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of Engineers**

Construction Engineering  
Research Laboratories

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# **USACERL's Technical Reviews of Economic Development Conveyances**

## **Lessons Learned**

by  
Dennis L. McConaha

A new property transfer method called an Economic Development Conveyance (EDC) has been implemented by the Secretary of Defense for installations scheduled for closure. This new method gives greater flexibility to military departments and affected communities to negotiate terms and conditions of the conditions if specified criteria are met.

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This report includes discussions of relevant findings, accepted methodologies, and process improvements discovered as a result of the EDC application and review process experience. This study focuses primarily on the economic issues and the financial analysis necessary to determine feasibility of the reuse plan, including the following key elements:

- the rate used to discount the income streams from the applicant's 15-year business plan
- the valuation techniques used to estimate the Army's appraised fair market value and the applicant's business plan scenarios
- the risk assessment of the applicant's overall redevelopment plan.

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## Foreword

This study was conducted for Headquarters, U.S. Army Corps of Engineers (HQUSACE) under Military Interdepartmental Purchase Request (MIPR) No. 6ACERB3003 dated 16 October 1995; Work Unit P26, "Technical Review of EDC Applications for U.S. Army." The technical monitor was Walter Borhorfoush, CERE-E.

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# 1 Introduction

## Background

In 1993 President Clinton requested that Congress provide new authority to expedite the reuse of military bases adversely affected by Base Realignment and Closure (BRAC) actions. The result was a new property transfer method called an Economic Development Conveyance (EDC). Designed specifically to ease the economic hardship caused by base closures, an EDC gives greater flexibility to the military departments and the affected communities to negotiate the terms and conditions of the conveyance if specified criteria are met. Goals and objectives of EDCs include facilitating rapid property transfer for the community's economic recovery while obtaining fair and reasonable compensation for the Federal Government. Benefits of the EDC property transfer method include productive reuse of the property that results in job creation and cost savings to the Federal Government from elimination of property protection and maintenance expenses.

The Secretary of Defense issued an Interim Final Rule for implementation of the property conveyance method that was published in the Federal Register (59-206 FR 53735-53741, 26 October 1994). Since the Interim Final Rule was issued, the U.S. Army Construction Engineering Research Laboratories (USACERL) has provided technical reviews and related documentation of the only three EDC application packages submitted to the Army for consideration.

The recently published Final Rule (60-139 FR 37337-37348, 20 July 1995) and the new Department of Defense (DOD) guidance, *Base Reuse Implementation Manual* (DOD 4165.66-M—hereafter referred to as "Reuse Manual") implements 32 CFR 90, 91, and 92. The Reuse Manual will provide guidelines for Local Redevelopment Authorities (LRAs) and the Army in the review and implementation of EDC application packages. These regulations and guidance documents require the LRA to include in its application both a comprehensive reuse plan for the surplus property and a business/operational plan that details the market and financial feasibility of the reuse plan implementation.

USACERL is tasked with technically reviewing the EDC applications submitted by the LRAs. Army decisionmakers use the findings resulting from this technical review for a variety of matters. The Secretary of the Army has the decisionmaking authority



with respect to the conveyance of surplus military property via an EDC. This authority was granted by DOD in the regulations cited earlier in this chapter. The rules also suggest several evaluation criteria and factors that the Secretary of the Army may consider, as appropriate, when deciding whether to convey property via an EDC. USACERL makes technical findings related to these suggested criteria:

- adverse economic impact of closure on the region and potential for economic recovery with the proposed EDC
- extent of short- and long-term jobs generated by the EDC
- consistency with the overall redevelopment plan
- financial feasibility of the development, including market analysis, and the need and extent of proposed infrastructure improvements and other investments
- extent of state and local investment and risk incurred
- current local and regional real estate market conditions in the affected area
- incorporation of other Federal agency interests and concerns, and applicability of (and conflict with) other Federal property disposal authorities
- relationship to overall military department disposal plan for the installation
- economic benefit to the Federal Government, including protection and maintenance cost savings and anticipated consideration from the transfer.

## **Objective**

The objective of this tasking was to facilitate EDC working group discussions and an investigation of the lessons learned from the experience of USACERL and other DOD and Army officials with the EDC application and review process of Sacramento Army Depot, CA, Lexington Bluegrass Army Depot, KY, and Jefferson Proving Ground, IN.

## **Scope**

The report includes discussions of relevant findings, accepted methodologies, and process improvements discovered as a result of the EDC application and review process experience. Experience has demonstrated that the LRA's redevelopment plan for the surplus military property is critically important, and considerable focus has been placed upon the economics of the business/operational plan. Further, one of the primary areas of controversy relating to the EDC application review has been focused on estimates of fair market value for the subject properties and the methodologies used to arrive at the valuations. Considerable efforts have been expended by the Office of the Assistant Secretary of Defense for Economic Security to adequately cover this

critical area in the Reuse Manual, which states: "A key to a successful EDC is a proper and realistic valuation of the property" (Ch 7, para 7.2.4).

Therefore, this lessons learned study has a primary focus relating to economic issues and the financial analysis necessary to determine feasibility of the plans, including the following key elements:

- the rate used to discount the income streams from the applicant's 15-year business plan
- the valuation techniques used to estimate the Army's appraised fair market value and the applicant's business plan scenarios
- the risk assessment of the applicant's overall redevelopment plan.

This report was not intended to be an exhaustive study of all the possible economic issues that occur in the EDC process.

## **Approach**

The experience necessary to collect lesson's learned from the EDC process included not only the technical review, evaluation, and reporting of the three EDC applications for the Army, but also included participation in briefings of USACERL's findings to EDC action officers. Formal and informal discussions of the pertinent issues with EDC policymakers, EDC action officers, and U.S. Army Corps of Engineers District real estate officials has provided further insight. In addition, interviews were conducted with professionals in the fields of economic development and real estate, including James Webster (MAI Appraiser, Webster and Associates, Urbana, IL), Professors Peter Colwell and Roger Cannaday (University of Illinois Office of Real Estate Research), and Ray Boudreaux, Director of Aviation and Development for the Village of Rantoul, IL (home to the former Chanute Air Force Base).

