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BETTER HOUSING Now

Public-Private Venture Housing
at Big Bend National Park, Texas

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Douglas M. Brown
Jordan W. Cassell

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<p>This report reviews the National Parks Service (NPS) employee housing program. Because of inadequate maintenance and construction funding, the inventory is deteriorating steadily. An estimated \$270 million is needed to replace or repair the existing housing. Those funds are not expected to be available, so Public-Private Ventures (PPVs) are being explored as an alternative.</p> <p>This report evaluates the feasibility of PPV leases through which employee housing might be provided at the Big Bend National Park in Southwest Texas. Due to the extreme isolation of the park, leases without guarantees proved impractical.</p> <p>The study finds that due to the limited value of the land and the absence of a local economy, a subsidized lease is the only feasible form of financing. Six methods of achieving this goal are examined. The report concludes that a PPV will be feasible at Big Bend National Park and no more expensive than traditional direct appropriation construction.</p> <p>Appendix A provides a draft of the necessary legislation language for providing the NPS with PPV authority. Appendix B provides a draft proposal solicitation document detailing the recommended terms and conditions of a PPV at Big Bend National Park.</p> <p>The report should be read in conjunction with LMI's report DI901R2 which presents the cost model used to evaluate the feasibility of the alternatives.</p>				
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PREFACE

This report was prepared by the Logistics Management Institute at the request of the U.S. Department of the Interior and the National Park Service. The observations and findings are strictly those of LMI; the use of the word "we" refers to the research team at LMI and in no way implies the concurrence of the National Park Service.



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Executive Summary

BETTER HOUSING NOW: Public-Private Venture Housing at Big Bend National Park, Texas

The National Park Service (NPS) maintains over 5,000 units of housing nationwide. Those houses are needed for employees whose duties require their continuing presence on the parks, many of which are dozens or even hundreds of miles from the nearest established communities. In the past, since NPS has received only limited funding for new houses, the current inventory is old. Maintenance is funded by rent receipts, but the control of rents through the Office of Management and Budget (OMB) Circular A-45, *Policy Governing Charges for Rental Quarters and Related Facilities*, results in the anomaly that the houses most in need of repair (the older houses in the most remote parks) receive the least rent money. The general condition of the housing is indicated by the fact that it will take an estimated \$270 million to replace or repair NPS housing.

In an era of declining budgets, we do not believe that the NPS will receive sufficient funding to solve the housing shortage through line-item construction. We investigated the feasibility of using a Public-Private Venture (PPV) as an alternative source of housing funds. A PPV is a capital project in which private investors provide the initial funding in return for long-term revenues (usually in the form of a lease) from or through the Government.

The park chosen as a potential pilot project site was Big Bend National Park in southwest Texas. Like most NPS parks that have housing problems, Big Bend is remote, and it has a relatively small number of employees. Those factors make it of limited desirability to a private contractor as a PPV. Nonetheless, a PPV is feasible. We estimate that the long-term cost of a PPV at Big Bend would be very similar to that of a traditional Government construction project; however, the PPV would provide housing more rapidly without the large initial capital outlay.

At present, the Department of the Interior has no authority under which to pursue a PPV. Without that authority, no solicitation documents can be published.

Once the authority is obtained, a prospectus should provide for a 30-year PPV located entirely on park property. The contractor would build new structures and renovate existing structures, and then maintain all housing on the park for the duration of the lease. To make the venture more attractive, housing units could be installed at Guadalupe Mountains National Park and Fort Davis National Historic Site; both are relatively near Big Bend and are too small to support their own projects.

To accomplish this pilot project, we recommend that the Director of the NPS coordinate with the Secretary of the Interior to pursue passage of enabling legislation; that after obtaining legal authority, the Director of the NPS Southwest Region solicit and evaluate proposals for PPV housing at Big Bend; and that the NPS evaluate the feasibility of PPVs at parks with characteristics different from those at Big Bend. This study suggests that PPVs will be most effective in parks with a potential for off-park commercial activity and a large number of housing units. Our feasibility analysis focuses on the comparison of the cost to the NPS of a PPV as compared to construction by direct appropriation. The NPS might be willing to incur a cost premium in order to achieve new housing units more rapidly.

Finally, we note that our feasibility assessment is based on industry averages and standard practices. The nature of an average is that about half of the industry can do better. The NPS should not close its thinking to PPVs because of the limited commercial attractiveness of a PPV at Big Bend. The NPS should remain open to unsolicited proposals for PPVs to solve employee housing problems in even the most unlikely parks.

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CHAPTER 1

INTRODUCTION AND BACKGROUND

CONSTRUCTION BUDGET REDUCTIONS

Over the past decade, National Park Service (NPS) employee housing has suffered from a significant underfunding that has resulted in the deteriorated condition of much of the housing stock. Federal budget deficits have made it difficult to substantially upgrade employee housing through direct appropriations for new construction and rehabilitation. Since providing employee housing is not a direct NPS mission, employee housing needs frequently receive low priority when conflicts over resources arise with mission-related activities. Nonetheless, the NPS has a substantial requirement for new housing to replace many substandard and aging facilities, and appropriated funding for NPS employee housing is not meeting the total need.

NPS HOUSING PROGRAM

The NPS has housing management professionals at the national and regional levels. Within the parks, however, the management of the housing program is simply an additional duty for the Park Administrative Officer. Overall responsibility falls on the Park Superintendents.

NPS Housing Inventory

The NPS has approximately 5,000 units of employee housing, located throughout the continental United States, Hawaii, Alaska, and the U.S. territories. The greatest concentration of these units is in the West. Housing sites vary in size from one unit to several hundred units. Most of this housing was built by the Government during the 1950s. Approximately 800 trailers are used as temporary housing; they have an average age of 20 years. Seasonal housing comprises 2,200 units of the total. Of the 5,000 units, approximately 60 percent are single-family houses, 20 percent are apartments, 10 percent are mobile homes, and the remaining 10 percent are

bunkhouses, cabins, tents, trailer pads, and the like. The average unit contains 1,023 square feet.

NPS Housing Conditions

NPS housing is deteriorating. About 10 percent of the inventory is in either poor or obsolete condition. An additional 50 percent is in only fair condition.

The current total backlog of capital improvements is estimated by the NPS to be \$90 million in rehabilitation costs for 4,600 units and \$180 million in replacement/new construction costs for 1,430 units. These estimates do not reflect infrastructure needs or continuing deterioration of housing.

Maintenance Program

Housing maintenance in the NPS is performed by in-house work forces. In many parks, those workers are provided to maintain public roads and facilities, with housing maintenance and repair being an additional duty. Ideally, annual Operations NPS (ONPS) funds would be adequate for all maintenance requirements. Under constrained budgets the funding priority must go to visitor facilities, leaving the maintenance of housing dependent largely on rental receipts. In theory, the operation and maintenance of NPS housing could be funded by rental receipts. The rental charges are established by Office of Management and Budget (OMB) Circular A-45, *Policy Governing Charges for Rental Quarters and Related Facilities*, which bases rental fees (monthly base rental rate [MBRR]) on comparable "markets," with reductions for such factors as isolated locations and inferior housing conditions. In other words, rental rates are set to reflect average rents in the region for comparable housing; those rates do not necessarily meet the cost of providing the housing. However, those rates were established to protect the employee from unreasonable Government charges, not to obtain cost reimbursement. It is the Government's responsibility to provide for its housing program.

Total rental receipts amount to approximately \$8 million per year, while the total estimated amount spent on housing operation and maintenance is \$13 million per year. This difference is caused by high maintenance costs for isolated housing in poor condition and short rental periods for seasonal housing.

Although the isolation adjustments to rental rates are a fair and necessary compensation for employees required to live in isolated housing, the fact remains

that reduced rental receipts leave less money to maintain the housing units properly. This decrease in maintenance results in a backlog of maintenance and repair. That in turn results in further reductions to the rental receipts because of deteriorated conditions. NPS housing is in a "cycle of poverty," with no way to recover.

We found that in general the MBRR itself is adequate to support effective maintenance of Government housing units. However, once adjustments are deducted, the more remote parks are unable to maintain the housing units without appropriated fund subsidies of the rental receipts. In only a few cases will the full MBRR, even without adjustment, be adequate to provide for maintenance *and* amortize the cost of new construction.

Employee Incomes

Even if OMB Circular A-45 permitted them, significant increases in MBRRs would be impractical. The NPS personnel structure is very lean: the average park employee is in pay grade GS-7 or GS-8 (depending on the park). The MBRR represents 25 to 35 percent of those employees' base incomes. However, after the adjustments are made, the rent is often as low as 10 to 15 percent of the lease income. In many of the remote parks, there is little opportunity for spousal employment, and many of the employees view the low rents as a necessary incentive to continuing in a career of long hours, low pay, and little opportunity to set down roots.

DIRECT APPROPRIATIONS

In the past, the NPS has relied upon appropriated construction funding to provide housing. In such an approach, the NPS justifies its need and an expected cost for housing to Congress, which then appropriates funding on a project-by-project basis. Bids for the approved projects are then awarded on a competitive basis, and the housing is constructed by private companies under Government contract. This approach is familiar and generally well executed. However, there are two serious obstacles. The first is that funds may not be available within annual resources. Although the complete satisfaction of all NPS housing requirements would entail less than one-thirtieth of one percent of the nation's annual budget,¹ in a

¹The NPS requirement for new, replacement, or rehabilitated housing is, as noted, estimated at \$270 million. The NPS 1989 budget included \$159 million for new construction of all types. Of this funding, \$10 million was available for housing. The national budget, by contrast, exceeded \$1 trillion.

time of increasing requirements and decreasing budgets even that amount of money is simply unavailable. Hence, even if the traditional approach were the most effective, it is not easy to afford it.

The second obstacle is that, as some studies suggest, the Government construction process is more expensive than private-sector construction. The Government must contract with the same companies that build private-sector buildings, so at best, the cost will not be less than it would be for a private construction contract. A certain amount of program management and monitoring is required, adding to the private-sector cost. Some evidence suggests that companies add a margin to their costs to account for the complications of Government paperwork and for anticipated Government postaward design changes. In addition, NPS projects incur additional costs because of strong emphasis on aesthetic concerns and because of the generally small size and dispersed nature of NPS construction activities. In short, it is impossible for Government construction to come in as cheaply as a similar project produced for a less risk-adverse private enterprise.

ALTERNATIVE FUNDING SOURCES

If adequate direct appropriations are not expected, the summation of the problem is that the NPS cannot buy enough houses for the amount of money it expects to get from the Congress. Either side of the shortfall may be addressed: the cost of the houses can be reduced, or the money can be found elsewhere. Both of these efforts can be carried out simultaneously.

The NPS does not have the money to pay for capital investments in cash. Private citizens have developed a means for affording this major purchase on their annual income, which is to borrow the money and pay it back over time, with interest. This is, of course, somewhat more expensive; on the other hand, the asset is placed into service rather than being wished for.

Housing funds from employees can be obtained through rents or through purchases. Better housing units will generate higher rents, but we have already seen that the park employees are at relatively low pay grades. Higher rents may impose intolerable financial burdens on NPS employees.

Employees could purchase houses from or through the NPS. This procedure would effectively end the NPS's requirement to build and maintain its own houses.

However, there are a number of policy issues involved with employee ownership of park land and structures: standards of appearance, the long-term increase in units as employees retire and continue to live in the parks, fair rent practices, etc. We have researched similar concepts for DoD and reached the same conclusion: employee-owned housing on Government land is financially feasible but may be unacceptable from a policy viewpoint. Our discussions with NPS officials indicate that those policy issues still pose intractable problems, and we decided not to study this alternative further.

There are three ways to get funding from the public. First, the NPS could obtain funding from park visitors by increasing the charges for its public services in order to build up a capital fund. (It might even be possible to raise the money by direct voluntary contributions from the public.) The complex combination of politics, public relations, and market elasticity surrounding this approach is beyond the scope of our study; however, the amount of money that would have to be raised compared to the number of park visitors annually would appear to require only modest increases. We have not analyzed this approach further.

Next, the NPS could borrow directly from the public in the form of a bond issue: essentially, mortgaging the property. At present, there is no authority to do so, and obtaining such authority might be considered a precedent for all Federal agencies to demand the same.

