

**PUBLIC AND PRIVATE ROLES IN
MAINTAINING MILITARY EQUIPMENT
AT THE DEPOT LEVEL**

The Congress of the United States
Congressional Budget Office

NOTES

Unless otherwise indicated, dollars in the study are 1995 dollars and all years referred to are fiscal years.

Numbers in the text and tables may not add to totals because of rounding.

Cover photo shows workers leaving a ship repair site at the end of the day. (Photo courtesy of the U.S. Navy)

Preface

Controversy over public and private roles in U.S. society is increasing in intensity. That debate is particularly timely in the area of national security. With the collapse of the Soviet threat and declines in available resources, the Department of Defense (DoD) and the Congress are reexamining public and private roles that seemed appropriate during the Cold War.

Maintenance of military equipment at the depot level is one of the functions that merits review. Depot-level tasks consist of overhauls, repairs, and modifications that are performed at fixed industrial facilities. During the Cold War, an extensive system of public depots (facilities owned by the government and staffed almost exclusively by civilian employees of DoD) did most depot-level work because DoD assumed that it could not depend on private industry to provide the large surge in maintenance called for in Cold War scenarios. Yet the need for such a surge would be much less in the relatively brief regional conflicts for which DoD now plans. Moreover, during such conflicts, private industry would not be fully occupied with war production and might be able to handle most of the military's maintenance needs. Those considerations raise an important question. Could DoD achieve significant savings in peacetime and still obtain the high-quality, responsive support it needs for regional contingencies by relying more on private firms for depot-level maintenance?

This study was prepared in response to a request by Daniel K. Inouye, former Chairman of the Defense Subcommittee of the Senate Appropriations Committee. It examines alternative methods for determining the appropriate roles of the public and private sectors in depot-level maintenance. In keeping with the mandate of the Congressional Budget Office (CBO) to provide objective analysis, the study contains no recommendations.

Deborah Clay-Mendez of CBO's National Security Division prepared the study under the general supervision of Neil M. Singer and Cindy Williams. Drafts of the study benefited from an insightful review by Frank Camm of RAND and useful comments by Rob Jordan of the Logistics Management Institute and Michael A. Miller, R. William Thomas, Richard Farmer, and Frances Lussier of CBO. The author gratefully acknowledges the valuable assistance of Nathan L. Stacy. She also thanks the numerous DoD and industry officials who responded, frequently at short notice, to questions and requests for data.

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June E. O'Neill
Director

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Summary

A debate has been growing recently about what roles government and private institutions should play in U.S. society. The question of public and private roles is especially controversial in the area of national defense. Defense is an inherently governmental function in which military traditions of honor, public service, and hierarchical authority frequently supersede the incentives of the marketplace. Yet the strength of the U.S. armed forces derives in part from their access to goods and services--ranging from environmental cleanup to weapon systems--produced by private firms that are, in many cases, innovative and efficient.

Depot-level maintenance of military equipment--those overhaul, repair, and modification tasks that can be done most efficiently at central industrial facilities--is one of the functions in which public and private roles are being reassessed. In 1995, the Department of Defense (DoD) will spend almost \$13 billion on depot-level maintenance. Approximately \$9 billion, or 70 percent of the total, will go for work performed by 95,000 DoD civilian and military personnel working in 30 government maintenance depots. The remaining 30 percent will pay for maintenance provided by more than 1,200 private firms.

The Current Debate Over Public and Private Roles

DoD has divided depot-level maintenance between the public and private sectors in roughly the same proportion since at least the mid-1980s. That allocation was consistent, in the department's view, with Cold War scenarios that required public depots to

maintain excess capacity in peacetime to handle the surge in maintenance and repairs that would occur during a prolonged conflict. In those scenarios, U.S. industry would mobilize fully for war production and might have little capacity to spare for repairs on military equipment.