The latest real estate valuation and financial analysis software was evaluated in an effort to determine its applicability to the EDC process. Attendance at the U.S. Army Corps of Engineers Directorate of Real Estate's 2-day workshop, New Ways of Doing Business (July 1995), and the National Association of Installation Developers' Annual Conference (August 1995) facilitated learning the latest BRAC and EDC program issues and process improvements. Finally, secondary research was conducted on timely real estate and financial analysis issues.

In addition to active participation in the EDC process, dialogue with relevant parties, and attendance at important conferences and emerging policy forums, a survey was

also developed to gather information from Army and DOD EDC action officers. The results of the survey have been incorporated into the lessons learned investigation and reporting that follows. The survey also provides direction from USACERL's customers on forthcoming EDC technical review, issues, efforts, and products.

### **Mode of Technology Transfer**

These lessons learned will be incorporated into the standing operating procedures for processing EDC reviews. A seminar will be held for Corps District real estate representatives to transfer knowledge gained from USACERL's lessons learned.

## 2 Preliminary Preparation and Evaluation

Before the issues listed in the Scope section (p 6) of Chapter 1 are discussed, some preliminary information must be mentioned. First, the results of a survey of DOD and Army EDC action officers will be discussed, followed by a discussion of USACERL's financial feasibility analysis.

### Survey of EDC Action Officers

#### *Purpose*

The purpose of this survey was to gather information from the individuals USACERL's technical reviews and documentation were intended to serve so that findings may be better prepared in the future. The survey questions were designed to obtain opinions and preferences from the action officers relating to the format and substance of USACERL's EDC technical review efforts. Appendix A is a sample survey form and a summary of results. Table A1 details the compiled results of the survey.

#### *Survey Findings*

Six responses have been received from the 15 action officers surveyed. The respondents were first asked to rank 12 issues from most important (listed as 1) through the least important (listed as 12). Specifically, the question read: **What are the most important issues/factors related to EDC technical reviews that would influence your decision on application approval or disapproval?** The top five answers in ranked order were:

1. Extent of short- and long-term job creation
2. Financial feasibility of redevelopment plan
3. Potential for economic recovery with proposed EDC
4. Adequate and reasonable redevelopment plan
5. Adverse economic impact of closure.

The respondent opinions of the overall level of EDC review and reporting (Question 2) were 100 percent "adequate" versus the "too extensive" and "inadequate" options. Likewise all respondents felt the briefings have been adequate (Question 3).

**Question 4: If you were to improve the overall structure of the EDC Technical Report, what would you change?** This question elicited the following comments:

- I would like to see added a synopsis of the consideration we will receive, the number of jobs created, the schedule for job creation, an assessment of the feasibility of the proposed redevelopment and other information provided in front of the technical report.
- I think CERL is in a position to make a very pointed recommendation to DASA (I&H) based on its assessment. Call it like it is!
- A brief summary statement on each finding that would convey to a laymen the results of the finding.
- Better predictors for job creation analysis, if possible.
- Insist on scope meeting with COE District Real Estate and Headquarters appraisers and in progress reviews.
- Can CERL establish potential municipal bond capacity (and rating etc.) to support funding needs? Or, can CERL identify other potential sources of funds (for LRA needs).

In the opinion of those responding to the survey, the level of review and reporting (Question 5) is "adequate" for all the major report sections (Appendix A through I) with the following exceptions:

- Appendix E: Extent of State and Local Investment and Risk received one "inadequate" response
- Appendix G: Conflicts With Other Federal Interest and Property Disposal Authorities received one "inadequate" response.
- Appendix H: Relationship to Overall Military Department Disposal Plan received one "too extensive" response and one "inadequate."

The following suggestions were provided to improve the sections:

- Appendix E: Talk with LRA about its plans and identify/verify/show proof of support by listed entities.
- Appendix G: JPG (Jefferson Proving Grounds); no mention of McKinney Act - why?
- Appendix H: This only plays a big part when the Military Department does not have a good rapport with LRA.

Question 6: **Please indicate any significant issues or areas of review that have not been sufficiently developed in USACERL's technical reviews and reporting.** This request received the following comments:

- None. Although it might be useful to have CERL compare proposed redevelopment against public sale by the Army to demonstrate the costs and benefits associated with each proposal.
- CERL has performed in a superb manner. Hope the other services can find the quality the Army has found.
- Appendices G & H need to be coordinated/integrated with District real estate efforts.

Questions 7 and 8 related to the rates used to discount the income streams from the redevelopment plans and financial pro formas. Specifically, Question 7 asked for the respondent to indicate their opinion of the LRA's discount rates. Of the three that responded, two felt that the discount rate used by Sacramento, 5 percent, was too low and one felt it was reasonable. All three indicated that the 8 percent discount rate used by the Commonwealth of Kentucky in the Lexington Bluegrass Army Depot EDC application was reasonable, while only one determined that the 15 percent discount rate used in the business plan for Jefferson Proving Ground was reasonable. Two respondents felt that 15 percent was too high in the Jefferson case.

Survey Question 8 asked the respondents to indicate how discount rates might be developed or determined. All three responses indicated a preference for developing a high and low range using the Office of Management and Budget (OMB) guidelines (low) and market indicators and level of risk assessments (high). No responses indicated a preference for using only the LRA's rate provided in the EDC application.

The last three survey questions were devoted to possible areas of future review and reporting improvements. Question 9: **In the future I would prefer USACERL develop a methodology to assess the risk of the LRA's redevelopment plan.** This question received four responses in agreement and one response indicating that current discussion of a plan's risk is adequate. All five respondents indicated a desire for USACERL to develop alternative cash flow scenarios to provide forecast ranges in addition to the LRA's redevelopment forecast scenario.

## Lessons Learned From the Survey

USACERL views the comments and results of this survey as a significant contribution toward improving the EDC review process and end products. All the suggestions and

recommendations provide further direction and focus for USACERL's EDC project team from its customer and will assist in the delivery of a valuable EDC product. Specifically, it is recommended that consideration be given to the following enhancements and or expansions of the financial analysis, valuation, and other economic evaluation components of the EDC process and USACERL's technical reviews:

- develop alternative cash flow scenarios to provide forecast ranges of 15-year income streams in addition to the LRA's 15-year redevelopment forecast scenario
- develop discount rate ranges and demonstrate the impact on the present value (PV) calculations, ultimately arriving at a low to high range of PVs for the redevelopment plan and alternative plan scenarios
- consider alternatives to risk assessment methodologies and begin evaluation of reasonable techniques that will provide reliable quantitative measurements that can be compared to other EDC redevelopment plan risk assessments
- explore existing economic forecast modeling and software application packages that can provide job creation forecasts and other related analyses.