Finally, the NPS could obtain funds through private businesses. These funds could not be provided as grants; interest would be required. Since the NPS cannot enter into a mortgage, the legal form must be that of a lease.

The payment of the construction cost, spread out over time, is much the same as a mortgage: a sum of money is advanced and is repaid with interest. Maintenance is an ongoing service. As such, it must be paid for as the service is performed and is simply a service contract. The mortgage and service contract may be less costly if the contractor can find another source of income from which to subsidize the rental housing. Such secondary income sources may derive from the NPS employees, the park visitors, and the general public. Examples might include the following:

- *Tenant services.* Park employees now pay for satellite television service. In our site visit, employees expressed willingness to pay fees for other lacking amenities: swimming pools, recreation centers, athletic facilities, etc.

- *Park facility leases.* The contractor may be able to operate facilities within the park in order to derive revenue from park visitors. Such facilities could include visitor centers, stores, restaurants, etc., although in any given park such activity would be constrained by the terms of the existing concession contract. It is also possible that the current park concessionaire may be an offeror on housing contracts.
- *Off-park facility revenues.* The contractor could operate any number of off-park facilities: hotels, restaurants, entertainment, sports, etc. The scope of such facilities is limited by the contractor's imagination and the marketing features of the park region itself. For projects in which the property and improvements are assigned to the contractor after the lease is ended, the contractor will be left with a significant asset. That will reduce the payments needed to convince contractors of the value of the lease as a financial incentive or reduce their perspective of the risk attached to the project.

EXISTING PROGRAMS USING PRIVATE FINANCING

Leases have been tried in a variety of forms by several public agencies; they have an advantage over mortgages in that the lender's continuing participation in the program is placed at risk on the basis of performance, so a commitment to quality facilities is obtained. Those features (private provision of the initial capital and a long-term involvement of both the Government and private investors) are the essential components of a form of long-term financing becoming known as the Public-Private Venture (PPV). The PPV concept can be woven into leases or other financial arrangements in a variety of ways, and the Federal Government has numerous prior experiences with various forms of PPV. Both OMB and Congress have urged the Department of Interior (DOI) and the NPS to pursue such concepts.

NPS Concessions

The NPS itself has extensive experience with PPVs in the form of its concessions agreements. The NPS concessions allow a contractor to place capital improvements on leased NPS land, within quality and aesthetic controls specified by the NPS. The contractor then operates the facilities for profit, under price controls established on the basis of regional averages and monitored by the NPS. A proportion of the profit returns to the NPS as a concession fee. If the contractor is found to be in violation of the lease terms, the NPS or another contractor may buy out the original leaseholder's equity in the capital facilities and take over the operation of the facilities. While there have been occasional unfortunate experiences, the NPS

concession system has proven over a half century to be a sound way of doing business understood by both industry and the Government. However, NPS concessions may only be granted for services provided to the visiting public. At present, neither the NPS nor DOI has the authority to use PPVs to provide services to Federal employees.

General Services Administration Lease-Purchases

The General Services Administration (GSA) has authority to enter into leases and lease-purchases as the agent for the Federal Government. Those actions are routine for the agency, but its authority is confined to office and administrative space. Some agencies see a problem with GSA as agent in that it must lease the space to the using agency at a market rate, which generates no savings for the user and does not reflect the actual terms of a long-term lease.

In addition, OMB has taken the position that a formal lease-purchase may be a circumvention of the Anti-Deficiency Act and therefore must be treated as a first-year capital purchase for budgeting purposes. Thus, if an agency cannot afford the cash cost of a \$23 million project, it might enter into a lease-purchase agreement with the price to be paid for over time at a fixed rate of \$1 million per year. The OMB requirement would force that purchase to be portrayed as a \$23 million line in the first-year budget; yet the agency already knows that it cannot afford \$23 million. Our draft legislation (Appendix A) includes language to avoid that problem.

In addition to the fact that GSA leases are not possible for housing, the two features discussed above make the acquisition of housing through GSA unattractive for NPS purposes.

Department of Defense

DoD is the Government's largest landlord (and one of the world's largest). At a single installation, Andrews Air Force Base, the count of DoD single-and family-housing units exceeds the NPS's entire inventory. Like the NPS, DoD installations have large cadres of junior-grade personnel. Because DoD personnel receive housing allowances, DoD programs may not be directly transferable to NPS needs. Nonetheless, the numerous test projects that DoD has sponsored hold some valuable lessons for other agencies.

Section 801: Build-to-Lease

This program allows the Government to provide a long-term guaranteed lease of the facilities, creating a solid basis for financing regardless of the local economic environment. The Section 801 program has one major deficiency. At the end of the lease, the Government must buy the improvements at fair market value in order to obtain title.

The Section 801 program has been very successful for DoD in terms of getting new houses built. The NPS might do well to consider the use of an 801-style arrangement if the NPS had ultimate ownership of the property without a second payment, and if the contractor retained some incentive in the operation of the facility. Our analysis assumes a PPV of this general form for the Big Bend project because employee rents alone cannot cover the cost of new construction. That makes a Government contribution essential.

Section 802: Rental Guarantee

This provision allows DoD to guarantee a building owner an occupancy rate of up to 97 percent. Failing this, the DoD must pay a "shelter rent" (essentially, cover the builder's principal and interest payments) for the unoccupied units up to the agreed occupancy minimum. This program has enjoyed no success whatever. The guarantee does not cover the builder's expenses, and the time lag between the initial occurrence of the vacancies and the Government obligation to pay vacancy costs can be several months. Thus, there is no incentive for the builder to respond to Section 802 solicitations.

Recent discussions of this program have centered on using it to encourage rehabilitation of existing Government-owned housing, thus reducing the builder's capital requirements. For the NPS, this might work at some larger parks where there would be enough units to justify the contractor's full-time management staff. We did not specifically evaluate this concept in this report because of the large requirement for new units, rather than rehabilitation, at Big Bend National Park.

Section 2667: Land Leases

DoD may outlease any temporarily unoccupied land (as opposed to "excess" land). The period of the lease is also unspecified, allowing extended leases for 40 or more years, well surpassing the time required to pay off the financing. Because the

2667 legislation is not confined to housing, rents can be subsidized by the revenues from other activities also located on the leased land, such as storage areas, retail facilities, etc.

The Government guarantees nothing while retaining control (through the lease terms) of the activity's pricing and management policies. Section 2667 finds its best application in high-cost areas where having free Government land significantly reduces the cost of construction. If houses could be built and paid for at reasonable rents, a Section 2667-like arrangement might be very suitable for the NPS.

Section 2809: Leases

The Section 2809 leases are very similar to the NPS concessions contracts. Military land may be leased to a contractor to provide a specific service directly to military consumers, with a portion of the profits returning to the installation. At the end of the contract, all capital facilities become the Government's property. Like the 2667 authority, the 2809 authority requires no investment by the Government and in fact offers a potential return. It is dependent for its success on the ability of the contractor to make a reasonable return while operating within specified market rate levels. In the case of housing, moving to a cost-based rent structure would require a massive increase in the employee rents in the more remote parks; thus, particularly for the Big Bend case study, success with this alternative is unlikely.

Pilot Projects

The programs above, and several others on a smaller scale, were tested by or within DoD using a minimum-exposure pilot project. Some were riskier than others. All of the programs that are now successful underwent initial failures; in other cases, partial failure led to a complete rejection of the concept. The objective of pilot projects is to test a concept with an appreciation of the risks, and if necessary, to accept less-than-optimal results in order to refine a good process to make it better. Pilot projects provide the opportunity for lessons to be learned inexpensively before implementing programs on a wide scale.

ALTERNATIVES TO BE EXAMINED

We have combined the feasible features of the approaches mentioned above with some NPS-specific requirements to create six possible approaches to the NPS housing problem at the Big Bend National Park.

Appropriated Funding

The appropriated funding alternative portrays the cost to the NPS of solving its housing problem with line-item construction appropriations as described earlier.² The Government designs units, contracts to have them built (paying in cash in the construction year), and then operates them, retaining permanent ownership.

Lease All On-Park Housing

In this alternative, the contractor would design and build a certain number of housing units on the park, renovate all remaining units as required, and then become the housing manager for the park. In exchange, the contractor receives a rent payment from the Government, which leases all units from the contractor and then sublets them to the employees. This approach severs the connection between OMB Circular A-45, *Policy Governing Charges for Rental Quarters and Related Facilities*, rent limits and the payment made to the contractor for the units. That allows the contractor to receive market rents for all the housing units, even though a substantial number may not have required much expense to place into service. In addition, the NPS staff is relieved of the daily responsibility for managing the housing.

Lease Off-Park and On-Park Housing

This alternative will be referred to as the "split location" alternative. This approach is very similar in concept to the on-park alternative above, except that some of the houses are built on private land. All the houses, whether in the park or outside, are managed by the contractor. The houses built outside the park would remain the property of the contractor. It is expected that the contractor will have to provide for bus service between the off-park housing area and the employees' workplaces.

²All Government spending is, of course, from appropriated funds. We use this term to distinguish this alternative from the others, all of which require some form of non-Government investment.

Lease Off-Park Housing, Retain On-Park Housing

In this approach, the Government leases houses built off-park by the contractor, much like the on-park alternatives above. The houses remaining on the park, however, are managed by the Government. The houses built outside the park would remain the property of the builder. Again, a bus service would be required.

Lease Off-Park Housing and an Administrative Center, Retain On-Park Housing

This alternative is the same as the previous one, except that the contractor will be permitted to construct and rent administrative space. That eliminates the need for the bus (since employees can be housed near their workplaces). Employees working within the park could be housed in the units to be retained by the NPS.

Direct Rent to Employees Off-Park, Retain On-Park Housing

This alternative will be referred to as the "direct rent" alternative. In this alternative, employees not strictly required to live on the park would be required to live outside the park and therefore rent on the economy. We estimate the cost to a builder to construct sufficient new housing. The remaining houses on the park would be used for mission-essential employees, and the Government would continue to maintain those units.

As mentioned earlier, since this shifts the burden of meeting housing costs directly to the employee, such an alternative will appear very cost-effective to the Government. However, the morale and retention impacts of such a course of action could be disastrous, and we reflect the potential for such an impact by identifying the new rent as a proportion of gross income.

ALTERNATIVE FORMS OF CONSTRUCTION

In addition to finding alternative sources of funding, the cost to place housing into service may be reduced by using methods less expensive than the traditional site-built approach. The NPS Housing Design and Rehabilitation Guidelines (NPS-76) allow for any form of construction conforming to Council of American Building Officials (CABO) codes. That would allow for both manufactured and modular housing if built to acceptable quality standards. Many people believe that such housing is necessarily less durable, less well-crafted, and less aesthetically

pleasing than site-built housing. That is not so, as can be seen from the photographs on the following pages.

In permitting a wide range of construction forms to be offered, the NPS must ensure that proposers meet necessary aesthetic and quality standards. This is done by carefully reviewing proposals, by on-site inspection of the offeror's existing projects, and by emphasis on those standards in the solicitation process.

Several other forms of housing are available. Kit houses are becoming popular. Geodesic domes are a growing style. Houses have been built out of foam sheets, logs, and blocks. Each of these methods offers significant cost savings over any of the alternatives considered in this study. Most were unsuited to the Big Bend landscape. In some parks, they would be more appropriate aesthetically, and a smaller number could be employed effectively in pilot projects. In addition, the NPS is rightfully wary of turning over a major park to such unfamiliar products without further experience.

ANALYSIS OF THE ALTERNATIVES

The alternative methods of providing housing for NPS employees are compared for cost in Chapter 2, following a description of the local considerations specific to the Big Bend NPS area. In Chapter 3, we present our recommendations about the alternatives to pursue in general and at Big Bend in particular.

