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Comparison of Features and Costs Per Square
Foot for Judiciary and Naval Systems
Commands Buildings

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General Government Division

B-243684

May 30, 1991

The Honorable Howard Metzenbaum
United States Senate

Dear Senator Metzenbaum:

In your February 7, 1991, letter, you asked us to compare the construction costs of the Judiciary office building, which is being built by the Architect of the Capitol next to Union Station in Washington, D.C., and an office complex that the General Services Administration (GSA) had planned for the Naval Systems Commands in Northern Virginia. The GSA Administrator announced in late March that, because of congressional concerns over possible costs, GSA halted bidding on the Navy project and will restart the process after the government acquires a site for the project.

Your request was prompted by a newspaper article indicating that the Judiciary building will cost about \$100 million for a 1-million-square-foot building, or about \$100 per square foot. By contrast, GSA estimated it would have cost \$273.8 million to build the first 1 million square feet for two office buildings for the Navy, or about \$273 per square foot.

In March 1991, we reported that GSA's \$273.8 million estimate for the first 1 million square feet of occupiable space for the Navy office complex may be too high, and we developed our own estimate of \$257.8 million.¹ However, in this report we used GSA's \$273.8 million estimate for comparison purposes.

On March 19, 1991, we briefed your office on our findings. This briefing report summarizes the information we provided.

Our objective was to compare the estimated construction costs of the Judiciary office building and the Naval Systems Commands office complex. Because the buildings are of different size, we calculated each project's estimated costs per square foot three different ways: (1) total gross space, (2) gross office space, and (3) occupiable office space. Gross square footage incorporates all space in a building, including offices, parking, and mechanical equipment rooms.

¹Navy Office Space: Cost Estimate for Consolidating the Naval Systems Commands May Be High (GAO/GGD-91-61, Mar. 8, 1991).



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Gross office square footage incorporates the space used for offices, restrooms, and mechanical rooms, but excludes parking. Occupiable office space is the area that can actually be used for offices; it excludes parking, restrooms, and mechanical rooms. Because the Architect of the Capitol's estimate includes some corridors as occupiable office space, and GSA's does not, we calculated occupiable office space costs per square foot both ways. A detailed explanation of our objectives, scope, and methodology is given in appendix I.

Results

Although the newspaper data showed that the estimated cost per square foot for the Naval Systems Commands office complex was higher than for the Judiciary building, the calculations we made showed that the Judiciary building will be more costly per square foot than the Navy office complex when all costs are considered. However, the estimated construction costs (not including land and other miscellaneous costs) of the Judiciary building per occupiable square foot were lower than GSA's proposed costs for the Navy buildings, primarily because the Architect of the Capitol uses a different definition of occupiable office square feet. When all costs were included, our analysis showed that (1) the estimated cost per gross square foot is \$180 for the Judiciary building, compared to \$123 for the Navy buildings; (2) the estimated cost per gross square foot of office space is \$261 for the Judiciary building, compared to \$190 for the Navy buildings; and (3) the estimated cost per square foot of occupiable office space is \$335 for the Judiciary building, compared to \$268 for the Navy buildings. Appendix II provides a more detailed breakdown of these figures.

We found that the Judiciary building will be generally more costly than the Navy office complex would have been because the Judiciary building uses more costly land, uses more expensive underground parking, and contains more special features than the conceptual Navy buildings. The Judiciary building is being built on land with an estimated value of \$230 per square foot, compared to \$78 per square foot that GSA estimated for a Navy office site in Northern Virginia.

Because the Judiciary building is located near the Capitol and Union Station and will house various judicial offices, including those for retired Supreme Court members, it is more monumental in design than what was envisioned for the Navy office complex. Also, the Judiciary building will have a granite exterior, a five-story atrium, and primarily private offices. By comparison, the Navy space would have had a pre-cast concrete exterior, a more austere lobby, and primarily open offices.

In addition, the parking garage for the Judiciary building has more space per car than the Navy buildings would have had. The Judiciary building will have 313,000 square feet of space for parking 750 to 890 cars, or between 352 and 417 square feet per car, depending upon how the parking spaces are configured. However, the Navy buildings would have had 754,800 square feet of space for 2,267 cars, or 333 square feet per car. Also, the Judiciary building will have underground parking, which is more costly than the aboveground parking structure that was proposed for the Navy office complex.

We discussed this report with officials from GSA and the Architect of the Capitol. GSA officials said they agreed with our analysis, which showed that building a complex for Navy personnel in Northern Virginia would be less costly per square foot than building a more monumental building for Judiciary personnel in an urban area of Washington.