During the Cold War, DoD argued that its depots were a "ready and controlled" source of maintenance for equipment essential to the services' combat missions. As such, the depots were necessary to protect against the risk that contractors might be either unable or unwilling to respond immediately to DoD's requirements for maintenance during a war. By using risk as the major criterion for allocating workloads to the two sectors, DoD was able to justify a large network of public depots. Those facilities had ample capacity, in peacetime, to conduct routine overhauls of major "end items" such as tanks, ships, and aircraft and to provide most of the repairs DoD needed on components. Because the military considered it too risky to rely on the private sector to maintain most mission-essential equipment, the relative costs of public and private production received little attention.

The collapse of the Soviet threat, however, has sparked controversy over the private sector's ability to meet DoD's requirements for maintenance. The risks of using private-sector contractors might be less severe in the regional conflicts for which the military now plans than they were in the Cold War scenarios. Depot-level maintenance during relatively brief regional conflicts would focus primarily on repairing components. The surge in maintenance on major end items would not reach its peak until the conflicts were over and DoD could return the damaged equipment to the United States. In addition, the nation's

defense industry would not mobilize fully for war production during regional conflicts. Those features of the current national security environment raise the possibility that DoD, with appropriate planning, could call on private industry to meet both the expected surge in repairs on components during the conflict and the surge in repairs on end items in its aftermath.

Some analyses (including the recent report by DoD's Commission on Roles and Missions of the Armed Forces) suggest that greater use of the private sector for maintenance could result in significant savings. Direct comparisons between the costs of public depots and private repair firms are fraught with difficulties. Nevertheless, the relevant economic theory as well as empirical studies dealing with a wide range of different industries supports the view that private production in a competitive environment is less costly than public production. That assessment is consistent with past and current DoD policies that restrict the role of public depots to the minimum required to ensure a ready and controlled source of maintenance.

DoD's Plans

Under DoD's current plans, the end of the Cold War will not change the share of DoD maintenance that goes to the public sector. Between 1991 and 1999, the department plans to reduce public and private workloads by roughly 30 percent each. Moreover, at least to date, DoD maintenance has shifted away from the private sector. Between 1991 and 1995, the amount of maintenance that DoD allocated to the private sector fell by 34 percent, but maintenance in the public depots fell by only 20 percent. Those declines, which threaten the survival of both public and private producers, intensify the debate over appropriate public and private shares of the work.

Overall, DoD's plans call for a more rapid decline in public than in private workloads between 1995 and 1999. But the department's ability to reduce the share of maintenance allocated to its public depots depends on an uncertain political process. In addi-

tion, the planned drop in the share of maintenance going to the public sector between 1995 and 1999 is not DoD-wide: it stems entirely from trends within the Department of the Navy. In contrast, the Air Force and the Army plan to increase the share of work they allocate to public depots during that time.

The Need to Analyze Public- and Private-Sector Roles

Changes in the national security environment and the battle for survival among maintenance facilities highlight the need for a clear analysis of public and private roles. Yet some observers considered such an analysis overdue even during the Cold War. Historically, each of the services has used the private sector in a somewhat different way. Those differences--which reflect accidents of history more than analysis or conscious decisionmaking--persist today. The Navy is comfortable, for example, in relying on private shipyards to maintain many of its surface ships, including some with combat missions. In contrast, both the Navy and the Air Force depend heavily on public depots for routine overhauls of frontline fighter planes and their engines, arguing that it is too risky to use the private sector to maintain that mission-essential equipment. (But at the same time, the private sector handles a large share of the repairs on components for those combat systems.) The pattern in the Army is mixed: the service maintains tracked vehicles in its own depots but uses the private sector for a large share of its maintenance on helicopters.

Those diverse patterns were possible under the umbrella of a DoD policy that asked the services to keep the capacity of their public depots to the minimum necessary to ensure a ready and controlled source of support but did not clearly set out how the services were to determine that minimum. To some extent, top-down constraints on the mix of public and private maintenance--including legislation limiting the percentage of work done in the private sector to no more than 40 percent--may have substituted for a careful analysis of what public- and private-sector roles should be.

