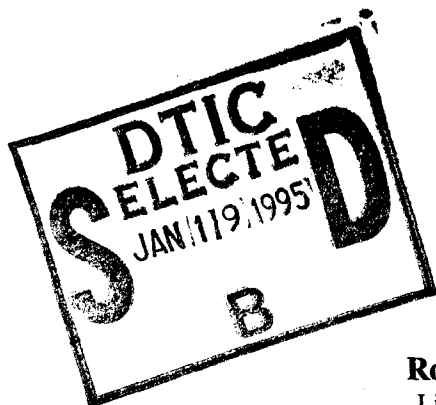


Public Sector Application of Real Estate Analysis and Finance Techniques

A Feasibility Study for Military Family Housing



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Introduction

INTRODUCTION

Combating a worldwide military family housing shortage is a continuing effort in the United States Department of Defense (DoD). Due to these shortages, military families are sometimes forced to live off base in surrounding communities where vacancies are low and rents are high, or to live within low-income, sometimes crime infested, neighborhoods in housing that is inadequate as defined by service component criteria. The primary tenet of DoD housing policy is to rely upon the private sector to provide adequate housing for military personnel and their families, and to acquire housing only where the surrounding community cannot meet service needs (NAVFAC P-1040, 20). Military housing policy requires installations to provide acceptable housing within 30 miles or a one-hour commute (Forgionne, 66). In many cities, locating affordable housing within policy boundaries is a major problem that continuously exacerbates a base's housing inventory deficit problems.

Background

Approximately two-thirds of the 900,000 military families living in the United States (US) receive non-taxable cash housing allowances that they use to rent or purchase housing in the private sector in communities near their respective military installations (Congressional Budget Office (CBO), p. 1). The remaining one-third forfeit their cash allowances, and DoD assigns them to houses and apartments that it provides. DoD is the nation's largest landlord, currently owning or leasing more than 300,000 units of family housing in the US, located mostly on military installations (CBO, p. 2). DoD spends approximately \$4 billion on housing allowances and \$3 billion on its family housing each year for military families living in the US (CBO, p. 1).

In a 1993 study, the Congressional Budget Office (CBO) found that distribution among service components' families who live in DoD housing was dominated by the Army and Air Force, each with 34 percent, compared to the Marine Corps' families with 29 percent followed by only 20 percent of Navy families (CBO, p. 5). The study asserted that the Navy's historical lack of emphasis on family housing may derive from the long deployments of its personnel aboard ships (reducing the visibility of family needs). Another possible explanation may be that, in the past, private-sector housing was more available in seaports than at isolated Army bases (CBO, p.5).

DoD has formally decentralized housing management and each military department operates its own housing program, the Congress and DoD still prescribe the basic ground

rules under which the program operates. The Secretary of the Navy (SECNAV) delegates centralized program management to both Chief of Naval Operations (CNO) and Commandant, Marine Corps (CMC), each of whom issues regulations for field activities. Naval Facilities Engineering Command (NAVFAC) and its Engineering Field Divisions (EFDs) serve as the program managers for CNO, and provide technical guidance and support to Marine Corps activities. An annual survey, conducted per the Office of the Chief of Naval Operations' (OPNAV) guidance, determines the need for family and bachelor housing. As the only vehicle for validating the need for additional housing, a timely and accurate survey will render a base competitive for its share of housing funding (NAVFAC P-1040).

The floor area of a typical military family housing unit assigned to a service member is usually less than 1,400 square-feet (depending on rank and size of family), is ten to thirty years old, and probably has received new occupants every two or three years. The unit will most likely be constructed of what is considered by the housing industry as "standard" grade materials, devoid of carpeting and draperies (shades or blinds are provided), often containing worn, older appliances and fixtures, and may have only one bath for a family of four.

So why then is living on-base desirable? Financially, a service member only forfeits the housing allowance portion of a paycheck. All maintenance and utilities are already paid for by the base housing operations and maintenance funds. This contrasts with off-base housing where rents and utilities must be paid at a rate that is on average 20 percent greater (in many cases much greater) than is received in housing allowances (CBO, p. i).

Many military families prefer to live on base for the intangible qualities that are fundamental to reducing routine stress and enhance everyday living. They benefit from a sense of community and easier access to base recreational, medical, and shopping facilities. For example, raising children in a nearly crime-free environment, where neighbors look out for each other, base security regularly patrols the neighborhood and strictly enforces the fifteen mile-per-hour speed limit. Children can safely play, walk and ride their bicycles (Ivanovsky), and most housing is within a walkable distance to day-care, transit stops, and work. These intangibles become very tangible to the service member who is put on alert and quickly deployed half a world away to a "regional crises." It brings the peace-of-mind knowing that loved-ones are safe, secure and among a supporting network of peers which, in turn, permits the deployed sailors and Marines to focus on the priorities at hand during what could be life and death situations.

Purpose

The Pentagon has estimated that solving the housing shortage would take tens of billions of dollars (Hudson). This amount includes the approximately \$11 billion required to revitalize and replace the unfunded backlog of existing substandard units (CBO, p.2) plus eliminating the current back-log of housing supply deficiencies identified by project documentation. The \$3.4 billion requested for family housing in the 1995 defense bill will barely scratch the surface (Hudson). The purpose of this paper is to approach military housing acquisition programs through the use of real estate development feasibility analysis - when combined with the revolving fund concepts of the Defense Business Operating Funds (DBOF) program - to determine if financial self-sustainability (by using housing allowance benefits for rent payments) is achievable in order to provide non-appropriated funding to plan, design, construct and operate military family housing.

The report will begin by presenting a description of past and present housing policy and programs, the current status of applicable Navy housing initiatives, and explanations of housing acquisition programs. Then a review and discussion of funding processes and budgeting regulations. Alternative analysis will follow which will include alternative financing concept proforma applications to an example case study of a proposed 116-unit Navy family housing project to be constructed at the Naval Technical Training Center (NTTC) Corry Station located in Pensacola, Florida. The concept proformas will utilize and compare rents derived from housing allowance benefits as rent payments to be paid against operating expenses and a debt service for "loan" borrowed from a revolving fund at the Federal Reserve's discount rate. The results will then be compared to a typical military construction funded project proforma to determine if a greater savings in tax dollars can be achieved over the project life-span. Further discussion and impact analysis will consider the new Private Development Limited Partnership program legislation contained in the 1995 Defense authorization bill. The final sections will provide recommendations and conclusions derived from results of the case study analysis and possible applications to other similar facility use types.

Discussion

DISCUSSION

*" We believe that quality housing fosters pride and productivity
among our people and directly affects mission readiness. "*

RADM Jack E. Buffington, CEC, USN
Commander, Naval Facilities Engineering Command
The Military Engineer, May 1994

The Navy is determined to raise the quality of its housing to a standard commensurate with the civilian community (Buffington, 46). In 1993, the Navy initiated the Neighborhoods of Excellence program to renew its commitment to improve the quality of life for all military families (McCay, 3). The program is intended to improve housing quality for over 200,000 single sailors, 250,000 Navy families, and 71,000 Navy houses worldwide. It seeks to create cohesive, well-ordered neighborhoods and overcome a shortage of quality, affordable housing, especially in high cost of living locations, through a combination of information and referral service, military construction (MILCON), and leasing (Buffington; McCay, 4-5). To accomplish this goal, the Navy has increased its funding plan for the next five years over thirty percent from previous levels. This program has also resulted in new family housing construction projects totaling \$500 million that will be awarded this year (Buffington, 44).

In addition to military construction, several methods of acquisition in the United States exist including Section 801 Build-to-Lease Housing, Section 802 Rental Guarantee Housing, which is a long-term domestic program (NAVFAC P-1040; Public Works Management (PWM), 1611-2-11), Section 2667 Land Leases, MILCON Direct Purchase, and a newly authorized program which will enable the Navy to be a limited partner in private sector housing project development ventures.

Congressional Budget Office Study

The Congressional Budget Office Study of Military Family Housing in the United States (September 1993) is an examination of policy options that may reduce the cost of Department of Defense owned family housing in the United States while attempting to protect the quality of life enjoyed by the families of military personnel. The study was prepared in response to a joint request by the Chairman of the Military Personnel and Compensation Subcommittee (now known as the Military Forces and Personnel Subcommittee) and the Chairman of the Subcommittee on Military Installations and Facilities of the House Armed Services Committee. In keeping with the mandate of the Congressional Budget Office (CBO) to

provide objective analysis, the study contains no recommendations. The following is a summary to DoD's analysis and recommendations of the options provided in the CBO Study:

(Excerpts from "Report to Congress on the Congressional Budget Office Study Military Family Housing in the United States," from the Office of the Under Secretary of Defense letters of 31 March 1994 to the Chairman, House of Representatives Committee on Armed Services, and, the Chairman, Senate Committee on Armed Services, pp. 1-3.)

OPTION 1: Maintain the Current Percentage of Families in DoD Housing

DoD owned family housing is normally more costly than paying housing allowances. The Department relies on the local community for housing. However, frequently there is insufficient adequate housing in the community, and DoD must build new housing and maintain and revitalize existing housing. DoD is actively reducing its family housing inventory as part of the Base Realignment and Closure (BRAC) process and by conducting continual analysis of requirements and private sector availability. Arbitrary ceilings on the number of houses would adversely affect the Department's ability to provide safe and decent housing in the most Cost effective manner.

Recommendation: Eliminate unneeded housing, but do not defer Maintenance or revitalization necessary to keep required housing fully adequate.

OPTION 2: Enforce Reliance on the Private Sector

An arbitrary ceiling on the number of military family houses precludes the accurate assessment of housing needs that must be determined base by base. Some local communities can meet most of the military's demand, while in others, military families do not fare well in competition for limited adequate housing.

Recommendation: Do not implement drastic, mandatory reductions in DoD owned family housing; reductions should rely on BRAC, and analysis of requirements and private sector housing availability. Continue to consider family housing requirements on a site specific basis.

OPTION 3: Raise Allowances and Cut Basic Pay

The proposal to cut basic pay is not acceptable. To cut pay would be unfair to those not receiving housing allowances, including single service members and essential members required to live on base. Cutting base pay also reduces retirement benefits and reserve drill pay and would have an adverse impact on retention, recruitment, and readiness.

Recommendation: Oppose reducing basic pay. Restructure housing allowances to more equitably cover community housing costs.

OPTION 4: Reallocate Allowances from Low-Cost to High-Cost Areas

Housing allowances should reflect more accurately the cost of living in the local community. Allowances should be higher in high cost areas than in lower cost areas. The CBO proposal is similar to recommendations of the 7th Quadrennial Review of Military Compensation, which called for increasing the accuracy of housing allowances and combining Basic Allowance for Quarters (BAQ) and Variable Allowance for Quarters (VHA) into one housing allowance.

Recommendation: Restructure housing allowances, including increasing allowances in high cost areas over time.

OPTION 5: Institute a Rental Market Within DoD

The Department has serious concern about the potentially negative impact this option could have on junior personnel, their families, and operational readiness. As noted in the CBO study, military personnel living off base are currently "out-of-pocket" over 20 percent for housing expenses and the trend is toward increasing the out-of-pocket even further. Personnel living on base experience no out-of-pocket housing expenses, and they share in a supportive military family community that is increasingly important to junior personnel and young families. Establishing rents that are high enough to eliminate waiting lists for on base housing would have a negative impact on those currently benefiting from this housing. The impact would be most severe on junior enlisted members who can least afford it. It would also be expensive to establish and operate a complex rental operation.

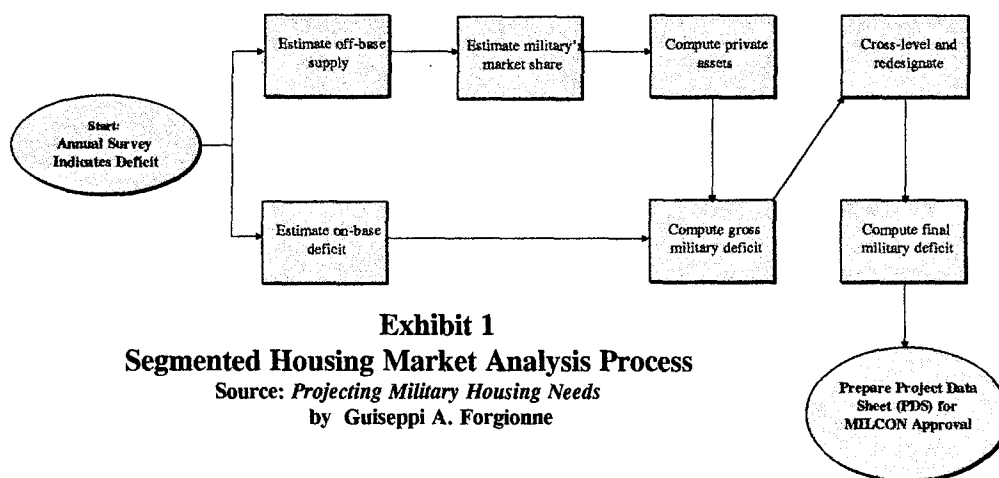
Recommendation: Further review and evaluate this option as part of the study of family housing and compensation policies.

Project Development Process

A Housing Market Area (HMA) analysis initiates the MILCON acquisition planning process in a similar manner in which a *Market Analysis* begins the private sector development process. If the HMA annual housing survey indicates an on-base housing deficit exists, the projected supply of available government housing may be insufficient to meet the demand by personnel expected at a military installation. An on-base housing deficit may force accompanied (with supported family members) and/or unaccompanied personnel to seek acceptable private housing in the local HMA which is the vicinity within a 30 mile radius, or, a one-hour drive of a base (Forgionne, 66). When the HMA supply of private housing is inadequate to eliminate the on-base deficit, the Navy will make a determination for the most effective acquisition alternative which may include entering into agreements to construct or lease housing. The Navy

must then economically justify any housing construction or leasing with a Segmented Housing Market Analysis (SHMA) (Forgionne, 66).

The SHMA involves the process displayed in Exhibit 1. This process requires computing the on-base deficit and estimating the off-base *supply* in the HMA. Next, the Navy's market share of this supply must be estimated and then compute the number of personnel that do not have adequate housing on-base or in the private market (gross military deficit: *demand*). The gross military deficit is reported as a matrix of six (studio/efficiency, one, two, three, four, and five plus: *market standards and differentials*) bedroom counts for personnel in each of the twenty Navy pay-grades (E-1 through E-9, W-1 through W-4, and O-1 through O-10: *consumer profile*) (Forgionne, 66). The Navy will offset deficits with available surpluses, if possible, to minimize construction. The process may involve cross-leveling - bedroom counts within the same grade - and redesignation - different grades within the same bedroom count.



Offsetting results in a final segmented housing deficit (resolution between supply and demand: *market share*) that is the basis for making construction or leasing requests (Ibid.).

New Military Construction projects are implemented with the submission by the base of a Project Data Sheet (PDS). The PDS is forwarded as shown in Exhibit 2. The PDS provides data on the need for the project and information to define project scope and costs. The PDS would be submitted initially along with the supporting Facility Planning Documents from the HMA segmented housing deficit. The purpose of the PDS is to obtain support from the base's major claimant (e.g., Atlantic Fleet, Pacific Fleet, Naval Education and Training, Naval Reserves, etc.) and to identify the Military Construction requirement in the project backlog known as the Military Construction Requirements List (MILCON RL). Projects cannot be

programmed, or placed into a program year until the project is defined in the MILCON RL (Ingalls and Thackston, p. 3).