## **USACERL's EDC Financial Feasibility Analysis Process**

### ***Overview***

USACERL's technical review report, Appendix D: Market Analysis, Financial Feasibility, and Extent of Needed Infrastructure Improvements provides a review and analysis of financial feasibility of the EDC Application and its business plan. USACERL's technical review of financial feasibility includes market analysis and the need and extent of proposed infrastructure investment. The following elements of the EDC business plan are the primary focus of the review:

- market analysis
- property development timetable and phasing plan
- cash flow analysis for a 15-year period
- proposed consideration or payment to the Army
- estimated fair market value of the property
- financial feasibility analysis describing the economic viability of the project
- cost estimate and justification for infrastructure and other investments needed for the development
- local investment and proposed financing strategies for the development.

Note: The Engineer District responsible for the EDC is solely responsible for estimating the fair market value of the property for the Army, but may use any information provided by USACERL in formulating the estimate.

### **Methodology**

**Cash Flow Forecasts.** The methodology of the three technical reviews to date has primarily involved a recast (using the same projections) of the LRA's 15-year financial pro forma and an evaluation of the reasonableness and financial feasibility of the plan. The LRA's forecast for revenues are determined from market information on rental rates and comparable land and building values in the market area and projected annually for the 15-year plan. A critical component of the EDC business plan is a reasonable determination of the annual market absorption rate for the properties in question, as well as a defensible accounting of the expenses related to property operating costs and capital improvement costs—expenditures necessary to bring the property's buildings and infrastructure up to market standards. A final component of the EDC application business plan and USACERL's recast is an accounting of the financing necessary to implement the plan. At a minimum, this includes a discussion of capital sources (grant and loan proceeds) and the use of those capital sources (debt payments and proposed payments to the Army).

**Discounted Cash Flow.** After considering expenditures and revenue sources on an annual basis over 15 years (maximum time period indicated in the regulations), the annual net proceeds for the project are determined. The annual cash flows (income stream) are discounted using the net present value (NPV)/PV method to arrive at a value of the plan's income stream. The PV is computed by generating the sum of the 15 cash flows that have been discounted at the specified rate. The NPV is the PV of the discounted cash flows minus the initial investment. In the case of an LRA making a request for a 100 percent discount of the estimated fair market value, the initial investment is zero. In this case, the PV and NPV calculations are the same. The annual cash flows are assumed to be received at the end of each period and the initial investment is made at the beginning of period one (time period zero) and is in current dollars, not discounted.

Generally, the investment decision using the NPV approach is to make the investment if the sum of the discounted income stream (including the initial cost of the investment) is greater than zero. An NPV of zero signifies that the project's cash flows are exactly sufficient to (1) repay the invested capital and (2) provide the required rate of return on the capital (Brigham and Gapenski 1993). If the NPV is greater than zero, then the cash flows are generating an excess return on the investment. Using the PV technique (cost of the initial investment to be determined or negotiated) allows the



analyst to arrive at a present valuation of the estimated future cash flows that have been discounted at the investors required rate of return (discount rate). Provided the proposed initial investment has been estimated, the analyst can then calculate the internal rate of return (IRR) of the initial outflow (investment) and the estimated annual cash flows (can be both inflows and outflows). The IRR is defined as that rate that makes the PV of the future cash flows exactly equal to the initial cash outflow (investment) and has been used traditionally as a measure of return on investment.

**Discount Rates.** While USACERL's technical reviews have included discussions of appropriate discount rates for the discounted cash flow (DCF) analysis of the redevelopment plan, the evaluations to date have used the LRA's given discount rate only.

### 3 Lessons Learned: EDC Financial Analysis and Evaluation

USACERL's technical reviews, as they relate to the development economics and financial feasibility of the plans, have enlightened those involved in the process, as well as produced a degree of confusion and controversy in some areas. In effect, the process has produced three broad questions:

1. What is the appropriate or reasonable range of discount rates that should be used in discounting the LRA's cash flows from the redevelopment plan?
2. Why is there such a wide range of valuation estimates when comparing the fair-market-value property appraisals with the present values of the discounted cash flows from the LRA's business plan?
3. How is a reasonable assessment of the risks associated with the redevelopment plans provided, and can the risks be quantified?

#### ***Discount Rates***

Traditional commercial real estate investment analysis requires the investor to make reasonable forecasts of potential gains and exercise sound judgment as to level of risk they are exposed to in an effort to determine the financial feasibility of the development. A technique to assist in this evaluation is the discounting of the forecasted future cash flows and the estimated residual (terminal and reversion) value of the development at the end of the investment period back to a PV. The rate of discount is determined by an assessment of the level of risk and can be equated to the required rate of return the investor seeks with similar investments. The required rate of return therefore can be defined as the rate that the investor requires given the risk of the investment. This assumes an investment unencumbered by financing. If the potential investment involves financing, the mortgage constant (total annual debt service including principal and interest) can be used in a weighted average cost of capital calculation to assure the investor of adequate cash flows to cover debt payments, and provide the required rate of return on the equity. The following example demonstrates how an investor might arrive at a discount rate assuming a 50

percent equity investment with a 13.5 percent required return and financing terms of 9.25 percent interest and 15 annual payments of interest and principal:

Cost of Capital	Rate %	Weight %	Weighted Average %
Mortgage constant	0.126	0.50	0.0630
Required rate of return on equity	0.135	0.50	0.0675
Weighted average cost of capital			<b>0.1305</b>

This simplified example also demonstrates that a reasonable range of discount rates would range from 12.6 percent for a 100 percent financed investment to 13.5 percent for the 100 percent equity investment. Further, market indicators for free and clear equity rates on institutional-grade industrial real estate have ranged from 9.5 percent to 14 percent in recent years (Korpacz, October 1994). The definition of institutional-grade real estate is "real property investments that are sought out by institutional buyers and have the capacity to meet generally prevalent institutional investment criteria" (Korpacz, October 1994). With this definition in mind, relying solely on market indicators from prime property sales may not provide a clear indication of appropriate discount rates for the EDC DCF analysis process. Korpacz provides further caution for use of the market indicator information; The information is not generally applicable to investments that are not institutional grade (Korpacz, October 1994). In fact, there has been considerable discussion that the private sector view of the level of risk associated with redevelopment of surplus military properties would require discount rates in the range of 14 to 15 percent at a minimum and possibly as high as 30 percent. In highly speculative real estate and business acquisitions, 30 percent or higher is not unheard of.

