How is E-procurement Related to the Success of U.S. Cities' Sustainable Purchasing Policies?

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Abstract

Sustainable purchasing policies and e-procurement are both fast becoming popular topics across city governments in the United States. As these two relatively new initiatives meet, the relationship they share has some promising implications that have gone mostly unexplored until now. E-procurement systems have gained a reputation of being one of the most effective ways to advance sustainable purchasing goals, but the belief alone may not be enough to create director-level buy-in throughout city governments. The possible link between these two tools was identified while working with the City of Phoenix's Office of Environmental Programs. While helping them integrate sustainability considerations into their procurement process, it was noticed that e-procurement systems typically facilitated many of the obstructions the department faced and that there could be a positive relationship between their already existing e-procurement system and their sustainable purchasing policy. To investigate this relationship deeper, a survey of city government procurement was sent to 1,845 directors from Finance, Public Works, and Environmental departments across 791 U.S. cities. These decision-makers answered questions relating to their assessment of how sustainable purchasing policies are implemented and the extent to which their city uses an e-procurement system. Tests of independence were then performed to determine if a relationship between different e-procurement activities and perceived success of cities' sustainable purchasing policies existed. Results show that the use of an environmentally friendly database of products and services in a city's e-procurement system is the single most important e-procurement pursuit cities can undertake to influence the opinions that city managers have regarding the success of their sustainable purchasing policy. By understanding this connection, The City of Phoenix and other cities facing the same challenges are able to develop best practices to leverage e-procurement for purchasing sustainably and fully implementing their sustainable purchasing policies.

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Problem Statement

The City of Phoenix has dedicated itself to sustainability goals that will enhance the quality of life for their residence and improve the relationship the built environment has with the natural one over the next 30 years (City of Phoenix, 2017). Many other U.S. cities have also signed climate action plans to reduce their environmental burden over the next few decades (Compact of Mayors). These cities recognize the value of seeking innovative ways to lower their carbon footprint while reducing costs and waste via pointed policy tools (Case, 2016). Sustainable purchasing policies (SPP), also known as green purchasing policies and environmental purchasing policies, are a set of purchasing policies that outline a government's preference for products and vendors that reduce the burden of environmental, social, and economic costs to their taxpayers and the larger society (Marron, 2004). However, these policy tools are not a silver bullet. Cities with SPPs may not have the capacity to integrated them sufficiently, hurting their ability to overcome entrenched barriers to sustainable purchasing (Walker &, Brammer 2012). To reduce those obstacles and realize the full potential of SPPs, cities require a comprehensible method to track sustainable metrics, overcome disjoined data systems, introduce mechanisms for accountability, and increasing efficiencies, effectiveness, and transparency (Clark, 2017). E-procurement (EP) systems have the capacity to provide for these needs (Prier & McCue, 2007). EPs allow city governments to measure and manage their efforts to reduce waste and cost associated with purchasing goods and services while enhancing their line-of-sight into a multitude of procurement operations. These EP uses have the potential to increase the success of cities' SPPs by empowering cities to make decision with clearer operational knowledge (Clark, 2017). The combined use of EPs and SPPs have significant implications for getting cities to

reduce their spending while also being socially and environmentally responsible through practical, data driven solutions. Yet, to facilitate these changes, city manager support is a crucial first-step. Their buy-in could potentially make or break their respective departments' and cities' ability to adopt tools that can enhance their sustainability efforts.

Project Background

In the Summer of 2016, Professor Nicole Darnall and three other ASU professors affiliated with the Center for Organization and Research Design (CORD) were awarded a grant from the V. Kann Rasmussen Foundation (VKRF), a charitable foundation with a mission of strengthening environmental research. The grant outlined a need for researching local governments' sustainable procurement efforts. The project involved a nationwide survey of directors within city governments that inquired about city procurement processes and sustainability efforts. The survey was sent to about 1845 directors from almost 800 of the U.S.'s largest city governments.

I joined the CORD team as a graduate researcher with an academic background in sustainability and public administration. My interests in these two fields coupled with my plan to use the data from this project as a base for my Sustainable Solutions Culminating Experience helped convey my enthusiasm about the position and why I was a good fit for the team.

