capabilities. Second I recall attention to the role of the three process mechanisms, as they manifest in the empirical investigation. Third, I present the framework that emerges progressively during analysis, which includes mechanisms of anticipation, actor involvement and change as moderators. Fourth, building on this framework, I suggest a typology of organizational capabilities that organizations can develop depending on the initiatives they pursue. This final step provides a significant refinement of the dynamic capability framework and justification of the contributions of this thesis to the literatures it is informed by. Finally, I present some unanticipated findings with notable implications on the applicability of the resource-based view in public sector contexts.

5.2 Phases of dynamic capability development

5.2.1 An extension of the dynamic capability framework

To understand the dynamic elements in the relationship between proactive sustainability strategies, initiatives, and the development of organizational capability, the data analysis relied on the framework developed by Teece et al. (1997). Specifically, I plotted the various themes that emerged from the data along the three phases of dynamic capability development: Sensing, Seizing, and Reconfiguring (described below in Table 5.1). As I advanced in the analysis, it became clear that the development of initiatives corresponded with Teece et al.'s process. At the same time, as interrelationships emerged, I noticed that themes clustered around sub-themes. For each phase, two specific stages can be described. Table 5.1 provides a description of the phases in the framework of Teece et al. (1997) on the left side, and the stages that correspond to these phases that emerged from data analysis in this study, on the right.

TABLE 5.1
PHASES AND STAGES OF DYNAMIC CAPABILITY DEVELOPMENT

Teece et al. (1997)		This study	
Phase	**Description**	**Stage**	**Description**
1 Sensing	Direct internal resources toward new technologies, tap into innovations along supply chain, learn about innovations in sciences	1 Identify opportunity	Develop systems to learn about opportunities inside and outside the organization. Create structure to aggregate ideas.
		2 Determine rationale	Assess rationale for each initiative, and understand the impacts on efficiencies, reputation, and socio-environmental performance
2 Seizing	Develop customer solutions, business case and protocols for decision making	3 Select initiative	Select initiative based on criteria evaluated at earlier stage and develop parameters of implementation
		4 Deployment	Implement initiative and make any necessary contingency adjustments
3 Reconfiguring	Govern change, decentralize structure, continuous learning	5 Formalization	Initiative is formalized within the organization. The successful development of valuable organizational capabilities informs further refinements and of the initiative
		6 Reinforce strategy	Successful deployment of the initiative reinforces the strategy renewal and legitimizes sustainability strategy internally and externally

5.2.1.1 Sensing opportunities: From strategy to initiative

The dynamic capability framework developed by Teece et al. (1997) shows that in this phase, firms develop processes to direct internal research and development and select new technologies, which tap into innovations developed along their supply chain, or in exogenous science and technology. Analysis of data from public transit authorities, specifically of the 32 initiatives examined, shows that there are two broad stages that occur during this phase, in which organizations identify opportunities and determine the rationale for investing in specific initiatives.

Stage 1 Opportunity identification. At this stage, ideas for initiatives can come up from anywhere, either inside or outside the organization. In fact, all three organizations claim that they have become very sensitive to inputs from anywhere, having realized that the pace of change and development in the area of sustainability is fairly rapid. The primary aim of the organization at this stage is to maintain awareness of possibilities, and encourage contact with possible collaborators, whether the supplied opportunity is pursued or not. Also, two of the three organizations describe distinct before/after scenarios regarding their approach to opportunity identification. Before sustainability was put on the strategic agenda of the organization, ideas did not move as freely, or had not clear direction. Often, ideas would be lost simply because the reporting structure did not enable opportunities to be identified outside the executive core.

After sustainability was placed on the strategic agenda, a structure was also created to funnel ideas up. Of the three organizations, two have created sustainability core teams, which report to executive leadership. The teams are cross-functional and their purpose is to integrate sustainability in all areas of the organization, to the extent that this is feasible. The third organization does not have a sustainability team, but a structure was formed, which consists of sustainability committees at the executive level, where board members and managers participate. The importance given to sustainability issues in the organization is clearly demonstrated by the major structural shift created to take advantage of new and innovative ideas from anywhere. As one executive put it:

> "Where do ideas come from? Right now they come from practically anywhere. We have internal structure, a sustainability action plan and sustainable development policy. Also, people, our employees have an interest in these issues — we have had sustainability champions here for the last 20 years. […] We also listen to ideas from our customers. The Québec society has been concerned with these [environmental] issues for quite a while. Our website, Society in Motion [.org] was created as a platform for ideas to come from anyone anytime."
> (Interview, August 17, 2010)

To sum, the data suggests that organizations are aware of the importance of strategic opportunities that can improve their competitiveness and have created structures and procedures to sense them. The primary levers at this stage are represented by multiple forums, internal and external to the organization, where stakeholders can contribute ideas, and by specialized cross-functional structure, able to understand the strategic implications of new opportunities brought forward.

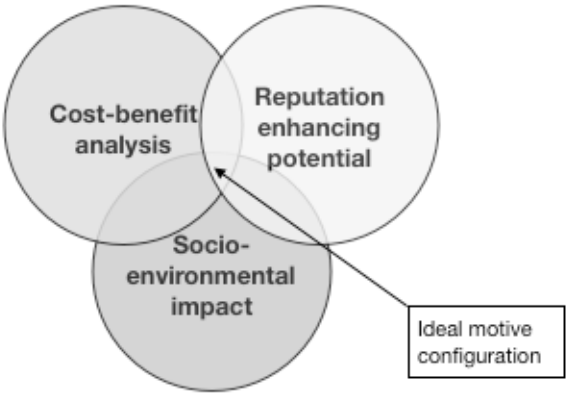
Stage 2 Determine rationale. At this stage, the organization sifts through ideas and opportunities generated internally or brought up by external actors, and aims to determine a rationale for initiative selection. What emerged from the data of the three organizations was a clear set of criteria they employ. These criteria are grounded in three areas of the firm. First, a favourable cost-benefit analysis is more likely to lead to initiative adoption than an unfavourable one. The mandate of organizations in the public transit sector is not geared towards engaging in broad socially responsible activities without some operationally justified output. Second, the socio-environmental impact is examined and a favourable analysis in this area is more likely to lead to initiative adoption than an unfavourable one. Public

transit organizations have long been required by regulators to produce environmental reports for all major projects they engaged in. For example, plans for rail line extensions are usually accompanied by ample evaluations of the impact to natural habitat, geology, and social factors. Third, the reputation enhancing potential of the initiative is also taken into consideration, and projects with higher such potential often receive more consideration.

For most of the strategic initiatives examined in this study, informants at the executive and senior manager level of the organization highlight an ideal motive configuration, where the three criteria discussed above are met in a significant way. Figure 5.1 below illustrates this ideal motive configuration, which, if achieved, forms an important part of the decision making process. All things being equal (e.g., regulatory environment, external economic incentives, other pressures), proactive sustainability initiatives are more likely to develop when the three rationales can meet in a complementary way. One of the executives interviewed for this research provides an illustration of how these three rationales are taken into account. Notice how the informant employs a rationalization process, which highlights the interconnectedness of the three criteria.

> "There are some board initiatives too. Staff has their mission, they have their wish list (for example there's an escalator department), but the board has a more global view of the organization. Sometimes there's a public relations aspect that the board can see as a liaison between the organization and the community. For instance, we can use an initiative to create employment. We've had energy audits, which identify opportunities for future projects and we go after the ones that make more sense. So, we did this lighting retrofitting for our shop that had a two-three-year payback. So, once we secure an initial investment, that pays off very quickly."
> (Interview, February 24, 2011)

FIGURE 5.1
COMPLEMENTARY RATIONALES FOR INITIATIVE SELECTION



While the criteria are clear, their employment is not uniform. Often initiatives are developed without the organization having achieved a harmonious satisfaction of all three rationales. As I show in the typology section of this chapter, many of the initiatives studied take into account only two rationales at a time, instead of seeking to satisfy all three. The only constant is the reputation enhancing potential of the initiative, which is present in either scenario. Apart from that, initiatives often develop having fully satisfied either the cost-benefit or the socio-environmental criteria.

One of the more useful insights suggested by data at the *Sensing* phase is that, initiatives represent the operationalization of organizational policies. The decision to make an investment is what distinguishes organizations that simply formulate policies from those that actually implement them. Therefore, the examination at the level of initiatives allows us to tease out substantive from

symbolic adoption of sustainability values, because we can assess the rationale developed to justify investment in these initiatives.

5.2.1.2 Seizing opportunities and internalizing processes: From initiative to capability

Teece et al. (1997) see this phase as the time when firms develop customer solutions and a business case, determine protocols for decision making, select boundaries to manage complements and control platforms, and build loyalty and commitment. Analysis in this study shows that there are two interdependent stages that happen during this phase, where a specific initiative is selected and deployed.

Stage 3 Select initiative. With all information regarding strategic opportunity and rationale available to decision makers, initiatives are selected. Two competing forces come into play at this stage: organizational structures and resource constraints. Two of the three organizations in this study have sustainability core teams, whose mission is to evaluate initiatives and champion them with the executives and board. When effective, these structures create hybrid dynamics by leveraging grassroots movements with organizational governance aiming to achieve buy-in simultaneously at the higher and lower levels of the organization. Notice the mediating role of the sustainability structure in the quote of one senior manager:

> "[The sustainability core team] has enabled us to have the coordinator program where they suggest ideas to the core team, and we'll be able to indicate what we might be able to do about that and our team leader can be a champion at the leadership level and she will also bring it to the general manager and determine what to do. So [the existence of this team] makes things more organic now than it was previously, so we're building a foundation.
> (Interview, September 20, 2010)

Nevertheless, while many ideas that trickle up have significant merits, the organization cannot undertake all of them. Resource constraints compete with the sustainable structure in the initiative selection stage. Finding the funds and organizational time necessary to implement initiatives is one of the major challenges experienced by organizations. As one interviewer explains, speaking of a new initiative that has not yet been implemented:

> "This is still a vision, and it's the first time, but there's certainly competition for time and energy and attention among the folks that will be doing this work because they're also responsible for all the other project elements."
> (Interview, September 20, 2010)

Another informant, speaking of the constraint on available resources of funds and time, notices a trade-off between improving operational or socio-environmental performance:

> "Let me start by saying that our mission is to provide public transit. That's the way we can be green and sustainable. The most important thing is to get people out of their cars. We could spend all of our money making our fleet, shops, station facilities as green as possible, but that's taking away financing from offering our service."
> (Interview, February 24, 2011)

To sum, initiative selection is a critical stage in the *Seizing* phase of capability development. To arrive at this stage, the organization has already identified opportunities and defined rationales for implementing the initiative. The

two competing forces that come into play in the selection of initiatives are the sustainability structure, which pushes for the implementation of initiatives with a strong socio-environmental potential, and the organization's own constraints on financial and time availabilities.

Stage 4 Deploy initiative. At this stage, selected initiatives are prepared for implementation. The elements that make up this stage are mostly operational, and functionally constrained. The strategic planning unit develops plans, presents them to the board of directors for approval. Funding for projects is sought, either internally, or externally, in the municipality, region or federal granting agencies. Also at this stage, depending on the nature of the initiative, regulation requires transit authorities to prepare detailed reports assessing the environmental, health, safety and economic impact of the proposed activity. Budgets are approved and activities relative to the implementation of the initiative undertaken. When necessary resources of funds, technology and labour are not available to the organization, complementary partnerships are often developed. To illustrate this issue, an executive at one of the organizations explains:

> "For a lot of our sustainable efforts, we need help, through a partnership either with an electricity company or an environmental protection agency, or some grant to incentivize public agencies to take these steps." (Interview, February 24, 2011)

Theories of strategy implementation inform this stage where initiatives are selected and move towards being internalized in the broader context of the firm. As I will show later in this chapter, the successful or unsuccessful realization of an

initiative is decided at this stage, and organizational actors evaluate success using typical by measures of implementation.

