



IBM Center for  
The Business of Government

Using Technology Series

# Reverse Auctioning

## Saving Money and Increasing Transparency



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# **Reverse Auctioning: Saving Money and Increasing Transparency**

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## Foreword

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, *Reverse Auctioning: Saving Money and Increasing Transparency*, by David C. Wyld, Robert Maurin Professor of Management, Southeastern Louisiana University. This report is Professor Wyld's second for the IBM Center on the subject of reverse auctions. In 2000, the IBM Center published *The Auction Model: How the Public Sector Can Leverage the Power of e-Commerce Through Dynamic Pricing*, the first major academic study of reverse auctions.

The current report by Professor Wyld describes the increasing use of reverse auctions by government at all levels across the world. Simply put, reverse auctions are auctions that enable sellers to "bid down" prices for their goods and services. The use of reverse auctions has substantially increased since Wyld's initial report in 2000, albeit at a slower pace than anticipated in the earlier study. This new report contains original research on the potential of reverse auctions as a government cost-saving tool that also saves time and increases transparency. Specifically, Professor Wyld presents the following in this report:

- A case study of how the U.S. Department of State has used reverse auctions to save money and increase competition
- A numerical analysis of (a) the scope of government procurements appropriate for reverse auctions and (b) the estimated potential savings to be derived by government in increased use of reverse auctions

Wyld estimates that the federal government could save \$8.9 billion by increasing the use of reverse auctions. Wyld's research also estimates that the Department of Defense alone could save nearly \$6.1 billion by increasing its use of reverse auctions. In addition to cost savings, the Wyld case study of the Department of State demonstrates that reverse auctions substantially increased competition among suppliers and saved departmental contract staff substantial time.



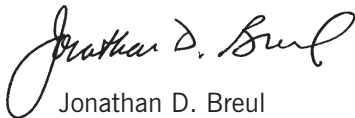
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While there is clear evidence of the value of reverse auctions, their use in government has still been somewhat limited. For this to change, Wyld recommends that departmental chief acquisition officers be assigned responsibility for taking the lead and making procurement savings and efficiencies a strategy priority for their organizations, with reverse auctions a central focus of that effort. Wyld also recommends intensive staff training and change management initiatives as government implements new and innovative approaches to procurement.

We trust that this report will provide useful and helpful information to government managers at all levels as they move toward the increased use of reverse auctions.



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# Executive Summary

Reverse auctions—auctions where an organization posts a buying requirement and interested suppliers drive prices down as they bid against one another to win the auction—are a simple idea whose time has come. The concept is straight out of the dot-com era; a decade ago, this author was among those who foresaw that electronic reverse auctions (eRAs) would be the way to carry out much of the procurement in both private and public sectors. Today, a combination of forces—economic pressures, technological change, and the strategic nature of acquisition—are making such predictions come true. Reverse auctions are indeed coming of age in both the private and public sectors, as organizations are rapidly discovering that eRAs can be a “faster, better, cheaper” method of procurement.

## Benefits of Reverse Auctions

This report begins with an overview of how reverse auctions work in the procurement context. Next, the benefits of reverse auctions are examined. These include:

- **Driving prices down.** Lowering the price to be paid by the organization across a wide swath of its procurement outlays for appropriate categories of goods and simple services
- **Increased competition.** Opening access to bidding from an expanding pool of suppliers to heighten competition in the procurement process
- **Real-time market pricing.** Since competitors can adjust their bids multiple times in response to other competitors' prices, the first and best offer can be improved to the benefit of both the buyer who saves hard dollars and the seller who ultimately gains the business.
- **Process efficiencies.** By leveraging the reverse auction tool, the acquisition function can be improved and generate soft-dollar savings through efficiency gains and more productive use of time, manpower, and resources.
- **Time savings.** Compressing the buying process from weeks or months to days or even hours, benefiting both sides of the procurement equation
- **Increased number of suppliers.** Encouraging new entrants into the contracting process to provide benefits to small businesses that enter
- **Sustainable cost savings.** Delivering not just cost savings in the initial round of reverse auctioning, but ensuring that the organization is paying a real-time market price on subsequent like acquisitions

The report also considers the concerns voiced about reverse auctions, both the switching costs that are part of all public-sector procurements and the impact of reverse auctions on buyer-seller relationships.

## The Three Stages of Reverse Auctions

The report examines the three stages of the reverse auction process:

- **Stage One—the decision on whether or not to use a reverse auction.** When is it appropriate to make use of an eRA and what categories of goods and services are suitable for competitive bidding?
- **Stage Two—the decision on whether to do it yourself or use a third party.** As all reverse auctions entail necessary functions, the acquisition function of the organization must make what is in essence a classic “make or buy” decision to carry out these tasks using internal resources or partner with an outside provider.
- **Stage Three—the decision on pricing and policy.** Ground rules have to be established in regard to both the actual conduct of auctions and integrating reverse auctioning into the traditional workings of the acquisition process.

## Analyzing the Potential Impact of Reverse Auctions

The second part of this report examines the present and the future of reverse auctioning in the federal government, first observing how reverse auctioning has made a *proven* impact on government operations and budgets. An in-depth examination of reverse auctioning at the Department of State shows the dramatic impact of competitive bidding in producing significant hard-dollar savings and dramatically improving small-business participation. There have also been demonstrated soft-dollar efficiency gains experienced by State’s contracting staff. The compressed time element of reverse auctioning saves almost a full day of effort on each acquisition; these professionals make use of the time to deliver better service and more value-added activities in their daily work.

Next, attention turns to the *prospective* savings that could be achieved in federal acquisition spending across all agencies, using proven academic methodologies to assess the potential savings that could be generated through the appropriate use of reverse auctioning. Almost \$75 billion of annual federal acquisition spending is appropriate for reverse auction-based procurements—over \$50 billion in the Department of Defense (DoD) alone.

This analysis presented in the report shows that if reverse auctioning were used in appropriate spend categories for commodities and selected services, the federal government could achieve savings of between \$7.5 and \$14.9 billion annually. Using a proven savings factor of 11.9% on reverse auction-based procurement competitions, appropriate use of reverse auctioning could produce an annual expected savings of \$8.9 billion across the federal government, with \$6.1 billion of savings coming from Defense spending alone.

This report demonstrates that reverse auctions are a powerful acquisition tool for government procurement. In short, reverse auctions:

- Can produce significant levels of savings
- Can be used for a wide variety of goods and services that make up a significant portion of agency spending
- Can make acquisition processes faster and more efficient, enabling agencies to deliver improved service levels and results with the same or fewer staff than before
- Can introduce new levels of competition by providing improved access to government contracting for small businesses



- Can be conducted in a manner that ensures transparency in the acquisition process and ensures competing suppliers and taxpayers a more fair and open competition among a wider field than in alternative procurement methods

Government leaders should now ask their organizations, “Why aren’t we using reverse auctions for appropriate—and significant—parts of our procurement spending?” Today, it is clear that the push for savings, transparency, and competition in the public sector makes the choice of reverse auctions a simple one. Making that happen is more complicated, and that is the focus of the 14 recommendations offered as a roadmap for an executive-led transformation program to make contracting more competitive, efficient, and transparent through reverse auctioning.

## Recommendations

### Leading Reverse Auctions

**Recommendation 1: Executive leadership must be put in place.** The chief acquisition officer (CAO) should take the lead and make procurement savings and efficiencies a strategic priority for the organization. Reverse auctions should be a central focus of this effort.

**Recommendation 2: An “Auction First” strategy should be adopted.** The CAO should set forth a policy statement on the importance of using reverse auctions where practicable as a first choice—an “auction first” strategy—or for specific categories of goods and services. The CAO should also establish a timeline for full implementation, along with specific goals in regard to the overall volume of auctions and the levels of dollar-cost savings to be achieved.

### Change Management Staff Training

**Recommendation 3: Organizations must manage the change effort.** The CAO and the senior leadership of the organization should understand that they are embarking on a major change. Organizations should devote sufficient time, attention, and resources to make the transition to auction-first procurement focus a success.

**Recommendation 4: Organizations should pilot reverse auctions.** Organizations should designate a unit within their acquisition operations to pilot reverse auction procurements in specific spend categories with a limited number of vendors to produce initial results. The organization can evaluate the results of the auction-based acquisitions and the lessons learned from these procurements from both the agency and supplier perspectives in setting the direction and policies for moving toward fully integrating reverse auctioning into its acquisition operations.

**Recommendation 5: Organizations should provide training on reverse auctions.** Organizations should begin efforts to educate acquisition staff on reverse auctions. The focus should be not just on how reverse auctions can save the agency money on procurement expenditures, but on the process improvements that can make their own work more productive and less tedious.

**Recommendation 6: Organizations should communicate with their present vendor community.** Organizations should also turn their attention to the vendor community. They should communicate clearly with present vendors that the organization is moving to reverse auctioning in appropriate types of acquisitions as a way to ensure that limited resources are expended in the most efficient manner possible. The agency should offer not just initial training, but ongoing support to facilitate vendors’ participation in reverse auction operations.

## Analysis Prior to Undertaking a Reverse Auction and After the Reverse Auction

### **Recommendation 7: Organizations should undertake a spend analysis of their procurements.**

The organization should undertake a spend analysis of its procurement to gain insight into the nature of the mix of goods and services it is acquiring for its end-customers. This analysis should be conducted with the goal of determining which portions of its procurements outlays are appropriate for reverse auctioning and can be carried out in partnership with academia (for objectivity) and/or third-party auction providers of reverse auction services.

### **Recommendation 8: Organizations should develop metrics and automate the collection of relevant data.**

Organizations should establish metrics and ensure that data collection processes are embedded into the reverse auction process. The agency should ensure the data visibility needed to evaluate each auction in terms of the cost savings produced and the aggregate results of the agency's competitive bidding acquisition efforts.

### **Recommendation 9: Organizations should evaluate their reverse auctioning efforts.**

Organizations should establish a program to evaluate the progress of their reverse auctioning efforts, both in terms of the dollars saved and the efficiency gains achieved. The goal of such efforts should be to continuously improve the effectiveness and efficiency of acquisition operations by learning how reverse auctioning contributes to the overall mission of the agency and its procurement processes.

## Communications Before, During, and After a Reverse Auction

**Recommendation 10: Organizations should expand their vendor base.** Organizations should look beyond their present vendor pool to reach small and disadvantaged businesses new to competing for agency contracts—and perhaps even new to government contracting opportunities. The goals of such efforts should be to increase competition levels for agency spending—thereby saving on expenditures—and to expand the agency's use of small businesses.

### **Recommendation 11: Organizations should communicate with stakeholders and policy-makers.**

The CAO should work to ensure that successes are communicated not just internally with acquisition staffers, but externally with stakeholders and policy-makers through the media. Collectively, CAOs of agencies should seek to share their lessons learned and best practices in reverse auctions to ensure that across the board, the government is taking full advantage of this e-procurement tool, thereby maximizing savings for the taxpayer through both hard-dollar savings and operational efficiencies.

### **Recommendation 12: Organizations should create dashboards to monitor organization progress.**

Dashboards show success with reverse auctions and should definitely be a part of the overall effort. The agency could create an eRA savings dashboard, available both internally for staff and perhaps also externally for communications purposes. This dashboard could show savings by department, subunit, or even by staffer, perhaps making it competitive for the individuals and units involved. There should also be training and sharing of ideas on best use of time savings.

## Use of Third-Party Service Providers

**Recommendation 13: Organizations must undertake a “make-or-buy” decision.** The agency should make a choice as to whether to conduct reverse auctions using in-house resources or to partner with a third-party auction provider. This is a multifaceted consideration that must be based on the advantages and disadvantages of using the agency's own capabilities versus the expertise of an outside partner.

## The Issue of “Keeping Savings”

### **Recommendation 14: Executives should be incentivized to undertake reverse auctions.**

Government executives should be encouraged to think outside the box in terms of rewarding acquisition units and even individual procurement professionals for the savings produced through reverse auctioning efforts. They should endeavor to protect the budgetary and operational resources of units that achieve savings and work to establish programs, compensation, and evaluation systems that make reverse auctioning an integral and ongoing part of individual and unit performance expectations.

## Conclusion

This report is a call to action for government executives and procurement leaders. They should reexamine their own acquisition strategies, especially in the current environment of doing more with less, which may be the norm for many years to come. For leaders at every level of government around the world, the time is now to put the power of reverse auctioning to work for government organizations, their acquisition staff, and most important, for the American public.

# Reverse Auctioning Today

## Defining Reverse Auctions

Reverse auctions have been given a number of different labels:

- Online reverse auctions
- Reverse e-auctions
- Downward price auctions
- Electronic reverse auctions (eRAs)

Internet-based or electronic reverse auctions are, by their very nature, a specific type of e-market: an electronic forum or marketplace where buyers and sellers interact online to exchange information and conduct trade with one another (Kaplan and Sawhney 2000).

In the context of procurement, a reverse auction can be defined as “a real-time online competitive bidding event where the buyer sends out a request for quotation and suppliers bid on the business, decreasing their selling prices until optimally a true market price has been reached” (Schoenherr 2004, p. 21).

According to the Institute for Supply Management, in the procurement context, reverse auctions are “a type of e-auction that is conducted online, in real-time, between a single buying organization and pre-qualified suppliers. Suppliers compete in presenting bids to the buyer for the supply of goods or services whose specifications for design, quantity, quality, delivery, and related terms and conditions have been clearly defined” (Institute for Supply Management 2003, p. 4).

## The Strategic Nature of Procurement

The reverse auction acquisition tool is not appropriate for all spending categories. In fact, there are “sweet spots” for the use of reverse auctioning, namely in the areas of commodity-type buys of goods and services and in goods that are readily specifiable. Thus, reverse auctions have been correctly categorized as “a ‘go/no-go’ decision” for procurement organizations and their individual acquisition staffers (Hawkins, Gravier, and Wittmann 2010, p. 24). This is because the acquisition tool will either be used or it will not for a specific procurement for a specific buy at a specific time. Thus, for any acquisition, procurement professionals have to make a decision regarding the reverse auction tool.

Figure 1: The Reverse Auction Process



It is important to recognize that the competitive environment of reverse auctions works to produce significant savings on prices to be paid for a whole range of goods and services. Yet, such “hard dollar” acquisition cost savings are only part of the equation. A report from the University of Arkansas’ Information Technology Research Institute has shown that by using reverse auctions, not only do companies save 15 percent on their acquisitions of goods and services, but procurement cycle times can be decreased by 90 percent (Setia 2009).

Today, there is growing interest in auctions in the federal government. Glenn Wheaton, senior manager at San Diego-based Epiq Technologies, reports that “many of the benefits of adopting reverse auctions were established by the private sector and were then confirmed by the experiences of states and government agencies” (Wheaton 2010a). Hawkins, Coyne, and Hudgens cite electronic reverse auctions (eRAs) as a superior method of competition for public sector procurement, citing the fact that the practice “allows multiple bids per offeror, versus the typical one shot (or limited exchanges) currently used in government contracting” (Hawkins, Coyne, and Hudgens 2009, p. 3). Yukins and Wallace conclude that for the public sector, the reverse auction acquisition method “marks an intersection between modern technologies and ancient issues of best value in public procurement” (Yukins and Wallace 2005, p. 2).

In the public sector acquisition context, the process of reverse auctioning is initiated by a user need for a good or service. The contracting and procurement operation uses the competitive bidding mechanism to fulfill that request at the lowest price possible. According to Wheaton, the benefits of reverse auctions for government agencies include:

- Significant cost savings
- Lower cycle times
- Increased compliance
- Enhanced transparency
- Increased collaboration
- Enhanced supplier participation
- Feedback for participants (Wheaton 2010a)

Additionally, there are a number of administrative benefits for reverse auctions in public procurement:

- Determine supplier selection without rounds of negotiations
- Disseminate information easily with potential suppliers
- Reduce inventory levels and carrying costs due to the quicker procurement cycle times
- Enhance transparency in the procurement process with a complete electronic record for auditing and compliance

In addition to cost savings, Shalev and Asbjornsen emphasize the transparency benefits from reverse auctions: “As transparency and compliance become increasingly important to public sector practitioners, these administrative benefits may become even more important than any cost savings achieved” (Shalev and Asbjornsen 2010, p. 431). Jaime Gracia, president and CEO of Seville Government Consulting, believes that the proven cost savings and improved transparency of reverse auctions “all outweigh any barriers that seem to be artificially created by federal organizations.” Gracia states that technological advancement has proven that “the reverse-auction process is Acquisition 2.0 in motion” (Weigelt 2010).