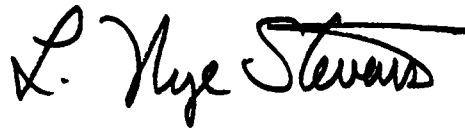
Architect of the Capitol officials also generally agreed with our analysis and provided some minor changes to the report, which we included where appropriate. Architect officials said that cost comparisons between buildings that differ substantially in use, programs, design, and construction can be deceptive. They said our report does not adequately reflect that the cost estimate for the Judiciary building was based largely on awarded contracts, whereas the cost estimate for the Navy buildings was based on conceptual costs. They also questioned why we included land costs in our comparison of the projects. Because of these issues, Architect officials said it would not be possible to conclude from the report's analysis whether either project had excessive costs.

We agree with the Architect officials that the report cannot be used to determine whether either project had excessive costs. Such a determination was not one of our objectives. We also agree that the projects compared have substantial differences, however, we believe our report provides sufficient detail on those differences, including what the cost estimates were based on. Further, we included land costs in our comparisons because GSA's estimate included land, and we wanted the comparison to be as comparable as possible.

As agreed with your office, we will send copies of this report to the Administrator of GSA, the Architect of the Capitol, and the Director of the Office of Management and Budget. Copies will also be sent to interested congressional offices and committees and will be made available to others on request.

The major contributors to this report are listed in appendix III. If you have any questions concerning this report, please call me on (202) 275-8676.

Sincerely yours,

A handwritten signature in black ink that reads "L. Nye Stevens". The signature is written in a cursive style with a prominent horizontal line at the end.

L. Nye Stevens
Director, Government Business
Operations Issues

Objective, Scope, and Methodology

At the request of Senator Howard Metzenbaum, we compared the estimated cost of constructing the Judiciary office building to GSA's cost estimate for the Naval Systems Commands office complex.

To make our cost comparisons, we reviewed GSA's cost estimate for the Navy complex, which was prepared in August 1989 on the basis of preliminary budget data, and the Architect of the Capitol's final project budget for the Judiciary building, which was dated October 1, 1990, and was based on the actual contracts awarded. In addition, to obtain information regarding the differences between the two projects, we interviewed officials at GSA and the Office of the Architect of the Capitol and reviewed documents such as the solicitation for offers, design guidelines, and program requirements.

The estimated costs for the Judiciary building and the Navy office complex were not prepared in a similar fashion. Different cost categories were used, and the estimates were prepared about a year apart. Further, while costs for a parking garage were shown separately in GSA's estimate, parking was included in the building construction costs for the Judiciary building.

To analyze the costs on a comparable basis, we grouped costs into what we considered similar categories. We added design and project management costs to the GSA estimate because these costs were included in the estimate for the Judiciary building. Further, to put the two projects on a comparable time basis, we escalated the GSA estimate to July 1991—the mid-point of construction for the Judiciary building—instead of using the August 1994 midpoint that GSA used. These changes lowered GSA's estimate from \$273.8 million to \$267.5 million. The estimate for the Judiciary building was \$180.8 million, including \$123.8 million in construction-related costs and \$57 million for the value of the land.

In our analysis of land costs, we used the values of land that the Architect of the Capitol and GSA had determined for each project. For the Judiciary building, the Architect of the Capitol based the land value on an appraisal of the property done by GSA in October 1990. For the Navy project, GSA estimated the land cost for a conceptual site in Northern Virginia at \$78 per square foot in its August 1989 estimate.

As you requested, we used GSA's \$273.8 million cost estimate adjusted to \$267.5 million for the Navy project, not our \$257.8 million estimate we

reported in March. We did not verify either GSA or Architect of the Capitol data, but we spent more time reviewing the GSA data in connection with our March 1991 report. (See page 1.)

Because the Judiciary and Navy buildings are different sizes, we calculated each project's estimated cost per square foot three different ways: (1) total gross space, (2) gross office space, and (3) occupiable office space. Gross space includes all space in a building, including offices, parking, and mechanical equipment rooms. Gross office space includes offices, restrooms, and mechanical rooms, but excludes parking. Occupiable space is the area that can be used for offices, and it excludes parking, restrooms, and mechanical rooms. Because the Architect of the Capitol's estimate includes some corridors as occupiable office space and GSA's does not, we calculated occupiable office space per square foot both ways.

We did our work during February and March 1991 in Washington, D.C., in accordance with generally accepted government auditing standards. We discussed our facts and conclusions with officials at GSA and the Architect of the Capitol and included their comments where appropriate in this report.