5.2.1.3 Reconfiguration: From capability to strategy

According to Teece et al. (1997), this stage is represented by efforts to decentralize structure, co-specialize, govern change and continue to learn. Analysis of initiatives in the three organizations indicates that there are two stages that occur often simultaneously, where the organization formalizes practices and internalizes capability developed to support sustainability initiative, and more broadly, a stage of reinforcement of strategy, based on the recognized capability. This last point is much in line with the resource-based thinking on this issue, where, upon internal analysis, firms develop or renew their strategy based on existing capabilities.

Stage 5 Formalize. At this stage, organizational actors observe the successful implementation of the initiative, and positive spillovers in other area of the organization. The data suggests that in most cases of successful initiative implementation, valuable organizational level capabilities were developed. The positive affect associated with these outcomes help formalize the initiative and help the organizational actors involved in its maintenance to refine it as needed. Explaining the spillover effects of a sustainability initiative, one informant describes

how employees from other departments started to integrate environmental values in their processes:

> "The result of that was, for instance, it helped folks in our maintenance shop come up with ideas for how to use materials that they're identifying and things like that, whereas previously, they did not have that responsibility and ability to identify opportunities."
> (Interview, March 10, 2010)

Stage 6 Reinforce. The successful deployment of an initiative along with the organizational outcomes reinforce strategy renewal and help legitimize the sustainability strategy both internally, among organizational actors and externally, in the core stakeholder group.

> "That was the hope of the P.I.P. [productivity improvement process], and that has now become the TriMet way. We wanted it to be ours more so than this external thing that we grafted on. It's about trying to integrate it as part of everybody's responsibility and we do have these core teams for that."
> (Interview, September 20, 2011)

The reconfiguration stage is powered by the positive affect associated with observing organizational benefits of sustainability initiatives, when successfully implemented.

In summation, the application of the dynamic capabilities framework (Teece et al., 1997) to the case study data allowed me to identify six stages that link an organization's proactive sustainability strategy to the development of capabilities. These stages are chronologically ordered and interdependent. To specify what distinguishes successful from unsuccessful development of capabilities, in the next section, I extend the dynamic capability framework to include the moderating role

of three complementary and interrelated mechanisms, relevant to the themes that emerged from the data.

5.3 The moderating role of capability development mechanisms

In chapter three, I developed a discussion around three loosely defined mechanisms. These mechanisms were derived as answers to questions asked by scholars theorizing along the resource-based view and the dynamic capabilities perspective. To understand *what* considerations are made regarding new initiative development, I discuss *processes of anticipation*. To understand *who* are the responsible actors for initiative development and what is their interaction, I suggest *processes of actor involvement*. Finally, to investigate *how* initiatives developed, I propose *processes of change*. At a theoretical level, these themes paint in large brush-strokes. Their nature, as laid out in chapter three, is exploratory. The purpose of this section is to show how these mechanisms surfaced in the data.

5.3.1 Emergent first- and second-order themes

Analysis confirmed that these themes are present in the dynamic capability development process in the context of proactive sustainability strategies, in the cases of all three organizations. Analysis further reveals a number of sub-themes associated with each and their respective sub-processes. Table 5.2 below describes the first and second order themes that emerged from the case data.

Representative quotes are also provided to illustrate the themes and the coding scheme used. While data confirmed the presence of the three core themes, this table contrasts the discussion from chapter three with findings from the data, showing the relevant sub-themes for each category present in the study.

TABLE 5.2
QUALITATIVE CODING SCHEME

Theme	Sub-theme	Representative statements
Anticipation processes	Cognitive	We scan for factors which significantly impact any transportation-related initiatives outside the control of the organization, such as gas prices, macro economics, nationwide trends
	Behavioral	But as far as sustainability goes, we're working cooperatively with a few other agencies, bargaining on the possibility to develop industry-wide standards.
	Affective	As we were preparing to launch the program, we could tell that there was some excitement and interest and pride around these practices and a recognition for their potential.
Actor involvement processes	Board	There are some board initiatives too. Staff has their mission, they have their wish list, but the board has a more global view of the organization. Sometimes there's a public relations aspect that the board can see as a liaison between the organization and the community. For instance we can use an initiative to create employment. We've had energy audits which identify opportunities for future projects and we go after the ones that make more sense. We have a committee where we talk about ideas. there're four directors on this committee, and it's a testing ground for different ideas.
	Executive	Our previous general manager along with our sustainability executive, who he brought in, was a strong leader on this issue. Since the beginning they made one of our strategic priorities to be an environmental leader and it's broadened into sustainability. He sees the social economic roles that transit plays in the community, both as a service and as employer and he's done a lot to focus on minority and disadvantaged enterprises, to get them engaged with our projects and helping the local economy.
	Managerial	The idea came from one of our managers. It's his passion. He sees pockets in the organization not adhering to the same standards, and came up with a way to coordinate things, and it works.
	Staff	Many initiatives in this area are staff driven. Some are just so obvious, or there's a grant opportunity that staff knows about. So, they drive the efforts in developing around that.
	Non-organizational	We use public hearings to consult on things from route changes to more substantive initiatives
Change processes	Incremental	We're looking at a regulator that can be placed on them, so that it responds to the weight on the escalator and it reduces the voltage required and will use the appropriate amount of energy to move a few people or if it's packed, so it will vary the engine speed. That will greatly reduce our energy. The downside is the 6 year payback period to invest that money, that will eventually pay off.
	Evolutionary	It took about five years for the program to be rolled out. That program represented an important shift for us
	Radical	There's a provision in the public code to circumvent the long biding contract process, if it's an environmental technology. If we want railroad ties, we have to publicly bid it out for anyone who wants to bid on that, we have to go through a public procurement process. if it's clean energy project, we can call a more informal bidding process, which is a lot more accelerated. That's the one loophole in the public bidding contract which allows us to move more quickly on some new ideas.

Anticipation. How do organizations engage with the future? Chapter three identifies *anticipation* as a composite construct, which includes activities such as

forecasting, scanning, and preparation, used by organizations in search for salient issues in their external environment. Data analysis indicates that the anticipative component consists of a sequence of sub-components, depending on the level at which these anticipative processes occur. At this point, I submit that the notion of anticipation is grounded on core constructs of strategic management. In a classic contribution to the field, Andrews (1971) elaborated the idea of tracking the changing environment of organizations as the process of obtaining strategic information. I agree with the Andrews's conceptualization of anticipation as a set of processes, which are far from systematic or complete. Evidence in the three organizations also confirms that anticipation represents attempts to build awareness of the external environment as a "continuing requirement for informed choice of purpose" (Andrews, 1971: 60). Furthermore, the study of anticipative processes also confirms Andrews's contention that "strategic decision is never wholly economic in character: corporate strategy is much more than a series of product-market decisions (1971: 72).

Data from the three public transit organizations in this study shows that organizations engage in different types of anticipative processes: cognitive, behavioral, and affective. At the cognitive level, organizations use systematic methods to scan and make sense of stimuli in their external environment. Strategic planning departments of all three organizations are typically most involved devising analytical tools and preparing reports regarding trends in the external environment.

At the behavioral level, organizations engage in activities as a reaction to stimuli from the external environment. The behavioral component may or may not be supported by findings from the analytical tools used previously. Often, organizations perceive a sense of urgency regarding certain stimuli, and engage in activities despite lack of deep analysis, simply because they wish to take advantage of a trend they perceive to be pressing. At one of the organizations, senior managers perceived an opportunity in partnering with another agency for a grant, and they did so with little prior forecast.

It was surprising to find that there was a significant presence of affective elements in how organizations anticipated. Moreover, this element was integral to initiative deployment and significantly linked to implementation. At the affective level, a sense of anticipation is built in employees and consumers, around new initiatives. Employees were described as experiencing pride and excitement about certain new initiatives. Organizations also use the affective element when redesigning services, taking into consideration the perceptions of the community. There is an implicit understanding of the role of affect in the successful implementation of new initiatives, and organizations take it into account. This appreciation is illustrated in the quote below, from an executive, who explains an important shift in how the organization sees its customers:

> "Our challenge is to provide an attractive, convenient, reliable option that people can feel good about either because it gives time in their day to read, or do other things, or to have more exercise or to feel good environmentally about doing it. "
> (Interview, March 10, 2010)

Organizations also understand that generating affective anticipation requires them to have a sense of timing, and insure that customers or employees have not reached saturation, or are simply unwilling to absorb new information or new initiatives. A senior manager describes this concern when asked about the challenges relative to implementation when multiple initiatives are being deployed:

> "[The challenge is] keeping things fresh, because there is a risk of diminishing returns. Where, for a while, we were doing quarterly campaigns on various areas, for a while we were focusing on various themes. But as you do that year after year you are trying to keep the content fresh. And, I think we saw that there was less uptake, partially because things were getting accomplished, but also because people saw that they had done that, they've seen this before. So I think another challenge is to continue to keep things fresh."
> (Interview, February 22, 2011)

In summary, I should reaffirm that organizations use processes of anticipation as a way to engage with their perception of the future and develop matching initiatives. The research indicates that these processes can be of a cognitive, behavioral, or affective nature. In other words, organizations may use highly analytical tools, such as quantitative models and forecasts; they may simply engage in actions without much foresight; or they may engage stakeholders affectively, to ease the implementation of a new initiative. In the section below, Table 5.3 shows how each type of anticipative mechanism comes into play during the six stages of initiative development. For the time being, let me conclude by saying that the concept of anticipation as described here, serves to validate a mechanism of capability development in the empirical context. Theoretically, it

provides an organizing framework for tools proposed by scholars of strategic management, around the question: How do organizations engage with the future?

Actor involvement. The actor involvement element builds on the notion advanced by Bower that "companies are not homogenous monoliths of interchangeable technocrats" (1970: 324) and that they acknowledge the role of specialization inside and outside the organization. In chapter three, actor involvement was put forward as a variable for investigating how the organization engages with actors inside and outside its core in the selection and deployment of new initiatives. Chapter three builds on existing literature on these issues and highlights broad categories of actors involved in the creation and deployment of initiatives. I distinguish actor involvement from other constructs by explaining that these processes refer to deliberate actions undertaken by organizations to involve specific actors, as needed or required by the stage of initiative. In this section I report on the categories of actors that were confirmed in the empirical context of sustainability initiatives in public transportation organizations.

To explore the question of how organizations involve relevant actors in the development of sustainability initiatives, I asked two complementary sub-questions: Where do initiatives start? and, How do ideas move within the organization? The purpose of this inquiry was to not only capture the genesis of an idea, but also to understand the interactive forces at play. Table 5.2 above shows evidence for the first question, where informants expressed the locus of ideas for selected initiatives.

Five categories of relevant actors emerge from the data. At the time of this study, all three organizations seem to have created sensing mechanisms such that an idea can be generated anywhere in their space of awareness. The issue of values comes into play at all levels, where an environmental or social mindset drives any actor to pursue some form of advocacy for an improvement. As such, board members with an interest in sustainability drive ideas downward, as do executives. At one of the organizations, the general manager had a background in environmental sciences, and came in with a vision to turn the transit authority into a national leader within the space of five years. As a result of this clear direction, many initiatives were implemented during his tenure.

While board members and senior managers have an important role and authority to shape firm strategy, the role of lower level managers, staff, and non-organizational actors cannot be understated. Research has shown that employee buy-in is critical to successful implementation of strategies (Huxham & Vangen, 2000; Ryals & Knox, 2001). Similarly, all three organizations are attuned to ideas brought on by staff and non-organizational members. When asked to describe where ideas come from, informants at two of the three organizations identify two periods: one where lower level actors would not be heard, and the present period, when they became very sensitive to new ideas. To increase exposure, one of the organizations devised an Internet portal independent of its regular web presence, which allows anyone to submit ideas, including staff, riders, and community members.

