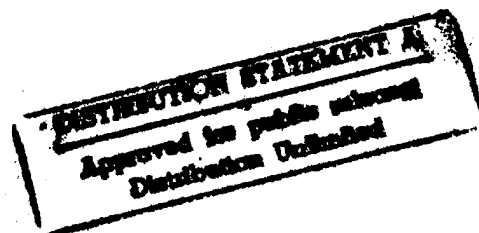

Logistics Management Institute

An Independent Evaluation of the Engineer Proving Ground

CE411MR1



Karen M. Dahut
Marguerite E. Moss
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An Independent Evaluation of the Engineer Proving Ground

Executive Summary

The Army Program Manager for Total Development in the National Capital Region has proposed a "public-private venture" to develop the 805-acre Engineer Proving Ground (EPG) site near Fort Belvoir in Fairfax County, Va. The EPG joint venture concept is that the Army will provide the land, and the developer will build office space for the Army, construct the necessary infrastructure, and build other space for private use. Revenues generated by the sale or lease of the private-sector space that the developer builds would be expected to pay for the cost of constructing the required infrastructure and the Army space. That arrangement would allow the Army to obtain "rent-free" space in which it could consolidate operations now located in leased space throughout the National Capital Region, thus reducing its long-term occupancy costs.

The 1990 *Defense Authorization Act*, which provided enabling legislation for the venture, specifies that the fair market value of the land conveyed to the developer may not exceed the value of the office space built for the Army. That is, the amount of rent-free space that the Army gets depends on the value of the land. Thus, the Army planned the EPG development so that it would maximize that value. As part of the planning process, the Army requested that Fairfax County rezone the land. In exchange for the rezoning, the Army made several tentative commitments, or proffers, to Fairfax County, that must be signed before the County will approve the EPG rezoning application.

The EPG development plan as conceived in 1990 was rational and feasible given what were, at that time, several reasonable assumptions: the slowdown in the office building boom in Fairfax County was seen as a short-term condition; residual rent payments were contemplated as the mechanism to ensure that developers could afford to provide the Army space at below-market rates; and it was expected that the Army could guarantee a large Department of Defense anchor tenant in Phase 1. However, since 1990, market and other conditions have changed considerably.

As a final check, the Army Corps of Engineers asked the Logistics Management Institute to assess the economic feasibility of the plan given current market conditions. We concluded the following:

- ◆ The EPG site would have difficulty attracting tenants for office space both because its projected lease rates are high relative to those of competing sites in Fairfax County and because its location is less desirable.

- ◆ The Army could expect to receive only 550,000 square feet of rent-free space in exchange for the land, or only 25 percent of the free space originally anticipated.
- ◆ It is unlikely that the Army will be able to attract an anchor tenant that would lease 1.2 million square feet of space because the expected lease rates for the EPG would be considerably above market rates.
- ◆ Proffers could place the Army in a position of financial risk. The Army will be required to relinquish over 300 acres of land regardless of the success of the overall development, and the Army will be responsible for infrastructure and other proffers that are identified with rezoning approval.
- ◆ Given the risks associated with the plan, we believe that the Army will be unable to attract potential investors or developers for the EPG development.

In sum, our analyses show that the current EPG development plan can provide, at best, only a fraction of the space originally anticipated. The Army Engineer District, Baltimore, appraisal, which was completed in January 1995, concurs with our finding that the current EPG development plan is not economically viable.

We recommend that the Army

- ◆ refrain from signing proffers that would commit future financial resources and
- ◆ address the fundamental issue of whether it wants to act as the long-term developer of the EPG site and assume the risks and liabilities associated with that role.

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CHAPTER 1

Introduction

BACKGROUND

The Army Program Manager for Total Development in the National Capital Region (PM, NCR) has proposed a plan to enter into a unique "public-private venture" to develop the 820-acre Engineer Proving Ground (EPG) site.¹ The EPG site is located in Fairfax County, Va., just west of Interstate 95 and south of the Springfield Central Business District. Special congressional legislative authority — Section 2821 of the 1990 *Defense Authorization Act* (Public Law 101-189) — allows the Army to convey "all or any portion" of the EPG site to a third party who will construct facilities for the Army and make infrastructure improvements to the site.

Basically, the EPG concept is that the Army will provide the land, and the developer will build office space for the Army, construct the infrastructure, and build other space for private use. The development plan specifies the square footage that will be constructed by the private developer for each phase and for each of four land uses. Revenues generated by the sale or lease of the private-sector space that the developer builds are expected to pay for the cost of constructing the required infrastructure and the Army space, as well as generate a return or profit for the developer.²

Based on Army space requirement projections, which take the current downsizing of Army operations into account, the projected total rental space requirement in the National Capital Region is 2 million square feet.³ The Army's objective is to consolidate operations currently located in leased space within the National Capital Region into the rent-free space and thus reduce its costs. By occupying owned rather than leased space, the Army could reduce its long-term occupancy costs.

¹The Army consultant model assumes 820 acres. A later submission to the County estimates the site to be 805 acres.

²To distinguish the office space that the Army will receive in exchange for the EPG land from the speculative office space the private developer constructs on the EPG site, the Army space is referred to throughout this report as Army "rent-free" space.

³Initially, the Army estimated that it would need 2.9 million square feet of office space to replace the space it is leasing.

THE EPG LEGISLATION

The legislation authorizing the EPG concept is specific with regard to certain aspects of how the public-private venture is intended to work. Below are the key specifications in the legislation:

- ◆ The value of the constructed Army space must be no less than the fair market value of the property that is conveyed to the developer. In other words, the value of the space built by the developer for the Army must be equal to the fair market value of the land that the Army conveys to the developer. That specification is significant; it means that the greater the value of the land, the more office space the Army gets.
- ◆ "The development and all such improvements [must] comply with the specifications of the master plan" and must be "agreed to by the appropriate officials of the County of Fairfax, Va., and the Commonwealth of Virginia."
- ◆ The development of the property shall "include improvements to public transportation systems, utilities and telecommunications."
- ◆ If the third-party developer is unable or unwilling to develop the real property in accordance with the master plan, "all right, title, and interest in and to the real property conveyed ... shall automatically revert to the United States, regardless of the reason for such inability or unwillingness."

THE TASK

The Army Corps of Engineers, prior to issuing a request for proposals (RFP) for the EPG development, asked the Logistics Management Institute (LMI) to conduct an independent analysis of the EPG development plan. We were to determine the plan's feasibility given current economic conditions and assess the risks associated with its implementation. The Army specified that LMI should consider only the current EPG development plan and not potential variations of that plan.

In our evaluation of the EPG development plan, we focused on assessing the financial feasibility with regard to the cash flow that would be required to support the plan and the income that could be generated. As a part of that analysis, we identified changes in the real estate market that have occurred since 1990 when the plan was originally developed and assessed the impact of those changes on the feasibility of the EPG development plan.

We also evaluated issues that could impede the successful implementation of the EPG development plan. Those issues concern both policies and financial aspects of the plan that may pose a problem for the Army or create a risk for potential developers, making it more difficult for the Army to attract a developer.

REPORT ORGANIZATION

This report is organized into six chapters. In Chapter 2, we describe the current EPG development plan. We identify how the Army expects to implement the plan, the infrastructure costs associated with each phase of the plan, and the status of that plan within the County's approval process. In Chapter 3, we review the current market conditions in Fairfax County and assess how they have changed from the projections made by the PM in 1990. In Chapter 4, we discuss our financial analysis of the EPG development plan. That chapter specifies how the analysis was conducted and discusses key parameters. In Chapter 5, we address issues that may affect the successful implementation of the plan. Finally, in Chapter 6, we draw conclusions about the likelihood of success of the EPG project. We also make two key recommendations regarding how the Army should proceed in the near term.

CHAPTER 2

The Planned EPG Development

This chapter describes the EPG development plan that was proposed by the PM, NCR and is the basis of our analysis and evaluation. We discuss the initial conception of the development plan and its proposed land uses and densities. We also discuss Fairfax County's requirements for site development, including preliminary estimates of infrastructure costs. Finally, we discuss the current development plan status and the remaining steps that have to be completed.

LOCATION AND SITE DESCRIPTION

The EPG site is located in Fairfax County, Va., 16 miles southwest of Washington, D.C., and approximately 10 miles northwest of Fort Belvoir. Figure 2-1 is a map showing the location of the EPG development site relative to the Washington metropolitan area. The Army expects that the project will be developed in five sequential phases. Each phase corresponds to one of five separate land bays, or geographic areas, on the EPG site.

OVERVIEW OF THE DEVELOPMENT PLAN

Initial Development Plan Concept

To ensure that it could get as much rent-free space as possible, the PM planned the EPG development to maximize the land value. The plan was based on the results of a study conducted for the PM, NCR by consultants and completed in 1990. That study, referred to here as the PM's study, included a detailed analysis of real estate market conditions through 1989, transportation impacts, and other aspects of the development. Since a higher land value translates into more rent-free space for the Army, the PM's study proposed maximizing the value of the EPG land by

- ◆ phasing the project over 20 years or more to reduce the discount in price that would be associated with selling the entire property at once,
- ◆ rezoning the property to allow substantial high-density income-producing development, and
- ◆ acting as master developer to control the timing of the project phases to avoid the effects of market downturns.

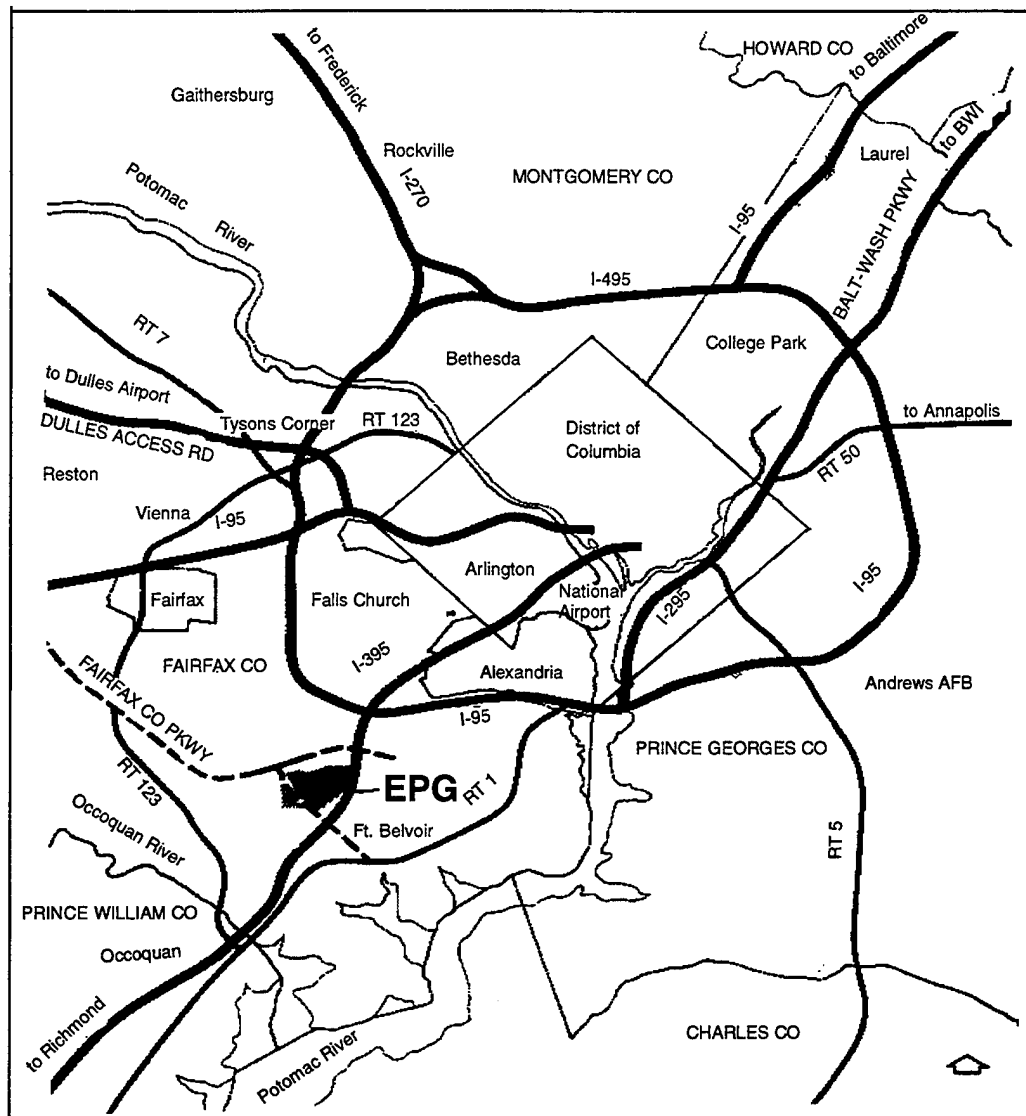


Figure 2-1.
Location of EPG Development Site

As authorized by the congressional legislation, the Army can exchange the EPG land for improvements equal to the market value.¹ The Army is seeking to exchange the bulk of the EPG land for office space that will be constructed on a small portion of the EPG site that the Army will continue to own. The Army will receive needed space, and the private developer will receive the ownership and development rights to the balance of the site for a preplanned and preapproved high-quality, mixed-use development. As the Army space is constructed and occupied, the land will be conveyed to the developer for further private

¹Refer to Chapter 1 for details of the congressional legislation.

development in accordance with the EPG development plan. Once the Army office space is constructed according to their specifications, the Army is responsible for the ongoing operating and maintenance expenses associated with ownership of its building.

To retain control of the EPG development, the PM structured the development plan so that each phase would be competed independently. Thus, a different developer could be selected for each of the five phases. In conjunction with the space constructed in each phase of the development, associated infrastructure improvements are required as a part of the development plan. (The cost of infrastructure improvements will be discussed later in this chapter.) The Army, as the landowner, will be responsible for ensuring that each phase is completed in accordance with the original development plan and that the proffers agreed to as part of the rezoning process or as a result of transportation studies are completed and meet Fairfax County requirements.

Land Use

The proposed EPG development is a multiuse, multiphase project. The Army envisions an urban village consisting of a series of high-quality, mixed-use centers situated amidst wide areas of open space. Specifically, the EPG development plan calls for four high-density, multiuse nodes that are separated by open space and by clusters of lower density development. Each multiuse node includes residential and office buildings grouped around landscaped plazas and open areas.

In general, the more income-producing space that the plan allows for, the more rent-free space the private developer is willing to provide the Army.² Consequently, the EPG development has to be large enough to generate sufficient income so the developer is able to construct significant rent-free space to meet Army objectives. The development program includes a schedule for the construction of 17.5 million gross square feet (GSF) of space. That space includes an estimated 2 million square feet of Army rent-free space and 15.5 million square feet of space privately developed for various uses. Commercial office space (including the Army space) accounts for 48 percent of the total EPG development space, and residential space accounts for an additional 40 percent. The remaining 11 percent is dedicated to hotel and retail space. The proposed land use allocation is currently under review by Fairfax County. Table 2-1 summarizes the Army's proposed development plan for the EPG site.

²This linkage ignores the infrastructure costs needed to support the given level of development, which may increase disproportionately with an increase in income-producing property on the site.

Table 2-1.
Distribution of Space by Land Use

Land use	Space (million GSF)	Percentage of total development
Office	6.55	38
Residential (about 4,000 units)	7	40
Retail	0.3	2
Hotel/other	1.65	9
Army rent-free space	2	11
EPG total	17.5	100

Estimate of Rent-Free Space

Given the proposed development plan, the Army consultants originally projected that, over the 21-year development period, a private developer would be willing to construct about 2 million square feet of rent-free space in exchange for the EPG land. Table 2-2 shows the Army consultant's projections for the amount of rent-free space to be constructed at the beginning of each phase. Underlying this estimate are assumptions regarding land value and future market conditions based on the regional and national economy in 1990. Because it is impossible to predict changes in these conditions, the actual amount of space the Army will receive and the development time period is uncertain. Chapter 3 examines the assumptions underlying the projection and provides an assessment of their reasonableness in today's market.

Table 2-2.
Projected Rent-Free Space Based on 1990 Army Consultant Market Analysis
(gross square feet)

Phase	Army Rent-free space
1	340,000
2	410,000
3	190,000
4	520,000
5	540,000
Total	2,000,000

Source: Preliminary Market Analysis of Engineering Proving Grounds, Basile Baumann Prost & Associates, Inc. (BBPA) Team, April 1990.