USACERL has reviewed three EDC applications and each redevelopment plan's cash flow analysis has used discount rates ranging from Sacramento's 5 percent (actual calculation by USACERL was 6.76 percent), to Lexington's 8 percent, to Jefferson's 15 percent. USACERL has taken the view that the LRA's stated discount rate used in their analysis is, in effect, the LRA's assessment of the risk of the redevelopment plan and the projected income stream and have not attempted to provide further analysis of the risk and the appropriate discount rate. It is unclear why Sacramento's LRA suggested using a discount rate of 5 percent that was clearly less than the risk-free rate. The Army's contract appraiser for Sacramento assessed the risk and arrived at a 13.88 percent discount rate for their DCF analysis (Wirth 1994, p 45). USACERL is inclined to support the higher rate in that case.

The above discount rates would produce a wide variance of PVs if applied to the same 15-year income stream. A number of methods can be developed to provide additional analysis in the reviews. Likewise, a number of opinions can be formulated as to what

is appropriate and reasonable. To gain some consensus and direction, USACERL surveyed the action officers on this critical issue. As reported earlier in *Survey Findings* (p 9), the survey results were mixed, with insufficient responses to Question 7 to have a reliable consensus. However, those that did respond indicated a preference for developing the DCF analysis using a range of discount rates with OMB guidelines as the low-end and market indicators and risk assessments producing the high-end discount rate (Question 8).

Note: OMB discount guidelines, currently at 7.9 percent for periods of analysis of 9 to 20 years (Young, March 1995), may be appropriate for investment analysis of Federal Government dollars, but a 7 to 8 percent discount rate would be viewed in reality as the risk-free rate (depending on treasury bond market conditions) from which a prudent private sector investor would build in various risk premiums. Those risk premiums could include recognition of future inflation, lack of liquidity for the investment, burden of management, and business risk (uncertainty in projecting future returns on the investment). This would be considered a risk-adjusted discount rate approach that is defined as follows: The discount rate that applies to a particular risky (uncertain) stream of income is equal to the risk-free rate of interest plus a risk premium appropriate to the level of risk attached to a particular project's income stream (Weston and Brigham, 1990).

At this point, it could be easily concluded that an appropriate and reasonable discount rate range for an EDC cash flow analysis could start at a minimum level of the low teens. On the other hand, it may be reasonably assumed that the public sector LRAs would view the reuse efforts in a somewhat different light than the typical private sector developer given the economic impact and value of job retention and creation to the community. One thing can be assured, private sector developers do not invest in projects that would produce negative PVs, yet public sector LRAs might recognize the negative PV of the redevelopment plan as a cost of retaining and creating jobs. In an effort to recognize the additional social and economic value associated with job creation in the face of the base closure, LRAs might use a lower discount rate than a private developer would use for the same future cash flow stream and comparable risk. Finally, an LRA (especially one formed by a state) may assess the risk of an EDC from a portfolio perspective versus a standalone project perspective. In other words, the EDC investment is but one of a portfolio of investments, and the risk of the state's investment portfolio—and thus the cost of borrowing capital or the appropriate discount rate—has been determined in the capital markets.

### ***Cash Flow Forecasts***

Providing reliable projections for 15 years of revenue and expenses requires considerable financial analysis expertise and a clear understanding of real estate market conditions, operating expenses, infrastructure and capital improvement programs, and associated costs. The analyst must make reasonable subjective assumptions based on experience and information gathered in the marketplace. The timing of the projected revenues and expenses have a tremendous impact upon the PV calculations. In most cases, EDC business plan cash flow pro formas will detail slow market absorption rates that show the potential revenue streams well into the future while incurring high operating expenses and infrastructure costs from the onset of the plan. Basically, the time value of money is nothing more than today's dollar becoming less valuable in the future, not just from inflation, but also because of the risks associated with earning that dollar in the future. The DCF analysis thus recognizes a larger portion of the negative net proceeds (resulting from greater cash out flows than cash inflows) in the early years while recognizing smaller and smaller portions of the future payoffs and positive net proceeds in the future.

To perform a DCF analysis, a wide range of possible variables are necessary, such as:

- estimates of market absorption rates (timing of the cash flows)
- estimates of market rates and capital improvement costs (amount of the cash flows)
- assessment of risk (appropriate discount rate).

With the subjective nature involved in selecting and combining these variables, it is understandable that different analysts can arrive at wide ranging estimates of value even when using the same valuation technique.

Differing task assignments for the analyst can obviously lead to differing conclusions and estimates of value. For the Sacramento EDC review, USACERL evaluated the financial and market feasibility, as well as the reasonableness of the business plan for the Packard Bell scenario and arrived at a PV of the future cash flows from that particular scenario as presented by the LRA. The Army's contractor appraiser was assigned the task of estimating fair market value, absent Packard Bell.

Using the same discounted cash flow methodology but vastly different variables and assumptions produced a business plan scenario present value of \$5 million using a discount rate of 6.76 percent (Cork, September 1995, Vol 1, p 48) and an appraised fair market value of \$6.3 million using a 13.88 percent discount rate (Wirth 1994, p 52). The LRA's business plan for the Packard Bell scenario outlined a 15-year income

stream that had zero cash flows from the Packard Bell deal through year nine. In year 10, they projected a cash flow of \$6.8 million from the Packard Bell option to purchase and in year 11, a \$2.9 million cash flow from sales of developable land. Discounting the two cash flows from the late years at 6.76 percent produced a present value of \$5 million. The contract appraiser arrived at a market value estimate of \$6.3 million using the discounted cash flow method and a much higher 13.88 percent discount rate. The appraiser's development scenario projected a total of \$28.9 million in net development income from lease income, revenues from sale of lots and improvements (absorbed over 15 years), minus development costs and loan payments over a 16-year redevelopment plan (Wirth 1994, p 17).

