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Understanding the Factors Determining Green Public Procurement Practices Among Local Governments in the United States

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UNDERSTANDING THE FACTORS DETERMINING GREEN PUBLIC PROCUREMENT PRACTICES AMONG LOCAL GOVERNMENTS IN THE UNITED STATES

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Ana Maria Dimand

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To: Dean John F. Stack, Jr.
Steven J. Green School of International and Public Affairs

This dissertation, written by Ana Maria Dimand, and entitled Understanding the Factors Determining Green Public Procurement Practices Among Local Governments in the United States, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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DEDICATION

I dedicate this dissertation to my family and friends. To my parents, Maria and Francisc, who have always supported me and pushed me to become the best version of myself. Thank you for teaching me to never give up and always aim high. To my wonderful and supportive sister, Adriana, and brother-in-law, Gabriel, thank you for your unending care during my doctoral journey and for always keeping me grounded and focused. To my nephews, Alex, Eric, Desmond, and Gabrielle, thank you for your love, hugs, and laughter, which helped me stay sane during this adventure. To my uncle and aunt, Maria and Zoltan, thank you for encouragement and love. To my unique best friend, Anda, thank you for always being there for me and encouraging me. I am grateful for your friendship! To the amazing friends I made during this adventure, thank you for the venting lunches, for caring, for laughing and crying with me, for sharing my struggles, and celebrating my accomplishments throughout this journey: Andra, Andrea, Evelyn (Dream Team member #1), Kira, Lilia (Dream Team member #2), Melissa, Seba, and Vaiva*. It does take a village!

*Note: the list is not exhaustive and is alphabetically ordered

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ABSTRACT OF THE DISSERTATION

UNDERSTANDING THE FACTORS OF DETERMINING GREEN PUBLIC PROCUREMENT

PRACTICES AMONG LOCAL GOVERNMENTS IN THE UNITED STATES

by

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One of the wicked problems communities face worldwide is climate change. Among potential solutions and current efforts is green public procurement (GPP), an innovative policy approach to change business as usual in the governmental sector. Local governments in the U.S. annually spend approximately $1.72 trillion on purchasing goods and services. Given substantial purchasing power of municipalities, GPP practices at the local level can incite a transition toward a more sustainable society. This study is the first to delineate the levels and variations of existing GPP practices among U.S. localities and examine the factors that facilitate or hinder GPP engagement.

Collaborative governance has been advanced as an approach to overcome barriers that arise from fragmentation of authority at the local level. Prior research suggests that collaboration leads to economies of scale, a more agile procurement process, and enhanced capacity. However, we know little about its impact on GPP practices. Drawing on Feiock's

(2013) Institutional Collective Action framework and resource exchange theory, this research also analyzes the impact of collaboration on GPP utilization.

I triangulate data from an innovative national survey, conducted in collaboration with the Institute for Public Procurement (NIGP), and multiple case studies. Research evidence shows that a strategic vision, pressures from the federal government, and familiarity with GPP practices motivate U.S. local governments to engage in GPP. Surprisingly, local governments' use of GPP practices is hindered by availability of green suppliers. I also find that collaborative governance could indirectly enhance GPP implementation. The findings of this dissertation contribute to the advancement of theory and provide actionable recommendations for practice, as well as avenues for future research.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACRONYM	DESCRIPTION
ABA	American Bar Association
CITI	Collaborative Institutional Training Initiative
CFO	Chief Financial Officer
EPA	Environmental Protection Agency
EPEAT	Electronic Product Environmental Assessment Tool
FAR	Federal Acquisition Regulation
FSC	Forest Stewardship Council
GPP	Green Public Procurement
ICA	Institutional Collective Action framework
IRB	Institutional Review Board
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
MOR	Motivation-obstacles-resources
MWB	Minority and Women Business Enterprises
NASPO	National Association of State Procurement Officials
NCMA	National Contract Management Association
NIGP	The Institute for Public Procurement
SPP	Sustainable public procurement

CHAPTER 1. INTRODUCTION

Public procurement is one of the most important economic activities in government, entailing purchasing goods and services needed for sustaining day to day activities (Brammer & Walker, 2011; Thai, 2001). Compared to the private sector, public organizations have a different role as consumers. Private corporations aim at increasing profits (Carroll & Shabana, 2010). Because they represent the taxpayers, public organizations must consider different values; although it is sometimes neglected, one such value is sustainability (Hall, Löfgren, & Peters, 2016). Sustainable public procurement is the process by which governments incorporate social, economic, and environmental specifications in their procurement processes (Alkadry, Trammell, & Dimand, 2019; Brammer & Walker, 2011).

United States local governments have annually spent approximately $1.72 trillion on goods and services (Darnall, Stritch, Bretschneider, Hsueh, & No, 2017). Substantial procurement spending lead to high purchasing power. This makes public procurement a tool government can use to drive the market to be more innovative and to transition toward a more sustainable society (Day, 2005) through Green Public Procurement (GPP) practices. The research literature has described GPP practices as innovative policy tools (Edler & Georghiou, 2007).

Green public procurement practices are present when organizations incorporate environmental and sustainability principles in buying goods and services. GPP involves innovation and expansion of traditional procurement process—explicitly adopting and implementing purchasing criteria (e.g., a certain good's life-cycle analysis) with the intent to reduce waste and packaging materials and to recycle. Transitioning to a more sustainable

society through GPP will likely mitigate adverse climate changes and environmental degradation (Terman & Smith, 2018).

The U.S. federal system is based on delegation and fragmentation of authority. Local governments have discretion to innovate. Yet, they are constrained by budget, resource, and administrative and technical capacities. Fragmented governments are often involved in small and/or infrequent purchasing orders; they lack technical capacity to design and implement such orders and, hence, are unlikely to reap benefits, such as lower prices resulting from scale economies of purchasing. Inter-government collaboration has been advanced as a mitigating solution to dilemmas that arise from fragmentation and as an alternative approach to centralized governance to tackle environmental issues (Yi et al., 2018). Inter-government collaboration, defined in this study as cooperative purchasing, refers to the act of aggregating demand into a single solicitation.

While public procurement has been an important topic within public management, research in this area has only recently caught the attention of academicians (Thai, 2001). Similarly, research on Green Public Procurement has historically been scarce, although the number of GPP studies is steadily growing (Cheng, Appolloni, D'Amato, & Zhu, 2018). However, few GPP studies have been conducted in the context of United States local governments. Through the lenses of the internal determinants model for policy innovation adoption (Mohr, 1969), Feiock's (2013) Institutional Collective Action (ICA) framework, and resource exchange theory, this dissertation explores GPP practices in U.S. local governments, and examines the variance in GPP policy implementation in United States local governments, by analyzing the factors that foster or hinder engagement in such practices and collaborative practices and their impact on GPP practices.

This introductory chapter presents an overview of the dissertation. The next section explores the background of the study and theory. Then, the research questions and objectives are presented in detail, followed by descriptions of the methodology employed and layout of the dissertation.

1.1 Background and Theory

Historically, organizations have employed a lowest initial cost criterion for purchasing goods and services, with a focus on efficiency and effectiveness (Rainville, 2017). Yet, currently, procurement has outgrown its purely administrative function (Trammell, Abutabenjeh, & Dimand, 2019) and is gradually becoming a demand-side tool to spur innovation and achieve secondary policy objectives that aim toward benefiting the communities (Edler & Georghiou, 2007).

Governments in the United States began tackling the concept of green public procurement in the early 1990s (U.S. EPA, 2014). In 1993, President Bill Clinton signed Executive Order 12873, urging the federal government to use its purchasing power to buy sustainable products (Executive Order 12873, 1993). To that end, the U.S. Environmental Protection Agency (EPA) enforced the Environmental Purchasing Program, and stipulations pertaining to inclusion of environmental requirements into the procurement process were incorporated in the Federal Acquisition Regulation (FAR). However, the FAR regulations are only mandatory for federal government procurement processes (FAR, n.d.). Therefore, local governments have discretion in procurement decision-making and, implicitly, in green public procurement adoption and implementation. Despite this relative autonomy, local governments have faced an array of obstacles as they shift toward green public procurement.

Local governments, compared to their federal counterpart, have faced greater challenges in adopting and implementing GPP practices (Cheng et al., 2018). First, environmentally friendly products and services have traditionally been viewed as more expensive. Perceived higher cost has been among the most cited barriers 7/23/20 7:52:00 PM. Second, lack of familiarity with the concept of GPP and its implementation process, as well as lack of technical capacity of structuring GPP, have exacerbated difficulties in uptake of such approaches on all levels of government (Brammer & Walker, 2011; Cheng et al., 2018; Testa, Iraldo, Frey, & Daddi, 2012).

Compared to other levels of governments, smaller public organizations face stronger hardships in terms of financial and technical capacity. They are less likely to have the resources to dedicate personnel to sustainability and environmental protection issues surrounding organizational processes, including purchasing. Implicitly, they are less likely to have the resources to engage in GPP. These issues, arising from the fragmentated authority that characterizes the U.S. context, have been noted as severe challenges that hinder adoption of environmental policies (e.g., GPP) (Yi et al., 2018).

The notion of green procurement is not new. Yet, the analysis of green procurement within the public sector has been rather limited (Cheng et al., 2018). In their review of the literature, Cheng et al., (2018) found that research on the topic has focused mainly on policy and regulations around GPP, driving and hindering factors, environmental requirements, and the effectiveness of GPP as an environmental policy tool. The authors also argued that the main focus has been on the European context and that qualitative research methods have been used with more frequency than quantitative methodologies—although that trend seems to be shifting (Cheng et al., 2018)

Due to the spillover effects of environmental issues across jurisdictions, in recent years, the literature has endorsed collaborative governance as an alternative to traditional centralized systems when dealing with climate problems (LeRoux & Carr, 2007; Yi et al., 2018). According to resource exchange theory and the Institutional Collective Action Framework, governments—through collaborative arrangements—can offset the shortcomings of fragmentation and organizations can reach otherwise intangible goals by acquiring lacking/scarce resources from others (Berardo, 2009; Feiock, 2009). The European Union provides an example of a successful international experience in terms of green public procurement practices (European Commission, 2019). The organization has called for agencies to utilize to a collaborative governance approach—formal or informal—to share best practices and networks to increase the level of GPP adoption.

While there is an extensive body of literature focusing on collaborative governance (e.g., Choi & Moynihan, 2019; Emerson, Nabatchi, & Balogh, 2012; Getha-Taylor, Grayer, Kempf, & O'Leary, 2019; Siddiki, Kim, & Leach, 2017), few studies have focused on outcomes of a collaborative governance approach and less attention has been directed toward this type of management approach for climate related spillovers (e.g., Berardo, 2009; Kalesnikaite, 2019).

The present study contributes to the emerging public administration literature by being among the first national comprehensive examinations of innovative adoption of GPP in the context of the United States, analyzing the factors that hinder and encourage engagement in GPP practices at the local level in the United States. Additionally, the present research is among the few studies to focus on the outcomes of government collaboration applied to Green Public Procurement policy.

1.2 Research Objectives and Questions

Limitations in the existing public administration body of literature led to the identification of three research objectives. First, this dissertation explores the current trends in Green Public Procurement practices among U.S. local governments. Second, the study examines decision-making practices in local governments. Lastly, the research explores outcomes of collaborative governance.

Drawing from these research objectives, the dissertation posits three interrelated research questions:

Research question #1: *What is the current level of green public procurement implementation among U.S. local governments?*

Research question #2: *What are the factors that may foster or hinder GPP engagement among U.S. local governments?*

Research question #3: *What is the impact of intergovernmental collaboration on GPP implementation?*

1.3 Research Hypotheses and Research Design

The first research question is exploratory in nature. For the second research question, building on policy innovation adoption literature and Mohr's (1969) motivation-obstacles-resources (MOR) model, I advance the following hypotheses: "innovation is directly related to the motivation to innovate, inversely related to the strength of the obstacles to innovation, and directly related to the availability of resources for overcoming such obstacles" (p. 63). For the third research question, I advance two guiding propositions: *A cooperative purchasing approach increases the technical capacity (P1)*

and *decreases transaction costs (P2) associated with engagement in green public procurement practices.*

The dissertation utilizes a mixed-method research design that involves both qualitative and quantitative data. The unit of analysis for the study is local government in the United States (i.e., city/town, county/regional, school system, special authority, utility). The mixed methods approach allowed the quantitative and qualitative components to enhance and corroborate each other to produce more effective and reliable research. The combination of these approaches allowed me to investigate and analyze the issues surrounding Green Public Procurement implementation in local governments, starting with understanding the *status quo*, determinants of GPP practices, and impact of inter-governmental collaboration on the implementation of GPP activities.

1.4. Purpose and Significance of the Study

Public procurement is a powerful instrument, within the reach of local governments, to push the market toward innovative products and services, including public works, which could help reduce the negative effect of production and consumption on the environment. Although public procurement is a chief tool for innovation, its implementation is hindered by several factors.

I conducted this research with three main purposes in mind. First, I aimed to assess the level of engagement in green public procurement practices among local governments. To that end, I aimed to identify the extent to which governments incorporate environmental requirements in their procurement processes. Secondly, I aimed to explore what influences government to decide to adopt such policies. Thirdly, I aimed to explore the relationship

between collaborative governance and GPP. To achieve these purposes, I reviewed the research literature on policy innovation, green procurement, and collaborative governance.

This dissertation has wide implications for both research and practice. In terms of theoretical advancement: first, the study expands understanding within three bodies of literature (i.e., innovation, sustainability, and collaborative governance) by assessing the *status quo* in GPP policy adoption, the factors that hinder and facilitate engagement in such practices among U.S. local governments, and the nexus between collaborative governance and GPP adoption. Governments, though public procurement, may spur innovation from the markets toward a more environmentally friendly approach to production of goods and delivery of services. Yet, both scholarship and practice have focused limited attention to the topic. While increasing consideration is attributed to collaborative governance in public administration scholarship (Kalesnikaite, 2019), little research has shed light on the collaborative process as it relates to government spending. The second implication for theory involves the triangulation and novelty of data utilized in the present study. This study builds on data obtained from a survey I designed after a comprehensive literature review, supplemented with data obtained from a multiple case study design. The third implication for theory is that the dissertation employs a novel operationalization of the dependent variable that accounts for all stages of the procurement process; the fourth theoretical implication is that the present study identifies directions for future research.

In terms of practical implications, this study provides guidance to procurement professionals, public managers, and policymakers—hopefully reducing the negative effect of production and consumption on the environment. As stated above, as the global

population grows, along with increases in resource consumption, waste, and CO2 emissions, “buying green” is essential for the planet’s sustainability.

The dissertation has vast implications for policy and practice. First, the empirical results demonstrate the importance of organizational technical capacity and a strategic leadership approach for a paradigm shift from a traditional procurement process to a more strategic and innovative approach. These factors surface as more important in this context than environmental challenges, the political environment in which the agency operates, or the financial resources of the organization. Second, the dissertation suggests that designating staff to issues related to sustainability is essential to the practice of GPP. Third, the study shows the importance of federal government as an external determinant for decision-making toward GPP, through federal funds and example setting. Fourth, the study documents the underutilized power of collaborative governance approaches to purchasing and sustainability and that public managers should utilize this tool proactively.

1.5. Organization of the Dissertation

This dissertation is organized as follows. Chapter 2 introduces the concept of public procurement and how it can be employed as an innovative environmental policy tool. Chapter 3 presents three body of literatures—green public procurement, policy innovation, and collaborative governance—followed by a summary of gaps in the literature. Theory, research questions, hypotheses, and conceptual framework are presented in Chapter 4. Next, in Chapter 5, I describe the research methodology employed to address the research questions. Chapter 6 explores the quantitative research results and discussion (Phase I), followed by Chapter 7, which illustrates the qualitative research results and discussion

(Phase II). Then, supplementary insight from the qualitative data (Phase III) is presented in Chapter 8. Lastly, concluding remarks are summarized in Chapter 9.

CHAPTER 2: PUBLIC PROCUREMENT AND INNOVATION

The purpose of this chapter was to introduce the concept of public procurement, outline the values that guide public sector activity, and explore how public procurement can be utilized as an innovative policy tool to help advance those values.

2.1 Public Procurement

A universal definition for public procurement does not exist—neither in practice nor in previous scholarship—which has created challenges for the public procurement profession (Lloyd & McCue, 2004). The U.S. federal government defined the function as:

> the acquiring by contract with appropriated funds of supplies or services (including construction) by and for the use of the Federal Government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated. Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract. (FAR, n.d. Section 2.101. Definitions; as cited by Lloyd & McCue, 2004, p. 3)

Several state and local governments have followed the American Bar Association's (ABA) Model Procurement Code, initially issued in 1979 and updated in 2000 (Pitzer & Thai, 2009), which defined public procurement as:

> buying, purchasing, renting, leasing, or otherwise acquiring any supplies, services, or construction. It also includes all functions that pertain to the obtaining of any supply, service, or construction, including description of requirements, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration. (*Model Procurement Code for State and Local Governments*, 1979; Lloyd & McCue, 2004)

In simple terms, procurement represents the act of obtaining goods and/or services (Prier & McCue, 2009). Procurement supports government functions (Coe, 1989) through a make/buy process. Public procurement is one of the four most important economic activities in public management, alongside providing a legislative framework, redistributing income through taxes and spending, and delivering public goods and providing services (e.g., defense, education, infrastructure, safety) (Thai, 2001).

In short, in the public procurement process, government spends taxpayer dollars on goods and services. Primarily, this process has been guided by values of transparency, accountability, and best value for citizens (Walker & Brammer, 2009, p. 128). To better understand potential implications of the public procurement process, we must consider the scope of government expenditures on goods and services. However, accurate data on dollars spent on public procurement in the United States are difficult to obtain—although a recent study by Darnall et al. (2017) showed that local governments annually spend around $1.72 trillion dollars on goods and services.

Practitioners, the procurement literature, and different geographies have interchangeably utilized various terms for public procurement: “purchasing,” “buying,” “acquisition,” “contracting,” and “materials or supply management” (Pitzer & Thai, 2009; Prier & McCue, 2009). “Purchasing” was the common terminology until the 1970s, when it was replaced by “procurement” (Pitzer & Thai, 2009). Therefore, procurement is the term utilized in the present study.

The public procurement function is conducted at all levels of government—federal, state, and local—and these include various quasi-public agencies: utilities, transportation authorities, and universities (Pitzer & Thai, 2009). This government activity has been among the most regulated government functions (Lloyd & McCue, 2004; Prier & McCue, 2009). The federal government’s procurement activities operate mainly under the legislative umbrella of the Federal Acquisition Regulation (FAR). State and local governments enjoy discretion in drafting their own rules and regulations. Therefore, there is no uniform set of norms that is applicable to all procurement practices across all levels of government (Thai, 2001).

In the United States, the public procurement profession has been supported by several organizations, including NIGP: the Institution for Public Procurement (NIGP), the National Contract Management Association (NCMA), and the National Association of State Procurement Officials (NASPO) (Lloyd & McCue, 2004). These organizations have provided resources and professional development opportunities for public procurement officials.

Public procurement has been a longstanding practice in government (Thai, 2001). Internationally, researchers have found evidence of procurement activities dating between

2400 and 2800 BC in Syria (Pitzer & Thai, 2009). In the United States, purchasing at the local level occurred before state and federal organizations engaged in purchasing (Page, 1980; Pitzer & Thai, 2009). For instance, researchers have noted that printing services were outsourced in early settlements and colonies in North America (Page, 1980; Pitzer & Thai, 2009). The federal government's first procurement activity was documented as dating back to 1778, when the Continental Congress contracted procurement commissionaires to conduct such activities; as payment for their services, the procurement commissionaires received 2% of the value of the expenditures (Pitzer & Thai, 2009).

As noted above, the notion of public procurement is not new; however, public procurement has recently drawn attention from academicians (Trammell et al., 2019). While initially viewed as a clerical, administrative task, public procurement has become a strategic function of government agencies (Lloyd & McCue, 2004; Pitzer & Thai, 2009).

2.2. Public Sector Values

Values are essential guiding principles in public management. Values such as political neutrality, accountability, efficiency, honesty, and integrity have been, and continue to be, of chief importance in public service delivery (Box, 2015). Public sector values have historically been driven by social realities. For example, during the 1960s and early 1970s, social changes influenced a shift in public sector values toward social equity; additionally, issues of discrimination, women's rights, voting rights, clean air and water, and environmental protection were at the center of public attention (Carroll & Shabana, 2010). Consequently, these values were translated into the legislation of the time. During the 1980s, when government grew, public sector values shifted again; market sector values were integrated into public sector activities, including entrepreneurship, innovation,

profitability, performance measurement, and customer service (Box, 2015). Contracting out became central for public organizations and so efficiency developed into a key value at the time, often surpassing other values that were still significant for the public sector, such as equity, fairness, and citizen involvement (Box, 2015).

Environmental degradation has been a central element in the public administration discourse of the 21st century. Researchers have noted that stakeholders, the environment, and human health experience severe, negative impacts of climate change and the wicked problems that arise from these changes (Chen, 2011; Wang, Hawkins, Lebredo, & Berman, 2012). Thus, I argue that sustainability is, or should be, added to the list of public sector values.

Public procurement has been noted as one of the most important economic activities in government (Thai, 2001). In developed countries, such as the United States, the "public procurement system has two goals, procurement-goals and non-procurement goals" (Thai, 2001, p. 27). Procurement-goals encompass values such as "quality, timeliness, cost, minimizing business, financial and technical risks, maximizing competition," while non-procurement goals refer to "economic goals (preference for local and domestic vendors), environment protection, social goals such as assisting minority and woman-owned businesses" (Thai, 2001, p. 27). Thus, sustainability should be included as a non-procurement goal/desired outcome in the public procurement process.

2.3. Public Procurement as an Innovative Policy Tool

Historically, organizations have employed a lowest initial cost criterion for purchasing goods and services, with a focus on values such as efficiency and effectiveness (Rainville, 2017). Yet, currently, procurement has outgrown its purely administrative

function (Trammell et al., 2019) and is gradually becoming a demand-side tool to spur innovation and achieve secondary policy objectives that aim to benefit communities (Edler & Georghiou, 2007; Pitzer & Thai, 2009).