Development Density

As part of the EPG development process, the Army has undertaken the necessary steps to rezone the EPG land in accordance with Fairfax County's Comprehensive Plan for the area.³ Zoning is a key factor in determining what the Army can realize in value for the EPG land since it prescribes what can be done on the site. In addition, having the zoning for the proposed development plan in place raises the value of the property. All other factors being equal, a property zoned for a proposed use is considerably more valuable than one without zoning because the buyer does not incur the risk and uncertainty of the rezoning process. The EPG land is currently zoned for residential development with a density of one unit per five acres.

The proposed zoning plan for the EPG site not only defines the land use but also the average density, or floor area ratio (FAR), of the development. The FAR is defined as the square footage a builder is allowed to construct on the site as a percentage of the acreage or size of the site itself. The proposed EPG rezoning plan calls for an overall FAR of 0.49, but the FAR will vary with land use; some portions of the site will have a FAR of up to 2.0.⁴ Since the EPG site is 820 acres, or 35.7 million square feet, a total of 17.5 million square feet of space can be constructed on the site given a FAR of 0.49.

A FAR of 0.49 is a relatively high density development for Fairfax County and particularly for the EPG, as this area already incurs traffic congestion. To support the level of proposed development at the EPG site, the County will require infrastructure improvements as a condition of rezoning approval.

In creating the proposed EPG development plan, the PM's study attempted to balance the increased revenues that can be generated from a higher density development and the reduction in value received by the Army for the land as a result of increased infrastructure costs.

The gross square footage that is proposed to be constructed for each of the four land uses in each phase is shown in Table 2-3.

³The current status of the rezoning application is discussed on page 2-9.

⁴The FAR of 0.49 is determined by the total EPG site, including land that will be dedicated to the County.

Table 2-3.*Amount of Space by Land Use and Project Phase
(square feet)*

Land use	Phase 1 (4 years)	Phase 2 (4 years)	Phase 3 (4 years)	Phase 4 (4 years)	Phase 5 (4 years)
Office	2,050,000	1,250,000	1,300,000	1,200,000	750,000
Residential	1,506,000	1,506,000	1,595,000	1,329,000	1,063,000
Retail	77,000	60,000	63,000	60,000	40,000
Hotel/other	50,000	450,000	450,000	450,000	250,000
Total	3,683,000	3,266,000	3,408,000	3,039,000	2,103,000

Note: The "other" category could include numerous uses such as a sports complex.

PROFFERS

Proffers are a formal negotiated agreement between Fairfax County and an applicant (in this case, the Army) that specifies certain commitments from the applicant in exchange for rezoning. Proffers typically identify specific items that the landowner agrees to accomplish in exchange for the rezoning of the property and for the right to develop the property in accordance with the Fairfax County Comprehensive Plan. Typically, the attorneys and experts representing the applicant meet with the County planning staff and work out mutually acceptable language. Such an agreement specifies what is being committed, who will implement the commitment (usually the applicant as landholder), and the timing of the commitment. Proffers cover such issues as the parameters of the development, land use, environmental issues, transportation issues, and public facilities.

Proffers are usually agreed to at the point when the rezoning approval is pending final approval by the County Board of Supervisors. In January 1995, the PM informally indicated agreement to some proffers for the EPG development. Formal, legally binding proffers, however, will not be finalized until the rezoning action is approved, which is expected to be no earlier than June 1995.⁵ Since the Army will be the owner of the land when the rezoning application is approved, the Army will be responsible for signing the proffer agreement, which then commits the Army to meet its requirements as long as the Army retains ownership of the land. Each phase of the development plan will have specified proffers, and since the Army will initially retain ownership of all EPG land, it will be legally responsible for ensuring that the proffers are met.

⁵Discussions with Fairfax County indicate that the June 1995 date may be unrealistic since the transportation study being prepared by the Army consultants had not been completed as of January 1995.

Because the current proffer submission to the County is preliminary, these proffers are expected to be modified and others added during the negotiation process with Fairfax County. Typically, proffer statements for a large development exceed 100 pages. The preliminary 26-page PM draft is not sufficiently specific to meet all the requirements of a negotiated proffer agreement.

Infrastructure-Related Proffers

Infrastructure improvements at the EPG site will cost an estimated \$200 million. Those improvements will include utilities and roads throughout the site as well as some improvements required by Fairfax County, including off-site road upgrades and the partial cost of a people-mover mass transit system. The cost of the improvements are expected to be borne by the private developer and paid for from the income-producing space. Table 2-4 shows the Army consultant's estimated costs for infrastructure improvements by phase.

Table 2-4.
Estimated Infrastructure Cost

Phase	Amount (\$000)
1	25,661
2	21,042
3	92,085
4	59,860
5	2,868
Total	201,516

The size, land-use mix, and density of the development dictate the infrastructure and site improvements that are required to obtain rezoning approval from Fairfax County. Because of the County's concerns as to the impact on existing traffic conditions, the Army has agreed that as a part of the EPG development, a people mover (a light-rail mass transit system) will be constructed to support the traffic flows in and out of the development. The Army (or designated developer) would fund 20 percent of the project, or about \$70 million.

In addition to the people mover, additional infrastructure improvements, specifically external roads, may be needed. Those improvements will be determined on the basis of transportation studies that will be conducted at the end of each development phase. Improvements identified in those studies would have to be made before the Army could progress to the next phase of the plan. Transportation improvements will be required such that the roads surrounding

the site maintain a service level "D"⁶ or better after each development phase is completed.

Development Restrictions

As stated in the Amended Comprehensive Plan, at least 80 percent of the nonresidential construction and 100 percent of all major infrastructure must be completed during Phase 1 before the next phase can be initiated. That means that at least 80 percent of all office space has to be ready for occupancy in order to begin Phase 2. This condition of completion refers only to commercial development. Presumably, residential unit completion rates are not a concern because the County wants to ensure that commercial development is constructed to offset the net fiscal cost of residential development. Therefore, Phase 2 could be initiated even if projected residential development is not constructed in Phase 1.

Land Dedication and Conveyances

As part of the proffer statement and consistent with the Amended Comprehensive Plan, the Army agreed to dedicate to Fairfax County

- ◆ 215 acres of the Accotink Creek valley for an environmental quality corridor;
- ◆ 45 acres to the Fairfax County Park Authority for parks and other uses, including 25 acres for such revenue-generating use as a stadium (the site is being considered for use as a baseball stadium);
- ◆ 25 acres for school/youth sports complex site;
- ◆ 2 acres for fire and rescue stations; and
- ◆ right-of-way for transportation facilities, mostly the Fairfax County Parkway, estimated to be 76 acres on a map submitted by the Army consultants to Fairfax County in January 1995. (The final number of acres required for right-of-way will not be determined until the monitoring and evaluation process is completed at the end of each development phase.)

The amount of dedicated land could total up to 363 acres, or as much as 44 percent of the gross land area, depending on right-of-way needs. As noted earlier, those land dedications have no impact on allowed maximum density for the site, which was based on the gross density of 805 acres.

The Army also agreed to dedicate the specified land, free of environmental hazards, within 60 months after Fairfax County approves the rezoning

⁶Service level "D" means that "at an intersection there is a delay of 25 to 40 seconds per vehicle. The influence of congestion becomes noticeable; longer delay may result." In general, service level "D" is the minimum design standard acceptable to Fairfax County.

application. These land dedications are independent of other activities. For example, even if no construction for Phase 1 were to take place within the first 60 months, land dedication would proceed unless Fairfax County agreed to a delay.

STATUS OF EPG DEVELOPMENT PLAN

Fairfax County Review and Approval

In November 1991, the PM, NCR submitted to Fairfax County a "conditional density proposal" for the development of the EPG site. During subsequent discussions with the County, the PM indicated that the Army intends to enter into a "residual value lease" agreement with the developer(s) selected to implement the EPG plan. This agreement would require that the Army pay rent for the amount by which the cost of improvements exceeds the value of the land.⁷

In response to that submission, the Fairfax County Office of Comprehensive Planning asked TAI Realty Advisors to conduct a market study and a feasibility analysis of the EPG development proposal. Following the completion of the consultant report and a review by County staff, Fairfax County amended its Comprehensive Plan to accommodate the proposed EPG plan. As part of this proposed site plan modification, the Army made several commitments, such as to dedicate a substantial share of EPG land, to design and construct a people-mover transit system and to develop strategies that would result in 40 percent of the employees arriving by means other than single-occupancy vehicles.⁸ That submission constituted the basis for amendments to the Fairfax County Comprehensive Plan to allow nonresidential development at the EPG site. The Comprehensive Plan, which includes the Army commitments noted above, was approved in February 1994.

Rezoning Application

Following the approval of Comprehensive Plan revisions in 1994, the Army and Fairfax County began discussions on the submission of a rezoning application. Their discussions, which began in March 1994, have continued. The size of the development dictates other infrastructure improvements and site improvements that are required to get rezoning approval from Fairfax County. In January 1995, Fairfax County received an initial draft of the transportation study prepared for the Army by consultants. That study focuses on traffic modeling factors, trip generation factors, and trip distribution. The rezoning application review cannot be complete until the transportation study is essentially complete. In addition, Fairfax County was also given an initial draft of proffers. The

⁷The ability for the Army to enter into a "residual value lease" agreement has since been questioned.

⁸Office of Comprehensive Planning, Fairfax County, Va., *Franconia-Springfield Area Plan*, February 1994.

rezoning application was scheduled to be heard by the Fairfax County Planning Commission in May 1995, but the hearing is likely to be delayed.

NEXT STEPS

An application for rezoning of a large site with multiple land uses, such as the EPG site, typically takes the County staff up to six months to review. As of mid-January 1995, the County had not received all of the necessary data, so, it is uncertain whether the currently scheduled May 1995 date for the Planning Commission to hold public hearings on the rezoning application can be met. The Fairfax County Board of Supervisors usually acts on rezoning about six weeks following the Planning Commission recommendation.

Proffers have to be signed by the applicant before the Fairfax County Board of Supervisors will approve the rezoning application. Following the approval of the rezoning application by the Board, the Army would presumably issue an RFP that would incorporate the conditions and terms of the rezoning and request respondents to specify how much office space the Army could expect to receive. Initiating an RFP prior to rezoning approval would be premature, as potential developers could not estimate the net the value of the land without detailed knowledge of the proffers.

CHAPTER 3

Market Analysis of Planned EPG Land Uses

Determining the economic feasibility of developing the EPG site requires an analysis of the competitive market for the proposed land uses — in this case, an evaluation of the demand for office space, housing, hotels/motels, and retail space at the EPG site — given market conditions in the area as a whole. In this chapter, we focus on the office space market; office space (commercial and Army) accounts for 48 percent of the space to be constructed at the EPG site, and it is the land use most affected by changes in economic conditions. We also briefly discuss the markets for housing, hotels/motels, and retail space. Housing accounts for 40 percent of the space to be built at the EPG site, and hotels/motels and retail space together account for the remaining 12 percent.

OFFICE SPACE

In our analysis of the demand for office space at the EPG site, we define the market area, characterize the current office market, and evaluate alternative estimates of market demand.¹ We then estimate the share of the office market that the EPG development is likely to capture.

Market Area

The definition of an office market area depends on the characteristics of the businesses seeking space. A few business firms have no predetermined preference for a site; they select a location on the basis of such factors as business climate, residence of the business owner, and quality of schools. Most firms, however, have a particular area in mind when seeking office space: a business dealing primarily with a particular Federal agency prefers to locate close to that agency, companies that interact closely with the Department of Defense prefer to be within 30 minutes of the Pentagon, medical offices prefer to locate near major hospitals, and law firms seek offices near courts.

Firms are also attracted to sites that already have a concentration of office space. This agglomeration effect is partially the result of a preference to be close to other firms performing similar or complementary functions. For example, financial services firms and law firms tend to cluster. Tysons Corner in Fairfax

¹The demand for office space excludes Army rent-free space; it is limited to space that the private developer must lease.

County and Rosslyn in Arlington County are examples of office concentrations in Northern Virginia.

The EPG site is within the Springfield office submarket of Fairfax County, as defined by the Fairfax County Economic Development Authority (FCEDA) and a private real estate firm. The Springfield office submarket comprises small office buildings clustered near Interstate 95. The construction of a metro station to serve Springfield, which is close to the EPG site, should improve accessibility and increase the likelihood of attracting firms that are considering locating within Fairfax County.

Market Characteristics

The Fairfax County office market is diversified. It includes small, one- and two-story office buildings as well as large, multistory, high-quality office complexes. The following subsections discuss the current and planned office inventory (in terms of square footage), the vacancy rates, and the lease rates for office space in Fairfax County as a whole and in the Springfield submarket. Each of those factors affect the demand for office space.

The PM's study considers Fairfax County the appropriate market area from which EPG would draw occupants. The County office market is subdivided into smaller areas of office concentration, called submarkets. Most submarkets are identified by a major road complex or a mass transit station. For this analysis, we considered Fairfax County to be the market area even though this approach probably overstates the demand.

CURRENT AND PLANNED INVENTORY

In mid-1994, the Fairfax County inventory of office space exceeded 74 million square feet. Table 3-1 shows the distribution of that space among County submarkets. The two largest submarkets are Tysons Corner and Reston; together they account for 44.7 percent of the total inventory. The Springfield submarket (the submarket that includes the EPG site) ranks eighth in size, accounting for 3.9 percent of all office space in the Fairfax County inventory.

An additional 40 million square feet of office space are planned (assuming a market demand) in Fairfax County. Nearly 60 percent of that space will be built in Tysons Corner, Reston, Merrifield, and Fairfax Center. The Springfield submarket accounts for only 2.7 percent, or 1.1 million square feet, of the planned office inventory (excluding office space planned for the EPG site).

VACANCY RATE

The Fairfax County vacancy rate in mid-1994, as computed by FCEDA, was 11.8 percent. At that time, 8.5 million square feet of office space were available for rent (Table 3-1). Nearly half of that space was in Tysons Corner and Reston.

The Springfield submarket had 600,000 square feet of office space available for rent, or a vacancy rate of about 21 percent.

Table 3-1.
Fairfax County Office Market Characteristics

Submarket	1994 inventory		Planned space		1994 available space (million sq. ft.)
	Square footage (millions)	Percentage of total	Square footage (millions)	Percentage of total	
Tysons Corner	21	28.2	6	15	2.5
Reston	11.9	16.0	7.9	19.7	1.5
Merrifield	6.8	9.2	5.1	12.7	0.5
Fairfax Center	6.1	8.2	4.6	11.5	0.8
Herndon	4.5	6.0	3.1	7.7	0.6
Baileys Crossroads	3.4	4.6	0.5	1.2	0.3
McLean	3.2	4.3	0.2	0.5	0.2
Springfield	2.9	3.9	1.1	2.7	0.6
Vienna	2.6	3.5	1.6	4.0	—
Dulles	2.5	3.4	3.3	8.2	0.3
All others	9.5	12.7	6.7	16.8	1.2
Total	74.4	100.0	40.1	100.0	8.5

Source: FCEDA Business Report — Midyear 1994 Real Estate Market Review.

LEASE RATES

The FCEDA estimated that mid-1994 full-service lease rates for office space in Fairfax County ranged from \$9.50 to \$29.50 per square foot. Table 3-2 shows the ranges of lease rates in each submarket for 1993 and 1994. The rents at the low end of the market ranged from \$8.00 to \$12.00 in 1993 and from \$9.50 to \$14.50 in 1994. At the high end, rents ranged from \$18.00 to \$29.50 in 1993 and from \$16.00 to \$29.50 in 1994. Reston had the highest rent (\$29.50), and Tysons Corner had the next highest (\$26.00 in 1994, a reduction from \$28.00 in 1993). The rents in the Springfield submarket were relatively low, ranging from \$9.65 to \$18.00.

A somewhat different estimate of lease rates was made by Smithy-Braedon, a major, private real estate firm.² That firm estimated that, in the third quarter of 1994, rents in Fairfax County averaged \$15.33 per square foot. Both the FCEDA and Smithy-Braedon calculated lease rates from asking prices.³ The

² Smithy-Braedon Third Quarter 1994 Market Report.

³ Typically, actual lease payments are somewhat lower than the full-service asking price as a result of discounts and other reductions offered as inducements for longer-term leases.