EXAMPLES OF DIFFERENT HOUSING STYLES



MODULAR HOUSE RECENTLY ACQUIRED AT BIG BEND

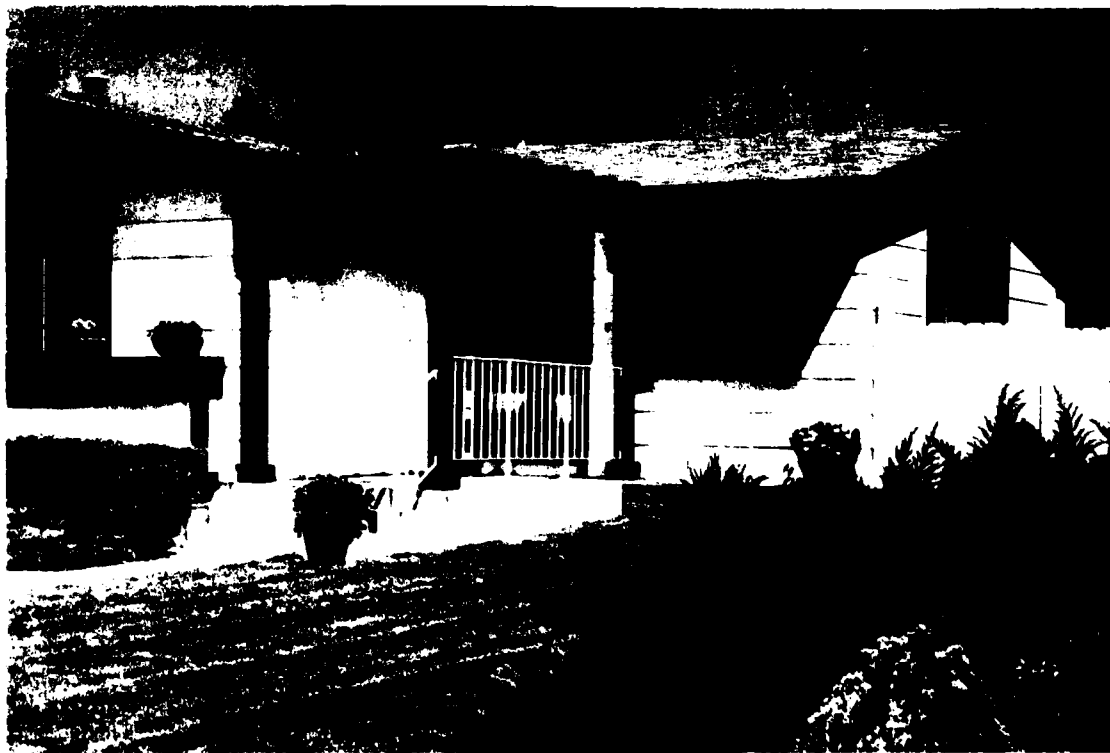


MANUFACTURED HOUSE ON AN ARMY SECTION 2667 PPV.
NOTE THE SIMILARITY TO MODULAR HOUSING ABOVE

EXAMPLES OF DIFFERENT HOUSING STYLES



SITE-BUILT HOUSING FOR ARMY PPV UNDER SECTION 2667

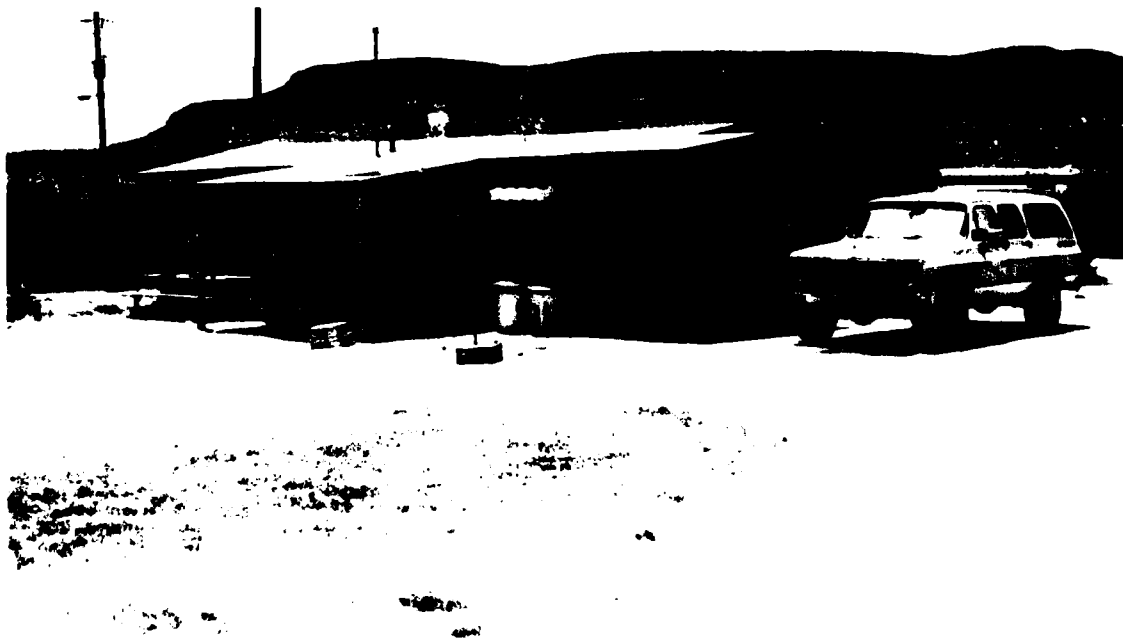


**MANUFACTURED HOUSING SHOWING FLEXIBILITY OF DESIGN WITH
LIMITED SITE WORK**

BIG BEND NEEDS NEW HOUSING



MOBILE HOMES



SITE-BUILT HOUSING IS NOT NECESSARILY AESTHETICALLY SUPERIOR

BIG BEND NEEDS NEW HOUSING



SITE-BUILT HOUSING SHOWING THE EFFECTS OF LACK OF MAINTENANCE FUNDS



CONTRACTOR'S HOUSE, SHOWING AN ACCEPTABLE PARK ARCHITECTURE

CHAPTER 2

TEST SITE - BIG BEND NATIONAL PARK

Big Bend National Park in southwest Texas was chosen as a potential pilot project for PPVs by the NPS. Big Bend shares many of the characteristics of other parks with housing problems. It is large and remote; its 116 employees form a significant but not particularly large population by private sector housing development standards.

LOCATION

The park contains over 775,000 acres in Brewster County, TX.; Figure 2-1 shows the location and size of the park.

The park includes both desert and mountain topography and an unusual array of plant and animal life, including many species that are endangered, threatened, or protected. In addition, there are numerous sites protected by the National Register of Historic Places.

The park is located in an isolated area. The closest viable housing market is Alpine, Texas, which is 108 miles from the Park Headquarters at Panther Junction. Alpine is also the nearest town offering medical services, dental services, or shopping facilities. The Big Bend area shares in the generally depressed economy of Texas. Local rents are low, and no new construction is being undertaken, especially housing.

CLIMATE

Big Bend National Park is located in a desert climate. Weather data are provided in Table 2-1. Temperatures in the higher mountain areas vary about 5 to 10 degrees below those shown, while temperatures along the Rio Grande are from 5 to 10 degrees higher. Sunshine is abundant the year round. Infrequent and brief periods of cloudy weather are confined mostly to the winter months. Snow falls very rarely and is generally light, lasting only a short time. Relative humidity is

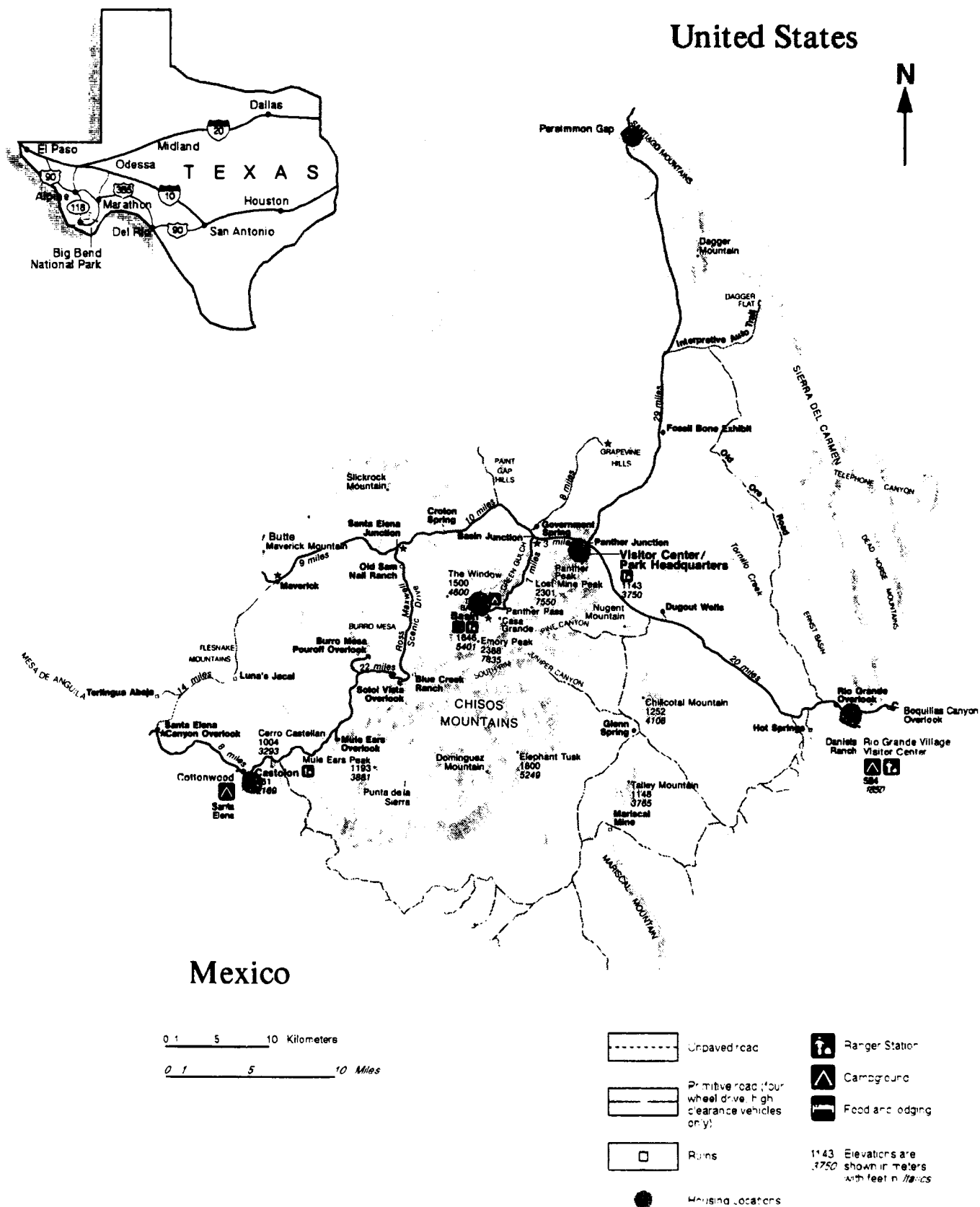


FIG. 2-1. BIG BEND NATIONAL PARK

usually quite low. The "rainy season" extends from mid-June through October, during which there can be locally heavy thunderstorms and some flash flooding.

TABLE 2-1

BIG BEND NATIONAL PARK WEATHER DATA

Month	Average maximum (degrees F)	Average minimum (degrees F)	Precipitation average (inches)
January	60.9	35.0	.46
February	66.2	37.8	.34
March	74.4	45.3	.31
April	80.7	52.3	.70
May	88.0	59.3	1.50
June	94.2	65.5	1.93
July	92.9	68.3	2.09
August	91.1	66.4	2.35
September	86.4	61.9	2.12
October	78.8	52.7	2.27
November	68.5	42.3	.70
December	62.2	36.4	.57

PARK THEME

NPS-76 requires that each park develop a cohesive design theme that will reflect the purpose and character of the park, or of individual areas of a large park like Big Bend. When we visited Big Bend National Park, its design theme was undefined. Since then, an ideal design theme has been developed to reflect the native character and cultural tradition of the local area. That theme consists of a Spanish-style architecture that includes adobe construction for all exterior walls and standing seam metal roofs. This type of construction is relatively expensive compared to alternative types of construction that builders normally employ when building housing and is in fact seldom seen in the area.

The Big Bend staff agreed that an acceptable design theme could include stucco walls rather than adobe, and shingle roofs rather than metal roofs. Those changes

will make it possible to carry out an acceptable architectural theme more economically.