While ideas may be brought from anywhere, an important distinction should be made based on the type of initiative identified. Results from this research suggest that upper level actors (e.g., directors, senior managers) are responsible for broad strategic ideas, with deep impact in both the organization and the community. For instance, the investment in a large photovoltaic field or sustainable capital project investments were ultimately top-level initiatives. Conversely, initiatives that essentially lead to high organizational impact, such as operational improvements to a bus body workshop or installing efficient lighting, are generated at lower levels of the organization, and trickle upward for approval and implementation planning.

To capture the interactive forces at play in initiative implementation, I asked informants and searched the archives for clues on how initiatives move within the organization. It became clear that no matter where an idea started, it seldom remained there for implementation. As discussed earlier, in the *initiative selection* stage, the sustainability core team aggregates ideas and makes a case for their further development. Beyond this level, initiatives are implemented by the appropriate actors. To illustrate, an initiative may start with non-organizational actors who provide feedback, then move through staff toward the sustainability core team, which assess its fit, is championed by a senior manager in front of upper echelons for approval and funding, then moves to managers and staff for implementation and tracking.

This research suggests that organizations can develop a strategic and deliberate approach to actor involvement processes. When successfully implemented, initiatives benefit from a purposeful match of the various stages of development with the most appropriate actor. Meanwhile, when initiatives are not successfully implemented, it is usually due to a poor match between actors and stages of development.

Change. Regarding change processes, data shows that organizations differ in how they approach change depending on the stage of capability development explained earlier. The perspective on change that emerges is one of deliberate change mechanisms, where organizational actors employ tactics relative to the type of change they wish to achieve. This approach differs from the change as a natural occurrence, observable through investigation over time, in that it assumes a deliberate role for organizational actors to align their objectives with specific timelines. This approach builds partially on the work of Hart and Milstein (1999), which empowers organizations to create change, not simply observe it.

In this study, I applied a focused approach to change, seeking to understand how long initiatives took from idea to implementation and the type of change that resulted. There was great variety between the 32 initiatives in the length of time they required from idea to investment. Some initiatives were implemented in under six months, while others took three years or more. The length of time depended on the required investment, and breadth of organizational areas affected

by the initiative. For example, some fuel conservation measures are relatively inexpensive to implement and do not require the involvement of many departments. On the other hand, an initiative like the Disadvantaged Business Enterprise program was a long-term, significant financial commitment, which involved most departments over time.

An important element emerged from the data, regarding the continuity assumption about this change. It appears that the type of change observed varies with each phase of initiative development. This was a surprising development, as I expected to see variability in change types between initiatives, and not within each initiative. The analysis suggests that organizations can utilize change processes in a strategic way, as they move along the phases of dynamic capability development.

5.3.2 Stages and processes — The moderating role of capability development mechanisms

As part of the analysis of 32 initiatives employed by the three organizations, I looked for interactions between the three broad themes, their sub-elements and the stages of capability development explained in the previous section. In Table 5.3 below, I show how, for each stage of capability development, a dominant mechanism is employed by the organization. This became apparent by looking at the frequency of each theme in the context of stages discussed by informants, described in archival data, or observed during public meetings.

TABLE 5.3
PROCESSES OF DYNAMIC CAPABILITY DEVELOPMENT

Phase	Stage	Primary mechanisms employed		
		Anticipation	Actors	Change
Sensing	1 Identify opportunity	Cognitive	Any	Incremental / evolutionary
	2 Determine rationale	Cognitive	Executive, Board	Incremental / evolutionary
Seizing	3 Select initiative	Behavioral	Executive, Board	Evolutionary / radical
	4 Deployment	Behavioral	Managers, Staff	Evolutionary / radical
Reconfiguring	5 Formalization	Affective	Managers, Executive	Incremental
	6 Reinforce strategy	Affective	Executive, Board, Non-organizational	Incremental

Analysis indicates that the three broad mechanisms display a moderating effect on the capability development process. Further analysis shows that certain sub-themes within these mechanisms are more important than others. For example, in the opportunity identification and rationale construction stages, organizations utilize a form of cognitive anticipation. Meanwhile, when they move on to selecting an initiative and deploying it, they engage behaviourally. At the formalization and reinforcing stages, they utilize tactics meant to build an affective response in customers or employees. To illustrate, Portland's Disadvantaged Business Enterprises initiative was developed based on careful forecasting, and an understanding of the possibilities to build TriMet's local standing, along with efficiencies and a positive social impact in the community. In the deployment stage, the organization engaged in specific investments bargaining on additional government support. Finally, with a successful first run, there was a positive affective response in the community and among employees, in anticipation of

further similar projects. Since the first iteration, the Disadvantaged Business Enterprises has become a framework used by TriMet to advance major construction projects in the community, becoming part of a dynamic process where new capabilities reinforce strategy.

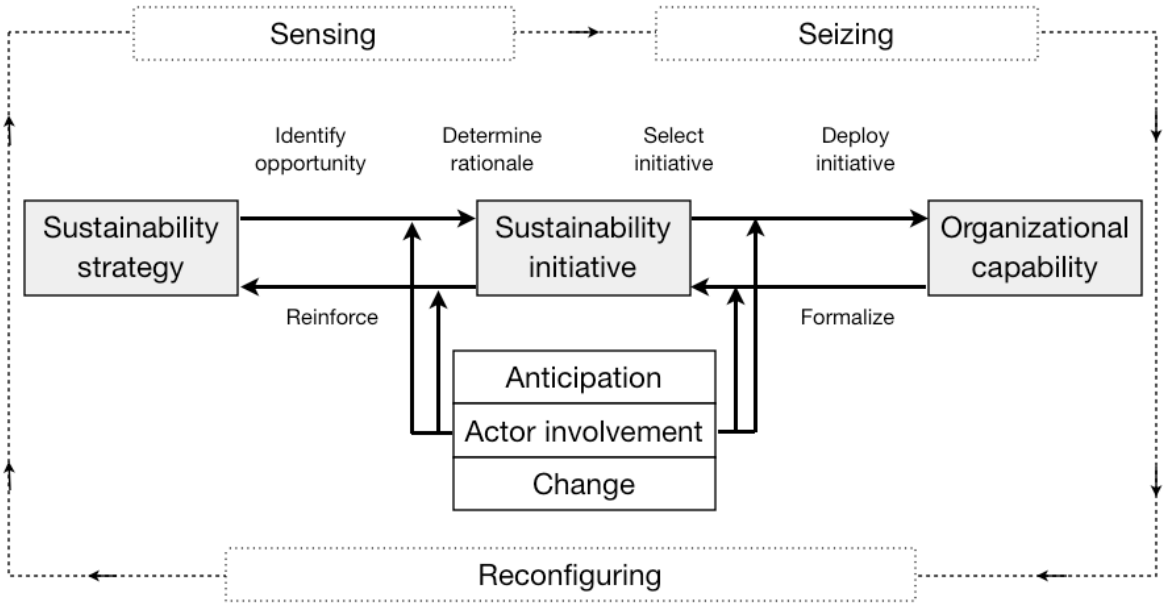
It appears then, that the processes of anticipation, actor involvement and change display a moderating role on the development of capabilities. These processes intervene at various stages in the capability development process, and either improve or diminish chances for successful development. Furthermore, the processes exhibit a hermetical nature, by which I mean that they cannot be easily unpacked. For example, analysis revealed that, at the opportunity identification stage, organizations used primarily cognitive tools of anticipation, but other tools (e.g., behavioral) were also employed, albeit, to a significantly smaller extent. In the context of the present study, it is, therefore difficult to prescribe an ideal use of these mechanisms by organizations. What can be stated with certainty, however, is that the three mechanisms appear intertwined with the capability development process.

5.4 Emerging framework for understanding capability development

In the two previous sections I (a) explained how the data is projected against the dynamic capability process and (b) examined the role of three mechanisms of capability development. In this section, I superimpose the two images to create a

multi-dimensional view of the dynamic capability process. Essentially, I propose that the three moderating mechanisms represent dynamic pieces of a larger process. Figure 5.2 shows how the various findings of this study fit together in the emerging framework. Notice on the outer side the three phases of capability development proposed by Teece et al. (1997). At the center of this model are the links between sustainability strategy, initiative and capability, which inform each other dynamically. The six stages of capability development are also pictured. Finally, observe the three mechanisms functioning as moderators along the various stages of capability development.

FIGURE 5.2
PROCESS FRAMEWORK FOR DYNAMIC CAPABILITY DEVELOPMENT



How did this model evolve from the discussion in chapter three? With analysis underway, it became apparent that a model of dynamic capability development was broader and more complex than anticipated. Furthermore, a literature search conducted in tandem with data collection pointed to the suitability of grounding the process variables in the dynamic capability of the firm (Teece et al., 1997), which provides excellent tools for understanding the dynamic nature of processes that lead to the development and renewal of general organizational capabilities. This framework supplements the resource-based view in that it allows for strategy to be part of the process of capability development in a dynamic way, where it provides an organizing context, which may predate the existence of the capability. This possibility is rarely acknowledged in the more performance-driven

resource-based examinations, which model capabilities as antecedents to strategy formulation.

Similar to the work of Hulland (2004) and others, the model that emerges here is one where a specific organizing context provides the basis for the development or renewal of capabilities in the organization. Hulland's (2004) study links the organizing context of information systems to capability development and shows how investments in technology-specific capabilities may not necessarily lead to competitive advantage, but may be critical to the firm's long-term competitiveness if they help develop other key capabilities over time. Where Hulland's organizing context is the technology sector, the organizing context in this thesis is that of proactive sustainability strategies linked to investments made in specific sustainability initiatives. I justified this choice earlier, saying that sustainability strategies have become central to organizations, as illustrated by the fact that sustainability functions are increasingly no longer isolated to remote environmental health and safety departments, but are strategic functions reporting to top executives. In essence, sustainability strategies have an integrative nature, and allow organizational actors to build around sets of shared values.

The model shown here allows for the possibility that capabilities may develop around the selection and deployment of initiatives, which are sustainability-specific, and may or may not have long-term competitiveness implications. This explains why all organizations studied engage in deep collaborations around developing best practices, standards, and sharing values,

without fear of losing their competitive advantage. The more important point is that, similar to Hulland (2004) these sustainability-specific bundles lead to the development of more general capabilities, embedded in the organization and with long term implications for competitiveness.

Figure 5.2 provides a visual mapping of the model that emerges from the data analysis, where sustainability initiatives mediate the relationship between proactive strategies and general capability development. Building on Teece et al.'s (1997) framework for dynamic capability development, analysis was organized around the three phases of Sensing, Seizing and Reconfiguring. What emerged in the refinement process were six stages that support the successful capability development process, which are, opportunity identification, determining rationale, selecting initiative, deploying initiative, formalizing, and reinforcing of the capabilities developed. The data also provided insights into initiatives selected but either unrealized or realized below expectations, as reported by informants, observations, or documents. There are two broad consequences of unrealized initiatives: no capabilities are developed, or imitable capabilities are developed, with no implications for long-term competitiveness. I discuss this scenario in the section on unanticipated results, at the end of this chapter.

Using the results presented so far, in the next section, I develop a typology of capabilities depending on the initiatives organizations select to engage in.

5.5 A typology of capability development in the context of proactive sustainability strategies

To extend the theoretical insights of this study, I analyzed initiatives and capabilities in context, and aimed, where possible, to find a link between specific initiatives and capabilities. Using this analysis, I was then able to extrapolate from specific to generic, and constructed a typology, which enhances the applicability of the findings. This is a necessary step to refine the theoretical framework and provide some generalizable insights. The idea that a specific initiative will always lead to a specific capability contains little functionality since not all organizations need to engage in the same initiatives. Also, such a prescription would limit the organizational innovation proclivities. Moreover, the scholarly contribution of such attempt would have to be enhanced with a larger sample of initiatives and organizations. Nevertheless, within the scope of this thesis, I was able to investigate and understand the relationship between general categories of initiatives and corresponding sets of capabilities. Accordingly, in this section I use the unit of analysis — sustainability initiatives — and develop a typology of broad capabilities that organizations can develop according to the framework shown above. First, I explain the factors used, then I explain the link between initiatives and capabilities, develop a typology, and, lastly, I discuss the outcomes of unrealized initiatives.