### **Discounted Cash Flow Valuations and Fair Market Value Appraisals**

This section is devoted to addressing some of the possible reasons for the wide ranging valuation estimates, on the same property, that are produced from the fair market value property appraisals and the PVs of the discounted cash flows from the LRA's business plan. The problem can best be described using lessons learned from the original Lexington Bluegrass Depot appraisal and EDC review. The original Corps of Engineer's appraisal resulted in an estimated fair market value of \$8.7 million (Mann, April 1995, p 2), while USACERL's technical review concluded the redevelopment scenario had a present value of *negative* \$1.6 million (Cork, September 1995, Vol 1, p 98).

Note: Final valuation reporting by the District produced amended NPVs ranging from \$2.34 million to \$3.49 million. The District's approach provided estimated values based upon the LRA's EDC reuse plan and took into consideration appropriate data from the original appraisal report. District methodology included discounted cash flow analysis, market-derived net operating income estimates, and capitalization rates reflecting appropriate risk factors. The process identified current and projected market rents for uses defined in the redevelopment plan with consideration given to estimated absorption rates found in the local market. In the opinion of this report's technical monitor, the remaining difference in valuation estimates can be attributed to the differing application of an Inter Service Support Agreement on 570,000 sq ft of space.

#### ***Appraisal Techniques***

At the risk of oversimplifying the problem, the Corps' property fee appraisal for Lexington contemplated a parcelization of the property with acquisition occurring on a parcel-by-parcel basis. In reality, an EDC is the conveyance of the entire surplus parcel to one entity, the LRA. More specifically, it would appear that the District

appraisers approached the property valuation process (market approach to value) from a perspective of there being multiple buyers of the properties and the accumulated individual property values all being received in the present versus a more protracted market absorption rate over an extended time. The Corps' income approach to valuation assumes a stabilized cash flow (net operating income) that is capitalized by a weighted average overall rate (Mann, April 1995, pp 131-135).

The traditional income approach to value assumes that the net operating income (gross rental income less vacancy and operating expenses) is the same over the investment period and is then divided by the capitalization rate (cap rate): \$793,800 divided by 9.31 percent. In the Lexington example, the income approach used by the Corps' District appraisers produced an initial \$8.5 million valuation (Mann, April 1995, p 135). When compared to USACERL's discounted cash flow approach, this approach produced considerable confusion. Using a 9.31 percent cap rate versus an arguably more reasonable rate of approximately 13 percent increased the valuation estimate with the income approach by more than \$2 million. While the effective gross income was in line with the LRA's phase one estimates, the operating expenses (26 percent of effective gross) were noticeably understated compared to the LRA's estimates (a \$284,000 versus a \$997,000 second year estimate). It is worth noting that, in USACERL's opinion, the LRA's labor cost component was considerably overstated and led to their overall operating cost estimate being at the high end. Nevertheless, the understating of operating expenses in the appraisal led to unrealistic estimates of net operating income, and the approach did not recognize the annual capital expenditures estimated by the LRA at more than \$1.2 million.

The market value approach, used in the Corps' fee appraisal of Lexington Bluegrass Army Depot, produced the \$8.7 million final value estimate for the appraisal (Mann, April 1995, p 128). This value was determined by taking the sum of the values of the individual parcels and building improvements. The value of a particular parcel was computed by determining the comparable cost per square foot/acre and multiplying that market value by the size of the parcel or improvement.

### ***Developer's Approach***

Both the income and market comparable valuation techniques described above are used extensively for appraising income producing real estate. However, these techniques seem to fail when determining the value of a stream of benefits from risky projects that lack stabilized incomes. At the same time, the use of DCF analysis to value income properties has been increasingly advocated by lending institutions and owner-investors during the 1990s because the analysis attempts to predict the future through multiyear net income projections (Martin 1993).

An example of a potentially risky investment environment would be when the local real estate market is, or is about to be, radically oversupplied—a condition that dramatically lowers levels of absorption and increases the level of risk. With low absorption rates and a large real estate holding lacking user-occupants, either the purchaser (negotiated or public sale) or the LRA (EDC) is forced to care for large amounts of unmarketable real estate, often at very high operating costs. This scenario and other unique characteristics associated with the redevelopment of surplus military properties renders less useful the traditional market and income approaches to estimating fair market values.

The contract appraiser for the Sacramento Depot used what is considered a land development approach, or what could be considered the real estate developer's approach. This approach weighs the limitations of traditional appraisal techniques and addresses some of the considerations necessary to adequately begin to confront the problems faced by the disposal and sale of large parcels of surplus military property. The following is the appraiser's description of the valuation method:

The primary method of valuation selected for use in this analysis is a modified land development approach that considers all elements of the proposed redevelopment plan. This method forecasts all elements of potential or anticipated income, cost, and reversion through sale of the property during a specified investment or holding period. The future projected cash flows are discounted to a present value through application of a market derived yield rate to arrive at a present value or residual indication of what a potential market investor would pay for the property. This method also utilizes common elements or appraisal methods known as direct sale comparison, cost, and income approaches to value. The development approach combines these elements into a single analysis. (Wirth 1994, p23).

This approach identifies the critical variables needed for the valuation analysis:

- market conditions and rates
- property absorption rates and timing of the revenues over the redevelopment period
- operating and infrastructure costs
- entrepreneurial-developer profits
- market derived yield (discount) rates.

In addition, the appraisal and analysis were consistent with the redevelopment plan for the property.

In real estate appraising, the concept of highest and best use is essential because considering the highest and best use for the subject property should produce the highest



PV. The four-test application for determining highest and best use is: (1) legally permissible, (2) physically possible, (3) financially feasible, and (4) must result in maximum value for the property (Lovell and Martin 1993). Sacramento's contract appraiser determined that the concluded highest and best use is built in accordance within legally permissible guidelines for the redevelopment as indicated in the Reuse Plan for the Sacramento Army Depot that produce market returns on and of the applied investment. The criteria for market returns are return on capital and return of capital within a specified and balanced plan (Wirth 1994, p 23).

### ***Financial Analysis Techniques***

Detailed financial analysis of real estate development is a complex process and relies heavily on sophisticated computer modeling. Those analysts that have a command of computer spreadsheets have found the flexibility offered with this method useful in developing their own models. Those less experienced may consider financial analysis software available commercially. Note: The unique nature of base reuse may make standard real estate software packages difficult to conform to the wide-ranging scenarios of the redevelopment plans.