The park staff has found significant shifts in employee demographics over time; sometime, families predominate and at other times, seasonal or single employees do. The staff is very interested in obtaining larger structures to serve as four-bedroom single-family homes and with little effort to be converted to several smaller units. Units in the Castolon housing area do this to some extent now.

INVENTORY

Big Bend requires a work force of over 100 employees to maintain a park of its size and complexity. Because of the distance to Alpine, and the absence of rental housing in the intervening miles, Government-furnished housing must be maintained within park boundaries for all employees. Accordingly, the park has approximately 108 units of employee housing located in five housing areas. Most of the permanent single-family units were built during the 1950s and 60s. Trailers initially purchased for temporary housing are now 20 years old on average. The following housing areas on the park are shown in Figure 2-1:

- Panther Junction housing area is located adjacent to the park headquarters and is the largest of the five housing areas. Panther Junction currently has 30 permanent single-family units, 10 apartment units, and 45 trailer/mobile home units.
- Chisos Basin includes visitor lodges, the concessionaire's dormitory, and a housing area. Chisos Basin currently has four NPS permanent single-family units.
- Rio Grande Village is located in the eastern part of the park adjacent to the Rio Grande River. Rio Grande Village currently has three permanent single-family units and six trailer units.
- Castolon is located in the southwest part of the park. Castolon currently has seven permanent single-family units and two apartment units.
- Persimmon Gap is located at the northern entrance to the park and has one trailer for the ranger stationed at that post.

CONDITION OF THE HOUSING

NPS accounting does not permit a precise statement of the maintenance expenditures for housing. Our technical survey estimated a cost of \$1.3 million to

accomplish the renovations specified by the park's staff. This is a reasonable approximation of the backlog but understates it because of needed actions that are not included in the renovation requirements. The park's staff believes that the poor quality of life offered by this deteriorated housing does reduce the park's attractiveness to NPS employees and limits competition for open positions. Many of the current employees believe that even the limited rent they pay for most of the housing is still excessive for the quality of unit provided.

COST COMPARISON OF THE ALTERNATIVES

We used a detailed cost model (Housing Options for United States Employees ["HOUSE"]) to compare the alternatives' expected costs to the Government. The model includes construction costs, financial considerations, operating and maintenance costs, and terminal value of the property. In this case, HOUSE is based on industry-accepted parameters, adjusted for the specific conditions at Big Bend, as represented by 58 data input items. Those items are displayed in Appendix D. A copy of HOUSE has been provided to the NPS.¹

HOUSE produces a comparison of the alternatives in terms of cost to the Government and estimates the annual lease payment required to meet contractor expenses and fair profit standards. It also estimates the rent that would be charged to employees if an off-park housing development were constructed without additional subsidy. Table 2-2 shows the summary data produced by HOUSE. Numbers shown in parentheses are negative — that is, savings.

Although the summary is fairly self-explanatory, a few definitions may be helpful. The Net Present Value (NPV) is a standard economic method of comparing unlike alternatives. It reduces each option to the basic question, "How much money would you have to have in an interest-bearing account to make all the payments required over the life of this project?" The lower the NPV, the better the alternative. The net annual cost takes the NPV and converts it to an equivalent annual payment, or answers the question, "What would be the fixed annual payment we would have to make to pay for this alternative?" This is not a "real" payment, since in some years

¹LMI Report DI901R2. *HOUSE A Decision Support System for Assessing the Cost of Housing Options for United States Employees*. Brown, Douglas M., and Jordan W. Cassell. December 1989.

more actual money must be paid than in others – it is simply a more understandable measure to some people than the NPV.

TABLE 2-2
COST SUMMARY FOR MODULAR HOUSING

Alternative	Government cost NPV (\$ millions)	Net annual cost to Government (\$ thousands)	Annual lease paid to contractor (\$ thousands)	Excess Government cost (\$ thousands)
Appropriated fund	4.8	424	0	NA ^a
On-park	4.4	391	649	(33)
Split location	7.4	652	878	228
Off-park only	7.9	696	709	272
Off-park w/administration center	8.0	702	714	278
Direct lease to employee ^b	0.5	48	0	(375)

Note: The Government costs for site work and foundations are included in the NPV and Net Annual Cost calculations. Obviously, they are not included in the lease.

^a Not applicable.

^b Unit rent (\$1,217 per month) is seventy percent of employee income; current average is 11 percent.

The annual lease is the lease payment that would be required in each year to meet contractor expectations of a fair profit after meeting costs. Notice that in some cases the lease payment exceeds the net annual cost; that is because over the long term the Government is building equity. In other cases, the net annual cost exceeds the lease payment, because the Government must continue to operate some facilities from its own appropriations. In the latter case, the annual cost is not the total appropriated fund cost, again because the annualizing technique allocates future gains over each year.

The excess cost to the Government is the difference between the appropriated fund alternative annual cost and each of the other alternatives. That difference shows that, although each alternative to appropriated fund construction may require large annual lease payments, those payments may still be less than the real cost of building with appropriated funds. Specifically, the on-park lease alternative ends up costing the Government less than appropriated fund construction.

While the off-park alternatives are somewhat more expensive than the on-park lease, the difference may be considered worth spending to further preserve park resources by moving activities off the park. That policy decision is one that only the NPS can make; HOUSE assesses the cost of such a decision.

We have shown the unit rent to employees living in off-park developments renting directly from the developer. Using the NPV system, that alternative is clearly the most inexpensive for the Government. That is because the employees are paying for the cost of building and operating the houses through the rent, without Government subsidy. However, the model summary shows that rents would balloon, while requiring the employees to live a significant distance from their place of work. The very large figures reflect the fact that market rents are inadequate to defray both capital and operating costs; thus, off-park renters would have to pay well above the market rent in subsidizing all the construction, renovation, and operating costs out of their own pockets. We are unable to quantify the impact of such a change in employee finances on morale and retention, but the implications of moving from paying 11 percent to paying 70 percent of gross income for housing are obvious.

Some caution is needed. The figures shown above reflect the comparative costs of the alternative using procedures specified in OMB Circulars A-104 and A-76. The most significant of those provisions is the requirement that the Government be assessed a cost for its own land. This provision has often been debated in terms of sunk costs versus opportunity costs. For the Big Bend analysis, the value of the land is so insignificant that this point becomes irrelevant, but it must be considered when trying to extrapolate our Big Bend conclusions to other Government properties in less isolated areas. In Appendix E, we provide a sensitivity analysis of all the alternatives to the major variables in HOUSE.

The next caution is that the analysis does not include the cost of funds to the Federal Government. The HOUSE model allows the cost of borrowing funds to be included or not. Table 2-3 shows the changes to the summary figure when the appropriated funds are considered to be debt-loaded. Clearly, this restriction makes Government appropriated fund activity less desirable than private financing.

The model's effectiveness is limited by the cost information collected from industry. We found that while builders were willing to talk in detail about DoD projects (for which both legislation and funding are in place), we had much less

TABLE 2-3
COST SUMMARY WHEN GOVERNMENT MUST BORROW

Alternative	Government cost NPV (\$ millions)	Net annual cost to Government (\$ thousands)	Annual lease to contractor (\$ thousands)	Excess Government cost (\$ thousands)
Appropriated fund	6.8	596	0	NA ^a
On-park	5.7	506	790	(90)
Split location	8.0	708	928	112
Off-park only	8.2	721	731	125
Off-park w/administrative center	8.3	731	740	135
Direct lease to employee ^b	0.5	48	0	(548)

Note: The Government costs for site work and foundations are included in the NPV and Net Annual Cost calculations. Obviously, they are not included in the lease.

^a Not applicable.

^b Unit rent (\$1,257 per month) is seventy two percent of employee income; current average is 11 percent.

substantive discussions on NPS projects. Industry managers stated that they could not invest unlimited time on projects that had no demonstrated Government commitment.

The HOUSE user's manual explains the calculations behind the HOUSE model. We used modular housing, with the Federal Government providing infrastructure runs and foundations for the delivered housing. Top-quality modular houses with on-site finishing work can provide a stucco exterior in keeping with Big Bend architectural themes, and we found that in the past year five modular houses have been placed on NPS-provided foundations and infrastructure at Big Bend. Had we used site-built housing in the analysis, the on-park PPV alternative would have generated savings over the appropriated fund alternative cost by an equivalent of \$137,000 annually, but the annual lease payment would be 16 percent higher.

Finally, we should point out a very important variable that the HOUSE model can only approximate: employee morale. In the absence of adequate appropriated funds, PPVs offer a means of providing housing within current budgetary constraints. DoD experience has shown that PPV housing can be placed into service within 12 months from the publication of the solicitation, as opposed to a normal 24-to-36-month completion cycle for appropriated fund projects. So, if the cost

discrepancy is not significant, even a slightly more expensive PPV could be a good investment if significant employee morale and retention problems are being experienced as a result of inadequate housing.

FEASIBILITY

The data portrayed in Tables 2-2 and 2-3 indicate that PPVs can be feasible, and competitive in cost with appropriated fund construction, at the Big Bend National Park.

Circumstances can also exist or be caused that make PPVs less attractive than appropriated fund construction. The HOUSE model, which has been delivered to NPS, can aid in the recognition of those situations. Our sensitivity analysis in Appendix E discusses the implications developed through HOUSE and the potential for expanding PPVs beyond Big Bend.

The feasibility of a PPV will be maximized (and the relative cost minimized) by the following actions:

- Replacing units rather than building new ones
- Renovating units rather than replacing them (unless a direct rent off-park is strongly desired)
- Using multifamily dwellings where possible
- Using minimal lease and loan periods
- Using as many units as possible as long as marginal units generate a net income.
- Selecting parks in which the land has some value and rents exceed operating costs.

Unfortunately, conditions at Big Bend do not permit all of those actions. The unattractive layout of the site on which trailers are located precludes significant replacement. Therefore, our data input (shown in Appendix D) maximizes the number of renovated units while replacing none. The park architecture is not fully conducive to multifamily dwellings although the NPS concept of a flexible structure should be retained as a desirable feature in any solicitation.

The fact that circumstances can be structured in favor of or against PPVs also warns that PPVs are not a panacea. The expected lack of appropriated funds cannot

be solved in a cost-effective way through PPVs at every location. In addition, cost models, even of the quality of HOUSE (a variant of which has successfully predicted contractor cost proposals in Staten Island, NY, and in Washington, D.C., for DoD), cannot account for individual anomalies or ingenuity. Thus, the actual costs and offerings will vary somewhat from those predicted.

CHAPTER 3

CONCLUSIONS AND RECOMMENDATIONS

As a result of our feasibility analysis, we offer the following recommendations in the order in which they should be implemented:

- The NPS and DOI should take positive action to supplement line-item construction funding for housing.
- The NPS and DOI should seek legislative authority for PPV housing.
- The NPS should solicit proposals for PPV housing at Big Bend NP.
- The NPS should perform PPV analyses at additional parks.

The conclusions from our observations and analysis (described in Chapters 1 and 2) which led to these recommendations are presented in order below, along with implementation details where necessary.

SUPPLEMENT LINE-ITEM CONSTRUCTION FUNDING

We have seen that, despite appropriated fund expenditures of approximately \$5 million for housing maintenance annually over and above the rental receipts, the NPS backlog of deferred maintenance for housing continues to grow. This deterioration of existing units results in decreasing rents for the same units even as the cost to maintain them increases. We conclude that, without dramatic increases in maintenance funding, the NPS housing inventory faces a continuing downward spiral — a cycle of poverty.

Current new-construction appropriations address less than 2 percent of the already-identified need, a need that will increase as the condition of units declines. In an era of fiscal inadequacy throughout the Federal Government, the NPS can expect that new-construction funding will remain inadequate to meet NPS needs. We conclude that new-construction appropriations alone cannot solve the entire NPS housing problem. The NPS will have to turn to the private sector to use existing funding levels to obtain new housing and management services. Since conditions are

not expected to get any better, positive action will be required to stop them from getting any worse. Both the OMB and the Congress are urging such action.

OBTAIN LEGISLATIVE AUTHORITY

This feasibility study is tentative because of the limited industry interest in the PPV concept as long as there is no authority for projects. Without funding authority for PPVs, NPS's need is not being taken seriously by the housing industry. In addition, there are practical issues. A solicitation cannot be prepared or released for comment without funding. Funding cannot be obtained without legislative authority. The process of obtaining that authority, once applied for, may be drawn out. In short, we conclude that further progress towards the realization of a PPV must wait for the NPS or DOI to obtain legislative authority.