5.5.1 Path dependence and motive configurations

Within the framework developed above, the data indicates that path dependence is set in motion most decidedly when organizations determine the rationale for pursuing an initiative (stage two). In the section on rationale determination, I showed that there was an ideal motive configuration, which brought together perceived socio-environmental benefits, operational efficiencies, and reputation enhancing potential. Data shows that many of the initiatives analyzed achieve an ideal motive configuration, but not all. Often, organizations choose to engage in sustainability initiatives primarily pursuing operational benefits, or environmental benefits, not both. I find that the motive configuration, then, draws a powerful trajectory of path dependence and leads to the development of markedly different types of organizational capabilities. This suggests that rationales have a determinant role in the development of organizational capabilities, because at that stage organizations draw clear path dependencies.

Table 5.5.4 below links the data regarding initiatives realized within expectations with the capabilities developed at the organization level. Some of the initiatives studied do not appear in this table, as they were either discontinued, or realized below expectation. At the end of this section, I discuss barriers, outcomes, and learning from those initiatives as well. Regarding the realized initiatives presented here, note that they were mapped against principal motive configuration,

on the left, while on the right, against the organizational capability they contributed to.

TABLE 5.4
FROM INITIATIVES TO CAPABILITIES

	Primary rationale for initiative selection	Initiatives (realized within expectations)	Capability developed
Q.2	**Organizational impact**		**Operational sensitivity**
		I-2, I-3, I-8, I-24	Cross-functional integration
		I-2, I-3, I-4, I-5, I-8, I-24	Product innovation
		I-24	Superior coordination processes
Q.3	**Socio-environmental impact**		**Outward sensitivity**
		I-22, I-26, I-28, I-30	Stakeholder engagement
		I-6, I-14, I-21, I-28	Supply chain relationships
		I-6, I-18, I-22, I-26	Effective communication
Q.4	**Both**		**Contextual sensitivity & renewal**
		I-1, I-7, I-16, I-17, I-20, I-25, I-29, I-31	Business model innovation
		I-1, I-7, I-10, I-25, I-31	Cooperative industry networks
		I-1, I-19, I-29	Standard creation and management

Organizational and socio-environmental impact. In general, initiatives can be matched with a primary rationale. For example, informants indicated that the decision to install high efficiency lighting in new cars was primarily taken because of its potential impact on efficiency. The environmental consideration was acknowledged, but secondary. The initiative appears under this category because

the decision would have been taken even in the absence of a positive environmental impact. Similarly, the decision to launch a web portal that engages the community with the socio-environmental initiatives undertaken, took into account the socio-environmental impact, and would have been launched independently of the organizational impact. Finally, there are initiatives that take both of these logics into account, and informants indicated that an investment would not have been made, had the two logics not been fully recognized. This is illustrated by one of the executives who explains the development of one of the initiatives:

> "Three years ago we put in these plastic railroad recycled ties and we took out the old ones and used them to generate electricity, and we replaced those with ties that last longer and can be made out of plastic jugs, old car tires, and plastic bags so there's less maintenance since their life cycle is a lot longer and they're made out of recycled content."
> (Interview, February 19, 2011)

The illustration shows how the decision was made because the initiative could satisfy environmental and efficiency conditions, and finally provide more value that the existing practice.

Reputation enhancing potential. As is evident in the table above, I do not analyze reputation as a distinctive motive for initiative selection. Data suggests that the reputation enhancing potential of initiatives is seen by organizations as an added benefit of pursuing strategy, and not a separate one. This was surprising, because the sustainability literature contains significant evidence of symbolic adoption of practices (i.e., greenwashing), where organizations invest in a marketing campaign

meant to influence public opinion, but fail to make substantive changes to their practices in a sustainable direction. What became clear during interviews was that executives, senior managers and board members consider reputation-enhancing criteria as instrumental to any of their initiatives. In other words, the reputation enhancing potential is an exit-criterion applied to all initiatives, whether motivated by a socio-environmental or operational rationale. While this is echoed at all three organizations, the executive at one of them makes it very clear:

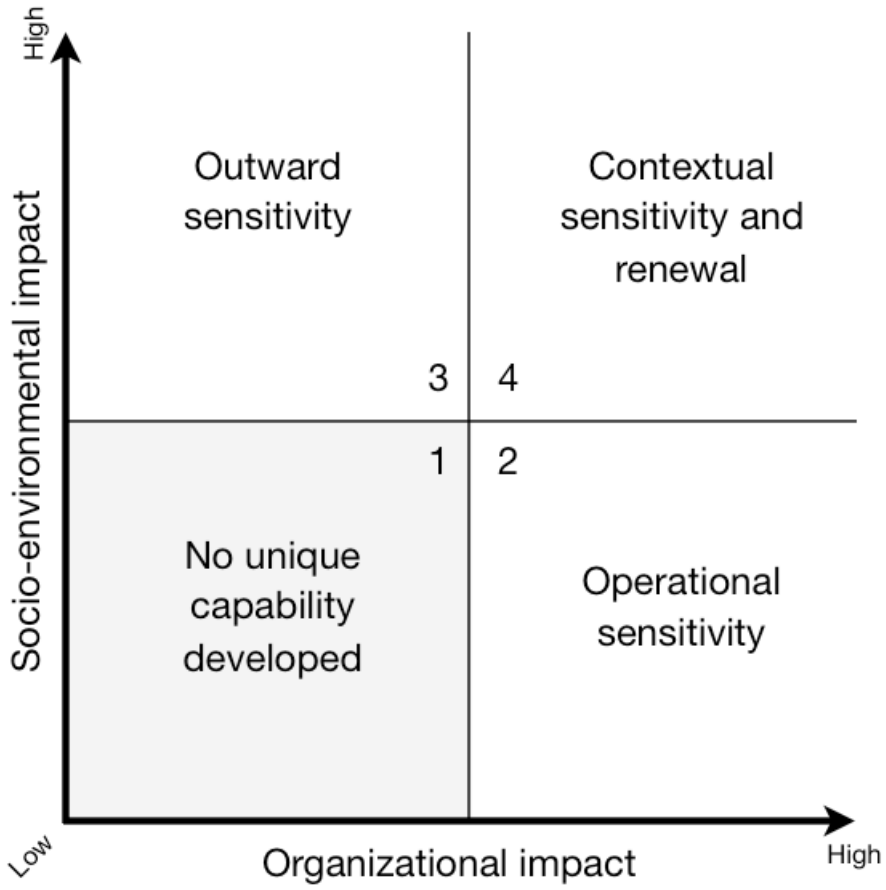
> "There is branding attached to our programs and projects, and that becomes part of the product. Branding is necessary to increase ridership." (Interview, February 24, 2011)

One of the organizations highlights that the reputation enhancing potential was not always a priority. This organization has been engaged in green practices, mostly in conjunction with operational efficiencies, for more than two decades. For instance, employees found that tires from metro cars could not only be recycled, but also retreaded, which would cut costs. They developed necessary skills and technology around this activity. Yet, they failed to communicate their innovations, because they did not perceive these to be of importance at the time. As stakeholders became more sensitive to socio-environmental issues in the last decade, the organization realized that it could capitalize on their existing green innovations, and developed strategies to communicate their legacy of green technologies and commitment to the environment.

5.5.2 From initiatives to capabilities

Patterns in the data indicate significantly relevant links between certain initiatives and capabilities developed at the organizational level. All capabilities reflect a newfound sensitivity on the part of organizational actors. Consequently, depending on organizational impact, I organize these capabilities in three broad areas of sensitivity: operational, outward, and contextual. Figure 5.3 below illustrates the conceptualization of the relationship between motive configurations and types of capabilities developed. The matrix is an appropriate mode of illustration, because it allows for a complex conceptualization of the decision-making reality, where most decisions are rarely monochromatic. Thus, using the sliding scale, envision managers selecting initiatives that build around the parameters of primary decision rationale. Accordingly, any given initiative may contain elements from both motivational components, with one dominating the other. The matrix also allows for the two rationales to be equally important. Let me now briefly explain the four quadrants.

FIGURE 5.3
A TYPOLOGY OF CAPABILITY DEVELOPMENT



Quadrant 1. No unique capability developed. In preliminary data gathering, I came across very few initiatives that did not have some organizational or socio-environmental consideration. This is likely explained by organizations not making these types of initiative public. The very few initiatives, which I coded in this quadrant, did not lead to any unique capability being developed.

Quadrant 2. Operational sensitivity. I define this category as a set of abilities that allow the organization to sense opportunities for continuous improvement in

operational areas. The primary interest here is not to improve socio-environmental performance, though the initiative may lead to positive socio-environmental outcomes. The interest is to improve operational performance. An example of a capability which two of the three organizations claimed to have developed as a result of several initiatives developed was cross-functional integration. The executive of one of these organizations explains further:

> "There's an undercurrent of people that have a focus on sustainability in the organization, so sustainability has brought together a sub-set of our employees for this purpose. They volunteer to setup a matrix that quantifies our greenhouse gas emissions, and plans for the future how will we grow in areas that are potentially unsustainable. So there is a great sense of collaboration among these different departments and people. So in one way it has brought some departments together. [Pause] It is an emerging issue, and it has served as catalyst for some departments to communicate." (Interview, November 15, 2010)

Notice how sustainability initiatives lead to a sense of shared values, which bring together several departments. The sense of collaboration that the executive refers to is an important outcome with potential to extend beyond the boundaries of a sustainability initiative, by facilitating communication among departments.

Quadrant 3. Outward sensitivity. I define this category as a set of abilities that allow the organization to sense potential for performance improvements directed outwardly, at the community and/or natural environment. Organizations using the socio-environmental logic appear to develop a sense of integration within their general environment, which may be superior to other players who do not see outside of their internal performance improvements. Certainly, an organization or

firm cannot survive simply by improving their socio-environmental performance, but, capabilities at this level contribute to their competitiveness, as, increasingly, stakeholders are looking for solutions in these areas. In the debate of substantive and symbolic sustainability actions, stakeholders have become weary of organizations using mostly symbolic means of reputation enhancements. Defying salient stakeholder concerns, some organizations continue to invest in green marketing unsupported by matching substantive investments. In this landscape where stakeholders are becoming educated of greenwashing practices, an important capability for organizations already involved substantively in their sustainability performance is effective communication of these actions.

All three organizations have developed some proficiency in communicating their achievements. Yet, two have also developed strong capabilities for effective communication of their sustainability initiatives, which have a broader organizational applicability. These two organizations integrate the creative strengths of their marketing department with the technical strengths of their engineers and strategists to create campaigns that are focused and grounded in real achievements, and are close to facts as possible in communicating about socio-environmental impact. A senior manager involved in overseeing communications and integrating the various perspectives explains:

> "Our mission is to sell seats on the bus and metro. So, we are sensitive to what people want to hear and the environment in general. But when it comes to marketing, we need to be careful. There is an internal reality and there is selling. We can't say things that are unjustifiable scientifically. There is the image factor, and there is the accounting. We use environmental

> accounting to ensure that our messages are accurate. We even include our calculations on the website, so people can check."
> (Interview, August 18, 2010)

Quadrant 4. Contextual sensitivity and renewal. I define this category as a set of abilities that allow the organization to sense how the interaction of organizational and environmental contexts can provide new and valuable opportunities. Perhaps the most important general outcome I observed of capabilities in this category is that it provides them with a keen ability to match opportunities with solutions. One of the more important capabilities developed by organizations in this area is business model innovation. Through business model innovation, organizations are able to redefine the scope of what they can do, and seek new revenue streams. A senior manager at one of the organizations illustrates how their engagement in one of the sustainability initiatives lead to a new way of thinking about their activity:

> "[The initiative] challenged the way we've always done business, the way we just go about our business. We're now ordering new rail, and are having to introduce a lifecycle element, a new way to think; it's not just a purchase of a new rail, but asking how long the new rail will hold up, what happens to it afterwards, where does it come from, how is it maintained? It's introducing that element, asking if there's a better way to do our normal routines. This is a departure from business as usual."
> (Interview, February 24, 2011)

Observe how the ideas carried from one of the sustainability initiatives to permeate multiple decision-making processes of the organization. Furthermore, the impact of this new thinking is quite pervasive, given the importance of an investment in new rail. During data collection for this research, two of the three

organizations were separately involved in negotiating new fleet purchases, as their existing fleets were aging and had outlived initial projections of a useful life.