Coinciding with the grant funded project, the CORD team coordinated with the City of Phoenix's Office of Environmental Programs to identify opportunities for the City to integrate environmental considerations more fully into its purchasing processes. CORD researchers, including myself, conducted focus groups with procurement officers across five different city departments, focusing on their insights to barriers and facilitators of effective sustainable purchasing practices. Additionally, I joined a team of graduate students from Dr. Darnall's Fall 2016 class titled, *Organizations, Sustainability & Public Policy* to benchmark the City of Phoenix's idea for a sustainability rating program against 10 other U.S. cities who had such a program in place and had a formal sustainable purchasing policy. From these separate but interconnecting projects, I identified a gap between most of the cities' inability to fully realize their sustainable purchasing goals with the potential of their e-procurement systems to help them in that endeavor. This potentially significant disparity became the basis for my Culminating Experience.

Stakeholders

I identified eight stakeholders, grouped into three categories, that were important to the success of this project. The first group of stakeholders were those who were directly linked to the project and who's support was critical for completing my culminating experience. This group of stakeholders was comprised of CORD and VKRF. CORD provided me with the educational foundation, mentorship, and collaboration that I benefitted from while taking on a project of this scope, while VKRF was my funding source throughout the academic year.

The second group of stakeholders is comprised of the City of Phoenix's Finance and Environmental Programs departments. This group was classified as significant because they have

been so willing to share the inner-workings of their City's procurement processes with the CORD team over the past year. Their involvement with this project had been invaluable and they will be provided with a first look at the results of this report. Both departments have expressed in maintaining a relationship with CORD and they have expressed interest in the potential role e-procurement may play in their pursuit of purchasing more sustainably.

I have coordinated with the City of Phoenix's Office of Environmental Programs to give valuable practitioner feedback of my report. Upon receiving criticism from this second group of stakeholders I can begin shopping my product to my third and final group. This third group of stakeholders is a list of individuals and groups who are potentially interested in the broader implications of this report. I plan to network with this group to enhance the conversation surrounding e-procurement and sustainable purchasing policies. These interested stakeholders include The American City and County Journal (ACCJ), GreyLine sustainability consulting group, The Sustainable Purchasing Leadership Council (SPLC), and The International City/County management Association (ICMA). A diagram of these stakeholder is shown in Appendix 1.

Introduction

As the U.S. population grows, so does demand for resources we use to maintain our way of life (Hardin, 2009). In the case of finite resources, we need to consider potential negative impacts to the environment and to human health to maintain social progression (Wackernagel & Rees, 1998). This dilemma has become a central talking point throughout the United States with many voices in local governments advocating for alternative solutions to the status quo. This growing group of sustainably minded public employees are fast becoming advocates for purchasing environmentally preferred products to reduce cost, waste, and environmental impacts (Walker et al., 2008). Entire city governments are beginning to look for environmentally sustainable processes to achieve economically sustainable solutions (Porter and Van de Linde, 1995). To this end, an increasing number of cities are reevaluating how they spend money and what they can do to implement more sustainably focused procurement practices (Case, 2016).

The use of sustainable purchasing policies (SPPs) in U.S. city governments is a growing trend among progressive municipalities (Case, 2016). 70 percent of all City purchasers say they consider procuring goods and services that meet certain environmental rated standards (Case, 2016). SPPs are designed to help city procurement officials purchase in a systematic way that outlines their city's commitment to supporting environmentally friendly, responsibly sourced, and locally operated goods and services (Walker et al., 2008). Yet, SPPs are just one of many purchasing policies that compete for priority within city procurement (Darnall et al., 2017) (Wilkes & Blaine, 2015).

For instance, the City of Phoenix has had an SPP in place since 2007. Yet the City faced several major roadblocks relating to its implementation of the policy. It lacked a uniform way to identify environmentally preferable products, leading to the confusion of procurement officers and vendors. There has also been insufficient funding to oversee the verification and monitoring of vendor sponsored sustainable products displayed on vendor websites (Darnall et al., 2017). Due

to their insufficient funding, the City has had to make tough choices regarding which programs they will monitor and which ones lose out to other competing commitments.

