

**Complex Contracting: Lessons in Contract Management from the Department of  
Homeland Security's Secure Border Initiative**

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# **Complex Contracting: Lessons in Contract Management from the Department of Homeland Security's Secure Border Initiative**

## **Introduction**

Governments that elect to contract for complex services – services with multidimensional and shifting goals, that resist easy measurement, and have significant uncertainty about required tasks – can mitigate transaction risks through contract design and contract management. When both the buyer and seller are uncertain about desired outcomes and required tasks, cost-reimbursement contracts are most efficient because they reduce ex ante and ex post transaction costs, but they shift cost risks from sellers to buyers and reduce sellers incentives' to minimize costs. Contracting governments can counter these risks and incentives. They can engage in monitoring to acquire information about outcomes, tasks and costs, and thus arm themselves with the means to police opportunistic behavior by the seller. They can simultaneously engage in coordinating activities with the seller to develop a constructive working relationship and establish trust to try to mitigate opportunism. Finally, they can potentially shift from cost-reimbursement to fixed-price contracts as they acquire information, or in thick markets shift tasks to fixed-price contracts with other sellers. All three of these require extensive contract management capacity – typically in the form of experience and well-trained procurement personnel. In this paper we discuss how contract managers can use contract design and contract management to mitigate risks. We illustrate these arguments by examining the case of the Department of Homeland Security's Secure Border Initiative (SBI).

This paper is divided into five sections beyond this introduction. In the first section we differentiate between simple and complex services. In the second and third sections we discuss how contract managers can use contract design and management to mitigate the risks inherent in contracting for complex services. In the fourth section we illustrate our arguments through the examination of the SBI case. We conclude the paper by describing ways to extend the arguments we lay out here by probing deeper into the case.

## **Service Complexity**

Political overseers charge government agencies with an array of program responsibilities, from the very simple to the very complex. Simple services are relatively straightforward responsibilities that have:

- Clearly defined and measurable goals and outcomes; and
- Easily identifiable and programmable tasks to be executed to effectively deliver the service.

With simple services public managers have clear guidance from stakeholders about what to achieve, both in terms of the substantive policy goal (e.g. reduce poverty) and the evaluative performance criteria (e.g. cost efficiency, effectiveness). Simple services are easily measured, with discernable outputs and outcomes, have clear-cut tasks requiring little specialized knowledge, and require little coordination across different organizations (Williamson, 1981, 1996). Managers who oversee the delivery of simple services face

little risk that those they assign the duties of carrying out tasks will shirk their responsibilities because policing delivery is easily detected. There is little uncertainty about simple services; there are few unforeseen circumstances that would change what the service should accomplish and how it should accomplish it. For example, with the delivery of mail throughout the United States there is basic stakeholder unanimity that individuals and organizations should be able to pen a letter that can be delivered in a timely and safe manner to a recipient almost anywhere else in the country. In addition, moving mail from point A to point B consists of a set of definable tasks including collection, sorting, transportation, and delivery. There are complexities inherent in this process, but the basic task elements that constitute the system are known and unambiguous, can be performed within a single organization, and can be managed with little risk through attentive oversight.

Complex services are much more challenging responsibilities which can be characterized by:

- Multidimensional, contradictory and often changing goals and outcomes that resist measurement; and
- Significant uncertainty about the tasks required to effectively deliver the service.

For complex problems, goals are evaluated along multiple dimensions without easy metrics for balancing, often leading to acrimonious stakeholder disagreement about even the nature of the problem. Public managers often have difficulty identifying what tasks must be performed to deliver the service. Complex services are not easily measured, and often require asset specific investments, so that even with some goal clarity, the tasks to be undertaken may require such specialized knowledge that few organizations have the requisite capacity. In some cases, task completion may require integrating expertise and processes from multiple organizations raising significant coordination costs. An example of a complex problem is someone lost at sea. The policy goal is relatively straightforward: find and safely retrieve the lost person. The complexity of the problem is driven by the tasks required to fulfill the goal. Each of the rescue aircraft and sea assets must develop an optimal search strategy for locating the lost person, given sea and weather conditions, tides and drift, and the search strategies and technological capabilities of the other craft. As the search progresses, the search craft would need to share data, refine their strategies in response to changing conditions, and, once the person was found, the air and sea assets would need a coordinated rescue plan. As long as the person remains lost, it is difficult to measure how well each is contributing to the goal, and even in a successful rescue may not reveal what would have been the best search strategy. For complex services, managers face the risk that those assigned the responsibility for carrying out service delivery tasks may pursue goals that run counter to their own and detecting such deviance is hard to observe. Complex services are highly uncertain; unforeseen circumstances are likely to change what the service needs to be and how to best accomplish them.