Table 3-2.

Full-Service Office Lease Rates in Fairfax County, by Submarket
 (\$ per square foot)

Major submarket	Mid-1993	Mid-1994	
		Range	Midpoint
Tysons Corner	11.00 – 28.50	14.50 – 26.00	20.25
Reston	11.00 – 29.50	10.50 – 29.50	20.00
Merrifield	12.00 – 21.00	13.00 – 21.50	17.25
Fairfax Center	9.00 – 20.00	9.50 – 17.50	13.50
Herndon	8.00 – 26.50	10.00 – 22.50	16.25
Baileys Crossroads	9.00 – 22.50	10.00 – 21.50	15.75
McLean	10.00 – 20.00	13.50 – 20.00	16.75
Springfield	10.00 – 18.00	9.65 – 18.00	13.83
Vienna	— ^a	10.00 – 18.00	14.00
Dulles	12.00 – 19.75	11.75 – 16.00	13.88

Source: FCEDA Business Report — Midyear 1993 and Midyear 1994 Real Estate Market Review.

^a Lower range includes net lease rates and is therefore excluded.

variation between the estimates may be attributable to differences in the definition of “asking price” and differences in the office inventory data base.

The U.S. Army Engineer District, Baltimore, estimated that rents in Fairfax County for Class A⁴ full-service office space in 1994 ranged from \$13.00 to \$24.00 per square foot.⁵ The highest rent range for Class A offices was in Reston (\$16.00 to \$24.00); in the Springfield submarket, the rent for quality space ranged from \$15.00 to \$16.00 per square foot.

Taking into account the various estimates, we assume, for purposes of this report, that office rents in Fairfax County during 1994 averaged \$15.00 to \$17.00 per square foot.

Projected Demand for Office Space

From the perspective of financial institutions, expected demand for new space is a major criterion in determining whether a speculative building should be financed. Future demand for office space depends on several factors. The most important variable is employment growth in sectors that use office space — business, financial, personal service, government service, etc. (Trade

⁴ Office space is usually grouped into three classes: A, B, and C. Class A is considered prime, high-quality space and is leased at higher rates than other office buildings.

⁵ Appraisal of Engineering Proving Grounds, Springfield, Va., U.S. Army Engineer District, Baltimore, January 1995.

and manufacturing account for most nonoffice employment.) In Fairfax County, an estimated 60 percent of all new jobs will be in sectors offering office employment.

Since 1990, County rents have been relatively stable because of a surplus of unleased space. The weighted average rent, based on FCEDA data, was about \$17.43 per square foot in mid-1994. As shown in Table 3-3, average rents remained essentially unchanged from mid-1993 to mid-1994.

Table 3-3.

*Average Full-Service Office Lease Rates in Fairfax County
(\$ per square foot)*

Year	Average low rent	Average high rent	Average mid-point rent	Average rent in highest quartile ^a
1993	10.71	23.97	17.34	20.59
1994 ^b	11.95	22.91	17.43	20.13

^a Assumes normal distribution.

^b Data available for first half of the year only.

A second factor affecting the projected demand for office space is the amount of space allocated to each employee. Space allocation can be attributed in part to industry characteristics. For example, medical offices require more space than real estate firms. Rent levels also affect space allocation. As rents rise, businesses become less willing to allocate a higher share of all revenue for space; conversely, when rents are relatively low, businesses allocate more space to their employees. For example, the typical office worker in Manhattan, N.Y., has substantially less space than a worker in the Washington, D.C., suburbs, where rents are one-half of the New York average. We found that, in Fairfax County between 1987 and 1993, the amount of space allocated to each employee averaged 298 square feet.⁶

The third factor affecting the demand for new office space is the rate at which old office buildings are being demolished or converted to another use. In Fairfax County, that factor is negligible, at least in the short run, because most office space is less than 15 years old.

The approach used by the PM to estimate the future demand for office space in Fairfax County was to project employment levels and then to apply the two primary factors affecting the demand for new office space in Fairfax County: the percentage of office-related jobs and the amount of space allocated per employee. Assuming moderate growth, the 1990 PM's study estimated that the employment level would increase by 121,900 employees from 1995 to 2000, by

⁶The PM's analysis estimates 290 square feet per employee on the basis of office employment changes during the 1980s. The slight increase is probably attributable to a relative decline in office rents between 1989 and 1993 (see the appendix).

133,700 employees from 2001 to 2005, and by an additional 140,900 workers between 2006 and 2010. (See Table 3-4.) Assuming that 60 percent of all employment is office related and that each new employee would require 290 square feet of space, the PM's study concluded that Fairfax County would need to add 4.2 million square feet of office space annually between 1995 and 2000. The annual requirement for new space would increase to 4.9 million square feet between 2005 and 2010. (As a frame of reference, the PM's projection of annual demand exceeds the highest historical level of new leased space in Fairfax County – 3.9 million square feet, which was reached in 1986. The annual amount of new leased space in Fairfax County during the 1980s averaged 2.5 million square feet.)

Table 3-4.
1990 Projection of Demand for Office Space in Fairfax County
(thousands)

Time period	Total number of new employees	Total number of new office employees ^a	Annual increase in office employees	Annual space requirement (sq. ft.) ^b
1995 – 2000	121.9	73.1	14.6	4,234
2001 – 2005	133.7	80.2	16.0	4,640
2006 – 2010	140.9	84.5	16.9	4,901

Source: *Preliminary Market Analyses — Engineering Proving Grounds* prepared for U.S. Corps of Engineers, Baltimore District, April 1990 (Moderate Growth Rate Assumption).

^a Assumes 60 percent of total employment growth is in sectors using office space.

^b Assumes 290 square feet per employee.

Because the estimates of the future demand for office space were outdated, LMI recalculated the projections using the PM's approach. Our projections were based on the latest available employment estimates derived by the Washington, D.C., area Council of Governments (COG) in cooperation with Fairfax County. The results are shown in Table 3-5.

Table 3-6 compares the 1990 PM projections with the current projections. Although the same approach was used, the difference between the two projections is substantial. The 1990 PM estimate exceeds current estimated annual demand for new office space by about 46 percent for the 1995 – 2000 time period and by 68 percent for the 2006 – 2010 time period. Two factors explain the difference. First, the PM projections were based on the high employment rates achieved in the late 1980s instead of on regional forecasts. After the PM made those projections, employment rates were reduced as a result of the 1990 – 1992 economic downturn in the region. Second, PM projections for 1995 – 2000 were based on a 4.5 percent annual employment growth rate, which exceeded COG forecasts. Because the lower projections are more realistic, we use them as a basis for assessing the market share that the EPG site must capture.

Table 3-5.

*Current Projection of Demand for Office Space in Fairfax County
(thousands)*

Time period	Total number of new employees	Total number of new office employees ^a	Annual increase in office employees	Annual space requirement (sq. ft.) ^b
1996 – 2000	73.7	44.2	8.8	2,552 ^b
2000 – 2005	55.8	33.5	6.7	1,943
2006 – 2010	44.7	26.8	5.4	1,566
2011 – 2015	32.3	19.4	3.9	1,131

Source: Fairfax County Planning Department. Fairfax County Employment Sectors, November 17, 1993.

^a Assumes 60 percent of total employment growth is office related.

^b Total annual demand should be reduced by 250,000 in this time period to allow for absorption of existing available space. Thus, new 1995 – 2000 demand is 2.3 million.

Table 3-6.

Comparison of Office Space Demand Projections

Time period	Annual space requirement (000 sq. ft.)		Percentage difference
	PM 1990	Current	
1995 – 2000	4,240	2,300	45.7
2001 – 2005	4,653	1,943	58.2
2006 – 2010	4,901	1,566	68.0

Source: Tables 3-4 and 3-5.

Estimated EPG Market Share

A crucial factor in determining the economic viability of constructing an office complex in a competitive market is the ability of that complex to capture a large enough share of that market to fill the planned space. For the EPG complex, the plan in Phase 1 is to build about 2 million square feet of office space, or some 410,000 square feet per year. As shown in Table 3-5, the County-wide annual net demand for office space for the next five years, adjusted to allow for the absorption of existing available space, is estimated to be 2.3 million square feet.

Assuming that it can compete for all new office space demand in Fairfax County, the EPG complex would have to capture 17.8 percent of the market in the 1996 – 2000 period, 16.1 percent in the 2001 – 2005 period, and 20.9 percent in the 2006 – 2010 period (see Table 3-7). Those capture rates are substantially higher than those projected in the 1990 PM's report, primarily because the total demand for office space in Fairfax County has been shown to be considerably

lower than was estimated in 1990. We believe that the true capture rates would have to be even higher because it is unlikely that the EPG complex would be competitive with all of Fairfax County. One reason for limited competitiveness is that the EPG complex is not in a prime location. Another reason is that EPG office rents are expected to be substantially higher than the estimated Fairfax County average of \$16 to \$18 per square foot in 1995. Typically, lease rates in new buildings exceed the average of all rents, in part because tenants prefer the amenities available in a new building.

Table 3-7.
Estimation of Required EPG Capture Rate of New Office Demand in Fairfax County

Measure	1995 – 2000	2001 – 2005	2006 – 2010
Annual new County demand (000) ^a	2,300	1,943	1,566
Annual EPG space (000)	410	313	325
EPG space as percentage of County demand	17.8%	16.1%	20.8%
EPG space (less anchor tenant space) ^b as percentage of County demand	7.4%	16.1%	20.8%

^aFrom Table 3-6.

^bAssumes anchor tenant will occupy 1.2 million square feet, or 240,000 square feet annually, in 1996 – 2000 time frame.

The estimated average Fairfax County lease rates from published reports are consistent with the Baltimore District appraisal, which estimated Fairfax County Class A full service rents to be between \$13 and \$24. In the Springfield submarket, lease rates for Class A space negotiated in late 1994 averaged between \$15 and \$16 per square foot. The appraisal assessed full service rentals in the immediate EPG market and states that “we concluded (for EPG) a market rental of \$16 per square foot, assuming a building of comparable quality was constructed.”⁷

Lease rate estimates derived from several sources for Fairfax County and the Springfield submarket are compared in Table 3-8. These rates are also compared to expected lease rates at the EPG site in 1998. The comparisons show a wide gap between the estimated 1995 and 1998 lease rates and the lease rates necessary at the EPG site to provide the Army the quantity of rent-free space required to meet their needs. Specifically, there is a difference of \$9, or 52 percent, between the EPG lease rates projected in the Baltimore District appraisal and the lease rates projected by the PM applying 1990 values. The difference using LMI 1994 values is 64 percent.

⁷ Appraisal of Engineering Proving Grounds, Springfield, Va., U.S. Army Engineer District, Baltimore, January 1995.

Table 3-8.

Comparison of Current and Projected Average Lease Rates in Fairfax County and the Springfield Submarket
(\$ per square foot)

Area	1994	1995 ^f	1998 ^f
Fairfax County ^a	17.54	18.07	19.75
Fairfax County ^b	15.33	15.79	17.25
Fairfax County – Class A ^c	18.50	19.06	20.83
Springfield submarket ^a	13.93	14.24	15.56
Springfield submarket – Class A ^c	16.00	16.48	18.01
Tysons Corner ^b	16.79	17.29	18.89
EPG — 1990 PM values ^d	—	25.00	27.32
EPG — 1994 LMI values ^e	—	27.00	29.50

^a Compiled from Fairfax County Economic Development Authority Business Report data.

^b Smithy-Braedon *Third Quarter Market Report* 1994.

^c U.S. Army Engineer District, Baltimore January 1995.

^d From Table 4-1.

^e See the appendix.

^f Annual rent increases 3 percent from 1994 base.

To test our belief that the capture rates calculated above are reasonable, we used an alternative definition of market demand: the number of leases for both new and relet space being negotiated in submarkets with similar lease rates. (From the perspective of leasing agencies, the total number of leases expiring or being negotiated is the most meaningful measure of the market; even without any net new demand, leases expire and some tenants seek to relocate.) If we assume that the 1996 EPG lease rates will range from \$25 to \$28 per square foot, the EPG complex could compete with only two submarkets — Tysons Corner Reston. Those two submarkets were the only ones with leases exceeding \$25.00 per square foot in mid-1994. With the possible exception of Herndon, which had lease rates of up to \$22.50 per square foot in 1994, none of the other submarkets are expected to have leases in excess of \$25.00 per square foot in 1996.

Total leasing activity in Fairfax County is expected to reach 5.6 million square feet in 1994 based on leasing activity the first half of the year. If we assume that about 50 percent of that space is in Tysons Corner, Reston, and Herndon (together, those three submarkets account for about 50 percent of the Fairfax County current inventory and 42 percent of the planned space) and that half of that space would have lease rates similar to the EPG lease rates, the EPG complex would be competitive with only 25 percent of the Fairfax County market. Thus, in the 1995 – 2000 time frame, the EPG complex would be competitive with 1.4 million square feet of new and relet space annually. That is, it would have to capture 29 percent of the high-end Fairfax County market in Phase 1 (see Table 3-9). That percentage is considerably higher than the percentage that results from considering the market for new space only (Table 3-7).

Table 3-9.***Estimation of Required EPG Capture Rate of Total Office Lease Activity in High-End Submarkets***

Measure	1995 – 2000	2001 – 2005	2006 – 2010
Total effective demand (000) ^a	1,400	1,623 ^b	1,882 ^b
Annual EPG space (000)	410	313	325
EPG space as percentage of effective demand	29.3%	19.3%	17.3%
EPG space (less anchor tenant space) ^c as percentage of effective demand	12.1%	19.3%	17.3%

^aValues represent 50 percent of all leasing activity in the Tysons Corner, Reston, and Herndon submarkets.

^bAssumes 3 percent annual increase in leasing activity.

^cAssumes anchor tenant will occupy 240,000 square feet per annum in 1996 – 2000 time frame.

The market share that the EPG site would have to capture could be reduced considerably if it could attract a large anchor tenant during Phase 1. For example, the presence of an anchor tenant occupying 1.2 million square feet could reduce the required capture rate in Phase 1 to as low as 7.4 percent, depending on how market demand is defined (Table 3-7 and Table 3-9).

The need for a large anchor tenant to capture a reasonable share of the Fairfax County market is consistent with the finding of the Baltimore District appraisal. The appraisal report concluded that the EPG plan "is not feasible without a major tenant. The two factors causing this are a lack of demand (for commercial space) and lack of financial feasibility."⁸

HOUSING

This section of the report examines the potential demand for residential units at the EPG site. Housing represents about 40 percent of all projected land uses at the EPG site in Phase 1.

Market Area

The market area associated with a proposed residential subdivision depends on housing type and household characteristics of potential residents. Typically, persons living in apartments commute shorter distances than people residing in detached housing. Because one or more members of a household usually work, employer location is a crucial factor in selecting a place to live. Thus, the demand for housing in areas relatively close to employment centers will be greater

⁸ Appraisal of Engineering Proving Grounds Springfield, Va., U.S. Army Engineer District, Baltimore, January 1995.

than that for outlying areas. For households with children, the quality of public schools is an important criterion in selecting a place to live. The price of housing is another key factor, with differences in selling prices or rents reflecting the relative desirability of neighborhoods based on location, the socioeconomic characteristics of residents, and other factors.

The EPG site near Interstate 95 is part of an established residential submarket that has a mixture of detached single-family houses, townhouses, and multi-family housing units.⁹ That location attracts people employed in Alexandria, Arlington, and the District of Columbia; even though commuting is difficult because of congestion on Interstate 95, the selling prices and rents are average for the area, and the quality of the schools is considered high.

The EPG housing market area as defined in the 1990 PM's study encompassed over one-third of Fairfax County; the market boundaries followed political subdivisions (supervisor districts). The 1993 County study defined the residential market area by Census tracts, which resulted in a substantially smaller market area. For this report, we selected a primary market area consisting of four planning districts near the EPG site. That area has about 50,000 dwelling units, or approximately 16 percent of the County housing stock (see Table 3-10).

Table 3-10.
*Planned Housing Units in Selected Planning Districts
Near the EPG Area*

Planning district	1995	2000	2005	2010
Springfield	15,591	17,088	18,418	19,600
Annandale	25,254	25,876	26,336	28,028
Lincolnia	5,564	6,094	6,846	7,286
Lower Potomac	5,137	7,009	8,776	9,342
Total	51,376	56,067	60,370	64,256

Source: Fairfax County Office of Research and Statistics, 1991 *Fairfax County Profile*.