The purpose of this typology was to show a generalizable link between rationales of initiative selection and capabilities developed by the organizations in this sample. This description can be carried forward to imply that the motive of selection matters because it sets the organization on a path dependent trajectory, which leads to the development of appreciably distinct types of capabilities.

5.5.3 Initiatives unrealized or realized below expectations

It was not the aim of this study to argue that all sustainability initiatives are successful and lead to capability development. Much learning occurs when we understand why certain decisions and investments do not work. Unfortunately, organizations do not eagerly discuss their less successful endeavors. In this study, however, leaders and staff at two organizations candidly discussed some initiatives that under-performed or were simply discontinued. At a third, where executives or managers abstained from commenting, the investigation was supported with information from staff or other actors.

In table 5.5 below I show, for each category of motives, specific barriers which redirected an initiative away from the development of valuable, organization-specific capabilities.

TABLE 5.5
BARRIERS TO CAPABILITY DEVELOPMENT AND UNREALIZED INITIATIVES

Primary rationale for initiative selection	Barriers
Organizational impact	Inability to legitimize new practice Inability to achieve continuity due to lack of organizational resources
Socio-environmental impact	Inability to achieve internal buy-in Coordination challenges Initiative saturation
Both	Inability to create a credible case Complacency

I should bring back the moderating role the three mechanisms of capability development discussed earlier. When asked what brought about the discontinuation of the focal initiative, informants often cited a blend of forces, which suggested a mismatch in the utilization of the three mechanisms. For instance, one of the initiatives failed due to the inability to achieve staff support in the implementation stage. This initiative was meant to produce operational performance improvements and was carried out by staff. Yet the planning around the initiative did not include any representatives from the staff, and failed to capture the parameters that were important to employees. Another initiative was discontinued due to lack of organizational resources. It became clear during interviews that, at the time of investment, the organization had not conducted serious forecasts on the ability to sustain the initiative financially for the time

projected. They had skipped engaging in processes of cognitive anticipation and the affective response was lukewarm.

It was, however, surprising that, in most cases, higher-level managers point to some form of learning as outcome of the initiative, and the possibility of returning to it. At the same time, staff do not have the same sense of continuation or learning, and simply consider the idea to have been put to rest indefinitely. Notice this contrast in the two quotes below, the first, from a senior manager who explains why the initiative was unsuccessful, and what was gained, and the second, from a staff member:

> "…at first, it was very successful. Than people stopped having time, partly because supervisors did not agree to having people take time away from operational duties for environmental initiatives. Also, [the organization] cut the budget for interns, which were instrumental in managing the various activities required to maintain the program. With reduced resources, it become difficult to monitor and control compliance across the organization. So, the initiative hasn't failed, per se, it's just withering on the vine. What we learned [pause] lesson learned from this is that it does provide us with a model for integration across departments, which can be resurrected when we get in better financial health, and have the money needed to engage in these types of activities."
> (Interview, February 22, 2011)

> "I enjoyed the training when it meant time away from work."
> (Interview, February 23, 2011)

While it was not within the scope of this study to understand in-depth whether these unrealized initiatives lead to a capability or not, the reference to learning as outcome of some of the unrealized initiatives is interesting, and provides the basis for developing further research along these lines. Within this

work, the link with capabilities is inconclusive, or, at best, unrealized initiatives seem to lead to capabilities that are not necessarily unique or valuable.

To summarize this section, notice how analysis at the three transit authorities lead to the development of a typology which clarifies to a significant degree the path from selecting an initiative to developing valuable, general, organization-specific capabilities. In the process, I underscore the importance of determining a rationale, and the path dependent trajectory that leads to certain types of capabilities, which afford the organization some sensitivity, internal, external, or contextual.

5.6 Unanticipated results

5.6.1 Cooperative capacity and its competitive relevance

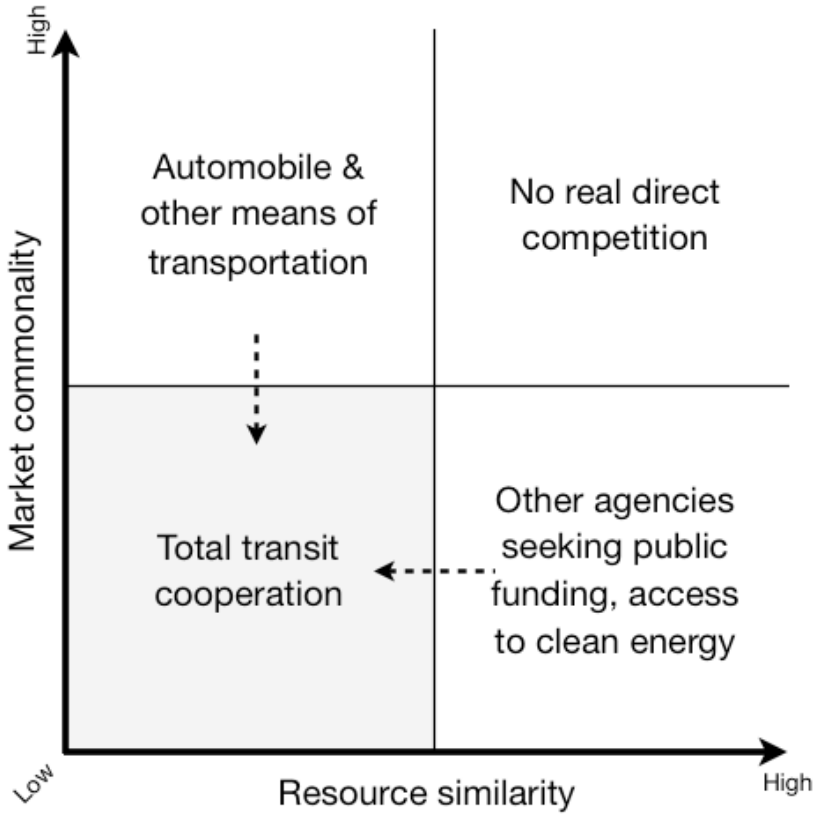
The first and most interesting unanticipated finding resulted from an understanding of how collaborative forces shape the competitive environment of the public transit industry. Figure 5.4 below describes the existing competitive environment. It also illustrates how organizations diminish competition through collaborative strategies. I describe the competitive environment and these collaborative strategies below.

The issue of competition is intrinsic to the resource-based view. Corporate activity typically lends itself easily to discussions of competitive dynamics. On the

other hand, non-corporate entities are not typically used by resource-based scholars in their investigations, due to the more complex nature of their competitive environment. Over the course of this research, I included questions regarding competition simply as a control to justify the usefulness of the resource-based view in a context where competition is not effortlessly operationalized.

Analysis of the data on competition in public transit indicated that, indeed, public transit authorities function in a competitive environment. To understand competitive dynamics, I mapped the data against an existing framework of competitor analysis, as developed by Chen (1996). This framework is singularly applicable in this context, because it expands beyond the notion of rivalry among direct competitors. Ming-Jer Chen (1996) enhanced our understanding of competition with a framework that effectively integrates existing notions of rivalry and resources and enables organizations to tackle a broader set of competitors. The value of this framework is that it widens what we consider competition, by taking into account competitors who provide services and products similar to those of the focal organization, as well as competitors who use similar supplies and resources. This framework is particularly applicable to organizations in the public sector, especially in areas where monopolies held by these organizations obstruct our ability to identify direct competitors. Figure 5.4 illustrates the competitive environment in the public transportation sector, noting that actors in these organizations do not perceive a threat from any direct competitor, though consider themselves in competition.

FIGURE 5.4
COOPERATIVE CAPACITY AND SUSTAINABLE DEVELOPMENT



On the demand side, informants identify competition with other means of transportation. Their aim and competitive actions are targeted at reducing the use of automobiles in their jurisdictions. In some municipalities, this aim is supported by local government policies and market mechanisms (e.g, high parking fees). To a smaller extent, they also consider competition from other means of transit, such as bicycles and motorcycles.

On the supply side, the competition for resources occurs on two primary fields: funding and energy. Public transit authorities compete with other (including

non-transportation agencies), for government grants to advance their projects. In two of the three organizations studied, their operational budget is secured through sales taxes, which afford them some comfort regarding general operations. However, all three organizations describe funding scarcity as an issue when undertaking new projects, especially those of socio-environmental nature. There is also competition for clean energy. Public transit organizations are large consumers of energy and have been relatively successful in bargaining for a lower cost for conventional sources of energy. Nevertheless, clean energy appears to be scarcer, and generates competition among actors who wish to green their supply chain. An executive at one of the organizations explains the competitive market for green energy:

> "There's a big competition for any alternative power source right now. There's [sic!] so many public agencies that want to get a green source of power, that there's a big competition for it. Even if you want to be green, not every agency will have power from wind or other renewable source. Supplies of renewable energy are increasing, but are still not a big percentage of overall energy production." (Interview, February 19, 2011)

Figure 5.4 also illustrates how organizations can move from high to low rivalry positions, whether they compete for market or resources. The example offered is a form of transit-oriented development. This is a generic designation for initiatives, which bring together multiple entities around shared values. All three organizations affirmed an interest and developed programs around transit-oriented development, though the specific programs differed among them. For example, one of the organizations partnered with the local bicycle sharing and car sharing schemes in the municipality, and offered consumers transit options that would

make it easier to move without their individually owned vehicles. Another organization partnered with the municipality parking services and offered advantageous commuting options for individuals willing to park outside of the downtown core. On the supply side, one of the agencies partnered with a developer of green technology, and became co-applicant for a government grant to develop and implement a new green technology.

Perhaps public transit authorities are better equipped than corporations to identify opportunities for cooperation, given that they function toward what is recognized as a social purpose. At the same time, an ever-increasing body of literature on corporate social responsibility is built around the premise that corporations also fulfill social objectives, in addition to increasing shareholder value. Consequently, the finding from this research casts a larger web, underscoring the organizational ability to identify potential shared values in its competitive environment as a valuable cooperative capacity, which may lead to competitive advantage against direct competition.

To conclude, this chapter was structured to show the findings regarding capability development based on 32 initiatives at three public transit organizations in North America. First, I organized the data into six distinct stages, building upon the model of dynamic capability development of Teece et al. (1997). Second, I explained how the three mechanisms for capability development appear in the empirical setting, and showed that their aggregate role is to moderate the various

steps in the dynamic capability development process. Third, I constructed the framework that emerges from the data and observed how it compares with the existing model of dynamic capability development. Fourth, I developed a typology that links initiative selection motives with types of capabilities. This step is an important aid toward generalizability of the findings. Finally, I discussed how cooperative capacity in a competitive context appears as unanticipated yet relevant result in the context of the theoretical development of the study.

Chapter 6. Discussion and conclusion

6.1 Introduction

The idea that organizational capabilities are developed through a deliberate or emergent use of processes is by no means novel. Almost eight decades ago Coase expressed it with reasonable clarity in his respected discussion of distinctions between markets and firms (Coase, 1937). He identified internal properties of organizations and noticed that one of their chief attributes is lack of effective replicability through acquisition and integration in a portfolio of business units, or through formal contracts. This is a line of thought further developed upon by Teece and colleagues (1997), as they show how the replication of distinctive organizational capabilities cannot be achieved simply by entering a market and formulating strategies that take for granted that organizational skills necessary to achieve competitive advantage are simply available to the highest bidder.