Public procurement's role as a demand side innovation policy tool has been acknowledged since the 1980s, although this aspect of the process is often overlooked. During the 2000s, public procurement was recognized as an important demand-side policy tool by several European countries alongside initiatives such as systemic policies, regulations, and support of private demand (Edler & Georghiou, 2007). Georghiou (2003) and Edler and Georghiou (2007) reintroduced emphasis on the role of public demand in innovation diffusion.

Innovation has been defined as "all public measures to induce innovations and/or speed up diffusion of innovations through increasing the demand for innovations, defining new functional requirement for products and services or better articulating demand" (Edler & Georghiou, 2007, p. 952). Scholars have made distinctions between innovation and invention. Innovation has been described as the adoption of a policy that a government has not previously utilized—it is not necessarily an altogether a new approach (Berry & Berry, 1990; Krause, 2011).

Following these arguments, public procurement should be viewed as an innovative policy tool available to government, which has grown beyond the administrative act of purchasing—evolving to incorporate other policy goals into the procurement process, such as environmental protection. Researchers have noted that these new requirements demand innovative solutions from the market (Edler & Georghiou, 2007).

The influence of public procurement as an innovative policy tool has been illustrated by Edler and Georghiou (2007) from three perspectives. Firstly, public procurement has been a major instrument for local /domestic demand. Through their purchasing power, governments can act as leaders by "initiating lead markets" (Edler & Georghiou, 2007, p. 956). Second, researchers have described public procurement as a tool to address system and market failures, especially those related, for example, to information asymmetries, poor interaction mainly due to fragmentation, costs, and market risks (Edler & Georghiou, 2007). Lastly, Edler and Georghiou (2007) recognized procurement's role as a tool to protect the public interest and achieve "normative policy goals, such as sustainability and energy efficiency" (p. 957).

This innovative policy tool, used by governments to spur environmental protection, is called Green Public Procurement. The guiding definition of Green Public Procurement for the present study is:

> the approach by which Public Authorities integrate environmental criteria into all stages of their procurement process, thus encouraging the spread of environmental technologies or services, and the development of environmentally sound products, by seeking and choosing outcomes and solutions that have the least possible impact on the environment throughout their whole life cycle. [adapted from Bouwer et al., (2005, p. 16)]

In early studies, *green public procurement* was sometimes used interchangeably with the term "sustainable public procurement" (Cheng et al., 2018). Alongside environmental protection, sustainable public procurement encompasses the social and

economic secondary outcomes of procurement (Cheng et al., 2018). For this reason, the present study intermittently references sustainability.

Following the Bouwer et al. (2005) definition, environmental criteria can be included in each stage of the procurement process: preparatory stage, technical specifications, contractor capacity, award criteria, and contractual clauses (Bolton, 2008). Below, I illustrate how environmental requirements can be included in each stage of the procurement process. An important step toward environmental protection is the preparatory/planning stage; an organization can reduce its spending by reducing procurement or repurposing (Bolton, 2008). However, the preparatory/planning stage is not considered in the present study, as it primarily involves actions taken pre-bid.

With *technical specifications,* an organization informs potential suppliers about its needs (Bolton, 2008). It is a guide that helps businesses submit proposals. Within this stage, governments can require utilization, for example, of products or services that are superior in environmental performance (Terrell, 2012). For instance, an agency can request paper produced from a certain percentage of recycled material and use of electricity derived from renewable energy sources. The purpose of *contractor capacity stage* or *selection criteria* is to ensure the potential supplier's competence to perform under the contract. An agency may seek to exclude vendors that do not have the environmental capacity to carry out the contract by demanding proof, for example, of access to a certain technical equipment or facility or to labor force with experience in environmental issues (Bolton, 2008). The *award or evaluation criteria* can be either lowest cost or best value/economically most advantageous offer (Day, 2005). The best value criterion may consider—alongside requirements for cost—factors related to quality, risk, and staff (Bolton, 2008). Within this

stage, an organization can award extra points for environmental protection requirements such as: proof environmental training for employees, eco-labels for products, life-cycle cost, and usage of electricity from renewable sources (Bolton, 2008; Day, 2005). Green specifications can also be incorporated within the *contract stipulation*, such as: delivering outside rush-hour, bulk delivery, and reduced packaging (Bolton, 2008).

When public sector demand is focused on innovation, changes (e.g., cost savings when considering life cycle costs; efficiently utilizing tax payer money) spur beyond the organization (European Commission, 2016); but there may also be positive spillover effects for society as a whole (Rainville, 2017), including economic development through ensuring better quality of life, minimizing the negative impact on the environment, spurring innovative market behavior, and setting an example for citizens in terms of environmental awareness (Day, 2005; European Commission, 2016). Thus, when governments adopt such policy tools, they send a signal to the entire economy, through vendors and supply chains.

GPP is a mechanism that can change organizational decisions and behaviors. For example, public procurement could either lock-in an organization's direction because goods and services last for a long time, or it can be used as an innovative tool to re-assess organizational mission and goals. Public organizations are responsible for promoting the public interest and democracy. In that capacity, they should set an example of environmental responsibility for the private sector and individuals alike.

Previous research has provided support for government purchasing as a source of behavior change and spillover effects. For instance, Simcoe and Toffel (2014) found a policy diffusion pattern—a spillover effect—from green public procurement policies to the private sector. Specifically, they found that green building requirements, applicable to

governmental buildings, speed-up the green behavior adoption process within the private sector in the same area. Likewise, Corts (2010), analyzing various counties in 6 states (i.e., Illinois, Indiana, Iowa, Minnesota, Missouri, and Wisconsin), found an increase in alternative fuel stations as a result of government purchasing alternative fuel vehicles.

This chapter shed light on the notion of public procurement and provided the background for the topic. It also outlined the nexus between public procurement practices and market behavioral change towards innovation. The following chapter explores these concepts within the respective literatures.

CHAPTER 3: LITERATURE REVIEW

Green public procurement is a demand policy tool government possesses to drive market innovation (Rainville, 2017; Edler & Georghiou, 2007). When targeted toward innovation, public demand can improve public service delivery (Edler & Georghiou, 2007). The current research literature has not sufficiently explored the nexus between procurement and innovation, although scholars have presented evidence of the spillover effects of GPP to the private sector (Rainville, 2017).

The U.S. administrative system is highly fragmented. Researchers have found that fragmentation could lead to responsiveness and resilience in service delivery (Feiock, 2013), but it could also lead to institutional collective action dilemmas and scarce resources to reach desired policy goals (Feiock, 2009; Berardo, 2009). Collaboration among governments was advanced by the literature as a tool to overcome the issues that arise from institutional collective action dilemmas (Feiock, 2013).

To better understand government decision-making and the outcomes of collaboration, this chapter explores the three main bodies of literature that frame this dissertation: green public procurement, policy innovation, and collaborative governance. Following a summary of existing studies, the chapter describes the identified research gaps.

3.1. Green Public Procurement Literature

Green Public Procurement refers to the act of incorporating environmental criteria in the procurement process (Cheng et al., 2018). To date, only two systematic literature reviews of green and sustainable public procurement practices have been published. Thus, this section begins by outlining results from the two studies; I will then complement previous results with my own review and observations.

Cheng et al. (2018) conducted a systematic review of the literature that surveyed peer-review articles from 2000 to 2016. While results showed that scholarship on the topic has increased over the years, the research questions addressed follow general traditional lines: *policy and regulations*, *practices and uptake issues of GPP*, *utilization of environmental requirements in the procurement process*, and *the effectiveness of GPP as an environmental policy tool*. Additionally, previous studies mostly analyzed geographical areas such Europe and Asia and most studies employed a qualitative design (Cheng et al., 2018; Terman & Smith, 2018). The United States' context remains notably unexplored. From the final sample in the aforementioned review of 67 journal articles, only four focused on the United States context: Li and Geiser (2005); Roman (2017); Simcoe and Toffel (2014); Swanson, Weissman, Davis, Socolof, and Davis (2005).

Li and Geiser (2005) examined environmentally responsible public procurement and its relationship with an integral product policy. Their unit of analysis is government computer purchasing at the U.S. state level. The authors concluded that public procurement "is a driving force in the integration of environmental product policy instruments" (p. 705). The work of Swanson et al. (2005) is highly practice oriented and applicable to organizations. They developed an environmental priority-setting tool for environmentally friendly products and services and applied it to several product category purchases by the State of California. Simcoe and Toffel (2014) studied whether there is a green procurement policy diffusion pattern (i.e., a spillover effect) from public sectors to private industries. Specifically, they researched whether green building requirements, applicable to governmental buildings, speed-up the green behavior adoption process within the private sector in the same geographical area. The unit of analysis is cities in California. The

researchers employed a matching method, which shows that the Leadership in Energy and Environmental Design (LEED) standard diffuses more rapidly in cities with a green building policy, as opposed to those cities that do not have such regulations. Therefore, their results showed the spillover effect of government policies to the private sector. Utilizing a structural equation model, Roman (2017) explored the conditions under which organizations engage in sustainable public procurement (SPP) practices, and the degree to which upper-level management leadership style influences the extent to which sustainable practices are encouraged. Roman found leadership style to be positively correlated with an agency's engagement in SPP. Roman (2017) studied sustainable public procurement by taking into account, alongside environmental aspects, the economic and social impacts of an agency's expenditures.

The second literature review was conducted by Sönnichsen and Clement (2020). The authors explored the literature on green and sustainable public procurement, focusing on articles published between 2000 and 2018 (Sönnichsen & Clement, 2020). Their emphasis was on elaborating a framework of factors that facilitate organizational change toward circular public procurement. They identified three main groupings of predictors: *organization aspects*, *individual behavior and practices,* and *operational tools* (Sönnichsen & Clement, 2020). Organizational aspects explored how agency size, strategy and management, policies and the quality of contracts are correlated with sustainable procurement practices implementation. The second category encompassed subthemes related to the agency and cross departmental management and beliefs, awareness, and guidance. Within this main theme, the authors stressed the importance of human capital as well as the importance of collaboration for engagement in these sustainable practices.

Third, Sönnichsen and Clement (2020) showed how different process and prioritization tools, selection criteria, and standards can be utilized to transition to a green economy.

In addition to the articles identified by Cheng et al. (2018) and Sönnichsen and Clement (2020), a recent study conducted by Terman and Smith (2018) assessed whether the factors that impact local government engagement in sustainability policies also apply to green public procurement (Terman & Smith, 2018). The study utilized data from 2011 and 2012 from U.S. local government. Results showed that professional management, membership in the climate protection network, and support from interest groups are positively correlated to engagement in GPP. The authors also called for more research on green public procurement practices, as it is one of the most "proactive ways governments engage in sustainability" (p. 211).

3.2. Policy Innovation Scholarship

For a policy to be considered innovative, it must add a novel component to an existing approach, as opposed to a completely new approach, which has been defined as an "invention" (Mohr, 1969; Edler & Georghiou, 2007).

As noted by Krause (2011), citing Berry and Berry (1990), policy innovation is currently studied from two perspectives. The first perspective involves internal determinants of the adopting agency and posits that policy innovation adoption is facilitated or hindered by political, economic, and/or social characteristics of an organization (Krause, 2011). The second perspective is a policy diffusion view, which theorizes that policy innovation adoption is a result of a government mimicking earlier adopters based on information obtained from intergovernmental networks (Krause, 2011).

This dissertation follows the first perspective—the internal determinants model for policy innovation adoption.

Innovation is difficult to implement because of inherent uncertainty and risks. For this reason, Mohr (1969) argued that several factors challenge innovation adoption, including the cost and the possible reluctance of individuals emanating from adoption of a new approach (Mohr, 1969). While obstacles may hinder innovation, based on previous research, Mohr (1969) explained that certain factors can encourage innovation adoption. Some organizations are more motivated than others to adopt a new approach. Likewise, one organization may have more resources than others. The resources factor incorporates financial and technical capacity to overcome challenges, as well as support from individuals in a "position of authority" and the confidence organizations/individuals has in their ability to overcome said obstacles (Mohr, 1969, p. 63). Therefore, based on this examination, Mohr (1969) advanced the motivation-obstacles-resources (MOR) model with the following hypotheses: "innovation is directly related to the motivation to innovate, inversely related to the strength of the obstacles to innovation, and directly related to the availability of resources for overcoming such obstacles" (Mohr, 1969, p. 63).

This model has been widely utilized to understand decision-making patterns related to state and local innovation (Berry & Berry, 1990; Krause, 2011; Wang & Zhao, 2014). Internal determinants models for policy adoption are essential for informing decision-making in organizations. The model assumes that political, economic, and social characteristics of a jurisdiction influence the adoption of a new policy (Sabatier & Weible, 2014). The theory behind it is that once an agency is aware of the existence of a new policy,

the adoption decision is based on the organization's internal characteristics, rather than the diffusion from earlier adopters (Sabatier & Weible, 2014).

3.3. Collaborative Governance Literature Review

The current U.S. administrative system has become less bureaucratic and less hierarchical, with local governments gaining more discretion to take action (Frederickson, Smith, Larimer, & Licari, 2018). The administrative system is based on delegation of authority, with the public sector being highly decentralized. Although said fragmentation could lead to responsiveness and resilience (Feiock, 2013), it could also lead to Institutional Collective Action problems such as "diseconomies of scale, positive and negative externalities, and common property resources problems" (Feiock, 2009, p. 357) and lack of resources to reach desired policy goals (Berardo, 2009). In this dissertation's case, one government's reluctance to engage in environmental procurement practices can reduce the chances of other governments being able and/or willing to solicit such practices from the market.

Due to the spillover effects of environmental issues across jurisdictions, in recent years, the literature has endorsed collaborative governance as an alternative to traditional centralized systems when dealing with climate problems (LeRoux & Carr, 2007; Yi et al., 2018). According to resource exchange theory and the Institutional Collective Action Framework, collaborative arrangements can offset the shortcomings of fragmentation and reach otherwise intangible goals by acquiring lacking resources from others (Berardo, 2009; Feiock, 2009). The European Union provides an example of a successful international experience in terms of green public procurement practices (European Commission, 2019). The European Union has called for agencies to resort to a

collaborative governance approach—formal or informal—to share best practices and networks for an increase in the level of GPP adoption.

There is no universal definition for collaboration in the literature (Kalesnikaite, 2019). Scholars have identified two types of collaboration: vertical or horizonal. Vertical collaboration arrangements involve government actors from different levels (McGuire & Silvia, 2010), while horizontal collaboration involves either agencies at the same level of government (McGuire & Silvia, 2010) and/or various actors in the community (Agranoff & McGuire, 2003). More recently, the collaborative governance approach is depicted more broadly, seeing beyond governmental actors, as "the process and structures of public decision making and management that engage people constructively across the boundaries of public agencies, levels of government and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished" (Emerson et al., 2012, p. 2).

This dissertation focuses on vertical and horizontal collaborative arrangements between governments as they relate to purchasing goods, services, and works for public service delivery. Following previous research, in the present study, I assessed the impact of such arrangements on the institutional collective action dilemmas that arise from fragmentation of authority (Feiock, 2013). Specifically, this research analyzed the impact of cooperative purchasing agreements on engagement in green public procurement practices in terms of resource availability and transaction costs.

Feiock (2009) outlined six tools for collaborative governance: regional authority, managed networks, regional organizations, contract networks, collaborative group/council, and policy networks. Particularly important to the present study is the use of contract

networks, which connect the governments involved through joint ventures, interlocal agreements, or other contractual arrangements and necessitate the consent of all parties involved (Feiock, 2009). These types of arrangements, in the form of cooperative purchasing agreements (contract networks), are the focus of the present study. According to the Coase (1960) Theorem, contracts, as voluntary solutions, may be utilized as tools to overcome problems of externalities (Feiock, 2013) and achieve "a Pareto-efficient outcome through voluntary bargaining" (Feiock, 2009, p. 364). The voluntary nature of a contractual agreement may enhance benefits for all parties involved (Feiock, 2009). One government's refusal to engage in GPP could negatively affect other governments' chances and capacity to solicit environmentally friendly products and services from the market. Such arrangements may offset barriers to GPP engagement and reduce the negative externalities of fragmentation.

Cooperative purchasing has been described as a "formal structure (setup) that aligns procurement needs to two or more organizations in a way that maximizes efficiencies through large volume procurement" (Roman & Matthews, 2018, p. 103). Generally, there are three types of cooperative procurement arrangements: Piggyback, Multiparty, and Broker Model (Roman & Matthews 2018). Under a piggyback cooperative contract, one or more organizations insert a special clause in their agreement allowing other agencies to utilize that contract, hence its name, without having to organize their own procurement procedure (Roman & Matthews, 2018). With a multiparty arrangement, two or more agencies join forces to contract out as a single entity (Roman & Matthews, 2018). Under the broker model, an external organization (i.e., the broker) handles the entire procurement

process and members have the option to select to purchase through any of the contracts available (Roman & Matthews, 2018).

By engaging in cooperative purchasing (any of the above), organizations have access to an array of resources from each other or the broker, respectively (e.g., financial, technical, legal) to potentially overcome institutional collective action dilemmas. These types of arrangements may add value to local governments, and lead to otherwise intangible benefits and resolve externality issues (Berardo, 2009; Feiock, 2009, 2013; Hawkins & Andrew, 2010). Previous research on the topic has identified two main positive outcomes of collaboration: (1) efficiency due to knowledge sharing and resource management and (2) economies of scale by pooling financial resources (Bakker, Walker, Schotanus, & Harland, 2008; Bel, Fageda, & Mur, 2014; Jost, Dawson, & Shaw, 2005).

While there is an extensive body of literature focusing on collaborative governance (e.g., Choi & Moynihan, 2019; Emerson et al., 2012; Getha-Taylor et al., 2019; Siddiki et al., 2017; Yi et al., 2018), few studies have focused on outcomes of a collaborative governance approach, and less attention has been directed to this type of management approach and its climate related spillovers (e.g., Berardo, 2009; Kalesnikaite, 2019). Moreover, few studies have explored cooperative purchasing. The existing literature has focused mainly on cooperative purchasing agreement on contractual costs (Bel et al., 2014), benefits of inter-organizational procurement of shared services in United Kingdom local governments (Murray, Rentell, & Geere, 2008), and theory building for cooperative purchasing (McCue & Prier, 2008).

3.4. Gaps in the Literature

This literature review has demonstrated that empirical knowledge on factors influencing public sector decision-making related to adoption of green public procurement practices is limited. Most of the current literature has focused on European Union and Asian contexts, and little empirical work has been done on the United States. Little research has been conducted with a focus on green public procurement adoption in local governments in the U.S. national context. While the literature on collaborative governance is wide-ranging, it is silent in regard to the impact of collaborative governance on the implementation of green purchasing practices in U.S. local governments.

The present research complements the emerging body of literature by being among the first national comprehensive evaluations of the "greenness" of public procurement in the context of the United States local governments—analyzing the factors that hinder and encourage engagement in sustainability practices at this level. Additionally, this dissertation is among the first to focus on the outcome of government collaboration applied to green public procurement policy. Specifically, the dissertation analyzes how cooperative purchasing impacts engagement in green contracting.

CHAPTER 4: THEORY, RESEARCH QUESTIONS, HYPOTHESES, AND CONCEPTUAL MODEL

This chapter outlines the research questions that guide the present study, along with the hypotheses and conceptual model. As previously mentioned, this dissertation has three interrelated objectives: first, to explore the current trends in Green Public Procurement practices among U.S. local governments; second, to examine decision-making practices in local governments; and, third, to explore the outcomes of collaborative governance as they relate to green public procurement practices.

Drawing from research literature on green public procurement, policy innovation, and collaborative governance, this dissertation explores the following research questions:

Research question #1: *What is the current level of green public procurement implementation among U.S. local governments?*

Research question #2: *What are the factors that may foster or hinder GPP adoption among U.S. local governments?*

Research question #3: *What is the impact of intergovernmental collaboration on GPP implementation?*

4.1. Research questions #1

The first research question is exploratory. Despite the growing interest in Green and Sustainable Public Procurement in the literature, we know little about what local governments in the U.S. are doing in this area. Most of the green or sustainable public procurement scholarship to date has focused on state purchasing (e.g., Swanson et al., 2005) with limited attention directed to local governments (e.g., Simcoe & Toffel, 2014; Terman & Smith, 2018).

Among U.S. local governments, adoption of green public procurement practices has been rather limited. A recent sustainability survey showed that only 21% of respondents have issued a green public procurement policy (Trammell & Dimand, 2019). To fill this gap in the literature, the present study explored the current level of Green Public Procurement policy implementation at the local level. To this end, this first research question assessed the level of GPP engagement as it relates to the procurement stages, assessed the level of engagement in terms of various GPP instruments, and illustrated the geographical distribution of low and high performing agencies.

4.2. Research Question #2, Model, Theory and Hypotheses

Building on Mohr's (1969) determinants of innovation model, this dissertation advances the motivation-obstacles-resources (MOR) model (see Table 1) with the following hypotheses: "*innovation is directly related to the motivation to innovate, inversely related to the strength of the obstacles to innovation, and directly related to the availability of resources for overcoming such obstacles*" (p. 63).

Motivations

Mohr (1969) outlined the most common sources of motivation for policy innovation adoption: environmental challenges and design, and relevant ideologies (p. 63). Building on Mohr's (1969) model, and combining previous research on sustainability (e.g., Roman, 2017; Wang et al., 2012), this study hypothesizes that the key motivations for GPP adoption are: environmental challenges (i.e., population change, population density), the political environment in which an agency operates, organizational strategy, and pressures from external stakeholders.

Environmental Challenges

Previous sustainability research has posited that adoption of sustainability practices is linked to pressures resulted from "environmental degradation and natural resource depletion" (Portney, 2013; Wang et al., 2012, p. 844). City population characteristics, such as population change and population density, have been noted as factors that may contribute to environmental degradation and natural resource depletion and, as such, may influence innovation adoption. Similarly, needs and expectations relating to sustainability have been found to vary depending on population characteristics (Portney, 2013; Wang et al., 2012). Previous studies have found a nexus between sustainability adoption and the characteristics for local governments (Wang et al., 2012).

Political environment

Citizens' political attitudes were linked to governments' sustainability actions as the latter are supposed to serve and be responsive to constituents' needs (Saha, 2009, as cited by Wang et al., 2012, p. 844; Alkadry et al., 2019). A politically liberal environment was found to be a significant factor influencing local government engagement in sustainable public procurement in a recent study by Alkadry et al. (2019). Similarly, Opp and Saunders (2013) acknowledged the link between liberal political attitudes and local government engagement in sustainability practices.