One of these competing commitments is the need to reduce spending (Thomas, 2010), which often sway city managers toward more fiscally conservative short-term focused decisions with detrimental effects to their sustainability efforts (Mitlin & Satterthwaite, 1996). However, increasing evidence challenges the viewpoint that sustainable procurement comes at a higher cost (Porter and Van de Linde, 1995). Technological advances to raw materials, manufacturing, packaging, distribution, use, reuse, operation, maintenance, and disposal of alternative resources used in primary spending categories like janitorial supplies and office products are leading to sustainable options that are becoming less expensive and more competitive (GSA).

But technological advancements are likely not enough to encourage cities to implement SPPs. Cities likely need a tool that can help them to measure and manage their sustainable purchasing efforts (Walker & Brammer, 2012). The use of an e-procurement system is one such tool that assists city managers when tracking their city's sustainability endeavors (Puschmann & Alt, 2005). However, it is unclear how city managers with both an e-procurement system and an SPP at their disposal use the former to assess the performance of the latter.

This study addressed this gap by using data from a recent survey on citywide government procurement. It examined whether various e-procurement activities are associated with the perceived success of a city's sustainable purchasing policy. Digging into this knowledge gap provides cities, like Phoenix, who may have just enough political capital to achieve one sustainability endeavor with analytical knowledge to make an informed decision on which e-procurement activities will offer them the biggest bang for their buck.

Sustainable Purchasing Policies

Public procurement is defined as the buying of goods or services by or for a governing agency (Fang, 2002). Collectively, city and state governments nationwide spend $1.6 trillion in the purchasing of goods annually (Potoski, 2008). Cities purchase a multitude of goods and services ranging from paper products to vehicle fleets. Over the past 20 years, an increasing number of city governments have begun thinking about more than just the financial costs of buying these products. In some instances, environmental and social considerations have become almost as important as financial ones (Walker & Brammer, 2012).

Local governments are starting to embrace the notion that fiscal, social, and environmental costs are all related (Albareda et al., 2007). Gradually, there is greater understanding why defining costs solely by financial standards isn't providing cities with all the information they need to make long-term decisions on behalf of their residents (Lange, 2013). More and more people are demanding environmental and social concerns be addressed with public funds (Lubchenco, 1998).

To soften the environmental, social, and economic impacts created by the sheer volume of goods and services being purchased by local governments, roughly one fifth of the largest U.S. city governments have adopted a formal sustainable purchasing policy (CORD, 2017). Their SPPs

outline their city's main objectives for purchasing sustainably and provide clear guidance for preferential products and third-party standards (Darnall et al., 2017). Cities implement SPPs to aid them in their plans to address holistic benefits to themselves, their residents, and the greater society (Preuss, 2009). There is good reason to believe that this trend will become the new norm in the United States. Approximately 60 percent of all city procurement agents nationwide reported using either a formal or informal SPP last year, with an additional 18 percent saying their city has plans to develop one (Case, 2016).

However, there are still many who challenge the notion that SPPs create a "win win" practice for reducing financial costs while also offsetting environmental and social costs (Porter and Van de Linde, 1995). These challenges typically exist when a city is unable to both manage and measure their purchasing and procurement in a centralized manner that can be readily accessible by decision-makers within the organization (Walker et al., 2008). Many times, the inability to produce useful metrics creates roadblocks that inhibit the connection of environmental issues to social ones, managing competing objectives, deconflicting prior commitments and agendas, changing outdated organizational culture, receiving top level buy-in and training, minimizing short term thinking, and generally staying the course when faced with tight financial resources (Walker & Phillips, 2009). Cities with SPPs are not immune from these barriers and in many instances, they find themselves underutilizing their policy. Many cities simply don't have the resources to follow up with the specifications of their sustainable purchasing policy or to ensure that their vendors are providing them with accurate sustainability metrics (Walker & Preuss, 2008). More tools are needed to streamline the process of procuring sustainably and an e-procurement system is one tool with promise.

Sustainability and E-procurement

The use of electronic procurement, like sustainable purchasing, is also a new phenomenon in government. These digital, business-to-government platforms enable the purchase and sale of goods and services via information network systems like the internet (Fang, 2002). As part of the new trend in e-government, e-procurement is a means to better serve citizens in the digital economy by increasing efficiencies, effectiveness, and transparency (Prier & McCue, 2007). EP can streamline once fragmented data systems, eliminating broken processes and simultaneously provides accountability in U.S. state governments (Clark, 2017). Measuring performance, centrally managing contracts, and enhanced sourcing strategies are a few priorities that local governments have collectively noted EP systems potentially offer to them (Clark, 2017).