Nevertheless, in contemporary strategy research, it is primarily within the last decade that explicit attempts have been made to understand how firms develop capabilities. For the most part, our epistemological legacy has been built on and consumed by work justifying the link between resources, strategy formulation and performance. The study of the link between resources, capabilities and firm performance is certainly a worthy pursuit for anyone working to understand the complex internal environment of the firm, and extant work shows the wide

acceptance of this theory in strategic management (Newbert, 2007; Powell, 2001; Priem & Butler, 2001).

As our understanding of the role of resources and capabilities matures (see upcoming anniversary special issue of the Journal of Management, with a reevaluation by Barney, Ketchen & Wright), questions of serious consequence and depth regarding how firms obtain these elusive bundles remain insufficiently answered. In particular, the central and dynamic relationship between strategy formulation, implementation and capability development, while firmly established, has not been fully dissected. Furthermore, some of the more recent studies continue to offer links instead of dynamic models of the capability development process (Bingham et al., 2007; Danneels, 2008; Ethiraj et al., 2005; Newbert, 2007)

In this thesis, I initiate an investigation to understand how organizations develop capabilities. I ask three related questions: What explains the link between proactive sustainability strategy and capability development? How do organizations develop generic capabilities once they formulate a proactive sustainability strategic intent? What are the mechanisms and processes of capability development? A focus on the role of initiatives helps answer these questions within the scope of the study. Specifically, I show how initiatives mediate the link between proactive sustainability strategies and organizational capabilities. Building on the work of Teece et al. (1997) I extend the dynamic capability framework by deconstructing six stages of capability development and three mechanisms, which act as moderators of these relationships. Perhaps the most important statement made in

this work is that organizations develop valuable, inimitable capabilities deliberately, by employing a powerful and integrative strategic intent coupled with a deep understanding of organizational processes.

6.2 Contributions to theory

6.2.1 Resource-based view

One of the chief contributions of this work is showing why and how capabilities develop, by providing some structure to the notion of path dependency. This refinement builds on elements of dynamic capability development, and significantly extends our understanding of path dependency in the context of proactive sustainability strategies. An added benefit of this work is to strengthen the resource-based view in face of criticism that its explanatory power is marred by tautology. By organizing the stages of capability development and explaining their boundaries, I distinguish more clearly between strategy, process and capability. With regards to the link between sustainability strategies and the resource based view, showing a multi-stage and multi-process framework now strengthens this link. The prescriptive implication of this study is that organizations that invest in and successfully realize sustainability initiatives, have a potential to develop valuable capabilities.

The strength of the framework rests in its multidimensionality, where I captured multiple dynamic processes within a specified closed-loop, observed

previously by Teece and colleagues (1997). The model also suggests knowledge flows built around mechanisms of anticipation, actor involvement and change, where ideas are captured by organizations from virtually any source, internalized and developed through the use of strategic activities and actors. At a granular level, the descriptive power of the model is greatly enriched by the discussion of unsuccessful initiatives. It suggests that the presence of proactive sustainability strategies notwithstanding, some initiatives succeed, others don't. Understanding that the lack of success is often due to the inappropriate use of capability development mechanisms is an important step to improve our understanding of how organizations develop valuable capabilities. The model suggests that discontinued or unsuccessful initiatives do not lead to any significant capabilities.

Another important contribution of this work is to extend the applicability of the resource-based view to the public sector. Peteraf and Barney suggest that the resource-based view can be "useful for non-profit organization and those with a stakeholder orientation" (2003: 321), since value creation is segregated from its distribution. Moreover, Russo and Fouts welcome the use of the resource-based view in the related domain of corporate social responsibility noticing that it "addresses the fit between what a firm has the ability to do and what it has the opportunity to do" (1997: 536). I add to these thoughts an empirical validation of the public sector, by illustrating and explaining the competitive dynamics in this industry. Moreover, findings indicate that public organizations function in a competitive environment.

An important finding with high potential for generalizability is the demonstration of organizational ability to mitigate the level of competition through cooperative strategies. The most effective tool used by organizations has been to build platforms of shared values with some of their competitors. On the demand side, I showed how public transit authorities compete with suppliers of other means of transportation, including automobiles, bicycles, etc. All three organizations acknowledge competition. At the same time, they also reflected on the complementary value offered by each, and consider strategies to take advantage of these complements. What resulted from these exercises of inward and outward reflection was the idea of transit-oriented development, which represents a platform of shared values where organizations meet and create mutual advantages. At the core of this program is a major shift in how public transit views customers. The shift is from transit-seekers to choice riders. They define choice riders as individuals who own independent transportation devices (e.g., car, motorcycle) and are in a position to use them, but choose to also use public transit, for its convenience.

6.2.2 Dynamic capabilities

Using Teece et al.'s (1997) framework as organizing context for the processes of capability development, this study offers refinements in the form of micro processes and moderating mechanisms. The sustainability initiatives, which I propose as moderators between strategy and capability fulfill an important role of

operationalizing abstract policy statements. In the empirical context, we saw how initiatives are a useful unit of analysis because they serve to create an immediate ecosystem of shared values around which a variety of actors and interests gather, cooperate, and find some degree of satisfaction. I distinguish initiatives from other common capability development elements, such as routines. While routines present many theoretical and empirical advantages, they assume a certain continuity and inertia. It becomes difficult to isolate them within a timeframe, and identify how various forces act upon them and change their behavior. Initiatives, on the other hand, allow for an easier identification of genesis, along with the mechanisms which lead to their selection, development, evaluations, and, possibly, discontinuation. In general, initiatives provide a beginning and an end, or a renewal, and are typically free of inertia, because they require organizational resources to be maintained. The sense of finality or clear timeline is methodologically practical, because it also allows the researcher to distinguish between successful or unsuccessful initiatives. As a unit of analysis, the initiative can be contrasted with the organization, which contains a survival motive, where initiatives are not conceived with survival logic.

Another important contribution of this work is to reinforce the dynamic nature of capability development by showing how organizational investment in new initiatives leads to the further development of organizational capabilities. Where prior research typically links capabilities to strategy, in this thesis I purposefully show that the order may be different, where a formulated strategy

leads to the development of capabilities, which, in turn, legitimize the elements of the strategy and inform new formulations. This approach is similar to that used by Hulland (2004), who also develop a dynamic view of capabilities developed as a result of changes in the firm's technological strategy.

The current study provides further evidence that proactive sustainability strategies are central to the dynamic capability debate. Where previous research showed a significant relationship, this study explains what leads to the existence of this relationship. Furthermore, the typology developed in this study provides additional specificity to the kinds of capabilities organizations can expect to develop as a result of their investment in sustainability practices. The three types of capabilities are developed around the notion of organizational sensitivity to it internal and external contexts.

The discussion of anticipative processes on multiple levels confirms emerging scholarship that investigates the cognitive, behavioral and affective components of organizational processes. This study shows that the complex yet understandable processes of anticipation form an important part of how organizations develop capabilities. This representation of the organization as an anticipative actor organizes the strategic management literature around the question of how organizations engage with the future. It further distinguishes the elements that contain known tools such as forecasting, prediction, or preemption.

6.2.3 Sustainability and the natural resource based view

This study is informed by the natural resource based view in the conceptualizations of proactivity. I build on this literature in deciding to analyze the link between proactive sustainability strategies and firm capabilities (Hart 1995, Sharma & Vredenburg, 1998). I further utilize refinements to this framework when operationalizing sustainability initiatives and ensuring that they indeed, satisfy the proactivity condition Buysse & Verbeke, 2003). The study contributes indirectly to this literature, by validating an important relationship, and expanding on how it comes to exist. Moreover, the thesis also calls attention to the importance of sustainability as a strategic imperative. The interplay between sustainability strategies and initiatives in the development of capabilities is shown here as a critical element with strong competitive implications. Most organizations operate in conditions of resource scarcity. If faced with a choice between other strategies, such as alliances or technology, organizations have to decide which has better chances of increasing their competitiveness. This study provides evidence that sustainability initiatives are helpful in developing certain organizational capabilities, and shows how.

A still relevant debate in the sustainability field relates to the issue of substantive and symbolic engagement in socio-environmental practices. I offer ways to operationalize capability development using measurable sustainability initiatives. Investment in proactive programs has been shown here to be a representation of substantive adoption of sustainability, not greenwashing.

Finally, this study validates the public transportation industry as a pertinent setting for sustainability research. While researchers may be reluctant to study an industry which is considered sustainable or contributing to the sustainability agenda by its simple existence, I have shown that the industry itself has a significant impact on socio-environmental issues, and that industry players are aware of their impact and working proactively to minimize it. Several of the organizations investigated in the sample selection process are proactive. However, even the most proactive organizations acknowledge that there are limits to how much they can do. Resource scarcity and bounded rationality determine the types of ideas they can pursue. An overarching theme of this thesis is that sustainability, sustainable development and planning are still young in public transportation. Many transit authorities do not consider this a priority, and many are just beginning to look at their socio-environmental footprint. Moreover, the recent economic downturn and political forces are powerful in shaping how authorities prioritize. These interplays and tensions provide a fertile ground for further investigations.

6.3 Implications for managers

The findings of this research contain several messages, which could benefit practicing managers. I will articulate three of what I believe to be the most important findings expressed in this work: (a) the usefulness of formulating sustainability strategies, (b) how sustainability strategies lead to competitive advantage, and (c) how cooperation can diminish rivalry in an industry.

First, this research contributes broadly to the debate on whether it pays to be green. The findings loosely suggest that indeed, it pays to be green, given that certain conditions are fulfilled. Specifically, it pays to be green it the organization formulates a proactive sustainability strategy. Moreover, a policy should be followed by an investment of similarly proactive nature, which engages the appropriate actors in cognitive, behavioral and affective processes as the initiative unfolds and is deployed. Successfully deployed initiatives have been shown here to lead to the development of valuable capabilities, which have positive performance implications.

Second, this research underscores the importance of perseverance. Path dependence was described as a force that leads from strategic intent to capability development provided that organizational leaders have the tenacity to carry through with the selected project. The findings indicate that unrealized initiatives, or those realized below expectations had no implications for strategic capability development.

Finally, the study confirms that cooperative strategies among indirect competitors have an important effect on diminishing rivalry and competitive dynamics in an industry, with positive performance implications. Organizations in this study used cooperative strategies to reduce competition with providers of similar services, or with seekers of similar resources, such as funding and clean energy. Competition reduction strategies were achieved by finding areas where shared values can lead to mutually useful outcomes for indirect competitors. The

usefulness of this finding is limited in the context of highly competitive industries, since none of the cases reported here were from such contexts.

6.4 Some residual issues and limitations

In the process of analyzing the data and showing findings, some simplifications were made, which should be acknowledged. These refer specifically to the three mechanisms of capability development, suggested in chapter three. I concede that the starting questions and proposed mechanisms are rather broad, and that the resulting framework lacks necessary details in that respect. While, the mechanisms, as proposed, emerge from important questions specific to process research (Pettigrew, 1992), the processes are not entirely new, nor was their measurement trailblazing. Given that research on capability development is budding, I chose to build on existing tools of strategic management to inform the important questions of how capabilities are developed. When faced with the important choice of theoretical contribution, I chose a large canvas, instead of attempting the rather risky yet necessary endeavor of unpacking these rather granular issues.

An important question that often arises refers to the nature of capabilities, where scholars question the necessity to understand how they come into existence. Capabilities are characterized as abstract and tautological and their understanding may not lead to prescriptive outcomes, since an important precondition is their inimitability (Priem & Butler, 2001). To circumvent this critique, I designed the

study around the relationship between initiatives and general firm capabilities, where the two can be separated and studied more easily.