The NPS presently has no authority to enter into PPVs. It does have extensive experience with a very similar enterprise form through its concession contracts, and PPVs should not provide a significant new challenge to management. Obtaining the authority to enter into PPVs does not commit the NPS to extensive use of them; although such authority might cause the NPS to be pushed in that direction, we note that OMB and the Congress are already making such a push regardless of the authority. We conclude that obtaining PPV legislation poses little new risk to the NPS.

We have provided as Appendix A to this report a draft of legislation that would authorize pilot PPV projects of limited risk in DOI's Bureaus. That text is based on the build-to-lease authority granted to DoD. We have included other DOI activities because of the similarity of the problems of poor housing and remote job sites found throughout DOI.

PURSUE A PPV AT BIG BEND

Pilot Project Risk Assessment

At Big Bend a PPV is more cost-effective than continued appropriated fund construction and maintenance under certain conditions, and under all conditions, the potential extra cost to the Government is limited. Since Big Bend was not identified by Congress as one of its priority sites for new housing in the 1989, 1990, or 1991 budgets, it is unlikely to receive appropriated fund support in any case. The housing conditions for the bulk of the employees are unsatisfactory, affect the morale of

assigned employees, and limit the pool of inbound transfers. In short, as long as the constructed PPV housing is of acceptable quality, a PPV will be unlikely to make things any worse.

We conclude that, although a PPV at Big Bend demonstrates little savings over present operations, the project has little risk; therefore the opportunity to obtain new housing is worth pursuing.

We recommend that the NPS solicit proposals for PPV housing at Big Bend.

Conditions of Lease

As displayed in Table 2-2, the most effective method is to use an on-park lease. Even within that decision, the relative effectiveness of a PPV depends on the terms and conditions of the lease. The HOUSE model was manipulated using sensitivity factors to identify the conditions under which the Government achieved the greatest possible savings or incurred the least cost. These considerations are based on the specific situation at Big Bend and will differ for other locations.

These conditions are as follows:

Term

The term of the lease is 40 years, which includes two optional extensions of 5 years each. HOUSE suggests that shorter terms are less expensive. However, the period of the guarantee is the primary consideration of financial institutions in lending decisions. The marginal attractiveness of the Big Bend project demands that the NPS assume some risk in order to ensure that the project does not fail simply because of financing difficulty. This risk is mitigated by providing that the last 10 years of the project be under extensions.

Location

The lease is on-park. The remoteness of Big Bend, which is neither populated nor on the way to any other destination, makes off-park development unrewarding.

Scope

- *Build, renovate, and manage all on-park units at Big Bend.* Since the NPS operation of its own housing requires appropriated fund support in addition to the rents received in any case, allowing the contractor to generate

economies of scale by operating all the units ends up reducing the total cost to the Government. In addition, it relieves a busy park staff of a task which consumes time and resources, both of which are scarce.

- *Construct the houses required at Fort Davis National Historic Site:* Adding an extra contractor housing office at Fort Davis is not cost-effective. The distance is such that a single management office at Big Bend could manage the housing at both sites only with difficulty. However, adding the construction of the Fort Davis housing units reduces the NPS cost slightly. The cost of building units at Fort Davis alone would be quite high, and we recommend that the NPS take the opportunity to address Fort Davis' needs as part of the package.
- *Offer a fixed-price option for Guadalupe Mountain National Park housing:* The most logical way to increase Guadalupe's housing supply is to include it as part of a package with Carlsbad Caverns. (However, we did not address the Carlsbad scenario in this analysis because major policy decisions remain on the need for housing in or outside the park in Carlsbad.) The requirement for housing at Guadalupe is so small that the cost is high if done alone. HOUSE suggests that again the total cost to the NPS would be reduced by adding more units; however, the desirability of a Guadalupe project would depend on the builder's preferences. We recommend that this housing be made available in the solicitation as a fixed-price option to the NPS if the offeror wishes.

Design Theme and Construction Type

HOUSE finds a PPV to be more cost-effective than appropriated-fund construction if modular housing is used. Modular and manufactured housing, with some site work by the builder, can achieve the wall and roof standards acceptable to the park. We recommend that the NPS allow this type of housing to be proposed. More complex forms of construction may offer higher aesthetic satisfaction (but not necessarily any added durability); the cost is also higher. These considerations are controlled through the lease cap and quality point system; less expensive forms of construction can offer more amenities and lower leases.

Cash Payments

HOUSE shows a significant cost reduction if the Government provides the infrastructure work. The work could be done by the Big Bend maintenance staff, as was done for Big Bend's most recent housing units, or by the winning offeror at a fixed price to be paid as an appropriated fund construction item. The latter

alternative is best from the project management view, unless the appropriation (estimated at \$305,000 for the infrastructure and \$240,000 for the site preparation) is unobtainable. In that case, the full cost of construction would have to be included with the lease payment, which would come from ONPS funding.

Lease Cap

We recommend a cap of \$649,000 for the first year's rent, representing the construction of 45 new buildings at Big Bend and 4 at Fort Davis; the renovation of 48 units at Big Bend, and the management of all 97 units, but not including the site work to be paid for separately. HOUSE's estimated lease for a modular home project lease would be \$649,000, as shown in Table 2-2. That figure is the same as a monthly rent of \$548 per unit. In using that cap, the NPS opens the door to site-built home builders able to come in under an industry-average lease of \$755,000. The \$649,000 figure does offer an immense profit margin for the minimum-quality manufactured home builders; however, the specification of CABO standards and a quality point system emphasizing aesthetics and durability will eliminate all but the best manufactured home builders. The lease of \$649,000 allows an annual cost reduction to the NPS of \$33,000 over the cost of building and operating the units itself; we suggest for the initial project only that this reduction be considered victory enough without worrying about the potential profit to the winning offeror. If the infrastructure and site work are to be paid for through the lease payment rather than specific appropriated funds, the lease cap should be set at \$790,000.

We have included all these conclusions in our draft prospectus at Appendix B.

Actions Remaining

Assuming that the necessary legislative authority is granted to the DOI, we recommend that the NPS obtain the necessary funding, collect the required technical documents to accompany the prospectus, and update it to reflect inflation since data collection of this report (September 1989).

After obtaining PPV authority, the NPS should refine the concept outlined in the prospectus by holding an industry forum in order to receive pre-publication comments. The forum should be held in the general region in order to be most attractive to those regional builders most likely to bid on the final project, yet accessible enough to allow national companies to attend. Santa Fe, NM, the location

of the NPS Southwest Regional Office, would be suitable. Big Bend itself should not be used as the site for the forum.

The final solicitation should be issued no more than 2 months after the industry forum in order to assure bidders that the NPS is serious about the project.

CONSIDER OTHER PARKS

Criteria

HOUSE sensitivity analyses, discussed in Chapter 2, were used to determine the most advantageous PPV structure for Big Bend. Ordinarily, such analyses could be used to suggest other sites where conditions would also be favorable.

In this case, the sensitivity analyses must be considered carefully because they are affected by the basic fact that local market rents are too low to offer a reasonable return to an investor if new construction is required. Injecting different hypothetical situations into HOUSE revealed that, while many factors result in minor adjustments, a few key factors can lead to PPVs being cost-effective for all forms of construction:

- A larger concentration of units
- A more vibrant off-park economy, or the potential for one
- Lower interest rates (which come with less perceived risk)
- A more valuable land contribution.

If feasibility analyses are to be performed for other parks, those parks should meet one or more of these criteria.

Repeating the Big Bend Scenario

PPV feasibility studies do not have to be pursued simply to find the most cost-effective solution and then implemented only in that mode. Sometimes, any effective solution is better than continuing with an unacceptable status quo. If the Big Bend project is feasible, the PPV concept can also be applied to similar parks to provide housing there. Crater Lake, OR, and Grand Canyon, AZ, cited in the FY91 appropriation acts as needing immediate attention, appear to fall into this category, as would most of the NPS's other large, remote parks.

Parks Where PPV Should Not Be Attempted

Although a Big Bend scenario may be feasible for PPVs, we have demonstrated that there is little room to spare. We would not recommend attempting a PPV approach for any parks with more than one of the following factors, unless they are mitigated by a major advantage:

- Few employees
- Little economic activity outside the park, or little land value, or not en route to other destinations
- Short season.

Big Bend, for instance, displays one of these defects but makes up for it by having a relatively large work force and a full-year season.

The HOUSE model and most of our findings are based on generalized industry experiences and averages, and many service providers can outperform the average. The NPS should not preclude itself from accepting an unsolicited proposal to provide PPV housing in even the most unlikely park.

Nontraditional Architecture

We did not consider kit homes, geodesic domes, foam structures, or other innovative techniques, despite significant cost advantages, because they were inappropriate to Big Bend. Such structures may be suitable in other settings.

APPENDIX A

DRAFT ENABLING LEGISLATION

DRAFT ENABLING LEGISLATION

GENERAL

The Department of the Interior (DOI) does not have the authority to enter into leases or concessions for the benefit of its employees. In this appendix, we propose the text for appropriate legislation based on the DoD Section 801 Build-to-Lease authority. We have modified that language to cover all capital facilities rather than merely housing to permit secondary income to subsidize the housing operation.

The proposed legislation addresses the DOI, rather than the National Parks Service (NPS), because all the bureaus of the DOI would benefit by such authorization for the Public-Private Venture (PPV) approaches toward affordable housing. It is given in eight paragraphs in the following section.

PROPOSED LEGISLATION

(1) Notwithstanding any other provision of law, any of the directors of the bureaus (to include the National Park Service) within the DOI may enter into a contract for the lease of capital facilities on or near the properties of those bureaus. Leases for facilities at more than one site may be incorporated into a single contract. A contract under this subsection shall include a provision that the obligation of the United States to make payments under the contract in any fiscal year is subject to the availability of appropriations for that purpose.

(2) Each contract under subparagraph (1) shall be awarded through the use of publicly advertised, competitively bid, or competitively negotiated contracting procedures. Such a contract may provide for the constructor of the facilities to operate and maintain the constructed facilities and any similar existing facilities during the term of the lease.

(3) Each contract under this subsection shall require that facilities constructed pursuant to the contract shall meet the then-current technical construction standards as specified by each bureau.

(4) A contract under this subsection may be for any period not in excess of 40 years following the acceptance of the facilities, except that optional extensions (under the same conditions as those of the original lease) of no more than 5 years each may be awarded for satisfactory performance up to a maximum total contract time of 50 years.

(5) A contract under this subsection shall provide that upon termination of the lease the United States shall receive without further compensation all rights, title, and interest to the facilities constructed under the contract, together with any land included in the contract and not already the property of the United States. This transfer of title shall be at depreciated book value. Amounts designated to be paid in any year under the terms of any lease or contract entered into under this section shall, for budgeting purposes, be considered as expenditures for that year.

(6) A contract may not be entered into under this subsection until:

(A) The Secretary of the Interior submits to the appropriate committees in writing an economic analysis (based upon accepted life-cycle costing procedures) which demonstrates that the cost of the proposed contract is similar to that of reasonable alternative means of furnishing the same facilities.

(B) A period of 21 days has expired following the date on which the economic analysis is received by those committees.

(7) This subsection may be implemented only by a pilot program. In carrying out such pilot program:

(A) The director of each bureau may not enter into more than three contracts under this subsection, and

(B) If any such contract is for the provision of employee housing units, it may not be for more than 400 new housing units. Renovated existing units, or units placed under the contractor's control for management, shall not count against this restriction.

(8) Not less than 2 years subsequent to the facilities acceptance of a total of three contracts for housing as authorized by Paragraph (7) within the DOI, the Secretary of the Interior may submit for approval contracts for up to 30 percent of any bureau's total housing requirement.

APPENDIX B

DRAFT PROJECT PROSPECTUS

DRAFT PROJECT PROSPECTUS

The National Parks Service (NPS) has extensive experience with concession operations. In many ways, a concession is a Public-Private Venture (PPV): the Government offers land, some capital support, and noncompetitive access to a significant market. The private operator provides the initial capital investment and continuing service. In some cases, there is a concession fee. The only real difference between the proposed housing PPV and a regular concession is that the "customer" is the Federal Government itself.