Estimated EPG Market Share

The current EPG plan is to construct a total of 3,950 housing units at the EPG site — townhouses, rental apartments, and condominium garden apartments; no detached single family housing is planned for the EPG site. About 21 percent of the residential space is to be built in Phase 1. That percentage equates to about 850 units, or about 170 units annually. The Army study concluded that the housing market could support close to 4,000 housing units given the location, easy

⁹The EPG development plan excludes single family houses.

access to the EPG site, and the presence of the Army as well as other development.

The Fairfax County report is less optimistic about absorption rates. In its view, the market area will be able to absorb only 872 units a year. Most of the absorption will take place east of Interstate 95. The County report concludes that the EPG site could capture only 11 percent of the housing market, or about 100 units annually.

The Army consultant's absorption estimate is the higher of the two, in part because it assumed a larger market area. It also projected a higher housing demand and assumed that the EPG site would have an advantage over nearby residential areas because of the collocation of housing with office and retail space. However, current estimates indicate that total housing demand in the market area will decline after the year 2000. Furthermore, we believe that the presence of the Army and other office development will have little immediate impact on housing demand. Such development will not have an appreciable effect until four or five years after construction is started.

Our estimate of the percentage of the housing market that EPG could capture is shown in Table 3-11. We assume that the EPG site will be competing for housing demand in four planning districts, that EPG housing prices will be competitive, and that County-wide demand will remain high. Given the continuing demand for housing in Fairfax County, the EPG site may be able to absorb 800 units during Phase 1. In later phases, if EPG office space is built at projected levels, demand for EPG site housing should increase. EPG will also have to capture over a third of total demand within the submarket that includes 16 percent of all Fairfax County housing in the 2001 – 2010 time frame.

Table 3-11.
Estimation of Required EPG Capture Rate of Housing Market in Four Planning Districts

Measure	1995 – 2000	2001 – 2005	2006 – 2010
Total new housing units ^a	4,691	4,309	3,880
Percentage of townhouses and multifamily units	70%	72%	74%
Total new townhouses and multifamily units	3,284	3,102	2,871
Proposed EPG housing units	800	1,062	1,125
EPG housing units as percentage of total new multifamily units	24%	34%	39%

^a Derived from data in Table 3-10.

HOTELS/MOTELS

The PM's study estimated that the EPG site has a substantial potential for hotels/motels. In part, that positive assessment had its basis in the dramatic increase in the number of hotel rooms built in Fairfax County during the 1980s. The total number of hotel rooms rose from 2,049 units in 1980 to 9,128 in 1989. However, from 1984 to 1993, only 43 rooms were added to the 1984 total of 1,485 rooms in the Springfield submarket, which includes the EPG site.

The PM's report indicates that the EPG site could support 800 to 900 rooms by 2000 and a total of 1,750 to 2,100 rooms, or over 20 percent of the Fairfax County 1989 total, by 2010. Those estimates assume that every 8,000 square feet of office space can support one hotel room. The ratio was derived from the number of hotel rooms at Tysons Corner and the Reston/Dulles corridor in relationship to office space in those submarkets. However, those two submarkets may not be comparable to the EPG site. Tysons Corner includes one of the largest shopping complexes in the nation, is located in an affluent area, and includes such prestigious hotels as the Ritz-Carlton. The Reston/Dulles corridor includes a major international airport. As such, one would expect considerable hotel occupancy unrelated to offices in these submarkets.

The County's report estimates that the EPG site could support only 330 hotel rooms by 2003, or a maximum of 815 rooms by 2010, which is only 42 percent of the number projected in the Army report. Although we did not undertake an independent analysis of the potential hotel market at the EPG site, we generally share the County's view that the demand will be lower than is planned for the EPG site. A total demand for 1,000 rooms may be reasonable given the projected level of other construction activity at the EPG site. That demand level is about one-half of the PM's estimate, but somewhat higher than the County's projections.

RETAIL SPACE

The 1990 PM study estimated the potential demand for retail space at the EPG site to be between 366,100 and 429,000 square feet by 2010. That estimate was subsequently reduced to 300,000 square feet at the end of Phase 5, with 77,000 square feet supportable in Phase 1. The estimated demand for retail space was revised downward by the PM in 1993 to reflect a reduction in employment estimates. The PM's estimates are based on a number of assumptions, including the following:

- ◆ Households residing at the EPG site will conduct 80 percent of their retail trade at the EPG site; that trade can support 26 square feet of retail trade per household.
- ◆ Each 100,000 square feet of office space can support 1,364 square feet of retail space.

The County study questioned the relationship between retail sales and other construction shown in the PM report. It estimated that the EPG development could support a total of only 208,000 square feet of retail space, and only 50,000 square feet in Phase 1. Those estimates are one-third lower than the estimates in the PM's report. However, the difference represents less than 1 percent of the total proposed EPG development for all land uses, so the estimate of either 208,000 or 300,000 square feet has little impact on the economic feasibility of the project.

CHAPTER 4

Land Value of EPG Site

BACKGROUND

Urban land has value because of its potential to produce income in the future. The income potential of a specific site is determined by several factors, including the following:

- ◆ Allowed use (zoning)
- ◆ Allowed intensity of use (zoning)
- ◆ Demand for allowed intensity
- ◆ Infrastructure costs (internal and external) associated with allowed density
- ◆ Accessibility of site
- ◆ Characteristics of site (terrain, environmental hazards)
- ◆ Supply of competitive land (alternative sites)
- ◆ Size of parcel.

Those factors are not all-inclusive. Interest rates, property taxes, and tax policies are among the additional variables that affect the value of land.

Congressional legislation requires that the Army receive improvements that are at least equal to the market value of the EPG site. The value of a parcel of land at a given time can be established only in an "arms-length" negotiation between a buyer and a seller. However, the market value of a particular parcel can be estimated.

Different approaches were used in three independent studies to estimate the value of the EPG site:

- ◆ The Army consultants used a quantitative model, called the EPG model.
- ◆ Fairfax County consultants conducted a market analysis.
- ◆ Baltimore District used standard appraisal techniques.

In addition, LMI ran the PM's EPG model using updated (1994) values for nine parameters. The EPG plan submitted to Fairfax County was developed on the premise that the results of the EPG model, and specifically land value projections, were reasonable representations of the expected market and other conditions in 1996.

This chapter describes the EPG model and presents results obtained by the PM's office in 1990 and by LMI in 1994. The market analysis and appraisal approaches used by Fairfax County and the Baltimore District, respectively, are not described because they are well understood; the results obtained using those two approaches are summarized. The chapter concludes with a comparison of the land value estimates. Those estimates are then converted to estimates of the amount of rent-free space the Army would get.

ESTIMATES USING EPG MODEL

Objective

To evaluate the financial feasibility of the EPG development plan, Army consultants established a framework to estimate the projected revenues and costs of the project and then to estimate the square footage of rent-free space the Army could receive from the development of the EPG site. By quantifying numerous parameters that affect the project's outcome, the reasonableness of assumptions could be assessed and sensitivity analysis performed.

The EPG model was developed as part of a comprehensive analysis of the EPG site by the Army consultants. This section describes the framework of the model, identifies key parameters, updates the parameters values to incorporate current conditions, and shows the effect of those updated values on the amount of Army rent-free space and on the financial viability of the EPG development project.

Framework

The EPG model is a spreadsheet-based tool that utilizes various input parameters or assumptions, including office rental rates, land appreciation rates, and construction costs, to project how much rent-free space the Army will receive in exchange for the EPG land. The model has two parts. Part One calculates the residual land value; the residual value is the amount that can be paid for the land after accounting for all other project costs and revenues. Part Two uses land values from Part One as the basis for estimating the amount of rent-free space that the Army will receive in exchange for the land.

In Part One of the EPG model, the calculated residual land value includes the cost of infrastructure in the total value estimate. When a portion of the value of land can be attributed to infrastructure improvements¹ that are in place, the value is known as improved land value. Part Two of the EPG model uses net land value to estimate the amount of rent-free space the Army will receive. Net land value excludes the needed infrastructure. It assumes that zoning will allow the development plan to be implemented. Improved land value is higher than net land value because a portion of the value is attributable to the value of the infrastructure improvements. Figure 4-1 shows the relationship between the two values.

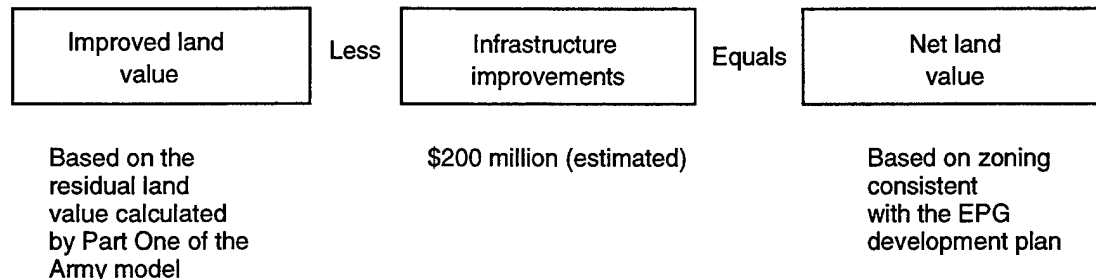


Figure 4-1.
Land Value Relationship

The appendix shows the model spreadsheets created by LMI using updated values to assess the PM's EPG development plan. The updated spreadsheets reflect the PM's estimate of 2 million square feet of rent-free space.

Residual Land Value

Part One of the EPG model uses the income capitalization method to estimate the residual land values for each of the four land uses. Income capitalization requires that a revenue stream be projected over a given time horizon, in this case 10 years. Assumptions are made regarding market conditions, such as rental rates, that influence expected income from the private EPG development. Costs are also projected for construction of the improvements such as office buildings or residential units and secondary infrastructure² as well as operating and financing costs over the 10-year time horizon. The projected net cash flow over the 10-year period is discounted using the rate of return desired by the developer, which results in the maximum amount the developer is willing to pay for the land. This approach yields the residual land value as used in the Army

¹Infrastructure refers to primary infrastructure improvements such as main roads and sewer lines. The model excludes secondary infrastructure such as driveways and sewer connections.

²In this analysis, primary infrastructure and any off-site road improvements are assumed to have already been made to the land.

model.³ Part One of the model reflects assumptions that determine the feasibility of the project in the marketplace or from the private developer's perspective. These assumptions include the developer's return or "profit," financing terms, rental rates, and market demand.

The EPG model expresses the residual land value as a dollar amount per buildable square foot. For example, the residual value of land used for an office building with 150,000 square feet of space is calculated based on the projected cash flow from a 150,000-square-foot office building. Once the 10-year cash flow is discounted to present value, the lump-sum residual land value is divided by the total number of square feet in the building to determine the residual land value per square foot of office building constructed. This value can be applied to any proposed EPG development plan given that the assumptions made for the hypothetical building apply to the speculative office space in the EPG plan.

Amount of Army Rent-Free Space

Part Two of the model estimates the amount of rent-free space the Army will receive from each of the five phases of the development. The improved value of the EPG land exchanged in each phase is determined in Part Two, based on the individual land-use values calculated in Part One of the model and on the amount of private space to be constructed consistent with the proposed rezoning plan. Once the improved land value is estimated, the value is reduced by the estimated cost of primary infrastructure to determine the net value of the EPG land. The net value of EPG land represents the value in rent-free space that the Army will receive for the EPG land. The net value of the land is then converted into square feet of rent-free space based on the estimated cost to construct the Army space.

Model Parameters

To construct the cash flows resulting from the EPG development, reasonable assumptions must be made about future expectations. Those assumptions can be grouped into six general areas: market conditions (demand and supply), construction cost of the improvements, financing costs and terms, operating expenses, depreciation and taxes, and project risk. Those parameters are not necessarily independent. For example, in the early 1990s when there was an oversupply of office space on the market, financing was difficult to obtain under any terms because the project risk was viewed as too high.

Of those areas, market conditions are probably the most difficult to predict because they can change rapidly and unexpectedly. The real estate industry is notorious for its boom-and-bust cycles. The rationale for the assumptions

³The resulting land value is referred to as residual since all other project cost and revenue components are accounted for; what remains, or the residual, is what can be used to pay for the land.

regarding market conditions is discussed in detail in Chapter 3. Additional background information on model parameters is provided in the appendix.

LMI reviewed the reasonableness of all model assumptions and input variables but focused on the office land value calculation. Office space constitutes nearly half of the planned EPG development and the likelihood of its success is uncertain.

To reflect current market conditions, we updated the values of seven key parameters used in Part One of the EPG model and two parameters in Part Two. Table 4-1 lists the parameters along with the values used in 1990 and 1994. The rationale for updating the values is found in the appendix.

Table 4-1.
1990 and 1994 Values for Updated Model Parameters

Parameter	1990 PM values	1994 LMI values
Part One		
Construction cost per square foot	\$118.80	\$133.00
Rent escalation rate (annual)	4.5%	3.0%
Expense escalation rate (annual)	4.5%	3.5%
Cap rate for sale of building	9.5%	10.5%
Interest rate	10.5%	9.5%
Developer internal rate of return	18%	18%
Full service rent rate per square foot	\$25.00	\$25.00
Part Two		
Land appreciation rate	8, 9, and 10%	6%
Discount rate	8.3 – 15.5%	10%

Results

The EPG land values and the resulting square footage of rent-free space are sensitive to the key model parameters listed in Table 4-1. The residual land value for office development falls from the \$20 per FAR square foot estimated in 1990 to \$3 per FAR square foot in 1994, assuming an identical rental rate for the space and modest changes in the other parameters. Because it is impossible to predict future market conditions with any degree of certainty, the Army should consider the amount of rent-free space a developer would be willing to provide in each phase as a broad estimate subject to the peculiarities of the marketplace conditions at a given time.

The values differ by land use. The highest value per square foot (for 1990) was determined to be land for hotels (\$24), and the lowest was for residential units (\$15) (see Table 4-2).

FAIRFAX COUNTY ESTIMATES

The Fairfax County study shows that the assessed value per square foot for office land has remained essentially unchanged in recent years. Office land was valued at \$13.18 per square foot in 1987 and rose only slightly to \$13.21 in 1993, the last year for which data were available. However, the County study estimated that the 1996 value of land would be considerably higher — \$20.00 per square foot — if the Army had an anchor tenant paying market rent.

The County's estimates of residential land values were \$30,000 for townhouses, \$17,500 for high-density units, and \$15,000 for garden apartment units. Those values, which were based on land sales in nearby residential developments, translate to \$17 per square foot for townhouses and \$14 per square foot for apartments.

Land for hotel and retail space was valued at \$12 per square foot. That value was based on the County's assessment of current market conditions and other factors.

BALTIMORE DISTRICT ESTIMATES

The Baltimore District completed a valuation of the EPG site in January 1995. That valuation was done using established appraisal techniques that involved examining recent sales of similar sites and market conditions. The District estimated the value of EPG land for three scenarios:

- ◆ Phase 1 assuming highest and best use
- ◆ Phase 1 assuming preleased office space totaling 1.1 million square feet⁴
- ◆ All phases (total 805-acre site) assuming highest and best use.

"Highest and best use" is defined as a use that supports the highest present value of vacant land. The analysis of highest and best use, takes into account legality, physical adaptability, the demand for the proposed use, and the profitability of the use. The Baltimore District's highest and best use differs from the EPG development plan because the appraisal concluded that the plan is not feasible because of a lack in demand for commercial space and the inability to finance commercial construction. Instead, the appraisal indicates that the highest

⁴The Baltimore District analysis estimated an anchor tenant for 1.1 million square feet, whereas the original estimate made by the PM's office in 1990 was 1.2 million square feet.

and best use of the EPG site, in the absence of a major tenant, is for the construction of 525 townhouses, 250 condominiums, and 330 apartments during Phase 1. The total number of units exceeds the EPG plan development plan, which assumed about 800 units. Commercial development would be limited to 327,000 square feet for neighborhood support services such as day care and medical offices.

The District's appraisal estimates that, in the absence of an anchor prelease (1.1 million square feet), the value of EPG land for office use is only \$5 per square foot. Given a major anchor tenant, the value of the land would be \$15 per FAR square foot. The value of the land is considerably lower if no anchor tenant is committed because the development is substantially more speculative and therefore riskier.