Comparison of Features and Costs Per Square Foot for Judiciary and Naval Systems Commands Buildings

Table II.1 compares some of the features being constructed in the Judiciary office building to those that were proposed for the Naval Systems Commands office complex. The figure shows that, in terms of gross space, the Navy complex would have been about twice the size of the Judiciary building. The Navy buildings were planned to house over three times as many employees as the Judiciary building.

The Architect of the Capitol designed the Judiciary building to house various judicial offices and to be compatible with the monumental style of the Capitol and adjacent Union Station. In keeping with this style, the Judiciary building will have a granite exterior and a five-story atrium. By contrast, the Navy buildings would have had a precast concrete exterior and a more austere lobby. Private offices will constitute 70 to 75 percent of the office space in the Judiciary building, compared to 30 percent that was proposed for the Navy buildings. Also, the Navy buildings would have had about 2-1/2 times as much parking space as the Judiciary building. Moreover, the Judiciary building is designed to last for 200 years, compared to 100 years for the Navy buildings. GSA officials said that they expected the Navy complex to last longer than 100 years, however, only with continued renovations.

The Navy buildings as planned by GSA would have had 71-percent occupiable space. The Judiciary building will have 78-percent occupiable space using the Architect of the Capitol's definition of occupiable office space, which includes corridors. Using GSA's definition of occupiable space, the Judiciary building will have 72-percent occupiable space. Thus, the Judiciary building has a slightly higher occupiable-to-gross space ratio.

The two projects have different parking designs. GSA envisioned a separate, aboveground parking garage for the Navy, whereas the Judiciary building includes two levels of underground parking.

Further, while GSA's design included space for a cafeteria, fitness center, and child care center, the GSA cost estimate did not incorporate the finishing costs of these areas. By contrast, the Judiciary building estimate included all of the costs of finishing these spaces.

Another difference in the construction of the buildings relates to the heating plants for the buildings. GSA envisioned a separate heating plant for the Navy complex, whereas the Judiciary building will be connected to the U.S. Capitol power plant.

**Appendix II
Comparison of Features and Costs Per Square
Foot for Judiciary and Naval Systems
Commands Buildings**

**Table II.1: Selected Features of Judiciary
Office and Naval Systems Commands
Buildings**

	Judiciary office building	Naval Systems Commands^a
Gross square feet	1,007,000 SF	2,166,300 SF
Office space	694,000 SF	1,411,500 SF
Parking	313,000 SF	754,800 SF
Occupiable office space	540,000 SF	1,000,000 SF
Occupiable to gross ratio	.78 ^b	.71 ^c
Site size	247,924 SF	606,667 SF
Number of occupants	2,400	6,800
SF per occupant	225 SF ^d	147 SF ^e
Construction cost ^f	\$99.2 million	\$187.5 million
Construction cost/occupant	\$41,333 ^g	\$27,576 ^h
Construction type	Monumental	Nonmonumental
Designed life	200 years	100 years
Parking	Basement	Open garage
Number of spaces	750-890	2,267
Exterior finish	Granite	Precast concrete
Private office percent	70-75	30
Entrance area	5-story atrium	7,500 SF lobby
Cafeteria	Fully equipped	Hookups only
Fitness center	Fully equipped	No equipment
Child care center	Fully equipped	No equipment
Heating plant	Capitol power plant	Separate plant
Floor loading	120 pounds/SF	100 pounds/SF
Finished ceiling height	8'6"	9'0"

Note: SF equals square feet.

^aFirst 1 million occupiable square feet.

^b540,000 SF/694,000 SF

^c1,000,000 SF/1,411,500 SF

^d540,000 SF/2,400 employees

^e1,000,000 SF/6,800 employees

^fNot including contingencies, land, design and management, or underwriting costs.

^g\$99.2 million/2,400 employees

^h\$187.5 million/6,800 employees

Source: Data provided by the Architect of the Capitol for the Judiciary building and by GSA for the Navy buildings.

Table II.2 compares the estimated costs per gross square foot for the Judiciary building and the proposed Naval Systems Commands complex. We divided the total estimated cost of each building by the amount of

**Appendix II
Comparison of Features and Costs Per Square
Foot for Judiciary and Naval Systems
Commands Buildings**

gross square feet each contained—1,007,000 square feet for the Judiciary building and 2,166,300 square feet for the Navy complex. The estimated cost per gross square foot of space for the Judiciary building is \$179.57, compared to \$123.49 for the Navy complex, a difference of \$56.08 per square foot.