Ideally, DoD would divide depot-level maintenance between the public and private sectors in the post-Cold War era to ensure high-quality, responsive support for U.S. forces, reduce the burden on the taxpayer, and balance fairly the different political interests involved. This study examined three methods that DoD might use to make that allocation.

- o The first, the core method, represents DoD's current policy. It assumes that because of the risk that private contractors might not provide adequate support, public depots must have the capability to maintain the mission-essential equipment required in the Joint Chiefs of Staff's (JCS's) warfighting scenario.
- o The second mechanism, public/private competition, would try to use competition on a level playing field to determine which producer--public or private--was the most cost-effective for each workload. By relying on impersonal market forces, that approach would free DoD and the Congress from having to decide how much maintenance should go to public depots.
- o The third approach requires DoD to analyze workloads and then assign them based on the different kinds of tasks and market conditions for which public, private, and mixed public/private forms of production are best suited. That approach is the most complex, but it might offer the greatest potential for reducing costs while still ensuring responsive, high-quality support.

The DoD Core Concept

DoD's proposed policy for the post-Cold War era specifies that DoD depots must maintain minimum "core" capabilities. Under that policy, core capabilities reflect military necessity and can be identified without comparing public and private costs. According to a May 1994 policy statement by John Deutch, then Deputy Secretary of Defense, "CORE is the capability maintained within organic Defense depots to meet readiness and sustainability requirements of the weapons systems that support the JCS contingency scenario(s). Core depot maintenance capabilities will

comprise only the minimum facilities, equipment, and skilled personnel necessary to ensure a ready and controlled source of required technical competence."

To lend concrete meaning to the core concept, the policy statement also laid out a multistep method for each of the services to use in determining core requirements. That method requires the services to identify the number and types of systems that are essential for the wartime planning scenarios outlined by the JCS, compute depot-level maintenance requirements based on those scenarios, and determine what size labor force in peacetime would provide sufficient capacity for the surge in maintenance needed to meet those requirements.

The Congressional Budget Office finds, however, that DoD's method is too broad to have practical value as a tool for oversight by the Congress or the Office of the Secretary of Defense. In several instances, the services appear to have adapted it to yield answers that are consistent with the views of senior military leaders. For example, when the Army's initial calculations produced estimates of workloads for electronic components that the service considered too low, the Army expanded the list of mission-essential components that it used. Similarly, the service based its core requirement on the workforce it would need to bring its equipment back into readiness within 17 months after the end of the first regional conflict in the JCS scenario. Although that approach might appear arbitrary (the Navy assumes a 24-month period), it yields a core requirement that validates allocating most peacetime maintenance to the public sector.

Had the Army focused on requirements for end-item maintenance during the regional conflicts, or allowed a longer period for repairing its equipment in the aftermath, it would not have been able to justify that allocation. Some people would argue that a desire to validate a large system of public depots is the reason the Army selected its approach. Although the Navy, the Army, and the Air Force applied the core method in different ways, each was able to justify the continued use of public depots for routine overhauls of major platforms in peacetime---even though the repairs needed on those platforms during an actual regional conflict would be limited.

The services' ability to adjust the DoD method to reflect the judgment of military leaders may not be undesirable. Indeed, that judgment may be a more valuable guide than the detailed, mechanical calculations on which the core estimates formally depend. The difficulty for Congressional and other overseers is that the different factors on which those judgments rest are not presented openly for evaluation. Instead, with the core method, aggregate outcomes are presented as if they were the automatic product of a large number of objective calculations, rather than the deliberate result of high-level, subjective decisions that might be legitimately reviewed and contested.

Another fundamental weakness in the core approach stems from the assumption that the military would incur unacceptable risks if it relied on the private sector to maintain the equipment required in the JCS scenario. That assumption leads the services to overlook some important questions. For example, it allows the Army to estimate its core requirement for public depots without examining the ability of the private sector to provide maintenance in the aftermath of a conflict. Moreover, in the case of repairs on components of mission-essential equipment, adhering to that assumption may not be feasible. As components become more reliable and the size of maintenance workloads declines, the services must increasingly balance the risk of relying on contractors for repairs against the cost of duplicating the capabilities of those contractors in public depots. The core method, which neglects costs and assumes that private maintenance is always too risky for mission-essential equipment, provides no guidance about how to make those judgments.