6.4.1 Capabilities and performance

Due to the already complex nature of the methodology employed, the present study does not test the performance implications once capabilities are developed. In the context of early criticism regarding the lack of nomic necessity of the resource based view (Priem & Butler 2001), understanding performance implications of this study would have been a useful element. However, I rely on recent contributions to the theory, which have provided sufficient empirical evidence that there is a significant relationship between capabilities and firm performance (Powell, 2001). Further evidence comes from scholarship focusing on knowledge-based resources (which resemble capabilities), which suggests that these resources cannot be imitated by competitors because they are subtle and hard to understand, involving talents that are elusive, and whose connection with results is difficult to discern (Miller & Shamsie, 1996). Furthermore, the stability of theory was demonstrated by Makhija (2003), who underscores the role of firm resources and capabilities as primary determinant of firm value in rapidly changing environments. Finally, I also relied on the argument of Hoopes, Madsen and Walker (2003) who explain the positive link with performance as a mixture of competitiveness and dynamic capability that regulates the ability of organizations to maintain a superior position in evolving industries.

6.4.2 Regarding generalizability

I accept that there are certain limitations to how much can be extrapolated from the study of public sector organizations, in the corporate domain. The generalizability potential of this work is threatened by the fact that the public sector has different constraints, distinct funding structure, and a lack of profit motive. While these facts are accurate, I attempted to curb the influence of public sector idiosyncrasies by extrapolating from the data, wherever possible. Through the use of frameworks inspired by general organizational contexts (including corporate) (Hart, 1995, Buysse & Verbeke, 2003), dynamic capability (Teece et al., 1997), I went to great analytical lengths to ensure that theory development was not context-specific. I explained this in depth in the section where I develop a typology of general capabilities based on motive configuration.

6.4.3 Sampling issues

The issue of sample choice pertains to explicit or implicit biases in the data that might confound the results. Theoretical sampling required the selection of organizations that already employed proactive sustainability strategies, at the detriment of others, which either formulated reactive strategies, or did not develop a sustainability policy at all. As such, the choice of organizations and the subsequent choice of initiatives was partially guided by the interest to learn lessons

of successful implementation, but may have been influenced by the availability of data, both in the form of documentation and archives, but also the willingness of informants to discuss issues pertaining to these initiatives. Delmas and Doctori-Blass (2010) discuss the issue of positive screening relative to the measurement of environmental performance and explain that problems are often difficult to identify and define, and the structure of thresholds plays a critical methodological role. This remains an important limitation of this work and would probably benefit from further research containing a specific focus on unsuccessful initiatives or organizations.

6.5 Further research

While the study of dynamic capability development and findings reported in this thesis enrich our understanding of these issues, many questions remain unanswered. Moreover, the study uncovered new possibilities and avenues for further investigation. The current study highlighted processes and mechanisms of capability development, but the three mechanisms of anticipation, actor involvement and change could benefit from further specification of the parameters of their behavior. What are the ranges of functionality, and what is the optimal mix?

The research highlighted the importance of anticipation as composite construct helping to organize existing strategic management concepts as tools of organizational engagement with the future. An important question to ask is, What

is the relationship between anticipation, as composite construct, and the tools of anticipation, which are core to strategy? What is the value added of this umbrella construct? The investigation should further describe which are the most effective tools of anticipation and in what context. How can we distinguish between good anticipators and bad ones? Finally, a question not addressed here but of particular relevance would be to ask, is anticipation itself a capability?

This research touches on related literatures, of which, due to the use of actors, the institutional theory may provide informative insights. Further research could employ the institutional theory as an alternative framework to understand the dynamics between firm strategy, capabilities and the link with the external context. Specifically, the use of actors and associated processes of their involvement might lend itself to an institutional analysis in conjunction with capability development. What are the institutional dynamics at play in the development of dynamic capabilities? How can the resource-based view and dynamic capability perspectives benefit from the tools afforded by an institutional lens.

6.6 Conclusion

In this dissertation I explored how organizations develop capabilities once they formulate proactive sustainability strategies. The research calls attention to the importance of engaging in substantial and noticeable initiatives, which match the strategic intent of organizations and provides evidence that such investments create path dependencies that lead to the development of valuable capabilities.

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Appendices

APPENDIX A
SAMPLE OF IDENTIFICATION DATA FROM PUBLIC TRANSIT AUTHORITIES IN NORTH AMERICA

		Montreal STM	Portland TRIMET	Washington DC, WMATA	San Francisco BART	Chicago CTA	Toronto TTC	New York MTA
ORGANIZATION	**Formed**	2002 (1950)	1969	1967	1972	1947	1954	1965
	Public (1) / Private (0)	1	1	1	1	1	1	1
DEMOGRAPHICS	**Metro population**	1,620,693	2,159,720	6,664,195	7,533,384	9,785,747	2,400,000	19,500,000
	Jurisdiction	Montreal	Metro Portland	Metro DC (MD,VA)	Metro SF	Metro Chicago	Metro Toronto	Metro NY, CT
	Density (/sq mi)	11,496	4,288.38	9,316.4	17,243	11,864	10,287	27,532
BUDGET	**Revenue from operations**	50%	20%	57.60%	62%	51%	70%	34%
	Revenue from other sources	50%	80%	42.40%	38%	49%	30%	66%
TRANSIT TYPE	**Commuter/lightrail**	1	1	1	1	1	1	1
	Streetcar	0	1	0	0	0	1	0
	Bus	1	1	1	1	1	1	1
	Paratransit	1	1	1	1	1	1	1
FARE	**Single trip fare**	$3	$2.30	distance-based	distance-based	$2.25	$3.00	$2.50
	One day pass	$8	$4.75	$9	-	$5.75	$10.00	-
	Monthly pass	$72.75	$88	$102	-	$86.00	$121.00	$104
RIDERSHIP	**Ridership (pssngr trips 000s)**	698,273.7	100,707.3	409,843.1	108,275.1	516,873.0	58,216.1	3,237,320.2
	Passenger miles (000s) (2009)	1,947,720	470,377.4	2,108,124	1,442,124	1,940,404	-	11,877,606
SUSTAINABILITY	**Sustainability report**	Since 2006	since 2006	0	0	0	0	1
	Sustainability strategy/ policy	1	1	1	1	1	0	1
	Sustainability structure/exec team	1	1	0	1	1	0	1
	Proactive rating	1	1	0	1	0	0	1
	Sustainability awards	1	1	0	1	0	0	1

Sources: American Public Transit Aassociation Factbook (2010, 2011), Bureau of Transportation Statistics reports (2010, 2011), and individual reports issued by transit authorities (2010, 2011)

APPENDIX B

EXAMPLES OF SUSTAINABILITY INITIATIVES DEVELOPED BY NORTH AMERICAN TRANSIT AUTHORITIES, BY MAJOR CATEGORY

Energy Reduction	Emissions reduction	Community and employee welfare	Recycling programs	Ridership and decongestion	Green construction
Mandate to increase use of biodiesel, hybrid, propane, or ultra-low sulfur diesel compatible fleet	Install particulate filters on buses	Smart (green) driving training program for bus drivers	Retreading tires and use of biodegradable grease on train wheels	Travel smart awareness program - information & incentives to increase use of alternative transportation.	Energy saving escalators
Technology innovations to reduce energy use: permanent magnet motors for car propulsion, ultracapacitors for regenerative breaking	Clean air campaign — reward individuals and employers for sustainability measures	Clean air task force — ambassador program where reps monitor and document emissions in their departments	Use recycled water to wash buses	Ride-share—custom mobility program offering incentives, vanpool lease subsidies, ride-matching etc.	Extensive environmental reporting and community consultation for line extensions and other construction work
Solar power program — increase use of solar energy at facilities	Bus emissions monitoring program	Training program for employees developing environmental and sustainability management system	Recycle antifreeze and cleaning solvents	Found NGO to encourage voluntary efforts in air quality improvement in the community	New construction contains measures of energy efficiency
Head-end power system— allows locomotive engines to be turned off overnight	Limit engine idling time	Bike-to-work week — sponsorship of bicycling initiatives	Scrap metal recovery program	Sustainable mobility transit boulevards — multimodal parkway that runs parallel to freeway	Transit-oriented development program — partnership with communities
Efficient lighting — replaced aging lighting system with new LED lighting	Optimize outside air intake into cars	Employer pass program — discounted transit pass offered to employees through payroll deduction plan	Subway / bus station waste separation and recycling	Host bicycle friendly events to encourage alternative means of transport	LEED construction mandate for new buildings
Use of wind-generated electricity to power transit fleet	GHG footprint tracking system	Transit equity and environmental justice initiative	Comprehensive groundwater program focused on recovery and reuse	Park and ride program development	Daylight controls on lighting systems
Pilot project to develop a model for locomotive engine pollution control devices		Donate-a-ride— fundraising program designed to provide transit tickets to citizens in need	Recycling fluorescent tubes	Equip buses with bicycle racks	Greening of bus body workshop

APPENDIX C.1
SUSTAINABILITY INITIATIVES AT BART, SAN FRANCISCO

	Initiative	Description	Socio-environmental aims
I-1	Transit-oriented development (includes engagement with San Francisco metro)	Broad strategic initiative developed to include sustainability objectives and priorities in new project development, land use and construction, and capital expenditures	Sustainable development
I-2	High efficiency lighting for C1 cars and new cars	Installation of efficient lighting systems	Energy reduction, Product stewardship
I-3	Optimize heating, ventilation and air conditioning (HVAC) in cars	Technology that reduces energy used by temperature control mechanisms in train cars. Multiple improvements undertaken, including direct cooler air to the inlet of condensers, install high efficiency units, optimize outside air intake into cars	Energy reduction, Product stewardship
I-4	Install daylight controls on fluorescent lamps	Technology used to regulate light in facilities based on daylight and sensors of movement	Energy reduction
I-5	Use ultra-capacitors for regenerative braking and permanent magnet motors for car propulsion	Technology used in rail cars to generate energy during breaking, and optimize use of energy during regular functioning	Energy reduction
I-6	Shade structures with solar panels for parking lots	Designed structures that reduce reliance on temperature control for buses and increase access to clean energy	Energy reduction, Pollution prevention
I-7	Investment in photovoltaic field	Partner in power alliance that increases BART's access and use of solar energy, and reduces dependence on non-renewable fuels	Energy reduction, Pollution prevention
I-8	Lighting retrofit project	Created energy efficient lighting fixtures and decreased maintenance due to smart design	Energy reduction, Low maintenance
I-9	Escalators regulator	Regulate escalator operation based on foot-traffic and utilization	Energy reduction
I-10	Railroad ties recycling program	Designed plastic railroad ties made of more durable recycled materials	Recycling, Green design, Product stewardship
I-11	Investment in geothermal energy	Developed geothermal alternatives for facilities	Renewable energy use
I-12	Investment in gas energy	Partnership to increase access to and use of gas energy	Clean energy use

APPENDIX C.2
SUSTAINABILITY INITIATIVES AT STM, MONTRÉAL

	Initiative	Description	Socio-environmental aims
I-13	Green driving techniques	Training program for bus drivers	Energy reduction, employee training
I-14	Fueling with bio diesel	Use of clean biofuel in buses	Reduce reliance on fossil fuel
I-15	Energy saving escalators	Use of 'idle mode' to extend service life of escalators	Energy reduction, environmental awareness
I-16	Retreading tires	In-house process to prolong life of bus and metro tires	Recycling
I-17	Recovering waste water	Water purification and use of recycled water	Recycling
I-18	Recycling fluorescent tubes	30000 tubes from station and other facilities are recycled each year	Recycling
I-19	Green bus body workshop	Employ green construction practices to reduce the current and future environmental footprint of facility	Green construction
I-20	Sustainable development training	Training for project managers and engineers aimed at factoring sustainable development criteria into project planning and design	Environmental awareness
I-21	Organic cleaning initiative	Ecological biotech solution for facility cleaning (used in metro stations and other facilities)	Energy reduction, use of non-polluting materials, recycling
I-22	Society in motion	Outreach program to collect ideas from and poll community members on socio-environmental issues	Stakeholder management