There are a variety of ways that cities using e-procurement systems can purchase goods and services. Cities have the option to centralize their purchasing in the finance department or decentralize their purchasing fully to the receiving departments. There are also various mixed centralization and decentralized methods used depending on the city (Prier & McCue, 2007). In the U.S., the use of some form of a mixed procurement structure is the most common approach to purchasing (Bartle & Korosec, 2003). However, mixed methods of purchasing create a need for each city department to track their own purchases and train their own personnel how to navigate e-procurement platforms (Preuss, 2009).

However, as more cities work to establish and operationalize their sustainability goals (Keating, 2017), they are looking to e-procurement as a tool that they can tailor to their specific needs. The use of EP is associated with increased communication between buyers and suppliers that are beneficial for environmental, health, and safety objectives of governing agencies (Walker & Brammer, 2012). EP systems can also generate awareness and demand for sustainable functionality between competing procurement policies while simultaneously promoting the use of internal tools that help green procurement initiatives (O'Rourke, 2015). The combined use of a sustainable purchasing policy and e-procurement therefore has the potential to be an extremely effective way for cities to measure their sustainable procurement efforts and to better manage them (Keating, 2017). Yet little is known about the influence an e-procurement system potentially has over city managers' perceptions of their city's efforts to procure sustainably. Likewise, there is no information regarding the effect that specific EP activities contribute to this possible relationship.

This study helps to understand these dynamics by determining which aspect of e-procurement activities are associated with city managers' notions of perceived SPP success. Understanding how these directors from cities currently using an EP perceive the success of their SPP helps to identify drivers that influence increased sustainable procurement (Hidson & Clement, 2008). Thus, creating the leverage for their city's environmental or sustainability departments to build the necessary financial, environmental, and social case to link the two tools together and increase their influence in their city's procurement process (Pruess & Walker, 2011).

Research Methodology

Data were collected by way of an online survey. The survey contained 39 questions and took approximately 16 minutes to complete. Survey questions examined both city and department level procurement and sustainability practices and were presented as scaled, or yes or no questions. Before distributing the survey, the CORD team built a list of prospective respondents from scratch. Our team targeted 1,845 director-level, city employees from cities' finance, environmental, and public works departments across 791 cities with populations of 50,000 people or higher. We focused on department directors because of their responsibility for implementing policies and for setting the tone within their departments regarding procurement norms.

After a master list of our desired respondents was built, we developed a plan to distribute our instrument. To enhance our legitimacy, we sent iterations of the survey reinforced with mail and phone calls that provided detailed information on our project. We began by sending an official letter to each person on our contact list that introduced our team and project. After the first letter, we timed an email delivery with a survey link to arrive in their inbox one week later. Then we sent a postcard that provided another introduction and additional contact information. That postcard was timed to arrive approximately at the same time the second email with a survey link was sent. We sent one last postcard with a reminder asking for participation that was also timed to arrive with a third email containing a survey link. By the end of our mail/email phase, our team recorded a response rate of 17 percent. We then undertook two iterations of phone calls to non-respondents. Those phone calls where matched to emailed survey links, mirroring our

mail/email approach. By the end of the phone call phase, our combined full and partial response rate was 46 percent or a total of 851 responses from 567 cities.

To look at how e-procurement was related to the perceived success of SPPs, only respondents whom answered yes to having both an e-procurement system and a formal SPP were considered. This cut was necessary to focus on survey questions that specifically looked at the relationship between EP and SPP. Therefore, only data from the following four survey questions were used in the analysis:

- "To the best of your knowledge, has your city implemented an e-procurement system?"
- "Please indicate whether your city has implemented the following elements in your e-procurement system:
  - Online bid process (yes/no/don't know)
  - e-procurement training for purchasing officers (yes/no/don't know)
  - Tracking of e-procurement purchases (yes/no/don't know)
  - Database of environmentally friendly products and services" (yes/no/don't know)
- "To the best of your knowledge, does your city have a Citywide environmental sustainability policy?" (yes/no/don't know)
- "We are interested in your overall assessment of the implementation of your city's environmentally sustainability purchasing policy." (rating scale from -5 to 5).