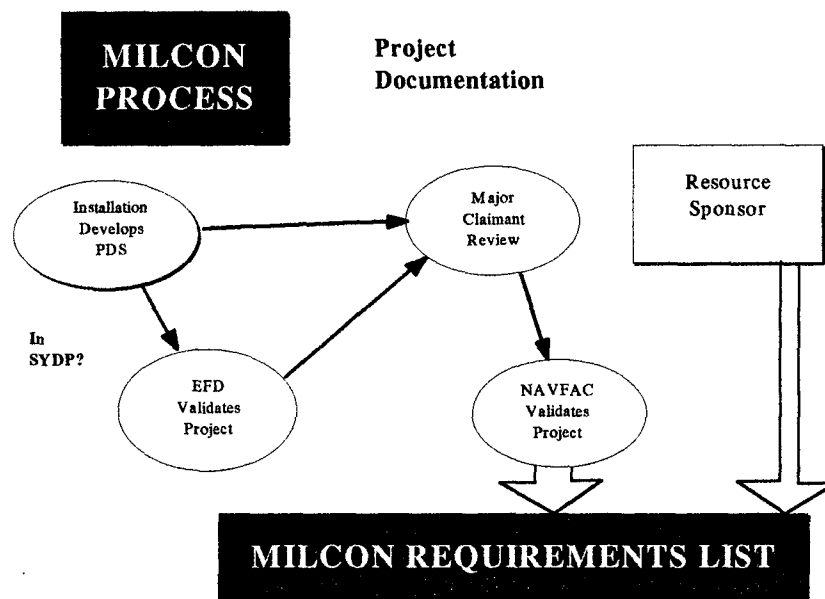


Exhibit 2
MILCON Approval Process

Acquisition Programs

MILCON:

Military Construction (MILCON) programs are developed through the following process: the funding level for a program year is established by CNO through the Navy Programming System, or more specifically the Program Objectives Memorandum (POM), based on fiscal guidance provided by Office of the Secretary of Defense (SECDEF). OPNAV Resource Sponsors (e.g., Air Warfare, Surface Warfare, Submarine Warfare, etc.) are responsible for planning, programming, and budgeting for all appropriations required to support their area of cognizance (Ingalls and Thackston, p. 3). This includes not only Family Housing MILCON, but other appropriations such as other Military Construction, Shipbuilding and Conversion, and Aircraft Procurement. The Resource Sponsor's role is to balance these competing interests for resources to develop a funding program that will provide the appropriate amount of resources required in each area for mission effectiveness (Ingalls and Thackston, p. 3).

Major Claimants are responsible for presenting and supporting their various installations' requirements for MILCON resources to the appropriate Resource Sponsor within OPNAV. Major Claimants direct activities under their cognizance to develop formal project documentation upon Resource Sponsor advisement.

As previously discussed, the installation is responsible for the preparation of all project documentation for MILCON projects (as well as projects funded as Special Projects for major repairs and renovations). After a MILCON project has been approved and supported by a Major Claimant (i.e., recommended for inclusion in the Six Year Defense Plan, SYDP), the Major Claimants will task the installation to prepare and submit additional documentation. At a minimum, an Environmental Assessment, site approval, a detailed cost estimate, and, where applicable, a Preliminary Hazard Analysis and a Quick SIR/PVA (Savings to Investment Ration/Present Value Analysis) will be required (Ingalls and Thackston, p. 3). Major Claimants will also request preparation of the DD Form 1391-Military Construction Data Form, and a facility study for each project. These forms provide more detail than the Project Data Sheets. The facility study provides detailed supporting information for a project, and is the foremost source of information for project justification. The MILCON program is then presented to Congress who approves the program project by project (Congress can add projects to, or take projects from the MILCON program).

The MILCON process, from deficiency identification to acceptance of a completed facility, may take as little as three years, to as long as ten years to plan, cycle through all the approval levels, contract to design and construct.

Direct Purchase Alternative:

The public law allowing construction of housing units, 10 U.S.C. 2824, also permits the acquisition of existing private sector housing instead of using the authorization to build. MILCON funded direct purchase can be a much faster method of acquiring units and getting them on line for waiting military families (McCarty, p. 10).

Planning for MILCON direct purchase is similar to construction planning. First, determine if the geographic area has sufficient existing civilian housing assets or units under construction by civilian contractors to meet deficiency needs. Next, determine if the building owners or developers are interested in selling their projects to the government. To get this information, a forum is conducted for local apartment building owners and developers. At the forum, the Navy's desire to purchase units is expressed, the bedroom composition and other

requirements are explained, and then let the owners and developers ask questions (McCarty, p. 10). As a result, it is determined if MILCON direct purchase is a viable option.

If MILCON direct purchase is viable, a request for proposals (RFP) is developed through close coordination with EFD personnel. Neighborhoods of Excellence standards are incorporated in the proposals.

Wherry/Capehart Housing Programs:

The Wherry/Capehart housing programs of the 1950s and 1960s respectively, allowed the Navy to lease base property for approximately 75 years at very low rates to developers. The developers then agreed to construct, operate and maintain housing for military families charging rents at a rate at or below their Basic Allowance for Quarters (BAQ) cash payment amounts. The developer was responsible for collecting rents and could increase them only after providing adequate cost and profit justification for approval to the Federal Housing Administration. Base housing management offices only had to monitor and control a future occupant waiting list. These programs quickly built an abundance of housing that were needed for cold war defense expansion. The problem was that the developers only provided absolute minimum maintenance often creating slum-like conditions after 10 to 20 years. Most units were then classified as inadequate thereby requiring the developer to charge rental rates at 75 percent of BAQ. The services eventually bought out the developers, made needed repairs and renovations, and added the units to their inventories to maintain and manage.

(The following are excerpts from, "Affordable Housing: The Public-Private Partners," by Douglas M. Brown of Logistics Management Institute (May 1988), as provided by the Navy Family Housing Management Institute, Acquisition and Disposal.):

Section 801 Build-to-Lease Housing:

In some aspects similar to Wherry/Capehart housing, Section 801 housing was mostly different because the Navy secured options on properties off-base for the developers and retained full management responsibilities. Section 801 of the Military Construction Act of 1984 authorizes housing to be financed, built, and operated by private contractors, and leased by the Government to make it more attractive commercially. Contractors finance, design, and build housing and lease it to the Military Departments in entirety for 20 years. The long term of the lease provides the guaranteed return allowing the project to be financed. Reflecting the Congress' desire to sponsor a greater supply of housing for the community rather than specifically for the military, the lease may not be renewed, although DoD may purchase the project at then-prevailing market rates at the end of the lease. The housing is assignable; when it is available, military families must live in it.

The cost of providing such housing is restricted to 95 percent of the MILCON cost for equivalent projects, excluding land value. Technically, Congress might elect not to fund lease payment in any given year; this concern has been alleviated by a DoD

Counsel ruling that the leases may be paid from nonspecified O&M funds if MILCON lease payments are not appropriated. However, the lingering perception of potential risk is reflected in high financing costs and the transfer of significant equity rights to the lender.

Section 801 housing suffers from a major logical flaw. The Office of Management and Budget (OMB) has ruled that DoD may not take or imply ownership of the project without either appropriating all the money in the first year, or paying full market value at the end of the lease. If all the funds must be appropriated in the first year, there is no point in allowing the contractor to take out a mortgage: DoD would pay cash in year one. Otherwise the contractor would take the money, and pocket the "interest charges" as profit. If DoD pays the capital cost in year one, the project is not a Section 801 lease but is a MILCON turnkey project. Appropriating in the first year, therefore, are impossible, even if the budget had room for them.

Section 802 Rental Guarantee Housing:

Section 802 of the Military Construction Act of 1985 authorized housing to be built and operated by a contractor and leased directly to Service members, with the Government guaranteeing a 97 percent occupancy rate. Section 802 programs reduce the need for a Government management force by permitting the rentals to be transacted between the project owner and individual Service members. Viewing the transaction as a plain commercial project rather than a formal procurement, DoD expected savings to arise from such conditions as the use of community building codes rather than DoD specifications and the use of prevailing wage rates rather than those imposed by the Davis-Bacon Act. In fact, these savings were not as great as expected and, in some cases, the Government began to develop traditional RFP documents. (The Davis-Bacon Act, passed in 1931, requires construction companies under Government contracts to use wages determined by the Department of Labor if the contract is in excess of \$2,000.)

To protect itself, the Government defined the guarantee level as requiring payment only of shelter rent - essentially, debt service - for empty units. At the same time, RFPs established rent ceilings at or near the existing housing allowance rates. Allowances that do not meet the rent on existing units with 30-year financing cannot offset the cost of new construction in 15 years. Although the contractor is allowed to rent units to the general public in the absence of Services family demand, the public is unlikely to desire the kind of units that could be built within the cost cap. Section 802 RFPs met with little response and no success.

For construction programs, Section 802 provides a low-margin product. Off-base, it has potential only in low-cost areas; on base, it has potential in high-allowance areas. It has failed where the even-riskier Section 2667 housing has succeeded because of restrictive RFPs that view a Section 802 program as a different way of getting normal MILCON housing. Even in low-cost areas, Section 802 housing requires low-cost, rugged construction techniques, which may mean manufactured (prefabricated) housing, or completely new methods. Dealing with the new processes will call for great flexibility and insight on the part of the DoD contract managers.

Section 2667 Land Leases:

Under 10 USC Section 2667, the Secretary of Defense is authorized to lease nonexcess Government land for up to 50 years to advance national security. When applied to housing, Section 2667 permits a contractor to operate a commercial venture on leased Government land. Its use avoids time limits that are shorter than mortgage lengths. Further, since Section 2667 imposes few ground rules, the contracting officers have been given a relatively free hand in developing suitable RFPs. Commonly, the rent structure is limited to Service member housing allowances, and DoD acceptable housing standards have been specified. Competition in esthetics and quality is encouraged by providing few restraints beyond the minimum cost and minimum standards; as a result, proposals tend to become quality competitions at the specified rent rates.

As with Section 802 housing, the Section 2667 program depends upon the contractor's ability to bring construction costs in line with allowances although the chance for success is increased by allowing secondary income to subsidize construction costs. Section 2667 projects will be most successful in high-allowance areas.

Private Sector Limited Partnership:

Representative Solomon P. Ortiz of Texas, a member of the House Armed Services Committee, inserted a provision in the 1995 defense authorization bill that would allow the Navy to contract with private developers (Hudson). Under Congressman Ortiz's plan, the Navy:

"may enter into a limited partnership with one or more private developers to encourage the construction of housing and accessory structures within commuting distance of the installation. The [Navy] may contribute not less than five percent, but not more than 35 percent, of the development costs under a limited partnership. The [Navy] may also enter into collateral incentive agreements with private developers who enter into a limited partnership to ensure that where appropriate:

(1) a suitable preference will be afforded members of the naval service in the lease or purchase, as the case may be, of a reasonable number of the housing units covered by the limited partnership; or

(2) the rental rates or sale prices, as the case may be, for some or all of such units will be affordable for such members.

...The legislation also requires the Treasury to establish a revolving account known as the "Navy Housing Investment Account" for authorized and appropriated funds to the Account and 'any proceeds received by the [Navy] from the repayment of investments or profits on investments.' Funds are to be 'provided in advance in appropriation Acts...the Account shall be available for contracts, investments, and expenses necessary for the implementation of this section.' The [Navy] cannot ...transfer the right, title, or interest of the United States in any real property under its jurisdiction" (Section 2802, p. 397-399).

The interesting point about this language is the Navy's contribution rate to a development venture - the Navy may contribute between five and 35 percent "...of the

development costs under a limited partnership..." (emphasis added). Development costs is a term commonly used in the development business for the total cost of a project's capital budget which is the total land costs plus total building/construction costs plus indirect development soft costs (e.g., architect/engineer fees, legal fees, developer's fee, etc.). A developer would then attempt to secure a permanent loan commitment for an amount determined by current lending policies that is based on a loan-to-value rate (typically 70-80% of the lesser between appraised value or development costs) or a debt coverage ratio (stabilized net operation income divided by the capitalization rate equals the maximum debt service payment which will determine the maximum loan). The developer must secure any amount of development costs not provided by the loan through equity investors. Each investor contributes a portion of the equity and, in turn, receives a return on investment.

DoD has tried similar programs in the past (e.g., the Wherry/Capehart housing programs above), but abandoned them because of a wide variety of problems. For example, "some developers were wary of entering into contracts with the military because they often proved unprofitable. Other developers failed to maintain the housing adequately - leaving some military families stuck in slum-like conditions" (Hudson).

Financial Budgeting and Funding

MILCON

The annual MILCON program is reviewed by the Comptrollers of the Navy, DoD, and the Office of Management and Budget (OMB) before being submitted to Congress. The Senate Armed Services and the House Appropriations Committees review each project and occasionally visit installation project sites. By the authorization bill, the scope identified in the DD Form 1391 is approved, and through the appropriation bill the funding for each project is established.

The Resource Sponsors also budget and fund collateral equipment related to the initial outfitting of MILCON projects. NAVFAC administers the MILCON program and awards design and construction contracts for execution.

Contracting:

The Navy is authorized to enter into design and construction contracts with the private sector. Contracting authority in this realm is delegated to Naval Facilities Engineering Command who further delegates authority to its Engineering Field Divisions who warrant qualified military and civilian personnel as Contracting Officers to execute appropriate

contracting actions. There are two primary contract forms which the Navy utilizes: Firm Fixed Price and Negotiation.

Firm Fixed Price - Invitation for Bid (IFB). Otherwise known as sealed bidding, a contractor is selected by competition based solely on price. The contract is awarded to the lowest qualified bidder after a public bid opening. The government usually prepares or contracts an architect/engineer firm to prepare the contract plans and specifications. The government is then also responsible for the accuracy and completeness of the contract documents.

Negotiated - Request for Proposal (RFP). The definition of contracting by negotiation is anything other than sealed bidding. Competition for source selection may be based on factors other than price. In the RFP process, a contractor's proposal responds to a performance-based criteria solicitation document that is then evaluated and negotiated and agreed upon, then formally awarded as a contract. Most housing projects are design/build which makes the contractor responsible for design liability and construction quality.

When developing an RFP for a housing project, these basic areas of consideration are included:

- Number of units and bedroom configuration that meets Navy requirements.
- Conformance to unit square footage limitations and requirements.
- Conformance to sprinkler and smoke detector requirements.
- Warranty items and time period.

Military Family Housing:

The entire family housing program is funded by a separate appropriation entitled the Family Housing, Navy (FH,N) appropriation. The FH,N account has specific statutory controls and is for the exclusive use of family housing for both MILCON and Operations and Maintenance. FH,N funds may not be used for other purposes, nor may other funds (such as Operations and Maintenance, Navy - O&MN) supplement the FH,N accounts cognizance. Within the overall family housing O&M account there are separate budget lines which contain the funds that pay for the salaries of the housing staff; services such as police and fire protection; utilities; furnishings; routine maintenance; major repairs; and improvements to the quarters (NAVFAC P-1040).