The highest EPG land value found was for townhouses at \$70,000 per unit, or \$32 per square foot; that for multifamily buildings was \$15,000 per unit.

COMPARISON OF ESTIMATES

Land value estimates derived from the various studies are shown in Tables 4-2 and 4-3.

Table 4-2.
1996 EPG Land Value Estimates
(*\$ per FAR square foot*)

Land use	EPG model – 1990 PM	EPG model – 1994 LMI ^a	Fairfax County	Baltimore District
Office without prelease	—	3.48	—	5
Office with prelease	22	—	20	15
Residential – townhouse	15	15 ^b	17 ^c	32 ^c
Residential – condominium	15	15 ^b	12 ^d	12 ^c
Residential – apartment	15	15 ^b	14 ^e	15 ^c
Hotel	24	24 ^b	12	10
Retail	24	24 ^b	12	10

^a Assumes full-service office rent of \$25.

^b Based on 1990 EPG analysis demand estimates. Hotel and retail values not adjusted downward to incorporate more recent estimated demand for these uses.

^c Assumes 1,772 square feet per unit.

^d Assumes 1,500 square feet per unit.

^e Assumes 1,050 square feet per unit.

Table 4-3.
1996 Net Present Value of EPG Land
 (\$ millions)

Scenario	EPG model – 1990 PM	EPG model – 1994 LMI	Fairfax County	Baltimore District
Phase 1, highest and best use ^a	—	—	—	10.2
Phase 1, assuming preleased of- fice space	41.8	5.7	29.2	16.4
All phases, highest and best use ^a	436.9	87.1	159.8	17.4 ^b
Internal rate of return	18%	18%	16% ^c	30%

^a“Highest and best use” for Army and Fairfax County based on PM plan submitted to Fairfax County prior to approval of comprehensive plan amendments. “Highest and best use” for the Baltimore District is a modified plan with less office space and more residential space.

^bMarket value of 805-acre parcel as of January 1995.

^cDiscount rate used to estimate net present value.

The Army consultant’s analysis was undertaken in 1990. The Fairfax County analysis was completed three years later. The Baltimore District valuation, the most recent of the studies, was completed in early 1995, about 15 months after the Fairfax County study. As shown in Table 4-2, the 1990 PM estimates are higher than those of Fairfax County and the Baltimore District for all land uses except townhouses. The PM’s estimates of hotel and retail space land values are about twice those of Fairfax County and the Baltimore District.

The net present value of EPG land in Phase 1 and in all phases, as seen in Table 4-3, varies substantially among the alternative approaches. Assuming preleased office space in Phase 1, the value of land developed in this phase varies from \$5.7 million to \$41.8 million. Considering all EPG land, the Baltimore District estimate of \$17.4 million is considerably below the level of the other estimates. The low value is attributable, in part, to the 30 percent internal rate of return applied in the determination of net present value.

CONVERSION OF LAND VALUES TO ARMY RENT-FREE SPACE

The amount of rent-free space the Army can expect to receive from residual land values depends on the value per FAR square foot and the estimated cost of construction per square foot. Estimates derived from FAR land values per square foot are shown in Table 4-4.

Table 4-4.
Army Rent-Free Space
(square feet)

Scenario	EPG model – 1990 PM	EPG model – 1994 LMI	Baltimore District
Phase 1, highest and best use	–	–	85,000
Phase 1, assuming preleased office space	340,000	46,000	136,667
All phases, highest and best use	2,000,000	550,000	145,000

Note: Fairfax County did not directly estimate Army rent-free space because the County assumed residual rent payments could be made by the Army.

^a Residual land values converted to square feet assuming a construction cost of \$120 per square foot. The Baltimore District's appraisal assumed a construction cost of \$100 per square foot.

The Baltimore District estimates the Army could obtain only 85,000 square feet of rent-free space for the land that comprises Phase 1. With preleased space, estimates vary from 46,000 to 340,000 square feet. The highest estimate, however, is based on obsolete 1990 EPG model values.

As noted in this report, the likelihood of preleasing space at market lease rates is low. The Baltimore District estimate of rent-free space for the total 805-acre site is only 145,000 square feet. This is the result of the high internal rate of return percentage estimate applied by the Baltimore District.

CHAPTER 5

Plan Implementation Issues

In this chapter, we discuss some issues that could impede the successful implementation of the EPG development plan. Those issues concern both policies and financial aspects of the plan that may pose a problem for the Army or create a risk for potential developers, making it more difficult for the Army to attract a developer.

TITLE CONVEYANCE

Timing of Conveyance

The PM plans to release the EPG land to developers in phases. In each phase, the developer must first build the rent-free space for the Army and meet all other conditions, such as infrastructure requirements; the Army will then convey to the developer title to the land included in that particular phase.

Typically, development of a site begins with the preparation of a development plan that specifies the location, indicates the necessary zoning, and identifies financing requirements. Next, the developer purchases the land upon which the proposed development is to be constructed. With that purchase, the seller conveys the title to the developer. Using the land title as collateral, the developer obtains a construction loan for land improvements, including the building and infrastructure. After construction is completed and the building is occupied, the developer secures long-term financing for the development.

The proposed EPG development process, though similar to the typical development process, differs in one critical area. As in the typical development process described above, site selection, preparation of the development plan, and identification of zoning requirements were completed first. However, the PM expects the developer of the EPG site to construct the site infrastructure and the Army rent-free space *before* it receives the title to the land. Only then can the developer use the land title as collateral to secure a loan for the construction of the remaining development for that phase. In other words, the timing of title conveyance in the EPG development is such that a developer would need access to substantial capital to fund the construction of the site infrastructure and the Army space. Funding that construction without the benefit of the land title places the developer at significant risk and may affect the Army's ability to attract a viable developer.

Reversion Clause

The legislation specifies that, if the developer is unable to develop the real property as specified in the plan, the title will automatically revert to the Army. The fact that the Army can trigger automatic reversion of the property conveyed is a serious concern. As we discuss below, the developer has limited flexibility to modify the existing development plan. If the attempt to develop the site in accordance with that plan is not successful because of unfavorable market conditions, the developer is at risk of losing the title to the land. Thus, the existence of the reversion clause is likely to affect the willingness of financial institutions to lend money to a prospective developer and, in turn, affect the ability of the Army to attract a developer.

LIMITED DEVELOPER FLEXIBILITY

The EPG development plan specifies the land uses at the site, the amount of space to be built for each type of land use, and the timing of the construction. Fairfax County used the development plan as the basis for modifying the Comprehensive Plan. The requested rezoning is based on the revised Comprehensive Plan, the EPG development plan, and additional information, such as transportation impacts.

The County expects the developer to adhere closely to the plan, particularly the level of commercial development. The County will not allow the developer to proceed with Phase 2 until at least 80 percent of the planned commercial development in Phase 1 is ready for occupancy. That requirement places the developer at considerable risk if economic conditions change substantially from those on which the EPG development plan was based.

IDENTIFICATION OF ANCHOR TENANT FOR PHASE I

The PM and Fairfax County agree that, for the EPG development to be successful, an anchor tenant is required to occupy the majority of the space that will be constructed in Phase 1. The presence of a major tenant is expected to draw additional tenants to the development and reduce the risk to the developer of holding unleased office space.

The PM has indicated that it can find a Defense agency to occupy 1.2 million square feet of space in Phase 1. However, it is unclear at this time how the PM expects to select a specific government agency as an anchor tenant at the EPG site given the General Services Administration (GSA) leasing guidelines that government agencies within the National Capital Region must follow. Those guidelines outline how additional space is to be acquired. The general procedure is to solicit competitive bids from lessors in accordance with the Federal Acquisition Regulations and the Competitive Contracting Act. By implication, the PM is suggesting a sole-source procurement action. Sole-source procurement of a lease is

allowed by GSA only if the agency has a mission-specific need for a particular space. We believe any agency would have difficulty justifying that need for space at the EPG site, particularly since the projected EPG rent of \$25 per square foot exceeds most current leasing levels.¹

Another option would be for the PM to identify a private company willing to move to the EPG development as the anchor tenant for Phase 1. A private company would not have the restrictions that are imposed on government agencies by the GSA leasing guidelines. To our knowledge, no one has been actively pursuing a private-sector tenant. Moreover, attracting such a tenant is likely to be difficult since EPG lease rates are expected to exceed the current market rates.

PROFFERS

The PM has made several tentative commitments, or proffers, to Fairfax County. Those proffers must be signed before the Fairfax County Board of Supervisors approves the EPG rezoning application. Once signed, those proffers will be legally binding and will represent a significant financial commitment by the Army. Of particular concern are proffers for construction of a people mover, construction of external roads, and dedication of Army land to the County.

People Mover

The dominant Fairfax County concern about the EPG development is its impact on traffic in the area. The Springfield interchange on Interstate 95 near the EPG site is one of the most congested areas in the Northeast. The additional traffic to and from the EPG site is expected to worsen that congestion. Because of the County's concerns, the PM agreed that, as a part of the EPG development, a people-mover transportation system would be constructed to support the flow of people to and from, as well as within, the development. The people-mover concept is based on the premise that the EPG development would provide 20 percent of the funding. The balance would presumably be obtained from the U.S. Department of Transportation. However, the likelihood either of the Federal government providing such funds or of Fairfax County voters approving a bond issue to pay for the people mover is considered low. Were the people mover to become a reality, it would be expected to mitigate a substantial, but undetermined, share of the traffic to the development.

External Roads

Fairfax County requires that a transportation study be conducted at the end of each development phase to determine the impact of the development in that

¹The Baltimore District appraisal shows GSA leasing space during the fourth quarter of 1994 in the Springfield submarket (Gateway 95 Park) at \$16 per square foot, which is \$9 per square foot lower than projected EPG levels.

phase on traffic congestion. The preliminary proffers indicate that, if traffic congestion exceeds the PM's estimate, the Army will be responsible for constructing additional external roads to mitigate that impact prior to initiating the next phase. The costs associated with constructing those external roads are not identified in the development plan; the PM assumes that the combination of the existing roads to the development, new roads within the development, and the people mover will mitigate any potential traffic impact. In the absence of a people mover, the PM has agreed to provide funds currently allocated for its share of the people mover (\$70 million) for external roads. That level of funding, however, may be insufficient to build enough roads to reduce congestion. Similarly, if the people mover were built but did not relieve traffic congestion to the extent the PM projects, Fairfax County may nonetheless require external road improvements. Under either scenario, additional funds may be required that would reduce the amount of rent-free space the Army would receive.

Additionally, the EPG plan assumes that the people mover will be constructed in Phase 3. Some Fairfax County elected officials have expressed interest in having the people mover constructed in Phase 1. If that were required, the EPG development plan would not be feasible because the 20 percent contribution to the cost of this construction cannot reasonably be covered by expected revenues from Phase 1.

Land Dedication

Perhaps the single most important proffer concerns the PM's agreement to dedicate to the County more than 300 acres of EPG land. If, for some reason, the EPG development is not successful and is therefore not built, the Army will still have to convey that land to the County.

Financial Risk to the Army

Because the EPG project may continue for 20 years or more, the anticipated proffers expose the Army to a long-term financial risk. The Army will retain ownership of the land until several conditions are met, so it will be legally responsible for ensuring that the proffers associated with each phase of the development plan are met. Fairfax County is expected to hold the Army responsible even if the developer selected for a phase is unable to develop the property in accordance with the plan. A guarantee that one or more of the developers will not default cannot be provided, particularly as it is impossible to project economic conditions two decades into the future.

CHAPTER 6

Conclusions and Recommendations

The EPG development plan as conceived in 1990 was rational and feasible given what were, at that time, several reasonable assumptions. The slowdown in the office building boom in Fairfax County was seen as a short-term condition. Employment growth was projected to be high. Financial institutions and developers anticipated that office space rents would rise, making new construction profitable. Residual rent payments were contemplated as the mechanism to assure that developers could afford to provide the Army space at below-market rates. Finally, the PM expected that it could attract a large anchor tenant in Phase 1.

Since 1990, market conditions have changed considerably, invalidating many of the assumptions on which the EPG plan was based. The growth in private employment in Fairfax County has slowed. Concurrently, military and Federal civilian personnel reductions are exceeding 1990 projections. Those reductions have an adverse effect on the local economy and reduce the demand for government-owned or leased space. Additionally, residual rent payments may not be feasible and severe constraints limit the chances of finding a DoD anchor tenant.

This chapter presents our conclusions about the feasibility of the EPG plan as proposed to Fairfax County, given our assessment of current conditions. Our conclusions are grouped into three specific categories. First, we address conclusions based on our analyses of current market conditions and the estimated market share required by the EPG. Second, we discuss our conclusions reached based upon the results of our financial analyses. Third, we present our conclusions about the effects of various implementation issues on the success of the EPG development plan. The final section of this chapter presents our recommendations about how the Army should proceed with the EPG development plan.

CONCLUSIONS

Market Analyses

- ◆ Office absorption rates in Fairfax County based on current employment data are substantially lower than the rates projected by Army consultants in 1990.
- ◆ The EPG site can expect office lease rates of \$16 per square foot (1995 dollars) on the basis of comparable leases negotiated during late 1994 in the Springfield submarket.

- ◆ The estimated EPG office lease rate of \$25 per square foot will restrict the number of potential tenants. Several other County submarkets, notably Tysons Corner, have a locational advantage over the EPG site, and their average lease rates are lower than \$25 per square foot.
- ◆ In the absence of a large anchor tenant, the EPG site will be unable to capture a sufficient share of the high-end lease rate market to absorb planned EPG office construction.
- ◆ The market for residential housing is likely to absorb most of the 800 planned units in Phase 1 of the EPG development. At that absorption rate, the EPG site would capture about one-third of the demand in that submarket for townhouses and multifamily units.
- ◆ The hotel market is expected to absorb only about half the planned units at the EPG site. However, planned retail space, which accounts for about 2 percent of total EPG construction, is likely to be absorbed.

Financial Analyses

- ◆ The use of updated assumptions in the EPG model shows that the Army can expect to receive about 550,000 square feet of rent-free space over the course of about 20 years with the proposed EPG plan.
- ◆ The Army can obtain only minimal rent-free space (46,000 square feet) in Phase 1.
- ◆ Market fluctuations make it difficult to predict conditions 20 years into the future. Conservative assumptions should be used in the EPG model because they are more likely to represent average economic and development conditions over a planning period of 20 or more years.
- ◆ The current rent levels do not support construction of new office space in the Northern Virginia marketplace.
- ◆ Given the conditions in the office development market, it is not financially feasible to construct 2 million square feet of speculative office space during Phase 1 without an anchor tenant.
- ◆ The absorption rates used in the EPG model based on 1990 market conditions for commercial space appear too aggressive. By extending the length of the phases, the Army will receive less space than projected, even with the updated assumptions.

Implementation Issues

- ◆ Given the risks associated with the plan, we believe that the Army will be unable to attract potential investors or developers for the EPG development as currently conceived.
- ◆ It is highly unlikely that the EPG program manager will be able to guarantee to a potential developer that a DoD anchor tenant will absorb close to 90 percent of the Phase 1 commercial office space. Without an anchor tenant, Phase 1 is currently not feasible.
- ◆ We believe that the transportation studies required at the completion of each phase of the development will show that additional infrastructure improvements will be needed to mitigate traffic congestion resulting from the development. The costs associated with these additional transportation improvements are not identified in the EPG plan and cannot be supported by the development.
- ◆ If it signs the proffers as currently structured, the Army will lose over 300 acres of land on the EPG site to Fairfax County, regardless of the success of the overall development.

RECOMMENDATIONS

Our analyses have shown that the EPG development, as currently planned, is not likely to be successful. Given that conclusion, we have two key recommendations:

- ◆ We recommend that the Army refrain from signing proffers that would commit future financial resources and would automatically dedicate over 300 acres of the EPG property to Fairfax County.
- ◆ While it is probably possible to structure a development plan that would be financially and economically feasible, we recommend that the Army address the fundamental issue of whether it wants to act as the developer of the EPG site and assume the risks and liabilities associated with that role.

APPENDIX

Assumptions Used to Estimate Land Values and Army Rent-Free Space at the EPG Site

APPENDIX

Assumptions Used to Estimate Land Values and Army Rent-Free Space at the EPG Site

The Program Manager for Total Development in the National Capital Region (PM, NCR) developed a spreadsheet-based model that incorporates many variables to estimate land values at the Engineer Proving Ground (EPG) site (EPG model — Part One) and to estimate the amount of rent-free square footage the Army could expect to receive in exchange for the EPG land (EPG model — Part Two). Land values were estimated for four categories of land use: office, residential, retail and hotels. Of those four land uses, two dominate the proposed development plan — office and residential.