Of the 851 respondents, 237 answered yes to having an e-procurement system. Those respondents were then prompted to answer follow-on question pertaining to the activities of their city's EP. Of which, 155 indicated having an online bid process, 156 used EP to train procurement agents, 154 tracked purchases through their EP system, and 50 had an environmentally friendly database of products and services. Similarly, 209 people indicated that they had a formal SPP in their cities. Of those respondents, 155 rated their city's SPP implementation. However, the total number of respondents who answered both yes to having and rating an SPP and to having an EP was a collective 60 people. Images of the survey questions presented is available in Appendix 2 while a chart of the response rate table is shown in Appendix 3.

I used a Chi^2 Test of Independence to examine the relationship between EP and SPP success of these 60 respondents. This test was suitable to evaluate the likeliness that the observed frequency differences in the high, medium, and low categories for SPP assessment were consistent with the significant outputs of their probability. This analysis was appropriate to evaluate whether the observed overlap between EP use and implementation, and SPP use and rating happened by chance or if it was statistically correlated (Pearson, 1900).

Along with a Pearson's correlation test of independence, a Fisher's exact test was also implemented in the analysis of the contingency tables. While the Pearson's correlation test was used to find the causal relationship between the e-procurement activates and the high, medium, and low categories of the SPP assessment, the Fisher's exact test was used to determine how probable is was that each of the EP activates shared a relationship to perceived SPP success given the small size of the sample.

Before the test could be run, answers pertaining to the respondent's knowledge of EP implementation were collapsed from yes, no, or don't know to yes or no. Answers of don't know were omitted. The object of the analysis was to determine performance perceptions that city managers have, therefore, answers of don't know produced invalidity in the dataset (Vannette, 2015). Similarly, the SPP 11-point ordinal rating scale had to be reformatted to a high, medium, and low categorical variable to perform a test of independence. Low ratings encompassed answers in the negative numbers on the scale while a medium rating was neither successful or unsuccessful and high ratings included all scale options that were positive numbers. A chart of the frequency table is shown in Appendix 4.

Four separate tests of independence were initially run using the high, medium, and low variable for SPP perceived effectiveness against each of the four EP activities question separately. Online bid process, e-procurement training for purchasing officers, tracking of e-procurement purchases, and a database of environmentally friendly products and services each were tested to determine the likeliness of there being a relationship with SPP assessment. After each EP activity was tested separately, they were combined with one another systematically to determine how they performed as a unit.

Results

Of the individual tests run for online bid process, e-procurement training for purchasing officers, and tracking of e-procurement purchases there were no significant results that would conclude they influenced the 60 department directors' assessment of their cities' sustainable purchasing policies. However, when a test of independence was run with EP database of environmentally friendly products and services, a significant relationship was found. A chart of the contingency table is shown in Appendix 5.

The results show that 58 percent of city managers with an environmental database report that their SPP is successful, whereas 36 percent of city managers without an environmental database report that their SPP is successful ($p<.05$). The 22 percent difference in perceived implementation success offers strong initial evidence about the importance that a city's environmentally friendly database of goods and services.

When different e-procurement activities were combined, they led to mixed results with respect to SPP success. Of all the combinations of EP activities tested, only four had significant results. The use of an environmentally friendly database combined with an online bid process was related to SPP success ($p<.10$), however, substantively, the results were not noteworthy. That is, by combining the database with an online bid process, SPP success increased by only 6 percent.

Similarly, the use of environmentally friendly database combined with an online bid process and EP training was also related to SPP success ($p<.05$). However, the effect was much greater in that it was related with a 27 percent increase in success rate. The use of an environmentally friendly database combined with an EP training and EP tracking had a similar effect. Appendix 5 describes each of the combined findings.

In conclusion, some combinations of EP activities strengthen perceptions of SPP success while others do not. The extent to which activities highlight the effectiveness of others is not clear from this analysis. At most, the observation that an environmental database positively increases the capacity of an online bid process and only the combination of these two may somehow influence the standing EP training and tracking can be made. Further testing is needed to understand the true nature that these combined EP activities have on city manager's assessment of their sustainable purchasing policies

Discussion and Conclusion

The implementation of an environmentally friendly database of goods and services is the single most important EP activity that a city can implement to increase the positive perceptions their department directors have for a sustainable purchasing policy. However, EP environmentally friendly databases are not a silver bullet. There were 42% of city managers recorded without a database who indicated success of their SPP meaning other factors are present that need to be addressed in understanding the perceptions city managers have of their SPPs.