Government agencies have a range of tools for delivering simple and complex services (Salamon, 2002). A fundamental choice is between internal service delivery, where all aspects of production and delivery are done in-house with government employees, and contracted service delivery, in which government hires external vendors

for production. The potential benefits of internal service delivery include high service quality, clear accountability and equality of provision, while the potential benefits of contracting are cost efficiency, innovation and access to expertise or capacity unavailable in-house (Kelman, 2002; Sclar, 2000). Governments face similar types of costs for internal and contract service delivery: the costs to produce the service – fixed assets, labor, capital – and the costs to manage the process, often referred to as transaction costs (Williamson, 1981). In both cases there are ex ante transaction costs – the costs of specifying tasks, recruiting and soliciting providers (e.g. employees or vendors), writing contracts (e.g. labor contracts or arms-length contracts), and selecting the providers. In addition, there are parallel ex post transaction costs – the costs of coordinating, monitoring and policing labor or vendor activity and performance, as well as renegotiating and arbitrating disputes arising from unforeseen service delivery ambiguities and changing circumstances. Simpler services have lower transaction costs and complex services have higher ones.

Transaction costs are but one factor in whether governments should produce or contract for a service. The decision hinges on the superiority of contracting versus internal production, taking into account all foreseeable costs (including transaction costs) and benefits, within the constraints of political overseers' directives and existing law (Brown, Potoski, and Van Slyke, 2006). Simple services may have lower transaction costs under contract service provision, but governments may have other advantages relative to vendors, such as expertise delivering a particular service, or face prohibitory political opposition or legal requirements.<sup>1</sup> Likewise, complex services have higher contracting transaction costs, but vendors may have other advantages relative to governments, such as economies of scale, specialized expertise, and greater flexibility, particularly in labor management.<sup>2</sup> Outsourcing is in part fueled by the comparative advantage vendors enjoy in experience, capacity and technical expertise (Van Slyke, 2003).

The upshot is that while complex services are risky, governments still sometimes contract for their production.<sup>3</sup> To an important degree, public managers have the ability to change important transaction costs, whether delivery occurs through internal production or through contract. While some costs and benefits are exogenous, such as the labor and asset prices, public managers can use contract design and management tools to reduce service delivery costs, enhance benefits, and reduce risks. Below we first discuss contract design and then contract management.

### **Contract Design for Complex Services**

Buyers in a contract want to optimize cost-quality tradeoffs, while sellers want to maximize their profits. When sellers know more than buyers about producing goods and

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<sup>1</sup> For example, the transportation of prisoners from one federal holding facility to another is a fairly straightforward activity for which a potential market exists. However, the Federal Acquisition Regulations (FAR), which govern federal contracting practice, prohibit outsourcing this task because it has characteristics that are “inherently governmental” (see FAR 7.5.03 (d) (19)).

<sup>2</sup> For example, many local and state governments contract with public, private or nonprofit vendors for high transaction cost social services like mental health and retardation programs or drug and alcohol treatment programs (Brown, 2008).

<sup>3</sup> Risks are also high when governments internally produce complex services. Here we focus on the contracting case.

services and exploit that information for their own advantage, a moral hazard problem occurs. This is a problem that economists often refer to as *post-contractual opportunism* (Milgrom and Roberts, 1992). For example, unbeknownst to the buyer, a seller might cut product quality and pocket the savings as profits. In a sense such “profits” are “rents” gained opportunistically by exploiting the seller’s information advantage. Alternatively, if the buyer knows more about the costs of producing a service than the seller, she can select fixed price bids below the actual costs to produce the service, using her own information advantage to extract her own “rents”.

For simple services, buyers and sellers both have low uncertainty about the good to be purchased, and its outcomes, tasks and associated costs. A thick market for simple services overcomes moral hazard problems as buyers can clearly specify desired outcomes and required tasks, competitive bidding reveals the sellers true costs, and buyers can easily detect vendors’ rent seeking. The availability of information mitigates or potentially eliminates conflicting goal problems because buyers can make informed decisions about which seller to select given their own cost-versus-quality preferences, and sellers face little risk of overrunning their cost projections.

Uncertainty – or the degree to which actors have imperfect information about outcomes, tasks and costs – complicates market exchanges. For complex services, the uncertainty of *both* buyers *and* sellers raise the ex ante and ex post transaction costs for both parties. Ex ante, both buyer and seller must invest more time and effort to specify in the contract the desired outcomes and required tasks. Ex post, unforeseen circumstances reveal ambiguities in the contract that require both buyer and seller to engage in costly coordination of service delivery tasks, monitoring and reporting, renegotiating contract terms, and resolving disputes that result.