There is a dichotomy in the literature in terms of the relationship between political ideology engagement in sustainability policies. On the one side, some studies have argued that Democrats are more likely to engage in "societal practices" than Republicans (Lubell, Feiock, & Handy, 2009; Opp & Saunders, 2013). Alkadry et al. (2019) found a strong and positive relationship between a higher percentage of liberal residents in the area and

engagement in sustainability practices. On the other side, scholars have argued that organizations functioning in a liberal context are more reluctant to contract out goods and services, due to concerns that the private sector prioritizes profit and not the public interest (Wang & Zhao, 2014; Ya Ni & Bretschneider, 2007).

Strategic Vision

GPP adoption has been associated with culture in the organization and whether management is supportive of engaging in these practices (Brammer & Walker, 2011). These objectives have usually been reflected in the agency's strategic plan, which typically includes an organization's mission and values (George, Walker, & Monster, 2019). In their assessment of the level of GPP in the Member States of the European Union, Bouwer et al. (2005) found the lack of management support in promoting green public procurement practices to be a chief barrier in the implementation process. Nasiche and Ngugi (2014) argued that "senior level support and the degree to which organizational processes and structures support or retard the development of sustainable procurement are chief in the implementation" (Ashenbaum, 2008; Björklund, 2011, as cited by Nasiche & Ngugi, 2014, p. 7).

Pressures from External Stakeholders

The literature on policy adoption has argued that individuals and advocacy coalitions are important determinants for the adoption of new policies (Sabatier & Weible, 2014). Thus, in addition to internal pressures, external stakeholders influence organizational behavior (Mintzberg, 1983). Consistent with the arguments made in the general literature on policy adoption, stakeholders (e.g., citizens/residents, the nonprofit sector, interest groups) influence the decision-making process in terms of sustainability

practices (Roman, 2017). Roman (2017) posited that both the private and public sectors face more pressure to engage in green public procurement practices from factors outside the organization rather than from within the organization.

Based on the abovementioned findings, this study hypothesizes that the following factors are likely to motivate GPP adoption: (H1) population growth, population density, (H2) higher percentage of citizens voting along Democratic Party lines, (H3) institutional strategic vision, and (H4) external pressures.

Obstacles

Two sets of barriers are considered to be particularly salient in the sustainable procurement scholarship: (1) perceived higher costs and (2) the extent to which the market is prepared to follow governments' requirements and deliver green goods and services (Nasiche & Ngugi, 2014).

Perceived Higher Upfront Cost

A key factor that hinders public authorities' engagement in green public procurement practices is the perceived higher costs of environmentally friendly products and services (Hall et al., 2016). While there are win-win situations, where values of efficiency and sustainability align, the literature has generally suggested that buying green is perceived as much more expensive, at least when considering initial expenditures and not considering a life cycle analysis (Boström, Börjeson, Gilek, Jönsson, & Karlsson, 2012; Bouwer et al., 2005; Hall et al., 2016; Testa et al., 2012; Zhu, Geng, & Sarkis, 2013). Due to budget constraints, and conflicting values in organizational management, most governments are reluctant to pay higher upfront costs for "green" products and services (Bouwer et al., 2005; Brammer & Walker, 2011).

Supply Capacity Issues

Considering the specialist nature of public procurement, one of the main obstacles in GPP has been market availability for green products and services (Brammer & Walker, 2011; Nasiche & Ngugi, 2014). This barrier has been more prevalent in small and medium sized local governments, compared to larger cities, and some suppliers have been unwilling to abide by governments' GPP initiatives, for several reasons, including resource constraints and poor practices. Brammer and Walker (2011) indicated that in the United States context, high concerns with product quality and market availability for green products and services has been reported. This has also been the case in the Italian context. Surveying 249 public administrators, Iraldo and Testa (2007) found that 27% of respondents posit difficulty in finding suppliers as one major barrier in engaging in GPP practices (Iraldo & Testa, 2007, as cited by Testa et al., 2012).

Therefore, this dissertation hypothesizes that the following factors are likely to deter GPP adoption: (H5) higher cost of green products, services, and public works, and (H6) lack of market availability of such commodities.

Resources to overcome obstacles

Aligning with theories of organizational innovation, I expected that available organizational resources can assist with overcoming the obstacles (i.e., barriers) of innovation adoption (Mohr, 1969; Sabatier & Weible, 2014). Previous studies posited that variation in adoption of green public procurement practices can be explained by the local government's financial condition (Berry & Berry, 1990; Mohr, 1969; Sabatier & Weible, 2014; Wang & Zhao, 2014). While financial resources are inherently crucial to the process, organizational technical capacity to adopt innovative approaches to procurement is also

key (Terman & Smith, 2018). To measure the organization's financial condition, the present study included annual procurement volume and the extent to which the organization has a centralized or decentralized procurement system. The United States' administrative system is based on delegation of authority, with public authorities being highly decentralized. In recent years, scholars have advanced collaborative governance approaches as tools to overcome issues that arise from decentralization, such as financial constraints and lack of technical experts (Feiock, 2013). Therefore, the present study argues that collaborative governance, in the form of cooperative purchasing, is a resource to overcome obstacles related to innovation adoption.

Organization financial resources

A first measure of the financial capacity of an organization is the *annual procurement volume*, which is closely related to budget size (Alkadry, 2004; Alkadry et al., 2019; Alkadry & Bhargava, 2005). Budget size translates into purchasing power and the capacity to influence the market toward more green products, services, or works. Another measure of the financial power of an organization is whether an organization procurement system is *centralized* or *decentralized*. In the European context, Bouwer et al. (2005) found the degree of centralization to be a driver for sustainable public procurement. The research literature and policy makers have acknowledged the power of centralized procurement strategies to drive a wider range of policy goals, such as environmental sustainability (Albano & Sparro, 2010). On average, decentralization provides organizations with greater discretion to innovate (Roman, 2017); however, a centralized procurement function represents a more powerful bargaining chip to influence market

behavior toward production of sustainable products and services (Albano & Sparro, 2010; Alkadry et al, 2019).

Organization technical capacity

To engage in green public procurement practices, an organization must be familiar with the concept and have capacity for implementation. Across different countries and contexts, capacity to formulate measurable environmental specifications (e.g., knowledge, awareness, and information on GPP) has been identified as having a significant and positive impact on adoption and implementation of green public procurement practices (Testa et al., 2012; Testa, Grappio, Gusmerotti, Iraldo, & Frey, 2016; Varnäs, Balfors, & Faith-Ell, 2009; Zhu et al., 2013).

The European Commission, the U.S. federal government, and the U.S. Environmental Protection Agency have made efforts to provide toolkits and guidelines to enhance implementation of green public procurement practices; however, research has shown that a lack of information, knowledge, and skills among procurers is common (Testa et al., 2016). Similarly, Trammell and Dimand (2019) reported a lack of high familiarity with the green public procurement concept among survey governments and U.S. agencies at the state and local level.

Intergovernmental collaboration

As mentioned above, the U.S. administrative system is highly decentralized. In some cases, fragmentation has facilitated responsiveness and resilience (Feiock, 2013; Oakerson & Parks, 2011); however, in other cases, fragmentation has also led to Institutional Collective Action problems: “diseconomies of scale, positive and negative externalities, and common property resources problems” (Feiock, 2009, p. 357). Therefore,

in the case of GPP, one government's refusal to engage in these practices may reduce or completely hinder other governments' capacity and/or willingness to solicit such behavior from the market. Feiock (2009) advanced several mechanisms for local actors to overcome Institutional Collective Action Dilemmas: regional authorities, managed or coordinated networks, regional organizations, contract networks, collaborative groups and councils, and policy networks.

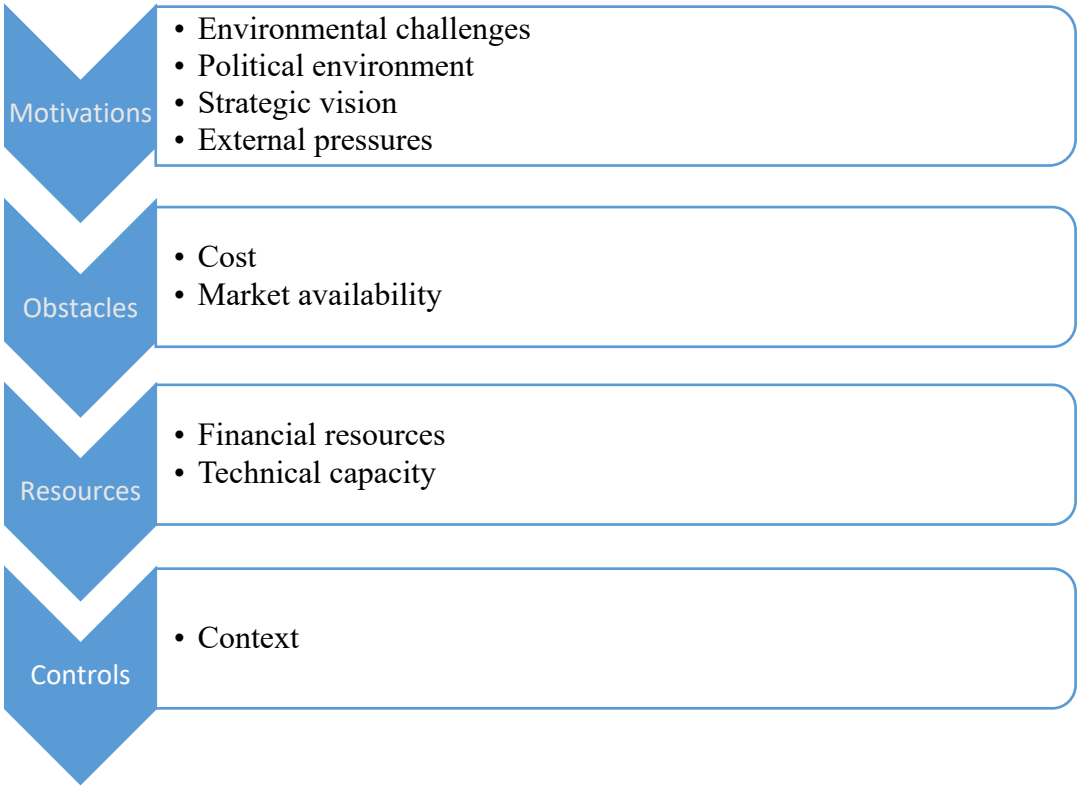
This dissertation focuses on intergovernmental contracting, and cooperative purchasing, as a mechanism to overcome fragmentation issues. This approach has been defined as "the combining of requirements of two or more public procurement entities" (Innocenti, Demel, Lucas, & Walton, 2012, p. 1). It has been considered to add "value" to local governments, and lead to otherwise intangible benefits and economies of scale and resolve externality issues. Per the Coase (1960) Theorem, contracts, as voluntary solutions, may be utilized as tools to overcome problems relating to externalities. The voluntary nature of a contractual agreement may enhance benefits for all parties involved (Feiock, 2009).

In their examination of the relationship between cooperative purchasing agreements among local governments and the adoption of certain economic development strategies, using the ICA Framework, Hawkins and Andrew (2010) found that communities with joint ventures were more likely to engage in locality development strategies. Johnson and Neiman (2004) also found a positive link between joint ventures and overall economic development activities (as cited by Hawkins & Andrew, 2010).

Based on previous research on sustainability, this dissertation hypothesizes that the following resources can help overcome obstacles to GPP adoption: (H7) higher financial

capacity, (H8) higher technical capacity, and (H9) a collaborative government arrangement.

Table 1. *Study framework (MOR Model for Policy Innovation Adoption)*



4.3. Research Question #3, Theory and Hypotheses

Local governments, compared to their federal counterparts, have typically faced greater challenges in adopting and implementing GPP practices (Cheng et al., 2018). First, environmentally friendly products and services have been stigmatized as being more expensive. Perceived higher cost has been cited as a common barrier 7/23/20 7:52:00 PM. Second, lack of familiarity with the concept of GPP and its implementation process, as well as lack of technical capacity of structuring GPP, make it difficult for the up-take of such

approaches on all levels of government (Brammer &Walker, 2011; Cheng et al., 2018; Testa et al., 2012).

Local governments and small size organizations have faced even more hardships than others in terms of financial and technical capacity. They are less likely to have the resources to dedicate personnel to sustainability and environmental protection issues surrounding organizational processes, including purchasing. Implicitly, they are less likely to have the resources to engage in GPP. These issues, arising from fragmentation of authority that characterize the U.S. context, have been considered to be severe challenges for adoption of environmental policies such as GPP (Yi et al., 2018).

The United States' administrative system is based on delegation of authority; with the public sector being highly decentralized. Although fragmentation has been found to promote responsiveness and resilience (Feiock, 2013), it could also lead to Institutional Collective Action problems [e.g., "diseconomies of scale, positive and negative externalities, and common property resources problems" (Feiock, 2009, p. 357)] and lack of resources to reach desired policy goals (Berardo, 2009).

Due to the spillover effects of environmental issues across jurisdictions, in recent years, the literature has endorsed collaborative governance as an alternative to traditional centralized systems when dealing with climate problems (LeRoux & Carr, 2007; Yi et al., 2018). Per resource exchange theory and the Institutional Collective Action Framework, collaborative arrangements can offset the shortcomings of fragmentation and reach otherwise intangible goals by acquiring the resources they lack from their environment (Berardo, 2009; Feiock, 2009). The European Union provides an example of a successful international experience in terms of green public procurement practices (European

Commission, 2019). The organization calls for agencies to resort to a collaborative governance approach—formal or informal—to share best practices and networks for an increase in the level of GPP adoption.

Cooperative purchasing has been described as a "formal structure (setup) that aligns procurement needs to two or more organizations in a way that maximizes efficiencies through large volume procurement" (Roman & Matthews 2018, p. 103). As mentioned above, generally, there are three types of cooperative procurement arrangements: piggyback, multiparty, and broker model (Roman & Matthews, 2018). Under a piggyback cooperative contract, one or more organizations insert a special clause in their agreement, allowing other agencies to utilize that contract, hence its name, without having to organize their own procurement procedure (Roman & Matthews, 2018). With a multiparty arrangement, two or more agencies join forces to contract out as a single entity (Roman & Matthews, 2018). Under a broker model arrangement, an external organization (i.e., the broker) handles the entire procurement process and members have the option to choose between all contracts that said cooperative offers (Roman & Matthews, 2018).

With cooperative purchasing, organizations have access to an array of resources (e.g., financial, technical, legal) to potentially overcome institutional collective action dilemmas. They may add "value" to local governments, and lead to otherwise intangible benefits and resolve externality issues (Berardo, 2009; Feiock, 2009, 2013; Hawkins & Andrew, 2010). Previous scholarship on the topic has identified two main positive outcomes of collaboration: (1) efficiency due to knowledge sharing and resource management on the one side and, on the other side, (2) economies of scale by pooling financial resources (Bakker et al., 2008; Bel et al., 2014; Jost, Dawson, & Shaw, 2005).

Building on this stream of collaboration research, the present study advances the following research question: What is the impact of cooperative purchasing on the engagement in green public procurement practices within the U.S. local government? To answer this question, I drew from multiple qualitative case studies. This type of research design is considered to be more compelling and robust compared to a single-case design (Yin, 2014).

CHAPTER 5: RESEARCH METHODOLOGY

This chapter presents the methodology employed to answer the three research questions in this dissertation. This dissertation follows a four-staged research design, which is presented in Table 2. The study utilizes a mixed-method approach that involved both quantitative (*Phase I*) and qualitative (*Phase II*) methods. The mixed methods approach allowed the quantitative and qualitative components to enhance and corroborate each other to produce more effective research. Triangulating quantitative and qualitative data has reportedly diminished the biases that arise from drawing conclusions from a single data source (Creswell, 2003). *Phase III* integrated data from both quantitative and qualitative sources, following a Sequential Explanatory Design (Creswell, 2003). *Phase IV* of the study will involve dissemination and reporting back to the agencies that participated in the research.

The research design is detailed below (see Table 2). Each step in the research design contributed to illustrating the whole picture surrounding Green Public Procurement implementation in local governments, starting with understanding the status quo, determinants of such practices, and impact of collaborative governance on the implementation of such activities.

As mentioned above, data for this study were comprised of primary and secondary information. First, a national survey was sent out to 1,983 agencies who were members of NIGP: The Institute for Public Procurement—a non-for-profit educational association, dedicated to the public procurement profession, with a membership that includes over 3,000 member agencies and more than 15,000 governmental procurement officials. In addition, semi-structured interviews were conducted to understand in-depth the findings

gathered from the survey instrument as well as the impact of collaborative governance on GPP adoption and implementation. The data were complemented with information from the U.S. Census Bureau and Harvard Dataverse – MIT Election Data and Science Lab (MIT Election Data and Science Lab, 2019). Detailed information is provided in Table 3 below. Below, I describe the following areas of this study: unit of analysis, instrument design, administration procedure, and response rate.

Table 2. *Research design*

Research question	**Variable (s)**	**Design and techniques**
1. What is the current level of green public procurement implementation among U.S. local governments?		Quantitative (Descriptive statistics, data drawn from the survey instrument - *Phase I*)
2. What are the factors that may foster or hinder GPP adoption among U.S. local governments?	**Motivations:** - Environmental challenges - Political environment - Strategic vision - External pressures **Obstacles:** - Cost - Market availability **Resources:** - Financial resources - Technical capacity **Contextual variables**	Quantitative (*Phase I*) Complemented with qualitative data from (*Phase II*) and open-ended questions from the survey instrument (*Phase III*); Ordered logit regression with the dependent variable: Green Public Procurement Scale; Negative binomial regression with the dependent variable: Green Public Procurement Scorecard
3: What is the impact of intergovernmental collaboration on GPP implementation?		Qualitative data (*Phase II*): semi-structured interviews with public sector officials involved in the procurement process – complemented with quantitative data (*Phase III*)
Phase IV - Disseminating and reporting back		

Table 3. *The Independent and Control Variables*

Variable	Operationalization	Source
Motivation		
Environmental challenges		
Population density	Population per unit area (number)	U.S. Census Bureau
Population change	Percentage population change 2016-2017	U.S. Census Bureau
Political environment	Percentage of votes with the democratic president in 2016 elections	Harvard Dataverse – MIT Election Data and Science Lab
Strategic vision	Does your organization's strategic plan/policy refer specifically to green purchasing? (Binary variable yes=1; no=0)	Survey
External pressures		
Federal funding	Pressures external to the organization exist to engage in green public procurement practices. Please rate the influence of the following groups (Likert-type scale)	Survey
Interest groups		
Obstacles		
Cost	The cost of green products/services/constructions limited my organization's engagement in green public procurement practices (Likert-type scale)	Survey
Market availability	Based on your expertise, please rate to what extent do you agree or disagree with the following statements: Adequate amount of green suppliers available for selection (Likert-type scale)	Survey
Resources		
Financial resources		
Annual Procurement Volume	Dollars	Survey

Centralization	Centralized procurement system/decentralized (binary variable yes=1; no=0)	Survey
Technical capacity		
Certification	Position requires certification/does not (binary variable yes=1; no=0)	Survey
Familiarity with GPP	How would you rank your organization's familiarity with the concept of green public procurement? (Likert-type scale)	Survey
Training	Does your organization offer any green procurement training to procurement personnel? (binary variable yes=1; no=0)	Survey
Collaboration	Does your organization engage in cooperative & group purchasing? (binary variable yes=1; no=0)	Survey
Contextual variables (control variables)		
Population Median Age	Number	U.S. Census Bureau
City's Resident Education Level	Percentage population with a bachelor's degree or higher	U.S. Census Bureau
Percentage of Hispanic Residents	Percentage	U.S. Census Bureau
Percentage of African American Residents	Percentage	U.S. Census Bureau

5.1. Phase I. Quantitative Method

The first phase of the study consisted of a quantitative method research design to address research question 1 and, partially, research questions 2 and 3, as depicted in Table 2.

5.1.1. Survey instrument Design and Administration

The unit of analysis for the study is local governments in the United States, including the following types: city/town, county/regional, school system, special authority, and public utility. The bulk of public contracting is conducted at the local level and, in the

United States federalist system, local governments have discretion to innovate, which makes the local setting an appropriate unit of analysis.

A chief issue in conducting a survey is maximizing of the number of potential respondents. The response rate is highly important to ensure that findings are statistically powered, to reduce error, and to increase generalizability. Therefore, to enhance the response rate for the study, the instrument was sent to members of NIGP: The Institute for Public Procurement.

The instrument was drafted after a thorough review of the literature on innovation, green public procurement, and collaboration. Before the survey was administered, a pilot study with public procurement professionals was conducted. The individuals chosen for the pre-test were representative to the final sample (Gore-Felton, Koopman, Bridges, Thoresen, & Spiegel, 2002). The pilot test occurred between September and November 2018. Seven individuals provided feedback on the questionnaire and the final survey was updated in accordance with the suggestions provided by the pilot study. Table 4 presents information about the job titles, states, and dates for the individuals involved in pretesting the survey instrument.

Table 4. *Pretesting sample*

Title	**State**	**Date/ Time of Pretest**
Procurement Contracting Analyst I	Florida	09/29/18 11 am, EST
Purchasing & Contracts Manager	Florida	10/19/18, 1:45pm EST
Sustainable Purchasing Coordinator	Oregon	10/19/18, 5:30pm EST

Administrator, Procurement Division	Florida	Email feedback received 11/08/18
Director, Content Research & Development	Virginia	Email feedback received 11/01/18
Former Agency Procurement Officer Currently-Contract Instructor for NIGP	Ohio	Email feedback received 11/10/18
Contract Management Specialist 2	New York	Email feedback received 11/07/18

Following the pilot test, the survey instrument was sent to 1,983 local governments, NIGP members, in November of 2018. It was sent via email and administered through Qualtrics, an online survey software. Due to the highly specialized nature of the research, NIGP membership was the most appropriate sample for the survey administration. Several email reminders were sent. The nominal response rate for the survey was 22%. The final sample was comprised of 189 usable cases of local governments, including the following types: city/town, county/regional, school system, special authority, and utility.

A respondents-non-respondents analysis was conducted (see Tables 5 and 6) utilizing demographic indicators, and results show that participation bias is not present. Non-respondents included partial respondents and non-respondents.

