



CONGRESSIONAL BUDGET OFFICE

# Comparing the Costs of Submarine Maintenance at Public and Private Shipyards

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Recently, several Navy attack submarines have been delayed in receiving maintenance at public shipyards. As a result, they have missed deployments or had shortened deployments.

The Navy could send some submarines to private shipyards for overhauls. However, the Navy has stated that it prefers using public shipyards because it believes that they cost less.

CBO was asked by members of the House Armed Services Committee to compare the costs of submarine maintenance at public and private shipyards.

CBO's analysis found that no matter which of the methods it used to calculate costs, **private shipyards were less expensive, on average,** than public shipyards for the most common type of overhaul for attack submarines.

## CBO's analysis:

- Focused on the most common type of overhaul, the Docking Selected Restricted Availability (DSRA), for SSN-688 class submarines;
- Used data from the Navy's Visibility and Management of Operating and Support Costs (VAMOSOC) system for costs, days of labor, and days in shipyard; and
- Adjusted for changes in accounting methods starting in 1999.

CBO made comparisons of the following between public and private shipyards:

- Unadjusted costs (as reported in the Navy's data system),
- Costs adjusted to include comparable overhead activities, and
- Costs estimated using a model that accounts for differences in the age of the submarine and its maintenance plan as well as including comparable overhead.

Those comparisons were made for various time periods.

# Comparisons of DSRA Overhauls of SSN-688s, 1993 to 2017

	<b>Public Shipyards</b>	<b>Private Shipyards</b>
Unadjusted Average Cost (Millions of 2018 dollars) <sup>a</sup>	26.1	20.9
Number of DSRA Overhauls <sup>b</sup>	117	29
Average Days in Shipyard	113	113

Source: Congressional Budget Office, using data from the Navy's Visibility and Management of Operating and Support Costs (VAMOSOC) system.

DSRA = Docking Selected Restricted Availability.

- a. These unadjusted results are biased in two ways: toward the private shipyards being less expensive because they did more overhauls in the early part of the sample period, when the submarines were newer and DSRA's were less expensive; and toward the public shipyards being less expensive because they did not report overhead costs in VAMOSOC after their transition to mission funding starting in 1999.
- b. Five observations were dropped as incomplete, and 12 were corrected with additional information from the Navy Center for Cost Analysis or Naval Sea Systems Command.

The Navy's four shipyards began to switch from working capital funding (WCF) to mission funding in 1999 and stopped reporting overhead costs.