One reason the Judiciary building costs more per gross square foot is because the land in Washington, D.C., on which it is being constructed, is nearly three times more costly per square foot than GSA's estimated cost of land for the Navy buildings in Northern Virginia. The land for the Judiciary building is valued at \$57 million, or \$229.91 per square foot for 247,924 square feet. However, the land for the Navy buildings was valued at \$47.3 million, or \$78 per square foot for 606,667 square feet.

Table II.2: Gross Square Footage Costs

	Judiciary office building		Naval Systems Commands ^a		Per SF difference
	Total (millions)	Per SF ^b	Total (millions)	Per SF ^c	
Construction	\$99.2	\$98.51	\$187.5 ^d	\$86.56	\$11.95
Contingencies	8.3	8.23	18.9	8.71	(.48)
Other costs ^e	16.3	16.23	13.8	6.37	9.86
Subtotal	\$123.8	\$122.96	\$220.2	\$101.65	\$21.31
Land (est. value)	57.0	229.91 ^f	47.3	78.00 ^g	151.91
Total	\$180.8	\$179.57	\$267.5	\$123.49	\$56.08

Note. The comparisons presented on this table are approximate because the categories used by GSA and the Architect of the Capitol for building costs were not always identical.

SF equals square feet.

^aFirst 1 million occupiable square feet.

^bBased on 1,007,000 SF for all costs, except land.

^cBased on 2,166,300 SF for all costs, except land.

^dGSA's August 1989 estimate inflated at 4 percent per year to July 1991, midpoint of construction for the Judiciary building. We agree with GSA that a 4-percent inflation rate for the period appears reasonable.

^eIncludes design and project management costs for both buildings and underwriting costs for the Judiciary building, due to its different financing arrangement.

^fPer SF land cost is computed by dividing the estimated value, \$57 million, by the SF of land for the site, 247,924.

^gPer SF land cost is computed by dividing the estimated value, \$47.3 million, by the SF of land for the site, 606,667.

Source: Costs were provided by the Architect of the Capitol for the Judiciary building and by GSA for the Naval Systems Commands buildings.

**Appendix II
Comparison of Features and Costs Per Square
Foot for Judiciary and Naval Systems
Commands Buildings**

Table II.3 compares the estimated costs per square foot of gross office space between the Judiciary building and the Naval Systems Commands complex. The estimated cost per square foot of gross office space for the Judiciary building is \$260.55, compared to \$189.52 for the Navy complex, a difference of \$71.03. To determine these costs, we divided the total estimated cost of each building by the amount of gross office space each was estimated to contain—694,000 square feet for the Judiciary building and 1,411,500 square feet for the Navy buildings.

Table II.3: Gross Office Square Footage Costs

	Judiciary office building		Naval Systems Commands ^a		Per SF difference
	Total (millions)	Per SF ^b	Total (millions)	Per SF ^c	
Construction	\$99.2	\$142.94	\$187.5 ^d	\$132.85	\$10.09
Contingencies	8.3	11.94	18.9	13.37	(1.43)
Other costs ^e	16.3	23.54	13.8	9.78	13.76
Subtotal	\$123.8	\$178.42	\$220.2	\$156.00	\$22.42
Land (est. value)	57.0	229.91 ^f	47.3	78.00 ^g	151.91
Total	\$180.8	\$260.55	\$267.5	\$189.52	\$71.03

Note: The comparisons presented on this table are approximate because the categories used by GSA and the Architect of the Capitol for building costs were not always identical.

SF equals square feet.

^aFirst 1 million occupiable square feet.

^bBased on 694,000 SF for all costs, except land.

^cBased on 1,411,500 SF for all costs, except land.

^dGSA's August 1989 estimate inflated at 4 percent per year to July 1991, midpoint of construction for the Judiciary building. We agree with GSA that a 4-percent inflation rate for the period appears reasonable.

^eIncludes design and project management costs for both buildings and underwriting costs for the Judiciary building, due to its different financing arrangement.

^fPer SF land cost is computed by dividing the estimated value, \$57 million, by the SF of land for the site, 247,924.

^gPer SF land cost is computed by dividing the estimated value, \$47.3 million, by the SF of land for the site, 606,667.

Source: Costs were provided by the Architect of the Capitol for the Judiciary building and by GSA for the Naval Systems Commands buildings.

Table II.4 compares the estimated occupiable office square footage costs between the Judiciary building and the Naval Systems Commands office complex. The estimated cost per square foot of occupiable office space is \$334.86 for the Judiciary building and \$267.51 for the Navy complex, a difference of \$67.35.