Table 5. Comparison of Means for Survey Respondents and Non-respondents

	Respondents	Non-respondents	Significantly different at α = 0.05
Education (% bachelor's degree or higher)	33	36	No
Median household income (%)	61,625.41	59,633.38	No
Population change 2016-2017	8,367.70	6,945.53	No
Urban Population	773,807.50	752,836.30	No
Rural Population	30,292.60	30,533.10	No
Population density	1,423.86	1,874.98	No

Table 6*. Comparison of Means Sample Size*

	n for respondents	*n* for non-respondents
Education (% bachelor's degree or higher)	204	1,778
Median household income (%)	204	1,776
Population change 2016-2017	204	1,777
Urban Population	204	1,777
Rural Population	204	1,777
Population density	204	1,775

**N is different for non-respondents due to 0s in the dataset*

5.1.2. Variables

To ensure the robustness of the findings, as recommended by Long and Freese (2014), two models were run using two different operationalizations for the dependent variable: a green public procurement scale (ordinal) and a green public procurement scorecard (count). A Cronbach alpha of 0.93 showed the internal consistency of the scorecard variables.

The dependent variable is an ordinal scale denoting the level of greenness of the public procurement adoption within an organization, ranging from Gray to Light Green and to Green (Figure 1). The ordinal scale of green public procurement is theoretically built on the definition and scales of green public procurement developed in Bouwer et al. (2005), focusing on all stages of the procurement process (Bolton, 2008)—specifically: selection criteria, evaluation criteria, technical specification, and contract stage. "Gray" represented the lowest level on the scale and incorporates responses from agencies that do not include environmental criteria in the procurement process, or if they do, they represent more of a recommendation but not a requirement. The "light green" category included answers from agencies that incorporate environmental requirements in the vendor selection criteria, whereas "green," the highest level on the scale, was comprised of organizations that have environmental specifications as evaluation criteria and/or such requirements are built into the technical specifications and/or contractual agreements. The "light green" category reflected the supplier's "environmental competence to render performance under a contract" (Bolton, 2008, p. 5). The "green" category captured whether an agency monitors and enforces environmental requirements, which increases the effectiveness of purchasing as an environmental policy tool (Bolton, 2008). Table 7 includes twelve green public procurement activities included in the analysis.

Figure 1. Dependent Variable Operationalization (GPP scale)

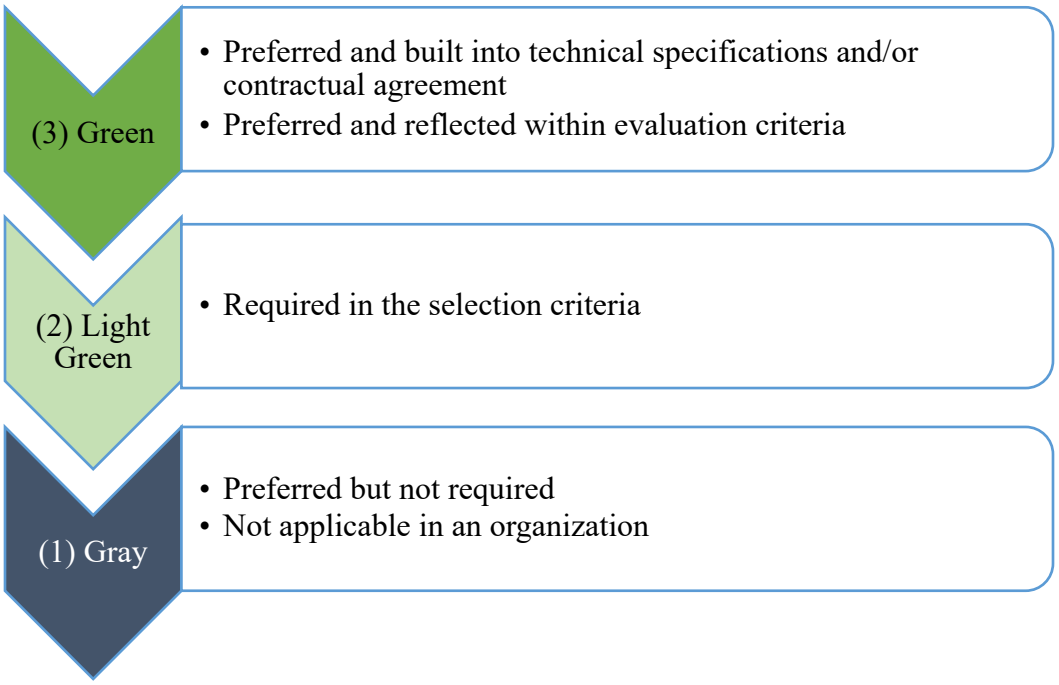


Table 7. *Green Public Procurement Requirements*

#	**Source: Survey instrument** **Green Procurement Initiatives**
1	Use of environmental labels
2	Use of renewable resources
3	Reduced packaging
4	Ecologically friendly products
5	Environmentally friendlier transport options
6	Use of recycled material
7	Use of products with reduced energy use of lifetime
8	Reduced use of water
9	Reduced content of toxic/harmful chemicals
10	Decrease of polluting emissions
11	Design for re-use dismantling and recycling
12	No hazardous waste over lifetime

The greenness ordinal scale is operationalized by survey responses. Data for constructing the ordinal scale were obtained from the survey question: *Please indicate your*

organization's preference regarding the following environmental specifications (please select all that apply). A total of 12 common GPP requirements were included in the survey (Table 7) and respondents were asked to evaluate their agencies' practices according to the "greenness" scale and indicate the extent to which each requirement was implemented and/or enforced and in which of the stages of the procurement process.

An agency may choose to engage in any of the GPP activities or none. For each item in Table 7, respondents were asked to assign a value on a Likert-type scale ranging from 1 to 5, specifically: (1) not applicable; (2) included in the agency's policies, preferred and not required; (3) required in the selection criteria; (4) preferred and reflected in the evaluation criteria; or (5) preferred and built into technical specifications or contractual agreements. Therefore, the overall score of an agency ranged from 12 (i.e., no requirements were implemented) to 60 (i.e., all requirements were fully implemented).

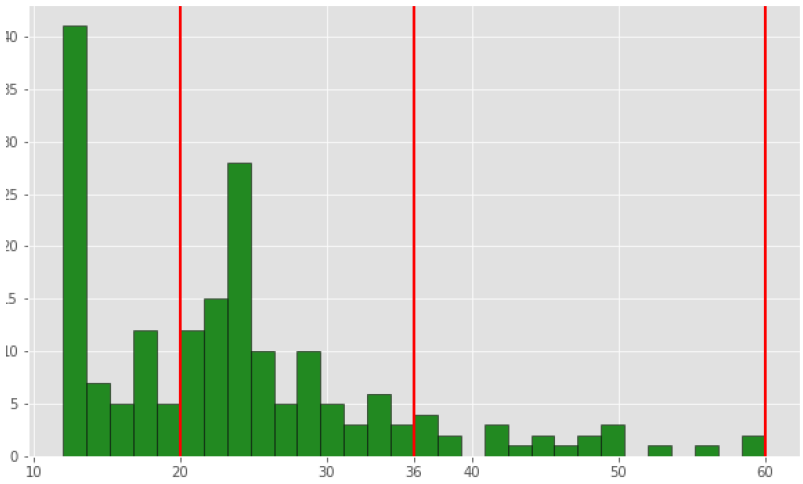
All respondent agencies are grouped according to the greenness scale. The "Gray" category consists of agencies that do not implement any surveyed GPP requirements or, when they do, such requirements are merely symbolic. The "Light Green" category includes agencies that aim to select suppliers that would have "environmental" capacity to perform under the contract. The agencies that fall into the "Green" category adhere to GPP by ensuring supplier compliance with environmental requirements and the delivery of environmentally friendly products and services, and by evaluating, enforcing, and monitoring green technical specification and implementation.

Therefore, based on the theoretical reasoning presented above, respondent agencies were categorized as Gray if their scores were 20 or lower; agencies were categorized as Light Green if their scores were greater than 20, but equal to or less than 36; agencies were

categorized as Green if their scores were greater than 36. The cutoff points for the three greenness categories are seemingly arbitrary; however, the rationale for these points is described in further detail below. Sensitivity tests of using "fuzzy" cutoff points were conducted to ensure research results and findings are not dependent on a specific set of cutoff points.

In addition to the theoretical, deductive approach used to operationalize and develop the ordinal dependent variable, an inductive, data-informed approach is also applied according to Jenks natural breaks of a dataset. Jenks (1967) method "forms internally homogeneous classes and ensures the heterogeneity between classes, minimizing the variance between each class" (Curto & Dias, 2015, p. 468). Please see Figure 2 for the results of Jenks optimization. The Jenks natural breaks are 20, 36, and 60, which corroborate categorization and cutoff points derived from theoretical conceptualization. When combining theoretically derived, data-informed, and fuzzy approaches, we are in a strong position to triangulate true cutoff points of the greenness scale and to ensure research findings are independent from specific cutoff points.

Figure 2. Jenks Natural Breaks for GPP Scale



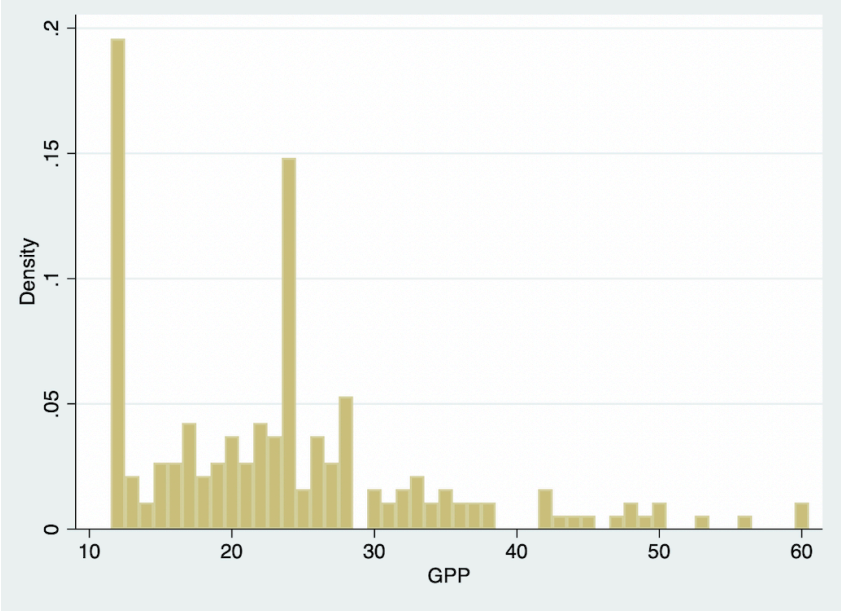
5.1.3. Quantitative Research Methodology

Two different models were explored and tested against the same independent variables: motivations, obstacles, resources, and controls. The first model employed a dependent variable, which is the ordinal index I developed for each agency. The second model utilized a dependent variable, which was a count value of each agency relating to its GPP practices and efforts (see Table 3 for description and sources of each variable, and Table 9 for summary statistics). To account for differences in cities, the framework was inclusive of several demographic features of the community: residents' median age, the educational level of the residents, median household income, and percentage of non-White race of the population. Building on the hypotheses mentioned above (Mohr, 1969; Wang & Zhao, 2014), the model of GPP adoption can be expressed as:

$$GPP = f(M, O, R, Controls)$$

When estimating a model with an ordinal dependent variable, researchers have recommended use of models that do not assume equal distance between categories (Long & Freese, 2014). Therefore, ordinal logistic regression was chosen to fit the main model. For the count dependent variable, a negative binomial model was used, instead of a Poisson regression. This is because the assumption of a Poisson distribution (i.e., the mean and the variance are equal) was violated. The distribution of the count dependent variable (GPP) is presented in Figure 3.

Figure 3. Distribution of the GPP Scorecard



Before running the regression analyses, the assumptions for regressions were tested. Therefore, several diagnostics were employed, including multicollinearity, the approximate likelihood ratio tests and Brant tests for the proportional odds assumption (Long & Freese, 2014). No major violations were found. In addition, for clarity, interpretations based on predicted probabilities are usually preferred in these types of models. Therefore, in addition to factor change in odds, the present study also reported marginal effects for an average agency (Long & Freese, 2014).

5.2. Phase II. Qualitative Method

The second phase was employed to complement the quantitative research in Phase I and address, in more depth, research questions 2 and 3. To that end, this dissertation utilizes an exploratory multiple qualitative case study research design (Stewart, 2012; Yin,

2014). The unit of analysis were two municipalities in the State of Florida, United States of America. See Figure 4 for research procedure and Table 8 for case study demographics.

Figure 4. Case study procedure (adapted from Yin, 2014, p. 60)

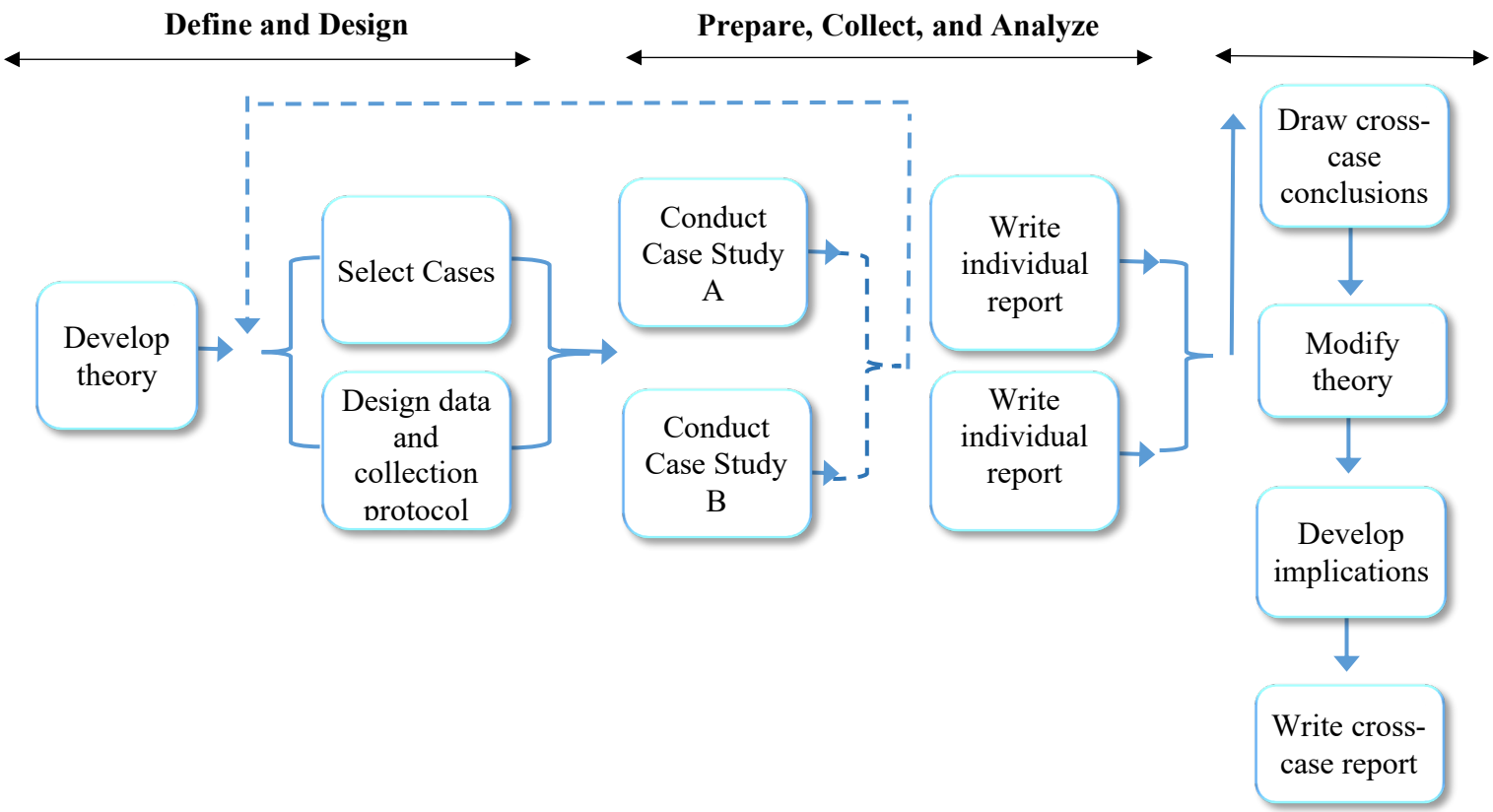


Table 8. *Case Study Demographics*

Name	Location	Population	Median Age	Median household income	Diversity (approximations)
Case Study A	South Florida	Approx. 12,000 residents	38.9	around $62,000	Around 53% Latino, 26% White, 14% Black or African American, 3% Asian, 2% Other
Case Study B	Central Florida	Approx. 280,000 residents	33	around $47,000	Around 30% Latino, 34% White, 26% Black or African American, 4% Asian, 5% Other

[i] *Approximate numbers are provided to ensure that the information cannot be traced back to the actual city*
Data Source: https://datausa.io 2017

Data for the case studies were collected mainly through semi-structured interviews and a review of secondary sources. Two open-ended questions were included in the survey instrument detailed in *Phase I* (described above) to understand hindering and driving factors of green public procurement practices in local government and, thus, strengthening the findings for research question 2. The following section describes the sampling method, data collection, and analysis.

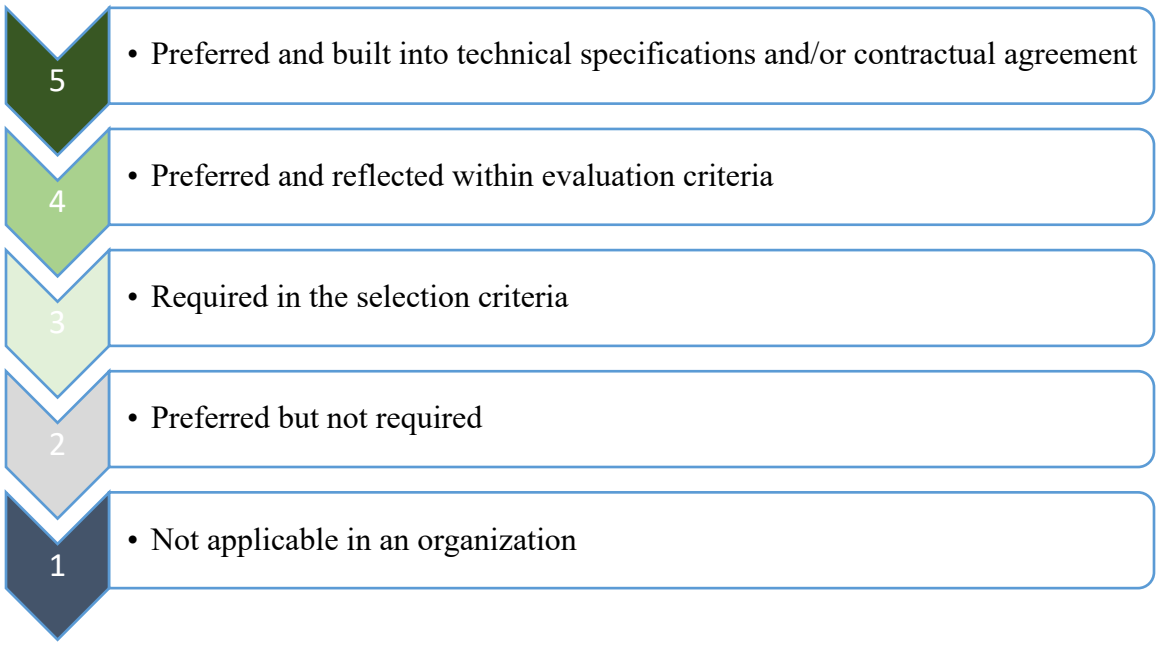
5.2.1. Sampling Method

The cases were selected from a nationwide survey I designed, pretested, and disseminated with the support of NIGP: The Institute for Public Procurement. For internal validity, I identified two comparable groups in terms of demographics and socio-economic variables. To facilitate the case selection, questions regarding engagement in cooperative purchasing were included in the survey. For example, the instrument asked whether the agency engaged in cooperative purchasing—if so, what was the objective of said collaboration and did the agency enter the cooperative purchasing agreement for the purpose of engaging in green public procurement; additionally, the instrument asked questions concerning the length, scope, frequency, and participants in the venture. Although practitioners are often familiar with the term "cooperative purchasing," to reduce any confusion surrounding the term, a definition was included in the survey.

The following criteria were used for selection: local governments in United States, state location to control for the environment in which the agency operates, comparable cases in terms of demographics, the level of green public procurement [per the green procurement scale I developed (Figure 5)], and whether or not the organization

engaged in cooperative purchasing. One organization engaged in cooperative purchasing and the other did not. Thus, the selection of case study for in-depth analysis was purposive.

Figure 5. Green Public Procurement Scale (Adapted from Bolton, 2008; Bouwer et al., 2005)



Note: 1=Gray; 2=Light Gray; 3=Light Green; 4=Green; 5=Dark Green

This was the initial research design. Yet, when conducting the interview, the discussion revealed that both organizations engaged in cooperative purchasing practices, though they used different types of practices and employed the practices to different extents. The original research design also included two cities in Louisiana. One city engaged in a low level of GPP and the other did not adopt any such policies. In addition, one city engaged in cooperative purchasing practices, while the other did not. The two organizations did not reply to my invitations to participate in the present study. To compensate for this, I invited two other local governments in Florida to participate in the

study; these governments were situated in more conservative areas, with lower levels of green public procurement. These governments did not reply to the invitation.

Face-to-face interviews were conducted at each location with procurement and sustainability professionals. The unit of analysis was the organization and not individuals. Due to the nature of the questions, few individuals in each organization had the knowledge needed to respond to the survey. Thus, to protect individuals' identities, I refer to the case studies as *Case Study A* and *Case Study B*. The small sample size is also due to the nature of the research. Procurement and sustainability officers are able to address the interview questions. When the invitation to participate in the project was extended, the researcher discussed the purpose of the study with city officials. Based on this discussion, the organization identified personnel that were fit to address the questions.

Questions addressed to procurement professionals focused on the reasoning for collaboration, who they collaborate with, what the process looks like, and the impact of collaboration on cost and capacity (see Table 13 in the Appendix for the full questionnaire). The interviews were recorded and transcribed verbatim by the researcher.