One of the primary ways to reduce transaction costs is through contract design – the terms of exchange specified in the contract. Contracts vary along a variety of dimensions (e.g. incentives and sanctions, monitoring and oversight provisions, arbitration procedures), but we focus here on one fundamental design element: the compensation mechanism. In a fixed price compensation mechanism, the buyer specifies what she wants in terms of outcomes and tasks and the seller tenders a price.<sup>4</sup> Upon delivery of the product, the buyer compensates the seller with the pre-negotiated price, regardless of the seller’s actual costs. In a cost reimbursement compensation mechanism, the buyer agrees to reimburse the seller for all of its costs.<sup>5</sup> Since costs are more easily measured than the outcomes, the buyer and seller negotiate ex ante which costs will be reimbursed (e.g. time and materials).

When both parties enjoy higher certainty about the good or service, a fixed-price contract is more efficient. Fixed price contracts give sellers incentives to reduce costs since they reap the resulting differential between actual and negotiated costs. The buyer faces the risk that because the seller is driven to reduce costs it will trade-off quality for

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<sup>4</sup> See FAR 16.2 Fixed-Price Contracts for a more detailed discussion of the elements of fixed-price contracts.

<sup>5</sup> See FAR 16.3 Cost-Reimbursement Contracts for a more detailed discussion of the elements of cost-reimbursement contracts. The FAR also specifies permutations of the basic cost-reimbursement structure. For example, under cost-plus-fee arrangements, the buyer and seller agree to a fixed fee – the profit ostensibly – as well as the basis for cost-reimbursement (FAR 16.304-.306). Alternatively, under time and materials contracts, the buyer and seller agree to a “fully loaded rate” for any materials and labor costs; here the fee, or profit, is built into the reimbursement rate (FAR 16.6).

cost savings. However, because simple services are characterized by easily monitored tasks and measurable outcomes, the buyer can prevent quality shirking through relatively low-cost monitoring, contract enforcement, or if the market is thick, replacing the vendor.

When both buyers and sellers are highly uncertain, a cost-reimbursement contract is more efficient. Cost-reimbursement contracts have lower ex ante costs because the ex ante costs of specifying inputs is cheaper than the ex ante costs of writing a contract that attempts to account for all outcome contingencies. Fixed price contracts also have higher ex post transaction costs than cost reimbursement contracts in high uncertainty contexts because the ambiguities in the contract coupled with unforeseen events will require expensive oversight, renegotiation and dispute resolution.

Cost-reimbursement contracts lower ex post transaction costs. When unforeseen circumstances arise, instead of costly disputes and renegotiations, the seller adapts work under the existing contract, knowing all its costs will be reimbursed under the contract. This is not to say that ex post transaction costs have been eliminated: the buyer, in particular, still has to monitor to gather information about service delivery activities, coordinate contracted tasks with any in-house production, and negotiate how the vendor should perform in light of new circumstances. In cost reimbursement contracts, the buyer bears the risk of future uncertainty because unforeseen circumstances will affect how much she pays for the good.

In sum, fixed-price contracts are most efficient for simple services, where both parties are relatively certain about costs and outcomes, while cost-reimbursement contracts are best suited for complex services, where both parties lack information about the costs and outcomes. Figure 1 presents this relationship graphically.<sup>6</sup> As noted earlier, these are ideal types. In reality, buyer and seller can negotiate more complex arrangements to address risk each faces under varying degrees of uncertainty. These two ideal types, though, represent the boundaries within which contract managers' design contracts to manage risk and lower transaction costs. As discussed in the next section, contract managers can also engage in a variety of management activities to mitigate uncertainty in contracting for complex services.

**Figure 1: Contract Designs as a Function of the Certainty Faced by the Buyer and the Seller**

		<b>Buyer</b>	
		<i>Certainty</i>	<i>Uncertainty</i>
<b>Seller</b>	<i>Certainty</i>	Fixed-Price	
	<i>Uncertainty</i>		Cost-Reimbursement

<sup>6</sup> Because our focus in this paper is on complex services, we limit our comparative discussion to simple and complex services. Future iterations of this manuscript will include a discussion of contract design when one party enjoys an information advantage over the other – the upper right and bottom left quadrants of figure 1.

## **Managing Contract Service Delivery for Complex Services**

Simple services purchased through fixed-price contracts require assuring quality control for purchased goods and services, but these tasks are straightforward compared to the tasks for managing complex services. For complex services, uncertainty about future outcomes, tasks, and costs gives buyers and sellers incentives to acquire information, although the seller enjoys an advantage because as producer it will learn more easily. In a cost-reimbursement contract, the seller may extract rents as it gains information by either inflating costs or unnecessarily enhancing service quality, often called “gold plating.” Contract management can help buyers minimize information asymmetries and align vendors and government goals. From a contract management perspective, there are a variety of activities the buyer can engage in to mitigate moral hazard risks, including:

- Managing the market
- Engaging in monitoring, oversight and policing
- Engaging in coordination and relationship-building with the seller to develop trust; and
- Altering the contract design over time, including shifting tasks to fixed-price contracts as information is acquired.