## Reverse Auctions in the Private Sector

Reverse auctions have become a best practice for procurement across the corporate landscape, not as a way to squeeze suppliers to reduce costs, but as a way to automate the negotiation process. For both sides of the procurement equation, reverse auctions today offer a streamlined way to communicate and collaborate so that competitive bidding processes that took weeks or even months to complete can be compressed into days or even hours. The procurement and supply chain management literature is replete with case studies and stories documenting how leading companies have effectively used reverse auctions, including these examples:

- 3M
- Bethlehem Steel
- General Electric
- Hewlett-Packard
- Home Depot
- Owens Corning
- Southwest Airlines
- Sun Microsystems
- Texas Instruments
- United Technologies

Analysts have noted that among Fortune 500 companies, almost all private-sector firms of this size employ reverse auctioning today to some extent (Moorhouse 2008). From a global perspective, the same is true for the worldwide list of Fortune 1000 companies. For example, Royal Dutch Shell, the global energy and petrochemical giant, has used reverse auctions for procurement since 2001 and today conducts over 100 reverse auctions monthly (Earls 2009). Looking ahead, it has been projected that as much as half of all corporate procurement could soon be conducted through reverse auctions (Chafkin 2007).

Morrell wrote that while eRA use has been exploding across the private sector, both in the U.S. and around the world, the procurement method is still controversial (Morrell 2007). Indeed, competitive bidding is a subject that many executives still shy away from for a variety of reasons, not the least of which is often a fear—or a realization—that the practice is a game-changer in the marketplace. Still, the value propositions for reverse auctions are quite clear. For buyers, reverse auctioning enables organizations to reap savings in both cost and procurement time, while also expanding the pool of eligible suppliers, thereby increasing competition. For suppliers, reverse auctions offer the prospect for reduced operating, selling, and customer acquisition costs through an improved and expedited bidding process. Moreover, reverse auctions also afford vendors improved access to new markets and new competition, while working to ensure a more level playing field in which small businesses can effectively compete.

## Reverse Auctions in Government

Some of the impetus behind the push for procurement reform and efficiencies is the simple fact that these are difficult times in the public sector. At all levels, government executives are being challenged each and every day to “do more without more”—as Ashton B. Carter, Under Secretary of Defense for Acquisition, Technology, and Logistics, put it (Shalal-Esa 2010). Budgets are being tightened, positions are being eliminated or remaining unfilled, and yet, agencies and their personnel are being tasked with bigger, more important missions than ever before. In response, the reverse auction model is now taking hold across the public sector.

At all levels of government in the United States, federal, state, and local agencies are turning to reverse auctions to make a wide range of decisions more efficiently. Likewise, governments around the world, in both developed and developing nations, are fast discovering the power of competitive bidding to bring about procurement reform and savings. This is due to a confluence of forces:

- **Budgetary and staffing challenges.** Budget constraints in the years ahead are likely to continue reductions in the acquisition workforce and the need for acquisition efficiencies. Indeed, a major challenge in federal procurement is that a “shortage of contract officers is making it imperative that agencies be more efficient with their acquisitions” (Wakeman 2009).
- **A push for openness.** There are rising demands for competition and transparency in government operations in general, with a particularly strong focus on the acquisition area.
- **Advancements in technology.** The omnipresence of Internet-based information and communications technology (ICT) makes possible instant access to the same information, no matter the size of company, the size of the data pipe, or the type of device organizations are using to connect to the Internet. These advancements enable wide and equal participation in reverse auctions.

In the federal government, reverse auctioning has moved from a questionably legal practice a little more than a decade ago to an endorsed and encouraged acquisition method today. In a 2004 memo from Robert A. Burton, then the associate administrator of the Office of Federal Procurement Policy (OFPP), the OFPP urged each federal agency, in the interest of “maximizing productivity gains from technology ... to explore increasing the use of commercially available online procurement services” (Burton 2004). One tool specifically mentioned in the Burton memo was reverse auctions, and the OFPP noted at the time that: “If used correctly, the reverse auction approach can ensure that the government receives competitive prices” (Burton 2004).

In July 2008, the Office of Federal Procurement Policy (OFPP) issued a memorandum calling upon each department’s chief acquisition officer to “use reverse auctioning tools where appropriate” (OFPP memo p. 3). In September 2010, the White House added specific goals and priorities to the previously announced Accountable Government Initiative that seeks to cut operating costs by \$40 billion annually in FY2011. The administration established “reforming contracting” as one of the six primary goals of this effort, and the OMB Deputy Director for Management specifically pinpointed competitive bidding as one of the primary ways that

### Reverse Auctions at the FBI

In a 2011 cover story for *Contract Management*, Deborah Broderick, the Federal Bureau of Investigation’s (FBI) procurement section chief and chief procurement officer, wrote about the experience of her agency as it undertook the challenge of reinventing, strengthening, and streamlining many of its acquisition practices. Integrating reverse auctions into the agency’s acquisition practices has been a major focus of the effort to streamline acquisition in the FBI.

Broderick wrote that the use of a commercially available reverse auction marketplace “has enabled our contracting officers to save money, improve their purchasing efficiencies, and increase the Bureau’s small business utilization” (p. 32). In regard to the increased competition, Broderick writes that the FBI’s contracting officers have “expanded the community of sellers they solicit well beyond their existing Rolodexes,” and in the process, created a great deal of opportunity for small businesses across the country. In fact, through the reach of the online marketplace, small suppliers won 81% of all the FBI’s awards and 76% of awarded dollars—nearly \$70 million—in Fiscal Year 2010 (Broderick, 2011, p. 32).

## Reverse Auctions Around the World

Examples of reverse auction success in the public sector can be found around the globe, including:

- **South Korea** is embarking on a program to integrate reverse auctioning into its national government's acquisition practices. The country's Public Procurement Service estimates that even though the government will only employ competitive bidding on contracts in excess of 190 million won (approximately \$175,000), the country will save approximately 20 billion won (over \$18 million) annually through reverse auctioning (Asia Pulse 2008).
- **New Zealand** is making the move to integrate reverse auctions into its procurement strategies. David Sheppard, an advisor to the New Zealand Trade and Enterprise Industry Capability Network, says that from a government perspective, the push for competitive bidding is a "no-brainer" for any public-sector agency (Pullar-Strecker 2008).
- **United Kingdom** Cabinet Office Minister and Paymaster General Francis Maude has called attention to procurement practices that he describes as "bonkers," in which in category after category, government agencies may be paying up to 10 times more than another purchaser for the same item. He has announced his intention to reform UK procurement, with a goal to save £10 billion by 2015. Quite significantly, in addition to savings on the prices paid for goods and services, the UK government is cutting almost a third of its civil service workforce in the procurement area (Shipman 2011).

The UK's Office of Government Commerce (OGC) has reported that it has achieved significant savings on its IT hardware procurement through introducing competitive bidding—over £50 million from 2005–2009. Now the OGC has developed a plan to more fully integrate reverse auctions into the UK government's overall acquisition strategy, seeking to save a total of £270 million by the end of 2012. The OGC has developed the Centre for e-Auctions ([http://www.ogc.gov.uk/categories\\_of\\_spend\\_centre\\_for\\_e-auctions.asp](http://www.ogc.gov.uk/categories_of_spend_centre_for_e-auctions.asp)) to facilitate information exchange and best practice dissemination on reverse auctions within the British government. Nigel Smith, Chief Executive of the OGC, commented that: "We have achieved solid and sustainable savings from e-auctions. The new Centre for e-Auctions is building on this work and is providing a widespread push to get e-auctions in regular use across all categories of spend" (OGC 2010).

federal agencies will strive to achieve this goal, stating: "Agencies identified \$19 billion in savings from contracting for FY 2010, and we remain on track to achieve this savings through a combination of program terminations and reductions, new and stronger applications of strategic sourcing, and continued implementation of innovative procurement methods, such as the use of *web-based electronic reverse auctions*" (emphasis added) (OMB 2010, p. 6). From the perspective of Neal Fox, who formerly served as the General Services Administration's Assistant Commissioner of Commercial Acquisition and is currently the President of Neal Fox Consulting: "Reverse auctions are an acceptable tool for government wide use by agencies in a tried-and-tested approach. They have proved to be both useful and safe" (Weigelt 2010).

According to the Office of Management and Budget the federal government contracts for well over half a trillion dollars of goods and services annually—approximately \$550 billion in 2009 (OMB 2010). This represents over one-sixth of all federal spending, and it is double what the government's acquisition budget was just a decade ago.

Governments around the world are discovering both their own purchasing power and the power of reverse auctioning. In almost every country, the public sector constitutes the nation's largest buyer of goods and services (Lindskog 2008). In fact, according to recent analysis from the Organization for Economic Cooperation and Development (OECD), government procurement accounts for—on average—15 percent of national GDP, and in some countries reaches 20 percent of GDP (OECD 2008). In the U.S., the buying power of government is unmistakable.



Yukins and Wallace commented on the similarity of issues faced today by governments and their acquisition professionals around the world, noting that because of commonly accepted procurement practices and global markets today, reverse auctions also “pose an extraordinary opportunity for sharing lessons internationally” (Yukins and Wallace 2005). Indeed, according to recent United Nations research on government procurement practices around the world, many national, state, provincial, and local governments are turning to reverse auctions. These include countries both in the developed world (including Australia, Canada, France, Korea, Portugal, the United Kingdom, and the United States) and in the developing world (including Brazil, Chile, China, Colombia, Ecuador, Estonia, Panama, Paraguay, and Peru) (Shalev and Asbjornsen 2010).

# Understanding Reverse Auctions

## Types of Auctions

Reverse auctions are just one type of e-market mechanism, bringing together buyers and sellers online to arrive at a price for a given transaction. This section provides an overview of reverse auctions, beginning with a description of the differences between forward and reverse auctions.

There is still much confusion today over what the difference is between auction types. There are really only two categories of auctions—forward and reverse. The differentiating factors between the two auction types are shown in Table 1. In brief, the two types may be described as follows.

- **Forward auctions** take the form of a single seller offering an item for sale, with buyers competing to secure the item by bidding the price upward. Forward auction operations are far better understood by the public at large than reverse auctions are, primarily because of their wide use at the consumer level. In fact, forward auctions underlie everything from eBay and other online auction sites to auctions of art, wine, and other collectibles. The forward auction model is also widely used for everything from autos and real estate to machinery, where the goal is for the seller to receive the most money possible for the item being offered at auction. Thus, a forward auction should be used for sales of goods and services of all types, whether conducted online, offline, or a hybrid of the two.
- **Reverse auctions** permit a single buyer to make potential sellers aware of intent to buy a specified good or service. During the actual reverse auction, sellers bid against one another to secure the buyer's business, driving the price to be paid for the item downward. Thus, the winning bidder is the seller who offers the lowest price. Reverse auctions not only use dynamic pricing; they change the dynamics of the purchasing process itself. In a reverse auction, the buyers and sellers essentially reverse their traditional roles. Rather than buyers reacting to what sellers have to offer, sellers react to the buyer's needs (Healthcare Purchasing News 2007). Reverse auctions are most typically used in procurement by private companies, public-sector agencies, and non-profit organizations.

Today, there is phenomenal growth in both categories of auctions, due in large part to the global reach of the Internet. Forward auctions are rapidly moving into new areas, as consumers now routinely participate in auctions for everything from electronics to travel online. While the

**Table 1: Differences between Forward and Reverse Auctions**

	Pricing	Marketing	Research
<b>Forward</b>	Buyers drive prices up	Sellers seek out buyers	Buyers research products
<b>Reverse</b>	Sellers drive prices down	Buyers seek out sellers	Sellers offer product information

reverse auction mechanism may be simple—having suppliers compete for the buyer’s business and driving prices down in the process—the task of managing and processing knowledge and information exchanged between the buying organization and potential vendors is actually quite a complex operation (Talluri, Narasimhan, and Viswanathan 2007). This is why, until recently, only the largest private-sector organizations have been able to take advantage of the cost savings associated with reverse auctions, as the task is beyond the scope of most small companies and certainly of public-sector organizations. We are thus seeing ever-increasing numbers of organizations, both in the United States and abroad, using reverse auctions as a key part of their procurement strategies as they seek to ensure that they are obtaining best value for their acquisition budgets by obtaining “real-time” market prices on both goods and services. With a reverse auction, a buyer can gather bids from interested suppliers, and unlike other procurement scenarios, suppliers can participate in the bidding at very low cost and irrespective of their geographic location (Jap 2002).

## Benefits of Reverse Auctions

### Benefit One: Driving Prices Down

According to Richard W. Schrader and Julie Toner Schrader, both of Bellarmine University, and Eric P. Eller, Upper Iowa University, reverse auctions work in many respects by creating an “information disequilibrium,” as they “present a unique opportunity for the buyer to obtain lower prices from the suppliers than would otherwise be possible, and thus transfer profits from the supplier to the buyer” (Schrader, Schrader, and Eller 2004, p. 64). Therefore, the ability of reverse auctions to produce significant cost savings for buying organizations is considerable. This has been proven in several recent studies in which purchasing research has found competitive bidding to produce cost savings of between 5 and 30 percent (Losch and Lambert 2007) and 3 to 37 percent (Smart and Harrison 2002), respectively. However, the generally accepted figures are that reverse auctions can produce savings of between 10 and 40 percent (Tassabehji 2010), with first-time reverse auction savings consistently reported at 20 percent (Penfield 2007).

Hawkins, Coyne, and Hudgens have categorized the business case for employing eRAs to be “compelling” for the public sector, citing the documented savings of between 5 and 40 percent (Hawkins, Coyne, and Hudgens 2009). Yet, some have questioned the accuracy of these savings rates when it comes to public-sector competitive bidding, believing that for government acquisition, an average savings of four percent is a “more realistic” figure (Singer et al. 2009). However, a recent study from researchers affiliated with the United Nations, which was, in effect, a “meta-analysis” of reverse auctions across four different government entities in the United States and Europe, reported an average savings rate of 12.1 percent (Shalev and Asbjornsen 2010).

### Benefit Two: Increased Competition

According to Loudin, a considerable portion of the contracting community has scoffed at the concept of “efficient competition” as a hallmark of acquisition reform efforts, believing “that staging a competition is inherently inefficient—after all, competitions consume valuable agency resources (i.e., contracting, legal, and technical support) and take a great deal of time” (Loudin 2005). And yet competition is undoubtedly at the heart of what makes reverse auctions work to drive prices lower and produce tangible, hard-dollar savings. According to Dr. Sandy Jap, Dean’s Term Chair and Professor of Marketing, Emory University’s Goizueta Business School, it is the competition between suppliers that “forms the bedrock of successful reverse auctions” (Jap 2003, p. 515). Wagner and Schwab state: “One can summarize the findings of our study as ‘all that counts is competition.’ The importance that a competitive

situation exists can never be over-emphasized” (Wagner and Schwab (2004). Recent research findings have highlighted the pivotal role that competition plays in producing reverse auction success. When dealing with either standardized or well-specified products, suppliers are more willing to compete, due to their relative certainty as to precisely what they are bidding on. This allows them to compete with confidence (Hawkins, Randall, and Whitman 2009; Schoenherr and Mabert 2007).

According to Wheaton, “As long as the government buyer has a pool of qualified suppliers that are willing to participate in a reverse auction, the power of competitive bidding and price disclosure will drive the price lower. It is important to remember that in a reverse auction, it is the power of the market and competitive bidding, not the buyer bullying the vendor that drives the pricing lower. Vendors then respond to these market price signals and adjust their pricing lower accordingly” (Wheaton 2010a).

### **Benefit Three: Real-Time Market Pricing**

Research has confirmed that the dynamic pricing of reverse auctions improves the chances that for any given procurement scenario, the buyer and selling organizations will meet at a price point that reflects the true, fair market value for the item in question (Schoenherr and Mabert 2007). While savings generated by reverse auctions are usually the focus of attention, whether the price point arrived at through the eRA is compared to the last contracted price, a market survey, an independent estimate, or on some other basis, competitive bidding can produce savings by lowering the amount for which a price increase would occur. Take for instance the case of an organization expecting a 20-percent increase in health insurance rates. If competitive bidding through an eRA can shave that increase down to 10 percent, then the organization effectively saved the same amount through using a reverse auction. With the present—and likely future—uncertainties in commodity pricing, we may well see more cases where competitive bidding is employed simply to stem the tide and lower the amount of price increases. As Frisch observed, such instances mean that “due to market fluctuations, an effective reverse auction might actually result in a price increase” (Frisch 2004, p. 16). This will cause procurement executives and auction service providers to reconsider exactly what is meant by savings and how such measures are calculated.