Because my project involves research with human subjects, I submitted the study to the Institutional Review Board (IRB) at my institution, Florida International University. For this process, I completed the Collaborative Institutional Training Initiative (CITI) Online IRB Training, drafted a consent form to participate in the study, and contacted the case study location to obtain approval to conduct research at their location. A consent was obtained from each participant in the research project prior to starting the interview. By providing participants with the consent form to participate in the study, I ensured that research subjects were aware of the purpose of the study, procedures, duration of the

interview, the risks and benefits associated with participation, alternatives, and the voluntary nature of participating in the research project (Institutional Review Board, Florida International University, n.d.).

Case Study A

Case Study A is a city in South Florida with a council-manager, weak mayor form of government. The procurement process is decentralized. The city has a Procurement Division that functions under the Finance Department, which reports directly to the City Manager. The city also has a Planning & Zoning & Sustainability Department, which reports directly to the City Manager as well. Their annual procurement volume is approximately $7.7 million dollars. In accordance with the survey results, Case Study A has a level of green public procurement of 3 (for more information, see Figure 5) and engages in collaborative purchases. Interviews *(N=4)* were conducted with the chief financial officer, chief procurement officer, a central services specialist, and an employee of the Planning & Zoning & Sustainability Department. Data were collected during August 2019.

Case Study B

Case Study B is a city in Central Florida with a mayor city-council, strong mayor form of government. Its procurement process is a hybrid that is centralized, but there is delegated authority. The City has a Procurement and Contracts Division under the Business and Financial Services Department. This unit is led by the Chief Financial Officer, who reports directly to the Mayor. The city also has an Office of Sustainability and Resilience that reports directly to the Mayor. Their total annual procurement spending is approximately $200 million. In accordance with the survey results, Case Study B has a

level of green public procurement of 5 (see Figure 5) and does not engage in collaborative purchases. Interviews *(N=4)* were conducted with the chief procurement officer, another procurement executive, a contract administrator, and a manager from the Office of Sustainability and Resilience. Data were collected during September 2019.

The data were collected, with the permission of study participants, through audio recordings and notes that were stored in a database. First, all recordings were transcribed verbatim. Next, all the information was entered into NVivo 12 software to identify themes and codes and run queries to understand the frequency of words and themes. The individuals interviewed were selected by judgement sampling and snowball sampling (Yin, 2014).

5.2.2. Qualitative Data Analysis

After the data were transcribed verbatim by the researcher, the documents were uploaded in NVivo 12 for analysis. The study was explorative in nature, and the themes/nodes were derived from the collected data, building on the propositions driven by the limited previous scholarship. Therefore, the study followed a deductive process.

5.3. Phase III. Integrating Qualitative and Quantitative Data

With the purpose of understanding the results from Phase I and to reduce biased results as much as possible, Phase III triangulated data from both the quantitative and qualitative methods (Creswell, 2003). Phase III followed a sequential explanatory strategy (Creswell, 2003) to integrate information from Phases I and II. The study began with a quantitative method and was followed by a qualitative method that involved an exploration utilizing a multiple case study design (Creswell, 2003).

5.4. Phase IV. Dissemination and reporting back

The last phase of this project will be reporting back to the public procurement community. This will be done either at the next meeting of NIGP: The Institute for Public Procurement or with a memo that will be sent to all the members. Dissemination and reporting back are of chief importance because it enhances trust in the overall findings.

CHAPTER 6: QUANTITATIVE RESEARCH RESULTS AND DISCUSSION (PHASE I)

6.1. GPP Status Among U.S. Local Governments

The first research question explored the current level of green public procurement in U.S. local governments. This question was answered with descriptive analysis of the survey results. Overall, the survey results demonstrate that green public procurement practices are not prevalent in agencies in the sample. Only 21% of local government respondents have a green public procurement policy in place. But adopting a policy did not equate to implementation. Findings show variation in level of implementation. Only 11% (32) of local governments in the sample have a high level of GPP (green)—these organizations include green specifications as an evaluation criterion and/or in the contractual agreement. Among these, only 3% (10) actually include these criteria in contractual specifications. Results show that 204 agencies (67%) either do not engage in GPP practices entirely or only have a policy for this initiative, meaning GPP is merely recommended, not required (see Figure 6). Figure 3 presents the results for the GPP scorecard. Two agencies have a score of 60. These two agencies are city/town governments in the State of Florida and Louisiana, respectively. Interestingly, neither agency has a GPP policy in place.

Figure 6. Level of GPP in U.S. local governments in the sample

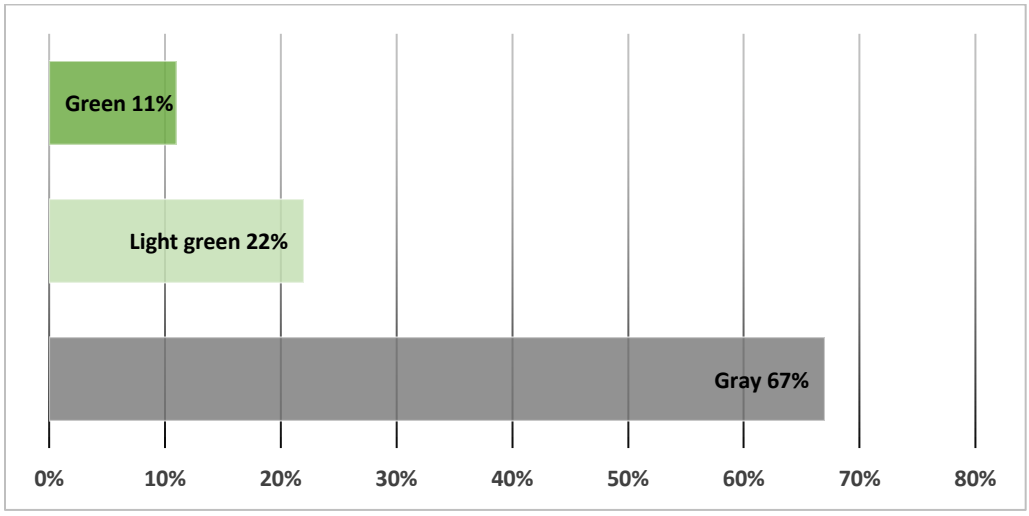
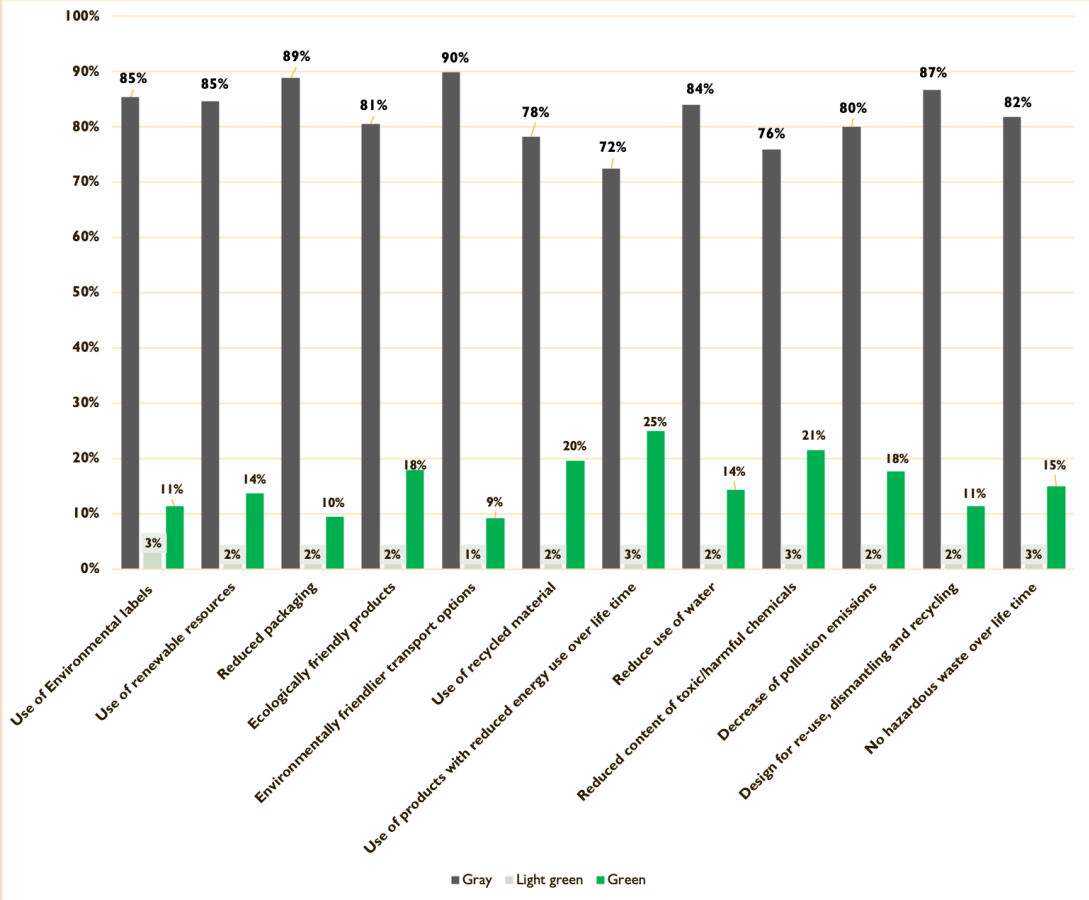


Figure 7 presents the distribution of adoption for each GPP initiative by the agencies in the study sample. Results support the assertion that green public procurement is not prevalent in the local governments I studied, and most did not engage in any type of GPP. When agencies do implement GPP, those identified as "green" (top 5), focus mostly on including the following requirements: the use of products with reduced energy use over lifetime (25%), reduced content of toxic/harmful chemicals (21%), use of recycled material (20%), use of ecologically friendly products (18%), and focus on decrease of pollution emissions (18%). These initiatives have been traditionally perceived as green.

Figure 7. Distribution of Green Public Procurement Activities



Figures 8 and 9 show agencies that are identified as "gray" and "green" on the green public procurement scale. Those that fall in the "gray" category are the low performers, and the "green" agencies are the top performers. The maps show the same geographical areas include both low and high performers—meaning that GPP adoption is not necessarily influenced by location.

Figure 8. GPP High Performing Agencies

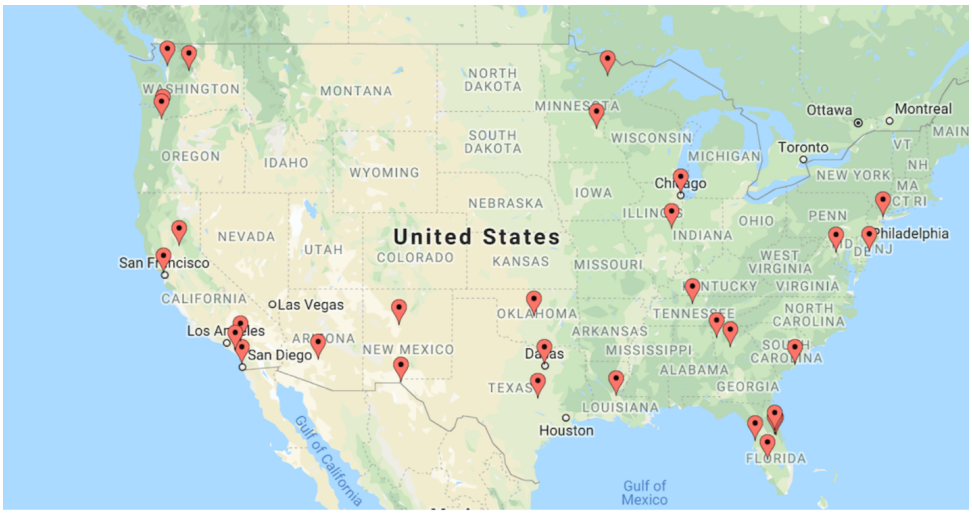


Figure 9. GPP Low Performing Agencies

6.2. Determinants of GPP Practices in U.S. Local Governments

The second research question explores the determinants of green public procurement practices in U.S. local governments. As mentioned above, to ensure the robustness of the findings, two models were run using two different operationalizations for the dependent variable: a green public procurement scale (ordinal) and a green public procurement scorecard (count). Summary statistics are presented in Table 9.

Table 9. *Descriptive Statistics*

VARIABLES	N	Mean	Std. Dev.	Min	Max
DVs					
GPP scale	189	1.44	0.68	1	3
GPP scorecard	189	23.61	10.42	12	60
MOTIVATIONS					
Environmental Challenges					
Population Change (logged)	189	10.11	1.85	4.69	13.24
Population Density (logged)	189	6.34	1.34	2.26	11.15
Political Environment	189	0.50	0.14	0.07	0.87
Strategic Vision	189	0.11	0.31	0	1
External Pressures					
Federal Funding	189	3.24	1.05	1	5
Interest Groups	189	2.96	1.04	1	5
OBSTACLES					
Cost	189	0.86	0.35	1	5
Supply side issues					
Market availability	189	2.87	0.87	1	5
RESOURCES					
Financial resources					
Annual Procurement Volume	189	2.34	1.75	1	6
Centralization	189	0.74	0.44	0	1
Technical Capacity					
Certification	189	0.57	0.50	0	1
Familiarity with GPP	189	2.80	1.12	1	5

Training	189	0.13	0.33	0	1
Collaboration	189	0.97	0.16	0	1
Control variables					
Population Median Age	189	37.53	4.40	25.80	54.50
Population Education	189	34.47	11.09	11.50	78.10
Percentage of Hispanic Residents	189	17.85	16.56	1.60	91.50
Percentage of African American Residents	189	12.84	11.50	0.30	53.20

The likelihood ratios (LR) demonstrate that the model is statistically significant as a whole, therefore providing evidence that the results are not random (Battaglio & Condrey, 2009). Ordered logit coefficients cannot be meaningfully directly interpreted (Long & Freese, 2014). Thus, the dissertation reports the factor change in odds (see Table 10) and marginal effects (see Table 11). Table 12 presents analysis of the hypotheses.

To further ensure the robustness of the results and demonstrate that they are not based on the cutoff points selected for the scale, two different methods were employed. First, I used different "fuzzy" cutoff points for the ordinal scale. Second, using Python 3.7, I observed the Jenks natural breaks in the distribution of the dependent variable and created three categories based on those results. All correspondent models are carried out and they are generally consistent in terms of signs and magnitude regardless of the construction of the ordinal scale.[1]

[1] Regression outputs are available upon request.

Table 10. *Regression Results*

Variables	(1) DV GPP Scale Factor change in odds (z score in parenthesis)	(2) DV GPP Score Factor chance in expected count (z score in parenthesis)
MOTIVATIONS		
Environmental Challenges		
Population Change (logged)	1.039	0.985
	(0.244)	(-0.743)
Population Density (logged)	1.407	1.044
	(1.511)	(1.549)
Political Environment	0.173	0.845
	(-0.821)	(-0.510)
Strategic Vision	**3.086****	**1.232*****
	(2.122)	(3.737)
Pressures from External Stakeholders		
Federal Funding	**1.447****	**1.062****
	(2.071)	(2.354)
Interest Groups	1.193	1.031
	(0.992)	(1.223)
OBSTACLES		
Cost	1.413	1.004
	0.764	(0.066)
Supply Capacity Issues		
Market Availability	**0.567*****	**0.936****
	(-3.877)	(-2.730)
RESOURCES		
Financial resources		
Annual Procurement Volume	0.902	1.000
	(-0.824)	(0.019)
Centralization	0.823	0.919**
	(-0.521)	(-2.805)
Technical Capacity		
Certification	1.222	1.032

	(0.566)	(0.613)
Familiarity with GPP	**2.310*** **	**1.161*** **
	(4.693)	(7.446)
Training	1.546	1.109
	(0.823)	(1.536)
Collaboration	2.111	0.932
	(0.733)	(-0.653)
The model controls for Population Median Age, City's Resident Education Level, Percentage of Hispanic Residents, Percentage of African American Residents (-*) - in the first model and Age (-**) in second model		
N	189	189
Pseudo R2	0.205	0.070
Robust standard errors clustered at state level		
*** p<0.01, ** p<0.05, *p<0.1		

Table 11. *Marginal effects*

Variables	Gray	Light Green	Green
MOTIVATIONS			
Environmental Challenges			
Population Change (logged)	- 0.008	0.006	0.002
Population Density (logged)	- 0.069	0.052	0.017
Political Environment	0.345	- 0.252	-0.093
Strategic Vision	**- 0.226 ****	**0.169****	**0.057***
Pressure from External Stakeholders			
Federal Funding	**- 0.075****	**0.057 ****	**0.018 ****
Interest Groups	- 0.036	0.027	0.009
OBSTACLES			
Cost	- 0.070	0.053	0.017
Supply Capacity Issues			
Market availability	**0.114 *****	**- 0.086*****	**- 0.028 *****
RESOURCES			
Financial resources			
Annual Procurement Volume	0.021	- 0.016	-0.005
Centralization	0.039	- 0.030	-0.009
Technical Capacity			
Certification	- 0.041	0.031	0.010
Familiarity with GPP	**- 0.168 *****	**0.127 *****	**0.042*****
Training	- 0.088	0.067	0.021
Collaboration	- 0.151	0.114	0.037

*** p<0.01, ** p<0.05, *p<0.1

Note: estimates are computed with margin option at mean and the results are reported for a 1-unit change. Average marginal effects are reported for a given independent variable X while holding other independent variables Xs at their means.

Table 12. *Hypotheses analysis*

Variables	Hypotheses	Results
MOTIVATIONS		
Environmental Challenges		
Population Change	+	Fail to Reject H_0
Population Density (logged)	+	Fail to Reject H_0
Political Environment	+	Fail to Reject H_0
Strategic Vision	+	Reject H_0
Pressures from External Stakeholders		
Federal Funding	+	Reject H_0
Interest Groups	+	Fail to Reject H_0
OBSTACLES		
Cost	-	Fail to Reject H_0
Supply Capacity Issues		
Lack of Market Availability	-	Reject H_0
RESOURCES		
Financial resources		
Annual Procurement Volume	+	Fail to Reject H_0
Centralization	+	Fail to Reject H_0
Technical Capacity		
Certification	+	Fail to Reject H_0
Familiarity with GPP	+	Reject H_0
Training	+	Fail to Reject H_0
Collaboration	+	Fail to Reject H_0

6.2.1. Motivations

As initially hypothesized, consistent in both models, management support is likely to positively influence the level of GPP engagement. Results show that for agencies that incorporate green public procurement practices in their strategic plan, compared to those that do not, the odds of a green level of GPP, rather than a less environmentally friendly and sustainable practice (i.e., light green and gray) increase by 3.09, holding all other

variables in the model constant. Moreover, compared to agencies that do not include GPP in their strategic plans, agencies that include GPP in their strategic plans will have 23 percentage points less probability of falling in the *gray* category. In the same comparison, the latter is 17 percentage points more likely to fall in the *light green* category and 6 percentage points more likely to be in the *green* category. All effects are statistically significant at $p<0.1$.

Similarly, with a one-unit increase in external pressure resulting from higher level funding, the odds of an agency adopting a green level of GPP—as opposed to the less environmentally friendly categories—increase by 1.45, holding all other variables in the model constant. Specifically, a one-unit increase in external pressure from federal funding decreases an agency's probability of falling in the *gray* GPP category by 8 percentage points, while increasing the agency's probability of being light green or green by 6 and 2 percentage points, respectively. All effects are statistically significant at $p<0.05$.

Contrary to what was hypothesized, environmental challenges, political environment of the population, and external pressure from interest groups do not have a statistically significant impact on the level of green public procurement.

6.2.2. Obstacles

The study argued that lack of market availability has a negative effect on the level of engagement in GPP. Results show that with a one unit increase in market availability, the odds of an agency adopting a *green* level of GPP versus *light green* or *gray* decrease by 0.57, holding all other variables in the model constant. Specifically, one unit increase in the perception of an adequate number of green suppliers available for selection increases an agency's probability of falling in the *gray* GPP category by 11 percentage points, while

decreasing the agency's probability of being *light green* or *green* by 9 and 3 percentage points, respectively. All effects are statistically significant at $p<0.01$. Results do not support a correlation between cost of green products or services and GPP adoption.

6.2.3. Resources

There is a strong statistically significant relationship between familiarity with the GPP concept and the level of GPP in an organization. As hypothesized, holding all other variables in the model constant, with one unit increase in familiarity with GPP, the odds of engagement in *green* GPP—compared to less environmentally friendly categories—increase by 2.31. More specifically, one unit increase in familiarity with the concept of GPP decreases an agency's probability of falling in the *gray* GPP category by 17 percentage points while increasing the agency's probability of falling in the *light green* and *green* categories, by 13 and 4 percentage points, respectively. All effects are statistically significant at $p<0.01$.

However, the study did not find support for the hypotheses related to the influence of financial resources, and certain elements of the organization's technical capacity—certification, training, and collaboration—on the level of green public procurement practices in U.S. local governments.

6.2.4. Control variables

The percentage of African American population in the community is statistically significant at $p<0.1$ only in the ordered logistic model. This suggests a negative relationship between a high percentage of African American population and engagement in such practices at the local level. Population Median Age is statistically significant at $p <.05$ level in the second model and the relationship with the level of GPP is negative

6.3. Conclusion and Implications for Research and Practice

The first research question explored the current level of green public procurement adoption in U.S. local governments. The second examined the factors that challenge or facilitate local government GPP adoption. To address the two research questions, the study expanded on a model of government innovation adoption (Mohr, 1969) and relied primarily on data from a national survey of public procurement professionals conducted with the support of NIGP: The Institute for Public Procurement (NIGP). The data from the survey was complemented with information from the U.S. Census Bureau and Harvard Dataverse – MIT Election Data and Science Lab.

Overall, the survey results demonstrate that green public procurement practices are not prevalent in agencies in the sample. Only 21% of local government respondents have a green public procurement policy in place. However, adopting a policy did not equate to implementation. Most agencies have green public procurement practices as symbolic policies: only 11% of local governments in the sample have a high level of GPP (green; see Figure 6)—these organizations include green specifications as an evaluation criterion and/or in the contractual agreement, while 67% either do not engage in GPP practices entirely or only have a policy for this initiative, meaning GPP is merely recommended, not required (See Figure 6).