Defense Business Operating Funds

Revolving funds, including the Defense Business Operating Fund (DBOF), operate like businesses by responding to operating force commander demands for goods and services, such as depot maintenance and transportation, in exchange for reimbursement of total costs incurred in delivering the goods or services (DoD Comptroller: Overview, p. 2; SECDEF Feb 1992; O'Keefe 1992).

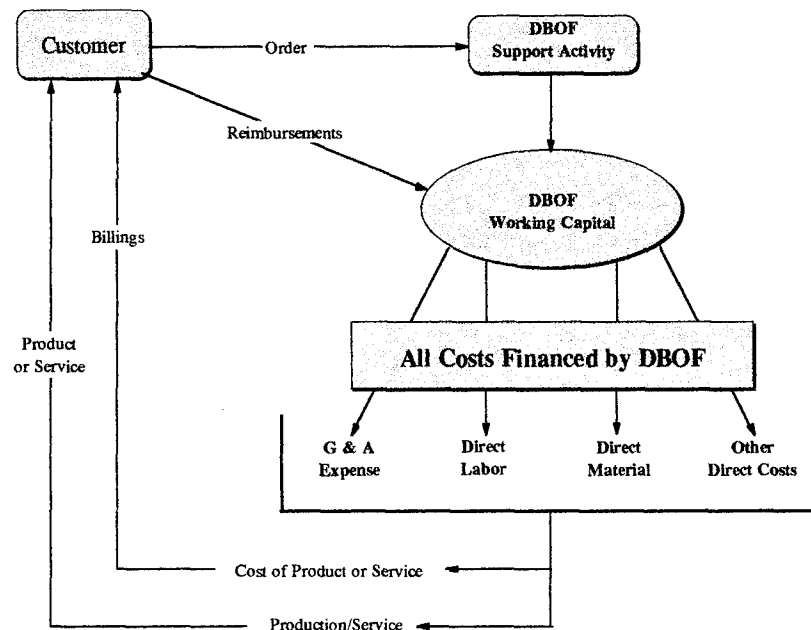


Exhibit 3
DBOF Operation Cycle

The Department of Defense expanded the use of businesslike financial management practices through the establishment of DBOF on October 1, 1991. The Fund builds on revolving fund principles previously used for industrial and commercial-type activities. This Fund provides increased emphasis on the principles that improved cost visibility, business financial systems, and accountability will enhance management of the Defense support establishment and improve the decision making process (SECDEF Feb 1992, p. 2; DoD Comptroller: Overview; O'Keefe 1992).

Revolving funds have been in use by DoD for many years. The Navy had a revolving fund as early as 1878. Authority for the Secretary of Defense to establish

revolving funds is provided by the National Security Act of 1947 (DoD Comptroller: Overview, p. 2).

Customer rates are established on a fiscal year basis to recover the full cost of operations. Adequate resources are budgeted in the customer's appropriated fund accounts to pay the established rates. Once established, rates are stabilized (held constant) for the applicable fiscal year. This "stabilized rate" policy serves to protect appropriated fund customers from unforeseen cost changes. In turn, this policy also reduces disruptive fluctuations in planned work load levels and thereby permits more effective utilization of resources. Rates reflect costs of operations and include gains or losses from prior years (DoD Comptroller: Overview, p. 2; SECDEF Feb 1992; O'Keefe 1992).

The use of DBOF in DoD is hoped to engender a change in the mind-set of many financial and operational managers from "how fast can appropriated funds be obligated and spent" to "how much can the cost of certain DoD goods and services be reduced" (DoD Comptroller: Overview, p. 2).

As a businesslike financial system, DBOF distinguishes between capital and operating costs using standard accounting principles. Capital costs include major repair of facilities, construction, development of automated information systems, procurement of equipment, and any other costs normally capitalized by businesses. The fund separately tracks execution of the capital budget and records depreciation used to finance capital purchases (SECDEF Feb 1992, p. 2; DoD Comptroller: Overview; O'Keefe 1992).

Currently, DBOF does not include projects funded by the Military Construction appropriations. Standard documentation for MILCON projects associated with each of the Fund's business areas are included with that business area's capital budget in order to show the full investment costs associated with each business area. Capital assets are depreciated on a straight line basis: buildings and facilities over 20 years; equipment over ten years; and automated information systems and information technology resources over five years (SECDEF Feb 1992, p. 16).

The use of capital budgeting is essential to capturing the total costs of operating a business area. Capital budgeting provides all levels of management better visibility of the costs that support the operating forces. The costs of capital investments are reflected in Fund operating budgets by including depreciation as an expense (SECDEF Feb 1992, p. 16).

Case Study Project

CASE STUDY PROJECT

Background

The President's Commission on Base Realignment and Closure (BRAC) was chartered on May 3, 1988, by the Secretary of Defense to recommend realignment and closure of military installations within the United States, its commonwealth territories and possessions. On June 28, 1993, the Commission recommended the realignment of the Naval Air Station (NAS) in Memphis, Tennessee and closure of the Naval Training Center (NTC) in San Diego, California. This action became law in September 1993 (Rosser May 1994, p. 33).

All of the naval training activity that has been offered at NAS Memphis, and a portion of the training activity being carried out at NTC San Diego, is being relocated to the Naval Air Station at Pensacola, Florida. NAS Pensacola is expecting a net gain of approximately 4,200 on-board students and an estimated increase in permanent naval support personnel of 2,200 (including dependents). As part of the effort to upgrade existing facilities and construct new facilities necessary to accommodate these activities, several projects have been funded, including the construction of 116 new housing units, the case study project of this paper (Rosser May 1994, p. 33).

In conjunction with BRAC and other base realignment activities, the Navy Public Works Center, will be eventually constructing a total of 300 units of new housing on approximately 80 acres within the Naval Technical Training Center property. This activity is planned to take place in two phases, with the first 116 units having already been funded for construction as the first phase of development. There are also proposed development activities associated with the expansion of the Navy Shopping Mall and the construction of a new Child Development Center adjacent to the existing family housing area. (Rosser May 1994, p. 8).

Site Location

Naval Technical Training Center (NTTC) Corry Station is located in Pensacola, Florida, three miles north of Naval Air Station (NAS) Pensacola. It is an integral part of the diverse group of military installations known as the Pensacola Naval Complex. This Complex is dominated by the 5,500 acre NAS Pensacola, frequently called "Mainside Complex" located on a peninsula about five miles outside of the city.

The city of Pensacola is situated on Pensacola Bay seven miles from the Gulf of Mexico and 15 miles east of the Alabama border (Exhibit 4). It is the county seat of Escambia

County and the leading industrial city in northwestern Florida. This is true in large part because of its strong interdependence with the Pensacola Naval Complex (Rosser May 1994, p. 7).

The Pensacola metropolitan area is a major urban center with an estimated total population of over 344,000 people (Exhibit 5). The population within five miles of the Corry Station is over 107,000, with an average density of 1,363 persons per square mile according to the Pensacola Regional Planning Council. These population densities surrounding Corry Station are relatively high because of the developed commercial, industrial and recreational activities in the immediate area (Rosser May 1994, p. 33).

Corry Station comprises an area of 604 acres. The Naval Technical Training Center (NTTC) at Corry Station occupies 431.5 acres and is the largest host activity at Corry Station. The Navy Public Works Center utilizes 88.5 acres to provide family housing for Navy personnel. The Naval Hospital compound encompasses 42.4 acres, while another 41.7 acres is used for the Navy Shopping Mall. (Rosser May 1994, p. 8).

Site Description

The housing project site is located on the west side of the Perimeter Road that leads to Corry Station and the Commissary/Exchange Shopping Mall (Exhibit 6). The property has approximately 3000 feet of frontage on U.S. Highway 98 and extends west to the Navy hospital fence line. Undeveloped portions of the Station that are utilized for recreational purposes bound the property to the north (Rosser May 1994, p. 15).

Originally, this area was developed as air training fields then abandoned after World War II. Today much of the area is still covered with long stretches of cracking black asphalt. These asphalt runways are constructed with two to three inches of asphaltic concrete underlain by four to nine inches of mixed-in-place sand asphalt. Over the years portions of the abandoned runways have been removed. This was done in order to construct the existing Corry Family Housing as well as other Station improvements. Many areas of the field have been left unchanged and are utilized as hard surfaces for roadways, race tracks and running tracks. A portion of the asphalt on the site near the Hospital is also utilized as a helipad for emergency medical landings by the military.

Approximately 80 acres has been identified for the new family housing. Of this, some 43.5 acres is covered with abandoned runways. The remainder of the site is covered with turf and stands of pine trees. There are no significant structures on the site (Rosser May 1994, p. 15).

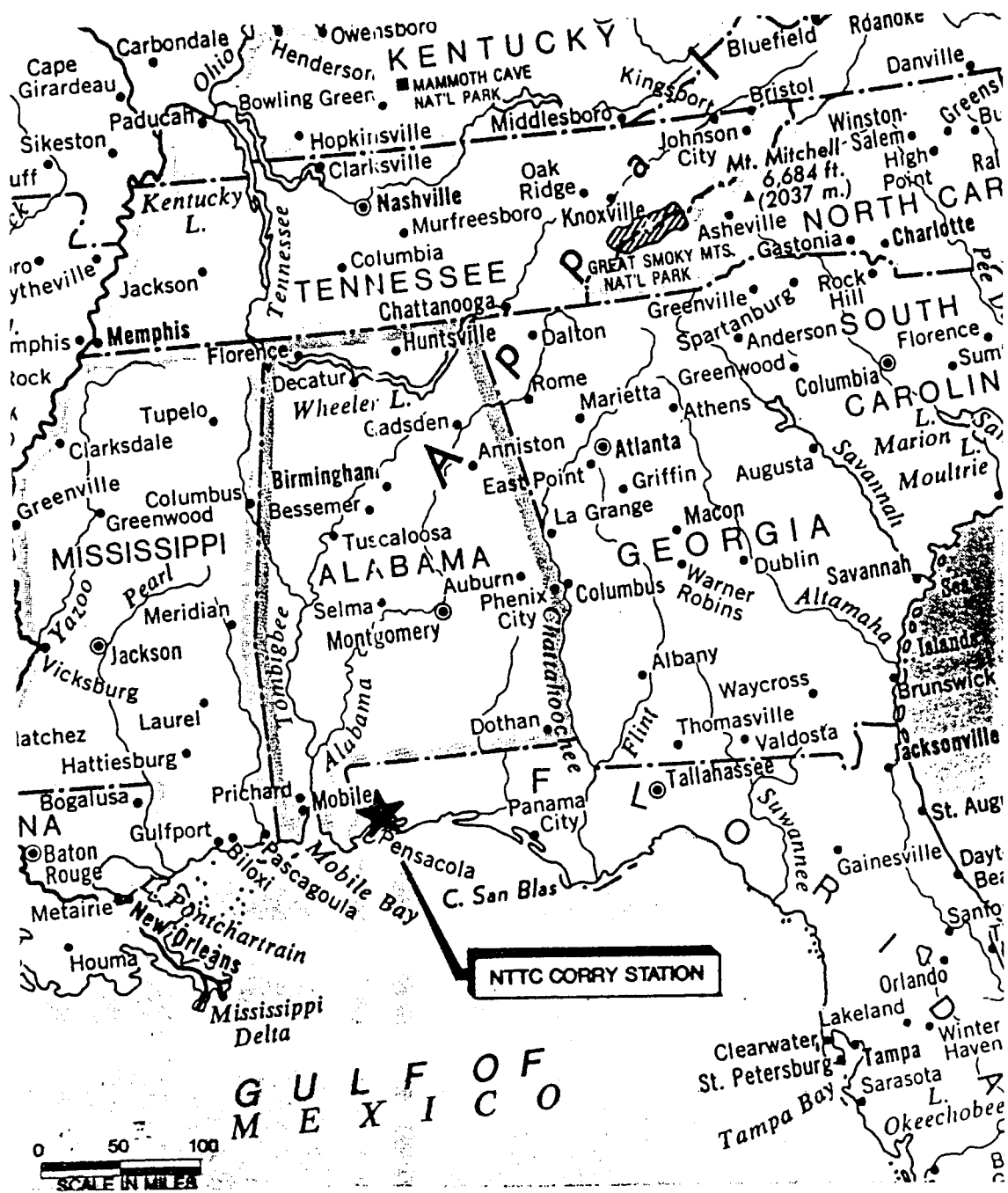


Exhibit 4
Regional Map

Public Sector Application of Real Estate Analysis and Finance Techniques:
A Feasibility Study for Military Family Housing

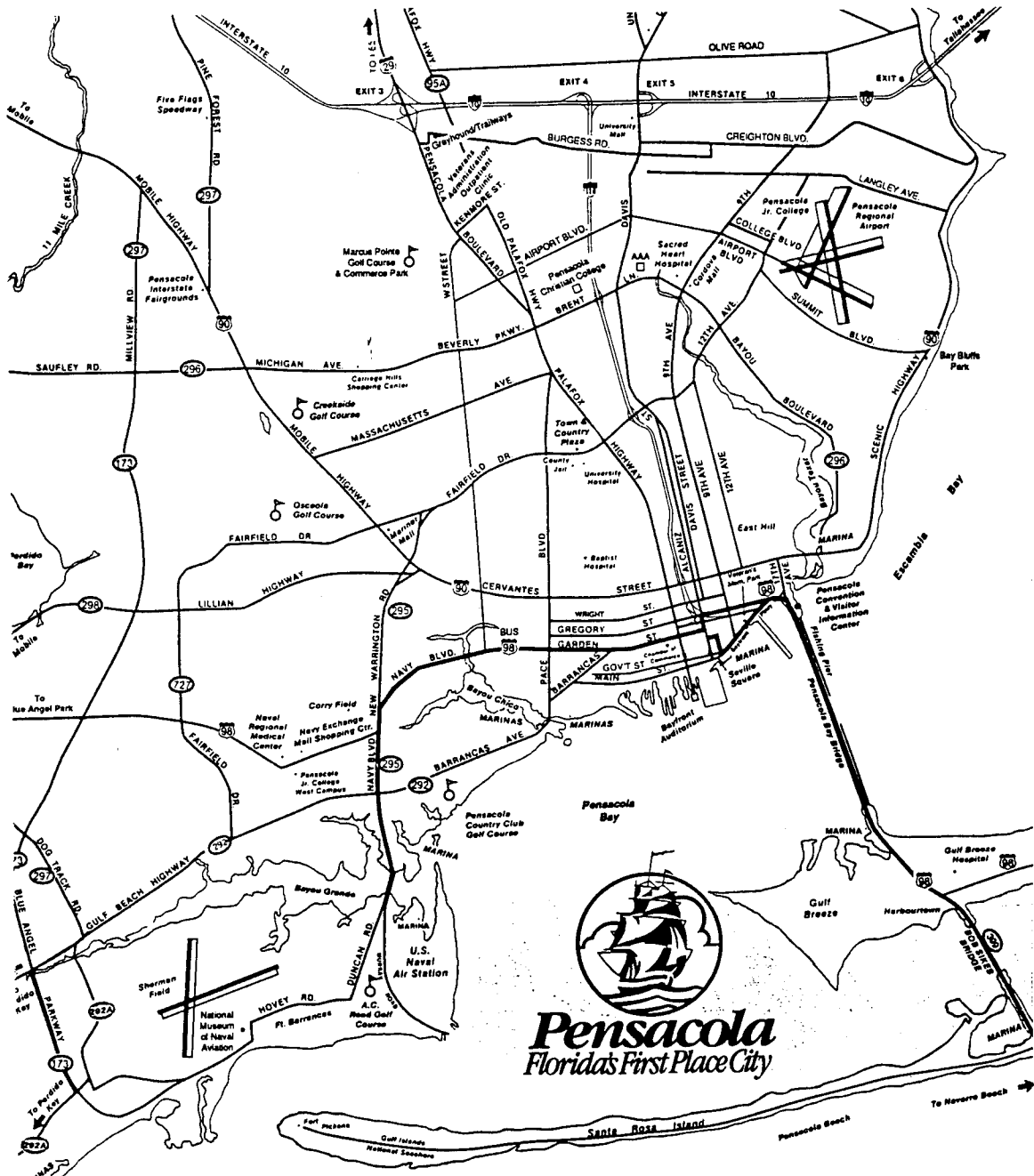


Exhibit 5
Metropolitan Pensacola Map

Public Sector Application of Real Estate Analysis and Finance Techniques:
A Feasibility Study for Military Family Housing