Buyers benefit from knowing that they are obtaining real-time market pricing on the goods and services they are procuring for their organization. Suppliers can also benefit as well in that they can balance their internal managerial considerations with their ability to offer pricing that most benefits them at the time. For instance, if a company finds itself with excess inventory or manufacturing capacity on particular item(s), they could then offer a lower bid price in order to win competitions that would offer the supplier cost savings by lowering their carrying costs for items on hand, or alternatively, by filling idle production capabilities (Wylid and Settoon 2003).

### **Benefit Four: Time Savings**

Reverse auctioning is more than a price-lowering mechanism. As Carbone observed, buyers increasingly view reverse auctions as “a time-saving tool” that allows them to focus on more value-added functions in their jobs than handling bids, paperwork, and routine communications (Carbone 2005a). As Martinelli and Marchi pointed out, one of the principal differences—and advantages—of reverse auctions over other procurement and negotiation methods is time. Even if there is increased time that must be devoted to making sure that all parties are properly trained in how to participate in the auction and fully understand the specifications for the item(s) being contested, reverse auctioning should mean that “overall procurement time(s) should be shorter” (Martinelli and Marchi 2007). This is due to the compressed nature of negotiations, which are carried out through the simultaneous evaluations made by the vendors participating in the reverse auction (Carter et al 2004). Simply put, with each

decision to bid or not bid and lower the price to be in a lead position in the reverse auction, negotiations that might have taken days or weeks to produce price concessions become immediate pricing decisions in the auction environment.

### **Benefit Five: Process Efficiencies**

While much attention has been paid to the hard-dollar savings that can be achieved through the use of reverse auctions, there are also significant—and important—soft-dollar savings associated with their use. Reverse auctions, especially those conducted through a third-party provider, can significantly reduce the time required for procurement staffers to make purchases. This efficiency gain was first documented by Vowler who examined the true cost impact of reverse auction utilization by municipal governments. He found that while 40 percent of the overall savings could be attributed to the lower prices paid on the items acquired through competitive bidding, fully 60 percent of the total savings were attributable to the efficiencies gained by having procurement staffers take on more productive tasks in the time freed up by the use of electronic reverse auctions over traditional, paper and labor-intensive purchasing methods (Vowler 2004). Wheaton also spoke to the efficiency aspects of reverse auctions in public sector procurement, finding that the ability to dramatically reduce acquisition cycle times through the use of competitive bidding can enable acquisition staffers to put their efforts toward far more productive activities (Wheaton 2010a).

The efficiency gains produced by reverse auctioning are coming to the forefront of attention in both the academic and business realms. Schrader, Schrader, and Eller have documented the process savings associated with reverse auctions, finding that the use of reverse auctions produced such “second order” savings as well, shaving up to 40 percent off procurement cycle times. These researchers observed that: “In addition to receiving cost savings in the form of lower prices, buyers are seeing increased productivity from their employees. With a standard interface for purchasing, redundancies are eliminated. Elimination of paper approvals and procedures leads to a substantial reduction in transaction processing costs.” (Schrader, Schrader, and Eller, p. 68). Companies competing in reverse auctions also benefit from the speed of reverse auctioning from a transactional perspective, in that they experience reduced cycle times for negotiations and lessened reliance on long-term commitments and contracts (Hartley et al. 2004).

### **Benefit Six: Increasing the Number of Suppliers**

There is an argument to be made that suppliers benefit from their participation in reverse auctions. This is because the need for specificity and clarity in agreeing on the goods and services being auctioned causes buyers and suppliers to actually have more communication and work more closely together in the process (Schoenherr and Mabert 2007). For suppliers, the zero-sum-game environment of reverse auctioning also provides them with immediate feedback on their ability to deliver the right good or service in a real-time market environment. Wheaton pointed out that such feedback is far more timely and specific than in a standard government procurement opportunity. As such, “If a supplier loses the reverse auction, the supplier has the opportunity to refine its operations to reduce costs, produce better products, or otherwise meet the buyer requirements better” (Wheaton 2010a). Also, the short timeframe in which a reverse auction takes place significantly reduces the time necessary to win a customer’s business—and minimizes time spent on business prospects that do not end up choosing a firm for that specific procurement.

Furthermore, other researchers have found that the opportunities afforded vendors to engage in reverse auctions not only provide companies new business opportunities (particularly small businesses) but also foster their ability to be more cost-competitive through the price pressures inherent in reverse auctions (Hirsch 2005; Standing et al. 2007). Moreover, as Wheaton

points out, this means that not only are vendors afforded more opportunities to compete for the business of more and more buying organizations, but they can do so on far more equal terms than ever before (Wheaton 2010e). Finally, small businesses may be more able to supply specialty or hard-to-find items, thus making reverse auctions open to more small businesses and increasing the likelihood of viable suppliers and competition among them (Carbone 2005a). In the niche-dominated era characterized as “The Long Tail,” more and more procurements—for everything from the specialty items that agencies invariably have to buy to spare parts for aged machinery, vehicles, and even computers and phones, may make a wide-span approach a necessity.

### **Benefit Seven: Sustainability of Cost Savings**

One persistent question surrounding the use of eRAs is the sustainability of savings. Kumar and Chang argued that organizations would see their chances for significant savings drop when reverse auctions are repeated for the same products (Kumar and Chang 2007b). However, the question becomes whether or not the important outcome is savings, or ensuring that fair and open competition has taken place and the buyer has obtained the best market price through the reverse auction competition.

To better understand this issue, examine an organization that has achieved a 20 percent savings on a significant buy of copy paper. Is it likely to achieve the same level of savings on successive buys? That depends on both internal factors (the volume or aggregation level of the specific purchase) and external factors (the number of competing suppliers, developments in the wider market, immediate supply and demand considerations, etc.). Empirical research has shown that while manufacturing firms using eRAs find—on average—30 percent cost reductions in their initial reverse auctions for procurement spending, they can in fact replicate the savings in future years, seeing 10–15 percent savings in subsequent reverse actions (Carbone 2008). This is an impressive statistic, as it proves the power of competition to produce continuing—not just one-shot—savings across procurement spending, while also serving to counter one of the principal criticisms leveled at reverse auctions, namely “OK, you did it once, but can you do it again?”

## **Limitations of Reverse Auctions**

### **Limitation One: The Cost of Switching**

The issue of switching costs is certainly a consideration for both buyers and sellers in reverse auctioning. Some researchers not only include the costs involved in actually switching from one vendor to another, but also consider the costs associated with searching for, qualifying, and training new competitive vendors to make such a switch possible (Leong 2008). Wagner and Schwab focused on the issue of switching costs in their research, noting that “the lower the switching costs, the more a buyer can benefit from conducting a reverse auction because switching costs would be offset by the potential savings” (Wagner and Schwab 2004). Thus, they noted that reverse auctions would be more likely to be used in situations where the cost of switching vendors was low or negligible. They also found that suppliers were more likely to participate in reverse auctions in such situations, for if vendors perceived that there would be high switching costs for the buyer, they would not bid out of a belief that the buying organization would not ultimately switch to a new supplier due to the level of switching costs involved versus the potential for net savings. Indeed, there is always a possibility that switching costs may reach a level prohibiting the use of a reverse auction—or any e-procurement tool—in a given procurement.

All buyer-seller relations are only as long-standing as the next competition. Therefore, the potential for switching suppliers, and thus switching costs, is simply a cost of doing business

for all parties and must be factored into cost equations for both the buying agency and for potential suppliers. Shalev and Asbjornsen observed: “public sector suppliers will always risk being replaced, and switching costs will be incurred in each case, regardless of the form of [competition]” (Shalev and Asbjornsen 2010).

### **Limitation Two: Relationships with Suppliers**

Reverse auctions have been characterized as “the technology that has triggered more ethical concerns in the e-commerce arena than in any other segment of activity” (Charki et al. 2011, p. 17). Some have specifically criticized reverse auctions as being “coercive” in nature, due to the buyer’s power to force suppliers to participate in auctions and reduce their prices during them (Giampietro and Emiliani 2007; Emiliani and Stec 2002). Indeed, some vendors may feel pressured to participate in a process where suppliers are pitted against one another to lower their prices and all the perceived benefits flow to the buying organization. Further, some suppliers may bristle at the notion that their products or services are evaluated on a single factor—price—to the exclusion of other considerations—effectively commoditizing their market offerings (Griffiths 2004).

From this perspective, the reverse auction scenario may cause an exploitative relationship between buyers and suppliers, rather than allowing procuring organizations to partner with their suppliers. Yet, there is also a perspective that such tensions are inevitable with the respective parties in the buyer-supplier relationship having conflicting needs, goals, and expectations, and that these are evidenced both within and outside of the context of reverse auctions in a number of ways (Tassabehji 2010). So suppliers face the question of whether to participate in reverse auctions. Increasingly, the answer today is that they simply have to, as greater amounts of corporate and government spending are decided through competitive bidding. As Moorhouse states, “refusing to play ... is an incredibly dangerous (and expensive) approach” (Moorhouse 2008, p. 25).

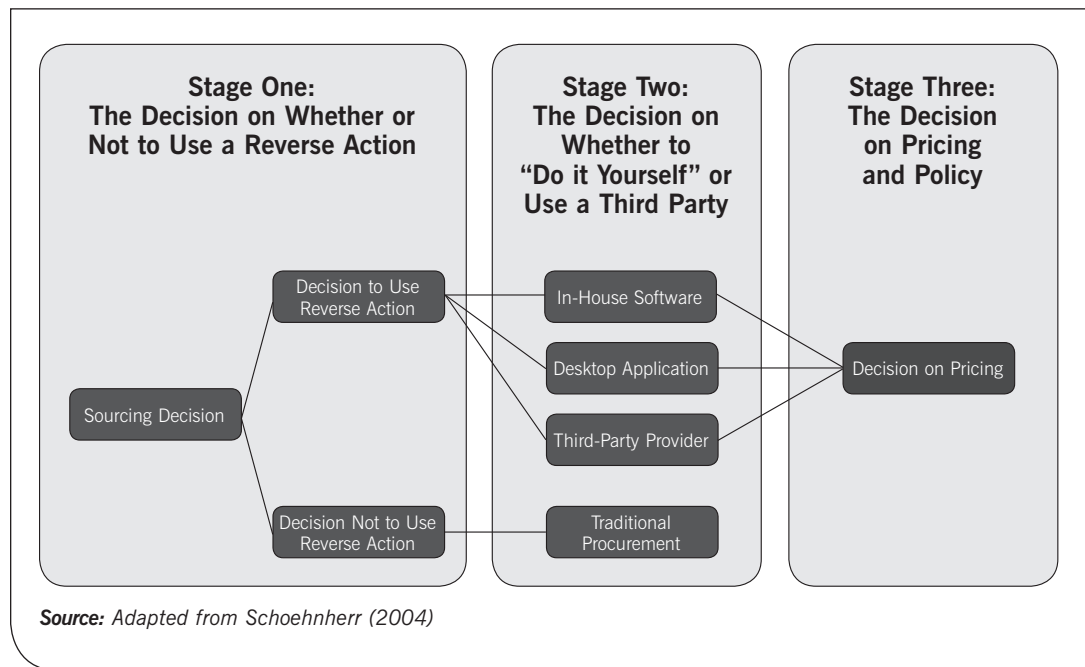
## **Stages in Conducting a Reverse Auction**

### **Stage One: The Decision on Whether or Not to Use a Reverse Auction**

Morrell commented that in organizations where there has been the most eRA penetration and adoption, the first question to be asked for any acquisition is simple: “Can it be auctioned?” (Morrell 2007). So, what types of goods and services are best suited for reverse auction-based acquisitions? There have been a variety of perspectives in the purchasing literature. According to a recent white paper, reverse auctions are especially suited for the procurement of:

- Goods with low or no price volatility
- Goods with little variance among supplier capabilities
- Goods sourced primarily on price with limited ancillary considerations
- Goods sold by a large, competitive supply base with all top suppliers willing to participate (Summit Energy 2011, p. 5)

Through research, reverse auctions have been found to be appropriate for products and services with “low complexity” that are easily understood by both buyers and suppliers. The low complexity of these products and services enable easy comparison of the offerings of competing vendors (Puschmann and Alt 2005). The idea of “low complexity” also holds true for the recommendations made by Wheaton, who categorized as appropriate both bulk items and goods “that are manufactured based upon an agreed upon standard” (Wheaton 2010c ). Losch and Lambert stated that reverse auctions were most appropriate for items that are “non-strategic” in nature and where there are a sufficient number of suppliers with the capacity to deliver the

**Figure 2: The Reverse Auction Decision Process**

good or provide the service (Losch and Lambert 2007). Wheaton characterized reverse auctions as being appropriate for:

- Purchases that feature little collaboration
- Shorter term contracts
- Products with common specifications and little complexity
- Purchases where there are savings opportunities (Wheaton 2009)

Conversely, some researchers have addressed items that should not be procured using reverse auctions. First, the number of available, truly capable, and competitive suppliers dictates whether a reverse auction should be used for any good or service in question. As Wheaton framed the matter: "Goods and services that can only be provided by a limited number of suppliers will not be effective with reverse auctions since the vendor, not the buyer, will have all of the power in the situation" (Wheaton 2010d). Kumar and Maher also found that products that require frequent changes in their design and/or components should expressly not be purchased through competitive bidding due to the problems associated with such items (Kumar and Maher 2008). Finally, items that require extra, non-standard features or services (such as a warranty) are not well-suited for competitive bidding (Wheaton 2010c).

Overall, procurement research has shown that if a good or service can be properly specified, it can be successfully procured through competitive bidding. In this regard, Kaufmann and Carter (2004) categorized "specifiability" as the most important criterion for determining if a reverse auction was appropriate for a particular acquisition. They defined this concept as the ability to provide a thorough and unambiguous description of all the requirements of a good or service being procured. Indeed, leading companies such as HP and Delta Air Lines have a significant track record of sourcing both direct and indirect spend goods and services through reverse auctions (Prema 2006). Other organizations have found the ability to compete even complex services, such as insurance and employee benefits, through reverse auctions. They have discovered that not only can such services be successfully procured through competitive bidding, but that they can gain price concessions and service level improvements through the



process (Bridgeford 2006). As such, researchers have categorized the widely held belief that reverse auctions should only be used for procuring commodity-type items and routine services as a “myth” (Schoenherr and Mabert 2007). Thus, as organizations gain experience in competitive bidding or partner with experienced third party service providers, they should be able to source ever greater percentages of their total procurement needs through competitive bidding. And, as Tassabehji recently commented, today, “e-auctions are being used to procure a broader and more complex range of goods and services, not purely commodities” (Tassabehji 2010, p. 433).

Guy Frankling, e-sourcing and implementation manager at Royal Dutch Shell, argues that specificity is key across all procurement methods. “If you are not clear on your specification, you won’t be successful doing it (procuring the good or service) either manually or electronically” (Earls 2009, p. 37). As Wheaton cautioned, not having clear specifications in a competitive bidding situation can be “disastrous” (Wheaton 2010e). This is because without a clear understanding of exactly what they are bidding on, vendors will either not bid or not offer their lowest possible price. At best, such inaccuracies in specifications lead to inaccuracies in pricing—and the attendant uncertainty for both the buyer and the “winning” supplier (Larson 2004). In the worst-case scenario, suppliers could actually think they are bidding to deliver different products or services than intended, leading to negative consequences for all parties. Alternatively, clear specifications have been found to not only increase supplier participation in government reverse auctions, but to allow suppliers to be more aggressive in their price offerings when they have clear certainty on precisely what they are bidding to provide (Shalev and Asbjornsen 2010). When it comes to services acquisitions, it is crucial that organizations be very clear on what is—and what is not—included in the intended procurement, and specify both benchmarks and penalties if these service levels or target dates are not met (Hannon 2009).

Clear specifications are important, but making sure that all participating suppliers understand and are bidding on the same “apples to apples” basis for the goods or services in question is essential. As Frisch put it: “Ensuring that all suppliers are on equal footing in terms of quality, delivery, and service is a critical success factor for reverse auctions” (Frisch 2004, p. 14). Once this is done, the benefits accrue to both the buyer and to the competing vendors. As Golaszewski, Whelan, and Pelican put it, suppliers have the chance to “put their best foot forward” on what is effectively “a level playing field” which means procurement decisions can be made far more quickly on a more informed and competitive basis (Golaszewski, Whelan, and Pelican 2009, p. 48). Thus, whether a reverse auction or an alternate procurement method is used, it is incumbent on buyers to have well-developed specifications on all dimensions associated with a procurement. However, this becomes especially critical with a reverse auction, as the more standardized the product is, the better fit the item is for a reverse auction (Kumar and Chang 2007a).