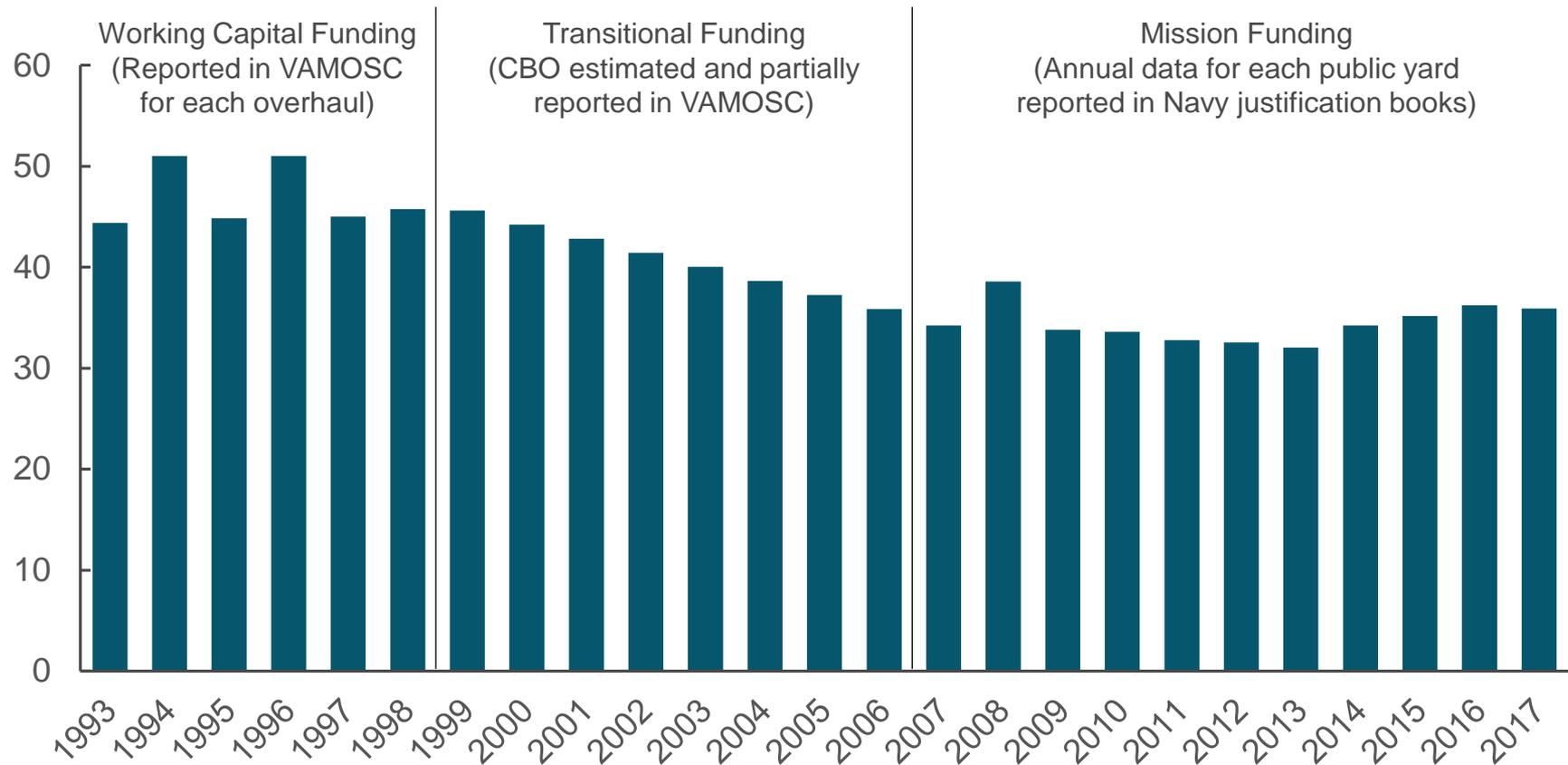
- Under the WCF approach, the shipyards set the rates they charged on the basis of their planned workloads and to cover all of their expected costs for performing that work, including labor and overhead.
- Under mission funding, direct appropriations authorize the Department of Defense to incur obligations for such designated purposes as ship maintenance or modifications.

Starting in 2007, CBO used data about overhead in mission-funded public shipyards reported in Navy justification books.

From 1999 to 2006, CBO estimated those overhead costs to smoothly reflect the transition from working capital funding to mission funding.