Also, in many instances perceived success went down when EP activities were combined with environmental databases while other combinations shown to increased efficacy. This study lacks the ability to understand the relationship that combined uses of e-procurement have with one another yet a few additional conclusions can be drawn from these findings.

Because no other EP activity was significant without being grouped with environmental databases, it is possible to conclude that only under the umbrella of environmentally friendly databases, other EP activates persuade have sway in city managers' assessment of their SPPs. TO be certain, further evaluation is needed. A multivariate ordinal regression using the four combined EP activities to predict positive or negative effects of the 60 respondents' SPP assessment would produce regression coefficients that represent how each EP factor positively or negatively effects the SPP performance score.

There are many possible reasons for the disparity in these results. One such reason could be the implementation of different types of purchasing structures (McCue, & Pitzer, 2000; Bartle & Korosec, 2003). Each type of system requires its own set of purchasing norms that could greatly influence the perceptions city managers have towards their SPPs. Another factor could be that the more a city manager is able to measure and manage their e-procurement platform, the more negative information they receive that might work to decrease their perception of their city's sustainable purchasing policy. Finally, understanding must be given to who oversees a city's EP.

E-procurement platform customers are typically one person within a city who must opt-in to sustainable functionalities. In many instances, the e-procurement platform customer is the city's CFO, Finance Director, or System Administrator (O'Rourke, 2015). However, these management-level, financial decision-makers tend to be more of a barrier to sustainable purchasing than a facilitator (Walker & Brammer, 2012). In this instance, finding leverage to upload tools like the EPA's faculty registry service links (FRS) that are complete with usable meta databases of environmentally friendly products or their guidelines for assessing performance standards and ecolabels may still be a difficult task to accomplish.

This scenario was true of the City of Phoenix and what was found was that further information sharing between the City's Environmental Programs Office (OEP) and their Finance Department was needed. During the pro bono and student projects with the City our team briefed both departments of our finding and were able to facilitate a discussion between the two departments. Information regarding Phoenix's plan to implement centralized tracking within the e-procurement system was passed from the Assistant Finance Director to the Environmental Programs Director after recommendations from the CORD team touched on this subject. This project hopes to build on the information sharing of the two departments by helping the City's OEP to push for an environmental database pilot test that could be centrally tracking with their new EP software.

Recommendations

Cities like Phoenix should consider implementing an environmental database in their city's e-procurement system.

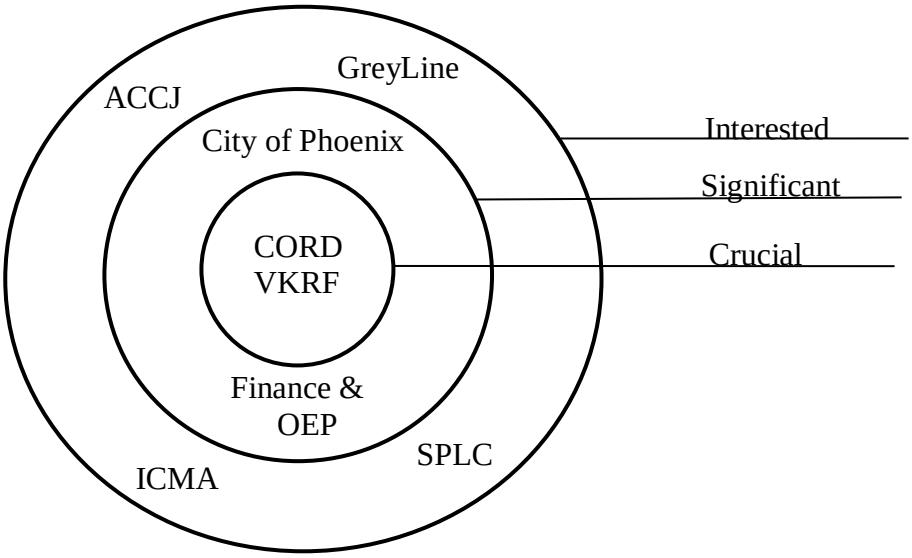
Cities should also look at combining use of an environmentally friendly database of goods and services with other e-procurement features (Online bid process, training for procurement agents, and e-procurement tracking of purchases.) for greater combined success, keeping in mind that the database must be in place first.