Results generally support Mohr's (1969) motivation-obstacle-resources model. Findings indicate that level of GPP adoption tends to be motivated by including these initiatives in the agency's strategic plan and external pressures from federal government. Previous research has shown that lack of leadership support is a chief barrier in GPP engagement, while emphasis on the economic benefits of such practices could ensure

leadership support (Ahsan & Rahman, 2017). The United States federal government has recommended the inclusion of environmental requirements in the procurement process since the early 1990s (U.S. EPA, 2014). Due to the decentralized administrative system in the United States, local governments have discretion in their policymaking process; however, the federal government can use federal funds as an instrument to drive policy at the local level (Peters, 2018).

Surprisingly, results show that higher level of perceived supply available for selection in the market has a negative impact on engagement in GPP, whereas this study hypothesizes the opposite. Previous research posits that governments in the United States express concern about market availability for green products and services (e.g., Brammer & Walker, 2011). It may be that, while the market may have evolved since, likely not competitive enough with the traditional commodities, in terms of price or quality.

From the resources available to overcome GPP adoption challenges, familiarity with GPP seems to matter most. These findings are consistent with previous research on sustainable procurement (Brammer & Walker, 2011; Testa et al., 2012, 2016; Varnäs et al., 2009; Zhu et al., 2013). The results can also be interpreted as related to a misconnection between the respondents' perception of supply availability and actual availability. Additionally, the results may have been influenced by how questions were phrased in the survey.

Findings from the present study also show that cities operating in communities with a higher percentage of African American residents have a lower level of engagement in GPP practices. These results are consistent with previous research on sustainable procurement (Alkadry et al., 2019) and with research on disparities on environmental

protection based on race that negatively affect the African American population (Mikati, Benson, Luben, Sacks, & Richmond-Bryant, 2018). This may indicate conflicting values in spending patterns—specifically, environmental justice may be supplanted by ethical spending.

6.3.1. Implication for Theory

These findings have several implications for theory advancement. First, the study fills the gap in the innovation literature by analyzing the level of "greenness" in local government procurement practices and the determinants of green public procurement adoption among U.S. local governments. Governments possess an important tool to drive the market toward a more environmentally friendly approach to production of goods and delivery of services: public procurement. Yet, the public administration research literature has focused little attention on the topic. By drawing on innovation adoption theory and employing Mohr's (1969) MOR model, the present study is among the first to understand determinants of GPP in U.S. local governments. To my knowledge, only one study has analyzed the topic, but it utilized data from 2011. In contrast, the present study utilized more current data in its analyses. A second implication for theory is the novelty of the data utilized in the study, which were obtained from a survey designed by the author after a thorough literature review. The third theoretical implication is that the study used a novel operationalization of the dependent variable to account for all stages of the procurement process. A fourth implication is that the research identified directions for future research.

Overall, the present study demonstrates that adoption of green public procurement practices is not necessarily a product of the political environment in which an agency operates or constrained by financial resources. Consistent with Roman's (2017) findings,

the present research shows the importance of sustainable procurement as a "core management concept" (p. 1055). Organizational characteristics and capacity resources are the main motivators for innovation adoption. Specifically, results support previous sustainability research on the importance of leadership and organizational culture and knowledge for engagement in green public procurement (Roman, 2017).

Results related to the influence of federal funding are consistent with the premises of institutional theory—namely, that coercive or regulatory pressures may be a solution to a higher level of adoption of GPP (Ahsan & Rahman, 2017). In the U.S. context, there is high discretion in decision making at the local level; however, in the E.U. context, the European Commission regulates and provides legitimacy to public procurement as an environmental policy tool.

6.3.2. Implications for Policy and Practice

Public procurement is an innovative policy approach to change "business as usual" in the governmental sector; it has been under-studied and under-utilized. Public procurement is a tool that may lead to unrealized achievements of environmental performance. The present study posits motivations and resources to overcome barriers of GPP engagement in U.S. local governments. It can be concluded that the decision-making process surrounding GPP is ultimately driven by who leads the organization, level of familiarity with the concept in the organization, and mandates from the federal government through funding mechanisms.

My findings offer two main insights for policy and practice. First, the empirical results demonstrate the importance of organizational technical capacity and a strategic leadership approach for a paradigm shift from a traditional procurement process to a more

strategic and innovative approach that considers the whole life cycle of a product, as opposed to lower upfront costs. This dissertation argues that GPP adoption is not determined by environmental challenges or the political environment in which the agency operates, nor is it limited by the financial resources of the organization. These findings support Roman's (2017) conclusions that engagement in sustainable procurement is a cumulation of organizational technical capacity and the "human element to it" – "organizational leadership and culture" (Roman, 2017, p. 1056). Consistent with Testa et al. (2012), the present research suggests that public managers should focus on raising awareness of the concept of green public procurement and equip employees with the necessary tools to implement green public procurement. Second, the study underlines the power of policy—in the form of the requirements that accompany federal government funding for motivating engagement in such practices.

Green public procurement practices are not prevalent in U.S. local governments, the private sector positions these policies at the forefront of their management agenda. For example, companies like Amazon emphasize renewable energy, environmentally friendly transportation systems, and reuse and recycling (Amazon, n.d.).

6.4. Limitations and Future Research

I identified three main limitations of the study: utilizing NIGP as the sample pool, common source bias, and social desirability bias. Because the study's sample pool is based on NIGP affiliation, concerns may arise regarding the generalizability of the study. However, NIGP membership is widespread across the country. "Common method bias is a biasing of results (which could be in the form of false positives from hypothesis tests) that is caused by two variables exhibiting related measurement error owing to a common

method, such as a single survey" (Favero & Bullock, 2015, p. 1). The survey was carefully designed to ensure that the dependent and main independent variables were separated by other questions to ensure that the first item does not inform the following item. Also, this paper is part of a larger study, and the results will be complemented with case study data. Another limitation of the present study is that the data were self-reported and based on the perceptions of individuals in the organizations and susceptible to social desirability bias. As Ritzer (1975) stated, "the sum of the individual replies does not equal to a social fact, but their perception on what the social fact is" (p. 160). Ritzer (1975) sees roles, values, groups, the family, etc. as social facts (Ritzer, 1975, p. 159). While this issue is acknowledged as a limitation, other scholars have taken a similar approach (e.g., Wang et al., 2012). More so, Remler and Van Ryzin (2010) argued that surveys can also be used to understand characteristics of the organizations by interviewing or surveying individuals in the organizations that are suitable to answer such questions (Remler & Van Ryzin, 2010). In addition, organizational data is usually reported by individuals.

Future research could focus more on the leadership theory implications of this study and analyze how each type of leader influences GPP adoption as well as the intersection between organizational strategy and GPP adoption. Also, the unit of analysis for this research is the local government entity; it would be interesting for future research to focus on individuals involved in the procurement process and their influence on the engagement in GPP practices. Additionally, while this research explains the decision-making process, future studies could assess the outcomes of GPP implementation. Likewise, the sustainability literature would benefit from an analysis of the actual behavioral change on

the supply side arising from implementation of green public procurement policies in the United States.

CHAPTER 7: QUALITATIVE RESEARCH RESULTS AND DISCUSSION (PHASE II)

Phase II focused primarily on addressing the following research question: *What is the impact of collaborative governance on the engagement in green public procurement practices within the U.S. local government?* Phase II also advanced two propositions based on Institutional Collective Action Framework and resource exchange theory: *A collaborative governance approach (P1) increases the technical capacity and (P2) decreases transaction costs associated with engagement in green public procurement practices.*

In pursuit of answering the aforementioned research question and the two propositions, I explored a series of questions regarding the types of collaboration in which the agency engages, the determinants of collaboration, actors involved, and type of contracts for which they chose a cooperative approach, impact on GPP, and challenges and outcomes of this approach. The analyses revealed five types of collaborations—extending beyond this study's initial framework.

The majority of respondents from both case studies posit that they engage in *horizontal collaborations* with other municipalities, mostly for sharing best practices and capacity building.

Case Study A:

> We collaborate on an ongoing basis with other municipalities. Also, there is a system state-wide, through NIGP, and you can put out a question to say hey I am having difficulty with this type of procurement, or I have an issue, or a legal issue... has anybody had any experience with that, can you provide

> any templates that you may have" … "we may have like a request to do a solicitation...and it's something we haven't really done before, and we start doing a little research, to see what is done out there, there is no plagiarism in purchasing.

Case Study B:

> I think in general, specifically in Florida, there is a lot of interaction between agencies and you know using other contracts, you know, it is very common for people to call here, we call there … do you have a contract for this for that … or to share specifications and best practices and do whatever the questions are …

Data from the two case studies revealed *vertical collaboration* in the form of piggy backing—the most utilized type of cooperation. These types of collaborative arrangements help offset the extensive timeline a procurement procedure entails, as well as other capacity setbacks small municipalities face. In addition, the bargaining power that comes from collaboration can also assist in the contract management phase. For example, Case Study A described a situation in which an electric vehicle purchased through piggy backing on the Sherriff's Department had an issue; having support from that organization helped offset the drawbacks of contract management:

> And the other good thing if you have any issue with that vendor or the dealer … You've got, I mean you try obviously to work it out, but you've got the Sheriffs behind you. We did have an issue with one of the electric cars, that they were not performing, and I guess there were other complaints, and they ended up taking them

> off the program. They blacklisted them so we needed to go to another… to get the car. So, yea, so it's the support, the service, the pricing. (Case Study A)

Besides collaborating with city, state, and federal governments and purchasing through a cooperative procurement model (broker model), cities also *collaborate with vendors in government-business collaboration*:

> But you know, if we want to do business with somebody, say if maybe police, if they have a specific need, we say look, we do a bid, we looking at time say three four months, we go to the vendor and say, is there any piggy backs that you can locate for us that you have done. Even if it's around the country, so we can take it from there. They would give us the lead, or we get the lead ... we try to do piggy backing when we can. (Case Study A)

The type of commodity an organization needs is what really drives engagement in these types of collaborative arrangements. For example, Case Study A argued that there are certain construction jobs for which only businesses in the area would be qualified to perform. The technical capacity, costs, and a more agile procurement process seem to be main drivers of engagement in collaborative arrangements. Thus, the outcomes of collaboration in such arrangements refer to economies of scales, compressing timeframes, and capacity to write specifications:

Case Study A:

> Well I think time, and we'd say that we are small, and we always look at the county, cause the county has such a big buying volume

> and power, sometimes we feel like we geez we just a little small city, does it really make sense for us to go out on our own versus to something already done by the county that we are getting that volume and pricing…Saving time, money, mostly it's time for us.

Case Study B:

> Using coop … a competitive process has already been done so quicker time to the contract ... Pricing … with the electric vehicles we went through that analysis ...what is a better pricing… through the coop or doing our own solicitation.

Along the same lines, *Case Study B* argued that cooperative purchasing would be more applicable for acquiring goods:

> With coops, I think…only natural they work better with the goods side, because you are buying whatever the good is, whereas the service depends, on what type of service that we do, we use coop for service, but it depends on how different the scope is or… unique…or…" … "And mostly you end up piggybacking products and goods more so than services. Because services are built on relationships… (Case Study B)

On top of inter-agency collaboration, be it horizontal or vertical, and collaboration with vendors, results show that *intra-agency collaboration* plays an important role in advancing green purchasing.

> I think … and this is where a good collaboration between procurement and the sustainability office comes into play, looking

for those opportunities. So what other products are out there? …
Like the paper... Not sure how that came about. It was something
that *** found, so we talked and now we are implementing that,
so we are looking for the next sugarcane paper… (Case Study B)

Collaboration between the sustainability office and the purchasing function plays an important role in both case study sites. It facilitates the process of identifying opportunities to transform the procurement process from a traditional one into a more strategic, sustainable one. For example, in Case Study B, intra-agency collaboration led to a series of sustainable initiatives, from sugarcane paper as a green alternative to regular paper, or paper produced from recycled material, to the development of a website tool for the city to align its goals with the federal government's eco-labels standards (e.g., Energy Star, Water Sense, RainForce Certified, FSC EPEAT).

The abovementioned website tool could address issues related to lack of capacity for GPP implementation and administration as well. The sustainability officer from Case Study B noted that the tool "*tells you the legal requirement and then it tells you the spec language for Energy Star basically that you should be incorporating.*" This tool aims to calculate the impact of purchasing green products. Monitoring implementation and assessing the impact of such purchasing is a challenge cities must overcome. With this tool and with community support, based on website cookies (i.e., user information that is collected via the website), the city would be able to calculate energy, water savings, and gas emission reduction. The city's vision is to make the system available for the organization but also for residents. In an innovative way, both case studies use the tools learned from procurement diffuse "green" behavior to their respective residents.

In addition to the aforementioned initiatives, due to the knowledge gap they identified among employees, the sustainability officer in Case Study B proposed the foundation of an academy that trains all employees on sustainability and explores ways in which sustainability applies to their jobs and the ways in which they can collaborate toward achieving sustainability goals.

Following similar initiatives to encourage and support residents toward alternative energy usage, Case Study A organized a procurement procedure to identify an authorized solar panel installer that would offer businesses and homeowners in the city discounted rates to install solar panels on their home or business, respectively.

Another important finding is that most professionals in the sample do not engage in cooperative purchasing with green public procurement practices as a goal in mind.

Case Study A:

> Not that it's green or not, we would look for it either way. It doesn't really matter if it's for green procurement or not. We would look for coops or ... again, why reinvent the wheel if it's already done.

Case Study B:

> Uhm as to green related procurement it's the fact that it's green I don t think it's a factor for us…

7.1. Collaboration risks

One issue identified by both Case Study A and B, in regard to piggybacking, involves the length of the agreement. One agency can only piggyback for the same timeline

as the original contract. Therefore, there is uncertainty around the renewal process, so the contract may potentially expire, leaving no time to organize a new procedure:

> And we are banking on one of the coops, if they will renew it, we'll be ok, but you are not gonna know that until to a point you are too late to do your own solicitation. (Case Study A)

This issue is more salient for contracts that are strategically important to the city.

> … So, if somebody else's contract. So, we use it. So, the contract expiration date could be today, so we don't know... some agencies are quicker and more efficient with that process than others. So maybe their contract is expiring today, and we've been reaching out to that agency and got no contract to review... So, if you take fuel for example…. that is a good…. But it is not something that we would like to piggyback cuz what would happen if the city doesn't have fuel tomorrow. So, we wanna be able to control that contract, to have a solicitation and control" … "I was a period of time in *** and we piggybacked all of our fuel I mean… and it was *** County mainly, fuel. When I first started working there, I went to a FAPPO conference and I had to come back because I had to issue a purchase order and so then I said, oh wait... we are going to do a blanket in the middle of the year so this doesn't happen again… (Case Study B)

In addition, another aspect of utilizing cooperative purchasing practices relates to it clashing with other organizational goals, such social equity in public procurement—in this

case, providing opportunities for Minority and Women Business Enterprises (MWB). One of the participants from Case Study B noted:

> And also, about the coop. We have an MWB program here, so we want to provide opportunities for the city certified firms. So, go or no-go decision in a coop ... is there an MWB firm there to provide this, if there is then we'll probably a do a bid or a quote and get that opportunity versus the coop. (Case Study B)

Also, when organizations choose to join a collaborative agreement, they are often limited in terms of the products that can be purchased because those decisions have already been made.

> Like if we are looking to get a certain type of electric vehicle and only this collaborative only has this other group of vehicles and not the one that you want then you're stuck, right? With buying the one that the collaborative has approved. So that is really the big challenge there. But other than that, we haven't had issues per se. (Case Study B)

7.2. Conclusion and Implications for Research and Practice

The research question that guides this study is: *What is the impact of a collaborative governance approach on the engagement in green public procurement practices?* To address this question and the two propositions advanced, following an extensive literature review, the study utilized data from exploratory multiple case studies. Specifically, I used a series of questions regarding the types of collaboration the agency engages in,

determinants of collaboration, actors involved, the type of contracts for which they chose a cooperative approach, impact on GPP, challenges, and outcomes of this approach.

7.2.1. Outcomes of Collaborative Governance

7.2.1.1. Collaboration and Resources

When cities engage in cooperative purchasing practices, the time and effort needed to secure a contract is greatly compressed. This makes a tremendous difference, mostly for small cities that lack capacity or time for purchasing the goods and services that an organization needs on an ongoing basis. However, results are also supported for the larger city in the study. Organizations desire faster, more efficient procurement processes to support day to day activities.

In addition to making the procurement process more efficient, this approach to purchasing enhances cities' capacity to draft specifications, a process that, at times, can become tedious and complex. As Case Study A posits: "And that frankly helps, because if you would have to do specifications on vehicles… that could be pretty… so all the specs are there, the Florida Sheriffs does that, and you just take of what you want option wise" (Case Study A).

Furthermore, across cases, NIGP: The Institute for Public Procurement seems to be an important resource for advancing collaboration for best practices and providing a cooperative platform for governments. Along the same lines, collaboration for best practices with the federal government seemed an important piece in Case Study B's model for *greening* the purchasing patterns of city personnel and residents.

The procurement process is even more complex when drafting specifications for products and services that are environmentally friendly. As described by Case Study B

when discussing collaborative arrangements "capacity is an issue for local governments," adding that challenges include "Just overall technical assistance and the capacity to spend time on drafting these kinds of things and working internally, and meeting internally with departments, directors, and trying to get their take on it as well." However, in the context of this study, green purchasing seems to be a positive, unintended externality of these types of collaborative approaches to purchasing, as opposed to a strategic, intentional decision. These results are in concert with Yi et al. (2018), explaining that environmental conditions may not drive governments to engage in a collaborative approach to governance. I do, however, find that the presence and intra-agency collaboration between departments and the sustainability officer plays an important role in the city being proactive in utilizing cooperative purchasing as a tool to advance green public procurement. While causality cannot be inferred in this case, it is worth mentioning as a possible strategic and sustainable managerial tool.

Supporting previous literature (e.g., Bel et al., 2014), data from the two case studies reveal that cooperative purchasing impacts costs. However, Case Study B noted that due diligence was needed to assess whether a collaborative approach is the most appropriate option. Due to better budgets, larger cities may benefit from better pricing. For example, in the case of electric vehicles, the city conducted an analysis to assess which approach would be more cost effective: purchasing individually or through the cooperative. By bundling their demand and utilizing the Climate Mayors Electric Vehicle Purchasing Collaborative, the city saved approximately $2,000 per car. In addition, Case Study B is assessing the possibility of collaborating with other Florida utilities to buy large scale solar together. By bundling their demand, according to their calculations, it is now cheaper to

produce electricity from solar than it is from fossil fuels through that model (Case Study B).

7.2.2. Implications for Theory

There has been increasing interest in collaborative governance in the public administration literature (Kalesnikaite, 2019). However, few studies have focused on the collaborative process as it relates to government spending. Moreover, few studies have analyzed the outcomes of such arrangements, and fewer have studied how the arrangements impact green public procurement practices in local governments. The implementation literature is also complemented by understanding how to utilize a collaborative governance model to generate sustainable and better community outcomes. Additionally, regarding the research literature on collaboration, the present study adds insights on the determinants of collaboration utilizing public procurement and green public procurement as the policy of interest. This work advances managerial strategies to use an array of collaborative models to increase the level of green purchases in government.

7.2.3. Implications for Policy and Practice

Results from the present study support previous collaboration research and reinforce the assertion that collaboration can be a strong public management tool for achieving economies of scale, increasing knowledge, and cultivating a more efficient procurement process (McCue & Prier, 2008). This research complements previous literature by first identifying various collaborative models used by local governments and identifying why the models were used, then assessing how this impacts green public procurement practices.

In this context, green purchasing seems to mostly be a positive unintended externality of these types of collaborative approaches to purchasing. However, data from Case Study B show that when *greening* the procurement process is the desired goal, and employees collaborate across agency to achieve said goal, while also utilizing a cooperative purchasing arrangement, the resulting level of GPP is higher. These findings indicate that there is a significant opportunity for managers to utilize these types of arrangements proactively; there is strong potential to reach higher level of GPP in organizations.

Another important finding with implications for management relates to the significance of a sustainability officer, or other employee with similar knowledge/skills, and how this individual collaborates with the organization to reach sustainability goals. As the sustainability officer in Case Study B argued, the majority of local governments in the United States do not have a sustainability position: in 3,500 cities across the United States, maybe 350-400 have such a position. Therefore, in terms of scale, and making an impact, all cities should employ a sustainability officer. As data show, procurement alone cannot tackle these challenges and, as the sustainability officer in Case Study B stated, "people do not think of procurement organically as a tool to green…"

7.2.4. Limitations and Future Research

This dissertation examines the impact of collaborative governance on engagement in green public procurement practices. Findings partially support the hypotheses advanced. Specifically, results show that a collaborative approach enhances organizational capacity and ensures economies of scale. However, in terms of engagement in green public procurement practices, results show that impact on GPP level is most often a spillover effect of collaboration.

Data for this study were collected by semi-structured interviews with local government procurement professionals and representatives with sustainability responsibilities from two case studies. Due to the limited sample, the validity of the results might be questioned. However, this study is part of a larger research. The impact of collaboration on green public procurement practices has been empirically tested in a previous study and the results were not significant. For this reason, I conducted a qualitative study, and my findings support most of the results from the previous study.

The present study is not without limitations. First, a caveat around generalizability: because the research draws on data from two case studies, it is not possible to make inferences beyond the two cases. Therefore, the topic must be explored further. Maybe collecting data from a larger and more representative sample could shed light on the results identified in this present study. Second, the results are based on respondents' perceptions; as such, they are prone to social desirability bias. Third, the study may suffer from selection bias. However, I systematically identified the case studies based on an array of criteria. Also, case studies outside of Florida were identified to avoid issues relating to location. However, these organizations did not respond to my invitation to participate in the study.

In addition, subsequent research could empirically assess how each of the identified collaborative approaches impacts engagement in green public procurement processes. Moreover, the sustainability officer's role in advancing green public procurement should be explored in future studies.

CHAPTER 8: SUPPLEMENTARY INSIGHT DRAWN FROM QUALITATIVE DATA (PHASE III)

To ensure the robustness of the research findings, the following strategy was adopted for this dissertation. To have a more comprehensive explanation regarding local governments' decision-making processes, as they relate to engagement in GPP practice, qualitative data were collected to complement the quantitative data. Said data were obtained in two steps: first, the survey instrument (*Phase I*) included two open-ended questions regarding the drivers and obstacles agencies face when engaging in such practices; second, similar questions were incorporated into the semi-structured interviews in *Phase II*. Similarly, to allow for triangulation of data sources, the survey instrument included several questions regarding cooperative purchasing practices that complement the data drawn from semi-structured interviews.