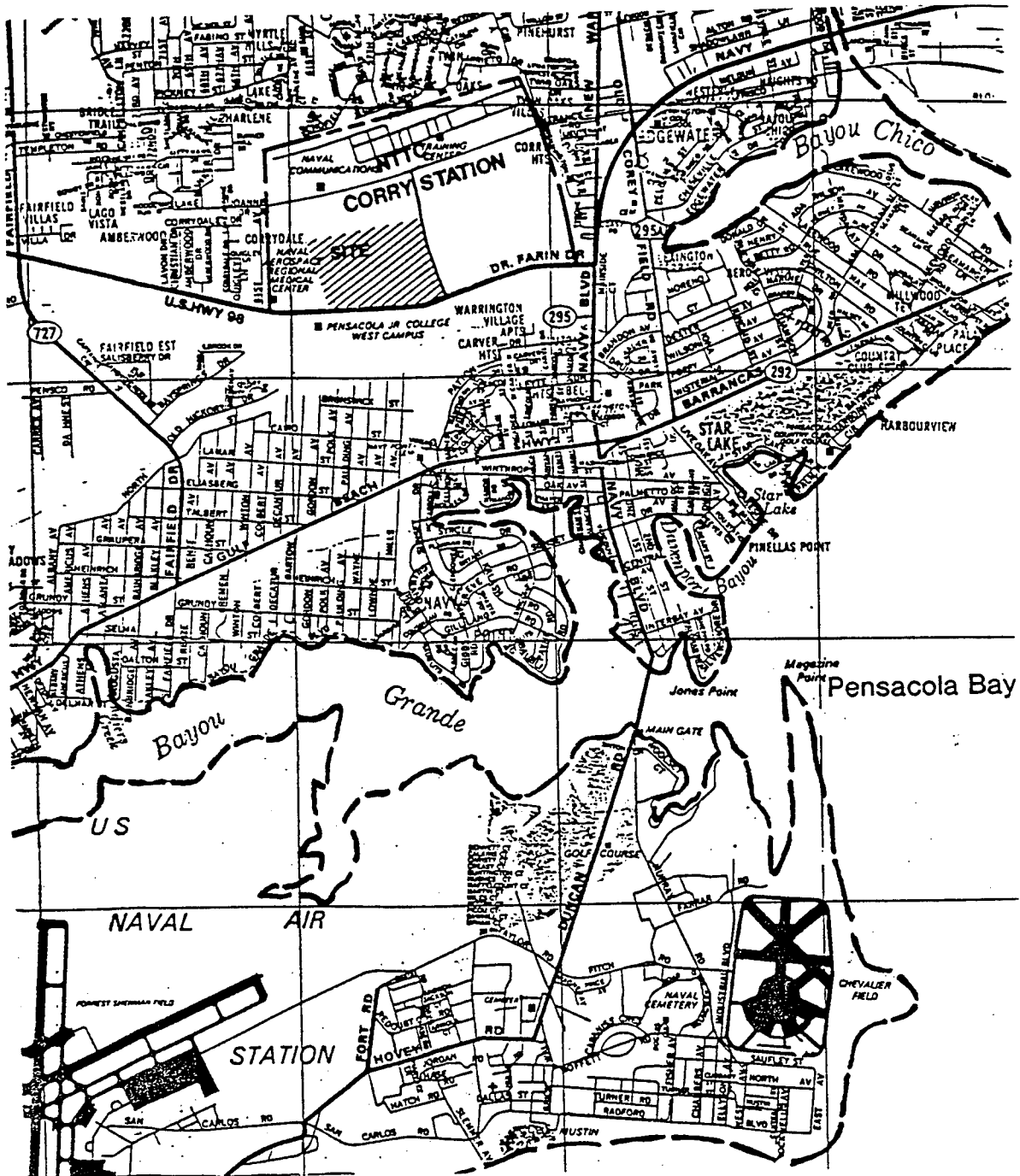


Exhibit 6
Project Site Location

Site utilities were found to be adequate to meet the requirements of the proposed development. Only the sewer system was found to need remedial work in order to provide the necessary capacities (Rosser May 1994, p. 3).

The Department of Growth Management Services in Escambia County handles land use issues around the Corry Station area through the Division of Planning and Zoning. The land adjacent to the Station is zoned for residential use with allowable densities ranging from four to twenty units per acre. The surrounding land uses are generally consistent with this zoning. The only nearby C-1 retail commercial area is located east of the Station and extends in a northerly and southerly direction along Navy Boulevard and New Warrington Road (Rosser May 1994, p. 9).

Project Requirements

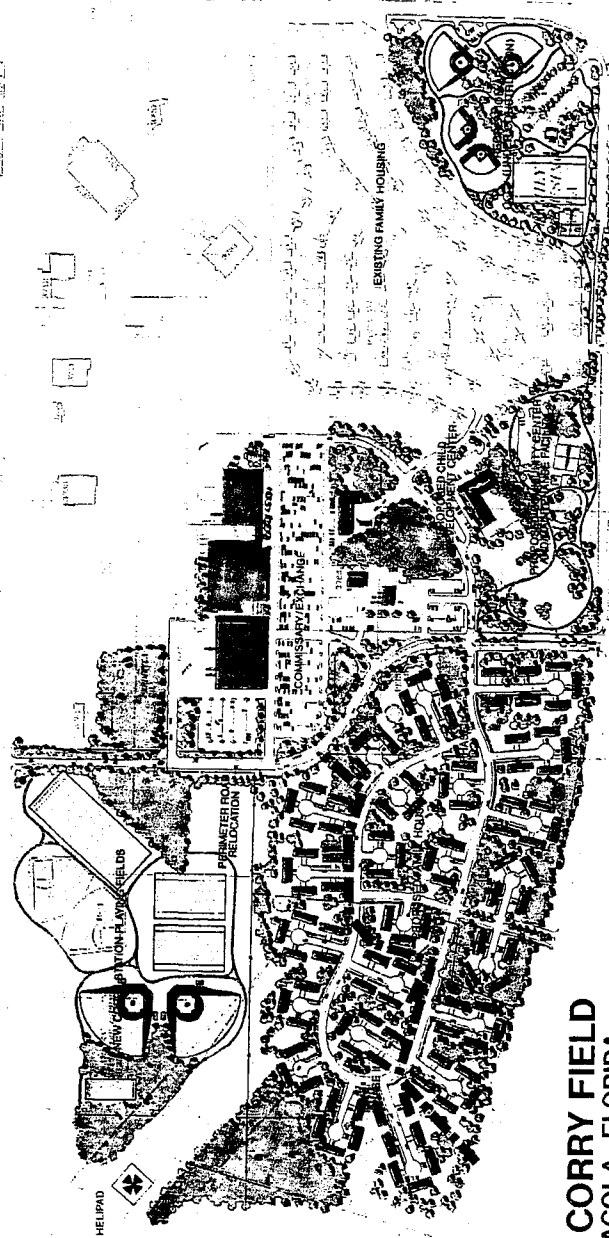
The local housing market was found to be unable to meet the housing requirements for junior enlisted personnel stationed at Pensacola. The Pensacola area has seen net vacancy rates drop to less than two-percent within the last five years, which makes locating adequate affordable housing nearly impossible for Navy enlisted personnel.

If construction of these new units is not provided, a shortage of available housing for junior enlisted personnel will continue to persist and worsen. Adequate, affordable, private sector rentals for junior enlisted personnel were found to be limited in the Pensacola area. Occupant frustration, low morale, vandalism, and associated problems will increase. (DD - 1391C Feb 1994).

Site Planning Principles

The cul-de-sac courtyard concept as the neighborhood layout was initially accepted as the basis for the project layout. This neighborhood layout is shown on the Master Coordination Plan (Exhibit 7), was created in December 1993. Interest was expressed by Southern Engineering Field Division (EFD) and NAS Pensacola Housing personnel in investigating the planning concepts developed for Seaside, a planned community on the Gulf Coast east of Pensacola (Rosser Feb. 1994, p. 4-1).

On February 2, the design team made a day trip to the Planned Community of Seaside. This trip was organized by Southern EFD for the team to see firsthand the planning concepts utilized that make this development unique. Rather than a conventional subdivision development of winding streets, Seaside is a planned development that includes a "Town



NTTC CORRY FIELD
PENSACOLA, FLORIDA

MASTER COORDINATION PLAN

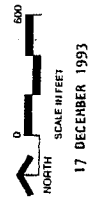


Exhibit 7
Master Coordination Plan

Center" that emphasizes pedestrian circulation while de-emphasizing the importance of the family automobile (Rosser Feb. 1994, p. 5-2).

The team developed a concept for not only the 116 units of new family housing to be built at NTTC Corry Station, but also what is hoped might set the standard for future Navy Family Housing. The design team's efforts that evolved into what was termed "The New Village Concept" (Rosser Feb. 1994, p. 5-2).

Out of the team design session evolved building principles that influence both site planning and architectural design. The Master Coordination Plan for NTTC Corry Field was revised to incorporate these new design principles.

Exhibit 8 is the revised Master Coordination Plan that incorporates the new principles. The central concept was to create a village that places great emphasis on pedestrians, especially children, and spatial experiences they encounter throughout their neighborhood.

At the village center, bisected by the main entry boulevard, is a large village green with outdoor play equipment and seating for adults at benches under trees as well as within the village center pavilion. A bermed amphitheater provides a large exterior gathering space for families in the community. The architecture surrounding the village greens is of greater density than the housing at the further extremities of the village. By placing two-story townhouses in a tight grouping around combined play areas, a sense of containment and security is achieved.

Radiating from the village center is a network of major footpaths which pass through neighborhood lot lots, intersecting minor footpaths which connect the various homes that make up the neighborhood. Within the network of footpaths, various site furniture will provide an opportunity for residents to meet informally.

In the northeast corner of the site, a major footpath axle provides for foot traffic to the commissary where footpaths cross a street surface textured pavement or concrete pavers will encourage drivers to slow their vehicles (Rosser Feb. 1994, p. 4-5).

Architectural Principles

It was important for the architecture to respond to the residential bungalow style of the Pensacola area. Architectural features include: 8/12 slope on gabled metal roof, horizontal shipped siding (vinyl or aluminum), square or vertically proportioned windows, triangular gable end vents, and 1/2 to 3/4 wrap-around porches.

The site plan was zoned so that the different buildings types (two-story townhouses, duplexes, detached) do not occur randomly, but are placed in groupings that reinforce the site

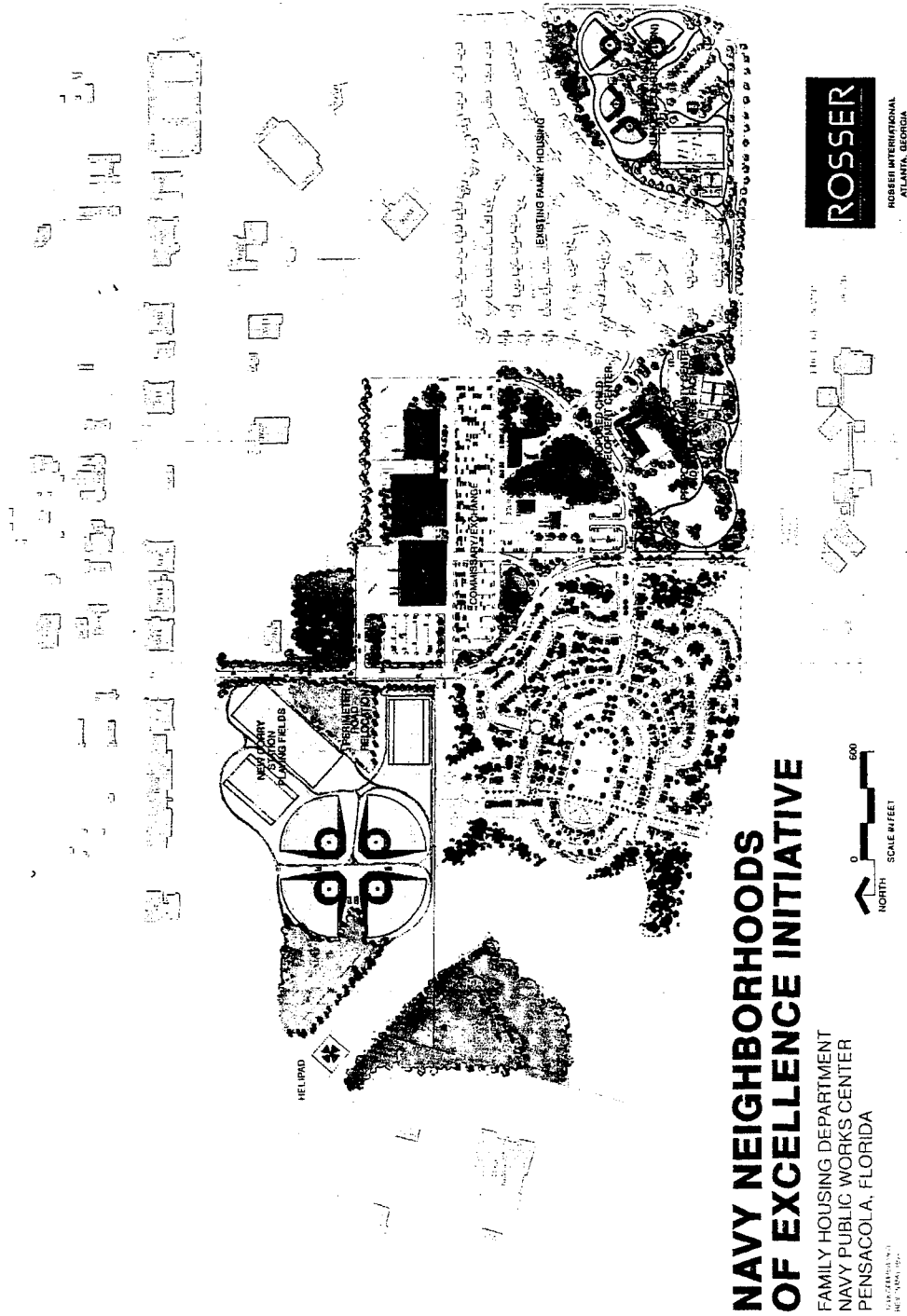


Exhibit 8
Revised Master Coordination Plan

concepts. Each residence will have an enclosed garage, a detached exterior storage shed, a front and rear yard and streetside parking to meet requirements for 2.5 spaces per unit.