APPENDIX C.3
SUSTAINABILITY INITIATIVES AT TRIMET, PORTLAND

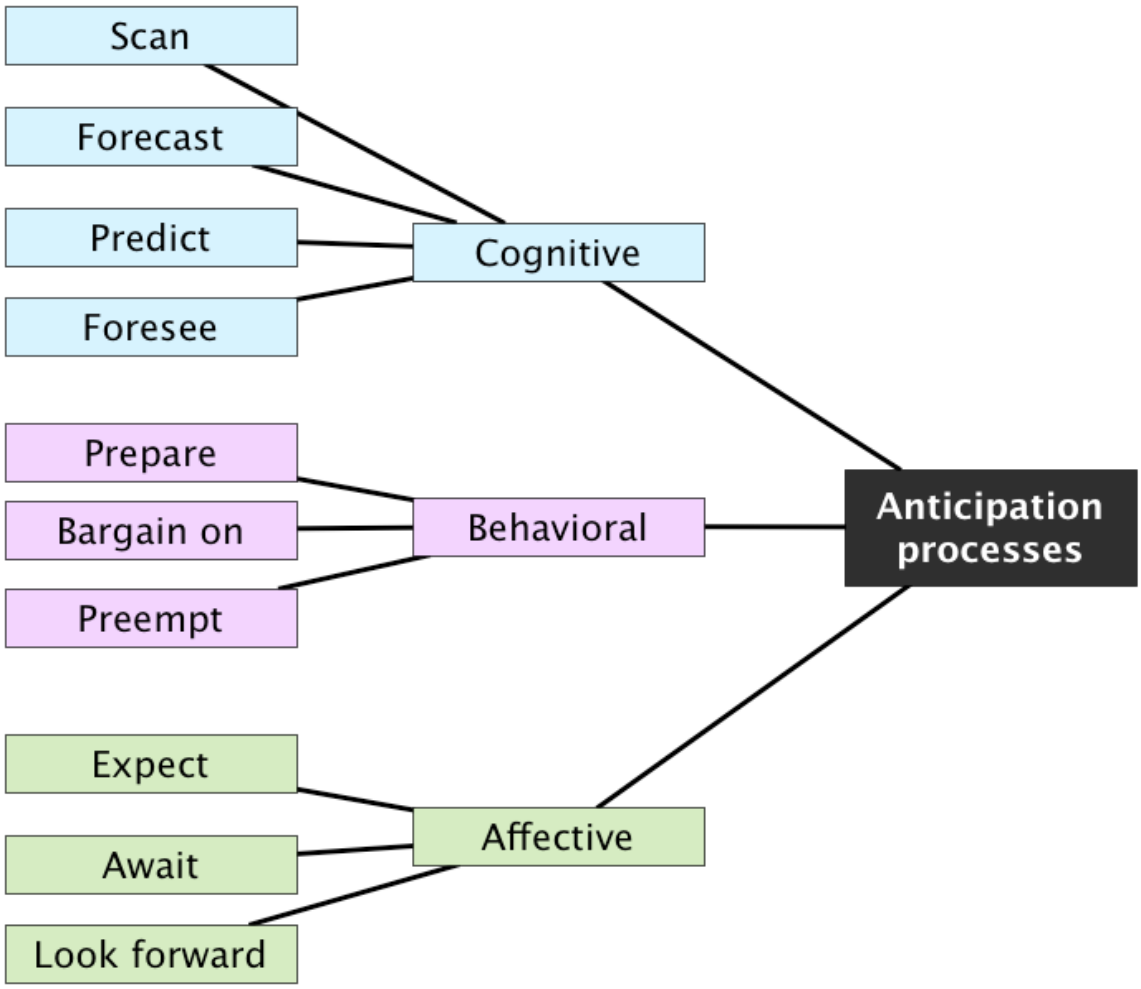
	Initiative	Description	Socio-environmental aims
I-23	Sustainable coordinators program	Training and development available to employees from any department. Emphasis is on providing practical tools for employees to become reference points in their respective department	Training and employee awareness, Sustainable development
I-24	Productivity improvement program	Ongoing program which emphasizes continuous improvement and adaptation to best practices	Pollution prevention, Product stewardship
I-25	Disadvantaged business enterprise	Comprehensive plan developed to increase use of local business in all major line extension and construction projects	Product stewardship, Sustainable development
I-26	Green Speak communication	Community initiative developed to communicate TRIMET's sustainability initiatives	Community outreach
I-27	Sustainable capital project investments	Investment tool developed to include sustainability criteria in all capital project plans	Sustainable development
I-28	Green construction practices	Nationally recognized system which includes many different components related to construction	Green construction & design, Product stewardship
I-29	Fuel conservation and emission reduction initiatives	Broad strategic plan which contains multiple ongoing projects aimed at reducing energy and emissions	Pollution prevention, Product stewardship
I-30	Transit equity and environmental justice	Broad strategic plan which contains ongoing projects aimed at improving accessibility	Community outreach
I-31	Transit-oriented development (includes engagement with urban planning of city of Portland)	Broad strategic initiative developed to include sustainability objectives and priorities in new project development, land use and construction, and capital expenditures	Sustainable development
I-32	Facility water use monitoring program	Facility-level initiative designed to create awareness of water use and design processes to optimize consumption	Reduce water and energy use, Water pollution prevention, Product stewardship

- Identify sustainability-related initiatives pertinent to the public transportation industry through published documents, conference papers (such as the recent UITP meetings), etc., and build a database, which includes initiatives, their definition, and organizations that have implemented them.
- Collect published and unpublished documentation (this phase will be continued throughout the research process, and will include requests for relevant documentation from the sites)
- Contact American Public Transportation Association, International Association of Public Transport, Ontario Public Transit Authority, regional Ministry of Transportation of British Columbia, Ontario, and Quebec
- Compile contact information (website, telephone numbers, emails) on the chosen organizations
- Contact organizations via email or telephone, if email is not available.
- If requested, send sample questions ahead of time, to allow preparation.
- Schedule and conduct interviews, either face-to-face or by telephone.
- Transcribe recorded interviews
- Request respondents to verify and/or comment on the transcripts or interview notes.
- Triangulate data by adding information collected from documentation and interviews in case study database.
- Prepare case study databases

APPENDIX E
KEY MECHANISMS OBSERVED IN CASE ANALYSES

Mechanism →		Anticipation			Actors					Change		
Initiative ↓		Cogniti	Behav	Affect	Exec	Board	Managg	Staff	Non-org	Increm	Evolut	Radica
BART	I-1	•	•	•	•	•	•	•	•		•	
	I-2	•	•		•	•	•	•		•		
	I-3	•			•		•	•		•	•	
	I-4	•	•		•		•	•		•	•	
	I-5	•	•		•		•	•			•	•
	I-6	•	•	•	•	•	•	•	•	•		
	I-7	•	•		•	•			•		•	•
	I-8	•	•		•		•	•		•		
	I-9	•	•	•	•	•	•	•		•		
	I-10	•	•		•		•	•	•		•	•
	I-11	•	•	•	•	•			•		•	•
	I-12	•				•			•			•
STM	I-13		•	•	•		•	•		•	•	
	I-14	•	•		•	•	•		•			•
	I-15	•	•	•	•	•	•	•		•		
	I-16	•	•	•	•		•	•			•	•
	I-17	•	•		•	•	•	•			•	•
	I-18	•	•		•		•	•		•	•	
	I-19	•	•	•	•	•	•	•		•	•	
	I-20	•	•	•	•	•	•	•		•	•	•
	I-21	•	•		•		•	•		•		
	I-22	•	•	•	•	•		•	•	•	•	•
TRIMET	I-23		•	•	•		•	•		•	•	
	I-24	•	•	•	•		•	•		•	•	•
	I-25	•	•	•	•	•	•	•	•	•	•	•
	I-26	•	•	•	•		•		•		•	
	I-27	•	•		•	•			•			•
	I-28	•	•		•		•	•	•	•	•	•
	I-29	•	•		•		•	•		•	•	
	I-30	•	•	•	•	•	•		•	•	•	
	I-31	•	•	•	•	•	•	•	•	•	•	•
	I-32	•	•		•		•	•		•		

APPENDIX F
SAMPLE CODING FOR ANTICIPATION PROCESSES



APPENDIX G
CERTIFICATION OF ETHICAL ACCEPTABILITY

Concordia
UNIVERSITY

CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Dr. Rick Molz
Department:	Management
Agency:	CASA, SSHRC
Title of Project:	How do organizations develop and manage capabilities that allow them to operate sustainably? Insights from the public transportation industry
Certification Number:	UH2008-103
Valid From: Nov 24 2008	to: Nov 24 2009

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. James Pfaus, Chair, University Human Research Ethics Committee

31/05/2007

APPENDIX H
CONSENT FORM

CONSENT TO PARTICIPATE IN THE REASEARCH STUDY:
How do organizations develop and manage capabilities that allow them to operate sustainably? Insights from the public transportation industry

This is to state that I agree to participate in a program of research being conducted by Dr. Rick Molz of the John Molson School of Business Management Faculty of Concordia University (Contact: 514.848.2424 Ext. 2933, molz1@alcor.condordia.ca).

PURPOSE
I have been informed that the purpose of the research is to determine how organizations in the public transit industry develop and manage capabilities for corporate environmental sustainability.

PROCEDURES
The proposed study will use structured interviews to collect the data. Measurement will include self reports, reports by other members of the executive or management team, and other documentation such as archival records and public media. Private information will be held confidential such that the researchers will know the identity of the participants, but will not disclose their identities in the published research.

Participants will be asked questions about initiatives in their organizations that pertain to sustainability, and what lead to the development of these initiatives. The interview will last about 60 minutes. Sometime after the interview, participants will receive a copy of the interview transcript to check and make comments on.

USE OF DIGITAL RECORDING
Please mark below if you accept or decline to have this interview recorded. Note that access to this recording is restricted to the research team. Note also that the recording will only be used for research purposes.

Accept [ ] Decline [ ]

RISKS AND BENEFITS
The results of this study will enrich the existing literature by broadening our understanding of how organizations develop capabilities for corporate environmental sustainability.

CONDITIONS OF PARTICIPATION

- **I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.**
- **I understand that my participation in this study is Confidential.**
- **I understand that the data from this study may be published.**

I HAVE CARFULLY STUDIED THE ABOVE AND UNDESTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

If at any time you have questions about your rights as a research participant, plase contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-2424 Ext. 7481 or by email at areid@alcor.concordia.ca.

APPENDIX I
PROJECT DESCRIPTION

Developing capabilities for proactive sustainability strategies
Insights from the public transportation industry

Description of research

A research project has been undertaken by Professor Rick Molz and research associate Cata Ratiu from Concordia University in Montreal to understand how mass transit authorities develop sustainability strategies. Your input is invaluable to generating an understanding of how organizations are innovating to undertake such initiatives.

Objectives

The objectives of this project are to (a) identify initiatives for sustainable development, and (b) understand how these initiatives are developed and organized.

The questions addressed by this project are: What initiatives reduce environmental footprint and position the organization for sustainable development? How do organizations acquire, develop and manage capabilities to develop sustainably?

This study is conducted in the context of public transportation and includes the authorities of Montreal, Portland, New York City, Chicago, San Francisco, and others. The results of this study will be shared with participants in the form of executive summaries and presentations. The results will benefit transit authorities looking to learn how to effectively implement sustainability initiatives.

Sample questions

I - Your organization has implemented a number of sustainability and environmental initiatives. Which do you think have the more impact? Can you discuss these programs and how they work?

II - What were some challenges you came across while developing environmental programs, and how were they dealt with?

III - Can you provide a unique insight into what contributed to the implementation of sustainability programs?

IV - Where did this initiative start? Was there a champion? Inside or outside the organization? How did the initiative move along the organization? How was executive buy-in achieved? Is there a system in place that allows for such initiatives to emerge? If so, can you describe how it works?

V - What is the impact of this initiative on the organization? What were the benefits and risks? Are there other areas of the organization where this initiative might be implemented?

VI - Follow-up: Can you suggest one operations manager and one staff or development manager who can provide some more information about these initiatives?

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