We briefly address each of these management activities in turn.

### Managing Markets

A thick market – where there are numerous buyers and sellers – lowers contracting transaction costs by reducing uncertainty and disciplining vendors. Competitive markets provide information as buyers can compare prices and product quality across bids (or through comparison with other sales). Competitive markets also discipline sellers because buyers can replace inefficient sellers with more efficient ones.

Thin markets – where there are few buyers and few sellers – raise contracting transactions costs.<sup>7</sup> First, fewer sellers mean less information about costs and product quality. Second, the lack of competition means buyers and sellers are mutually dependent to the extent each has made investments in assets that can be used only to fulfill the contract. Each is subject to being “held up” by the other: a buyer may seek to lower prices, knowing the vendor has no other market and a seller may look to raise prices, knowing the buyer has no other sources. Solving thin market problems can occur ex ante through stimulating competition (e.g. Brown and Potoski, 2004). Ex post, thin markets imply higher transaction costs because buyers and sellers are locked in with their contract partner, requiring stronger, more binding contracts, more monitoring and policing, and renegotiation.

### Monitoring and Policing

Monitoring is the most direct means for acquiring information in complex contracting. Provisions for monitoring can be written directly into the contract, such as

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<sup>7</sup> Markets may be thin ex ante because the purchased tasks are so specialized that there’s only one or two sellers. Alternatively, there may be many initial sellers, but once the contract has been let, the winner enjoys an asset specific advantage that subsequently makes markets uncompetitive (Williamson, 1981; Sclar, 2000).

requirements that the vendor be open to auditing. Monitoring can also include information disclosure requirements, such as requiring vendors to disclose costs and prescribing accounting procedures. To the extent both actors have sufficient certainty, they can negotiate performance metrics that tie vendors' performance to meet specific, measurable contract milestones.

The sellers' information advantage is often tacit in that it derives from first hand experience with the problem and is difficult to communicate. Responding to sellers' tacit knowledge requires buyers to go beyond simple reporting, auditing, and monitoring. Buyers can try to learn the tacit knowledge for themselves through onsite visits to watch the seller's behavior. Tacit knowledge reflects an information asymmetry in that sellers know more about the product than the buyer: effective tacit knowledge often requires highly technical skill and expertise about the product. Buyers can also overcome tacit information problems by hiring third parties to conduct monitoring on their behalf, particularly those with technical expertise. Third party monitoring raises its own set of transaction costs because monitors have information advantages over the buyers and different goals. To be effective, monitoring needs to be coupled with some means to align sellers' behavior with buyers' objectives (e.g. strong incentives, dispute resolution mechanisms, informal negotiating and formal mechanisms for renegotiation, sanctioning, and in extreme cases, litigation).

### Building Trust

For complex problems unforeseen circumstances can change the goals of the program, the requirements of the solution, the technical uncertainty, and the costs and benefits of the solution. While cost-reimbursement contracts place most cost risks on the buyer and fixed-price contracts place most cost risks on the seller, in either case, unforeseen circumstances can change the costs and benefits buyers and sellers receive from either type of contract. And, while sellers have a strategic advantage in that they are likely to gain information certainty more quickly, both sides are still vulnerable in that new circumstances may place either in a disadvantaged contract that it would not have entered had it known what was to come. Parties in such circumstances might choose to cooperate and renegotiate a win-win modification to the contract, but renegotiation carries high transaction costs and the advantaged side may rather look for greater short term gains by riding out the contract. The broader danger of this problem is that the advantaged side has an incentive to exploit contract ambiguities to its full benefit, creating a win-lose contract at the expense of a more efficient win-win renegotiation, because its own gains are greater in a win-lose than in a win-win. If both parties anticipate future contracting, the prospect of win-win gains gives parties incentive to cooperate in renegotiations, but only if they have confidence the other side is willing to cooperate as well; both sides need assurance that it will not bear the full costs should it find itself on the wrong end of a win-lose exchange. Trust is the shared belief among actors that they will cooperate for win-win outcomes when confronted with the choice between win-win and win-lose (or even lose-lose) results. One actor can trust the other to the extent they can accurately predict the other's behavior and the extent to which the other's behavior is aligned with their own goals, preferences, and expectations (Brown, Potoski, and Van Slyke 2007).