Project Description

The project requirement is to construct 116 junior enlisted units to support base closure migration from NAS Memphis. Supporting costs include all site preparation, utility systems, roads, curbs and gutters, recreational areas and landscaping. Recreational facilities include tot-lots, jogging paths, and playing courts/fields in accordance with Neighborhoods of Excellence and applicable military housing design standards.

Exhibit 9 is the DD 1391 *Military Construction Project Data Form* submitted in February 1994. It indicates the project consists of 76 two-bedroom units with a net area of 950 square feet (at 82-percent efficiency) each, at a total cost of \$3,781,000 and 40 three-bedroom units with a net area of 1200 square feet (at 82-percent efficiency) each, at a total cost of \$2,514,000. The project costs also include a 10,020 square foot Community Center for \$633,000 and supporting costs for site improvements, utilities, landscaping and recreational facilities for \$3,472,000. The total estimated project cost of \$11,575,000 also includes a five-percent contingency allowance and six-percent SIOH (Supervision, Inspection and Overhead) fee that goes to the EFD for their construction contract management and administrative services.

Project construction is anticipated to consist of wood-frame or masonry, with stucco or vinyl siding, covered patios, privacy fencing, exterior storage and recreational facilities. The cost estimate also includes special construction features for hurricane and wind bracing and fire sprinkler systems.

Phasing Plan

The Master Plan created for the development of future housing at Corry Field identifies a potential buildout of approximately 300 units. The initial phase of 116 units is based on the BRAC requirement identified for FY 96 at NAS Pensacola. The configuration of the initial phase of housing development has been planned so that the Phase I neighborhood layout presents a "complete" neighborhood design with no dead end streets or the appearance of incomplete neighborhood design. The remaining housing units and street network can be constructed as future fiscal year projects when the requirements arise.

Public Sector Application of Real Estate Analysis and Finance Techniques:

A Feasibility Study for Military Family Housing

1. Component Navy		FY1995 MILITARY CONSTRUCTION PROJECT DATA			2. Date Feb 94 10% Design	
3. Installation and Location Public Works Center Pensacola, FL			4. Project Title Family Housing			
5. Prog Element	6. Cat Code 711	7. Project Num H-406T	Project Cast (\$000) 11575			
9. COST ESTIMATE						
ITEM	UNIT OF MEASURE	QUANTITY	UNIT COST	COST (\$000)		
Family Housing:	EA	116	59.73	6,928		
Buildings	SF	120,200	52.37	(	6,295	)
Community Center	SF	10,020	63.20	(	633	)
Supporting Costs:	LS				3,472	
Paving & Site Improvements				(	1,381	)
Utilities				(	1,886	)
Landscaping				(	98	)
Recreation				(	107	)
Subtotal					10,400	
Contingency (5.0%)					520	
Total Costruction Cost					10,920	
SIOH (6.0%)					655	
Total					11,575	
10. Description of proposed construction						
Multi-family housing units; wood frame or masonry with stucco or vinyl siding, cover patios, privacy fencing, exterior storage and recreational facilities. Special construction feature is for hurricane wind bracing. Fire sprinkler system included in unit prices.						
Grade	Bedroom	Net Area	Project Factor	Unit Cost	No Of Units	(\$000) Total
JEM2	2	950	0.82	63.86	76	3,781
JEM3	3	1200	0.82	63.86	40	2,514
Community Center	0	10020	0.82	77.00	1	633
						6,928

DD-1391

Page: 1

Exhibit 9

DD 1391 Military Construction Project Data Form

**Project Financing
Alternative Analysis**

PROJECT FINANCING ALTERNATIVE ANALYSIS

The following analysis examines three different financing alternatives for the case study project: (1) standard military construction, (2) the use of the Defense Business Operating Funds program to establish Navy Rental Housing, and (3) the new limited partnership program. What follows is a brief discussion about the assumptions that are common to all three alternatives which are necessary to establish commonality for comparison purposes.

Income - Housing Allowances And Rents

DoD provides three kinds of housing allowances: the Basic Allowance For Quarters (BAQ), the Variable Housing Allowance (VHA), and the Overseas Housing Allowance (OHA). Only the BAQ and VHA are paid to families living in the United States and, therefore, OHA will not be further discussed. All military personnel who do not live in DoD housing are eligible for the BAQ. The amount of the allowance depends on rank and whether the individual has dependents. It does not depend on geographic location or the individual's actual expenditures for housing. Annual increases in the rates of the BAQ are tied to increases in basic pay.

Congress enacted the VHA in 1980 to compensate families living in the United States for regional differences in the cost of housing. VHA rates vary by geographic location. They are set for each paygrade and dependency status based on local median expenditures by military personnel for housing.

The Congressional Budget Office calculated the average annual BAQ and VHA for 1992 to be \$5,400 and \$1,800, respectively. The sum of these amounts is \$7,200 as indicated on the Gross Potential Income Estimate (Exhibit 10). These amounts were then inflated at the actual pay rate increase to 1996 (which is estimated) for use in the analysis.

The Actual Housing Allowance table in Exhibit 10, presents the actual housing allowances received by the three enlisted paygrades targeted for the case study project. These amounts are from the official pay chart for fiscal year (FY) 1994 and inflated at the authorized pay increase rates to 1996.

The third table in Exhibit 10 shows the 1994 average monthly rents in the Pensacola housing market. Rent plus utilities for a two-bedroom is \$500 per month, and for a three-bedroom, \$700 per month. The black-shaded columns in the second table indicates that none

of the respective allowances add-up to the \$500 per month rate, let alone the \$700 per month rate. This is an example of the additional 20% out-of-pocket expense discussed earlier.

Gross Potential Income Estimate

CBO 1992 Average Annual...	1992	1993	1994	1995	1996
Percent Authorized Raise:		2.50%	2.20%	2.60%	2.00%
Basic Allowance for Quarters (BAQ):	\$ 5,400	\$ 5,535	\$ 5,657	\$ 5,804	\$ 5,920
Variable Housing Allowance (VHA):	1,800	1,845	1,886	1,935	1,973
Total Housing Annual Allowance:	\$ 7,200	\$ 7,380	\$ 7,542	\$ 7,738	\$ 7,893

Source: Military Family Housing in the United States, Sep. 1993, Congressional Budget Office (CBO), p. 7.

Actual Housing Allowance (FY-94/95)		1994	1995	1996
Percent Authorized Raise:	1994	2.20%	2.60%	2.00%
E-4: Petty Officer Third Class	(Monthly)			
Basic Allowance for Quarters (BAQ):	\$ 361.50	\$ 4,338	\$ 4,451	\$ 4,540
Pensacola Area VHA:	37.43	449	461	470
Total Housing Annual Allowance:	\$ 398.93	\$ 4,787	\$ 4,912	\$ 5,010
E-5: Petty Officer Second Class				
Basic Allowance for Quarters (BAQ):	415.50	4,986	\$ 5,116	\$ 5,218
Pensacola Area VHA:	40.16	482	494	504
Total Housing Annual Allowance:	\$ 455.66	5,468	\$ 5,610	\$ 5,722
E-6: Petty Officer First Class				
Basic Allowance for Quarters (BAQ):	462.30	5,548	\$ 5,692	\$ 5,806
Pensacola Area VHA:	30.73	369	378	386
Total Housing Annual Allowance:	\$ 493.03	5,916	\$ 6,070	\$ 6,192

Source: Navy Times, Jan. 3, 1994, pp. 24A, 34A

1994 Pensacola Private-Sector Average Monthly Rents

Rental Cost (Deposit + Average Monthly Costs)					
	Deposit	Rent	Utilities	Total	Annualized
Efficiency	\$ 150	\$ 300	\$ 75	\$ 375	\$ 4,500
One Bedroom	150	350	75	\$ 425	\$ 5,100
Two Bedroom	200	400	100	\$ 500	\$ 6,000
Three Bedroom	300	500	200	\$ 700	\$ 8,400
Four Bedroom	400	600	300	\$ 900	\$ 10,800

Source: Navy Pensacola 1994, Public Affairs Office, NAS Pensacola, Florida.

Exhibit 10 Income Sources

Operating Expenses

The CBO study found the average annual operating and maintenance (O&M) cost for DoD family housing to be \$6,200 per unit in 1993 (Exhibit 11). The study divided this

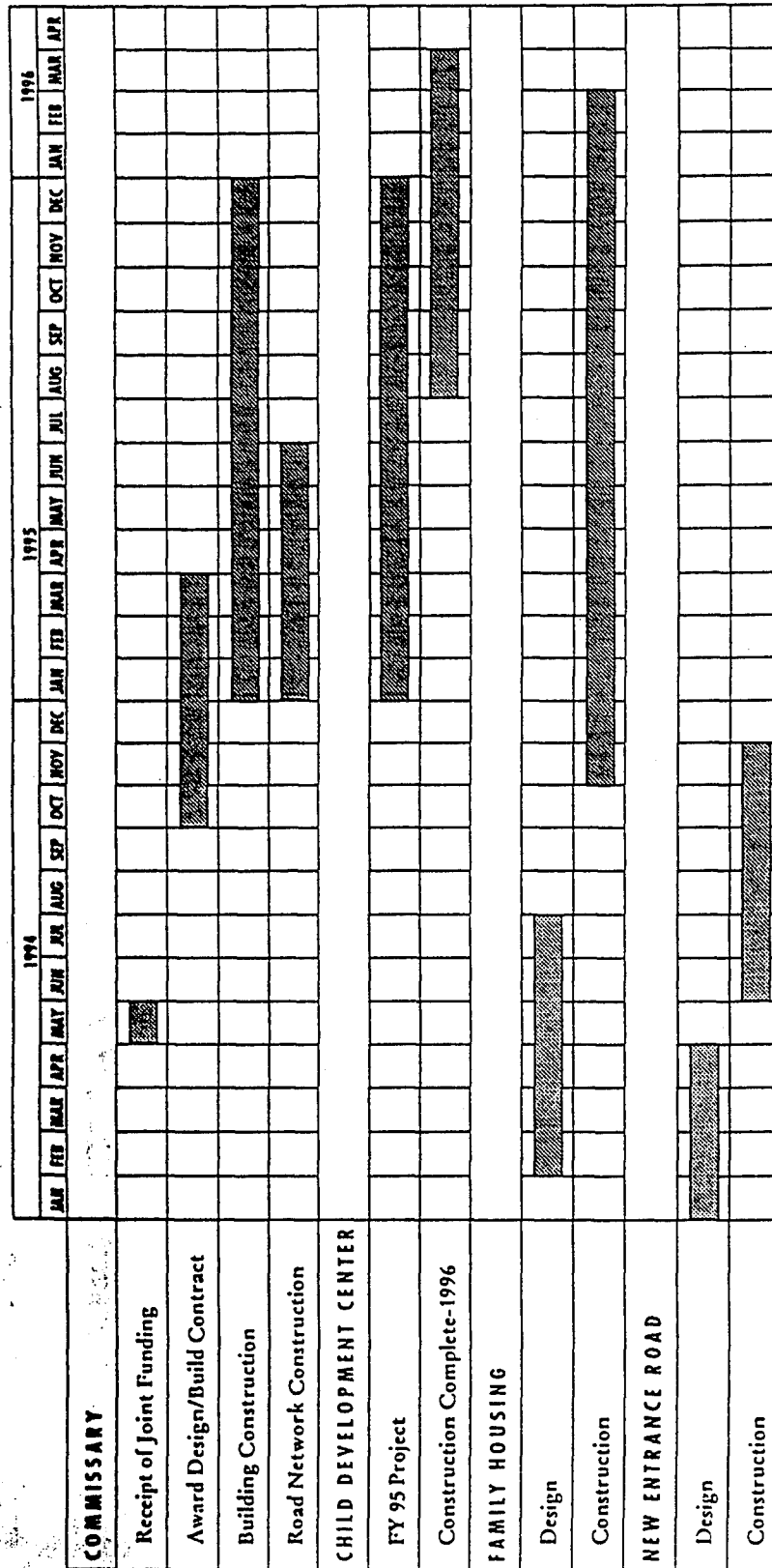
amount between maintenance costs which were 50 percent (\$3,100), utilities at 30 percent (\$1,860; all utilities for base housing are paid through the installation's Housing O&M account), and Management and Services at 20 percent (\$1,240; these costs are for local courtesy moves, referral services and housing office management and overhead). These costs were then inflated at a four percent inflation rate to 1997 for use in the proformas.

DoD Operations and Maintenance Analysis (Per Unit)										
Annual Average Operations And Maintenance (O&M) Cost: \$ 6,200 * (CBO 1993, p. 18.)										
			1993	1994	1995	1996	1997			
Maintenance Costs:	50%		3,100	3,224	3,353	3,487	3,627			
Utilities:	30%		1,860	1,934	2,012	2,092	2,176			
Management & Services:	20%		1,240	1,290	1,341	1,395	1,451			
	100%		\$ 6,200	\$ 6,448	\$ 6,706	\$ 6,974	\$ 7,253			
Inflation Rate:	4%									
Maintenance Costs Analysis:										
Average Maintenance:			\$ 3,100	3,224	3,353	3,487	3,627			
Variance (assume plus or minus):	65%									
Lower Limit During 1997:								\$ 1,269		
Upper Limit During 2052:								\$ 5,984		
Revised Operations and Maintenance Costs:										
Maintenance Costs:	50%							\$ 1,269		
Utilities:	30%							2,176		
Management & Services:	20%							1,451		
	100%							\$ 4,896		
Inputs:										
Regression Formula: $y = a + b(x)$.										
a = \$ 1,269 (1997 Maintenance amount)										
b = 83.188 (Slope = $[5,984/1,269]/[57 \text{ yrs} - \text{first } 2 \text{ yrs}]$)										
x = # of years										
y = Resulting amount										
* (50% is maintenance, 30% are utilities, and 20% are local courtesy moves, referral services and management overhead. Also accounts for a 57 year life span of a DoD unit and certain construction and equipment repairs and replacement costs that would be treated as capital expenses in the private sector.)										
** First Year (1996) is under Construction Contractor Warranty.										
Year:	1994	1995	1996**	1997	1998	1999	2000	2001	2002	2003
Annual Maintenance Cost:***			0	\$ 1,269	1,440	1,525	1,611	1,697	1,783	1,868
*** (in 1997 dollars)										

Exhibit 11 DoD Housing Average O&M Cost Analysis

The maintenance cost was re-examined for the case study. The project construction schedule indicates completion in February 1996 (Exhibit 12). Navy construction contracts contain a clause stipulating a minimum one-year construction and workmanship warranty, and some contracts require recurring periodic maintenance to be conducted by the contractor during that period. Therefore, the Annual Maintenance Cost for 1996 is assumed to be zero. The CBO O&M cost also takes into account the 57-year life-span of the average DoD housing unit. Generally, new housing will last three to five years, perhaps up to ten years, without incurring significant maintenance and repair costs (damage caused by occupants is reimbursed by the

NTIC CORRY STATION, Pensacola, Florida
Schedule for Proposed Development and Construction



These are estimated time schedules as discussed in the On-Site Schematic Design Conference December 8, 1993

Exhibit 12
Project Construction Schedule

occupant). Maintenance costs will slowly begin to increase at around the ten-year point and continue to accelerate until the 35th year, when the first typical revitalization occurs (CBO 1993, p. 18).