Reverse auction appropriateness can be defined as “the degree to which a sourcing professional views the use of an eRA as a fit between the attributes of the tool, the specific requirement being sourced, and the supply market” (Hawkins, Randall, and Whitman 2009, p. 56). The factors that play into the situational appropriateness for the use of reverse auctions include:

- Organizational policy
- Manager mandates
- Organizational incentives
- Competition
- Specificity
- Price-based selection criteria
- Leadership

These researchers go on to clarify that while a sourcing professional may deem reverse auctions appropriate for a given procurement situation, extraneous factors may not translate an appropriate competitive bidding environment into an actual success (Hawkins, Randall, and Whitman 2009).

### **Stage Two: The Decision on Whether to Do it Yourself or Use a Third Party**

Eric van Heck, in his *Theory and Practice of Online Auctions*, identified five basic processes that all online auction designs must entail:

- Search processes allow buyers and sellers to discover and compare trade opportunities.
- Pricing processes ensure that pricing and allocation take place. Auctions, fixed price, or bilateral negotiations are a way to achieve pricing and allocation.
- Logistics processes coordinate the transfer of physical and digital goods between sellers and buyers.
- Payment and settlement processes ensure that payments are made from buyer to seller.
- Authentication processes verify the quality of the goods sold and the reliability of buyers and sellers (Eric van Heck 2009 p. 291).

In choosing reverse auctions, an organization has to decide how many of the above processes to take on. The decision depends not just on the organization's internal capabilities, but also on its desire to take on the necessary processes and undertake a cost/benefit analysis to determine whether to take on these tasks internally or outsource them. Thus, online reverse auctions can be used by organizations in a variety of ways along a continuum between full-service ("when organizations use an outsourced vendor to provide some or all of the auction services") and self-service ("when the organization decides to use software and to conduct the reverse auction events themselves") (Wheaton 2009b).

Today, there are a number of firms—established names in e-procurement and entrepreneurial start-ups—that are service providers to public-sector agencies (See Table 2 on page 27). Why do organizations partner with such providers of reverse auction services? According to Wheaton, the decision to outsource reverse auctions may be made for a variety of reasons, including:

- Scarce purchasing resources
- Time constraints for the purchase
- Fear of failure or lack of expertise
- Size and scope of the purchase
- To develop internal expertise and best practices
- To reduce liability (Wheaton 2009b)

Certainly, when making the decision to do a reverse auction, an organization has to do the math—realistically—in making what is essentially a “make or buy” decision. If the organization—be it a for-profit company or a government agency—has internal capabilities and software that can handle reverse auction operations, the process can be done in house. However, while in-house often is the cheapest option (and the one that allows the organization to retain all purchase price savings generated from competitive bidding procurements), this is generally not the option that maximizes the savings and efficiencies to be gained from venturing into reverse auctioning. Indeed, experience has shown that involving a service provider expedites and enhances the process for both the buying organization and its sellers. Research has confirmed that

## The Make or Buy Decision In Reverse Auctioning

When making decisions regarding reverse auction utilization, an organization has to do the math to make what is essentially a make-or-buy decision. If the government agency has internal capabilities and software that can handle reverse auction operations, the process can be done in house. If not, then the agency will need to contract for the services of an ASP (auction service provider).

What are the factors to be considered in making the insourcing versus outsourcing decision for the reverse auction process? These are summarized in the table below.

	Benefits to Insourcing	Benefits to Outsourcing
Control	The agency retains total control over the procurement process and screening and qualification of the competing vendors.	The agency will have to rely on the ASP to make certain that all competing vendors are qualified to its standards. The ASP may be able to bring more suppliers to compete in the procurement process and increase competition.
Software	If the agency has the ability to use either a reverse auction module that is already part of its e-procurement solution or in-house developed auction software, there is no need to purchase auction software or pay for the services of an ASP.	As a specialist in the field, the ASP possesses a software platform that may be superior on several fronts (user interface, features, platform stability, etc.) to either an internal tool or an add-on reverse auction module that is a subset of a larger e-procurement solution. The ASP can conduct needed support and training for operations, both among agency staff and vendor personnel.
Savings	The agency retains 100% of the purchase price savings achieved through the reverse auction.	The market-making expertise of the ASP may produce greater levels of savings than can be produced in-house by the agency, even after taking into account the net cost of the event including the costs of the ASP's involvement.
Speed	The agency may be able to conduct both an initial reverse auction—especially a repeat event for the same category/quantity/type of procurement—faster in-house versus having to involve a third party in the form of the ASP in the process.	Working with an ASP may enable agency acquisition personnel to use a reverse auction competition to meet the needs of their end-users more quickly than conducting an in-house auction or using other standard procurement methods.
Reach	If there is a known base of qualified vendors, especially if only a select group of firms may be able to provide the needed products or services, the agency may be able to produce the most competitive auction possible through its own efforts without incurring the costs associated with the use of an ASP.	The ASP may have an active base of qualified sellers that the agency does not possess in house, thus producing more competitive procurements.
Independence		The involvement of the ASP as an independent actor between the buying organization and the competing sellers adds to the integrity of the competitive process.

**Table 2: Partial List of Reverse Auction Providers to the Public Sector**

Provider	Website
Ariba	<a href="http://www.ariba.com">www.ariba.com</a>
ChemConnect	<a href="http://www.chemconnect.com">www.chemconnect.com</a>
eBridge	<a href="http://www.ebridgeglobal.com">www.ebridgeglobal.com</a>
Exostar	<a href="http://www.exostar.com">www.exostar.com</a>
FedBid	<a href="http://www.FedBid.com">www.FedBid.com</a>
HedgeHog	<a href="http://www.hegdehog.com">www.hegdehog.com</a>
iASTA	<a href="http://www.iasta.com">www.iasta.com</a>
OnDemand Sourcing	<a href="http://www.ondemandsourcing.com">www.ondemandsourcing.com</a>
Perfect Commerce	<a href="http://www.perfect.com">www.perfect.com</a>
Sorcify	<a href="http://www.sorcify.com">www.sorcify.com</a>

service providers play a greater role than simply handling the mechanics of the reverse auctions and the transactions that flow from them. Indeed, while the third party does derive revenue from the transaction, it also serves a value-added role by enhancing buyer capabilities and enlarging supplier opportunities (Standing et al. 2006). Service providers may make the reverse auction process easier and more efficient for both parties through conducting important functions including, but not limited to:

- Providing a structured process with milestones
- Automating the process of creating RFPs
- Offering expertise in analysis of markets and prices
- Training both buyers and suppliers in use of the system
- Offering expertise in software, technical support, and project management
- Recruiting new suppliers to the marketplace, increasing the level of supplier competition (Kumar and Maher 2008)

These third-party providers add value in another way. If buyers run their own reverse auctions, vendors could become skeptical as to the legitimacy of bids, or come to believe that the auction software is being manipulated by the buyer. The involvement of the third party provides neutrality and legitimacy to the reverse auction that is not possible without it (Major 2007; Kumar and Maher 2008). While simply using a reverse auction can enhance public and supplier trust in the openness and transparency of the process, the third-party market maker's involvement can take that trust to levels not possible through an internal, agency-led process. Indeed, organizations employing competitive bidding can accomplish significant supplier buy-in to the process. Hannon reported what others in private-sector and government procurement commonly report today, with buyers finding that: "We have found that our suppliers, even the incumbents, respect the integrity of the (reverse auction) process. We believe that a well-executed direct materials e-RFP followed by a reverse auction will give an excellent sense of what the market price is" (Hannon 2004b, p. 41).

Once an organization—whether in the public or private sector—decides to make use of the services of a third party, then the matter of cost comes into play. According to the research of Hawkins, Coyne, and Hudgens, there are four typical business models of eRA providers.

These are:

- **Winning seller pays a per-transaction fee (percent of pre-auction estimated value of procurement).** The eRA service provider assists with market research, builds the eRA in the software, trains bidders, and runs the eRA bidding event (full service option).
- **Buyer pays a per-transaction fee (percent of pre-auction estimated value of procurement).** The eRA service provider helps with market research, builds the eRA, trains bidders, and runs the eRA (full service option).
- **Software-only option.** The buyer acquires a license to use eRA software, builds each auction, and conducts eRAs in-house. Here, the buyer must provide training to bidders and conduct all market research.
- **Outsourced option.** The buyer contracts with an eRA service provider for a fixed price per time period (or for an estimated number of eRA events). For each requirement the eRA service provider helps with market research, builds the eRAs, trains bidders, and runs the eRA bidding events during this time period (Hawkins, Coyne, and Hudgens 2009, p. 5).

Based on the level of services and the vendor's pricing model, an organization must expect to give up a percentage of the savings generated through engaging in reverse auctioning as a cost of doing business. However, based on the value delivered by the market maker in facilitating and administering the auction process—and the internal cost/labor savings—the calculus to involve the market maker is most often a positive one. There are clearly costs associated with conducting reverse auctions, whether the organization uses a third-party service provider or opts to conduct the bidding through its own auspices and resources. Kumar and Chang outlined the possible indirect costs for buyers associated with utilizing reverse auctions to include:

- Service fees or licensing of third-party reverse auction software
- More supplier visits
- Increased costs associated with transporting the product
- Qualification and inspection efforts
- Longer lead times; additional resources to manage new suppliers
- Expenses in the extreme case when litigation is necessary to address supplier non-compliance (Kumar and Chang 2007a, p. 80)

Critics have pointed out the difference in gross savings produced by a given reverse auction and the actual net savings to be realized from the specific competitive bidding event (Emiliani and Stec 2002). While there are various ways to calculate the actual net savings from reverse auctions, these are “sometimes hard to assess” (Leong 2008).

### Stage Three: The Decision on Pricing and Policy

How does a buyer actually determine the vendor who wins the auction and therefore gets the award? Jap broadly classified the two general bases for determining which vendor would be selected as buyer-determined and auction-determined award rules.

- **Under a buyer-determined award rule,** suppliers understand that they are placing bids for the buyer's business. However, the buyer retains the right to make the award decision on any basis. This is the commonly used approach in public sector procurement and is widely used in the private sector as well. This is because it gives the procuring organization the latitude to take into consideration a variety of factors (quality, reputation, past performance, etc.) in making the award decision.
- **Under the auction-determined award rule,** suppliers are told up front that the business will be awarded to the first-place (lowest-price) bidder or alternatively, to the next-lowest-

price bidder (using what is known as a Vickrey auction). Research conducted to date shows that less than 20 percent of all reverse auctions are structured to use the auction-determined rule, and while it is indeed in the interest of the buying organization to have bidders believe that the lowest price will be chosen (to stimulate the maximum amount of competition), the reality is that procuring organizations have to date more valued the flexibility to base decisions on “price-plus” or softer decision processes more than a hard-and-fast “price-only” rule (Moorhouse 2008). Research has indeed confirmed that in corporate and government use of reverse auctions for procurement, most awards are typically made on a “price-plus” basis. In such instances, rather than strictly awarding a contract to the lowest bidder, other factors, such as quality, reliability, reputation, etc., are factored into the buyer’s decision calculus to determine who gets the business resulting from a competitive bidding event (Jap and Haruvy 2008).

In regard to pricing visibility issues, reverse auctions will generally have either full visibility (where suppliers can see competing bidders’ price offerings anonymously on screen in real-time) or partial visibility (where vendors can only see “lead-lag” information, and can only determine if they are in the “lead” position—and thereby do not need to enter a lower bid—or in a “lag” position—and thus would need to enter a lower bid to have a chance to capture the business up for bid).

Jap found that suppliers have far more confidence in their bid positions and in their overall trust in the process when they have partial visibility (Jap 2003). This stems from the perception that full visibility reverse auctions exert more pressure on vendors to lower their bid offerings, risking the possibility of a bidding frenzy that can result in a winner’s curse, or the belief that the winner gets a smaller price than the services are worth. Full-visibility auctions may not draw the highest level of competition because even in anonymous bidding, some suppliers may be unwilling to participate out of fear of revealing pricing intelligence to their rivals. Additionally, in a full-visibility auction, there is a perception among suppliers that the process is more susceptible to bidding collusion, promoting greater supplier trust and buy-in for the competitive bidding process.

## The Size and Scope of Auctions

There are strong reasons—both for the interests of government buyers and for interested suppliers—to have reverse auctions involving higher volume transactions (both in terms of units and total price). As Shalev and Asbjornsen explained: “In order to compensate for lower prices and lower margins, suppliers seek higher volumes to maintain or increase the total revenue. Buyers, in turn, benefit from the lower transaction costs and economies of scale that result from larger volumes ... The procurement volume must be sufficiently high to provide sufficient profits to attract enough suppliers, and provide buyers with enough savings to cover their additional costs” (Shalev and Asbjornsen 2010, p. 433).

Government agencies have recognized the need for sufficient volume to be there for reverse auctions to make sense. In fact, according to its reverse auction guidance for buyers, the State of New South Wales, Australia (NSW) advised that “generally, the higher the volume of the procurement, the greater the potential for realizing savings” (New South Wales 2006, p. 5). However, the Shalev and Asbjornsen study noted that “differing auction volumes may attract different suppliers” (Shalev and Asbjornsen 2010, p. 446). Simply put, smaller companies may be more able and ready to compete in auctions that are small in scope, whereas they may be less able to compete against larger firms—or even be able to provide the goods and services in the quantities and locales needed—in higher volume acquisitions. So, a varied approach is vital for agencies, as focusing their reverse auctions only for acquisitions above a

certain unit volume or dollar threshold may work against the interests of both the agency and smaller enterprises.

What is the minimum number of suppliers necessary to make a reverse auction work?

Research has shown that the wider the field of qualified suppliers, the more likely it is that the reverse auction will produce a successful outcome for the buying organization. Wagner and Schwab found that there is a strong correlation between the number of firms bidding and the intensity of competition in the reverse auction (Wagner and Schwab 2004). And, taking it to the next step, Singer et al. (2009) found that more competing bidders leads to higher amounts of savings from reverse auctions. Most researchers agree that there should be at least three to five suppliers actively bidding in a reverse auction for the power of competition to work to produce a lower, real-time market price (Shalev and Asbjornsen 2010).

# Case Study: Reverse Auctions in the Department of State

The mission of the Department of State is to “create a more secure, democratic, and prosperous world for the benefit of the American people and the international community” ([www.state.gov/s/d/rm/rls/dosstrat/2004/23503.htm](http://www.state.gov/s/d/rm/rls/dosstrat/2004/23503.htm)). Fulfilling this vital mission and promoting American interests around the world involves significant overhead and operating costs. Today, the State Department confronts the same budgetary challenge that faces all levels of the U.S. government—to “do more without more.” One major area in which the agency’s leadership has sought to save taxpayer dollars is its acquisition costs. As one of the longest-standing users of reverse auctions in the federal government, the Department of State demonstrates that competitive bidding generates cost savings and improves competition.

This case study explores the State Department’s experience with reverse auctions and the cost and process efficiencies generated through the integration of competitive bidding into the agency’s acquisition practices. The author was granted access to acquisition data from the past four fiscal years (FY2007–FY2010). The agency’s reverse auction procurements, conducted via the FedBid online marketplace, are examined. Specifically, the volume, types of acquisitions made, and the activity metrics were studied.

This first part of the case study focuses on quantifying direct, hard-dollar savings, competition, and small business utilization. The second part of the case study examines the process efficiencies—or soft-dollar savings—experienced both by the agency and its contracting staff through the shift to competitive bidding. The researcher conducted a focus group with senior acquisition professionals in the Department of State to assess the impact of integrating reverse auctioning into their procurement routines.