In this appendix, we review and provide an updated estimate of key assumptions used to project office and residential land values as well as to project the amount of Army rent-free space. This appendix concludes with a comparison of the results using 1990 and the 1994 values. The spreadsheets showing the detailed model results for 1990 and 1994 are shown in Annexes 1 and 2, respectively.

RESIDUAL LAND VALUE — OFFICE

The following sections describe some of the key variables that help determine the residual land value for office development. These variables and their corresponding values are incorporated into Part One of the model, which then generates an estimate of land value.

Current and Projected Office Space Demand in Fairfax County

EMPLOYMENT

Office space demand is driven primarily by office-related employment. That is, as office-related employment grows, so does the demand for additional office space. That relationship is not necessarily linear. For example, when rents are depressed, an organization may elect to occupy more space than when rents are high. There are also lags in office occupancy. Thus, some space may be occupied during a period of little employment growth because the decision to lease the space was made at an earlier period when employment prospects were more

positive. Some firms may elect more expensive space than they currently occupy because rents are depressed. In the longer run, however, there is a high correlation between office employment growth and demand for office space.

The preliminary market analysis conducted by the PM's office in 1990 estimated the demand for office space at the EPG site based on Fairfax County's projections of office-type employment. As shown in Table A-1, however, the 1990 projections differ considerably from the latest available Fairfax County/Council of Governments (COG) projections. For the 1995–2000 time period, the 1990 projections are 41 percent above the latest County estimates. Thus, the office space demand levels computed in 1990 for future demand are substantially higher than current estimates.

Table A-1.
Comparison of Fairfax County Employment Projections

Year	Annual percentage growth		Percentage difference
	Fairfax County/COG ^a	PM ^b	
1980 – 1984 ^c	6.1	6.1	–
1984 – 1988 ^c	8.0	8.0	–
1990 – 1995 ^d	1.6	5.0	212
1995 – 2000 ^d	3.2	4.5	41
2000 – 2005 ^d	2.1	4.0	90
2005 – 2010 ^d	1.6	3.5	119

^a Fairfax County Memorandum, Nov. 19, 1993.

^b *Preliminary Market Analysis of Engineering Proving Grounds, April 1990 (Moderate Growth Scenario).*

^c Actual annual growth rate.

^d Projected annual growth rate.

OFFICE SPACE PER EMPLOYEE

In the 1995–2000 time frame, assuming 290 square feet of office space per new job, annual demand for office space is expected to total 2.5 million square feet. In the 2001–2005 time frame, demand will be reduced to 1.9 million square feet. However, on the basis of mid-1994 data, there will be a limited surplus of space in 1995 and 1996. Taking this space into account, total annual demand should be about 2.3 million square feet.

The 290 square feet per employee space requirement in the PM's study was based on employment growth in the mid-1980s. As shown in Table A-2, space utilization appears to have grown moderately from 290 to 298 square feet (3 percent increase) when the tabulation is based on the 1985–1993 time frame.

The more recent data indicate that space requirements per employee increased during the period of stagnant or declining rents. As such, this may be a short-term phenomenon. Were office demand in Fairfax County to be 298 square feet per employee, annual demand in the 1995 – 2000 time frame would be slightly (3 percent) higher.

Table A-2.

*Estimated Fairfax County Office Space per Employee,
1985 – 1993*

Parameter	Value
Change in new leased space (sq. ft.) ^a	31,597,000
Change in office-type employment (persons)	106,000
Space per employee (sq. ft.)	298

^a Includes new space available but not leased.

OCCUPANCY RATES

The PM's cost analysis assumes 92 percent occupancy rates beginning in the third year of office leasing. That rate compares to current (third quarter 1994 average) occupancy rates of 88 percent in Northern Virginia and 85 percent in Fairfax County.¹ The ability of the project to reach virtually full occupancy within three years is totally dependent on the likelihood that DoD agencies, such as the Defense Information Systems Agency and the Defense Nuclear Agency, and support contractors will occupy about 1.5 million square feet of office space in the first three years of Phase 1. The 1990 study assumed that in Phase 1 most non-Army office space would be occupied by DoD or DoD contractors. If only about 350,000 square feet were available to the private market during Phase 1, 186,000 square feet would have to be leased in the speculative market, assuming an 8 percent vacancy rate. Under those conditions, both the assumption of space occupied within three years and occupancy rates appear realistic.

If no DoD agencies can provide assurance that they intend to occupy all or most of the space as projected, expected occupancy rates are not likely to be reached. That conclusion was also reached by the Army consultants in their 1990 report. That report states, "without such office development," we expect private EPG office absorption to be approximately one-third to one-half of the absorption forecasted with the Army office development.²

¹Smithy-Braedon, *Third Quarter 1994 Market Report*; rates include sublet space. Mid-1994 rates in Fairfax County Economic Development Authority Business Report are slightly lower.

²The TAI Realty Advisors Report prepared for Fairfax County states that the Army indicated that it is "not counting on the normal speculative market to provide any absorption in Phase 1" (page 20).

Currently (1994), office property in Northern Virginia is being sold at 50 percent to 75 percent of replacement cost. Although this represents considerable market improvement over the 1991 – 1993 period, investors can purchase buildings at a considerable discount. This is no doubt a key factor explaining why practically no new office space is under construction in Fairfax County. As vacant space becomes occupied (in 1996 – 1997 at current leasing rates), rents may be bid up and new construction initiated. That is, investors will speculate on new buildings when net cash flow for expected rents in these buildings will exceed the cost of new construction with reasonable rates of return.

The model assumes that the speculative office space constructed in each year will be absorbed by the marketplace over a two-year period. The updated model does not alter this assumption. However, given the previous discussion of net office demand in the Fairfax County market, this is an aggressive assumption without an anchor tenant.

Office Rent

Office rent levels in Fairfax County are affected by several variables, including the following:

- ◆ Accessibility
- ◆ Neighborhood/agglomeration
- ◆ Building quality
- ◆ Building age.

ACCESSIBILITY

Office buildings located near intersections of major roads (such as Tysons Corner) have higher value than buildings with relatively difficult access. Road congestion and nearness to mass transit are also factors.

NEIGHBORHOOD

Certain areas with concentrations of quality office space, such as Tyson's Corner and Reston, add to the value of new office buildings.

BUILDING QUALITY

Holding other factors constant, rent varies with the quality and amenities of an office building. Most of the office buildings constructed in Fairfax County during the 1980s are the upper range of the quality spectrum.

AGE

In general, a new building will charge higher rent than an older building in an equivalent location. In part, this is attributable to the incorporation of new technology in buildings constructed since the mid-1980s.

Distribution of Office Rents in Fairfax County

Fairfax County publishes data semiannually on the range of rents by submarket. These submarket ranges in 1994 vary from a full-service low of \$9.50 – \$17.50 at Fairfax Center to a high of \$14.50 – \$26.00 at Tysons Corner.³ To obtain an average rent distribution, submarket values have to be weighted. For example, Tysons Corner, the largest submarket in the County, includes 28.2 percent of all office square footage, while Mt. Vernon has only 1.4 percent.

Average Fairfax County rents are approximately the same in 1993 as in 1994, or about \$17.40. However, these computed averages exceed the level estimated by a private firm.⁴ That source estimates that, in the third quarter of 1994, full-service rents in 513 buildings in Fairfax County averaged \$15.33. In each submarket, private firm estimates were equal to or lower than County estimates.

The EPG site has both locational advantages and drawbacks. One of the advantages is the metro location relatively close to the site and the Fairfax County Parkway interchanges at the site. The two drawbacks are the congestion along Interstate 95, which is likely to continue following improvements to the corridor, and the absence of other large Class A office complexes in the immediate vicinity. Taking these facts into account, the EPG site is likely to compete with other good locations (such as Merrifield, which has metro access) but will have some difficulty competing with Tysons Corner, the largest Fairfax County submarket.

The EPG site is part of the Springfield submarket. Full-service rents in that submarket in 1994 ranged from \$10 to \$18 per square foot. In 1996, rents in the Springfield submarket are expected to range from \$16 to \$18 per square foot (Table A-3).

The PM assumes a base rent of \$22.50 per square foot excluding an estimated \$2.50 in pass-through operating costs. Thus, the effective full-service rent is \$25.00 per square foot in the EPG model assuming 1990 parameter values.

³Lease rates are based on data from the FCDEA *Business Report*.

⁴Smithy-Braedon, *Third Quarter 1994 Market Report*.

Table A-3.

*Projected 1996 Full-Service Rents for Class A Building in Springfield
Submarket
(\$ per square foot)*

Estimate	Rent
Low	16
Most likely	17
High	18

For the updated 1994 model, a range of full-service rents that approximate the level required for a reasonable rate of return was used to evaluate the sensitivity of land value (and consequently Army rent-free space) to the rent a building can command in the market place. The rates used were \$23 per square foot, \$25 per square foot, and \$27 per square foot. Those values exceed the upper end of market rent rates. The 1994 spreadsheets in Annex 2 use a full-service rent rate of \$25 per square foot.

Annual Rent Appreciation

During the 1990 – 1993 downturn, there was essentially no rent appreciation for new tenants. Higher costs, if any, were absorbed by building owners. Although the market as of 1994 continues to be soft relative to the market in the 1980s, the market is expected to be stronger by 1996 – 1997 when the proposed office buildings may be constructed. Nonetheless, 4.5 percent annual appreciation applied in the EPG model is more than could be expected even in periods of market stability, when occupancy rates may exceed current levels. At most, annual rent increases are not likely to exceed the general projected inflation rate of 3.0 to 3.5 percent. Many longer term leases would only absorb pass-through costs. For such leases, 2 percent annual increases may be a more realistic value based on expected market conditions.

For purposes of the EPG model, the consultants used a value of 4.5 percent annual appreciation in base rent levels, while the 1994 updated model uses a value of 3 percent annual appreciation rate.

Operating Expenses

The average operating and fixed expenses in Northern Virginia during 1993 are shown in Table A-4.

Table A-4.***Average Office Building Expenses per Square Foot in Northern Virginia***

Expense	Office size	
	100,000 – 300,000 sq. ft.	300,000 – 600,000 sq. ft.
Number of buildings	14	3
Cleaning	\$.98	\$1.11
Repair/maintenance	1.53	1.23
Utilities	1.84	1.70
Other operating expenses	1.24	1.23
Real estate taxes	1.22	1.60
Insurance and other	.20	0.25
Total	\$7.01	\$7.12

Source: 1994 BOMA Experience Exchange Report.

As these data show, the average expenses (excluding leasing costs) were about \$7.07 per square foot in 1993. Given 3 percent annual cost increases, these costs would be \$7.73 in 1996. For purposes of the analysis, however, we assumed the cost to be \$6.50, or 84 percent of the average, on the premise that a new, high-quality building will have lower than average repair and utility costs. The \$6.50 value is used when determining the full-service rent rate used in both the 1990 and in 1994 models.

Selling Price of Office Building in Year 10

The EPG model assumes that the prototype office building will sell for 53 percent above the initial construction cost and land value 10 years following first occupancy. This represents a reasonable, annual appreciation rate of 4.4 percent, and implies that construction costs rise about 4 percent a year and that land appreciation somewhat faster. The data suggest that, at a 4.4 percent appreciation rate, an investor should be indifferent between purchasing an existing building or building a new structure. However, an existing structure may have the advantage of substantial space already leased, reducing the investment risk. For both the 1990 and 1994 versions of the model, no change was made in the selling price of the office building in order to estimate residual land value.

Office Construction Cost

The 1990 study by the PM's office estimates total office construction costs (including partially covered parking) to be \$118.79 per square foot. The costs were reestimated in 1994 for the year 1996 at \$120.00 per square foot and the

1996 – 1997 midpoint cost (the projected time of construction) at \$122.70 per square foot.

The 1990 estimate appears appropriate for a high-quality (Class A) office building constructed in 1990 – 1991. An examination of *Means Square Foot Cost Guide for 1994* shows that costs in Northern Virginia rose 2.2 percent annually between 1990 and 1994 (from an index of 86.1 to 93.9). The rate in Northern Virginia was somewhat below the 2.5 percent national annual rise. As shown in Table A-5, a 2 percent annual increase to the 1990 base would result in a 1996 estimate of \$134 per square foot.

A lower quality office building could probably be constructed for 10 percent less, or for \$120 per square foot in 1996. However, such a building would have more difficulty attracting “top line” tenants, given that a high percentage of newer buildings were built to high standard.

Table A-5.
Construction Cost Projections

Year	Cost per square foot		Percentage difference
	Most likely	Army consultant estimate	
1990	118.79	—	—
1994	128.52	—	—
1996	133.71	120.00	11.1
1996.5 ^a	135.05	122.70	11.0

^aMidpoint between 1996 and 1997.

The projected 1994 – 1996 rise of 2 percent assumes modest inflation over the next two years. Assuming that construction begins in 1996, the 1990 version uses a construction cost of \$120 per square foot, while the 1994 version uses a cost of \$133 per square foot.

Capitalization Rate

The assumed capitalization rate for the project in 1990 is 9.5 percent. The capitalization rate in the model determines the value (and thus the selling price) of the office buildings. For example, given an annual net operating income of \$1,000,000, the selling price of a building would be $\$1,000,000 / .095$, or \$10.5 million. The capitalization rate is related to several factors, including the projected stream of future earnings, the strength of outstanding leases, and other risks associated with the flow of future earnings. In our view, a more appropriate capitalization rate would be 10.5 percent.

Loan Interest Rate

The EPG model assumes the interest rate for long-term loans (mortgages) to be 10.5 percent beginning in 1996. We adjusted this interest rate downward to 9.5 percent, which is slightly above the 1994 mortgage rate but is the rate projected for 1995.

RESIDUAL LAND VALUE — RESIDENTIAL

Key variables and their corresponding values used to determine the land value for residential development applying the residual value methodology in the Army consultants model are listed in Table A-6. For purposes of applying the model to estimate residential land values, the assumptions used in 1990 are considered reasonable for use in the 1994 analysis.

Table A-6.
Rental Apartment Key Land Value Parameters

Parameter	Value
Construction cost	\$55.75/GSF
Average unit size	1,100 GSF
Building size	110,000 GSF
Monthly rent	\$1,075/unit
Stabilized occupancy	95%
Year of stabilized occupancy	Year 3
Average annual rent escalation	4.5%
Annual operating expenses	30% of revenues
Building sales price, Year 10	\$13,419,439
Apartment building capitalization rate	9.5%
Interest rate for borrowed capital	10.5%
Internal rate of return to equity investors	18%

Source: *Preliminary Market Analysis of Engineering Proving Grounds*, Basile Baumann Prost & Associates, Inc. (BBPA) Team, April 1990.

RESIDUAL LAND VALUE — OTHER USES

Hotel, retail, and other land uses constitute only about 2 million square feet or 12 percent of the private development space. The detailed residual land value calculation is not included in this appendix but can be found in *Army Corps of Engineers — Preliminary Financial Analysis*, April 1990. The residual land values calculated in that report are used to estimate the amount of Army rent-free space.

EPG MODEL — PART TWO ASSUMPTIONS

The cost per square foot of constructing office space is discussed as an input to Part One of the model for speculative office land value. However, in order to estimate the amount of rent-free space, the cost of this construction over the 20-year development period must also be projected. This value is used for the cost of construction of Army rent-free space.

The PM estimates that construction costs will rise 4.5 percent annually from 1996 on. The *Means Square Foot Cost Guide for 1994* shows that, between 1984 and 1994, construction costs in Northern Virginia rose by 25 percent, or less than 2.5 percent annually. Nationally, the rise was 27 percent over the decade. Based on this historical pattern and the anticipation of low to moderate inflation over the next few years, the 4.5 percent projection seems high. We believe that a "most likely" scenario would be in the vicinity of 3.0 percent with 4.5 percent, being an upper estimate and 2.0 percent a lower end estimate. The 1990 model used a 4.5 percent escalation rate while the 1994 model uses a value of 0.05 percent from 1990 to 1996 based on historical data and then 4.5 percent throughout the remaining development period.