For this analysis, the \$3,100 per year average maintenance costs was regressed starting at 35-percent of that cost in year two (1997) of the project's life and increases, using the straight-line method, to 165 percent of the cost in 2052, the project's 57th year. This allows for a 65-percent variance from the average from beginning of project life to the end of the project's life span. The increasing yearly costs are then inflated in the proforma spreadsheets at the indicated expected inflation rates.

Another government expense for military supported family housing is School Impact Aid. CBO found the average cost in 1993 dollars to be \$1,900 per year, per unit. This cost is paid by the Department of Education on behalf of the children of families living in DoD units less the average cost of the payment that would be made if these families lived in private sector housing. Other cost elements will be discussed separately during each proforma's presentation.

Military Construction (MILCON) Proforma

The capital budget in the MILCON proforma (Exhibit 13) was derived from the project's DD-1391 form (Exhibit 10). Total building costs for 76, 950-square-foot (sf) two-bedroom units (JEM2); 40, 1,200-sf three-bedroom (JEM3) Units, and the 10,020-sf Community Center is \$6,928,138. The land cost is zero because the project will be constructed on Navy property. Supporting costs including paving and site improvements, utilities, landscaping and recreational facilities is \$3,472,000. Total building costs are \$79.87 per square foot is \$10,400,138. The total construction cost of \$10,920,145 also includes a five-percent contingency.

Supervision, inspection, and overhead (SIOH), are the government costs incurred for project planning, contract administration and overhead. Other soft costs typically associated with a project such as legal fees, architectural, engineering, etc., are already incorporated into the construction costs during the government construction cost estimating process. SIOH at six percent is \$655,209. Total development cost is \$11,575,354.

The MILCON Proforma is described in terms of savings and costs to the government for easier comparison to the other proformas. Since BAQ/VHA housing allowances are not paid to service members living in government quarters, these amounts are considered as savings to the government. The housing allocation per paygrade was distributed arbitrarily, but

did consider that the lower paygrade personnel would most likely be younger and have smaller families, thus assigned primarily to the two-bedroom units. The higher paygrade personnel would therefore fall into the opposite category - older with larger families qualifying for primarily three-bedroom units. The BAQ/VHA amounts are from Exhibit 10, in 1996 dollars. The total annual savings is calculated to be \$697,888. Vacancy loss is set at three-percent because of the military family housing waiting lists permit immediate occupancy (three percent represents housings turnover periods between occupants when BAQ/VHA is being paid to the members).

Total savings for 1996 is \$564,120 (project completion is scheduled for February allowing only ten months of BAQ/VHA savings). Savings for 1997 is \$715,327, the full 1996 figure plus a two-and-one-half-percent increase for an authorized pay increase. An average pay increase of two and one-half percent is assumed for all future projections and is based on pay increases from the past ten years.

The Total Costs included the Total Development Cost of the project divided over a 14 month period - 12 months in 1995 and two months in 1996. Total Costs, factoring in Total Savings, for 1995, 1996 and 1997 are \$9,921,732, \$1,697,297, and \$211,900, respectively.

The MILCON Proforma's Discounted Cash Flow Analysis assumes, as discussed earlier, a three-percent annual vacancy loss rate to Savings, Annual BAQ/VHA Savings increase at a rate of two-and-one-half-percent, and Annual Expenses increase at the inflation rate of four-percent.

The analysis displays that the Costs outweigh the Savings throughout the 57 year life-span of the project. The Net Present Value (NPV) for the first 30 years of the project is negative \$24,788,593 based on a four-percent discount rate. This amount represents the sum of the total anticipated savings and costs for the first 30 years (to 2025) of the project in 1996 dollars.

Public Sector Application of Real Estate Analysis and Finance Techniques:
A Feasibility Study for Military Family Housing

Capital Budget - 116 Family Housing Units, NTTC Corry Station: MILCON

Building Type	Unit Area	Proj. Factor	Unit Cost	Unit Count	Total Area	Cost
JEM2	950	0.82	\$ 52.37	76	72,200	\$ 3,781,114
JEM3	1,200	0.82	52.37	40	48,000	2,513,760
Community Center	10,020	0.82	63.20	1	10,020	633,264
Building Cost						\$ 6,928,138
Building Size (Square Feet)					130,220	

Land Cost	\$ -
Site (Acres)	80.000
Site (Number of Square Feet)	3,484,800

(Navy Property)

Construction Costs	
Supporting Costs:	
Paving & Site Improvements:	\$ 1,381,000
Utilities:	1,886,000
Landscaping:	98,000
Recreation:	107,000
Total Supporting Costs:	\$ 3,472,000
Supporting Costs per S.F.	\$ 26.66
Building Cost per S.F.	53.20
Total Construction Cost Per S.F.:	\$ 79.87
Total Building Costs:	\$ 10,400,138
Contingency (5%)	\$ 520,007
Total Construction Cost:	\$ 10,920,145

Soft Costs	
SIOH (6%)	\$ 655,209
Total Soft Costs	\$ 655,209

(Supervision, Inspection, and Overhead)

Land & Acq Cost	\$ -
Hard Costs	10,920,145
Soft Cost	655,209
Total Development Cost:	\$ 11,575,354

VHA/BAQ Housing Allowance Savings

Housing Allocation Per Paygrade	Unit Area (S.F.)	Unit Count	Units Assigned	BAQ+VAH Unit/Yr.	Total Annual Savings
E-4					
JEM2 (40%)	950	76	30	\$ 5,010	\$ 152,304
JEM3 (10%)	1,200	40	4	5,010	20,040
E-5					
JEM2 (45%)	950	76	34	6,580	225,046
JEM3 (45%)	1,200	40	18	6,580	118,445
E-6					
JEM2 (15%)	950	76	11	6,192	70,589
JEM3 (45%)	1,200	40	18	6,192	111,456
Total Annual Savings					\$ 697,880

Exhibit 13 (page 1 of 2)
MILCON Proforma

**Public Sector Application of Real Estate Analysis and Finance Techniques:
A Feasibility Study for Military Family Housing**

Operational & Maintenance (O&M) Expenses (in 1996 Dollars)											
Management Services and Utilities:											
	Unit	Mgt & Svcs/ Utilities/ Costs	Utilities/ Unit/Yr.	Total Annual Costs							
JEM2	76	\$ 1,451	\$ 2,092	\$ 269,258							
JEM3	40	1,451	3,854	212,176							
Total Annual O & M Exp:				\$ 481,435							
Annual Maintenance Regression (in 1997 Dollars)											
	1983**	1987	1988	1989	1990	2000	2005	2015	2025	2035	2045
Annual Maintenance Cost per Unit:		\$ 1,269	1,440	1,523	1,611	2,040	2,897	3,754	4,611	5,469	6,069
Total Annual:		\$ 147,238	\$ 167,009	\$ 176,933	\$ 186,896	\$ 236,613	\$ 336,046	\$ 435,480	\$ 534,914	\$ 634,348	\$ 703,951
School Impact Aid Expenses											
	1996/	1996	1997/								
	Unit	x 116 units	Unit	x116 Units							
School Impact Aid ¹	\$ (1,781)	\$ (206,600)	\$ (2,223)	\$ (257,837)							
Savings											
	1995	1996	1997								
VIA/BAQ Housing Allowance	\$ (9,921,732)	\$ (1,653,622)	\$ (500,692)								
Less Vacancy Loss (3.00%)	0	(401,195)	(147,238)								
Annual Maint.	0	0	(237,837)								
School Impact Aid:	\$ (9,921,732)	\$ (2,261,417)	\$ (905,767)								
Total Costs:	\$ (9,921,732)	\$ (2,261,417)	\$ (905,767)								
Total (Cost) or Savings:	\$ (9,921,732)	\$ (1,697,297)	\$ (211,900)								
Inputs:											
	1995	1996	1997	1998	1999	2000	2005	2015	2025	2035	2045
Vacancy Loss to Savings	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Annual BAO/VHA Savings Increase	N/A	N/A	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Annual Expense Increase due to Inflation	N/A	N/A	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Present Value Factor	0.961339462	0.924556213	0.888996359	0.854804191	0.821927107	0.795564169	0.765386946	0.730818668	0.690890045	0.64712615	0.106930023
Discounted Cash Flow Analysis											
	1995	1996	1997	1998	1999	2000	2005	2015	2025	2035	2045
Potential Gross BAO/VHA Savings	0	\$ 581,567	\$ 596,106	\$ 611,009	\$ 626,284	\$ 641,941	\$ 691,300	\$ 782,143	\$ 884,923	\$ 1,001,209	\$ 1,132,776
Less: Vac. Loss to Savings	0	(17,447)	(17,883)	(18,330)	(18,789)	(19,248)	(20,729)	(23,464)	(26,548)	(30,036)	(33,983)
Effective Gross BAO/VHA Savings	0	\$ 564,120	\$ 578,223	\$ 592,679	\$ 607,496	\$ 622,693	\$ 670,561	\$ 758,679	\$ 858,375	\$ 971,173	\$ 1,098,793
Costs:											
Completed Project:	\$ (9,921,732)	\$ (1,653,622)	\$ (500,692)	\$ (520,720)	\$ (541,548)	\$ (563,210)	\$ (685,232)	\$ (1,014,310)	\$ (1,501,427)	\$ (2,222,478)	\$ (3,289,811)
Annual Maint. & Utilities Expenses:	0	(401,195)	(147,238)	(173,690)	(184,031)	(194,372)	(246,077)	(349,488)	(452,899)	(556,310)	(659,722)
School Impact Aid	0	(206,600)	(237,837)	(268,150)	(278,876)	(290,031)	(352,868)	(522,330)	(773,176)	(1,144,490)	(1,694,124)
Total (Cost) or Savings:	\$ (9,921,732)	\$ (1,697,297)	\$ (237,544)	\$ (369,481)	\$ (396,960)	\$ (424,930)	\$ (613,615)	\$ (1,127,450)	\$ (1,869,127)	\$ (2,952,105)	\$ (4,544,863)
Discount Rate***											
Net Present Value (Qlyra.):											

**Exhibit 13 (Page 2 of 2)
MILCON Proforma**

* Source: CBO 1993, p.18. Average Annual Long-Run Costs of DoD Housing in 1996 dollars at 4% annual inflation beginning 1993.
 ** Project is scheduled for completion and acceptance in March 1996.
 *** First year cost are therefore prorated to 9 mos.
 **** The charge on loans to depository institutions by the Federal Reserve (Gov't's cost of money).
 Source: The Wall Street Journal, Monday, Oct 31, 1994, p. C19.

Defense Business Operating Funds (DBOF) Proforma: DoD Housing Rental Market

This alternative directly addresses the CBO study's Option Five: Institute A Rental Market Within DoD. This alternative assumes that all military families would get housing allowances, families who choose to live in military housing would pay rent and utilities and that rents for each type of house at each installation would be set to eliminate waiting lists and vacancies (rent would be set at prevailing market rates for comparable housing in the housing market area). This approach may reduce housing inventory and save money, will require the use of on-base housing to be guided by principles of supply and demand and should reduce or eliminate the current long waiting lists. The level of effort required to implement this approach would include: determining appropriate rental charges, significant lead time and funding for transition, e.g., legislation would be needed to pay housing allowances to members occupying military housing, set-up of a rental collection system, utility meter installation, and authorization for DBOF funded family housing military construction.

The Defense Business Operating Funds (DBOF) program could effectively be utilized for this approach to redirect the potentially self-sustaining features in developing and operating housing projects on bases and to establish a non-appropriated fund organization. Exhibit 14 demonstrates the use of a revolving fund housing account for operations, maintenance and project construction which would function in a similar manner in which private sector commercial residential operators conduct business. The process is fairly straight-forward and begins at a base housing office.

For new construction, the base housing office would work closely with the public works planners to develop project documentation validating the requirement for additional housing, quantity and location. Once the project is authorized, a permanent construction loan agreement would be established between the Navy Housing DBOF working capital account and the base comptroller. The agreement would be a hybrid combination of a construction loan and permanent mortgage (little risk involved - the government will be able to pay itself back). Loan funds would be transferred to the cognizant NAVFAC activities (EFD/EFA) for contracting for design and construction. The base's resident officer in charge of construction (ROICC) would provide contract quality assurance and administration until final acceptance of the completed units by the Housing Office.

The Housing Office would then make housing assignments to service members and begin collecting monthly rents either through direct pay allotments or cash payment. Rents would be deposited into the base's housing DBOF account and used to pay monthly

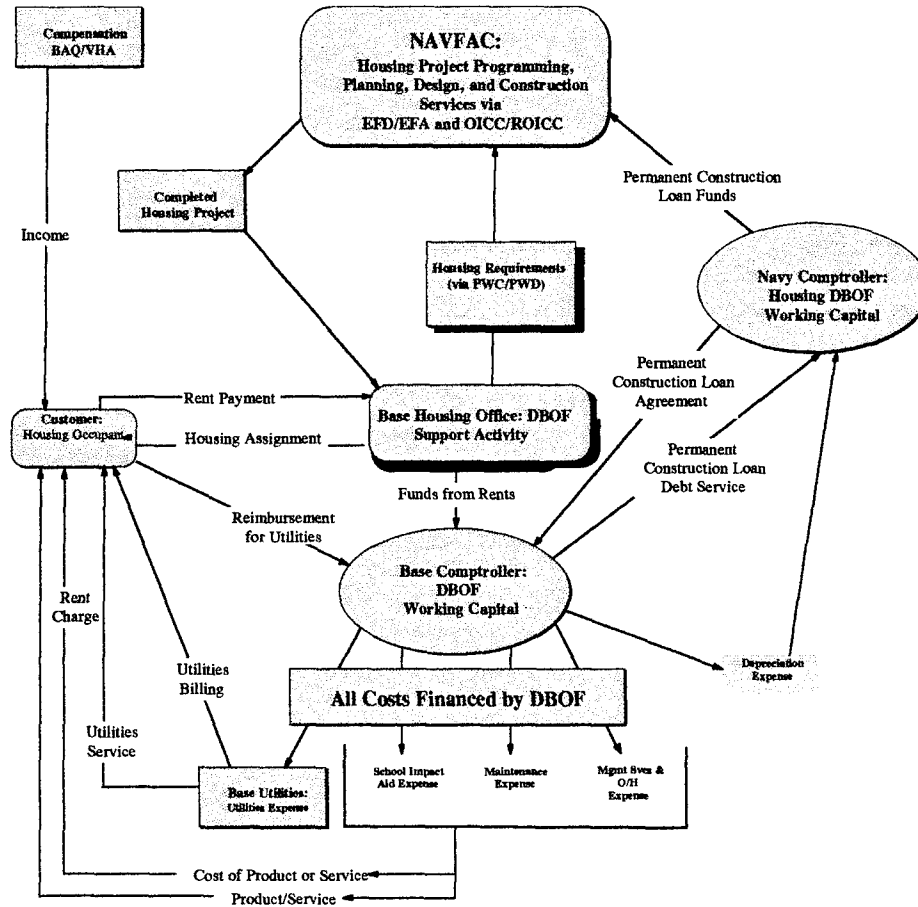


Exhibit 14
Implementing DBOF in Housing Operations

maintenance charges and housing office support expenses. Base utilities would bill the housing occupants for electricity, water, sewer and gas charges according to unit usage. The occupants would reimburse the utility service through the comptroller who credits the utility accounts. School Impact Aid would be reimbursed to the Department of Education from rents as well. The comptroller would also make debt service payments for the construction loan and credit the depreciation expense account to the Navy Housing DBOF Account.