USACERL has performed preliminary evaluations of two software companies' financial application packages, finding one inadequate and the other very useful and flexible but lacking in some critical areas. The Windows™ software version (financial analysis of real estate holdings) appeared to have the necessary functionality for an analysis similar to the Lexington redevelopment plan where the LRA developed and maintained the property, receiving lease revenues for the redevelopment period and estimating a terminal value at the end of the 15-year plan. However, an analysis similar to the Sacramento case, where the LRA develops and leases the property and sells both improved and unimproved properties as the market allows, is not possible without modification to the software, and is in fact a separate MS-DOS\* software version. Both of the companies' packages offered discounted cash flow capabilities, the superior package allowed greater freedom and more functionality in developing the cash flows and featured considerably more depth and options with the analysis.

Further evaluation of available software or the possibility of developing new applications would be necessary if the Army were to consider standardizing the EDC valuation and financial analysis process within the Corps' District Real Estate Offices and

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\* MS-DOS: Microsoft® Disk Operating System.

USACERL. Functionality and capabilities of the computer software needed to assist the appraiser/analyst should include, at a minimum:

- market absorption rates for multiple property types (both sale and lease) and annual property reversion schedules
- market comparable data base and analysis
- lease income schedules and operating pro formas for the redevelopment period
- inclusion of infrastructure, capital improvement, and other development costs
- reversion value calculations for multiple property sales over the redevelopment period
- assistance with market derived yield, discount, and capitalization rate calculations, loan analysis, and DCF analysis with ability to develop ranges of present value estimates from multiple redevelopment scenarios.

The District Real Estate Offices lack the necessary computer software (and in some cases the hardware) tools and technologies to effectively and efficiently perform the EDC appraisals and analysis without undo hardships being placed on the staff appraisers. Further, it is recommended that a study be commissioned to determine the feasibility of equipping the offices with available off-the-shelf technologies.

### **Risk Analysis and Assessment**

USACERL has not attempted to provide a quantitative measurement of the risk of an LRA's redevelopment plan. However, the survey results indicate a desire on the EDC action officers' part to include some acceptable form of methodology to demonstrate the level of risk associated with an LRA's redevelopment plan. Note: Considerable uncertainty exists in the development of risk assessment methods because of the subjective judgment of the analyst, and whether it is a reasonable and practical application for the EDC review and evaluation process is still to be determined. One drawback: Once the quantitative measurement has been developed, with what do you compare the results? A practical application would be to compare two alternative investments and their respective risk measurements and choose the least risky project (i.e., the project with the smallest standard deviation). It will take considerably more research and real life applications in the upcoming EDC reviews to determine an acceptable methodology. Possible techniques under consideration include sensitivity analysis, scenario analysis, Monte Carlo computer simulation, and standard financial ratio analysis.

### ***Techniques and Methodologies***

Risk is defined as uncertainty of future events. In the context of base redevelopment plans, the risk is the variability of the expected (projected) cash flows and the resulting PV of those cash flows. A real estate developer/analyst can use one or two simple but nonquantitative approaches to recognize the riskiness of an investment: (1) the developer/analyst could make more conservative cash flow estimates and (2) adjust the discount rate upwards from the required rate of return. But how much higher should the discount rate be raised given the level of risk? Or, returning to our original Question 1, What is the appropriate and reasonable range of discount rates that should be used in discounting the LRA's cash flows from the redevelopment plan? To arrive at reasonable discount rates, the level of risks associated with the type of investment being dealt with must be known.

No apparent mechanical process is available to quantitatively measure risk and apply that measurement to a risk-free rate to arrive at a discount rate that properly reflects the level of risk for the particular investment. Nevertheless, all those involved in military base reuse must have some idea of the level of risk involved in a particular redevelopment plan. The next four sections discuss these critical risk assessment issues.

***Sensitivity Analysis.*** This approach measures the impact on the expected results (cash flows and PV of the LRA's redevelopment plan) when certain variables are changed, such as increasing market absorption rates or reducing market rental rates or any other variable or combination of variables in the plan. Sensitivity analysis is designed to answer the "what-if" questions (i.e., what is the impact to the PV of the LRA's plan if market rates are 10 percent lower than projections). The analyst can pose any number of "what-ifs" and plot the new PV calculations to provide a measurement for how sensitive the PV is to a change in the variable (i.e., if market rates are reduced by 10%, the PV of the plan declines by \$1.5 million). This method can provide valuable insights into the riskiness of the LRA's redevelopment plan by demonstrating how a relatively small error in estimating a variable can produce a large impact to the expected PV of the plan.

***Scenario Analysis.*** In general, a project's standalone risk depends on both (1) the sensitivity of its NPV to changes in key variables and (2) the range of likely values of these variables as reflected in their probability distributions (Brigham and Gapenski 1993). The scenario analysis technique considers both the sensitivity of the PV to changes in key variables and the range of likely variable values. Typically, the analyst develops three scenarios of cash flow projections: (1) worst case, (2) most likely case, and (3) best case, and then attaches a probability of the particular scenario case

occurring. PVs are calculated for each scenario and multiplied times the probability of occurrence. The products of the three calculations are then summed to arrive at the expected PV. From this point, the standard deviation of the PV and the coefficient of variance can be calculated to demonstrate the variability (in dollars) of the scenario's PV from the expected PV.

**Monte Carlo Computer Simulation.** This method links sensitivities and input variable probability distributions and requires a sophisticated software package such as @ Risk.\* The simulation would determine a range of PVs with calculated probabilities of the likelihood that the actual results would fall within that range. As with the sensitivity and scenario analyses, the range of possible PVs may be so wide that to conclude the likelihood of occurrence is 95.5 percent likely may not demonstrate anything of value to the analysis. In other words, if the approach produced an expected PV of \$4.7 million and a standard deviation of \$1.4 million the analyst could conclude the following:

With a normal distribution and two standard deviations, it is 95.5 percent likely that the *actual* cash flows received from the investment would produce a PV range from \$1.9 million (\$4.7 minus two standard deviations of \$1.4) to \$7.5 million (\$4.7 plus two standard deviations of \$1.4).