IMPACT OF EPG MODEL PARAMETERS ON ARMY RENT-FREE SPACE

Table A-7 summarizes the resulting impact to office land value as a result of updating the seven parameters shown in Table 4-1, based on the rationale discussed throughout this appendix as well as in Chapter 3.

Table A-7.
Office Land Value for Different Full-Service Rental Rates
(\$ per square foot)

Parameters used in EPG model	Rent of \$23	Rent of \$25	Rent of \$27
1990 values	4.26	20.06 ^a	35.82
1994 values	0	3.48	18.92

^aThe difference of \$0.01 in land value between the PM's version of the EPG model and LMI's version as shown in the appendix is due to rounding.

Table A-8 compares Army rent-free space using the 1990 values and the 1994 values. For this comparison, the 1994 model uses a full-service rent rate of \$25 per square foot. Small changes in parameter values have a significant impact to the amount of rent-free space the Army is projected to receive.

Table A-8.
Projected Army Rent-Free Space by Phase
(000 square feet)

Parameters used in EPG model	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
1990 values	341	415	191	520	705	2,172
1994 values	46	192	0	68	244	550

Note: Assumes a full-service rental rate of \$25 per square foot for both scenarios.

ANNEX 1

EPG Model Spreadsheets Using 1990 Assumptions

EPG Army Model Reflects 1990 parameters.

Model Results - Part 1

Land Values as projected by residual value calculation:	
	(1995)
Office	\$20.05
Support retail	\$21.96
Hotel/other	\$22.12
Residential (see note)	\$14.08

Note: The residual land value for residential was calculated by the Army consultants for three residential uses as follows:
 Townhouse - \$14.18 /sf, Condominium - \$12.03 /sf, Apartment - \$10.13 /sf. An aggregate value is used in the model of \$14.08 /sf
 While the exact mix of residential types is not available, this average is inconsistent with the individual values as it assumes all units will be townhouses.

Model Results - Part 2

Amount of rent free space projected for the Army

	Phase I	Phase II	Phase III	Phase IV	Phase V	Total
Site Area (Acres)	145.0	171.0	143.0	225.0	136.0	820
Site Area (SF)	6,316,229	7,448,794	6,229,109	9,801,045	5,924,187	35,719,364
Programmed Development (SF)						
Private Office	2,050,000	1,250,000	1,300,000	1,200,000	750,000	6,550,000
Retail	77,000	60,000	63,000	60,000	40,000	300,000
Other	50,000	450,000	450,000	450,000	250,000	1,650,000
Residential	850	850	900	750	600	3,950
Subtotal - private space	1,506,000	1,506,400	1,595,000	1,322,000	1,063,200	6,999,600
	3,683,000	3,266,400	3,408,000	3,039,000	2,103,200	15,499,600
Financial Analysis (\$000)						
Army Disposition Revenues (Improved value of EPG land)	\$67,498	\$84,515	\$126,892	\$173,030	\$185,605	\$637,540
Less: Infrastructure cost	\$25,661	\$21,042	\$92,085	\$59,860	\$2,868	\$201,516
Army rent free space (Net value of EPG land)	\$41,837	\$63,473	\$34,807	\$113,170	\$182,737	\$436,024
Resulting Army Rent free space						
Construction cost (\$/sf)	\$122.70	\$152.91	\$182.34	\$217.45	\$259.31	---
Army rent free space (sf)	340,970	415,107	190,888	520,445	704,702	2,172,113

EPG Land Value Projection - Office
Residual land value calculation

Residual land value calculation

A-1-4

Army Model - Part 1

EPG Land Value Projection - Office Reflects 1990 parameters.
Residual land value calculation

Table 1 - Debt Service Calculation

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Supportable Debt										
Year 3 NOI		\$2,227,000								
Loan Coverage Rate		1.2								
Annual Debt Service (maximum allowed)		\$1,856,000								
Supportable Debt		\$15,277,000								
Amortization schedule:										
Beginning Loan Balance	\$15,277,000	\$15,025,032	\$14,746,607	\$14,438,948	\$14,098,985	\$13,723,326	\$13,308,222	\$12,849,533	\$12,342,681	\$11,782,610
Payment	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053	\$1,856,053
Interest	\$1,604,085	\$1,577,628	\$1,548,394	\$1,516,090	\$1,480,394	\$1,440,949	\$1,397,364	\$1,349,201	\$1,295,982	\$1,237,174
Principal repayment	\$251,968	\$278,425	\$307,659	\$339,963	\$375,659	\$415,104	\$458,689	\$506,852	\$560,071	\$618,879
Ending Loan Balance	\$15,025,032	\$14,746,607	\$14,438,948	\$14,098,985	\$13,723,326	\$13,308,222	\$12,849,533	\$12,342,681	\$11,782,610	\$11,163,731

Table 2 - Cash from sale of building in year 10

	Year 1	Year 10
Development Costs:		
Hard Construction Cost	\$7,500,000	
All other costs (including parking)	\$10,320,000	
Total development cost	\$17,820,000	
Cost per sq. ft.	\$118.80	
Occupied sq. ft. (year 3-10)		117,300
Rent/SF (escalation from base year)		\$33.45
Gross revenue		\$3,923,685
Less expenses		\$891,657
Net operating income (NOI)		\$3,032,028
Building Sale Year 10		
Sales Price (Yr. 10 NOI / Cap rate)		\$31,900,211
Less		
Closing costs & commissions		\$1,276,008
Outstanding debt in year 10		\$11,163,731
Net proceeds from sale		\$19,460,471
Tax on building sale		
Original building cost (basis)		\$17,820,000
Less: depreciation of building (years 1-10)		\$2,145,905
Tax basis of building in year 10		\$15,674,095
Net Gain (loss) on Sale (net proceeds less basis in yr		\$3,786,376
Taxes on Gain (tax credit)		\$1,079,117
Net adjusted proceeds from building sale		\$18,381,354

<= added to cash flow in year 10

Army Model - Part 1

EPG Land Value Projection - Office

Residual land value calculation

Reflects 1990 parameters.

	Year:									
	1	2	3	4	5	6	7	8	9	10
Annual Cash Flow Projection										
Base rent (per sf)	\$22.50	\$23.51	\$24.57	\$25.68	\$26.83	\$28.04	\$29.30	\$30.62	\$32.00	\$33.44
Average Occupancy (sf)	82,875	95,625	117,300	117,300	117,300	117,300	117,300	117,300	117,300	117,300
Gross Revenue	\$1,864,688	\$2,248,383	\$2,882,127	\$3,011,823	\$3,147,355	\$3,288,986	\$3,436,990	\$3,591,655	\$3,753,279	\$3,922,177
Operating expenses (developer paid)	\$600,000	\$627,000	\$655,215	\$684,700	\$715,511	\$747,709	\$781,356	\$816,517	\$853,260	\$891,657
Net Operating Income	\$1,264,688	\$1,621,383	\$2,226,912	\$2,327,123	\$2,431,844	\$2,541,277	\$2,655,634	\$2,775,137	\$2,900,019	\$3,030,520
Annual Debt Service (from Table 1)	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000	\$1,856,000
Net Revenue	(\$591,312)	(\$234,617)	\$370,912	\$471,123	\$575,844	\$685,277	\$799,634	\$919,137	\$1,044,019	\$1,174,520
Taxes										
Net Revenue After Taxes	(\$422,788)	(\$167,751)	\$265,202	\$336,853	\$411,728	\$489,973	\$571,738	\$657,183	\$746,474	\$839,782
Depreciation (FF&E)	196,223	196,223	196,223	196,223	196,223	196,223	196,223	196,223	196,223	196,223
Depreciation (building)	116,479	116,479	116,479	116,479	116,479	116,479	116,479	116,479	116,479	116,479
Net cash flow	(\$110,086)	\$144,951	\$577,904	\$649,555	\$724,430	\$806,452	\$888,217	\$973,662	\$1,062,953	\$1,153,376
NPV of net cash flow	\$5,550,037	<=amount of equity development can support and provide an 18 percent return								
Discount rate for NPV	18.00%									

Residual Land Value

Debt (from Table 1)	\$15,277,000
Equity	\$5,550,037
Supportable private investment	\$20,827,037
Less: Building Cost	\$17,820,000
Residual Land Value	\$3,007,037
Building square footage	150,000
Office Land Value per FAR SF	\$20.05

Army Model - Part 2

Reflects 1990 parameters.

Army rent free space projection

Variables:

Army construction cost - 1996	\$120
Land appreciation rate: 1995-2003	8.00% <= Parameter 8
Land appreciation rate: 2004-2011	9.00%
Land appreciation rate: 2012-2018	10.00%
Discount rate #1	12.50% <= Parameter 9
Discount rate #2	15.55%
Discount rate #3	14.50%
Discount rate #4	12.00%
Discount rate #5	8.30%

EPG Army Model - Part Two

Reflects 1990 parameters.

	Phase 1					Phase 2					Phase 3					
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Space Absorption (000 sf)																
Army rent free office space (projected)				340.0	0.0	0.0	0.0	0.0	410.0	0.0	0.0	0.0	190.0	0.0	0.0	0.0
Private Office				250.0	625.0	625.0	275.0	275.0	312.5	312.5	312.5	312.5	325.0	325.0	325.0	325.0
Retail				12.8	32.1	32.1	0.0	0.0	15.0	15.0	15.0	15.0	15.7	15.7	15.8	15.8
Other				10.0	10.0	10.0	10.0	10.0	112.5	112.5	112.5	112.5	112.5	112.5	112.5	112.5
Residential				301.2	301.2	301.2	301.2	301.2	376.6	376.6	376.6	376.6	398.7	398.7	398.8	398.8
Total constructed space				914	968	968	586	586	1,227	817	817	817	1,042	852	852	852

Land Values by use: (from Part One)

Land appreciation rate				8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Army Office	0.0%	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Private Office	\$20.05	\$21.65	\$23.38	\$25.25	\$27.27	\$29.45	\$31.81	\$34.35	\$37.10	\$40.44	\$44.08	\$48.05	\$52.37	\$57.08	\$62.22	\$67.82
Retail	\$21.96	\$23.72	\$25.62	\$27.67	\$29.88	\$32.27	\$34.85	\$37.64	\$40.65	\$44.31	\$48.30	\$52.65	\$57.39	\$62.56	\$68.19	\$74.33
Other	\$22.12	\$23.89	\$25.80	\$27.86	\$30.09	\$32.50	\$35.10	\$37.91	\$40.94	\$44.62	\$48.64	\$53.02	\$57.79	\$62.99	\$68.66	\$74.84
Residential	\$14.04	\$15.16	\$16.37	\$17.68	\$19.09	\$20.62	\$22.27	\$24.05	\$25.97	\$28.31	\$30.86	\$33.64	\$36.67	\$39.97	\$43.57	\$47.49

Improved value of army land (\$000)

Army Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Private Office	0	6,313	17,044	18,406	8,748	9,446	11,594	12,638	13,775	15,016	17,020	18,551	20,222	22,042	24,000	26,117
Retail	0	354	959	1,036	0	0	610	665	725	790	901	982	1,077	1,174	1,274	1,374
Other	0	279	301	325	351	379	4,606	5,020	5,472	5,965	6,501	7,086	7,724	8,420	9,174	9,938
Residential	0	5,325	5,750	6,211	6,708	7,244	7,800	8,380	8,984	9,612	10,264	10,940	11,640	12,364	13,112	13,884
Total	0	12,270	24,054	25,978	15,806	17,069	26,590	28,983	31,593	34,439	39,043	42,556	46,399	50,574	55,000	59,749

Phase I	0	0	0	12,270	24,054	25,978	15,806	17,069	0	0	0	0	0	0	0	0
Phase II	0	0	0	0	0	0	0	0	26,590	28,983	31,593	34,439	0	0	0	0
Phase III	0	0	0	0	0	0	0	0	0	0	0	0	39,043	42,556	46,399	50,574
Phase IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Construction cost of Army rent free space

Annual construction cost escalation rate	4.50%															
Cost (\$/sf)	\$114.60	\$120.00	\$125.40	\$131.04	\$136.94	\$143.10	\$149.54	\$156.27	\$163.30	\$170.65	\$178.33	\$186.36	\$194.74	\$203.51	\$212.66	\$222.23

Site Infrastructure

Phase I	24,015	25,096	26,225	27,405	28,639	29,927	31,274	32,682	34,152	35,689	37,295	38,973	40,727	42,560	44,475	46,476
Phase II	15,803	16,514	17,257	18,034	18,845	19,693	20,579	21,506	22,473	23,485	24,541	25,646	26,800	28,006	29,266	30,583
Phase III	58,460	60,601	63,328	66,178	69,156	72,268	75,520	78,918	82,470	86,181	90,059	94,111	98,347	102,772	107,397	112,230
Phase IV	55,462	33,034	34,521	36,074	37,697	39,394	41,166	43,019	44,955	46,978	49,092	51,301	53,609	56,022	58,543	61,177
Phase V	1,270	1,327	1,387	1,449	1,514	1,582	1,654	1,728	1,806	1,887	1,972	2,061	2,154	2,250	2,352	2,458
Total on-site infrastructure (primary)	\$155,010															

EFG Army Model - Part Two

Reflects 1990 parameters.

	Phase 4					Phase 5				
	2011	2012	2013	2014	2015	2016	2017			
Space Absorption (000 sf)										
Army rent free office space (projected)	520.0	0.0	0.0	0.0	540.0	0.0	0.0			
Private Office	300.0	300.0	300.0	300.0	187.5	187.5	187.5			
Retail	15.0	15.0	15.0	15.0	10.0	10.0	10.0			
Other	112.5	112.5	112.5	112.5	62.5	62.5	62.5			
Residential	332.2	332.2	332.3	332.3	265.8	265.8	265.8			
Total constructed space	1,280	760	760	760	1,066	526	526			

Land Values by use: (from Part One)

Land appreciation rate	9.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%			
Army Office	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
Private Office	\$73.92	\$81.31	\$89.44	\$98.38	\$108.22	\$119.04	\$130.94			
Retail	\$81.02	\$89.12	\$98.03	\$107.83	\$118.61	\$130.47	\$143.52			
Other	\$81.58	\$89.74	\$98.71	\$108.58	\$119.44	\$131.38	\$144.52			
Residential	\$51.76	\$56.94	\$62.63	\$68.89	\$75.78	\$83.36	\$91.70			

Improved value of army land (\$000)

Army Office	0	0	0	0	0	0	0			
Private Office	22,176	24,393	26,832	29,514	20,291	22,320	24,551			
Retail	1,215	1,337	1,470	1,617	1,186	1,305	1,435			
Other	9,178	10,096	11,105	12,215	7,465	8,211	9,033			
Residential	17,195	18,915	20,812	22,892	20,142	22,157	24,374			
Total	49,764	54,741	60,219	66,239	49,085	53,993	59,393			

Phase I	0	0	0	0	0	0	0			
Phase II	0	0	0	0	0	0	0			
Phase III	0	0	0	0	0	0	0			
Phase IV	49,764	54,741	60,219	66,239	0	0	0			
Phase V	0	0	0	0	49,085	53,993	59,393			

Construction cost of Army rent free space

Annual construction cost escalation rate										
Cost (\$/sf)	\$232.23	\$242.68	\$253.61	\$265.02	\$276.94	\$289.41	\$302.43			

Site Infrastructure

Phase I	48,568	50,753	53,037	55,424	57,918	60,524	63,248			
Phase II	31,959	33,397	34,900	36,471	38,112	39,827	41,619			
Phase III	117,280	122,558	128,073	133,836	139,859	146,152	152,729			
Phase IV	63,930	66,807	69,813	72,955	76,238	79,669	83,254			
Phase V	2,568	2,684	2,804	2,931	3,063	3,200	3,344			
Total on-site infrastructure (primary)										

ANNEX 2

EPG Model Spreadsheets Using 1994 Assumptions

EPG Army Model Reflects 1994 parameters.

Model Results - Part 1

Land Values as projected by residual value calculation:	(1995)
Office	\$3.48
Support retail	\$21.96
Hotel/other	\$22.12
Residential (see note)	\$14.08

Note: The residual land value for residential was calculated by the Army consultants for three residential uses as follows:
 Townhouse - \$14.18/sf, Condominium - \$12.03/sf, Apartment - \$10.13/sf. An aggregate value is used in the model of \$14.08/sf
 While the exact mix of residential types is not available, this average is inconsistent with the individual values as it assumes all units will be townhouses..