Contracting governments and vendors can create and promote trust in several ways. First, they can build a reputation for trust over time by engaging in a series of win–win cooperative interactions. If both parties are cooperating, repeated win-wins can create a virtuous cycle as trust begets more trust and win–win outcomes lead to further gains as contracting continues. Second, contract parties can look to build a trustworthy reputation by credibly committing to cooperation ex ante (Mayer et al., 1995). Third, contract parties can establish trust by choosing partners with similar missions. For example, contracting governments and non-governmental organizations (NGOs) may have more similar goals (and may thus make more attractive contracting partners) than contracting governments and for-profit companies especially for services that are more asset-specific and less easily measured and observed (Van Slyke, 2007).

### Contract Renegotiation and Redesign

Parties can use cost-reimbursement contracts for complex problems where they are mutually uncertain, fixed-price contracts for simple problems, and they can switch from cost-reimbursement to fixed-price as experience lowers the uncertainty. Switching the contract requires synthesizing information to determine which tasks can be shifted (and when) from one contract design to another. Renegotiation is a transaction cost, but the benefits of switching to a fixed-price contract may outweigh the costs of continuing under a cost-reimbursement contract.

Summarizing our theoretical argument, governments that elect to contract for complex services can mitigate transaction cost risks through contract design and contract management. Notably, when both the buyer and seller are uncertain about desired outcomes or required tasks, cost-reimbursement contracts are most efficient because they reduce ex ante and ex post transaction costs. Cost-reimbursement contracts shift cost risks from sellers to buyers and reduce sellers' incentives to minimize costs. Contracting governments can counter these risks and incentives in several ways. They can engage in monitoring to acquire information about outcomes, tasks and costs, and thus arm themselves with the means to police opportunistic behavior by the seller. They can simultaneously engage in coordinating activities with the seller to develop a constructive working relationship and establish trust to try to stifle potential seller opportunism. And finally, they can potentially shift from a cost-reimbursement to a fixed-price arrangement with the existing seller as they acquire information, or shift tasks to fixed-price contracts with other sellers in thick markets. These activities require extensive contract management capacity – typically in the form of experienced and well-trained procurement personnel.

To illustrate our arguments about how contract design and corresponding contract management activities can potentially address the risks of complex contracting we examine the case of the Department of Homeland Security's (DHS) Secure Border Initiative (SBI).

### **Contracting for Complex Services: The Department of Homeland Security's Secure Border Initiative**

In the first half of this decade, concerns about terrorism and a desire to curb illegal immigration led to calls to strengthen US border security. Political overseers in

Congress and the White House have charged DHS with securing the U.S. land borders with Mexico and Canada – 6000 miles of largely uninhabited, variable, and inhospitable terrain. DHS determined that it lacked sufficient capacity to develop in-house a border security plan and instead opted to contract for a solution design through a program called SBInet.

Border security is a complex problem in that there is considerable uncertainty about the goals and outcomes the program is to achieve, the tasks and technologies for achieving them, and the ultimate costs of those activities. DHS' task is complicated by shifting debates among politicians and stakeholders over what it means to secure the border (for example, a complete embargo of illegal crossings or more traceable information about who and what crosses the border) and who are interdiction targets (e.g. terrorists, drug traffickers, laborers, families). The political objectives may change with turnover in Congress or the White House, perhaps even resulting in termination of the program. In the absence of goal clarity, DHS faces significant challenges in identifying explicit border security outcomes and the tasks required to achieve these shifting and enigmatic goals remains unclear. Topographical diversity along both borders means a varying problem and solutions need to be tailored to local circumstances. Because the border crossers will seek out the border's weak points, the solution also needs to be adaptive and flexible, while maintaining a command and control structure that responds effectively to breaches.

In this next section we describe SBInet contract design and how it manages the risks of designing a solution for a complex problem. Finally, we provide an example of how DHS has used one contract management activity – monitoring and oversight – to reduce uncertainty.

### *Contract Design and SBInet*

In November 2005, DHS launched SBInet, a contract program to secure US land borders. DHS's SBInet Request for Proposal was an open-ended solicitation specifying broad border security goals, but to maximize innovation and creativity, provided bidders considerably flexibility in the conceptualization, design, construction and operation for the "full panoply of supplies and services required to secure the 6000 miles of U.S. border."<sup>8</sup> In September 2006, DHS awarded the Boeing Corporation a three-year indefinite delivery indefinite quantity (IDIQ) SBInet contract with three one year renewal option periods. An IDIQ contract is an overarching agreement that structures negotiations for more specific contracts for component objectives, called task orders. The Boeing SBInet contract is a systems-of-systems (SOS) contract with Boeing serving as the lead systems integrator (LSI). The LSI is responsible for system design, testing, integration, deployment and optimization of the project, as specified further in task orders.