8.1. Determinants of GPP: Insight from Open Ended Questions in the Survey

The survey instrument, detailed in Chapter 5, included two open ended questions: *What do you feel the biggest obstacles of implementing Green Public Procurement practices are? Please enumerate following the order of importance?* and *What do you feel the biggest facilitators of implementing Green Public Procurement practices are? Please enumerate following the order of importance.* The answers to these two questions were grouped and weighted utilizing the order of importance indicated by survey respondents. Figure 10 presents the perceived facilitators to GPP implementation in U.S. local governments in the sample, while Figure 11 presents perceived obstacles in the implementation of such policies.

Figure 10. Drivers of GPP Engagement (N=140)

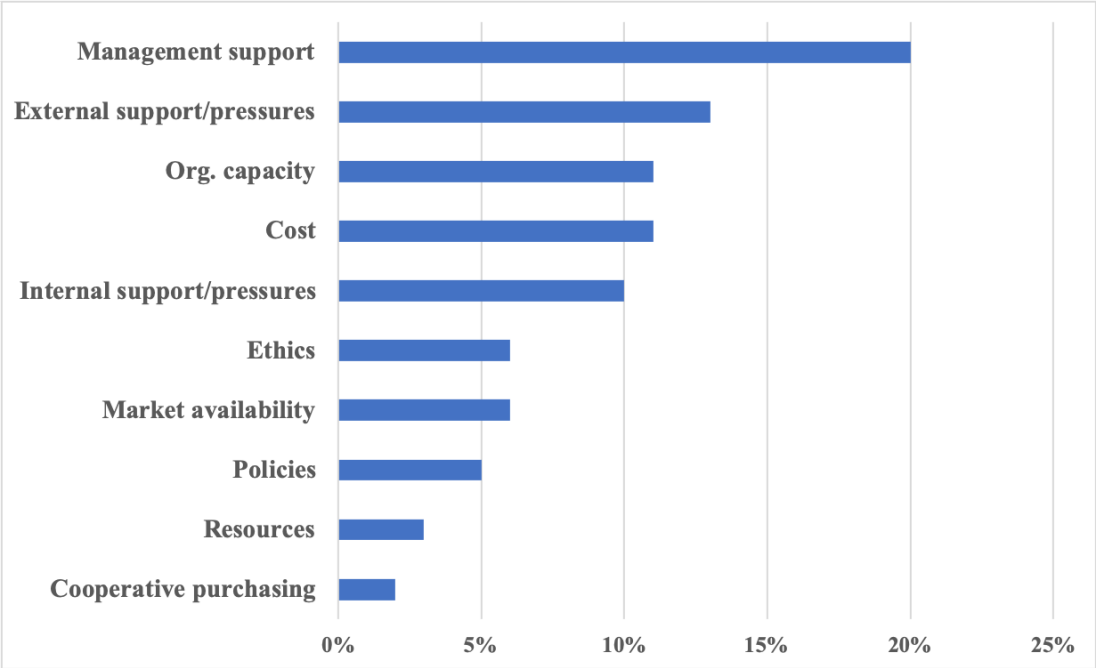
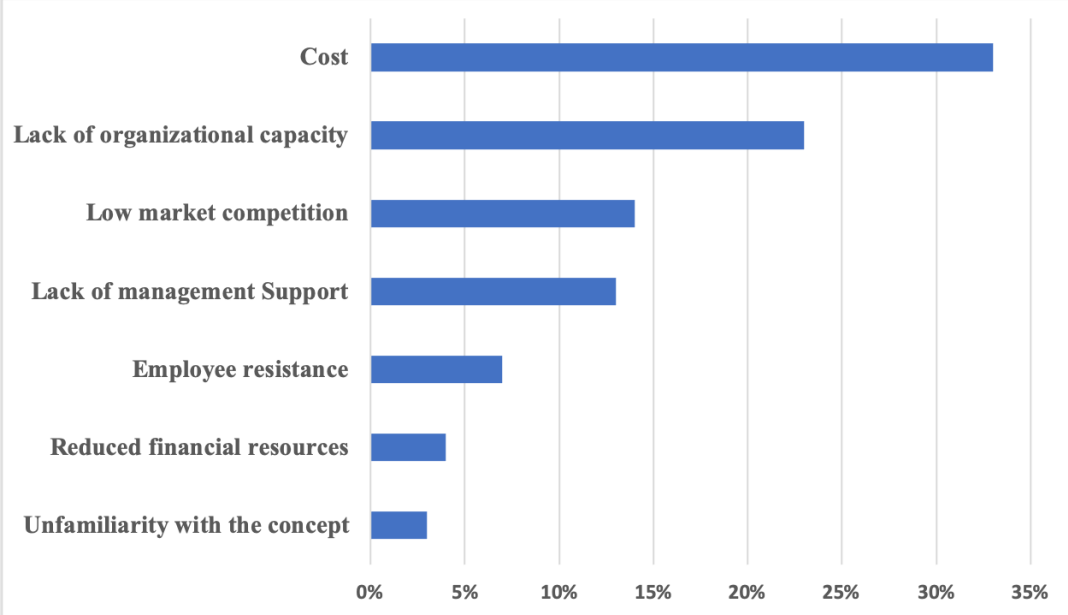


Figure 11. Barriers to GPP engagement (N=211)



8.2. Determinants of GPP: Insight from Semi-Structured Interviews

The questionnaire administered in the case studies, detailed in Chapter 5 (Phase II), included items focusing on drivers and barriers to GPP adoption and solutions to overcome challenges—in addition to questions about collaborative governance approaches to public procurement. Following the same process as the one described above, this section outlines the common themes identified for drivers of, and barriers to, GPP adoption as well as the solutions identified to overcome said challenges.

8.2.1. Drivers of GPP Adoption

Notably, neither of the two cities has adopted a sustainability policy and both engage in GPP. The most common theme for facilitators of GPP adoption identified in the semi-structured interview data is related to *internal characteristics of the organization*. Specifically, the organizational culture—instilled by the city's *leadership* and normatively established in the strategic plan/policies—is positively related to engagement in such practices:

> ….. it is really driven by the mayor who is saying this is what we need to do, and this is the way the world is going…. But what I think what the city is doing is recognizing what is needed and what is necessary, so they are not waiting for an external force to say why are you not doing this. We are developing and being creative and innovative in our thinking is and how we are trying to say with the way the world is going. No external pressures here but I have seen it in the works. Yea, the pressures can be hard, those groups coming to your meetings and you know is why are you not doing this and

that… So that is what they are doing in transportation, but I think we are on the forefront of doing things correctly… (Case Study B)

Leadership in Case Study A has made strong commitments to a sustainability agenda, passing resolutions for the municipal government to achieve 100% renewable reliance by 2030. The mayor played a key role into transforming the purchasing of vehicles into a green procurement activity by focusing on hybrid automobiles.

The *residents* have also expressed a desire for the city to be sustainable because environmental pollutants have been discovered during local cleanup projects. The residents have pressured the city to regulate those environmental polluters. Local governments do not have legal authority to regulate those environmental pollutants, yet they have the ability to transform their own purchasing behavior to be more sustainable (Case Study B). *Non-profit organizations* also play a role in the city's sustainability approaches as they represent constituents, who are also members of these organizations (Case Study B). Case Study A argued that residents and nonprofit organizations do not influence the procurement practices in a direct way because there is no direct line of communication between them. The community speaks to the elected officials (Case Study A). Similarly, the *federal government*'s policies function as a trend setter and example for Case Study B. Federal green purchasing policies were the main factor that inspired Case Study B to adopt their own such initiative.

8.2.2. Barriers to GPP Adoption

Green public procurement practices are more commonly applied to the following contracts: construction, paper, janitorial, cleaning, ground maintenance, computers, printers, electric vehicles, and landscaping. The main concern *Case Study A* reported, in

terms of engagement in such practices, is related to balancing budget requirements. The city is relatively small, and it does not have the capacity to make drastic changes and also to face potential lawsuits (Case Study A). In addition, Case Study A representatives did not approve of the quality of the affordable electric vehicles on the market at this time. Those that have higher range, in terms of driving distance and battery charge capacity, are usually more expensive. Case Study A illustrated the political environment as a possible barrier to GPP adoption by summarizing a situation they had faced when they separated trash from recyclable waste; they had contracted a company to purchase these items instead of sending them to the landfill, however, the county, which owns the landfills, did not renew the permits to the city's contractor—so the initiative halted: "So, even sometimes when we try to go green, understand something… somebody is losing out somewhere and XXX County has the power to shut down other places." This happened although "…it is supposed to be great for the environment because they are reusing it as mulch, …. but apparently XXX County did not like that although the purchase being 'between 20 to 30 % cheaper' and 'I am not standing in line for 4 hours at the landfill waiting to dump my stuff' ... 'so again, other interests were at stake, even if it's another government entity…'" (Case Study A).

The main challenge for Case Study B involved *monitoring and tracking spending* on green public procurement, which is closely related to difficulty in defining green purchases. Cities do not have a uniform system to track these types of purchases. This challenge is magnified if the procurement function is decentralized. This theme is also reflected in the Case Study A results. The representatives outlined the difficulty of

calculating savings from using hybrid or electric cars in terms of time and technical capacity.

In addition, there is skepticism around certain Eco-labels and aligning those characteristics with city priorities. Likewise, familiarizing staff with the concept of sustainability and how it can be incorporated in their day-to-day activity is important. *Lack of knowledge* was cited as another issue, and more so in the case of those cities that do not have sustainability programs. Tied to lack of knowledge, lack of capacity and support to choose, for example, products that entail more upfront costs but lead to long-term savings are other obstacles to engagement.

> And so, yes the LED might be marginally a little bit more, but when you look at the life cycle assessment, the life cycle cost, it is way cheaper. It is the no brainer situation to buy. And still educating people about looking at things long term, versus short term it's always gonna be a challenge. But I think government is well positioned to have that argument because government is here for the long term. We are here in perpetuity…. And the question became well why are we doing that? LEED certified buildings are more expensive. Yes, they are more expensive, marginally, 5 to 7% more to be certified, but we are gonna save 20 to 30 % cost of operation of this building over the lifetime. So of course, government has the ability to see those savings cuz we are gonna be here much longer but again there is still that education gap, that hurdle, internally to

those that are purchasing these things and making those decisions. (Case Study B)

Much of the extant literature has cited cost as a barrier to GPP engagement (e.g., Brammer & Walker, 2011). Case Study B argued that cost may have been a barrier a few years ago, but now the market has evolved and progress has been made to "eco-lize things."

8.2.3. Solutions to Overcoming Challenges to GPP Adoption

Case Study A underlined the critical role of federal subsidies for research on this issue and the importance of continuing such support.

> If they don't continue doing that then there is not going to be any progressive movement towards alternative fuel sources and until that happens it is all finances, it is all about numbers. (Case Study A)

Case Study B posited the importance of *intragovernmental collaboration* between the purchasing and sustainability functions in order to draft uniform policies around the city to collect data on these types of spending:

> So, I think we talked with XXX about how we track green products and how we track the usage and how we track the volume. I think that is something that we are talking about and it probably it has to be in partnership with his organization. Because it can be a part of a bigger package. So if we were getting ready a boiler replacement, is that boiler gonna be a green boiler. What is the sustainability for that? But that would be a part of a bigger package so we will have

> to work as a team to say when you will buy a piece that is sustainable bring that piece and bring that data to us and we have to manually do it. Because there is no way to systematically do it or capture it electronically, unless you break it out because it can be part of the bigger picture. (Case Study B)

To overcome issues related to technical capacity, familiarity with the concept, and possible outcomes, Case Study B created an employee education program; every year, trainings are held for certain staff members, representing every department and division, once per month over a seven-month period. Within this model, employees focus on sustainability and explore ways in which sustainability can be applicable to their jobs and ways in which they can collaborate internally to achieve its sustainability goals. This program was developed and implemented because certain departments were not embracing the leader's sustainability goals. It started as a *lunch and learn* model, growing into an employee education program that teaches staff about sustainability, cost reduction, operational effectiveness and efficiency, lowering the carbon footprint, impact on climate change, and minimizing natural resources degradation. The city is already seeing positive outcomes from this employee education model. Procurement staff is contacting sustainability staff for assistance to update procurement documents with a sustainability component (Case Study B).

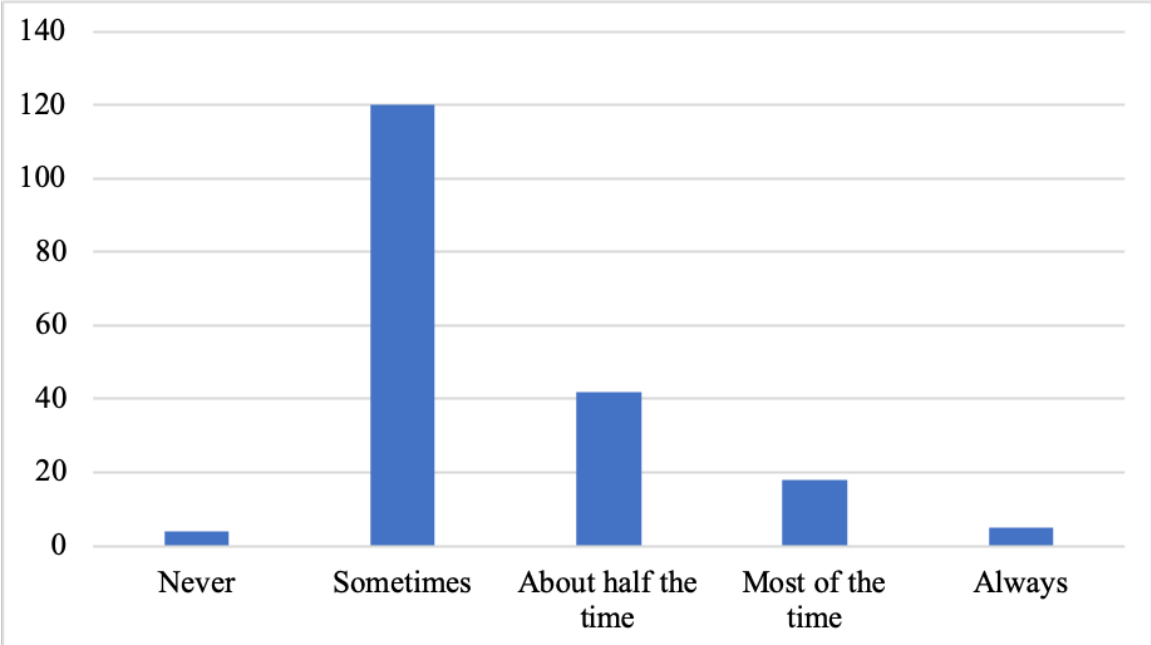
8.3. Collaborative Governance in Public Procurement: Insights from the Survey Instrument

To understand adoption of collaborative governance approaches in local government procurement practices, several questions around this model were included in

the survey instrument, detailed in Chapter 5: *How often does your organization engage in cooperative & group purchasing?, Select the reason for your organization's engagement in cooperative & group purchasing, Who does your organization tend to cooperate with when engaged in cooperative & group purchasing?* Therefore, this section presents findings obtained from these questions.

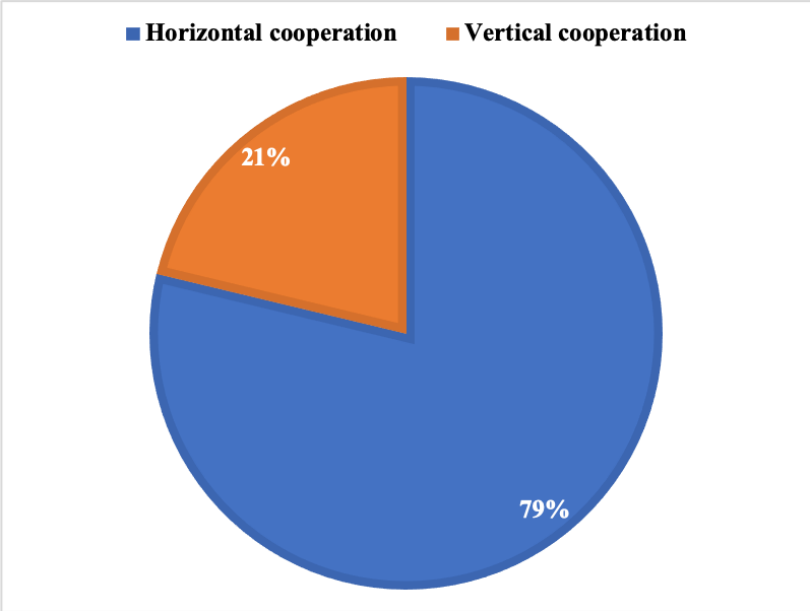
Results show that, overall, local governments in the sample utilized cooperative purchasing practices; 185 agencies reported collaborating *sometimes, about half of the time, and most of the time,* and *always*, while only 4 agencies stated that they never do (see Figure 12).

Figure 12. Frequency of engagement cooperative & group purchasing in U.S. local governments (N=189)



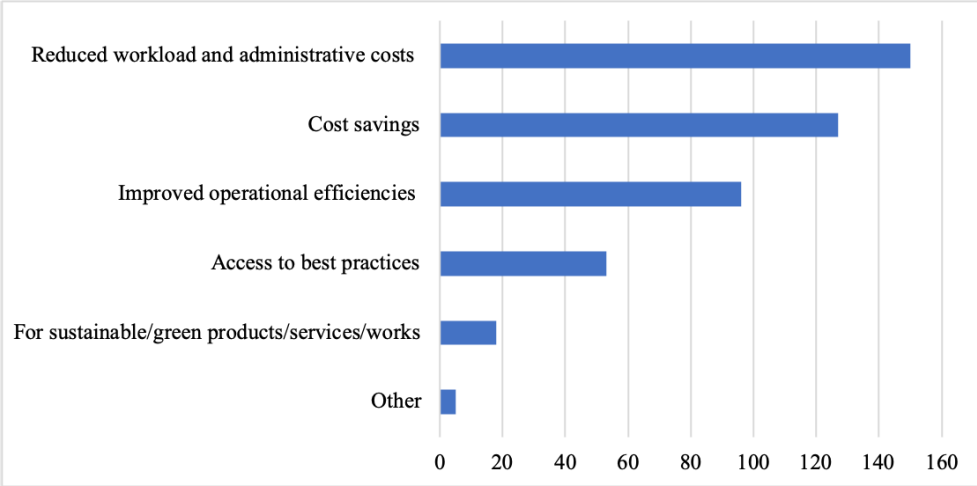
Horizontal collaborations were more frequent than vertical ones: 79% of agencies reported having partners at the same level of government, while 21% cooperated with governments at different levels (see Figure 13).

Figure 13. Collaboration type



Results show (see Figure 14) that local government collaborations were mostly incentivized by reduced workload and administrative costs (*N=150*), followed by cost savings (*N=127*), improving operational efficiencies (e.g., reduced cycle times, delivery terms, enhance market availability, *N=96*), access to best practices (*N=53*), and, lastly, for purchasing sustainable/green products/services/works (*N=18*).

Figure 14. Drivers of collaboration



CHAPTER 9: CONCLUSION

This dissertation was guided by three research questions: (1) *What is the current level of green public procurement implementation among U.S. local governments?;* (2) *What are the factors that may foster or hinder GPP engagement among U.S. local governments?;* and, (3) *What is the impact of intergovernmental collaboration on GPP implementation?* In order to suitably address these questions, this dissertation utilized a mixed methods approach, linking qualitative and quantitative methodologies. This approach allowed for an in-depth analysis of the factors that hinder or facilitate engagement in GPP as well as the nexus between intergovernmental collaboration and GPP adoption.

Chapter 1 of this dissertation was an introduction to the overall study. To that end, it illustrated the background of the study and theory, and outlined the research questions and objectives that drove this work, which was followed by an exploration of the research design and a summary of the purpose and significance of the study.

Chapter 2 introduced the concept of public procurement and explored its link to innovation policy. To that end, the chapter contained an overview of definitions of public procurement at different levels of government. This section is followed by the assertion that sustainability is an important value that is neglected by governments. This chapter also outlined the power of public procurement as an innovative policy tool.

Chapter 3 focused on three bodies of literatures that were applicable to this dissertation: green public procurement, policy innovation, and collaborative governance. After assessing and critiquing the existing research literature, a summary of the research gaps was presented to establish how this dissertation aimed to address these gaps.

Chapter 4 was dedicated to outlining the theory, research questions, and hypotheses—exploring the conceptual framework that guided this dissertation. The foundation of the present research was built on the internal determinants model for policy innovation adoption (Mohr, 1969), Feiock's (2013) Institutional Collective Action (ICA) framework, and resource exchange theory.

Chapter 5 examined the research methodology employed to address the research questions. This dissertation employed a four-stage research design, as presented in Table 2. The study utilized a mixed-methods approach that involved both quantitative (*Phase I*) and qualitative (*Phase II*) methods. This methodology allowed the quantitative and qualitative components to complement each other to produce more effective research. In addition, this method allowed for triangulating data, which may diminish biases that arise from drawing conclusions from a single data source (Creswell, 2003). *Phase III* integrated data from both quantitative and qualitative sources, following a Sequential Explanatory Design (Creswell, 2003). *Phase IV* explored the dissemination and reporting back methodology.

Chapter 6 explored the results obtained from the quantitative research (Phase I). This chapter outlined the status of GPP practices among U.S. local governments and the driving and hindering factors in the adoption of such policies. To that end, I drew data from a U.S. national survey, complemented with information obtained from U.S. Census Bureau and the Harvard Dataverse - MIT Election Data and Science Lab (MIT Election Data and Science Lab, 2019) and utilized the internal determinants model for policy innovation adoption. Overall, the survey results demonstrated that green public procurement practices are not prevalent in agencies in the sample. Findings also indicated that level of GPP

adoption is correlated with the inclusion of such practices in the agency's strategic plan as well as with external pressures from the federal government. Surprisingly, higher level of perceived supply shows a negative correlation with GPP adoption. Familiarity with the concept of GPP may be a resource that governments can utilize to overcome the barriers to adopting such innovative policies.