There is no profit or return on investment to be met. The loan is paid back at the Federal Reserve Bank's Discount Rate at the time the agreement is made. The Discount Rate is the interest, that takes inflation into account, that the government loans its fund out at, so there

is no loss in time value of money to the government. The housing occupant's compensation for housing would have to be analyzed in further detail and for location specific adjustments.

The DBOF method for military rental housing proforma is displayed in Exhibit 15. For comparison reasons, the Capitol Budget is the same as the MILCON Proforma (Exhibit 13), everything else is different. Starting with the Financing Table on the next page of the exhibit, a permanent construction loan for \$11,575,354 is required at a four percent interest rate for thirty years. The annual debt service is \$669,404. To be competitive with the private rental market, a 27.5 year depreciation factor is used (since the government does not pay taxes, annual depreciation works against the cash flow analysis, but could be used to fund future repairs or facility replacement if necessary).

The expected rents for a two-bedroom unit is \$6,600, and \$7,800 for the three-bedroom unit per annum and approximate the CBO Average Annual Housing Allowance inflated to 1996 dollars (Exhibit 10). The rental rates are higher than the average rents in the Pensacola market, however. These rental rates represent out-of-pocket expense for the target market (paygrades E-4 to E-6) of between 41-percent to nearly 100-percent (including utilities). Even with these higher rents, the Net Present Value of Cash Flows from Operations (before depreciation expense) is negative \$8,428,728 for the 30 year period. This loss is substantially less than the over \$24 million loss from the MILCON proforma, nonetheless, the Capitol Budget must be reduced or rents increased to break even.

Exhibit 16 illustrates what the differences in project cost and rents would need to be to break even (all costs are in 1997 dollars derived from Exhibit 15). The Income-To-Cost proforma begins with rents/GPI adjusted for an additional 15 percent out-of-pocket cost, less utilities on an annual basis. The rents are the Pensacola VHA and BAQ for an E-5 (approximately average for E-4 through E-6). Utilizing this rent amount, the total development cost on the Capitol Budget could not exceed \$4,206,552, or, \$30.74 per square foot construction cost. The Cost-To-Income Proforma indicates that given current development costs, rent required to break even would be \$1,165 per month. This amount represents a 227-percent out-of-pocket cost for an E-5 service member.

Public Sector Application of Real Estate Analysis and Finance Techniques
A Feasibility Study for Military Family Housing

Capital Budget - 116 Family Housing Units, NTTC Corry Station: DBOF						
Building Type	Unit Area	Proj. Factor	Unit Cost	Unit Count	Total Area	Cost
JEM2	950	0.82	\$ 52.37	76	72,200	\$ 3,781,114
JEM3	1,200	0.82	52.37	40	48,000	2,513,760
Community Center	10,020	0.82	63.20	1	10,020	633,264
Building Cost						\$ 6,928,138
Building Size (Square Feet)					130,220	
Land Cost						
			\$ -			(Navy Property)
Site (Acres)			80.000			
Site (Number of Square Feet)			3,484,800			
Construction Costs						
Supporting Costs:						
Paving & Site Improvements:			\$ 1,381,000			
Utilities:			1,886,000			
Landscaping:			98,000			
Recreation:			107,000			
Total Supporting Costs:			\$ 3,472,000			
Supporting Costs per S.F.			\$ 26.66			
Building Cost per S.F.			53.20			
Total Construction Cost Per S.F.:			\$ 79.87			
Total Building Costs:			\$ 10,400,138			
Contingency (5%)			\$ 520,007			
Total Construction Cost:			\$ 10,920,145			
Soft Costs						
SIOH (6%)			\$ 655,209			(Supervision, Inspection, and Overhead)
Total Soft Costs:			\$ 655,209			
Land & Acq Cost						
			\$ -			
Hard Costs			10,920,145			
Soft Cost			655,209			
Total Development Cost:			\$ 11,575,354			

Exhibit 15 (Page 1 of 3)
DBOF Rental Housing Proforma

Public Sector Application of Real Estate Analysis and Finance Techniques:
A Feasibility Study for Military Family Housing

Financing										
Inputs:		The charge on loans to depository institutions by the Federal Reserve (What the Gov't would make on funds if used elsewhere).								
Discount Rate	4.00%									
No. of Annual Pmts.	30.00									
Book Value	\$ 11,575,354									
Investment Value	\$ (9,667,000)									
Results:										
Total Loan Amount	\$ 11,575,354									
Annual Debt Service	\$ (669,404)									
Amortization		1996	1997	1998	1999	2000	2005	2010	2015	2025
Principal Amount		\$206,300	\$214,645	\$223,231	\$232,160	\$241,447	\$293,757	\$357,400	\$434,832	\$643,658
Interest Amount		\$463,014	\$454,759	\$446,173	\$437,243	\$427,957	\$375,647	\$312,004	\$234,572	\$25,746
Outstanding Debt		\$11,368,964	\$11,154,319	\$10,931,087	\$10,698,927	\$10,457,480	\$9,097,417	\$7,442,691	\$5,429,465	\$0
Depreciation & Adjusted Basis Calculation										
Land & Structure Cost		\$ 11,575,354								
+ Cost of Improvements										
- Disallowed Costs										
Basis		\$ 11,575,354								
- Land Cost										
Depreciable Basis		\$ 11,575,354								
Depreciable Basis		1996	1997	1998	1999	2000	2005	2010	2015	2025
Depreciable Basis		\$ 11,575,354	\$ 11,575,354	\$ 11,575,354	\$ 11,575,354	\$ 11,575,354	\$ 11,575,354	\$ 11,575,354	\$ 11,575,354	\$ 11,575,354
x 27.5 Yr. Dep. Factor		3.030%	3.636%	3.636%	3.636%	3.636%	3.636%	3.636%	3.636%	0.000%
Annual Dep. Expense		\$ (350,768)	\$ (420,922)	\$ (420,922)	\$ (420,922)	\$ (420,922)	\$ (420,922)	\$ (420,922)	\$ (420,922)	\$ -
Less: Accumulated Depreciation		\$ (350,768)	\$ (771,690)	\$ (1,192,612)	\$ (1,613,534)	\$ (2,034,456)	\$ (4,770,449)	\$ (6,875,058)	\$ (8,979,668)	\$ (11,475,354)
Adjusted Basis		\$ 11,224,585	\$ 10,803,663	\$ 10,382,741	\$ 9,961,819	\$ 9,540,898	\$ 6,804,905	\$ 4,700,295	\$ 2,595,685	\$ -
Inputs:										
Expected Rents (at market rates)		Unit Area (S.F.)	Unit Count	Rent/Unit	Rent/Unit/Year	Monthly Rents	Annual Rents			
JEM2 (Two Bedroom)		950	76	\$ 550	\$ 6,600	\$ 41,800	\$ 501,600			
JEM3 (Three Bedroom)		1,200	40	650	7,800	26,000	312,000			
Total Annual Rents								\$ 813,600		
Impacts:										
Expected Expense vs Income		Annual BAQ & VHA	Annual Rents	Annual Utilities	Total Annual Cost	Out of Pocket Expense	Out of Pocket % over BAQ/VHA			
E-1										
Two Bedroom		\$ 5,010	\$ 6,600	\$ 2,176	\$ 8,776	\$ 3,766	75.17%			
Three Bedroom		5,010	7,800	2,176	9,976	4,966	99.12%			
E-5										
Two Bedroom		5,722	6,600	2,176	8,776	3,054	53.37%			
Three Bedroom		5,722	7,800	2,176	9,976	4,254	74.34%			
E-6										
Two Bedroom		6,192	6,600	2,176	8,776	2,584	41.73%			
Three Bedroom		6,192	7,800	2,176	9,976	3,784	61.11%			
Operations & Maintenance (O&M) Expenses (in 1996 Dollars)										
Management Services		Unit Count	Met & Svc/ Unit/Yr.	Total Annual Costs						
JEM2		76	\$ 1,395	\$ 106,020						
JEM3		40	1,395	\$ 55,800						
Total Annual Operations Exp:					\$ 161,820					
Annual Maintenance Costs Regression (in 1997 Dollars)										
Annual Maintenance Cost per Unit:		1996**	1997	1998	1999	2000	2005	2010	2015	2025
Total Annual:		\$ -	\$ 1,260	\$ 1,332	\$ 1,524	\$ 1,611	\$ 2,040	\$ 2,468	\$ 2,897	\$ 3,724
Total Annual:		\$ -	\$ 147,204	\$ 166,976	\$ 176,920	\$ 186,864	\$ 236,584	\$ 284,304	\$ 336,024	\$ 435,464
School Impact Aid Expenses		1996/ Unit	1997	1997/ Unit	1997					
School Impact Aid		\$ (1,583)	\$ (1,583)	\$ (1,900)	\$ (220,400)					
Summary (w/ inflation factor to 1997)										
Annual Rents (GPI)		1996	1997							
Annual Operating Expenses		\$ 678,000	\$ 833,040							
Annual School Impact Aid Expense		(134,850)	(168,293)							
Annual Maintenance Cost		(153,056)	(220,400)							
Going-in Capitalization Rate		-	(147,204)							
Terminal Capitalization Rate		9.00%								
Discount Rate		9.50%								
Discount Rate		4.00%								
Annual Vacancy & Collection Loss		1996	1997	1998	1999	2000	2005	2010	2015	2025
Annual Pay Increase (Avg)		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Annual Expense Increase due to Inflation		N/A	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Present Value Factor		N/A	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Present Value Factor		0.961538462	0.924356213	0.888996339	0.854804191	0.821927107	0.675564169	0.355264503	0.146386946	0.030318668

Exhibit 15 (Page 2 of 3)
DBOF Rental Housing Proforma

Discounted Cash Flow Analysis												
Income:	1996	1997	1998	1999	2000	2005	2010	2015	2025	2035	2045	2055
Potential Gross Rent	\$ 678,000	\$ 833,940	\$ 854,789	\$ 876,138	\$ 898,062	\$ 991,293	\$ 1,121,537	\$ 1,264,938	\$ 1,624,348	\$ 1,624,348	\$ 1,624,348	\$ 1,624,348
Less: Vac. & Coll. Loss	(20,340)	(25,018)	(25,644)	(26,285)	(26,942)	(79,732)	(133,647)	(138,068)	(148,730)	(148,730)	(148,730)	(148,730)
Effective Gross Rent	\$ 657,660	\$ 808,922	\$ 829,145	\$ 849,853	\$ 871,120	\$ 911,561	\$ 987,890	\$ 1,126,870	\$ 1,475,618	\$ 1,475,618	\$ 1,475,618	\$ 1,475,618
Less: School Impact Aid	(153,056)	(220,400)	(229,216)	(238,385)	(247,920)	(301,633)	(366,982)	(429,317)	(587,550)	(587,550)	(587,550)	(587,550)
Less: Maintenance	(147,204)	(173,655)	(173,655)	(183,997)	(194,339)	(246,047)	(297,756)	(349,465)	(452,882)	(452,882)	(452,882)	(452,882)
Less: Operating Expenses	(134,850)	(168,293)	(175,025)	(182,025)	(189,307)	(230,320)	(280,220)	(340,920)	(454,660)	(454,660)	(454,660)	(454,660)
Net Operating Income (NOI)	\$ 369,754	\$ 272,025	\$ 251,249	\$ 245,467	\$ 239,555	\$ 183,564	\$ 144,952	\$ 111,158	\$ 30,525	\$ 30,525	\$ 30,525	\$ 30,525
Less: Annual Debt Service	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)	(669,404)
Cash Flow from Operations	\$ (299,649)	\$ (396,379)	\$ (418,155)	\$ (423,937)	\$ (429,849)	\$ (485,850)	\$ (526,452)	\$ (558,246)	\$ (638,879)	\$ (638,879)	\$ (638,879)	\$ (638,879)
Income & Loss												
From Operations:	1996	1997	1998	1999	2000	2005	2010	2015	2025	2035	2045	2055
Cash Flow After Financing	\$ (299,649)	\$ (396,379)	\$ (418,155)	\$ (423,937)	\$ (429,849)	\$ (485,850)	\$ (526,452)	\$ (558,246)	\$ (638,879)	\$ (638,879)	\$ (638,879)	\$ (638,879)
+ Principal Amount	206,990	214,645	223,231	232,160	241,447	293,757	357,400	434,832	643,658	643,658	643,658	643,658
- Depreciation	(350,768)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)	(420,922)
Income or (Loss)	\$ (444,028)	\$ (602,656)	\$ (615,845)	\$ (612,699)	\$ (609,324)	\$ (613,015)	\$ (589,974)	\$ (544,336)	\$ 4,779	\$ 4,779	\$ 4,779	\$ 4,779
Project Returns												
Plant Value	1996	2015	2035	2045	2055	2065	2075	2085	2095	2105	2115	2125
Market Value	\$ 11,575,354	\$ 4,108,383	\$ 167,212	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Present Value of Income:	\$ -	\$ -	\$ (9,667,147)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Present Value of CF from Operations:	\$ -	\$ -	\$ (8,428,728)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Present Value of NOI:	\$ -	\$ -	\$ 3,011,746	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Exhibit 15 (Page 3 of 3)
DBOF Rental Housing Proforma

Public Sector Application of Real Estate Analysis and Finance Techniques
A Feasibility Study for Military Family Housing

Definitions:

GPI=Gross Potential Income
 vac. ratio=average vacancy expected
 EGI=Effective Gross Income
 NOI Ratio=operating expenses divided by EGI
 NOI=Net Operating Income
 proj. dev. cost=buildings development cost
 dev. to bldg ratio=total development cost divided by construction cost

Ratios:

vac. ratio (100%-3%=97%=.97): 0.97

NOI Ratio:

Annual Operating Exp=	\$ 168,293		
Annual Sch. Impact=	220,400		
Annual Maint Cost=	<u>147,204</u>		
Total=	<u>\$ 535,897</u>		
EGI=	\$ 808,922	=	0.66

dev. to bldg ratio:

Dev. Cost=	<u>\$ 11,575,354</u>		
Bldg Cost =	\$ 10,920,145	=	1.06

Rent:

BAQ/VHA Income=	\$ 715,327	+ 15% =	\$841,561
	-Utilities		<u>(252,416)</u>
Rent =			\$ 589,145

Income - To - Cost Proforma

\$ 589,145	- Rent = GPI
<u>x .97</u>	- vac. ratio
571,471	- EGI
<u>x .66</u>	- NOI ratio
378,590	- NOI
<u>div/by .09</u>	- cap rate
4,206,552	- proj. dev. cost *
<u>div/by 1.06</u>	- dev to bldg ratio
3,968,445	- constr. cost
<u>div/by 116</u>	- # of units
34,211	- avg cost per unit
<u>div/by 1,113</u>	- avg sf/unit
\$ 30.74	- avg cost/sf

Cost - To - Income Proforma

1,113	- avg unit size (sf)
<u>x \$84.59</u>	- avg cost/sf
\$ 94,149	- avg cost per unit
<u>x 1.06</u>	- dev to bldg ratio
99,798	- dev cost
<u>x .09</u>	- cap rate
8,982	- NOI
<u>div/by .66</u>	- NOI ratio
13,558	- EGI
<u>div/by .97</u>	- vac. rate
13,977	- PGI
<u>div/by 12</u>	- # Of months
\$ 1,165	- rent required to break even

* Total Project Cost not to be exceeded if BAQ/VAQ + 15% are maintained at current levels.