Public/Private Competition

Some analysts question DoD's focus on the risks of contractor support. They suggest that the relative ability of public and private producers to deliver high-quality maintenance at a low cost in peacetime should play a major part in determining how much of the maintenance workload those producers take on in the post-Cold War era.

Currently, the services assign workloads either to a specific public depot or to the private sector, where private firms may compete for them. DoD has used public/private competition in the past but only to identify the supplier that will take on a particular workload for the least cost and not as a tool to determine the overall share of work going to each sector. Yet if cost is the criterion, dividing the various tasks between the two sectors might not require a formal method. DoD could set up a level playing field for competition between public and private facilities and let the invisible hand of market forces resolve the difficult issue of public and private roles.

One of the obstacles to that approach is establishing a level playing field. DoD's *Cost Comparability Handbook*, which guides public depots in making their bids comparable with those of private firms, fails to consider some important factors. For example, a level playing field might be defined as one on which competition will identify the producer (public or private) that would prove least costly to the government as a whole. In that case, public depots should, like private firms, include an allowance for taxes and for a market return on capital in their bids. Another obstacle is DoD's current accounting systems: they are incapable of accurately tracking the costs of specific workloads. In 1994, DoD suspended further public/private bidding on the grounds that its accounting systems did not permit fair competition.

In time, DoD could improve its *Cost Comparability Handbook* and its accounting systems. Those improvements might enable public/private competition to play a useful part in controlling the costs of specific workloads for which competition among private firms is not possible. Even so, the Congressional Budget Office finds a number of reasons, given the fundamental characteristics of public and private enterprises, that public/private competition might not prove a satisfactory way to shape the overall roles of the two sectors.

One problem is that public/private competition can only determine the relative size of the two sectors if DoD and the Congress adopt a hands-off policy that permits workloads to shift based on competitive outcomes. Such a policy is likely, however, only as long as those shifts do not have a significant im-

pact on the level of work at any public depot. Because DoD depots are important local employers, decisions about closing them or reducing their size must be made as much in a political as in an economic forum.

Closely related to that problem is the one posed by so-called soft budget constraints. Managers of public depots who are concerned about maintaining levels of production or employment may have a strong incentive to underbid on contracts. Their depot will not go bankrupt if costs exceed the bid. Instead, taxpayers will cover the costs.

To cite a further difficulty, one of the major advantages of in-house production in public facilities relative to private production is that it avoids the risks and costs associated with the use of contracts. In-house public production is most likely to be cost-effective in the case of maintenance tasks for which contracting would prove difficult or costly. Such tasks would include those for which outputs are ill-defined, quality is difficult to specify or monitor, or requirements change frequently and the need to renegotiate inhibits timeliness. It could be self-defeating to use public/private competitions that require clearly written contracts to allocate those workloads.

A review of the economics literature dealing with the characteristics of public and private producers also prompts questions about the value of public/private competition. Although public production offers other advantages, little conceptual or empirical support exists for the view that, setting aside the costs of contracting, public producers can provide services more cheaply than private producers in competitive markets. In general, public producers labor under many disadvantages in their efforts to hold down costs, including the need to follow federal personnel regulations and to rely on the appropriation process for investment funds. Empirical studies of public and private production in a variety of different areas--ranging from hospitals to airlines--have commonly found that public production was from 20 percent to 40 percent more costly.

Finally, the question of allocating work must be considered both in the short run and over the long term. Although direct comparisons between the costs incurred by public and private maintenance facilities

sometimes indicate that public production is currently less costly for particular workloads, those differences do not necessarily reflect any inherent advantage of public facilities. In the short run, public production may be less costly because DoD has traditionally assigned many of the largest and steadiest depot-level workloads to public facilities. As a result, public depots may now have the most experience and the best (or even the only) facilities for particular kinds of work. To identify appropriate long-run roles for the public and private sectors, DoD will need to look beyond the current structure of the repair industry.