# Overhead Costs as a Share of Total Costs at Public Shipyards

Percent

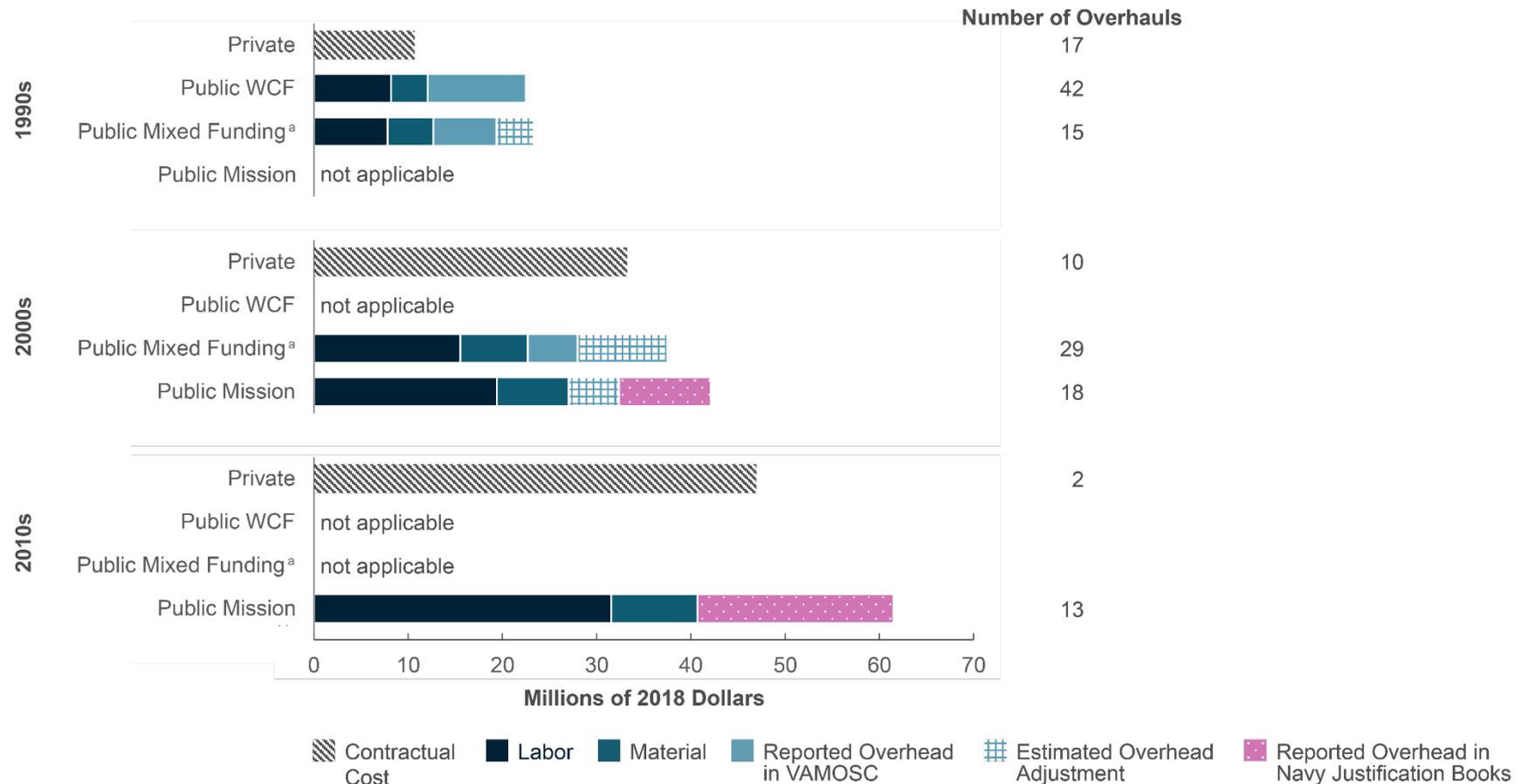


Source: Congressional Budget Office, using data from VAMOSC and Department of the Navy, *Budget Materials, Operation and Maintenance, Navy (OMN) Volume II Data Book, "Naval Shipyards"* (February 2018 and previous years).

VAMOSC = The Navy's Visibility and Management of Operating and Support Costs system.

CBO used its estimates during the period from 1999 to 2006 to adjust for missing or incomplete overhead costs in its analyses of total shipyard costs by decade.

# Comparisons of Average DSRA Costs, Adjusted for Missing or Incomplete Overhead Costs



Source: Congressional Budget Office, using data from VAMOSOC and Department of the Navy, *Budget Materials, Operation and Maintenance, Navy (OMN) Volume II Data Book, "Naval Shipyards"* (February 2018 and previous years).

DSRA = Docking Selected Restricted Availability; VAMOSOC = The Navy's Visibility and Management of Operating and Support Costs system; WCF = working capital funding.

a. Some costs were reported under WCF, and some were reported under mission funding.

After adjusting for missing or incomplete overhead costs, CBO found that the average costs at private shipyards were 38 percent lower than at public shipyards over the 1993–2017 period.

CBO found that cost differences between public and private shipyards narrowed after 1999, but costs remained lower at private shipyards.

# Comparisons of DSRA Overhauls of SSN-688s

	1990s	2000s	2010s	1993 to 2017
<b>Adjusted Average Cost<sup>a</sup></b> (Millions of 2018 dollars)				
Public Shipyards	22.7	39.2	61.4	33.6
Private Shipyards	10.7	33.2	46.9	20.9
Difference (Percent)	-53	-15	-24	-38
<b>Number of DSRA Overhauls</b>				
Public Shipyards	57	47	13	117
Private Shipyards	17	10	2	29
<b>Average Days in Shipyard</b>				
Public Shipyards	88	117	209	113
Private Shipyards	72	127	399	113

Source: Congressional Budget Office, using data from VAMOSC and Department of the Navy, *Budget Materials, Operation and Maintenance, Navy (OMN) Volume II Data Book, "Naval Shipyards"* (February 2018 and previous years).

DSRA = Docking Selected Restricted Availability.

a. Costs are adjusted for missing or incomplete overhead costs.

CBO also compared the costs of overhauls estimated using a model that accounts for differences in the age of the submarine and its maintenance plan as well as including comparable overhead.

The results from that analysis were similar to those presented on the previous slide.

The information in this document is preliminary and is being circulated to stimulate discussion and critical comment as developmental work for analysis for the Congress.

Derek Trunkey composed this document, and Eric J. Labs provided assistance. Christine Bogusz edited the document, and Casey Labrack formatted it. An electronic version is available on CBO's website ([www.cbo.gov/publication/54444](http://www.cbo.gov/publication/54444)).