Boeing's SBInet proposal was to design a border security program that gives US border security agents precise information about their proximity to illegal aliens and other agents through a network of over 1800 towers armed with cameras and heat and motion detectors. While Boeing proposed to integrate cutting-edge technology (i.e. remote sensing devices attached to towers) with existing systems (i.e. tactical infrastructure,

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<sup>8</sup> The GAO has repeatedly cited DHS for failing to specify measurable outcomes or tasks arguing that the current contract specification is too vague (GAO-07-309 and GAO-07-504T).

fencing and physical barriers), it could not specify the exact asset allocations nor did it have direct experience integrating assets for border security tasks. DHS chose Boeing's proposal in part because Boeing had extensive systems-of-systems experience serving as the LSI on several other complex programs to which multiple organizations provided components.

At its core, the SBInet contract with Boeing is an open ended contract for the design and initial implementation of a solution to the complex border security problem. The SBInet contract specifies a minimum payment – \$2 million – but no ceiling and only a time period limitation. To date, DHS has awarded Boeing initial task orders valued at \$67 million for border security in Arizona, including in October 2006 a \$20 million task order to provide equipment and services necessary to achieve effective control of 28 miles of US-Mexico border just south of Tucson, Arizona. This task order, dubbed Project 28, is essentially a pilot program to develop and test both border control technologies and management tools for the broader border procurement program. The border control technologies being developed and tested are the remote sensors, towers, fences, and communication, command and control systems. The procurement management tools include performance metrics for specifying in a contract what future vendors should accomplish to protect the border.

#### *Uncertainty and Risk in SBInet*

The IDIQ features of the SBInet contract are a cost-reimbursement contract design. While the individual task orders have been fixed-price, DHS is essentially reimbursing Boeing's costs for designing and implementing a secure border program. In this sense, through each task order, DHS is buying a piecemeal reduction in uncertainty about how different technologies secure the border, how much they cost, and the how procurement for the program can be managed. In the SBInet case, DHS does not want to commit to a constricting long-term contract that obligates high payments to Boeing because it does not know how much it needs from Boeing to sufficiently reduce its uncertainty about border security problems, goals, tasks, and costs. The FAR recognizes this in its IDIQ guidelines:

Contracting officers may use an indefinite-quantity contract when the Government cannot predetermine, above a specified minimum, the precise quantities or supplies or services that the Government will require during the contract period, and it is inadvisable for the Government to commit itself for more than a minimum quantity (FAR 16.504 (b)).

The objective of the task orders is to reduce uncertainty until DHS knows enough to either produce the solution in-house or contract for it through well specified fixed price contracts. For example, in project P-28 after Boeing initially designed and built a portion of the fence for the 28 mile border, DHS then went outside the IDIQ to contract with another vendor for the remainder of the physical barrier and tactical infrastructure. Once DHS has the capacity to implement the border security system, the IDIQ contract will for all intents and purposes be terminated and DHS will assume the role of managing the production, implementation and ultimately the operation of the border security network.

As a cost reimbursement contract the IDIQ framework has the advantage of reducing the transaction costs for negotiating task orders. The FAR's regulations covering an IDIQ contract states that:

The contracting officer may exercise broad discretion in developing appropriate order placement procedures. The contracting officer should keep submission requirements to a minimum. Contracting officers may use streamlined procedures, including oral presentations (FAR 16.505 (b)(1)(ii)).

The SBI net IDIQ contract means that Boeing and DHS have at the outset agreed on the broad parameters for the task orders, such as quality and cost parameters for the product, the production and delivery time frame, the process by which the product can be exchanged should the buyer deem the parameters have been met, and the process by which the product is to be further modified if the performance parameters have not been met. These broad parameters lower the costs of negotiating individual task orders.

The cost reimbursement nature of the IDIQ contract means that DHS assumes cost risks for the program as long as it remains uncertain about how to design, implement and manage the border security program. As the system designer, integrator and initial operator, Boeing knows that it can propose multiple, and potentially costly, tasks to fulfill its mandate as the system designer. Over the life of the contract, Boeing's information advantage may grow as it gains tacit knowledge about border security goals, tasks and solutions that, coupled with its privileged market position, it may look to exploit at DHS's expense, for example by inflating costs and gold plating services.

The contract is also risky for both Boeing and DHS because of the asset specific nature of the task – designing, building and integrating a complex system. For DHS, investments made in the project, such as payments to Boeing, may be lost if Boeing exits or delivers poorly on its contract obligations. Even though DHS received multiple bids for its original RFP, each bid proposed a different solution; once DHS chose Boeing as LSI it committed to Boeing's solution, for which there are no clear immediate alternative vendors in the market. For Boeing, the SBI net IDIQ contract risks are similar. While Boeing made significant upfront investments to win the SBI net IDIQ contract, it does not have any guarantee that DHS will grant sufficient future task orders through which it can recoup its initial investments or reap profits.