Benefiting from the Strengths of Public, Private, and Mixed Production

Rather than rely on the core method or on public/private competition, DoD could allocate different maintenance workloads to public, private, and mixed modes of production on the basis of each mode's particular strengths. For example, DoD could evaluate and assign workloads by considering whether the characteristics of a task would make contracting risky or costly or would forestall competition in the private sector. Unlike public/private competitions, that approach acknowledges the advantage that in-house production offers as a controlled source that does not require contracts. At the same time, it permits trade-offs between the disadvantages of contracts and the potential advantages of private production (trade-offs that DoD's core method does not allow).

A very simple, general review of DoD's maintenance needs in the post-Cold War era suggests that the above approach, unlike the core method or public/private competition, could lead to a significant increase in the share of work that DoD allocates to the private sector. Neither the risks associated with the contracting process nor the limits on competition in the private sector, which are discussed below, appear to justify a dominant role for public production. Thus, some work could be moved to the private sector. Provided that the tasks DoD moves are those for

which competition in the private sector is possible and for which relatively standard contracts can be used, savings of 20 percent would not be surprising. If, as seems possible, 60 percent of the current public workload meets those criteria, shifting it to the private sector might reasonably be expected to save \$1 billion annually in the long run. To ensure that DoD transferred 60 percent of its public workload, the Congress could limit the percentage of DoD's total workload performed in the public depots to roughly 30 percent.

The Risks of Using Contracts

DoD's core concept implicitly assumes that only public depots can provide the quality and level of responsiveness needed for weapon systems that will be used in the JCS scenario. Although that assumption may be valid for particular systems, it may not be an appropriate generalization. The Navy, for example, has successfully relied on private shipyards to maintain surface ships that would be required in a conflict.

Contracting for maintenance might be particularly difficult for DoD in wartime situations that suddenly impose unique and entirely unforeseeable repair and manufacturing tasks. (Arranging with established contractors to increase their level of output on routine tasks could be less difficult because the cost and technical requirements of the tasks would already be known and because firms that rely on DoD contracts in peacetime would have a strong incentive to be responsive in wartime.) The new tasks that arise may be small, although important in terms of the war effort; taking them on would force the prospective supplier to disrupt its normal commercial operations without promising significant profit. A large system of public depots is one way to provide DoD with the capability to meet those unforeseeable needs. Arguably, however, the core of skills and facilities that DoD would keep in its depots if that capability was the criterion would not be those that DoD requires to perform efficient, routine maintenance on major end items in peacetime.

In regional conflicts, unlike the broader Cold War scenarios, U.S. industry will not mobilize fully for war production. Moreover, in no way can DoD

duplicate in its depots the scope and depth of the manufacturing and repair capabilities that are available in the U.S. economy as a whole. DoD already depends on those resources to repair many specialized components. The most versatile and responsive maintenance system might be one that, in the event of a major regional conflict, would give DoD immediate access to the maintenance capabilities of U.S. industry, including the capabilities of the large defense contractors.

The Potential for Competition

Contracting is most likely to outperform public production if competition exists among private firms. The absence of competition does not preclude a favorable outcome, however, since the bargaining power of the monopolistic provider may be counterbalanced by that of DoD, a single (monopsonistic) buyer. Nonetheless, the lack of competition may reduce the private sector's ability to provide services for the least cost and increase the risk of poor-quality or nonresponsive support.

DoD uses competition to a greater extent in the area of equipment maintenance than for other purchases of goods and services. In 1993, 66 percent of the funds DoD obligated for equipment maintenance were for contracts awarded on a competitive basis, compared with 50 percent for all purchases. In that year, DoD used competition most often for maintenance on airframes, engines, ship repair on the West Coast, and ground vehicles. The types of workloads for which it generally awarded contracts on a sole-source basis included fire-control systems, guided missiles, communications and radar equipment, and electronic components.