We originally intended to provide a statement of work for a more traditional Federal Acquisition Regulation (FAR) contract. However the similarity of the PPV to a concession, and the complete confidence in and familiarity with concessions found at all levels of the NPS, lead us to conclude that a concession form would be much more appropriate. The statement of work as originally envisioned is contained in the various paragraphs of the prospectus which begins on the next page.

In the event of a final decision from the NPS, the necessary technical exhibits to the prospectus would be provided by the NPS.

The remainder of this appendix conforms to the *New Authorization Process - Contracts and Permits (Prospectus)*, National Park Service Guideline Number 48, May 1, 1986.

INTRODUCTION

The National Park Service (NPS) of the Department of the Interior (DOI) is seeking a qualified contractor to provide, operate, and maintain the accommodations, facilities, and services described herein for the Federal employees at the Big Bend National Park and the Fort Davis National Historic Site in Texas. In order that interested parties may submit a proposal pursuant to the synopsis published in the *Commerce Business Daily* (CBD), the following information on the proposed contract operation at Big Bend is provided. This invitation is issued to evoke the widest possible interest in providing, operating, and maintaining the facility, and to inform all interested parties of the requirements and conditions under which the operation(s) may be conducted.

Contractors who have provided satisfactory service during the lifetime of their contracts enjoy, pursuant to the Act of October 9, 1965, a preference in the renewal of their contracts upon the expiration of contracts covering their operations.

An industry forum, for the purpose of refining this prospectus and the proposed contract, will be held on (Date) , at (Time) in Santa Fe, NM. Applicants who wish to attend this conference or who have any questions regarding this Prospectus should contact (Name) on (Phone No.) . The NPS expects to issue the formal solicitation 60 days after the industry forum.

GENERAL AREA DESCRIPTION

The Big Bend National Park is located in southwest Texas. It is approximately 300 miles from El Paso, TX, and approximately 270 miles from Midland, TX. The nearest significant town is Alpine, TX, which has a population of approximately 5,000 and is located 108 miles north of the park headquarters. Other than the concession-operated lodge, local accommodations are available in Study Butte (Terlingua), TX, approximately 25 miles from the park headquarters.

The Fort Davis National Historic Site is located approximately 20 miles northwest of Alpine. Adequate local accommodations exist.

The nearest rail facilities are in Alpine. Good open roads lead to the park from El Paso and (through Alpine) from Midland and San Antonio. The change in

elevation from those cities to the park is minimal; although there are some hills around Alpine, they pose no significant obstacle to commercial hauling.

Because the park is remote, the NPS offers housing to all employees. Presently, only two families have chosen to live outside the park. Rental income is artificially low and maintenance budgets, limited to the rent receipts, are inadequate to meet minimum upkeep requirements. As a result, the housing stock is deteriorating steadily. The current inventory includes 52 mobile homes, most of which are in poor condition, 9 modular housing units; and 47 concrete-block houses in good structural condition but requiring renovation.

The terrain is not ideal for construction, but is not unfavorable. The terrain in the Panther Junction area (in which the majority of the construction is needed) is on a moderate slope, free of significant vegetation, and is composed largely of small rocks. The Rio Grande Village area, in which the remaining seven new units are required, is more heavily vegetated, flat, and somewhat sandy. Access to this latter site is restricted by a tunnel which is also on a curve; the tunnel will permit the passage of a manufactured house section. The Chisos Basin, in which the lodge is located, is contained within a circle of mountains, and has very steep grades and tight curves. Oversize trailers have been taken there with traffic control by the NPS; however, this project envisions only renovation work being necessary in the Chisos Basin.

The climate is favorable for construction. Rainfall is minimal. Winter temperatures are mild. Summer temperatures are high, ranging routinely up to 100 degrees, but low humidity allows even heavy labor to continue with appropriate precautions.

The park currently houses approximately 100 employees and their families. The precise number varies routinely because of the presence of seasonal employees. However, the contractor in this instance will be receiving rent from the NPS directly as the overall tenant, so that vacancies are an NPS problem rather than a contractor problem. In the event that unforeseen circumstances eliminate the NPS need to continue renting housing, the contract contains equitable termination arrangements. Current and 3-year historical figures for employees and family members are furnished as Exhibit _____ to this prospectus to allow offerors to plan secondary revenue generating activities, but the NPS does not warrant the validity of these data in their application to any future year.

The contractor has an option to offer additional houses in Guadalupe National Park, some 250 miles to the north. Guadalupe is approximately 70 miles from Carlsbad, New Mexico. Rail facilities are available in Carlsbad or in Van Horn, TX., approximately 100 miles to the south. Good, open roads are available; the altitude changes perceptibly over the course of travel from either of these two centers but at no point does the slope appear noticeable.

All houses will be located on NPS property. Construction and aesthetic standards and all required permits will be in accordance with NPS requirements (refer to NPS-76 for details). No local authority permits are anticipated, but if necessary they will be obtained by the NPS.

REQUIREMENTS

The contractor shall be required to provide the services and facilities set forth in SEC. _____ of the attached contract under the following conditions:

1. The contractor shall construct at least 45 residential buildings at Big Bend NP on the site indicated in Exhibit _____ to the attached contract. This construction shall include necessary roadways within the project site. The contractor shall remove all debris, to include all mobile homes.

a. Single-family houses: 15 buildings shall be three-bedroom houses, and 15 shall be two-bedroom houses. Each house shall have a two-car attached carport or garage, and at least 200 cubic feet of secure storage space (interior or exterior) in addition to normal closet space.

b. Multipurpose houses: The remaining houses (at least 15) shall be 4-bedroom houses. These houses shall be easily and inexpensively reconfigured to a four-bedroom single-family house, two two-bedroom duplex homes, three one-bedroom apartments, or one six-person dormitory. The apartment and dormitory configurations make use of common areas for facility rooms except for bathrooms. This type of structure is hereafter referred to as a "multipurpose house." Each house shall have at least four attached covered parking spaces and a total parking facility sufficient for at least six cars. These parking areas need not be adjacent to each other. Each house shall have four independently secure storage areas (interior or exterior) of at least 100 cubic feet each in addition to normal closet space.

c. Contractor houses: The contractor shall construct appropriate housing units for full-time employees. Such housing must conform to the aesthetic design of the rest of the houses; but specific adherences to minimum amenity standards is at the contractor's discretion.

2. The contractor shall renovate 48 existing houses as prescribed in SEC _____ of the attached contract.

3. The contractor shall provide two play areas.

4. After NPS acceptance of the construction and improvements, the contractor shall operate and maintain the housing on the park in accordance with the offered operating plan and maintenance plan. Those plans shall meet or exceed the standards provided as Exhibit__ to this prospectus. This property management period shall extend for a period of 30 years, except that two further extensions of 5 years each may be granted at the option of the NPS.

5. The contractor shall construct four multipurpose houses at the Fort Davis National Historic Site (NHS). These houses shall be maintained by the NPS unless the offeror proposes to maintain all the residences at the NHS. If the offeror proposes maintenance of the NHS housing, additional quality points shall be awarded. Each offeror proposing to maintain the NHS housing shall include a proposed lease payment if the NPS maintains the NHS housing, and the NPS shall have the option of choosing either approach without further negotiation.

6a. The NPS shall provide monthly progress payments for site work and infrastructure based on the schedule and total cost of the work as proposed and accepted.

6b. The NPS shall provide an annual lease payment. The payment shall consist of a fixed facility rent and a changing maintenance rent. The maintenance rent shall increase annually by the general inflation rate for the previous calendar year as announced by the U.S. Department of Commerce. One-time annual assessments may be granted at the discretion of the Contracting Officer as a result of unforeseeable circumstances. Such assessments shall not be included in subsequent years' calculation of the maintenance rent. The first year's total rent shall not exceed \$649,000. Offerors shall identify the fixed and variable components of that rent.

7. The offeror may propose additional services to be provided on a voluntary, fee-paying basis to NPS employees as a means of reducing the NPS rent. Those services may not include any of the activities listed in Exhibit _____ to this Prospectus and will not be available to the visiting public. Offerors proposing such secondary revenue-generation activities must include a proposed lease payment without such secondary activity; that proposed lease payment may exceed the cost cap specified in this prospectus. The NPS shall have the option of choosing either approach without further negotiation.

8. The offeror may propose the provision of six multipurpose units for the Guadalupe Mountains National Park. The NPS will maintain those units. The offeror shall propose an additional fixed rent due to those units. The NPS shall have the option of accepting those additional units or not, without further negotiation, but shall not obtain the Guadalupe units under the provisions of this solicitation from any offeror other than the contractor selected to provide the Big Bend and Fort Davis houses.

9. The housing shall have an exterior architecture suitable for the Rio Grande region. The general color scheme shall be earth tones (such as brown, tan, green, etc.). All buildings shall have significant roof overhangs to provide daylong shade. Roofs may be composed of standing-seam metal, Spanish tile, red shingles, or other subdued colored shingles in that order of preference. The preferred exterior material is a stucco-like finish; due to the extensive woodpecker population in the area, exteriors made from wood are not acceptable, and trimwork made from wood is not advisable.

10. This Prospectus does not encourage any form of construction (manufactured, modular, or site-built) over another. All proposed construction must conform at least to the minimum standards established by NPS-76; however, the point scheme makes it clear that the NPS seeks a maximum quality in durability and aesthetics rather than a minimum rent.

11. Bonds: The proposal shall be accompanied by a bid bond in the amount of 10 percent of the proposed first-year rent payment. Within 30 days of selection, the contractor shall obtain a performance bond in an amount equal to the construction costs identified in the proposal (but not less than \$2 million) and a payment bond in

the amount of 50 percent of the construction costs identified. Details of bonding requirements are contained in the proposed contract, SEC _____.

CONSTRUCTION AND IMPROVEMENT PROGRAM

The construction and improvements are described in the previous paragraph. Concept drawings shall be provided with the proposal. All 100 percent design documents shall be provided within 90 days of contract award. All construction shall be completed within 300 days of design approval. All renovation shall be completed within 360 days of contract award. All mobile home removal shall be completed within 400 days of award. All days noted herein are calendar days.

TERM OF CONTRACT

The term of concession contracts under existing policies is to be commensurate with the size of the investment. The substantial investment required for this concession warrants a term of approximately 30 years. The NPS has an option to renew the contract under the agreed terms for two extensions, each of 5 years.

This contract is required by law to be submitted to the Congress for approval sixty (60) days before award.

OPERATING PLANS AND MAINTENANCE PLANS

An Operating Plan and a Maintenance Plan will be submitted by the offeror. The NPS may accept the plans as offered. NPS-initiated changes to the plans will be concurred in during contract negotiations. The plans will be renewed on no less than an annual basis with the appropriate changes developed by the superintendent and the contractor. NPS minimum standards are provided as Exhibit_____.

RATES FOR SERVICES

This prospectus permits offerors to propose complementing services to be sold to NPS employees. The proposal shall specify the initiation rates as a part of the operating plan. These rates shall be revised annually and shall be reasonable.

Reasonableness of rates and prices will be judged primarily by comparison with those currently charged for comparable accommodations or goods furnished or sold outside of the areas administered by the NPS under similar conditions, with due allowances for length of season, provision for peak loads, average percentage of

occupancy, accessibility and cost of labor and material, type of patronage, and other conditions customarily considered in determining charges, but due regard may also be given to such other factors deemed significant.

UTILITIES

Rates for utility services furnished to contractors by the NPS shall be passed through at the same rate as charged to the NPS.

Utilities for each residence will be paid directly to the Government or the providing utility company by the residents. Each house constructed shall have a separate meter. The four-bedroom multipurpose houses shall have three meters, situated to cover the single-family, duplex, and three-apartment configurations explained earlier. Any building used by the contractor shall have a separate meter.

INSURANCE

The proposed contract requires the contractor to purchase and maintain fire and extended coverage insurance for full replacement value of those buildings, structures, equipment, furnishings, and betterments and merchandise used in the operation. Exhibit _____ of the attached contract lists the NPS buildings and structures to be provided for renovations, and their full replacement values.