Chapter 7 illustrated the qualitative research results and provided a discussion about the findings (Phase II). The chapter focused on addressing the research question, *What is the impact of collaborative governance on the engagement in green public procurement practices within the U.S. local government?*, and two propositions built on the Institutional Collective Action Framework and resource exchange theory: *A collaborative governance approach (P1) increases the technical capacity and (P2) decreases transaction costs associated with engagement in green public procurement practices.* In concert with previous collaboration scholarship, the present study reinforced the assertion that collaboration can be a strong public management tool for achieving economies of scale, increasing knowledge, and increasing efficiency in the procurement process (McCue & Prier, 2008). The present study complemented previous research by first identifying various collaborative models used by local governments and identifying why the models were used, then assessing how this impacts green public procurement practices. Moreover, this study illustrated that, in this context, green purchasing seems to mostly be a positive unintended externality of these types of collaborative approaches to purchasing. And thus, if managers utilize these types of arrangements proactively, there would be potential to reach higher levels of GPP in organizations.

Chapter 8 integrated the quantitative and qualitative research findings. Triangulation of data sources assisted in forming an in-depth understanding of the research questions the dissertation sought to address. Overall, the results from both main data sources complemented and informed each other.

This chapter incorporated the Quantitative and Qualitative Research Findings and presented the overall findings, the dissertation's overall strengths and limitations, and implications for theory and practice, followed by suggested avenues for future research.

9.1. Incorporating the Quantitative and Qualitative Research Findings

Triangulation of data sources assisted in forming an in-depth understanding of the research questions the dissertation sought to address. Generally, the results from both main data sources complement and inform each other.

As previously mentioned, the first research question was exploratory in nature. Little research has been conducted on the level of engagement in GPP among U.S. local governments. The findings demonstrate that green public procurement practices are not prevalent and, when they are, their implementation varies across agencies and levels of implementation. Among the local government respondents, only 21% have a green public procurement policy in place. Moreover, when analyzing the level of implementation, I noted that most agencies have green public procurement as symbolic policies: 11% of local governments in the sample reported a high level of GPP (see Figure 6), while 67% either do not adopt GPP practices entirely or have such a policy, but implementation is merely recommended, not required (see Figure 6).

The second research question aimed to pinpoint to the driving and hindering factors of GPP adoption. To that end, the study built on Mohr's (1969) model for policy innovation adoption. Data were obtained from a self-designed national survey of public procurement professionals conducted with the support of NIGP: The Institute for Public Procurement (NIGP). These data were complemented with information from the U.S. Census Bureau and Harvard Dataverse – MIT Election Data and Science Lab. To better gauge the underlying mechanisms behind the results from the quantitative research component, I conducted semi-structured interviews with local government officials involved in the procurement process. For the most part, the qualitative component supported results from *Phase I*.

The results from the quantitative phase mainly provided support for Mohr's (1969) motivation-obstacle-resources model. Findings indicated that level of GPP adoption tends to be motivated by incorporating these policies into the agency's strategic plan and motivated by external pressures from the federal government. Existing research has shown lack of leadership support as an important challenge to GPP adoption, and that demonstrating economic benefits of such practices could ensure leadership support (Ahsan & Rahman, 2017). Findings from interviews supported these results and show the importance of a strategic leadership approach to including sustainability as part of the agency's strategic vision.

The United States' federal government incorporated green public procurement in their agenda starting in the early 1990s (U.S. EPA, 2014). Due to the administrative system in the U.S., local governments have discretion in their policymaking process; however, the federal government possesses an important tool, in the form of federal funds, to drive

policy at the local level (Peters, 2018). The interview data reveled that while the respective agencies do not directly sense the influence of the federal government on GPP adoption, agencies are emulating federal government policies and practices.

While external pressures from residents and non-profit organizations could not be accounted for in the statistical modeling due to multicollinearity, the interview data show that these external pressures may influence local government decision making in environmental policy adoption.

An interesting and surprising finding is that results show a negative relationship between higher level of perceived supply and level of GPP adoption, whereas this study initially hypothesized the opposite. Previous research posits that governments in the United States have expressed concern about market availability of green products and services (e.g., Brammer & Walker, 2011). The interviews provide a possible explanation for this result. While there may be an increase in supply, the market may not produce the products that governments need. For example, the electric vehicles have low range and those with a high range are very costly. Similarly, the interviews indicated that lack of technical capacity and human capital—specifically, difficulties in monitoring and tracking spending on green public procurement—are some of the biggest challenges to adoption. These findings may also be related to a misconnection between respondents' perception of supply availability and reality. Also, the results may have been influenced by how the survey question was phrased.

Consistent with existing literature (Brammer & Walker, 2011; Testa et al., 2012, 2016; Varnäs et al., 2009; Zhu et al., 2013), familiarity with the concept of GPP may be a resource to overcome adoption challenges. Data from the semi-structured interview

support the finding that familiarity with the concept of GPP is instrumental for implementation. One of the case studies enacted an academy within the agency to teach employees on how to include sustainability in day-to-day activities, including the purchasing division. This led to an organizational shift; employees now contact the sustainability department for advice on prioritizing sustainability. Similarly, results from the semi-structured interviews illustrate the importance of dedicating staff to sustainability in order to facilitate implementation of green public procurement practices.

The third research question examined the relationship between collaborative governance and engagement in green public procurement. While the statistical analysis did not yield significant results for the relationship between collaboration and the engagement in green public procurement practices, the qualitative analysis provided a possible explanation for this result. The interview data revealed that these types of arrangements may lead to a more efficient procurement process, enhanced capacity, and lower costs. However, these outcomes are applicable to any type of purchasing—not exclusively GPP. The results seem to indicate that, primarily, green purchasing is a positive unintended externality of collaborative approaches to purchasing, as opposed to a strategic, intentional decision. Similarly, study findings posit that intra-agency collaboration between departments and the sustainability officer play an important role in the city being proactive in utilizing cooperative purchasing as a tool to advance GPP.

Per the qualitative data obtained from the survey instrument, in the contracting realm, collaboration between agencies in the sample seems to be a common practice. Agencies mostly choose to partner with the same level of governments and less with state and federal organizations. Reduced workload and administrative costs, cost savings,

improved operational efficiencies, and access to best practices seem to be the most important drivers of collaboration between government agencies. Few organizations enter partnerships with green purchases in mind. These results are consistent with the information obtained from the semi-structured interviews.

9.2. Overall Implications for Theory and Practice

9.2.1. Implication for Theory

The dissertation's findings have several implications for theory advancement. First, the study contributes to three bodies of literature—innovation, sustainability, and collaborative governance—by assessing the *status quo* in green public procurement policy adoption, the factors that challenge and facilitate engagement in such practices by U.S. local governments, and the impact of collaborative governance on engagement in GPP.

Governments possess an important tool to drive the market toward a more environmentally friendly approach to production of goods and delivery of services: public procurement. Yet, both public administration scholarship and practice have focused little attention on the topic. While increasing attention is being focused on collaborative governance in public administration scholarship (Kalesnikaite, 2019), few studies have investigated the collaborative process as it relates to government spending.

Drawing on innovation adoption theory and employing Mohr's (1969) MOR model, the present study is among the first to examine GPP adoption in U.S. local governments. To my knowledge, thus far, only one study has researched the topic in the same context, though it drew data from 2011; the present study utilized more current data.

Overall, the findings indicate that adoption of such practices is not necessarily determined by the political environment in which an agency operates, nor is it hindered by

the financial resources available to the agency. In concert with Roman's (2017) findings, the present study notes the importance of sustainable procurement as a "core management concept" (p. 1055). The main motivators of policy innovation adoption are related to organizational characteristics and capacity resources: leadership, organizational culture, and knowledge necessary for engagement in green public procurement (Roman, 2017). In terms of the influence of federal funding on GPP adoption, my results are consistent with the premises of institutional theory—that coercive or regulatory pressures may be a solution to a higher level of adoption of GPP (Ahsan & Rahman, 2017).

While public administration research has showed an increased interest in collaborative governance, few studies have focused on the collaborative process as it relates to government spending. Notably, to date, few studies have assessed the outcomes of such arrangements, and fewer have focused on the impact of green public procurement practices among U.S. local governments. The collaborative governance literature is complemented by understanding how to utilize such model to generate better community outcomes as they relate to sustainability. Additionally, for the collaboration literature, the present study adds insights on the determinants of collaboration utilizing green public procurement as the policy of interest.

The second theoretical implication involves the triangulation and novelty of the data utilized in the study. The study relied on information obtained from a survey I designed after a thorough literature review, complemented with data obtained from a multiple case study design. The third implication for theory is that the dissertation employed a novel operationalization of the dependent variable that accounts for all stages of the procurement process. Fourth, the research identified directions for future research.

9.2.2. Implication for Policy and Practice

The dissertation has vast implications for policy and practice. First, this study notes that the public sector lags behind private sector initiatives for environmental protection. Green public procurement practices are not prevalent in U.S. local governments, while companies such as Amazon, for example, emphasize renewable energy, environmentally friendly transportation systems, reuse, and recycling (Amazon, n.d.).

Second, the regression results illustrate the importance of organizational technical capacity, paired with a strategic leadership approach for a paradigm shift from a traditional procurement process to a more strategic and innovative approach to procurement. These findings support Roman's (2017) conclusions that engagement in sustainable procurement practices is a result of organizational technical capacity complemented with the human element in leadership and culture. Consistent with Testa et al. (2012), results suggest that public managers should consider focusing on raising employee awareness of the concept of GPP and equipping them with the necessary tools to implement such policies. Third, the study underlines the power of policy—namely, the requirements that accompany federal government funding—to motivate engagement in such practices. Upper levels of government should utilize the power of the funding they provide to lower levels of government to mandate GPP practices.

Fourth, results support previous collaboration research and reinforce the assertion that collaboration can be a strong public management tool for achieving economies of scale, increasing knowledge, and increasing efficiency in the procurement process (McCue & Prier, 2008). In this context, green purchasing seems to mostly be a positive unintended externality of these types of collaborative approaches to purchasing. However, interview

results showed that when *greening* the procurement process is the desired goal, intra-agency and inter-agency collaboration to achieve this goal may lead to a higher level of GPP. Thus, the present study notes that the there is a significant opportunity for managers to utilize these types of arrangements proactively and, thus, reach a higher level of GPP in organizations. The fifth important finding, with implications for management, relates to the significance of a sustainability officer, or other employee with similar knowledge/skills to advance sustainability within the organization. As the sustainability officer in *Case Study B* argued, most local governments in the United States do not have a sustainability position: in 3,500 cities across the United States, maybe 350-400 have such a position. Therefore, in terms of scale, and making an impact, all cities should follow employ a sustainability officer. As shown by data in the present study, procurement alone cannot tackle these challenges, and as the sustainability officer in Case Study B stated, "people do not think of procurement organically as a tool to green…" The presence of the sustainability officer seemed to be correlated to familiarizing the organization with GPP and equipping employees with the necessary tools for policy innovation adoption. Familiarity with GPP is the sixth point this dissertation outlined as an important goal that organizations should work toward. To that end, targeted trainings, such as those held in one of the case studies, may facilitate GPP adoption.

9.3. Overall Limitations of the Study and Future Research

As stated above, this study is not without limitations. This section outlines the overall limitations of the study as well as avenues for future research. First, utilizing NIGP as a sample pool for the dissemination of the survey instrument and then selection of case studies may raise concerns regarding the generalizability of the results. However, NIGP

membership is widespread throughout the country. A second limitation involves common source bias, which may arise when data for the dependent and independent variables are drawn from the same survey data. To overcome this potential bias, the survey instrument was carefully designed so that dependent and main independent variables were separated by other questions—to ensure that the first item does not inform the following item. In addition, the results and information from *Phase I* were complemented with data from *Phase II*. Third, the overall study may be susceptible to social desirability bias. However, it is common practice in the social sciences to examine characteristics of the organizations by interviewing or surveying individuals in the organizations that are suitable to answer such questions (Remler & Van Ryzin, 2010). Thus, organizational-level data are usually reported by individuals operating in said environment. Fourth, the major qualitative component of the study relies on only two case studies. Thus, while the results are highly insightful, one should use caution when generalizing the findings yielded. Therefore, the topic should be further explored—beyond the two case studies. Maybe collecting data from a larger and more representative sample could shed light on the results. Fifth, the study may suffer from selection bias. However, I systematically identified the case studies based on an array of criteria. Also, case studies outside of Florida were identified to avoid issues around location. However, these sites did not respond to my invitation to participate in the study.

This dissertation opens avenues for exciting future research projects. First, public administration scholars should focus more on strategy and leadership theories in relation to engagement in green public procurement practices. For instance, they could analyze how each type of leader influences GPP adoption as well as the intersection between

organizational strategy and GPP adoption. Second, the unit of analysis for this research is the local government entity. Future research should focus on the individual purchasing officer and their influence on engagement in GPP practices. The perspective of the elected officials would also enrich current understanding of GPP adoption. Additionally, while this research explains the decision-making process, future studies could assess outcomes of GPP implementation. Fourth, the sustainability literature would benefit from an analysis of behavioral change on the supply side in response to government implementation of GPP policies in the United States. Next, an interesting avenue for subsequent research would be to empirically assess how each of the identified collaborative approaches impacts engagement in GPP processes. Lastly, additional research could further explore the role of the sustainability officer for advancing green public procurement.

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APPENDICES

Survey Questions Utilized for the Study

State

▼ Alabama (1) ... Wyoming (50)

County where jurisdiction is located

_____

What type of agency do you work for?

- ○ Federal Government (1)
- ○ State Government (4)
- ○ County/Regional Government (5)
- ○ City/Town Government (6)
- ○ School system Other (7)
- ○ College/University (2)
- ○ Health-Related (3)
- ○ Utility (8)
- ○ Special Authority (9)
- ○ Other (Please Specify) (10)

_____

Please indicate your organization's preference regarding the following environmental specifications (please select all that apply).

	Not applicable (1)	Preferred but not required (e.g. mentioned in sustainability policy/sustainable purchasing policy, but not enforced) (2)	Preferred and reflected within evaluation criteria (4)	Preferred and built into technical specifications and/or contractual agreement (5)	Required in the selection criteria (3)
Use of environmental labels (1)	○	○	○	○	○
Use of renewable resources (2)	○	○	○	○	○
Reduced packaging (3)	○	○	○	○	○
Ecologically friendly products (4)	○	○	○	○	○
Environmentally friendlier transport options (5)	○	○	○	○	○
Use of recycled material (6)	○	○	○	○	○
Use of products with reduced energy use over life time (7)	○	○	○	○	○

Reduced use of water (8)	○	○	○	○	○
Reduced content of toxic/harmful chemicals (9)	○	○	○	○	○
Decrease of polluting emissions (10)	○	○	○	○	○
Design for re-use, dismantling and recycling (11)	○	○	○	○	○
No hazardous waste over life time (12)	○	○	○	○	○
Other "green" practices (please specify) (13)	○	○	○	○	○

How would you rank your organization's familiarity with the concept of green public procurement?

- ○ Not familiar (1)
- ○ Slightly familiar (2)
- ○ Somewhat familiar (3)
- ○ Moderately familiar (4)
- ○ Well familiar (5)

Does your organization offer any green procurement training to procurement personnel?

- ○ Yes (1)
- ○ No (2)
- ○ I don't know (3)

From your expertise, green products/services/constructions (for instance, purchasing copy machine paper from recycled material, energy efficient computers, energy efficient building materials, organic food, environmentally friendly cleaning products) are more expensive than the "grey" ones:

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Neutral (3)
- ○ Agree (4)
- ○ Strongly agree (5)

Does your organization's strategic plan/policy refer specifically to green purchasing?

- ○ Yes (if possible and available, please provide link to reference) (1) _____
- ○ No (2)
- ○ I don't know (3)

Which of the following positions require a professional procurement certification (at the time of application or within a specified period upon hire)? Professional procurement

certifications include Certified Professional Public Buyer (CPPB), Certified Public Procurement Officer (CPPO), or related certification.

- ☐ Head of Procurement/Director (1)
- ☐ Supervisors/Managers (3)
- ☐ Senior Buyers/Contracting Officer (4)
- ☐ Buyers (5)
- ☐ Contract Specialist (6)
- ☐ Assistant Buyers/Clerks (7)
- ☐ Other: (8) _____
- ☐ Not applicable (9)

What is the approximate annual procurement volume under purchasing?

- ○ Less than $100 million (1)
- ○ $100,000,001-$200,000,000 (2)
- ○ $200,000,001-$300,000,000 (3)
- ○ $300,000,001-$400,000,000 (4)
- ○ $400,000,001-$500,000,000 (5)
- ○ More than $500,000,000 (6)

How centralized is the purchasing authority in your organization? (please check one)

- ○ Purchasing is fully centralized (No delegation of authority) (1)
- ○ Purchasing is centralized but some purchasing authority is delegated based on dollar amounts (2)
- ○ Purchasing is centralized except where departments/divisions have been granted authority to purchase (3)
- ○ Purchasing function is decentralized but authorization occurs at a centralized level (4)
- ○ Purchasing function is fully decentralized and the central purchasing office's authority is to make sure that service departments/agencies comply with purchasing regulations. (5)
- ○ Other: (6) _____

Pressures external to the organization exist to engage in green public procurement practices. Please rate the influence of the following groups.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Residents (as initiators) (1)	○	○	○	○	○
Citizen advisory boards (6)	○	○	○	○	○
State funding (2)	○	○	○	○	○
Federal funding (3)	○	○	○	○	○
Interest groups (4)	○	○	○	○	○
Non Profit Groups (7)	○	○	○	○	○
Other (please specify) (5)	○	○	○	○	○

Based on your expertise, please rate to what extent do you agree or disagree with the following statements:

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Adequate amount of green suppliers available for selection (1)	○	○	○	○	○
Suppliers are resistant to green requirements in public procurement (4)	○	○	○	○	○
Suppliers have the technical and operational capacity to satisfy our organization's requirements for green products/services/constructions (2)	○	○	○	○	○

Does your organization engage in cooperative & group purchasing?

- ○ Yes (1)
- ○ No (2)
- ○ I don't know (3)

How often does your organization engage in cooperative & group purchasing?

- ○ Never (1)
- ○ Sometimes (2)
- ○ About half the time (3)
- ○ Most of the time (4)
- ○ Always (5)

Select the reason for your organization's engagement in cooperative & group purchasing (please select all that apply).

- [ ] Cost savings (1)
- [ ] Reduced workload and administrative costs (2)
- [ ] Improved operational efficiencies (e.g. reduced cycle times, improved delivery terms, enhance market availability) (3)
- [ ] Access to best practices (4)
- [ ] For purchasing sustainable/green products/services/works (5)
- [ ] Other (6) _____

Who does your organization tend to cooperate with when engaged in cooperative & group purchasing?

- ○ Horizontal cooperation, please specify (e.g. other local governments) (1) _____
- ○ Vertical cooperation, please specify (e.g. upper level of government) (2) _____

What do you feel the biggest obstacles of implementing Green Public Procurement practices are? Please enumerate following the order of importance.

_____

What do you feel the biggest facilitators of implementing Green Public Procurement practices are? Please enumerate following the order of importance.

_____

Table 13. Questionnaire for Case studies

Organizational Structure

1.1. How is the procurement function organized?

1.1.1. Own department or functioning under another department?

1.1.2. Decentralized or centralized?

1.1.3. Number of procurement staff vs. annual purchasing amount.

1.2. Are green public procurement (GPP) practices incorporated in the City's policies? (e.g. Are they part of the strategic plan? Does the city have a sustainability policy? Does it incorporate GPP) Please elaborate.

2. Green Public Procurement

2.1. % or amount of GPP every year?

2.2. When did you start engaging in green public procurement practices?

2.3. What determined engagement in such practices? External pressures or incentives vs. internal belief or leadership? Can you please elaborate?

2.4. What role do residents/nonprofit organizations play in your organization's engagement in GPP?

2.5. What role does the organization's location play in engagement in GPP? (As it is at the forefront of climate impact)

2.6. What were the biggest challenges to engagement in GPP faced by the city?

2.7. In your opinion, how can these challenges be overcome?

2.8. What worked with green public procurement practices and what did not?

2.9. What type of procurement is more likely to be GPP? E.g. construction vs. service vs. equipment? One time purchasing vs. repeated, reoccurring orders?

3. Collaborative governance?

3.1. Does your city engage in cooperative purchasing practices?

If the answer to 3.1. is positive

1. Does the city collaborate with other cities/state/federal government?
2. When did the city start engaging in cooperative purchasing practices?
3. What determined engagement in cooperative purchasing?
4. For which type of contracts does the city utilize these arrangements?
5. What was the purpose of entering a cooperative agreement? Was that purpose achieved?
6. Does the city use cooperative purchasing practices for green public procurement?
7. What was the impact of cooperative purchasing practices on engagement in green public procurement practices? Specifically, what was the impact on costs, organizational capacity.
8. What worked with engaging in cooperative agreements?
9. What were the challenges the city faced when engaging in cooperative agreements?
10. How can these challenges be overcome?

If the answer to 3.1. is negative

1. Please explain the reasoning behind the city's decision not to engage in cooperative purchasing agreements.

2. Based on your experience what would determine the city to engage in cooperative purchasing?
3. How do you think these agreements would affect engagement in green public procurement practices? Would these agreements drive the city to engage in a higher level of green public procurement practices? Could you please elaborate

4. Is there anything else you would like to add?

VITA

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2003-2007	LL.B., Bachelor of Laws, Romanian-American University Bucharest, Romania
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PUBLICATIONS AND PRESENTATIONS

Alkadry, M. G., Trammell, E., & Dimand A.M. (2016, March). *Sustainable procurement and The Future of Public Spending*. Paper presented at the meeting of the American Society for Public Administration, Seattle, Washington.

Alkadry, M. G., Trammell E., & Dimand A. M. (2016, June). *The Power of Public Procurement: Social Equity and Sustainability as Externalities and as Deliberate Policy Tools*. Paper presented at the meeting of the Social Equity and Leadership Conference. San Francisco, California.

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Abutabenjeh, S., Trammell, E., & Dimand, A. M. (2018, October). *A Review of Public Administration Research: Where does Public Procurement Stand?* Paper presented at the meeting of The Network of Schools of Public Policy, Affairs, and Administration (NASPAA), Atlanta, Georgia.

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