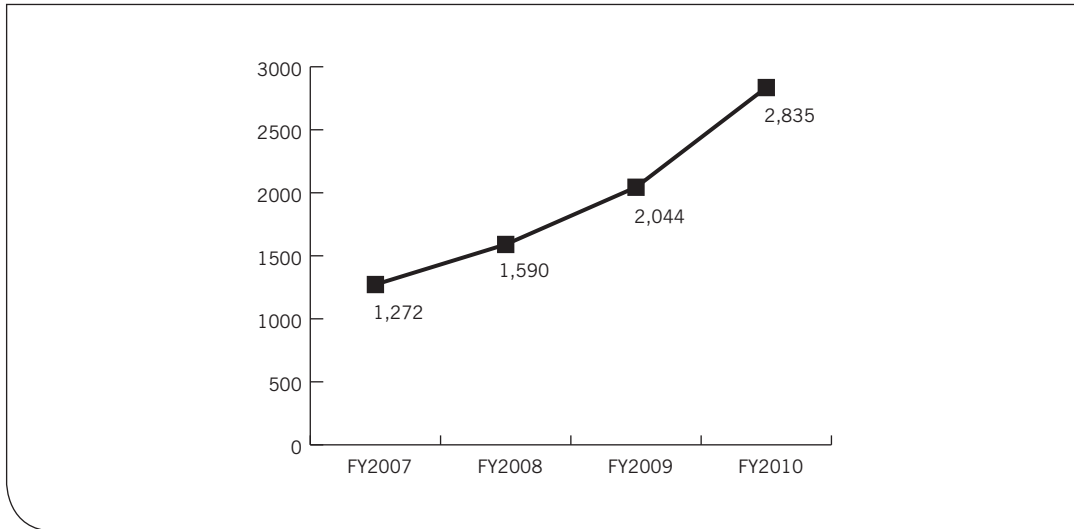
## Reverse Auction Dollar Savings at the Department of State

As can be seen in Figure 3, the State Department has more than doubled the number of acquisitions made through competitive bidding over the past four years, with the number of events topping 2,800 in FY2010. At the same time, the total dollar amount awarded through reverse auctions has risen steadily. As shown in Figure 4, in FY2010, State made reverse auction-based awards totaling well over \$231 million, again more than doubling the \$100 million in competitively sourced goods and services awarded by the agency in FY2007. This level of activity has produced dramatic levels of savings. As demonstrated in Figure 5, in FY2010 alone, State saved over \$27 million on its procurements of goods and services through acquisitions made through reverse auctions in the FedBid online marketplace. During the four-year time span under review, State saved well in excess of \$70 million in acquisition costs through the use of competitive bidding.

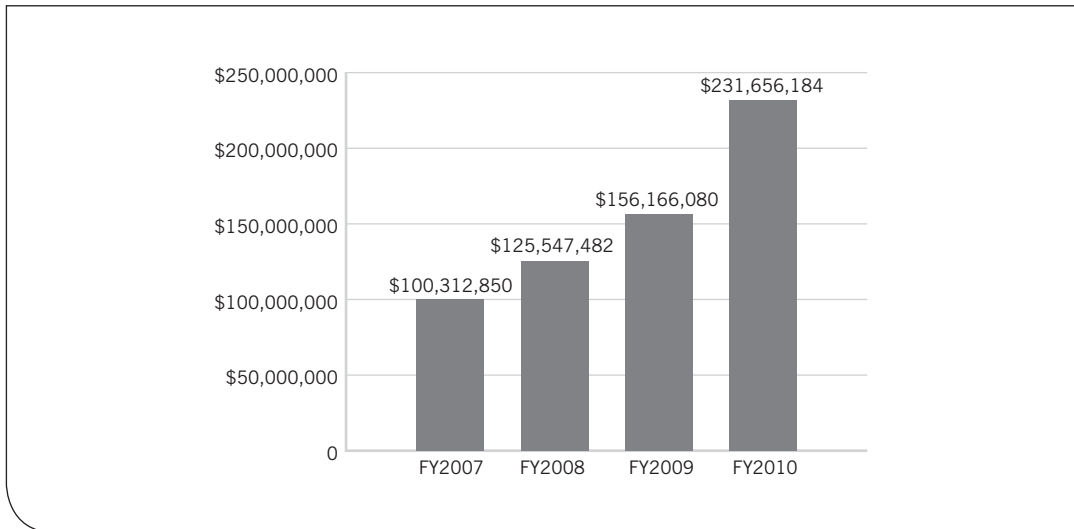
What was State buying through these reverse auctions? While State acquired a wide array of goods and services, information technology purchases far and away exceeded any other category. In FY2010, the department procured over \$180 million worth of IT hardware, software,



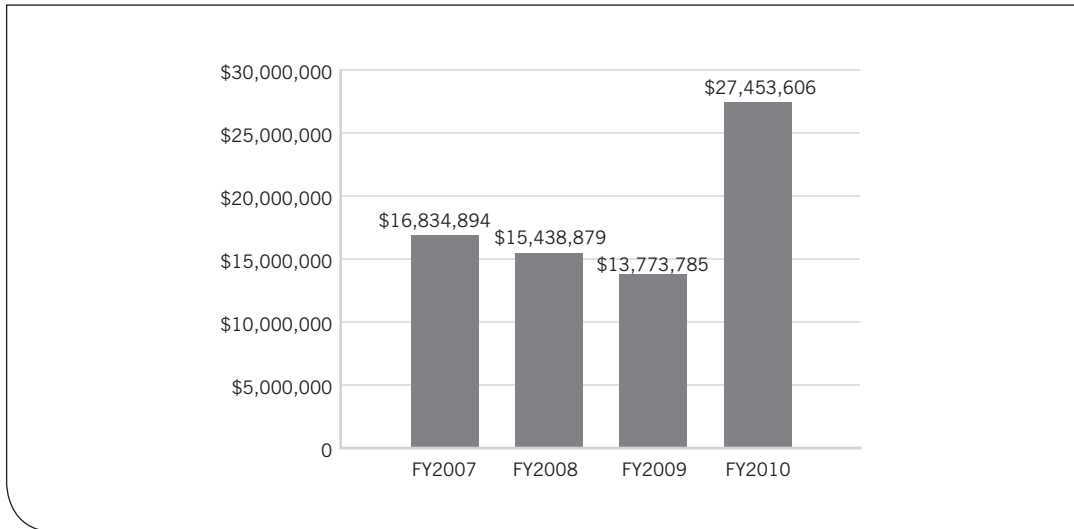
**Figure 3: Number of Reverse Auction Procurements (Department of State)**



**Figure 4: Dollar Volume of Reverse Auction Procurements (Department of State)**



**Figure 5: Cost Savings from Reverse Auction Procurements (Department of State)**



peripherals, and other computing equipment. (Appendix Table AI.1 lists the top 10 categories of purchases for the Department of State). State's reverse auction procurements in the top 10 product categories made up over 86 percent of the total dollar volume and 76 percent of the acquisitions made through reverse auctions. It is clear that State contracting staffers have begun routinely integrating competitive bidding into their procurement playbook in a major way, especially in the information technology area, where using real-time market pricing is especially important to maximize spending effectiveness.

Due to the State Department's worldwide buying needs, much of its procurement takes place outside the continental United States (OCONUS). In FY2010, almost a quarter of all reverse auction buys were made OCONUS. And as can be seen in Table 3 (Percentage Savings by Region), while State saved an average of 11 percent overall on its reverse auction procurements made through the FedBid online marketplace during the four years under review, the agency has saved over 26 percent on its internationally conducted buys.

In FY2010 alone, the agency saved over three times as much—on a percentage basis—on its OCONUS buys than its CONUS procurements. In addition to producing significant savings, these buys conducted through the FedBid online marketplace mean that U.S. embassies and consulates around the world have the opportunity to source their procurement needs from suppliers in the United States. This creates increased opportunities for American suppliers to be involved in internationalizing their firms' operations and promote job growth at home, all while giving State Department personnel the opportunity to avoid potential operational disruptions that can occur because of problems dealing with host country suppliers.

**Table 3: Percentage Savings by Region (Department of State)**

Net Savings Percentage	FY2007	FY2008	FY2009	FY2010	AVERAGE
Overall	14.4%	11.0%	8.1%	10.6%	11.0%
CONUS	13.3%	10.6%	7.8%	9.1%	10.2%
OCONUS	30.5%	22.2%	18.5%	35.1%	26.6%

## Increasing Competition via Reverse Auctions

State Department data show that competition is at the heart of what makes reverse auctions work by making federal procurement more competitive, transparent, and accessible. As can be seen in Table 4, State's reverse auctions drew an average of 5.4 bidders per buying opportunity; between them, these competing suppliers placed an average of a dozen bids over the course of each competition. Perhaps just as important, the number of potential bidders (those businesses notified based on the nature of the buy and their companies' specializations) increased by roughly 50 percent over the four-year time span. Lastly, and perhaps most important, the use of competitive bidding helps level the playing field and provide increased opportunities for small businesses to not just compete but to win federal contracting opportunities. In the case of State, fully three-quarters of the business made available through competitive bidding is won by small businesses. This has significant ramifications in terms of making American firms more competitive and able to provide jobs and opportunities at home by helping support our diplomatic efforts abroad.

**Table 4: Competition Metrics (Department of State)**

	FY2007	FY2008	FY2009	FY2010	AVERAGE
Average number of sellers bidding	6.4	5.0	5.7	4.5	5.4
Average number of bids per buy	13.8	11.5	12.6	10.1	12.0
Average number of no-bids per buy	84.4	95.1	115.8	110.6	101.5
Average number of sellers notified	1817	2415	3557	4121	2977
Max number of sellers bidding	68	84	111	80	86
Max number of bids per buy	198	372	263	219	263
Max number of no-bids per buy	248	323	402	469	361
Max number of sellers notified	3,812	5,077	7,198	8,430	6,129
% count to small businesses	82.3%	81.4%	75.0%	75.7%	78.6%

## Increasing Dollar Savings through Efficiency Gains

In addition to analyzing actual dollars saved through reverse auctions, the case study also examined the impact that the use of reverse auctions has in terms of the efficiencies—or soft-dollar savings—experienced both by the agency and its contracting staff in the shift to competitive bidding.

In regard to the efficiency savings, Cathy Read, Director of the Office of Acquisition Management for the Department of State, commented:

How perfect for an acquisition professional to be able to achieve better customer service and work more productively and efficiently—saving almost a day’s worth of time through each reverse auction buy. This study validates the efficiency gains we have been observing anecdotally through our contracting officers’ use of the online marketplace.

## Assessment of Time Saved

The panelists assessed how much time they would spend on individual elements of the acquisition process, conducting acquisitions both through traditional methods and through reverse auction-based methods. They were presented with a case scenario depicting what for them would be a “typical procurement” consisting of items that would be of a type and dollar amount ordinarily included within the scope of their work. The panelists were then instructed

### Focus Group at the Department of State

In the spring of 2011, the author traveled to Arlington, Virginia to meet with acquisition leadership and staff at the Department of State and conduct a panel discussion on their experiences in competitive bidding. The panelists were selected for their expertise and experience in conducting acquisitions via reverse auctions through the online marketplace and included:

- Branch Chief Gary Clark
- Contract Specialist Steven Haines
- Contract Specialist David Cubitt (who joined via teleconference from Frankfurt, Germany)

The panelists had an average of 6.3 years of federal contracting experience at State, and each had competed numerous reverse auction acquisitions (over 100 each in FY2010), with the largest single procurement in excess of \$2.5 million.

to estimate the average “time on task” they would spend on each element of the acquisition process under this typical procurement scenario. They were asked to respond in whole minutes and use an eight-hour workday (so that a half day would equal 240 minutes, a whole day 480 minutes, a 40-hour workweek 2400 minutes, etc.).

The panelists’ individual responses were tallied. The results of that compilation are shown in Appendix Table A1.2. The consensus was that online reverse auctioning saves them a great deal of time over traditional federal procurement practices. The total time estimated to be saved each time an acquisition was conducted through the online marketplace was 475 minutes, or 7.92 hours—an amount equivalent to an entire workday.

These findings are important because they document the significant time savings—nearly a full day’s worth—for each procurement professional each time acquisitions is conducted through eRAs. The participants described how using reverse auctions to purchase goods and services saves time and effort across 11 areas where time differences were found. This discussion yielded specificity as to where important process efficiencies can be typically experienced when using reverse auctioning versus traditional acquisition methods:

- **Soliciting qualified sellers.** The panelists noted that reverse auctioning was both a quicker and better means for purchasing appropriate goods and simple services. By tapping into an ever-expanding network of over 40,000 suppliers in the online marketplace, they could not only save time soliciting qualified sellers, but also increase the level of competition and open up competitions to more small business participation. This is especially true in procurements for the many facilities located outside the continental United States, as U.S. sellers can compete to supply necessary goods and services to embassies around the world.
- **Amending specifications, revising the acquisition scenario, and reissuing solicitation to qualified sellers.** In discussing the advantages of using the online marketplace to repost amended solicitations, one panelist stated that he uses the environment as an “intel tool.” He elaborated on this by saying that once a solicitation is “out there,” the sellers’ feedback allows him to “see if there is anything that may be amiss with the buy (in regard to specifications, part numbers, etc.). And, as one panelist put it, “the automation of using the online marketplace produces time savings from the grunt work.”
- **Fielding, managing, and responding to seller questions.** The panelists all agreed that the online marketplace saves them time in answering seller questions. If a question requires an actionable response (e.g., sellers report that the specified part number is bad), buyers can simply change the solicitation requirements and quickly repost the buy out for competition. If buyers wish to respond to questions through the system, buyers can provide responses to all potential sellers, resulting in fewer questions overall. Moreover, panelists collectively agreed that they received far fewer phone calls from sellers in solicitations posted on the online marketplace than in alternative methods.
- **Collecting, organizing, and evaluating bids.** The standardized documentation through the online marketplace saves procurement personnel time in collecting and organizing bids for evaluation. Bids are recorded in uniform format as they are submitted and are immediately available for review. As one panelist commented, “This method forces sellers to bid apples to apples, as sellers do not have the option to bid on previous iterations but must bid on current posting with amendments.” Another panelist noted that using the online marketplace saved him significant time that would otherwise be spent printing and sorting through bidders’ faxes and e-mails to find, analyze, and compare individual quotes and then organize those documents for the contract file.
- **Performing due diligence.** Automation of steps in the marketplace process—from the standpoints of both the procurement professional and the vendors—provided a great deal of the information necessary to perform due diligence. However, the automated information

is not a substitute for the due diligence efforts performed by the procurement professional. As one panelist remarked, “When it comes to ensuring FAR [Federal Acquisition Regulation] regs are followed ... we do lose time, partially because of the large vendor pool. The terms of use will be overlooked, and yes we can hold them to it, but what do we do when wrong equipment shows up? The system is a tool, but it is important to know that the system is not going to do your job for you.”

- **Making award decisions.** While the panelists recognized that the online marketplace’s automation presents them with comprehensive bidder and bid information, they cautioned that in no way did they—or should any contracting specialist—simply look at the low bidder as the winner. Rather, they go beyond the pricing results and look at the nature of the bids, particularly those detailed bids submitted in response to “meet or exceed” and “brand name or equal” competitions, and examine the companies bidding. As one participant remarked: “I feel that I am very familiar with the seller community, and I will look at the variance between the first and second-ranked sellers and second on down. I’ll look at whether or not they are bidding GSA Schedule or not. Additionally, if I am not familiar with a new vendor, I will check their Schedule. If I have to get down in the weeds, I will start comparing each line item.”
- **Making award notifications.** The panelists believed that this was an important area for time efficiencies. The automated notifications to both successful and unsuccessful bidders are a real improvement over the standard practice of having to send e-mails or make phone calls, which one panelist referred to as “old school.”
- **Documenting the procurement process.** Much of the documentation that must be created as part of the acquisition process is built into the online marketplace. Participants commented that, by choosing to use reverse auctioning via the online marketplace, information is conveyed in a consistent format that enables them to conduct bid analysis and perform other documentation tasks more quickly and easily.
- **Handling post-award inquiries.** Focus group participants agreed that using the online marketplace makes it easier to handle internal audit requests on buys, as they are able to quickly access complete information on the buy and all relevant data in the system.
- **Ensuring compliance with FAR.** While the panelists generally felt that meeting FAR (Federal Acquisition Regulation) requirements is at the heart of their jobs and part of every acquisition they carried out, whether or not using the online marketplace, they agreed that FAR compliance was essentially “baked in” to the online process. In essence, although the buyer retains the decision-making responsibility and authority for meeting agency regulatory requirements, much of the thought process to ensure such compliance is pre-loaded into the online system, which guides the user through compliance steps throughout the process.

## Case Study Findings

The case study demonstrates that significant time savings to both contracting officers and specialists occur across all phases of the acquisition process—from the time the customer submits the acquisition order through the completion of the procurement process (and beyond if complications such as bid protests, audits, etc., arise). This is because by competing appropriate acquisitions for both goods and services through online reverse auctioning, contracting personnel have found not only that they can handle more acquisitions, but also that they have more time available during their work time to devote to higher-value tasks, such as:

- Communicating with customers and suppliers
- Handling more complex procurements
- Engaging in professional development activities

For both the agency's contracting operation as a whole and for the individual procurement professional, shifting increasing proportions of appropriate buys (both bulk commodities and a wide array of goods and services) to reverse auctioning produces both a "win" through the hard-dollar savings generated through reverse auctions and an additional and critical "win" through the soft-dollar savings that spring from the more efficient and effective use of the contracting professionals' time and efforts every day. At a time when the number of contracting staff is not expanding, even as the demands and expectations for them grow, these time and process efficiencies can be crucial in enabling procurement professionals to keep their heads above water by effectively managing their ever-expanding workloads and addressing the more complex procurement issues that require their immediate attention.