A blanket policy may be proposed. If the applicant considers full replacement value insurance not economically feasible, he/she may propose a lesser insurance coverage such as a deductible, self-assumption, actual cash value or, in extreme cases, no insurance. Proposals for lesser coverages must be fully justified by providing rate quotations from an insurance broker together with a financial projection which demonstrates impact on the contractor. Applicants who intend to make a proposal for lesser coverage are advised to obtain a complete copy of the NPS Insurance Program before doing so.

The contractor is to purchase and maintain a Builders Risk Form Policy at the time construction commences.

The contractor is also required to purchase and maintain Comprehensive General Liability insurance coverage in the minimum amount of \$ _____ per occurrence and \$ _____ Annual Aggregate and Property Damage of at least

\$ _____ per occurrence and \$ _____ Annual Aggregate. The following additional liability coverages are required:

- Products/complete operations as applicable
- Automobile liability
- Workers' compensation.

Applicants should review Section _____ of the attached contract and include his insurance proposal as Part _____.

Any applicant who wishes to obtain the NPS's complete Insurance Program Requirements should contact: _____.

POSSESSORY INTEREST

Possessory interest is the contractor's partial ownership (compensable interest) in Government-acquired or -constructed facilities and ownership of contractor-acquired or -constructed facilities. Under the proposed contract contemplated hereunder, the contractor shall have a possessory interest in improvements it makes to Government improvements to the extent of book value pursuant to Section 4 of the proposed contract.

Section 6 of the Act of October 9, 1965, P.L. 89-249, states that contractors who acquire or construct, pursuant to a contract and with the approval of the Secretary, any structure, fixture, or improvement upon land owned by the United States within an area administered by the National Park Service, shall have a possessory interest therein, which shall consist of all incidents of ownership except legal title which shall be vested in the United States. The provision states further that possessory interest may not be extinguished by the expiration or other termination of the contract and may not be taken for public use without just compensation. Just compensation is defined as reproduction cost less depreciation, not to exceed fair market value, "unless otherwise provided by agreement of the parties."

For the purpose of the contract contemplated hereunder just compensation is described in Section 12 of the enclosed proposed contract (Enclosure No. _____), and, again, will be equal to the book value of the acquired property.

The foregoing requirements represent the present objectives of the NPS in the area, but it is recognized that the specific details may be subject to amendment by mutual agreement between the Service and the offeror.

SUBMISSION OF PROPOSALS

The format to be used for the applicant's transmittal letter is attached, and any additional comments of the applicant may be included therein. The Statement of Qualifications of Applicant must be used in applying for this opportunity and must be completed in accordance with the instructions contained therein. The applicant's proposal, i.e., the transmittal letter and the Statement of Qualifications of Applicant should be submitted in such detail to facilitate a comprehensive analysis. Proposals should be submitted to:

Regional Director
NPS Southwest Region
P.O. Box 728
Santa Fe, NM 87504-0728

on or before _____ (due date). Proposals submitted or postmarked after the evaluation panel convenes will not be considered during the evaluation of offer, and will be returned (unopened) to the sender. However, if it is determined to be in the best interest of the Government, the Service reserves the right to evaluate late proposals in the event that other proposals received are not satisfactory. Offers and modifications thereof shall be enclosed in sealed envelopes marked "BID PROPOSAL." In addition, the offeror shall show on the envelope the date specified in the public notice or newspaper release for receipt by the National Park Service, and the name and address of the offeror.

Attached hereto as Enclosure No. _____ is the proposed contract which sets forth the terms and conditions under which the operation is to be conducted. APPLICANTS SHOULD CAREFULLY CONSIDER THIS DOCUMENT AND THOROUGHLY READ ALL OF THE INFORMATIONAL DOCUMENTS, ENCLOSURES 2, 3, 4, AND 5, BEFORE COMPLETING THE STATEMENT OF QUALIFICATIONS OF APPLICANT.

The applicant selected by the NPS must agree to complete the negotiation and execution of a contract containing substantially the terms and conditions included in

the proposed contract attached within sixty (60) days after it is presented to the applicant.

EVALUATION OF PROPOSALS

Managerial competence, conformance to the terms of the prospectus in relation to quality of the initial construction and renovations and the subsequent service, financial ability to perform, and the proposed lease payments will be prime factors in evaluating proposals. In the evaluation of proposals, these factors will be weighted as follows:

- Quality of construction and renovations — 50 percent
- Quality of service — 22 percent
- Managerial competence — 15 percent
- Financial ability to perform — 7 percent
- Lease payments — 6 percent

If an applicant fails to complete any part of the Statement of Qualifications of Applicant, his/her proposal will be considered by the National Park Service as being nonresponsive. Lease payment proposals in excess of the ceiling stated in this prospectus shall be considered nonresponsive.

All proposals submitted in response to this prospectus may be disclosed by the Department of the Interior to any person upon request pursuant to the Freedom of Information Act. If the offeror believes that the proposal contains trade secrets or confidential commercial or financial information exempt from disclosure under the Freedom of Information Act, (5 U.S.C. 552), the cover page of each copy of the proposal shall be marked with the following legend:

The information specifically identified on pages of this proposal constitutes trade secrets or confidential commercial and financial information which the offeror believes to be exempt from disclosure under the Freedom of Information Act. The offeror requests that this information not be disclosed to the public, except as may be required by law. The offeror also requests that this information not be used in whole or part by the Government except that if a contract is awarded to the offeror as a result of or in connection with the submission of the proposal, the Government shall have the right to use the information to the extent provided in the contract.

The offeror shall also specifically identify trade secret information and confidential commercial and financial information on the page of the proposal on which it appears and shall mark each page with the following legend:

This page contains trade secrets or confidential commercial and financial information which the offeror believes to be exempt from disclosure under the Freedom of Information Act and which is subject to the legend contained on the cover page of this proposal.

Information in a proposal identified by an offeror as trade secret information or confidential commercial and financial information shall be used by the Government only for the purpose of evaluating the proposal, except that (i) if a contract is awarded to the offeror as a result of or in connection with submission of the proposal, the Government shall have the right to use the information as provided in the contract, and (ii) if the same information is obtained from another source without restriction it may be used without restriction.

The NPS reserves the right to disregard any proposals submitted or to make any counterproposals which it may consider reasonable or desirable.

APPENDIX C

COST ESTIMATES

COST ESTIMATES

The following tables show the cost estimate produced by the Housing Options of United States Employees (HOUSE) model for different types of construction. The interpretation of the model summaries is explained in Chapter 2.

TABLE C-1

BIG BEND PUBLIC-PRIVATE VENTURE WITH MANUFACTURED HOUSES

Option	Net Present Value (NPV) (\$ thousands)	Net annual cost (\$ thousands)	Annual lease (\$ thousands)	Subsidy (\$ thousands)
Government built & operated	4.6	403	0	NA ^a
On-park	3.3	293	529	(110)
Split location	6.0	528	736	125
Off-park only	6.7	592	583	189
Off-park w/administration ctr.	6.8	598	589	195
Direct lease to employee	0.8	71	0	(332)

Note: Unit rent \$999 per month. Fifty seven percent of employee gross income; current average is 11 percent.

Big Bend, TX 1 Mgmt Office		93 Manufactured houses	
Switch settings		(1 = yes)	
Cost for Govt. land	1	Government provides foundation	1
Landlord pays utilities	0	Government has to borrow	0
Govt. provides site work	1	No bus provided	0

^a NA = Not applicable

TABLE C-2

**BIG BEND PUBLIC-PRIVATE VENTURE
WITH MODULAR HOUSES**

Option	Net Present Value (\$thousands)	Net annual cost (\$thousands)	Annual lease (\$thousands)	Subsidy (\$thousands)
Government built & operated	4.8	424	0	NA ^a
On-park	3.4	391	649	(33)
Split location	7.4	652	878	228
Off-park only	7.9	696	709	272
Off-park w/administration ctr.	8.0	702	714	278
Direct lease to employee	0.5	48	0	(375)

Note: Unit rent \$1,217 per month. Seventy percent of employee gross income; current average is 11 percent.

Big Bend, TX 1 Mgmt Office 93 Manufactured houses			
Switch-settings		(1 = yes)	
Cost for Govt. land	1	Government provides foundation	1
Landlord pays utilities	0	Government has to borrow	0
Govt. provides site work	1	No bus provided	0

^a NA = Not applicable.

TABLE C-3

**BIG BEND PUBLIC PRIVATE VENTURE
WITH SITE-BUILT HOUSES**

Option	NPV (\$thousands)	Net annual cost (\$thousands)	Annual lease (\$thousands)	Subsidy (\$thousands)
Government built & operated	5.2	462	0	NA ^a
On-park	3.7	325	755	(137)
Split location	5.0	442	857	(20)
Off-park only	6.6	586	781	124
Off-park w/administration ctr.	6.7	598	784	128
Direct lease to employee	-0.7	(60)	0	(522)

Note: Unit rent \$1,343 per month. Seventy seven percent of employee gross income; current average is 11 percent.

Big Bend, TX 1 Mgmt Office 93 Manufactured houses			
Switch settings		(1 = yes)	
Cost for Govt. land	1	Government provides foundation	1
Landlord pays utilities	0	Government has to borrow	0
Govt. provides site work	1	No bus provided	0

^a NA = Not applicable.

TABLE C-4

**BIG BEND PUBLIC PRIVATE VENTURE
WITH SITE-WORK INCLUDED IN LEASE**

Option	NPV (\$thousands)	Net annual cost (\$thousands)	Annual lease (\$thousands)	Subsidy (\$thousands)
Government built & operated	4.8	424	0	NA ^a
On-park	5.7	506	790	82
Split location	8.0	708	928	284
Off-park only	8.2	721	731	297
Off-park w/administration ctr.	8.3	731	740	307
Direct lease to employee	0.5	48	0	(375)

Note: Unit rent \$1,217 per month. Seventy percent of employee gross income; current average is 11 percent.

Big Bend, TX		1 Mgmt Office	93 Manufactured houses
Switch settings		(1 = yes)	
Cost for Govt. land	1	Government provides foundation	0
Landlord pays utilities	0	Government has to borrow	0
Govt. provides site work	0	No bus provided	0

^a NA = Not applicable.

APPENDIX D

**DATA USED IN HOUSE MODEL
FOR BIG BEND CASE STUDY**

DATA USED IN HOUSE MODEL FOR BIG BEND CASE STUDY

The following tables use the data input forms provided with the Housing Options of United States Employees (HOUSE) model to reproduce the data used to generate the results displayed in Chapter 2 and Appendix C.

TABLE D-1

ASSUMPTIONS ENTERED INTO MODEL

Data item	Your data	Default
Minor construction		\$4,263
Backlog		\$716,688
Location factor		
Labor		0.673
Materials		0.996
Land cost/unit		\$25
Town (Alpine, TX)		
Distance (miles)		108
HQ-gate (miles)		25
Children/unit		0.75
Impact aid		\$0
Season length (months)		12
Occupancy		
Permanent families		15
Season families		20
Permanent singles		16
Season singles		20
Project concept		
Start year		1991
Remove		39
Replace		0
Build new		48
Renovate		45
Capital replacement		5%
Infrastructure		\$250,000
Utilities		\$55,000
Potential secondary income unit-end-month		
on park:		\$50
off park:		\$100
Commercial lease		\$7
Square foot - Government		1,120
Square foot - local		1,120
Appliances		\$4,000
Administrative square foot		7,000
Private rentals		
on park:		1
off park:		0
Average employee salary		\$21,000
Current average		\$196
Inflation		4%
Discount		9%
Capital		11%
Lease period (years)		40
Loan period (years)		30
Davis-Bacon		15%
Denver Service Center overhead		46%

TABLE D-2
DATA PREPARATION SHEETS – INDUSTRY COSTS

	Waco, TX	Realtors Odessa, TX	IREM ^b El Paso, TX	IREM ^b El Paso, TX	Realtors Odessa, TX	Realtors Odessa, TX
Construction type	Manufactured	Modular	Elevator	Low rise 24 +	Townhouse	Single-family
Market rent	\$3.40	\$3.90	\$2.50	\$4.52	\$4.14	\$5.50
Management	0.10	0.14	0.14	0.21	0.14	0.14
Administrative staff	0.01	0.22	0.22	0.33	0.22	0.22
Supplies	0.03	0.03	0.03	0.02	0.03	0.03
Utilities	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a	NA ^a
Heating fuel	0.01	0.01	0.01	0.09	0.01	0.01
Electric	0.15	0.15	0.15	0.11	0.15	0.56
Water	0.34	0.34	0.34	0.12	0.34	0.38
Gas	0.08	0.08	0.08	0.08	0.08	0.56
Sewer	0.00	0.00	0.00	0.00	0.00	0.00
Building services	0.06	0.06	0.06	0.02	0.06	0.06
Other operations	0.09	0.09	0.09	0.15	0.09	0.09
Security	0.01	0.01	0.01	0.03	0.01	0.01
Grounds maint.	0.17	0.17	0.17	0.13	0.17	0.17
Maintenance	0.32	0.32	0.32	0.19	0.32	0.32
Painting/decorating	0.29	0.29	0.29	0.13	0.29	0.29
Property tax	0.37	0.37	0.37	0.46	0.37	0.37
State/local	0.01	0.01	0.01	0.01	0.01	0.01
Insurance	0.35	0.35	0.35	0.15	0.35	0.35
Recreation/amenities	0.23	0.23	0.23	0.05	0.23	0.23
Other payroll	0.28	0.41	0.41	0.19	0.41	0.41

^aNA = Not applicable.