Boeing's position as LSI raises important longer term issues for the border security program. Boeing does not have incentive to help DHS reduce its uncertainty because, so long as DHS remains uncertain about the program's goals, tasks and costs, Boeing enjoys the advantages of the low risk IDIQ contract in which DHS covers its costs and from which it faces little potential competition. Over the long term, even if DHS reduces its uncertainty, Boeing has an incentive to design a border security program that requires asset specific products for which it is the only viable vendor. Thus, DHS's central contract management objectives through the project design and development stage are to reduce its uncertainty and establish a competitive supplier market for building the border security network.

### *Contract Management and SBInet*

Given the central importance to DHS of reducing uncertainty about tasks, goals and costs, DHS staff has engaged in both active monitoring and oversight and market management. DHS has approached SBInet incrementally, carving up the overall project of designing and implementing the system into smaller parts. Along these lines, DHS has tasked Boeing with a pilot task order, the aforementioned P-28. In large part this pilot is an attempt to reduce uncertainty about goals, tasks and costs. P-28 represents a mere fraction of the overall task of securing 6000 miles of border, but as the first step it serves as a laboratory for identifying measurable performance metrics and a testing ground for integrating programs, technology and infrastructure.

The P-28 task order charges Boeing with a variety of technical tasks:

- Deploy nine towers with associated sensors to improve detection identification and classification;
- Establish two command, control and communication (C3) units to enable situation awareness;
- Retrofit 50 vehicles to provide rugged, secure, mounted laptop computers to enable displays of common operating picture data;
- Deliver 50 satellite phones to improve communications;
- Develop three Rapid Response Transports (RPT) to increase the speed of transportation of illegal immigrants from point of capture to detention facilities; and
- Build three unattended ground defense systems to provide additional security for the sensor towers.

Boeing and DHS jointly execute these tasks, although Boeing's management team is primarily responsible for the complete production process (i.e. planning, architecture design and systems engineering, integration and testing, laydown and deployment, and maintenance and support). DHS' role is primarily to oversee and manage the Boeing management team. Specifically, DHS established a SBInet Program Management Office (PMO) under the Customs and Border Patrol (CBP) located on-site in Tucson, Arizona. The PMO has been assigned the tasks of identifying user/customer needs, goals, objectives and task requirements, and undertaking operational testing and systems acceptance.<sup>9</sup>

While DHS' SBInet management in Washington has formally assigned these tasks to the PMO in the field, informally the expectation is that goal clarity and outcome measurability will be achieved through oversight of Boeing's implementation of its assigned tasks.<sup>10</sup> Under P-28, PMO staff has been developing a wide-variety of metrics to measure outputs and outcomes in hopes of identifying a comprehensive, but limited, set that could be applied to future task orders. In addition, while DHS has repeatedly stated that its outcome specification in the IDIQ with Boeing is sufficient, oversight bodies, notably the Government Accountability Office (GAO), have indicated that this specification does not meet the requirements of the FAR. Instead, GAO officials have

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<sup>9</sup> See Boeing P-28 Backgrounder ([http://www.boeing.com/defense-space/sbinet/sbinet\\_p28\\_0407.pdf](http://www.boeing.com/defense-space/sbinet/sbinet_p28_0407.pdf))

<sup>10</sup> Interview with Greg Giddens, Executive Director of SBInet, and Tiffany Hixson, Acting Executive Deputy Director of SBInet, September 11, 2007.

pressed DHS to identify specific outcome measures. According to Richard Stana, GAO's Director of Homeland Security and Justice Issues,

We want DHS' performance measures to be outcome based. '...the full panoply of supplies and services to provide 6000 miles of secure U.S. border...' is not outcome based. For example, DHS might use percentage of illegal immigrants captured....

...If DHS were to use P-28 and the other early task orders as a means to calibrate performance measures I think this would be a reasonable way to capture learning. However, DHS has been unwilling to bring these P-28 performance measures back to SBIInet as a whole and therein lies the rub.<sup>11</sup>

DHS has resisted the elevation of its trial performance measures in P-28 to the overarching IDIQ because it wants to maintain flexibility. The goals may vary from one part of the border to another. For example, stakeholders (e.g. community leaders, other federal agencies, state and local authorities) in the Tucson, Arizona area may have very different demands than those in southern California cities. Consequently, DHS wants to be able to adapt goals and outcomes for future task orders to account for known and unknown differences along the border. In short, while P-28 has provided DHS with information about goals and the required tasks for securing the 28 miles of border just south of Tucson, the pilot has not succeeded in producing performance measures that can be applied uniformly across the system.