Brigham and Gapenski (1993) view the matter as follows:

A problem with both scenario and simulation analysis is that even when the analysis has been completed, no clear-cut decision rule emerges. We end up with an expected NPV (net present value) and a distribution about this expected value, which we can use to judge the project's standalone risk. However, the analysis provides no mechanism to indicate whether a project's profitability as measured by its expected NPV is sufficient to compensate for the risk as measured by the standard deviation of the NPV or coefficient of variance of the NPV.

In a more typical financial analysis, the cost of the investment has been determined and the analysis is performed to determine whether to recommend the investment. The analyst uses the required rate for the firm considering the investment to discount the cash flows (including the cost of the investment), if the sum of the discounted cash flows (NPV) is greater than zero, the investment adds value to the firm. In the EDC review and evaluation process, as well as the appraisal, the analysis has concentrated on providing a present valuation of the cash flows.

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\* Palisade Corporation, 31 Decker Road, Newfield, NY 14867.

**Financial Ratio Analysis.** Ratio analysis has been a common practice of the lending community to assist in assessing the risk of the projects cash flows. Of particular interest in the EDC review process is (1) the debt coverage ratio, (2) the default ratio, and (3) operating expense ratios. The debt coverage ratio (net operating income as a percent of debt service) demonstrates to what extent the debt is covered by operating income (after operating expenses and before debt payments). The default ratio measures the ability of the project's effective gross income (gross possible less vacancy) to cover all the obligations, operating expenses, and debt service. Lastly, operating expense ratios are a percent of effective gross income and can be used as an operating efficiency measurement against industry standards.

All three ratios have some practical application in the EDC review process, but at the same time have limitations. For instance, ratios are easily distorted with over or understated components. In the case of base redevelopment plans, low initial incomes and high expense levels may limit the operating ratio's usefulness. Inclusion of the default ratio would be helpful in any scenario analysis. Calculating the default ratio for the differing scenarios would demonstrate the likelihood of default or level of additional funding required given a worst-case scenario.

**Summary.** While this chapter did not settle upon any firm recommendation for the best approach to analyzing and assessing risks of EDC redevelopment plans, USACERL will continually evaluate various risk analysis techniques and will incorporate some form of the above described risk analysis in future reviews where it is practical and adds value to the evaluation.

## 4 Conclusions and Recommendations

### Conclusions

This lessons learned study was to have a primary focus relating to the economic issues and the financial analysis necessary to determine financial feasibility of LRAs' redevelopment plans including three key elements, discount rates, valuation techniques, and risk assessment. The study concentrated on providing answers to three questions that have been the focus of the three reviews to date:

1. What is the appropriate or reasonable range of discount rates that should be used in discounting the LRA's cash flows from the redevelopment plan?
2. Why is there such a wide range of valuation estimates when comparing the fair-market-value property appraisals with the PVs of the discounted cash flows from the LRA's business plan?
3. How is a reasonable assessment of the risks associated with the redevelopment plans provided, and can the risks be quantified?

Responses to the survey of EDC action officers produced the following ranking of the most important EDC application review issues:

1. Extent of short- and long-term job creation
2. Financial feasibility of redevelopment plan
3. Potential for economic recovery with proposed EDC
4. Adequate and reasonable redevelopment plan
5. Adverse economic impact of closure.

### Recommendations

Lessons learned from the survey have led to the following recommendations for enhancing and expanding the financial analysis, valuation, and other economic evaluation components of the EDC application process:

1. Develop alternative cash flow scenarios to provide forecast ranges of 15-year income streams in addition to the LRA's 15-year redevelopment forecast scenario.

2. Develop discount rate ranges and demonstrate the impact to the PV calculations, ultimately arriving at low to high range of PVs for the redevelopment plan and alternative plan scenarios.
3. Consider alternatives to risk assessment methodologies and begin evaluation of reasonable techniques that will provide reliable quantitative measurements that can be compared to other EDC redevelopment plan risk assessments.
4. Explore existing economic forecast modeling and software application packages that can provide job creation forecasts and other related analyses.

The above list is not all inclusive of USACERL's lessons learned nor of the intended future review and reporting enhancements. Process and product improvements will be a continual goal for the project team. After improving processes within the focused areas above, USACERL could examine future economic issues relating to the EDC process, such as improved economic impact modeling, developing database applications for tracking LRAs' redevelopment experiences and trends, developing standard property valuation computer applications to support HQUSACE's Real Estate Directorate, and developing techniques to measure real estate market impacts. The team will continue to address controversial issues and will endeavor to achieve reasonable solutions through the use of available resources.

While the Army's EDC process has been successful, it is USACERL's intent to continually strive for process improvements, not only on the technical review product, but on the process as a whole.

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## Appendix: Survey Sample With Summary of Results

### USACERL Survey of Economic Development Conveyance Action Officers

Since the 26 October 1994 Interim Final Rule regarding Economic Development Conveyances (EDCs) was issued, USACERL has provided a technical review and related documentation of the EDC application packages submitted for consideration to Army decision makers. The purpose of this survey is to gather information from the people these documents were intended to serve so that we may better prepare our findings in the future. Please take a moment to answer these brief questions relating to the format and substance of USACERL's past EDC related technical review efforts. The results of this survey will be incorporated into a "Lessons Learned" report that USACERL is preparing, and it will also serve to direct our forthcoming EDC technical review efforts. After you have completed the survey, please drop it in the mail using the self-addressed, stamped envelope or fax it to Dennis McConaha at (217) 373-7222. Thank you in advance for your cooperation.

**Please rank the importance of the below listed issues/factors from most important (1) to least important (12).**

1. What are the most important issues/factors related to EDC technical reviews and that would influence your decision on application approval or disapproval.

**Survey Ranking/Option #**

- # 1/c. Extent of short- and long-term job creation
- # 2/e. Financial feasibility of redevelopment plan
- # 3/b. Potential for economic recovery with proposed EDC
- # 4/d. Adequate and reasonable redevelopment plan
- # 5/a. Adverse economic impact of closure
- # 6/g. Extent of local investment, (proposed financing strategies,) and level of risk incurred
- # 7/f. Need and extent of infrastructure improvements
- # 8/i. Proposed consideration and estimated market value
- # 9/i. Economic benefit to the Federal Government
- # 10/h. Local and regional real estate market conditions
- # 11/l. Relationship to overall military disposal plan
- # 12/k. Incorporation with other Federal agency interests

Please indicate your response to the question by marking an X on the line where appropriate.