The Department of State case study demonstrates how agencies across the federal sector can achieve not only the hard-dollar cost savings for which reverse auctions are traditionally recognized, but also soft-dollar process efficiencies that arise from the use of a faster, better, cheaper acquisition tool. State's acquisition leadership has urged its contracting staff to make increased use of reverse auctioning, and the results have been dramatic:

- Tens of millions of dollars have been saved
- Competition has increased
- Small business opportunities have improved

When all federal agencies and the individual procurement professionals are constantly challenged to do more without more, the Department of State case study has shown how the soft-dollar, process efficiencies generated through using reverse auctioning can make a significant difference in the operational capabilities of the agency and in the daily work lives of contracting professionals. The experience of the Department of State stands as a model for the power of reverse auctioning not just for federal agencies, but for all government agencies at all levels around the world.

# Potential Cost Savings from Reverse Auctioning

In this researcher's decade-long work with reverse auctioning in the public sector, both in the United States and around the world, one question always comes up, "What is the potential for reverse auctions?" This question is often asked by agency heads, elected officials, and members of the media. If government leaders fully bought into competitive bidding and conducted reverse auctions in appropriate categories, what would the potential savings be? Federal procurement executives, governor's representatives or mayors always want to know a critical, "what if" number. They ask, "If my agency fully committed to employing reverse auctions as part of the overall acquisition strategy, how much could we potentially be saving?" Today, in an era of continuing economic uncertainty and constant budgetary challenges, the "what if" question is not just academic. Indeed, such potential savings can be crucial for acquisition leadership to come through in the clutch and produce real, hard-dollar savings to enable government to operate in a more efficient manner.

This section presents the findings of a spend analysis (evaluating the levels and categories of federal expenditures) focused on the U.S. federal government as a whole, examining a very straightforward research question: What is the size of the savings that could be produced throughout the federal government if reverse auctioning was implemented across all agencies on appropriate spending?

To conduct this analysis, federal spending data for Fiscal Year 2010 were obtained from the Federal Procurement Data System (FPDS) (<https://www.fpds.gov/>). These data were used to conduct an agency-by-agency analysis of acquisition spending from this past fiscal year to determine first, the amount of spend appropriate for reverse auction procurement, and second, the amount of savings that could be expected to accrue from the application of competitive bidding.

We applied three alternate screening percentages to scope the percentage of federal procurement outlays suitable for reverse auctioning. Specifically, the alternate decision metrics were determined as follows:

- **Method 1**—Applying the 25.18 percent of total spend appropriate for reverse auctioning derived from the analysis of Department of Defense spending conducted by Hawkins, Coyne, and Hudgens (2009).
- **Method 2**—Applying the cross-industry benchmark of 2.58 percent of total spend developed by the Center for Advanced Purchasing Studies (CAPS 2008).
- **Method 3**—Taking the median point between the two methods (Hawkins et al. 2009 and CAPS 2008) and applying a new metric of 13.88 percent of total spend.

We also applied three alternative savings percentages to the total federal government and individual agency spending at the 13.88 percent level. These were:

- **Method 1**—20 percent savings, accepted through research in the field as a *maximum* reasonable level of savings expectations to be derived through reverse auctions.

- **Method 2**—10 percent savings, accepted through research in the field as the *minimum* reasonable level of savings expectations to be derived through reverse auctions.
- **Method 3**—11.9 percent savings, the savings figure demonstrated by Wyld in an analysis of procurements made through reverse auctions across all federal agencies (Wyld 2011a).

## Determining the Scope of Procurements Appropriate for Reverse Auctioning

The analysis was applied to the more than half a trillion dollars—\$537.4 billion—in spending on goods and services by the federal government in FY2010. This total represented some 5.9 million individual award actions made in the most recent fiscal year. The results of our analysis of the FPDS data are summarized in Appendix Table All.1.

Using the most aggressive measure (Method 1), \$135.3 billion in federal acquisition spend should be conducted via reverse auctioning. Alternatively, using the most conservative metric, Method 2, \$13.9 billion in procurement spending should be made through competitive bidding. Then, Method 3, the unique blended measure developed for this study (formed by taking the midpoint between the two alternative metrics) of 13.88% of total spend, was applied to the FPDS data, both for the government in total and on an agency-by-agency basis. As can be seen in Appendix Table All.1, this measure shows that almost \$75 billion of annual spending is appropriate for reverse auction-based procurements—over \$50 billion of which comes from the Department of Defense (DoD) alone. In Appendix Table All.2, the DoD spending is further broken down by service area. This shows that significant amounts of acquisition dollars across all DoD branches and support/headquarters operations should be subject to reverse auctioning:

- Army: \$19.5 billion
- Navy: \$12.2 billion
- Air Force: \$9.0 billion

It is clear that significant savings can be achieved by all agencies based on the aggregate levels of their acquisition outlays. Of course, the precise amount of agency spending that is truly appropriate for reverse auctioning would need to be determined by a complete analysis of their spend to determine the commodities, the highly specifiable and standardized goods, and the simple services that are most suitable for competitive bidding-based procurement methods.

## The Scope of Potential Savings from Reverse Auctioning

We now turn to the matter of the expected level of savings that could be derived on an annual basis from the application of reverse auctions to appropriate categories of acquisition spend across the federal government. In doing so, we made use of the blended method-determined levels of aggregate agency spending—13.88 percent of total procurement outlays—in calculating the projected levels of savings. As can be seen in Appendix Table All.3, using the blended method, \$74.5 billion in federal acquisition spending should be competed through reverse auctions. Thus, using the maximum (20 percent) and minimum reasonable level of savings to be gained through reverse auctioning, the range of expected savings would be between \$7.5 and \$14.9 billion dollars (see Figure 6), as well as the demonstrated savings projected (11.9 percent).

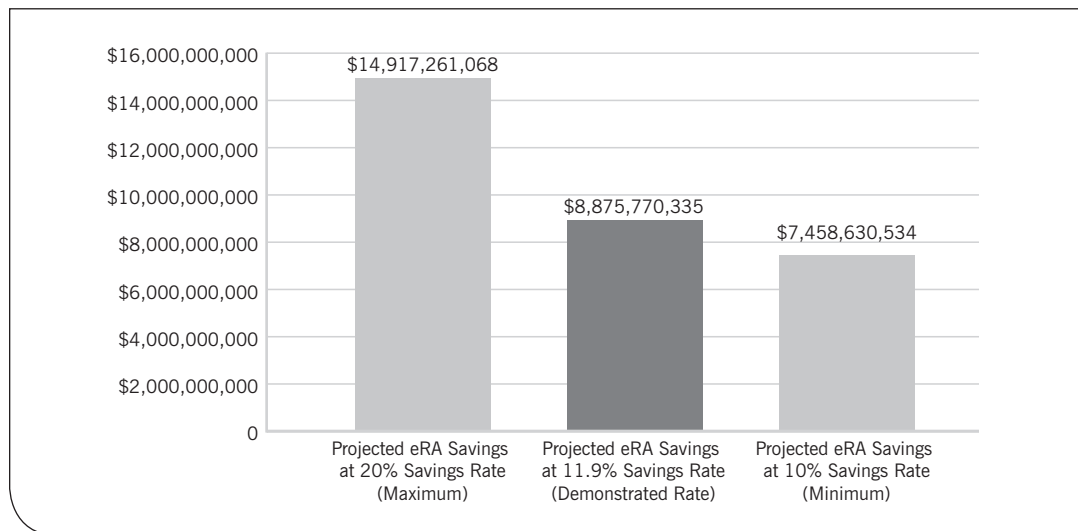
In the Department of Defense, which accounts for over two-thirds of procurement expenditures, the possible savings range would fall between \$5.1 and \$10.2 billion each year (see



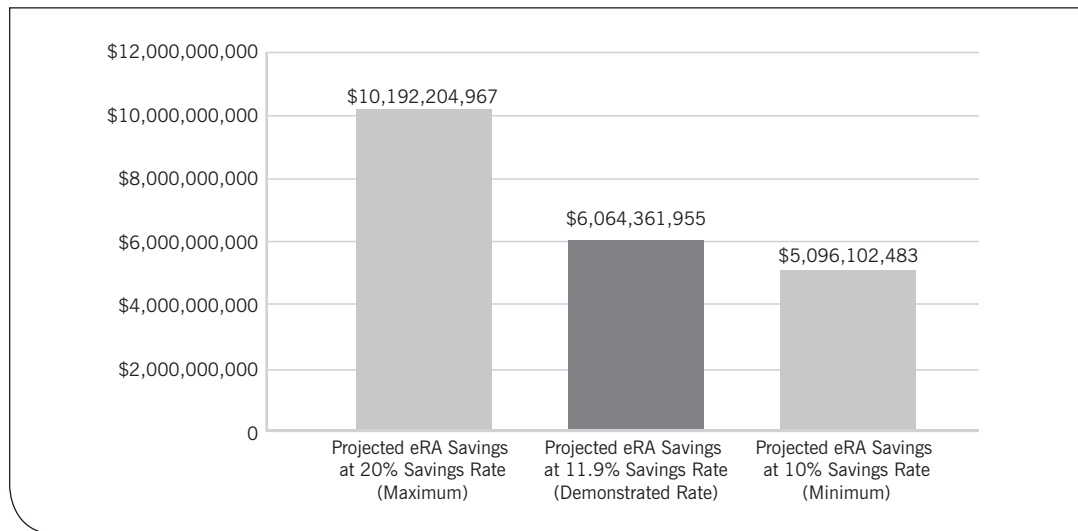
Figure 7). Appendix Table All.4 presents a breakdown of these projected savings across the DoD, showing the calculations by branch. The Army has the largest procurement budget—and therefore the largest savings potential of between a minimum of almost \$2 billion and a maximum of \$4 billion in reverse auction generated savings.

Based on the author’s research included in this report, as well as his previous research, the most reliable projected savings is based on an 11.9 percent savings rate which would provide \$8.9 billion in savings government-wide. Referring back to Appendix Table All.3, applying this savings factor would mean an expected savings of \$8.9 billion across the federal government, with \$6.1 billion of savings coming from the Department of Defense alone. As can be seen in Appendix Figure All.1, Projected Annual Savings Expected from Reverse Auctioning in the Federal Government, Outside the Department of Defense, significant amounts of savings—in excess of \$2.7 billion dollars annually—can be generated across all Cabinet-level agencies and in the departments of the executive branch through the use of reverse auctions across appropriate categories of spend.

**Figure 6: Annual Savings Expected from Reverse Auctioning, U.S. Government**



**Figure 7: Annual Savings Expected from Reverse Auctioning, Department of Defense**



## Findings from Spend Analysis

The critical “how much” question posed by policy makers at all levels is answered by the results of this analysis. This spend analysis demonstrates the dramatic level—literally billions of dollars—of hard-dollar savings that can be readily produced by more widespread use of reverse auctioning.

On a public policy level, it is clear that in a time of unprecedented fiscal challenges, the federal government could, and should, take far greater advantage of reverse auctioning. An acquisition tool widely used as a best practice in the private sector, competitive bidding could be employed across the federal government to produce billions of dollars in savings annually for the taxpayer. Reverse auction-based competition has proven to not only deliver cost savings to the government, but great opportunities to small businesses, as entrepreneurial firms fare far better in these competitive bidding environments than in other forms of federal procurement. There are also dramatic efficiency gains to be garnered from using reverse auctioning, thereby creating a second order of often-incalculable savings. These efficiencies are consequential, as they enable acquisition professionals to do their jobs in a more time-efficient and productive manner and devote more time to higher-order, higher-value tasks and deliver greater service to their internal customers and to the taxpayer as well.

The data clearly demonstrate that reverse auctioning does, in fact, have the potential for major costs savings in the federal government. Today, officials across the federal government are examining how to best implement reverse auctions and gain financial savings, while improving contracting methods and enhancing transparency.

### Cost Savings in State and Local Government

Reverse auctioning at the state and local level could produce similar or even greater savings than in the federal government. According to a recent report from the Pew Center on the States, state and local government spend over \$200 billion annually on procurement (Brown, Fernandez, and Heckman, 2010). Applying the same savings factors used in this study, every state and municipality would significantly benefit from the appropriate integration of reverse auctioning into acquisition practices. And so, as government executives at all levels face unprecedented budgetary and operational challenges, the significant hard-dollar savings and process improvements to be gained through reverse auctioning make it clear that the time is now to examine how to best integrate reverse auctioning in your agency’s procurement processes.

# Findings and Recommendations

## Findings

Reverse auctions are receiving increased attention today in the public procurement community. In many areas, such as e-procurement, the hype of the e-business era has now become reality, with proven results in the private and public sectors. As demonstrated in this report, governments around the world, through an essentially simple mechanism, are saving millions and even billions of dollars today.

The Department of State's experience demonstrates how one federal department has effectively employed reverse auctioning to produce both hard-dollar savings and softer savings in increased efficiency to its acquisition operations. With judicious use of this e-procurement tool, the savings could be far more in coming years. Indeed, the savings analysis presented here demonstrates the savings potential to be in the billions of dollars at the federal level alone. This has the potential of producing all-important savings at a critical time not just at the U.S. federal level, but in government at every level worldwide.

Equally important, the competitive environment of a reverse auction levels the playing field. Reverse auctions make it easier for new suppliers to break through and openly compete for government contracts. Reverse auctions also make the competition itself more transparent. While incumbent suppliers may feel uncomfortable with having their positions challenged, the openness works for all parties—both buyers and sellers. Today, reverse auctions are not hype; they are a real tool that can be used by government acquisition officials to produce significant results. With pressure mounting for government to “do more without more,” reverse auctioning—now proven through a decade's worth of successful performance—can go a long way toward making acquisition efforts better, faster, cheaper, and more accountable and transparent.

This report demonstrates that reverse auctioning is a better, fairer way to conduct a significant portion of government procurement. In short, this report has shown that reverse auctions:

- Can produce significant levels of savings
- Can be used for a wide variety of goods and services that make up a significant portion of agency spending
- Can make acquisition processes faster and more efficient, enabling agencies to deliver improved service levels and results with the same or fewer staff than before
- Can introduce new levels of competition by providing improved access to government contracting for small businesses
- Can be conducted in a manner that ensures transparency in the acquisition process and ensures competing suppliers and taxpayers a more fair and open competition among a wider field than in alternative procurement methods

Government leaders should now ask their organizations, “Why aren’t we using reverse auctions for appropriate—and significant—parts of our procurement spending?” Today, it is clear that the push for savings, transparency, and competition in the public sector are converging to make the choice of reverse auctions a simple one. Making that happen is more complicated, and that is the focus of the recommendations below.

It is important that the shift to reverse auctioning be carried out with several key considerations in mind. While the technology and policy matters surrounding and underlying reverse auctions are important, the people issues (both on the internal customer side and the supplier side) are perhaps even more significant. Based on lessons learned through successful government reverse auctions both in the U.S. and abroad, and the author’s experience of over a decade in this area, the following recommendations are provided to assist in the implementation of reverse auctions.

## Recommendations

### Leading Reverse Auctions

#### **Recommendation 1: Executive leadership must be put in place.**

The Chief Acquisition Officer (CAO) should take the lead and make procurement savings and efficiencies a strategic priority for the organization. Reverse auctions should be a central focus of this effort.

#### **Recommendation 2: An “Auction First” strategy should be adopted.**

The CAO should set forth a policy statement on the importance of using reverse auctions where practicable as a first-choice—an “auction first” strategy—or for specific categories of goods and services. The CAO should also establish a timeline for full implementation, along with specific goals in regard to the overall volume of auctions and the levels of dollar-cost savings to be achieved.

There is no doubt as to the strong role that acquisition leadership plays in advancing the use of reverse auctions. In every organization studied that has successfully integrated competitive bidding into its acquisition strategies, there have been one or more champions who have emerged to make it their mission to advance the use of reverse auctions in their organization. This has been true at every level of government, both in the United States and abroad, and this idea is strongly supported by the e-sourcing literature.

However, while effective leadership is instrumental in fostering reverse auction adoption, there is a precise tightrope to be walked by procurement executives. Recent research shows that sourcing professionals tend to form their opinions on reverse auctions quite independently, and indeed, a mandate approach to implementing reverse auctions can actually lead to negative impressions and even some degree of pushback from acquisition staff members. Therefore, a mandate may not be the best way to bring about change. Consideration should be given to other ways to bring about the desired result, such as memorandums encouraging reverse auctioning or simply “baking” eRAs into procurement decision-making and processes. Further, officials must consider how they can—through policy and personality—raise the perceived usefulness of reverse auctioning in the minds of their acquisition staff, removing barriers and erasing mindsets that might have formerly worked against the concept of reverse auctions.