This is not the only type of information DHS has acquired through the P-28 pilot. In addition, as the PMO and the Boeing management team work in collaboration to execute the task order elements, DHS has acquired information about Boeing's orientation and effort. In response to delays in completing contracted tasks on time, DHS discovered that Boeing's management team was governed by the personnel who negotiated the P-28 task order, and not by Boeing personnel with experience in systems-design and integration. One interpretation of this personnel move by Boeing is that the IDIQ contract design with multiple discrete task orders creates the incentive for Boeing to focus on capturing future task orders rather than effectively and efficiently executing those that they have won. With no certainty that DHS will continue to turn to Boeing for all future task orders, Boeing's initial investment was to focus its management team on positioning itself for subsequent task orders (i.e. revenues). While this feature is potentially a downside of the IDIQ design, the contract arrangement also provides the flexibility to negotiate a solution to this problem (once discovered) without resorting to costly negotiation. DHS' senior management team in Washington simply approached Boeing leadership and asked that the P-28 management team be switched. By August of 2007 a new Boeing management team with systems-integration experience was in place. According to Director Giddens:

We've learned more about the company's (Boeing's) mindset. They have trappers and skimmers. We got caught in the wrong business unit within Boeing

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<sup>11</sup> Interview with Rich Stana, Director of Homeland Security and Justice Issues of the GAO, September 10, 2007.

under P-28. The trappers managed P-28 for too long and they didn't have the management capacity. We had a mission alignment problem. We weren't in the right business unit. As of August 1 the new program team is the right one – they're skimmers. They're a program team and they're doing alright.<sup>12</sup>

In short, P-28 provided important information about Boeing's activities and the IDIQ design offered DHS and Boeing a low-cost means to adjust.

While one of the hopes of the P-28 pilot was to reduce uncertainty about goals and performance measures (which could then be used to reduce task ambiguity), in practice the usable knowledge gained from monitoring and oversight under P-28 has come in the form of important information about Boeing's behavior and effort. The IDIQ design provides flexibility to utilize this information to potentially minimize the inherent risks of complex contracting. Not only has DHS utilized the information to adjust their oversight of P-28, but it has also impacted their approach to future task orders. Originally, DHS planned to run a series of task orders almost simultaneously after pilots like P-28. As a result of their experience under P-28, DHS has reworked its task order schedule, planning many future task orders sequentially rather than concurrently. In this way, DHS enjoys the possibility to continue to reduce uncertainty by developing a process of acquiring information about goals, outcomes and tasks, and then using that information to improve the implementation of follow-on task orders. In fact, DHS' Washington management team has plans to institute formal "lessons-learned" exercises within a month of completion of each task order, followed by a subsequent learning activity six months later.<sup>13</sup>

## **Conclusion**

The effort to secure the border through SBIInet is a dynamic process. We have only begun to sketch out the early phases here. However, the early phases illustrate how contract managers can utilize contract design and contract management to minimize the inherent risks of contracting for complex services. Specifically, the IDIQ contract design provides both the buyer and seller sufficient certainty that neither party will exit the arrangement in the near term, but also does not lock either party into an agreement with high levels of risk of falling prey to opportunistic behavior by the other party. The SBI case also illustrates how contract managers can engage in various management activities – in this case monitoring and oversight – within and around whatever design governs the exchange to further mitigate inherent production and transaction cost risks. Our analysis of the SBI case is by no means exhaustive or definitive, but it demonstrates the explanatory power of simultaneously examining contract design and management.

The SBI case is ripe for opportunities to further explore contract design and management. We have focused on only one element of contract design in this paper – the basic compensation mechanism – and have oversimplified it. In the future we intend to explore the compensation arrangement in more detail, but also examine other contract design features (e.g. incentives and sanctions, monitoring and oversight provisions,

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<sup>12</sup> Interview with Greg Giddens, Executive Director of SBIInet, and Tiffany Hixson, Acting Executive Deputy Director of SBIInet, September 11, 2007.

<sup>13</sup> Interview with Greg Giddens, Executive Director of SBIInet, and Tiffany Hixson, Acting Executive Deputy Director of SBIInet, September 11, 2007.

arbitration procedures) to assess how the overall level of contract specificity impacts the buyer-seller relationship and various performance dimensions. We have also focused on only one contract management activity – oversight and monitoring – and for only one of the task orders. In subsequent iterations of this analysis we intend to investigate other management activities, namely managing the market, undertaken cooperatively and relationship-building actions, and redesigning and renegotiating the contract design. This will provide a more complete explanation and illustration of how these two fundamental elements of contract governance can reduce uncertainty for complex services and potentially improve performance.

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