Model Results - Part 2

Amount of rent free space projected for the Army

	Phase I	Phase II	Phase III	Phase IV	Phase V	Total
Site Area (Acres)	145.0	171.0	143.0	225.0	136.0	820
Site Area (SF)	6,316,229	7,448,794	6,229,109	9,801,045	5,924,187	35,719,364
Programmed Development (SF)						
Private Office	2,050,000	1,250,000	1,300,000	1,200,000	750,000	6,550,000
Retail	77,000	60,000	63,000	60,000	40,000	300,000
Other	50,000	450,000	450,000	450,000	250,000	1,650,000
Residential	850	850	900	750	500	3,950
Subtotal - private space	1,506,000	1,506,400	1,595,000	1,329,000	1,063,200	6,999,600
Financial Analysis (\$000)	3,683,000	3,266,400	3,408,000	3,039,000	2,103,200	15,499,600
Army Disposition Revenues (Improved value of EPG land)	\$31,355	\$50,427	\$66,226	\$74,539	\$66,066	\$288,613
Less: Infrastructure cost	\$25,661	\$21,042	\$92,085	\$59,860	\$2,868	\$201,516
Army rent free space (Net value of EPG land)	\$5,694	\$29,384	(\$25,859)	\$14,679	\$63,198	\$87,097
Resulting Army Rent free space						
Construction cost (\$/sf)	\$122.70	\$152.91	\$182.34	\$217.45	\$259.31	...
Army rent free space (sf)	46,407	192,170	0	67,507	243,717	549,801

Army Model - Part 1
Reflects 1994 parameters.

EPG Land Value Projection - Office
Residual land value calculation

Variables:

Total Square Feet
Rentable Square feet

150,000
127,500

Hard Construction Costs
Other Construction Costs
Total Construction Cost

\$60.00
\$73.00
\$133.00 <= Parameter 1

FFE Allowance

\$27.00

Construction Escalation Rate 97-end
Construction Escalation Rate 90-96

4.50%
0.05%

Occupancy Rate (stabilized in year 3)

92%

Base Rent (\$/sf)
Estimated expenses (total \$/sf)
Developer portion (\$/sf)
Pass Thru / tenant portion (\$/sf)
Total Occupancy Costs (full service rent)

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Base Rent (\$/sf)	\$23.18	\$23.88	\$24.60	\$25.34	\$26.10	\$26.88	\$27.69	\$28.52	\$29.38
Estimated expenses (total \$/sf)	\$6.73	\$6.97	\$7.21	\$7.46	\$7.72	\$7.99	\$8.27	\$8.56	\$8.86
Developer portion (\$/sf)	\$4.14	\$4.33	\$4.52	\$4.72	\$4.93	\$5.15	\$5.38	\$5.62	\$5.87
Pass Thru / tenant portion (\$/sf)	\$2.59	\$2.64	\$2.69	\$2.74	\$2.79	\$2.84	\$2.89	\$2.94	\$2.99
Total Occupancy Costs (full service rent)	\$25.77	\$26.52	\$27.29	\$28.08	\$28.89	\$29.72	\$30.58	\$31.46	\$32.37

^Λ= Parameter 7

Rent Escalation Rate
Expense Escalation Rate

3.00% <= Parameter 2
3.50% <= Parameter 3

Developer paid operating expenses(annu
Tenant paid operating expenses(annual)

	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Developer paid operating expenses(annu	\$621,000	\$642,735	\$665,231	\$688,514	\$712,612	\$737,553	\$763,368	\$790,085	\$817,738
Tenant paid operating expenses(annual)	\$388,500	\$396,000	\$403,500	\$411,000	\$418,500	\$426,000	\$433,500	\$441,000	\$448,500

Cap Rate for sale of building
Closing and commission costs
Tax rate

10.50% <= Parameter 4
4.00%
28.50%

Loan coverage rate
Interest rate
Term (years)
IRR

1.2
9.50% <= Parameter 5
20
18.00% <= Parameter 6

EPC Land Value Projection - Office Reflects 1994 parameters.
Residual land value calculation

Residual land value calculation

Supportable Debt		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Year 3 NOI		\$2,157,000									
Loan Coverage Rate	1.2										
Annual Debt Service (maximum allowed)		\$1,798,000									
Supportable Debt		\$15,845,000									
Amortization schedule:											
Beginning Loan Balance		\$15,845,000	\$15,552,237	\$15,231,661	\$14,880,631	\$14,496,253	\$14,075,359	\$13,614,480	\$13,109,817	\$12,557,212	\$11,782,610
Payment		\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038	\$1,798,038
Interest		\$1,505,275	\$1,477,462	\$1,447,008	\$1,413,660	\$1,377,144	\$1,337,159	\$1,293,375	\$1,245,433	\$1,192,935	\$1,135,450
Principal repayment		\$292,763	\$320,576	\$351,030	\$384,378	\$420,894	\$460,879	\$504,663	\$552,605	\$605,103	\$662,588
Ending Loan Balance		\$15,552,237	\$15,231,661	\$14,880,631	\$14,496,253	\$14,075,359	\$13,614,480	\$13,109,817	\$12,557,212	\$11,952,109	\$11,120,022

	Year 1	Year 10
Development Costs:		
Hard Construction Cost	\$9,000,000	
All other costs (including parking)	\$10,950,000	
Total development cost	\$19,950,000	
Cost per sq. ft.	\$133.00	
Occupied sq. ft. (year 3-10)		117,300
Rent/SF (escalation from base year)		\$29.38
Gross revenue		\$3,446,274
Less expenses		\$817,738
Net operating income (NOI)		\$2,628,536
Building Sale Year 10		
Sales Price (Yr. 10 NOI / Cap rate)		\$25,008,419
Less		
Closing costs & commissions		\$1,000,337
Outstanding debt in year 10		\$11,120,022
Net proceeds from sale		\$12,888,060
Tax on building sale		
Original building cost (basis)		\$19,950,000
Less: depreciation of building (years 1-10)		\$2,336,695
Tax basis of building in year 10		\$17,613,305
Net Gain (loss) on Sale (net proceeds less basis in yr		(\$4,725,245)
Taxes on Gain (tax credit)		(\$1,346,695)
Net adjusted proceeds from building sale		\$14,234,755

<= added to cash flow in year 10

Army Model - Part 1

Reflects 1994 parameters.

EPG Land Value Projection - Office Residual land value calculation

	Year:									
	1	2	3	4	5	6	7	8	9	10
Annual Cash Flow Projection										
Base rent (per sf)	\$22.50	\$23.18	\$23.87	\$24.59	\$25.32	\$26.08	\$26.87	\$27.67	\$28.50	\$29.36
Average Occupancy (s0)	82,875	95,625	117,300	117,300	117,300	117,300	117,300	117,300	117,300	117,300
Gross Revenue	\$1,864,688	\$2,216,109	\$2,799,980	\$2,883,980	\$2,970,499	\$3,059,614	\$3,151,403	\$3,245,945	\$3,343,323	\$3,443,623
Operating expenses (developer paid)	\$600,000	\$621,000	\$642,735	\$665,231	\$688,514	\$712,612	\$737,553	\$763,368	\$790,085	\$817,738
Net Operating Income	\$1,264,688	\$1,595,109	\$2,157,245	\$2,218,749	\$2,281,985	\$2,347,002	\$2,413,849	\$2,482,577	\$2,553,238	\$2,625,884
Annual Debt Service (from Table 1)	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000	\$1,798,000
Net Revenue	(\$533,312)	(\$202,891)	\$359,245	\$420,749	\$483,985	\$549,002	\$615,849	\$684,577	\$755,238	\$827,884
Taxes										
Net Revenue After Taxes	(\$381,318)	(\$145,067)	\$256,860	\$300,836	\$346,049	\$392,536	\$440,332	\$489,473	\$539,995	\$591,937
Depreciation (FF&E)	196,223	196,223	196,223	196,223	196,223	196,223	196,223	196,223	196,223	196,223
Depreciation (building)	135,558	135,558	135,558	135,558	135,558	135,558	135,558	135,558	135,558	135,558
Net cash flow	(\$49,537)	\$186,714	\$588,641	\$632,617	\$677,830	\$723,059	\$768,390	\$813,721	\$859,052	\$904,383
NPV of net cash flow	\$4,626,715 <==amount of equity development can support and provide an 18 percent return									
Discount rate for NPV	18.00%									

Residual Land Value

Debt (from Table 1)	\$15,845,000
Equity	\$4,626,715
Supportable private investment	\$20,471,715
Less: Building Cost	\$19,950,000
Residual Land Value	\$521,715
Building square footage	150,000
Office Land Value per FAR SF	\$3.48

Army Model - Part 2

Reflects 1994 parameters.

Army rent free space projection

Variables:

Army construction cost - 1996	\$120
Land appreciation rate: 1995-2003	6.00% <= Parameter 8
Land appreciation rate: 2004-2011	6.00%
Land appreciation rate: 2012-2018	6.00%
Discount rate #1	10.00% <= Parameter 9
Discount rate #2	10.00%
Discount rate #3	10.00%
Discount rate #4	10.00%
Discount rate #5	10.00%

EPG Army Model - Part Two

Reflects 1994 parameters.

Space Absorption (000 sf)	Phase 1					Phase 2					Phase 3					
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Army rent free office space (projected)				340.0	0.0	0.0	0.0	0.0	410.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private Office				250.0	625.0	625.0	275.0	275.0	312.5	312.5	312.5	312.5	325.0	325.0	325.0	325.0
Retail				12.8	32.1	32.1	0.0	0.0	15.0	15.0	15.0	15.0	15.7	15.7	15.8	
Other				10.0	10.0	10.0	10.0	10.0	112.5	112.5	112.5	112.5	112.5	112.5	112.5	112.5
Residential				301.2	301.2	301.2	301.2	301.2	376.6	376.6	376.6	376.6	398.7	398.7	398.8	398.8
Total constructed space				914	968	968	586	586	1,227	817	817	817	1,042	852	852	852

Land Values by use: (from Part One)

Land appreciation rate																
Army Office	0.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Private Office	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Retail	\$3.48	\$3.69	\$3.91	\$4.14	\$4.39	\$4.65	\$4.93	\$5.23	\$5.54	\$5.87	\$6.22	\$6.59	\$6.99	\$7.41	\$7.85	\$8.32
Other	\$21.96	\$23.28	\$24.68	\$26.16	\$27.73	\$29.39	\$31.15	\$33.02	\$35.00	\$37.10	\$39.33	\$41.69	\$44.19	\$46.84	\$49.65	\$52.63
Residential	\$22.12	\$23.45	\$24.86	\$26.35	\$27.93	\$29.61	\$31.39	\$33.27	\$35.27	\$37.39	\$39.63	\$42.01	\$44.53	\$47.20	\$50.03	\$53.03
	\$14.04	\$14.88	\$15.77	\$16.72	\$17.72	\$18.78	\$19.91	\$21.10	\$22.37	\$23.71	\$25.13	\$26.64	\$28.24	\$29.93	\$31.73	\$33.63

Improved value of army land (\$000)

Army Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Private Office	0	0	0	1,035	2,744	2,906	1,356	1,438	1,731	1,834	1,944	2,059	2,272	2,408	2,551	2,704
Retail	0	0	0	335	890	943	0	0	525	557	590	625	694	735	784	832
Other	0	0	0	264	279	296	314	333	3,968	4,206	4,458	4,726	5,010	5,310	5,628	5,966
Residential	0	0	0	5,036	5,337	5,657	5,997	6,355	8,425	8,929	9,464	10,033	11,259	11,933	12,654	13,412
Total	0	0	0	6,669	9,250	9,802	7,667	8,126	14,649	15,526	16,456	17,443	19,234	20,387	21,618	22,913

Phase I	0	0	0	6,669	9,250	9,802	7,667	8,126	0	0	0	0	0	0	0	0
Phase II	0	0	0	0	0	0	0	0	14,649	15,526	16,456	17,443	0	0	0	0
Phase III	0	0	0	0	0	0	0	0	0	0	0	0	19,234	20,387	21,618	22,913
Phase IV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Construction cost of Army rent free space

Annual construction cost escalation rate	4.50%															
Cost (\$/sf)	\$114.60	\$120.00	\$125.40	\$131.04	\$136.94	\$143.10	\$149.54	\$156.27	\$163.30	\$170.65	\$178.33	\$186.36	\$194.74	\$203.51	\$212.66	\$222.23

Site Infrastructure

Phase I	24,015	25,096	26,225	27,405	28,639	29,927	31,274	32,682	34,152	35,689	37,295	38,973	40,727	42,560	44,475	46,476
Phase II	15,803	16,514	17,257	18,034	18,845	19,693	20,579	21,506	22,473	23,485	24,541	25,646	26,800	28,006	29,266	30,583
Phase III	58,460	60,601	63,328	66,178	69,156	72,268	75,520	78,918	82,470	86,181	90,059	94,111	98,347	102,772	107,397	112,230
Phase IV	55,462	33,034	34,521	36,074	37,697	39,394	41,166	43,019	44,955	46,978	49,092	51,301	53,609	56,022	58,543	61,177
Phase V	1,270	1,327	1,387	1,449	1,514	1,582	1,654	1,728	1,806	1,887	1,972	2,061	2,154	2,250	2,352	2,458
Total on-site infrastructure (primary)	\$155,010															

EPG Army Model - Part Two

Reflects 1994 parameters.

	Phase 4		Phase 5						
	2011	2012	2013	2014	2015	2016	2017	2018	
Space Absorption (000 sf)									
Army rent free office space (projected)	520.0	0.0	0.0	0.0	540.0	0.0	0.0	0.0	0.0
Private Office	300.0	300.0	300.0	300.0	187.5	187.5	187.5	187.5	187.5
Retail	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0
Other	112.5	112.5	112.5	112.5	62.5	62.5	62.5	62.5	62.5
Residential	332.2	332.2	332.3	332.3	265.8	265.8	265.8	265.8	265.8
Total constructed space	1,280	760	760	760	1,066	526	526	526	526

Land Values by use: (from Part One)

Land appreciation rate	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Army Office	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Private Office	\$8.82	\$9.35	\$9.91	\$10.50	\$11.13	\$11.80	\$12.51	\$13.26	\$13.26
Retail	\$55.79	\$59.14	\$62.69	\$66.45	\$70.44	\$74.67	\$79.15	\$83.90	\$83.90
Other	\$56.21	\$59.58	\$63.15	\$66.94	\$70.96	\$75.22	\$79.73	\$84.51	\$84.51
Residential	\$35.65	\$37.79	\$40.06	\$42.46	\$45.01	\$47.71	\$50.57	\$53.60	\$53.60

Improved value of army land (\$000)

Army Office	0	0	0	0	0	0	0	0	0
Private Office	2,646	2,805	2,973	3,150	2,087	2,213	2,346	2,486	2,486
Retail	837	887	940	997	704	747	792	839	839
Other	6,324	6,703	7,104	7,531	4,435	4,701	4,983	5,282	5,282
Residential	11,843	12,554	13,312	14,109	11,964	12,681	13,442	14,247	14,247
Total	21,649	22,949	24,330	25,787	19,190	20,342	21,562	22,854	22,854

Phase I	0	0	0	0	0	0	0	0	0
Phase II	0	0	0	0	0	0	0	0	0
Phase III	0	0	0	0	0	0	0	0	0
Phase IV	21,649	22,949	24,330	25,787	0	0	0	0	0
Phase V	0	0	0	0	19,190	20,342	21,562	22,854	22,854

Construction cost of Army rent free space

Annual construction cost escalation rate									
Cost (\$/sf)	\$232.23	\$242.68	\$253.61	\$265.02	\$276.94	\$289.41	\$302.43	\$316.04	\$316.04

Site Infrastructure

Phase I	48,568	50,753	53,037	55,424	57,918	60,524	63,248	66,094	66,094
Phase II	31,959	33,397	34,900	36,471	38,112	39,827	41,619	43,492	43,492
Phase III	117,280	122,558	128,073	133,836	139,859	146,152	152,729	159,602	159,602
Phase IV	63,930	66,807	69,813	72,955	76,238	79,669	83,254	87,000	87,000
Phase V	2,568	2,684	2,804	2,931	3,063	3,200	3,344	3,495	3,495
Total on-site infrastructure (primary)									