An important leadership task is to set goals for the agency in terms of the procurement cost savings to be achieved. It is vitally important to make sure the agency establishes benchmarks and goals for the use of competitive bidding and formalizes a means of measuring the hard-

dollar cost savings achieved through reverse auctioning. Organizations should also look to assess the soft-dollar savings and efficiencies gained through the use of competitive bidding by acquisition staffers.

## Change Management and Staff Training

### **Recommendation 3: Organizations must manage the change effort.**

The CAO and the senior leadership of the organization should understand that they are embarking on a major change. Organizations should devote sufficient time, attention, and resources to make the transition to auction-first procurement focus a success.

### **Recommendation 4: Organizations should pilot reverse auctions.**

Organizations should designate a unit within their acquisition operations to pilot reverse auction procurements in specific spend categories with a limited number of vendors to produce initial results. The organization can evaluate the results of the auction-based acquisitions and the lessons learned from these procurements from both the agency and supplier perspectives in setting the direction and policies for moving toward fully integrating reverse auctioning.

### **Recommendation 5: Organizations should provide training on reverse auctions.**

Organizations should begin efforts to educate acquisition staff on reverse auctions. The focus should be not just on how reverse auctions can save the agency money on its procurement expenditures, but on the process improvements that can make their own work more productive and less tedious.

### **Recommendation 6: Organizations should communicate with their present vendor community.**

Organizations should also turn their attention to the vendor community. They should communicate clearly with present vendors that the organization is moving to reverse auctioning in appropriate types of acquisitions as a way to ensure that limited resources are expended in the most efficient manner possible. The agency should offer not just initial training, but ongoing support to facilitate vendors' participation in reverse auction operations.

One critical test of reverse auctions is whether the users—both the buyer and the seller—believe that the technology works and that it really helps them. Anyone who has dealt with acquisition professionals knows that by nature, these individuals are sometimes risk-averse—a fact well-documented in the procurement literature.

Thus, this process will not take a single memo, single meeting, or single training session. Instead, implementing and managing eRAs is a major organizational change effort. It is imperative to commit to an ongoing program of support—moral and technical—for the process, both for the internal staffers and external parties involved. Internally, it will be important to provide ongoing training and support for staffers on how to best use reverse auctions. There should also be technical support available for users from the auction service provider. Staff should also be encouraged to share best practices and to develop a repository of training and information on how best to use this procurement tool. Within the organization, leadership should work to celebrate and publicize “wins” resulting from reverse auctions and document the savings based on analysis of data accumulated through the process.

To be successful, public-sector executives need to place educational efforts at the forefront of their reverse-auction strategies. They need to provide information on reverse auctions—how they work, the pros and the cons, and why they are beneficial to the organization and its stakeholders, including suppliers. Organizations must be willing to engage with their present supply base and with potential new suppliers on how reverse auctions will provide them with opportunities for new business, as well as compressed negotiation time and increased

transparency. In short, education is fundamental, serving as *the* building block for success in implementing reverse auctions for all public-sector agencies. Acquisition heads should thus place a great emphasis on such efforts and be willing to share materials and best practices for doing so successfully.

### **Analysis Prior to Undertaking a Reverse Auction and After the Reverse Auction**

#### **Recommendation 7: Organizations should undertake a spend analysis of their procurements.**

The organization should undertake a spend analysis of its procurement—in order to gain complete visibility into the nature of the mix of goods and services it is acquiring for its end-customers. This analysis should be conducted with the goal of determining which portions of its procurements outlays are appropriate for reverse auctioning and can be carried out in partnership with academia (for objectivity) and/or third-party auction providers of reverse auction services.

#### **Recommendation 8: Organizations should develop metrics and automate the collection of relevant data.**

Organizations should establish metrics and ensure that data collection processes are embedded into the reverse auction process. The agency should ensure the data visibility needed to evaluate each auction in terms of the cost savings produced, as well as the aggregate results of the agency's competitive bidding acquisition efforts.

#### **Recommendation 9: Organizations should evaluate their reverse auctioning efforts.**

Organizations should establish a program to evaluate the progress of their reverse auctioning efforts, both in terms of the dollars saved and the efficiency gains achieved. The goal of such efforts should be to continuously improve the effectiveness and efficiency of its acquisition operation through learning how reverse auctioning contributes to the overall mission of the agency and its procurement processes.

The bottom line is that data, data, and more data are needed to effectively implement and evaluate eRAs. As this report has documented, there are two levels of savings involved with the use of reverse auctioning. It is vital to not just look to collect data for evaluating and tracking the first-order savings to be derived from competitive bidding (data related to the hard-dollar savings from using eRAs), but to track the efficiency gains—the second-order savings—from implementing reverse auctioning. In regard to answering the hard-dollar savings questions, acquisition units—in coordination with the involvement of third-party service providers for facilitating the reverse auctions—will be looking to track several variables. These include the actual final price for the selected supplier (determined by the auction) and what is to be the comparative measure. In regards to the latter, one could make use of the independent governmental estimate (IGE) (as is done in the federal government), or alternatively, a commercial price comparator or, as a last option, the last purchase price paid for comparable goods/services in a like quantity. While some may question the accuracy of using the IGE or a past purchase price, due to both accuracy and fluctuating market conditions, it is in the interest of all that some standardization of cost comparison methods be made over the next few years.

Data on auctions should be tracked longitudinally, in order to examine the long-term price and competitive impact of reverse auctions. Only in this way can agencies—and indeed the auction service providers—learn how suppliers—and prices—react when subject to repeated reverse auctions over time. As stated earlier, the expectation is that savings will continue to be produced, even if at diminished levels in subsequent auctions. Yet, even if an auction does not prove to save money, it may indeed be cheaper than current comparative prices in the wider marketplace due to the competitive ability to bring about real-time market pricing through the auction event.

Finally, in regard to the efficiency aspects of utilizing reverse auctions, there is a pronounced need for research into how the use of this e-procurement tool impacts the way government procurement is carried out, both on an agency-wide basis and on individual acquisition professionals, as was demonstrated in the study of the impact on the U.S. Department of State. Certainly, this area is ripe for far more sophisticated research to be carried out on a much wider basis. Research delving into the time savings and process efficiencies could indeed be done across agencies and even levels of government. In doing so, we could learn how reverse auctioning may impact differently the jobs and processes of procurement professionals in agencies of various types, even capturing differences as reverse auctioning is deployed between headquarters and field offices of various agencies. The data can be captured both on an individual and agency-wide basis through surveys, case studies, job analyses, etc.

### Communications Before, During, and After a Reverse Auction

#### **Recommendation 10: Organizations should expand their vendor base.**

Organizations should look beyond their present vendor pool to reach small and disadvantaged businesses new to competing for agency contracts—and perhaps even new to government contracting opportunities. The goals of such efforts should be to increase competition levels for agency spending—thereby saving on expenditures—and to expand the agency's use of small businesses.

#### **Recommendation 11: Organizations should communicate with stakeholders and policy-makers.**

The CAO should work to ensure that successes are communicated not just internally with acquisition staffers, but externally with stakeholders and policy-makers through the media. Collectively, CAOs of agencies should seek to share their lessons learned and best practices in reverse auctions to ensure that across the board, the government is taking full advantage of this e-procurement tool, thereby maximizing savings for the taxpayer through both hard-dollar savings and operational efficiencies.

Today, communications are indeed intertwined in everything we do. Whether a government agency, a corporation, or even an individual, we have to think about how we communicate our message. Thus, as part of their thinking in regard to reverse auctions, government executives need to strategize how to best communicate their successes with this e-procurement tool. This report has stressed the importance of capturing metrics in regard to the hard and soft-dollar cost savings, and such savings should be routinely tracked on a dashboard, both for internal agency use and for public awareness. Likewise, agency executives and public affairs offices should work to communicate reverse auction success stories, both in terms of the impact on the agency and its operations and on small businesses who will find success in working with the agency through the reverse auction process.

#### **Recommendation 12: Organizations should create dashboards to monitor organization progress.**

Organizations should create dashboards. This shows success with reverse auctions and should definitely be a part of the overall effort. The agency could create an eRA savings dashboard, available both internally for staff and perhaps also externally for communication. This dashboard could show savings by department, subunit, or even by staffer, perhaps making it competitive for the individuals and units involved. There should also be training and sharing of ideas on best use of time savings.

Understanding that the shift to greater use of reverse auctioning is a major change for all parties involved is thus paramount, and effective communication is the key to the implementation process. It is thus essential that acquisition leaders place a high priority on communications—both internally among acquisition staff and between the acquisition staff and agency end-users (the customers), as well as externally (with suppliers). Clear communications are essential not just at the outset of the process. Procurement leaders must ensure that they continually

update both internal and external eRA users and participants on developments, changes and opportunities.

## Use of Third-Party Service Providers

### **Recommendation 13: Organizations must undertake a “make-or-buy” decision.**

The agency should make a choice as to whether to conduct reverse auctions using in-house resources or to partner with a third-party auction provider. This is a multifaceted consideration that must be based on the advantages and disadvantages of using the agency’s own capabilities versus the expertise of an outside partner (see box: *The Make or Buy Decision In Reverse Auctioning* on page 26).

The fundamental decision is how to get started with reverse auctioning. And inherent in this decision is the calculus of whether the agency should—or even can—conduct the auction itself or involve a third-party auction provider—a so-called market maker—to provide the necessary services.

There are a wide variety of services available from third-party providers and thus, there is a range of costs associated with the decision to go with a full-service provider versus one that simply provides the auction software. While there have been limited cases where a government agency has been able to conduct an auction totally in house using its own, independently developed software, there is always a cost associated with eRAs. Thus, it is not possible to say that 100% of the savings generated through any eRA end up being the net savings from the event.

While it would be advantageous to think that if we saved a million dollars through a reverse auction on a 10-million-dollar acquisition, it is not realistic to look at that million as the absolute net savings number. Yes, there is a cost to conducting the reverse auction—even if done with totally internal resources. However, by involving a third-party service provider and choosing to incur the cost based on the level of services provided, both the outcome of the process *and* the process itself can be enhanced.

## The Issue of “Keeping Savings”

### **Recommendation 14: Executives should be incentivized to undertake reverse auctions.**

Government executives should be encouraged to think outside the box in terms of rewarding acquisition units and even individual procurement professionals for the savings produced through reverse auctioning efforts. They should endeavor to protect the budgetary and operational resources of units that achieve savings and work to establish programs, compensation, and evaluation systems that make reverse auctioning an integral and ongoing part of individual and unit performance expectations.

This recommendation raises a touchy subject, but one that must be addressed. It boils down to the question, “Who gets the money?” After stepping forward and making the change to integrate reverse auctioning into its contracting operations, does the innovative agency get use of the saved monies in its budget, or are the savings funneled back to the “general fund?” Worse, if an agency saves X on its annual procurement budget through effectively using eRAs, does it then see its next fiscal year’s budget reduced by the same amount (effectively being punished for doing good)? Does the agency’s procurement office get to recoup a percentage of the savings to operate more effectively—in effect, to be able to leverage savings to produce more savings?

On the other hand, if the acquisition area of an agency operates on a fee-for-service model, garnering a percentage of the transaction dollars processed, then certainly the calculus



becomes even more complicated. This is because by producing Y dollar savings through reverse auctioning, all things being equal, the procurement shop's budget would actually *go down* by saving money for the taxpayer. Clearly, this is no academic matter for those involved. This means that such arrangements will have to be modified to allow fee-for-service shops to share in the savings produced through their use of competitive bidding. Otherwise, they would have a disincentive to actually save money, where the catch-22 for them is presently that by spending more on goods and services, their acquisition operation would actually have more resources available than if they used reverse auction competitions to drive procurement costs down.

## Conclusion

This report stands as a call to action for government executives and procurement leaders to reexamine their own acquisition strategies—especially in light of the current environment of doing more without more, which may be the norm for many years to come. For leaders at every level of government around the world, the time is now to put the power of reverse auctioning to work for government organizations, their acquisition staff, and most important, for the American public.

# Appendix I: Additional Information on the Department of State Case Study

**Table AI.1: Top Ten Purchase Categories, Department of State**

Category	Buys	Total Awarded
70—Information Technology (ADP) Equipment (Including Firmware), Software, Supplies, and Support Equipment	1,416	\$182,152,403
84—Clothing, Individual Equipment, and Insignia	183	\$5,571,942
58—Communication, Detection, and Coherent Radiation Equipment	110	\$6,001,405
99—Miscellaneous	105	\$1,752,186
71—Furniture	83	\$1,761,344
75—Office Supplies and Devices	71	\$1,466,206
59—Electrical and Electronic Equipment Components	69	\$739,091
72—Household and Commercial Furnishings and Appliances	47	\$470,928
41—Refrigeration, Air Conditioning, and Air Circulating Equipment	46	\$597,908
51—Hand Tools	46	\$868,307
<b>Agency Procurement in the Top Ten Purchase Categories</b>	<b>2,176</b>	<b>\$201,381,718</b>
<b>Total Agency Reverse Auction Procurement</b>	<b>2,835</b>	<b>\$231,656,184</b>
<b>Top Ten Categories of Awards as Percentage of Total Activity</b>	<b>76.8%</b>	<b>86.9%</b>

**Table AI.2: Average Time on Task Using Traditional Procurement Methods Versus Reverse Auctioning**

<b>Task in the Acquisition Process</b>	<b>Time on Task (in Minutes) Using Traditional Methods</b>	<b>Time on Task (in Minutes) Using eRAs</b>	<b>Minutes Saved</b>
Determining buyer needs	31.67	31.67	0.00
Specifying the items/services to be procured	36.67	36.67	0.00
Soliciting qualified sellers based on specifications and designated acquisition scenario	186.67	10.00	-176.67
Amending specifications and reissuing solicitation to qualified sellers	101.67	13.33	-88.33
Revising acquisition scenario and reissuing solicitation to qualified sellers	101.67	16.67	-85.00
Fielding, managing, and responding to seller questions	40.00	35.00	-5.00
Collecting and organizing bids	56.67	5.00	-51.67
Evaluating bids	40.00	16.67	-23.33
Performing due diligence	30.00	16.67	-13.33
Making award decisions	8.33	8.33	0.00
Making award notification to both successful and unsuccessful bidders	18.33	6.67	-11.67
Documenting the procurement process	30.00	23.33	-6.67
Handling post-award inquiries	20.00	13.33	-6.67
Resolving bid protest actions	20.00	20.00	0.00
Ensuring compliance with FAR (Federal Acquisition Regulations) and other applicable regulations	15.00	8.33	-6.67
<b>Total Time in Procurement</b>	<b>736.67</b>	<b>261.67</b>	
<b>Time Differential (in Minutes)</b>			<b>475.00</b>
<b>Time Differential (in Hours)</b>			<b>7.92</b>

## Appendix II: Potential Savings of Reverse Auctions

**Table AII.1: Potential Procurement Suitable for Reverse Auctioning: Total Federal Government**

Agency	Dollars Obligated	Method 1: eRA Appropriate Spend per Hawkins et al. (25.18% of Total)	Method 2: eRA Appropriate Spend per CAPS Benchmark (2.58% of Total)	Method 3: Blended Method Projected Reverse Auction Appropriate Spend (13.88% of Total)
<b>Total Federal Government</b>	<b>\$537,365,312,232</b>	<b>\$135,308,585,620</b>	<b>\$13,864,025,056</b>	<b>\$74,586,305,338</b>
Department of Defense	\$367,154,357,599	\$92,449,467,243	\$9,472,582,426	\$50,961,024,835
Independent Agencies	\$46,113,857,802	\$11,611,469,395	\$1,189,737,531	\$6,400,603,463
Department of Energy	\$25,748,365,130	\$6,483,438,340	\$664,307,820	\$3,573,873,080
Department of Health and Human Services	\$19,014,190,698	\$4,787,773,218	\$490,566,120	\$2,639,169,669
Department of Veterans Affairs	\$16,128,003,211	\$4,061,031,209	\$416,102,483	\$2,238,566,846
Department of Homeland Security	\$13,570,404,226	\$3,417,027,784	\$350,116,429	\$1,883,572,107
Department of State	\$8,121,816,045	\$2,045,073,280	\$209,542,854	\$1,127,308,067
Department of Justice	\$6,472,645,219	\$1,629,812,066	\$166,994,247	\$898,403,156
Department of Interior	\$6,112,373,597	\$1,539,095,672	\$157,699,239	\$848,397,455
Department of Agriculture	\$6,066,136,864	\$1,527,453,262	\$156,506,331	\$841,979,797
Department of the Treasury	\$5,961,666,568	\$1,501,147,642	\$153,810,997	\$827,479,320
Department of Transportation	\$5,639,742,484	\$1,420,087,157	\$145,505,356	\$782,796,257
Department of Commerce	\$3,935,185,629	\$990,879,741	\$101,527,789	\$546,203,765
Department of Labor	\$2,235,662,868	\$562,939,910	\$57,680,102	\$310,310,006
Department of Education	\$1,835,178,394	\$462,097,920	\$47,347,603	\$254,722,761
Environmental Protection Agency	\$1,657,923,372	\$417,465,105	\$42,774,423	\$230,119,764
Department of Housing and Urban Development	\$1,597,802,528	\$402,326,677	\$41,223,305	\$221,774,991