A brief review of DoD's workloads for airframes, engines, and ship repair suggests that many of the tasks that DoD keeps in its public depots are similar to ones that are already being handled competitively in the private sector. For example, 50 percent of the workload for fixed-wing airframes in Air Force depots and 36 percent of that workload in Navy depots are for cargo, tanker, surveillance, and patrol planes whose airframes are either directly derived from commercial airframes or have similar characteristics.

For other workloads, competition in the private sector is not yet established, but it could develop if DoD transferred its depot facilities and workloads to private hands. Those workloads are ones that are not closely related to commercial work and might require a significant investment in specialized skills and capital. Yet they are large and steady enough to be attractive to firms that have enduring relationships with DoD. Included in that category might be maintenance on airframes and engines for combat aircraft with large inventories and workloads, as well as routine and refueling overhauls of attack submarines. However, establishing competition and maintaining reliable support for those workloads in the private sector could require explicit DoD involvement in managing the private industrial base for that work.

Some workloads cannot be handled by the private sector on a competitive basis. Among them are tasks that are most efficiently performed by a single producer at any point in time and that also require specialized skills and capital (making it impractical to shift the workload to a new producer following recompetition for a contract). Examples might include work on aircraft with small inventories and unique requirements (like the F-117 fighter), repairs on components in cases in which it would be costly to duplicate the capabilities of the original equipment manufacturer (OEM), and inactivations of nuclear ships. In those areas, DoD cannot reap the full benefits of market solutions. But mixed arrangements--ranging from sole-source contracts with OEMs negotiated in accordance with DoD profit policies (similar, in effect, to a regulated monopoly) to government-owned/contractor-operated facilities--might still offer some advantage over the public depots.

Shifting from Public to Private Production

In the post-Cold War era, DoD may find that allocating a larger share of maintenance to the private sector can reduce its costs and yet still ensure high-quality, responsive support in major regional conflicts. But any effort to implement such a shift must take account of political realities as well. Increased reliance on the private sector may not be politically accept-

able unless people see the process of transition as fair to the employees of government depots and to private-sector firms.

As noted earlier, DoD is limited by law to contracting for no more than 40 percent of its depot-level maintenance. The Congress could reverse that restriction and require DoD to allocate most of its maintenance to the private sector. Although that policy would increase the amount of excess capacity within the public sector, the Congress could use the Base Realignment and Closure Commission process to close any public depots that were no longer needed. Such an approach, however, could be perceived as unfair to public employees; some people might argue that those employees had never had an opportunity to prove that their facilities could compete for DoD's business. As an alternative, DoD might convert many of its operating depots to private ownership. An initial, fixed-price contract for specific workloads might make it attractive to private firms to purchase the depots, although the survival of each facility over the long run would depend on its ability to earn a market rate of return on its capital. The transition to private ownership could be made immediately through a public offering of stock or a private negotiated sale. Or it could involve an interim period in which the depots converted to businesslike operations under the auspices of a government corporation.

Any effort by DoD to rely more on the private sector for its maintenance is likely to impose some costs in the near term. DoD could incur one-time personnel costs of roughly \$70 million for transferring a depot with 3,500 workers to private ownership. Other costs might arise from the need to purchase additional rights to technical data and to consolidate in DoD's remaining public depots any workloads that could not be handled in the private sector. Such a transition would also impose risks: in the short term, the risk of disrupting ongoing repair operations, and in the long run, the risk that comes from DoD's depending on a contractual relationship with its suppliers rather than having direct management authority.

Yet for a number of reasons, DoD might consider increasing the share of its maintenance done in the private sector. One reason is the opportunity for long-run savings, which could be on the order of \$1

billion annually. Cost is not the only potential advantage, however. Competition in the private sector might push providers to improve the quality of the maintenance that DoD receives. Moreover, some people might argue that industrial activities should,

as a matter of principle, be left in the private sector to the maximum extent possible. That same principle underlies DoD's core philosophy. The difference in outcomes stems from different views of DoD's needs and what the private sector can accomplish.