^bIREM = Institute of Real Estate Management.

TABLE D-3

GOVERNMENT OPERATING AND MAINTENANCE COSTS
(Dollars per square foot per year)

Government operating and maintenance costs	Your data	Big Bend data
Year of data		1988
Management		0.19
Administrative staff		0.05
Supplies		0.75
Utilities		0.98
Heating fuel		0.00
Electric		0.30
Water		0.20
Gas		0.20
Sewer		0.29
Building services		0.00
Other operations		0.00
Security		0.00
Grounds maintenance		0.00
Maintenance		0.00
Painting/decorating		0.00
Property tax		0.00
State/local taxes		1.78 ^a
Insurance		0.00
Recreation		0.00
Other payroll		0.90
Total	NA	5.65
Less utilities	NA	4.67
Per unit/year	NA	\$4,702.00
Per unit/month	NA	\$392.00

Note: NA = Not applicable

^a From Andrews Air Force Base.

APPENDIX E

SENSITIVITY ANALYSIS

SENSITIVITY ANALYSIS

The results produced by Housing Options of United States Employees (HOUSE) are dependent on the data provided by the operator. Since there are 52 data items, in addition to several hundred industry standard factors, the combinations are too numerous to analyze here. Instead, we have shown for each of the major input items (which are mostly, but not all, park-specific) the direction of the change to the cost of each alternative as a result of changing the data variable. Those changes are shown in Table E-1. Since it is a cost table, the plus signs indicate an increase in cost for that alternative as a result of the stated action. Minus signs indicate a decrease in cost, and "0" indicates no effect.

Table E-1 shows the change in cost due to various circumstances that may prevail as alternatives are being structured. For the purposes of this study, however, the more important question is the relative affordability of the different alternatives. Table E-2 shows the change in ranking of the alternatives due to changes in the conditions. A plus sign indicates that the stated change causes the alternative to move upward in the standings; a minus sign indicates a downward move. The large preponderance of blanks (no change) shows the relative stability of the alternatives, reinforcing our earlier statement that in construction projects, the costs "are what they are."

Some caution in interpretation of the Appropriate Funds and On-Park lease alternative columns is required: since these two alternatives are generally the least expensive, it is very hard to show an upward move in the rankings. The same applies to the showing of downward movement for the Off-Park combinations. We have not assigned a relative ranking to the Direct Rent to Employees alternative. Because it pushes both Government and contractor costs off to the employee, it is necessarily the most cost-effective; but, as we stated earlier, the implementation of such a plan may be impossible.

SENSITIVITY TO STANDARD FACTORS

We used Tables E-1 and E-2 in deciding on the most feasible approach to Public-Private Venture (PPV), by emphasizing the factors that make them most effective. A

TABLE E-1

CHANGES IN NET PRESENT VALUE ABSOLUTE COST
 (+ = more; - = less; 0 = unchanged)

Sensitivity Test	Appropriated Funds	On-Park Lease	Split Location	Lease Off-Park Only	Off-Park Adm.	Direct Rent to Employees
Increase inflation	-	-	-	-	-	-
Increase interest rates	0	+	+	+	+	+
Increase discount rate	-	-	-	-	-	-
U.S. Govt. borrowing	+	0	0	0	0	0
Construction-type increase ^a	+	+	+	+	+	+
Replace more units vs. build	-	-	-	0	0	0
Renovate in lieu of build/replace	-	-	+	0	0	+
Add more sites/parks	0	+	+	0	0	0
Add more offices	0	0	+	+	+	+
More families per unit	-	-	-	-	-	-
Replace more units	+	+	+	+	+	-
Build more units	+	+	+	+	+	-
Renovate more units	+	+	+	+	+	+
U.S. Govt. land assessed cost	+	0	0	0	0	0
Shortened lease	-	-	-	-	-	-
Shortened loan	0	-	-	-	-	-
Shortened loan + lease	-	- ^b	-	-	-	-
Increase distance to town ^c	+	+	+	+	+	0
Increase local rents	-	-	-	-	-	- ^d
Increasing land value ^e	0	0	0	0	0	0
Decreasing cost of Govt. maintenance.	-	0	0	-	-	0
Tenants pay no utilities	+	+	+	+	+	+
Govt. provides infrastructure	+	-	-	0	0	0
Govt. provides foundations	0	-	-	0	0	0
No bus for off-park residents	0	0	-	-	-	-
Off-park private rentals	0	0	+	+	+	0

^a Increase = manufactured, modular, single-family, townhouse, low-rise, high-rise.

^b Begins to increase when lease period not much longer than loan period.

^c Minimum rental rates requirement takes effect at approximately 75 miles.

^d Few off-park renters absorb contractor's costs on park.

^e Land value not significant until over \$10,000 per acre.

TABLE E-2
CHANGES IN RELATIVE RANKING OF ALTERNATIVES
 (+ = improved; - = worse)

Sensitivity Test	Appropriate funds	On-Park lease	Split Location	Lease Off Park Only	Off/-Park Adm.	Direct Rent to Employees
Increase inflation						
Increase interest rates	+		-	+		
Increase discount rate						
U.S. Govt. borrowing	-	+				
Construction-type increase ^a		- ^a				
Replace more units vs. build						
Renovate in lieu of build/replace						
Add more sites/parks		-				
Add more offices						
More families per unit						
Replace more units						
Build more units						
Renovate more units						
U.S. Govt. land assessed cost	-					
Shortened lease						
Shortened loan						
Shortened loan + lease						
Increase distance to town						
Increase local rents						
Increasing land value						
Decrease cost of Govt. maintenance	+	-	-	0	0	
Tenants pay no utilities			-			
Govt. provides infrastructure						
Govt. provides foundations						
No bus for off-park residents			+	+	+	
Off-park private rentals			+	+	+	
Original Ranking	2	1	3	4	5	

^a On-park option same as off-park for apartment buildings.

number of the variables that we analyzed for sensitivity are not alterable by any National Park Service (NPS) action (specifically, the general inflation, discount and commercial interest rates, and the consideration of deficit spending). However, the sensitivity of the PPV process to those factors must be known. Those factors are built into the model, having been quite stable over the past few years, and are not accessible to model operators. That is, they are standard factors rather than input variables.

In terms of absolute costs, higher interest rates increase the cost of every alternative except appropriated fund construction (when the Government does not have to borrow). Higher inflation and discount rates, however, decrease the cost of all alternatives, because the costs are locked in at today's prices while the future dollars with which the bills are paid are less valuable. Government borrowing affects only the appropriated fund alternative (making it, obviously, more expensive), because in all other cases the Government is already borrowing, using the contractor as a funding intermediary.

SENSITIVITY TO SITE-SPECIFIC DATA

The rest of the sensitivity tests were conducted on data that will change with each project. These sensitivities are important in that they help decide which parks might be suited for PPVs. Many of these effects are self-evident (i.e., increasing the cost of the construction through more complex building types increases the cost of all alternatives). We will therefore discuss only those alternatives in which the explanation is not as obvious.

Replacing units rather than building them completely from the foundations up results in reduced expenses in the on-park alternatives. Outside the parks, since there are no existing units, no savings are possible. The same holds for renovations. In fact, where extensive replacement or renovations are done in conjunction with off-park direct rentals, and since the on-park rents are controlled by the Office of Management and Budget (OMB) Circular A-45, *Policy Governing Charges for Rental Quarters and Related Facilities*, any subsidies to the contractor costs are paid through the uncontrolled rents of the off-park employees.

Including more on-park sites in the solicitation does not increase NPS costs since the housing functions exist today. It does increase the cost to the contractor of maintaining more offices in the on-park or split location alternatives, just as adding more off-park sites does to the off-park alternatives.

Clearly, adding more families per square foot of housing under management (e.g., making more use of duplexes, etc.) would reduce the cost of all alternatives. The addition of more units to the total package increases the cost, because there is more construction and operations work to be done; but, as can be seen from the "direct rent" levels, the cost per unit declines. (That does not apply in the case of added renovation work, where, as described earlier, contractor costs must be recovered at the expense of renters in uncontrolled-rent units.)

Additionally, the lease period must exceed the depreciation period to minimize cost. In general, however, and contrary to expectations, the cost declines with shorter lease periods and shorter loan periods. That is because of the NPV formulation: even though longer loan periods allow for lower annual payments, a shorter period leads to a more rapid acquisition of the asset by the Government or the private owner. From then on, the property is unburdened by debt. This effect is seen in the prepayment of home mortgages by private citizens in order to reduce their total costs. This is perhaps the primary distinction between DoD PPVs, in which DoD enjoys no terminal ownership, and our assumption that NPS will own on-park properties at the end of the lease.

The change in distance to the nearest established community affects the relationship between rental rates and isolation adjustments. Increasing distance leads to increasing adjustments and therefore increasing costs to the Government, just as increasing the Monthly Base Rental Rate (MBRR) provides increasing receipts and lower costs to the Government. However, there is a minimum proportion of the base rent that must be paid. In the case of Big Bend National Park, this transition point occurs at about 75 miles, after which the sensitivity analysis shows no change in cost. That computation is a simultaneous equation, dependent on both the distance and the MBRR, so the effect will differ when analyzing other parks.

Finally, increasing land value should obviously increase the cost of most alternatives (depending on whether or not the Government is being assessed for its land value). In the case of Big Bend National Park, however, the land value is so low

(\$150 per acre being the overgenerous allowance used by HOUSE) that it must increase a hundredfold before attaining significance. Parks (in more expensive areas), such as California, may find such per-acre costs relevant.

The last set of sensitivity tests is aimed at providing subsidies in kind using available resources. Providing such services is quite cost-effective on the Government's part, at least as calculated by HOUSE, because it is not burdened with overhead and profit by a contractor, and not subject to supervisory overhead. The effectiveness is shown by the decline in net cost of the other alternatives even though that cost does include the Government's cost of providing the service.

Finally, we looked at the effect of increased rental rates and the possibility of private rentals. In the case of Big Bend National Park, these factors are adverse because local rental rates are inadequate to fund acceptable new construction.

However, when we increased the rental rate and simultaneously allowed for private rentals, dramatic improvements in the off-park alternatives occur. This suggests that other parks, slightly less remote than Big Bend National Park, might offer the potential for significant savings through PPVs.

Park Selection

The primary constraints of a PPV are that (1) the income generated by the contractor must exceed operating costs and (2) the cost to the Government should minimize the gap between the rent paid to the contractor and the rent received from the tenants.

Both these issues depend primarily on the economic situation in the region around the park. PPVs will be most successful where the area, or the park itself, is a healthy community. This is characterized by the higher number of units, the higher rents, and the higher land values found to be significant in the sensitivity test. Such a location will also offer alternatives to the developer or investor in the event that the Government is unable to fulfill its obligations; that reduces the project risk. Big Bend National Park is a case where PPVs are competitive with, but not much better than, Government construction. A search for even more effective PPV candidate parks should emphasize the following:

- A larger concentration of units

- **A stronger off-park economy**
- **A more valuable land contribution.**