**Appendix II
Comparison of Features and Costs Per Square
Foot for Judiciary and Naval Systems
Commands Buildings**

Before contingencies, land, and other costs are added, the construction cost per occupiable office square foot for the Judiciary building is \$183.70, compared to \$187.52 for the Navy buildings. The estimated construction cost per square foot of occupiable office space is about \$4 less for the Judiciary building because the Judiciary building has a higher occupiable-to-gross space ratio and because the Architect of the Capitol includes some corridors in their definition of occupiable space, whereas GSA does not.

Calculating the construction costs of the Judiciary building using GSA's definition, that is by not figuring all corridors in as occupiable space, raises the per square foot cost from \$183.70 to \$197.22, as shown in Table II.5. This increase occurs because GSA's definition results in 503,000 occupiable office square feet, as opposed to 540,000 square feet using the Architect's definition. Similarly, using GSA's definition of occupiable space lowers the occupiable-to-gross space ratio for the Judiciary building from .78 to .72.

**Appendix II
Comparison of Features and Costs Per Square
Foot for Judiciary and Naval Systems
Commands Buildings**

Table II.4: Occupiable Office Square Footage Costs

	Judiciary office building		Naval Systems Commands ^a		Per SF difference
	Total (millions)	Per SF ^b	Total (millions)	Per SF ^c	
Construction	\$99.2	\$183.70	\$187.5 ^d	\$187.52	\$(3.82)
Contingencies	8.3	15.34	18.9	18.87	(3.53)
Other costs ^e	16.3	30.26	13.8	13.80	16.46
Subtotal	\$123.8	\$229.30	\$220.2	\$220.19	\$9.11
Land (est. value)	57.0	229.91 ^f	47.3	78.00 ^g	151.91
Total	\$180.8	\$334.86	\$267.5	\$267.51	\$67.35

Note: The comparisons presented on this table are approximate because the categories used by GSA and the Architect of the Capitol for building costs were not always identical.

SF equals square feet.

^aFirst 1 million occupiable square feet.

^bBased on 540,000 SF for all costs, except land.

^cBased on 1,000,000 SF for all costs, except land.

^dGSA's August 1989 estimate inflated at 4 percent per year to July 1991, midpoint of construction for the Judiciary building. We agree with GSA that a 4-percent inflation rate for the period appears reasonable.

^eIncludes design and project management costs for both buildings and underwriting costs for the Judiciary building, due to its different financing arrangement.

^fPer SF land cost is computed by dividing the estimated value, \$57 million, by the SF of land for the site, 247,924.

^gPer SF land cost is computed by dividing the estimated value, \$47.3 million, by the SF of land for the site, 606,667.

Source: Costs were provided by the Architect of the Capitol for the Judiciary building and by GSA for the Naval Systems Commands buildings.

**Appendix II
Comparison of Features and Costs Per Square
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Commands Buildings**

Table II.5: Occupiable Office Square Footage Costs, Excluding Corridors as Occupiable Space for Judiciary Office Building

	Judiciary office building		Naval Systems Commands ^a		Per SF difference
	Total (millions)	Per SF ^b	Total (millions)	Per SF ^c	
Construction	\$99.2	\$197.22	\$187.5 ^d	\$187.52	\$9.70
Contingencies	8.3	16.47	18.9	18.87	(2.40)
Other costs ^e	16.3	32.48	13.8	13.80	18.68
Subtotal	\$123.8	\$246.17	\$220.2	\$220.19	\$25.98
Land (est. value)	57.0	229.91 ^f	47.3	78.00 ^g	151.91
Total	\$180.8	\$359.49	\$267.5	\$267.51	\$91.98

Note: The comparisons presented on this table are approximate because the categories used by GSA and the Architect of the Capitol for building costs were not always identical.

SF equals square feet.

^aFirst 1 million occupiable square feet.

^bBased on 503,000 SF for all costs, except land.

^cBased on 1,000,000 SF for all costs, except land.

^dGSA's August 1989 estimate inflated at 4 percent per year to July 1991, midpoint of construction for the Judiciary building. We agree with GSA that a 4-percent inflation rate for the period appears reasonable.

^eIncludes design and project management costs for both buildings and underwriting costs for the Judiciary building, due to its different financing arrangement.

^fPer SF land cost is computed by dividing the estimated value, \$57 million, by the SF of land for the site, 247,924.

^gPer SF land cost is computed by dividing the estimated value, \$47.3 million, by the SF of land for the site, 606,667.

Source: Costs were provided by the Architect of the Capitol for the Judiciary building and by GSA for the Naval Systems Commands buildings.

Major Contributors to This Report

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