**Table All.2: Potential Procurement Suitable for Reverse Auctioning, Department of Defense**

Agency	Dollars Obligated	Method 1: eRA Appropriate Spend per Hawkins et al. (25.18% of Total)	Method 2: eRA Appropriate Spend per CAPS Benchmark (2.58% of Total)	Blended Method 3: Projected Reverse Auction Appropriate Spend (13.88%)
Total Department of Defense	\$367,154,357,599	\$92,449,467,243	\$9,472,582,426	\$50,961,024,835
Defense Logistics Agency	\$34,981,267,184	\$8,808,283,077	\$902,516,693	\$4,855,399,885
Air Force	\$64,921,702,093	\$16,347,284,587	\$1,674,979,914	\$9,011,132,251
Army	\$140,219,684,593	\$35,307,316,580	\$3,617,667,862	\$19,462,492,221
Navy	\$87,869,652,899	\$22,125,578,600	\$2,267,037,045	\$12,196,307,822
All Other Defense Agencies	\$39,162,050,830	\$9,861,004,399	\$1,010,380,911	\$5,435,692,655

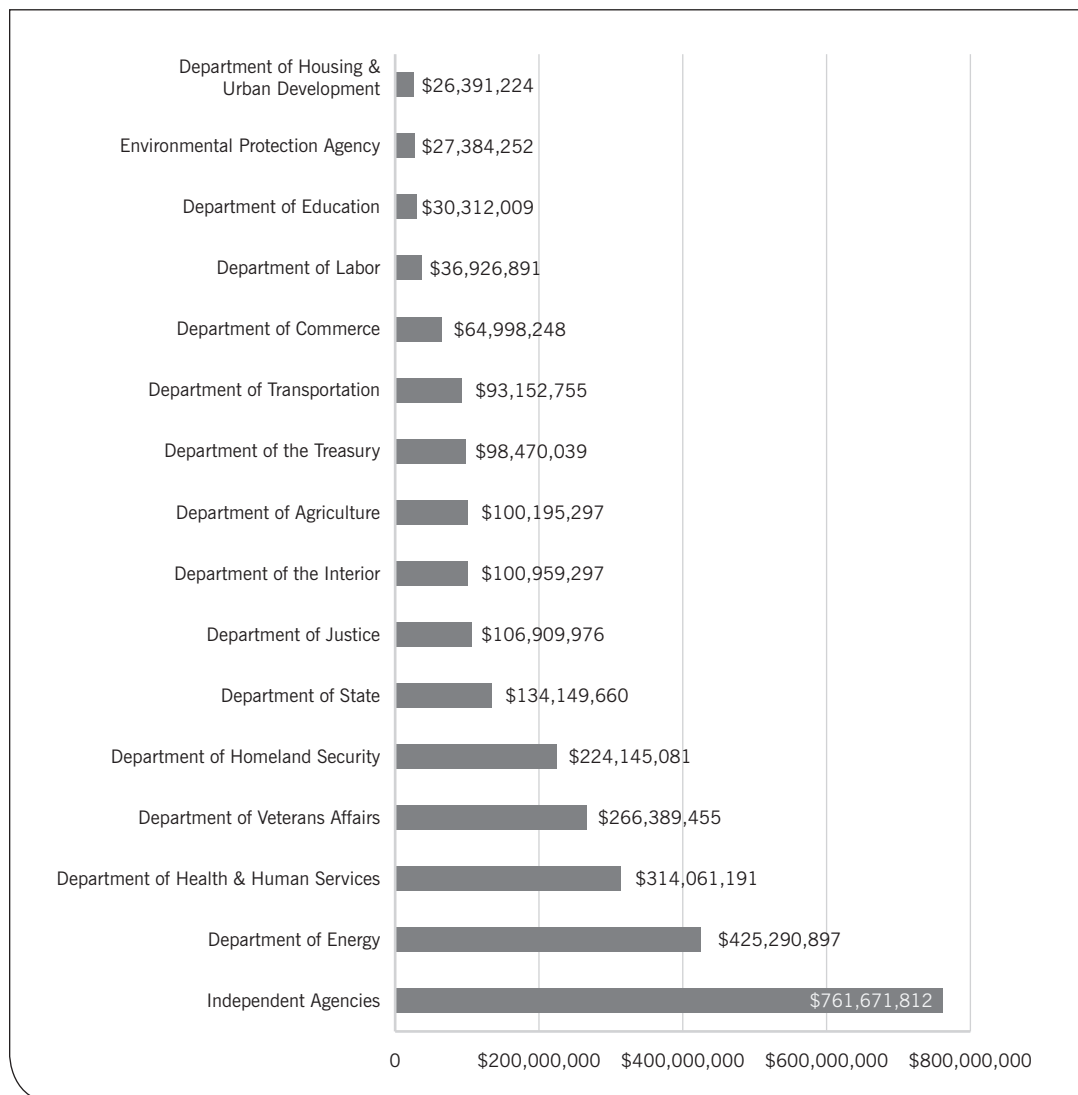
**Table All.3: Potential Reverse Auction Savings, Total Federal Government**

Agency	Blended Method Projected Reverse Auction Appropriate Spend (13.88%)	Projected eRA Savings at 20% Savings Rate	Projected eRA Savings at 10% Savings Rate	Projected eRA Savings at Demonstrated 11.9% Savings Rate
Total Federal Government	\$74,586,305,338	\$14,917,261,068	\$7,458,630,534	\$8,875,770,335
Department of Defense	\$50,961,024,835	\$10,192,204,967	\$5,096,102,483	\$6,064,361,955
Independent Agencies	\$6,400,603,463	\$1,280,120,693	\$640,060,346	\$761,671,812
Department of Energy	\$3,573,873,080	\$714,774,616	\$357,387,308	\$425,290,897
Department of Health and Human Services	\$2,639,169,669	\$527,833,934	\$263,916,967	\$314,061,191
Department of Veterans Affairs	\$2,238,566,846	\$447,713,369	\$223,856,685	\$266,389,455
Department of Homeland Security	\$1,883,572,107	\$376,714,421	\$188,357,211	\$224,145,081
Department of State	\$1,127,308,067	\$225,461,613	\$112,730,807	\$134,149,660
Department of Justice	\$898,403,156	\$179,680,631	\$89,840,316	\$106,909,976
Department of Interior	\$848,397,455	\$169,679,491	\$84,839,746	\$100,959,297
Department of Agriculture	\$841,979,797	\$168,395,959	\$84,197,980	\$100,195,596
Department of the Treasury	\$827,479,320	\$165,495,864	\$82,747,932	\$98,470,039
Department of Transportation	\$782,796,257	\$156,559,251	\$78,279,626	\$93,152,755
Department of Commerce	\$546,203,765	\$109,240,753	\$54,620,377	\$64,998,248
Department of Labor	\$310,310,006	\$62,062,001	\$31,031,001	\$36,926,891
Department of Education	\$254,722,761	\$50,944,552	\$25,472,276	\$30,312,009
Environmental Protection Agency	\$230,119,764	\$46,023,953	\$23,011,976	\$27,384,252
Department of Housing and Urban Development	\$221,774,991	\$44,354,998	\$22,177,499	\$26,391,224

**Table All.4: Potential Reverse Auction Savings, Department of Defense**

Agency	Blended Method Projected Reverse Auction Appropriate Spend (13.88%)	Projected Savings at 20% Savings Rate	Projected Savings at 10% Savings Rate	Projected Savings at 11.9% Savings Rate
Total Department of Defense	\$50,961,024,835	\$10,192,204,967	\$5,096,102,483	\$6,064,361,955
Defense Logistics Agency	\$4,855,399,885	\$971,079,977	\$485,539,989	\$577,792,586
Air Force	\$9,011,132,251	\$1,802,226,450	\$901,113,225	\$1,072,324,737.81
Army	\$19,462,492,221	\$3,892,498,444	\$1,946,249,222	\$2,316,036,574.36
Navy	\$12,196,307,822	\$2,439,261,564	\$1,219,630,782	\$1,451,360,630.86
All Other Defense Agencies	\$5,435,692,655	\$1,087,138,531	\$543,569,266	\$646,847,425.97

**Figure All.1: Projected Annual Savings Expected from Reverse Auctioning in the Federal Government, Outside the Department of Defense (Based on 11.9% Projected Savings)**



## Appendix III: Directions for Future Research

In light of the activity taking place in the area of competitive bidding, and the rapid growth in the use of reverse auctions, research in the previously unstudied and underappreciated area of e-procurement will be vital in the years ahead. This is especially critical as executives on both sides of the procurement equation look not only for best practices, but for real guidance as to the factors in reverse auction success, and for more empirically based findings on the hard-dollar savings and soft-dollar acquisition efficiencies that can be gained through competitive bidding. As noted in this report, there is a dearth of empirical research available about reverse auctioning. However, public-sector organizations have been overrepresented in the research conducted to date. This is due both to the interest level in using reverse auctioning to produce savings and the fact that there is no concern with proprietary data or processes with government agencies.

### Replicating Spend and Savings Studies

A good starting point for research in this area would be to simply replicate facets of this study at the state or even the local government levels to determine what part of their acquisition spending is “reverse auctionable” and to then project savings based on these analyses. This would not simply be one study, but perhaps dozens—or even hundreds. Such scoping studies would focus on the potential savings for individual states, cities, counties, school districts, etc., and similar studies could be done at comparable agency levels in foreign governments. Such research is far beyond the scope of any single researcher or research center. Further, research should be conducted to help refine the methodologies that project both the portion of government agency spend that can be appropriately competed through reverse auctioning and the expected savings amounts (both in the initial eRA competition and in subsequent procurement rounds). The research methods could likely be made more granular and precise, especially as actual experiential and longitudinal data from agencies employing eRAs would be available. The U.S. Department of State information analyzed in this report provides an example.

It is certainly in the interest of government agencies to work with academic partners to conduct such analyses—if the goals of such research are forward-looking and not retrospective. The objective of these studies should be to examine current and past spend data in order to refine acquisition methods and processes to ascertain how eRAs can be used effectively to produce savings going forward.

### Comparative Studies on Reverse Auction Practices

As Shalev and Asbjornsen noted, there is a need for comparative research on the special nuances and differences between the public and private sectors in regard to reverse auctioning (Shalev and Asbjornsen 2010). Comparative studies could also be done in government agencies of different sizes. Perhaps more appropriately, this could be expanded to examine competitive

bidding in different strata within government. For instance, when examining procurement from a dollar/volume perspective, the acquisition budget and workforce for a small state (i.e. Rhode Island or Connecticut) may be more comparable to a larger city, such as Philadelphia or Phoenix, than to large states such as Texas or California, whose procurement scopes may be more comparable to a major federal agency. Thus, much comparative work investigating the entire reverse auction landscape remains to be done, especially as more longitudinal data become available and more public-sector agencies develop a real track record with multiple years of experience in using competitive bidding.

## The Importance of Metrics in Evaluating Reverse Auctions

The research findings of Mithas and Jones on procurement auctions highlighted how important it is to continually evaluate auction data—both in terms of the process and results of the reverse auctions—in order to be able to “calibrate the auction parameters” to produce the most effective and efficient competitive bidding situations (Mithas and Jones 2007). This finding means that the auction service providers and procurement managers must be continually focused on making sure that the auction rules, duration, bid decrement amounts, and visibility of supplier bids are set so as to maximize the returns from reverse auctioning. The only way to do this correctly is through an emphasis on generating and evaluating appropriate data regarding the use of reverse auctions. The bottom line is that data, data, and more data are needed to effectively implement and evaluate eRAs.

As this report has documented, there are two levels of savings involved with the use of reverse auctioning. Thus, it is vital to not just collect data for evaluating and tracking the first-order savings to be derived from competitive bidding (data related to the hard-dollar savings from using eRAs), but to track the efficiency gains—the second-order savings—from implementing reverse auctioning. In answering the hard-dollar savings questions, acquisition units—in coordination with the market makers who facilitate the reverse auctions—will seek to track several variables. These include the actual final price for the selected supplier (determined by the auction) and what is to be the comparative measure. In regard to the latter, one could make use of the independent government estimate (IGE) (as is done in the federal government), or alternatively, a commercial price comparator or, as a last option, the last purchase price paid for comparable goods and services in a like quantity. While some may question the accuracy of using the IGE or a past purchase price, due to both accuracy and fluctuating market conditions, it is in the interest of all that some standardization of cost comparison methods be made over the next few years. Certainly, as data are accumulated over time, research efforts—such as those done by this author through the Reverse Auction Research Center (<http://www.reverseauctionresearch.com>)—will be helpful in this regard. Further, as has been demonstrated in this report, savings issues must be addressed in the context of both result-based (in terms of small business participation) and activity-based metrics (in terms of auction dynamics). In regard to the former, tracking is essential to delve into the competitive aspects of the auction events themselves, such as the number of bidders and the number of bids submitted. By tracking such metrics, analysis can look at the levels of competition and the effect on price movements in individual auction events, in categories of procurements, and eventually, on an interagency or even an intra-agency basis.

Finally, all data on auctions should be tracked longitudinally to examine the long-term price and competitive impact of reverse auctions. Only in this way can agencies—and indeed auction service providers—learn how suppliers and prices react when subject to repeated reverse auctions over time. As stated earlier, the expectation is that savings will continue to be produced, even if at diminished levels in subsequent auctions. Yet, even if an auction does not prove to save money, it may indeed be cheaper than current comparative prices in the wider



marketplace due to the competitive ability to bring about real-time market pricing through the auction event.

In regard to the efficiency aspects of reverse auctions, there is a pronounced need for research into how the use of this e-procurement tool impacts the way government procurement is carried out, both on an agency-wide basis and on individual acquisition professionals, as demonstrated in this research effort's study of the impact on the U.S. Department of State and in an earlier study of the U.S. Customs and Border Protection (Wyld 2010b). Certainly, this area is ripe for far more sophisticated and wide-based research. Research delving into the time savings and process efficiencies could indeed be done across agencies and even levels of government. In doing so, the potential impact of reverse auctioning on the jobs and processes of procurement professionals in agencies of various types could be discovered, even capturing the differences as reverse auctioning is deployed between headquarters and field offices of various agencies. The data can be captured both on an individual and agency-wide basis through surveys, case studies, job analyses, and more.

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**David C. Wyld** (dwyld@selu.edu) currently serves as the Robert Maurin Professor of Management at Southeastern Louisiana University in Hammond, Louisiana. He is the Director of the College of Business' Strategic e-Commerce/e-Government Initiative and a frequent contributor to both academic journals and trade publications. He is also the founding editor of the *International Journal of Managing Information Technology*, the *International Journal of Managing Value and Supply Chains*, and the *International Journal of Managing Public Sector Information and Communication Technologies*. He has established himself as one of the leading academic experts on emerging applications of technology in both the public and private sector. He has been an active consultant, a qualified expert witness, and an invited speaker on the strategic management of technology to both trade and academic audiences, as well as an invited panelist on technology issues on The Discovery Channel and other media outlets.



He presently serves as the Executive Director of the Reverse Auction Research Center (<http://www.reverseauctionresearch.com/>), which serves as a hub of research and news in the expanding world of competitive bidding. He also maintains a blog, Wyld About Management, which can be viewed at <http://wyldaboutmanagement.blogspot.com/>. Finally, as a prolific writer and researcher, Dr. Wyld works with his students to help them become published authors, and assists in launching them in their careers. To that end, he maintains compilations of the works he has helped his students to turn into editorially reviewed publications at the following sites:

- Management Concepts (<http://toptenmanagement.blogspot.com/>)
- Book Reviews (<http://wyld-about-books.blogspot.com/>)
- Travel and International Foods (<http://wyld-about-food.blogspot.com/>)

In recognition of his research accomplishments, Dr. Wyld has been awarded Southeastern Louisiana University's President's Award for Excellence in Research, and was named a Rising Star in Government Information Technology by Federal Computer Week Magazine. Dr. Wyld and his family reside just outside New Orleans in the small town of Hammond, Louisiana.

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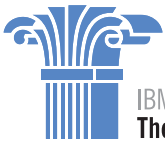
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