Exhibit 16
Cost to Income and Income to Cost Proformas

Limited Partnership Financing Alternative

This new legislation authorizes the Navy to invest in limited partnerships to develop privately owned family housing near military installations. It also requires the establishment of a board of Navy and private sector individuals to administer a revolving fund. DoD's position on the partnership alternative is that it would work only in select locations with appropriate housing market conditions where there is a firm, long-term requirement for military family housing (Under Secretary of Defense Letter, *Enclosure* p. 10). Military families would have to have priority for fair share of any housing built and rental rates or sale prices would be affordable to them. Initial investment in a project could be recouped upon sale of development, and, with any additional funds realized, used in additional developments. Exhibit 17 is the proforma for the Pensacola project if it were developed as a Navy Limited Partnership. Elements of the Capitol Budget remain the same for comparison purposes.

First, there are land acquisition costs, but this cost is not reflected in the Capitol Budget as a separate item. The CBO study stated that private-sector projects are less expensive than military housing in two areas: Labor and contract requirements. DoD construction projects fall under the Davis-Bacon Act, which requires that federal construction projects pay "prevailing wages" (interpreted to mean union rates). CBO cites that this expense increase DoD construction costs by between five-percent and 15-percent compared to the private sector (CBO, p.21).

Other costs, including preparing a bid for work, administration requirements, and special quality requirements included within federal contracts further add 12-percent to DoD housing compared with housing in the private sector (CBO, p. 22). The Capitol Budget for the Limited Partnership, therefore, reduces the Total Development Cost of \$11,575,354 by 15-percent for labor and 12 percent for federal contract requirements. The CBO study does not mention an increase in cost for land acquisition in the private sector, thus it is assumed, as a total cost comparison the Capital Budget also included land costs resulting in a private sector net total development cost of \$8,450,000. Land costs, nevertheless, are assumed to be 20-percent of that total for calculating the depreciable basis.

The Limited Partnership proforma follows the format of a typical commercial residential real estate financial model. The Capitol Budget's Total Development Cost assumes the cost of completed construction ready for permanent mortgage financing. The interest rate is prime plus two points, the Pensacola area standard lending policy (prime was taken from the

Wall Street Journal, 31 October 1994). The permanent loan is for 30 years with a required loan to value ratio of 80-percent. The market value (as it may be determined by a lender) is stabilized net operating income (NOI) divided by the capitalization rate of nine-percent which equals \$5,613,227. The loan amount is then set at 80-percent or \$4,490,581 with the other 20-percent to be equity investment. This amount is still \$2,836,781 short of the Total Development Cost, which is where the Navy's investment fills the equity gap. The Navy would contribute the \$2,836,781 and remain under the 35-percent investment limit in the legislation at 33.57-percent.

The Depreciation and Inputs tables are fairly straight forward. Monthly rents are \$600.00 for two-bedroom units and \$700.00 for three-bedroom units. The \$550 and \$600 rents used in the DBOF Proforma were attempted, but resulted in a decreased NOI, which in turn, decreased market value, which increased the Navy's contribution to a rate over 38-percent. The required rate of return for the equity investors is reasonable at eight-percent (this project would expose investors to less risk because of the Navy's participation, therefore a lower rate of return should be acceptable).

On the open market, vacancy and collection loss will increase - 40-percent in 1996 is due to start up leasing and a lack of a waiting list at these rents. Rents and expenses will increase at an equal rate since there is no reason to tie rent increases to the service member's annual pay increases.

The Project Returns table represents returns, including reversion at years 5, 7, 15, 20 and 30. Net Present Value (NPV) of the After Tax Cash Flow (ATCF) is the return at each of those years in 1996 dollars, after the required rate of return for equity investors were paid. The Internal Rate of Return (IRR) is the average annual yield for those periods if NPV were zero (again, the 8-percent equity investment would have been paid). These are the amounts the Navy should consider negotiating for as return to its equity contribution. These funds could be used for other projects or to partially subsidize rents for the service members who live in the housing project.

This alternative is successful in that the NPV's are all positive. However, the rents that must be charged to assure this success are greater than the DBOF Rental Market Rents, which were over the 15 to 20-percent average out-of-pocket housing expense rate sought by DoD policy.

Public Sector Application of Real Estate Analysis and Finance Techniques
A Feasibility Study for Military Family Housing

Capital Budget - 116 Family Housing Units, Pensacola, FL: Navy Limited Partnership						
Building Type	Unit Area	Proj. Factor	Unit Cost	Unit Count	Total Area	Cost
JEM2	950	0.82	\$ 52.37	76	72,200	\$ 3,781,114
JEM3	1,200	0.82	52.37	40	48,000	2,513,760
Community Center	10,020	0.82	63.20	1	10,020	633,264
Building Cost						\$ 6,928,138
Building Size (Square Feet)					130,220	
Land Cost¹						
Site (Acres)					80.000	
Site (Number of Square Feet)					3,484,800	
Construction Costs (From Gov't Estimate on DD-1391 Form)						
Supporting Costs:						
Paving & Site Improvements:			\$ 1,381,000			
Utilities:			1,886,000			
Landscapeing:			98,000			
Recreation:			107,000			
Total Supporting Costs:			\$ 3,472,000			
Supporting Costs per S.F.			\$ 26.66			
Building Cost per S.F.			53.20			
Total Construction Cost Per S.F.:			\$ 79.87			
Total Building Costs:			\$ 10,400,138			
Contingency	5%		520,007			
Total Construction Cost:			\$ 10,920,145			
Soft Costs (Included in Construction Costs)²						
SIOH	6.00%		\$ 655,209			
Total Soft Costs			\$ 655,209			
Land & Acq Cost						
Hard Costs					10,920,145	
Soft Cost					655,209	
Total Development Cost:					\$ 11,575,354	
Private Sector Deductions (Per CBO 1993)						
Cost of Labor ²	-15%		\$ (1,736,303)			
FAR/DoD Requirements ³	-12%		(1,389,042)			
Revised Total Development Cost for Private Sector:					\$ 8,450,008	

¹Financing Costs: Construction Loan Interest Rate and Point-Fees are from a Pensacola Mortgage Backing Institution. The Construction Loan Interest is calculated as Follows: PMT for a loan where: i= interest rate /12, n=construction period in months, and PV=(Soft Costs Subtotal + Revised Const. Costs/2) + Land Cost. The Interest Rate is Prime + 2, and there a 1% Origination Fee and a 1 Discount Point Fee.

(Supervision, Inspection, and Overhead)

Exhibit 17 (Page 1 of 3)
Navy Limited Partnership Proforma

⁴Current Rate for a fixed 30-year loan.

Depreciation & Adjusted Basis Calculation

¹ Average Operating Expenses in the Private Sector is 40% of Potential Gross Income (PCI) per CBO 1993, p. 22.

Exhibit 17 (Page 2 of 3)

Discounted Cash Flow Analysis												
Income:	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Potential Gross Income	\$ 881,200	\$ 918,528	\$ 955,269	\$ 993,480	\$ 1,033,219	\$ 1,074,548	\$ 1,118,914	\$ 1,168,993	\$ 1,224,480	\$ 1,285,993	\$ 1,353,993	\$ 1,428,993
Less: Vac. & Coll. Loss	(353,280)	(45,926)	(47,763)	(49,624)	(51,518)	(53,459)	(55,459)	(57,518)	(59,648)	(61,848)	(64,118)	(66,459)
Effective Gross Income	\$ 527,920	\$ 872,602	\$ 907,506	\$ 943,856	\$ 981,701	\$ 1,021,089	\$ 1,063,455	\$ 1,111,426	\$ 1,164,832	\$ 1,224,145	\$ 1,289,875	\$ 1,362,534
Less: Operating Expenses	(353,280)	(367,411)	(382,108)	(397,322)	(413,288)	(429,912)	(447,108)	(464,892)	(483,172)	(501,948)	(521,224)	(541,012)
Net Operating Income (NOI)	\$ 174,640	\$ 505,190	\$ 525,398	\$ 546,534	\$ 568,413	\$ 591,177	\$ 616,347	\$ 646,534	\$ 681,660	\$ 722,197	\$ 768,651	\$ 821,522
Less: Annual Debt Service	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)	(446,812)
BTICF from Operations	\$ (272,172)	\$ 58,378	\$ 78,586	\$ 99,722	\$ 121,595	\$ 143,365	\$ 165,135	\$ 186,905	\$ 208,675	\$ 230,445	\$ 252,215	\$ 273,985
(Tax Pmt.) or + Tax Credit	\$ 155,256	\$ 53,384	\$ 45,500	\$ 36,822	\$ 27,852	\$ 18,882	\$ 9,912	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
ATICF from Operations	\$ (116,916)	\$ 111,762	\$ 124,086	\$ 136,544	\$ 149,447	\$ 162,247	\$ 175,047	\$ 188,847	\$ 202,647	\$ 216,447	\$ 230,247	\$ 244,047
Revenue												
Sales Price												
Less: Closing Costs (Seller)												
Less: Outstanding Debt (End of Holding Period)												
Before Tax Reversion												
Less Tax Payment												
After Tax Reversion												
Total BTICF (including Reversion)												
Total ATICF (including Reversion)												
Project Return												
Book Value	\$ 8,450,000	\$ 3,574,609										
Market Value	\$ 5,613,227	\$ 16,062,460										
Net Present Value (BTICF)	\$ 1,300,555	\$ 2,251,143	\$ 5,124,342	\$ 6,373,482	\$ 7,793,635							
IRR	1.44%	4.96%	7.57%	7.64%	6.56%							
Net Present Value (ATICF)	\$ 72,504	\$ 268,447	\$ 1,052,749	\$ 1,492,799	\$ 2,035,702							
IRR	4.17%	4.86%	6.66%	6.92%	6.33%							
Profit & Loss												
From Operations:												
Cash Flow After Financing (BTICF)	\$ (270,172)	\$ 58,378	\$ 78,586	\$ 99,722	\$ 121,595	\$ 143,365	\$ 165,135	\$ 186,905	\$ 208,675	\$ 230,445	\$ 252,215	\$ 273,985
+ Principal Amount	31,440	34,349	37,256	40,163	43,070	45,977	48,884	51,791	54,698	57,605	60,512	63,419
- Depreciation	(204,490)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)	(245,818)
Taxable Income or (Loss)	\$ (443,887)	\$ (183,090)	\$ (139,714)	\$ (105,237)	\$ (79,518)	\$ (58,276)	\$ (37,033)	\$ (15,790)	\$ 6,478	\$ 32,392	\$ 63,914	\$ 95,437
x Effective Tax Rate	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%
Tax Pmt. or (Credit)	\$ (155,256)	\$ (64,081)	\$ (48,800)	\$ (36,822)	\$ (27,852)	\$ (20,397)	\$ (13,137)	\$ (5,532)	\$ (2,283)	\$ 11,338	\$ 22,372	\$ 33,407
From Reversion:												
Sales Price												
Less: Closing Costs (Seller)												
Less: Adjusted Basis												
Taxable Income												
x Effective Tax Rate												
Tax Pmt.												

Exhibit 17 (Page 3 of 3)
Navy Limited Partnership Proforma

Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

The feasibility analysis of the three alternative project financing approaches in the previous section provide a useful perspective on the housing problems facing the military. All three alternatives utilized a case study housing project to be constructed in Pensacola, Florida, to be ready for occupancy in 1996. The Navy's current project cost estimate is \$11,575,354 for 116 two and three-bedroom units and a community center on an 80-acre track of property.

The MILCON Proforma documented the project life cycle cost for 31 years starting in 1995 with construction costs and continuing through 2025 with operating costs. Average annual per unit costs, derived from the CBO study's findings were applied to the project proforma projection for discounted cash flow analysis. These costs included maintenance, utilities, housing office management overhead and services, and school aid impact. The housing allowances withheld from occupants were applied to off-set the annual costs to arrive at an absolute amount as a cost or savings to the Navy. For this specific project, the result after a 31 year operating period was an overall cost of \$24,788,593 in 1996 dollars (discounted at four percent annually) as shown in the net present value.

The DBOF Rental Housing Proforma utilizes the same Capital Budget and Total Development Cost as the MILCON Proforma for the case study project. This approach to financing and operations was different in that it incorporated revolving fund principles and utilized the Defense Business Operating Funds program. This concept was a means to allow military housing offices to operate as a property development and management firm would in the private sector. The concept premise was to pay full housing allowance benefits to service members assigned to base housing for payment of rent and utilities charges. This would allow military housing to compete on an equal footing with the area's rental housing market and thereby reduce or eliminate housing waiting lists.

The discounted cash flow analysis results indicated that although the costs to the Navy would be almost two-thirds less than what MILCON costs were for the same period, there was still a net present value cost of \$8,428,728 over a 30-year period at a four percent discount rate.

Navy Limited Partnerships with private sector housing developers were authorized in the 1995 Defense Authorization Bill sent to the President. This will allow the Navy to invest between five and 35-percent of the project development cost for private sector housing projects. The final proforma illustrates the application of this legislation on the case study project.

The Capitol Budget was reduced from \$11,575,354 to \$8,450,008 to allow for DoD costs that the private sector is not exposed to. The lower development cost also includes the land and acquisition costs (which were estimated at 20-percent for depreciation purposes). All other private sector cost applications described in the CBO study were applied to the discounted cash flow analysis. The project is financially successful in that all net present values at each reversion year tested were positive.

The problem is that rents required to meet, what is considered an industry minimum required rate of return of eight-percent, are greater than 50 to 100-percent over the average Pensacola combined housing allowances of the paygrades used. Another problem is that as a limited partner in a development venture, the Navy relinquishes its abilities to manage any aspects of the project.

The Income-to-Cost Proforma (Exhibit 16) shows that the total development cost for the case study project should not exceed \$4,206,552 in order to maintain rents at current housing allowance levels plus 15-percent out of pocket costs. The Cost-to-Income Proforma indicates average rents should be set at \$1,165 per month to pay for this project at its current Total Development Cost to break even.

In determining DoD housing policy, these results suggests that housing allowances should be increased significantly to match current market rent levels. It also suggests that housing built by DoD needs to become less costly to the extent that it can utilize the housing allowances and be competitive with the private sector. If DoD is to compete with the private sector, socio-economic benefits contained in contracting regulations have to be reduced or eliminated. The alternative is to centrally subsidize these costs in order to eliminate them from project discounted cash flow analysis.

This study provides a basis for the concept of employing housing allowances as potential self-sustaining support for DoD housing rental market applications. The results indicate that, for this specific case study project, the use of DBOF revolving fund principles would cut project life cycle costs by almost two-thirds when compared to the MILCON alternative. It is therefore recommended that further study be conducted using a larger sampling of case study projects in different geographic locations. It is further recommended that the Navy actively pursue limited partnership agreements that are fair and reasonable to the equity investors and provide guaranteed rents that are equitable to service members.

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