2. What is your overall opinion of the level of review and reporting for USACERL's EDC reporting?  
Review is too Extensive \_\_\_\_\_ Review is Adequate 100% Review is Inadequate \_\_\_\_\_
3. What is your overall opinion of the level of reporting for USACERL's EDC briefing?  
Briefing is too Extensive \_\_\_\_\_ Briefing is Adequate 100% Briefing is Inadequate \_\_\_\_\_
4. If you were to improve the overall structure of the EDC Technical Report, what would your change?

Please indicate your response to the question by marking an X on the line where appropriate.

5. What is your opinion of the level of review and reporting for each of the following report appendixes?

Appendix A: ***Adverse Economic Impact of Closure and Recovery Potential***

Review is too Extensive \_\_\_\_\_ Review is Adequate 100% Review is Inadequate \_\_\_\_\_

Suggestions to improve section: \_\_\_\_\_

Appendix B: ***Short- and Long-Term Job Creation***

Review is too Extensive \_\_\_\_\_ Review is Adequate 100% Review is Inadequate \_\_\_\_\_

Suggestions to improve section: \_\_\_\_\_

Appendix C: ***Consistency with Overall Redevelopment Plan***

Review is too Extensive \_\_\_\_\_ Review is Adequate 100% Review is Inadequate \_\_\_\_\_

Suggestions to improve section: \_\_\_\_\_

Appendix D: ***Market Analysis, Financial Feasibility, and Infrastructure Investment***

Review is too Extensive \_\_\_\_\_ Review is Adequate 100% Review is Inadequate \_\_\_\_\_

Suggestions to improve section: \_\_\_\_\_

Appendix E: ***Extent of State and Local Investment and Risk***

Review is too Extensive \_\_\_\_\_ Review is Adequate 83% Review is Inadequate 17%

Suggestions to improve section: \_\_\_\_\_

**Appendix F: Local and Regional Real Estate Market Conditions**

Review is too Extensive  Review is Adequate 100% Review is Inadequate

Suggestions to improve section: \_\_\_\_\_

**Appendix G: Conflicts with Other Federal Interest and Property Disposal Authorities**

Review is too Extensive  Review is Adequate 83% Review is Inadequate 17%

Suggestions to improve section: \_\_\_\_\_

**Appendix H: Relationship to Overall Military Department Disposal Plan**

Review is too Extensive 16.67% Review is Adequate 66.67% Review is Inadequate 16.67%

Suggestions to improve section: \_\_\_\_\_

**Appendix I: Economic Benefit to the Federal Government**

Review is too Extensive  Review is Adequate 100% Review is Inadequate

Suggestions to improve section: \_\_\_\_\_

6. Please indicate any significant issues and or areas of review that have not been sufficiently developed in USACERL's technical reviews and reporting. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Please indicate your response to the question by marking an X on the line where appropriate.

7. Please indicate your opinion regarding the use of discount rates in the discounting of cash flows from the LRA's redevelopment plans.

The discount rate used (5%) in *Sacramento Army Depot's* review was .....

Too High  Too Low 2 Reasonable 1

Should have been in the range of 8 - 10%.

The discount rate used (8%) in *Lexington Army Depot's* review was .....

Too High  Too Low  Reasonable 3

Should have been in the range of \_\_\_\_\_%.

The discount rate used (15%) in *Jefferson Proving Ground's* review was .....

Too High 2 Too Low  Reasonable 1

Should have been in the range of \_\_\_\_\_%.



Table A1. Compiled results of USACERL survey of economic development conveyance action officers.

6 TOTAL SURVEYS												
Question 1												
Ranking of Important Issues/Factors												
#	a	b	c	d	e	f	g	h	i	j	k	l
5.2	3.8	1.3	4.0	2.7	6.3	5.7	7.0	8.5	6.7	11.5	10.5	
5	3	1	4	2	7	6	9	10	8	12	11	
1	3	6	3	5	1	1	1	0	1	0	0	

  

Opinion of Review & Briefing			
Question 2		Question 3	
Extensive	Inadequate	Extensive	Inadequate
0	6	0	6
0.00%	100.00%	0.00%	100.00%
6			

**TOTALS**  
% of Total Response Responses

  

Opinion of Review & Briefing of Following Appendices - Question 5														
Appendix A			Appendix B			Appendix C			Appendix D			Appendix E		
Extensive	Inadequate	%	Extensive	Inadequate	%	Extensive	Inadequate	%	Extensive	Inadequate	%	Extensive	Inadequate	%
0	6	0.00%	0	6	0.00%	0	6	0.00%	0	6	0.00%	0	5	83.33%
6			6			6			6			6		

**TOTALS**  
% of Total Response Responses

  

Question 5 (continued)												
Appendix F			Appendix G			Appendix H			Appendix I			
Extensive	Inadequate	%	Extensive	Inadequate	%	Extensive	Inadequate	%	Extensive	Inadequate	%	
0	6	0.00%	0	5	83.33%	1	4	66.67%	0	6	100.00%	
6			6			6			6			

**TOTALS**  
% of Total Response Responses

  

Opinion of LRA's Discount Rate - Question 7														
Sacramento			Lexington			Jefferson			Options for Developing Rates					
High	Low	Reasonable	High	Low	Reasonable	High	Low	Reasonable	# a	# b	# c	# d		
0	2	1	0	0	3	2	0	1	1	2	3	0		
0.00%	66.67%	33.33%	0.00%	0.00%	100.00%	66.67%	0.00%	33.33%	33.33%	66.67%	100.00%	0.00%		
3			3			3			6			6		

**TOTALS**  
% of Total Response Responses

  

Preference for Expanded Analysis				
Question 9 - Risk Assessment				
Agree	Disagree	No Opinion	Agree	Disagree
4	0	0	5	0
80.00%	0.00%	0.00%	100.00%	0.00%
5				

**TOTALS**  
% of Total Response Responses

**Distribution**

Chief of Engineers  
ATTN: CEHEC-IM-LH (2)  
ATTN: CEHEC-IM-LP (2)  
ATTN: CERD-L  
ATTN: CERE-E (2)  
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