They should also consider linking their e-procurement system to the EPA's guidelines for assessing performance standards and ecolabels.

Understand that there is no silver bullet. A database will work best if accompanied by other positive reinforcement for shifting procurement habits. Enhanced communication between a city's finance department and other departments is central in changing purchasing behavior.

Appendix

1. Stakeholder Diagram



2. Survey Questions

2. To the best of your knowledge, has your city implemented the following purchasing activities?

	Yes	No	Don't Know
Citywide contracts to reduce purchasing costs	○	○	○
An e-procurement system	○	○	○

2B. Please indicate whether your city has implemented the following elements in your e-procurement system:

	Yes	No	Don't Know
Online bid process	○	○	○
E-procurement training for purchasing officers	○	○	○
Tracking of e-procurement purchases	○	○	○
Database of environmentally friendly products and services	○	○	○

3. To the best of your knowledge, has your city **implemented a formal policy** pertaining to any of the following purchasing issues:

	Yes	No	Don't Know
Minority-owned business purchasing	○	○	○
Women-owned business purchasing	○	○	○
Environmentally sustainable purchasing*	○	○	○
Veteran-owned business purchasing	○	○	○
Local business purchasing	○	○	○
Small business purchasing	○	○	○

* **Environmentally sustainable purchasing** is the set of activities undertaken by an organization to implement purchasing that reduces negative effects on the environment.

19B. We are interested in your overall assessment of the implementation of your city's environmentally sustainability purchasing policy.

	Very Unsuccessful -5	-4	-3	-2	-1	Neither Successful nor Unsuccessful 0	1	2	3	4	Very Successful 5
How would you assess your city's overall implementation of this policy?	○	○	○	○	○	○	○	○	○	○	○

3. Response Rates Table

Total Survey Responses: n=851

Questions	**Yes**	**No/DK**
Use of EP	237	514
-Online Bid	155	82
-EP Training	156	81
-EP Tracking	154	83
-Enviro DB	50	187
Use of SPP	209	642
-Assessed SPP	155	54
-SPP Assessment	H= 90, M= 44, L= 21	

*See frequency table for SPP assessment High/Low breakdown

4. Frequency Table

Assessment of SPP Implementation: n=155

Scale	Value	Frequency	Rating
-5	Very Unsuccessful	3	Low
-4		6	Low
-3		7	Low
-2		6	Low
-1		2	Low
0	Neither/Nor	41	Medium
1		29	High
2		23	High
3		27	High
4		10	High
5	Very Successful	1	High

5. Contingency Table

Individual Factors

	Perceived SPP Performance							
EP Activity	**Low with**	**Low without**	**Med with**	**Med without**	**High with**	**High without**	**Pearson**	**Fisher's**
Online Bid	57%	43%	77%	23%	75%	25%	0.41	0.47
EP Training	75%	25%	83%	17%	87%	13%	0.65	0.71
EP Tracking	83%	17%	85%	15%	78%	22%	0.85	1.0
Enviro DB	36%	64%	11%	89%	58%	42%	**.042**	**.046**

Combined Factors

	Perceived SPP Performance							
EP Activity	**Low with**	**Low without**	**Med with**	**Med without**	**High with**	**High without**	**Pearson**	**Fisher's**
DB + Bid	31%	69%	11%	89%	40%	60%	**.058**	**.063**
DB + Train	27%	73%	13%	87%	33%	67%	0.23	0.27
DB + Track	27%	73%	11%	89%	43%	57%	0.22	0.27
DB + Bid + Train	27%	73%	0%	100%	54%	46%	**.017**	**0.13**
DB + Bid + Track	30%	70%	11%	89%	38%	62%	0.34	0.43
DB+Train+Track	27%	73%	0%	100%	47%	53%	**.05**	**.043**
All Combined	27%	73%	0%	100%	37%	63%	**.017**	**.013**

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