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ECONOMIC IMPACTS STUDY

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ABSTRACT

This is a progress report on the first phase of a project to measure the economic impacts of a rapidly changing U. S. target base. The purpose of the first phase is to designate and test the microeconomic impact analysis model. Criteria were established for a decision-support model. Additional criteria were defined for an interactive microeconomic impact analysis model. After a review of several models, the Economic Impact Forecast System model of the U. S. Army Construction Research Laboratory was selected as the appropriate input-output tool that can address local and regional economic analysis. The model was applied to five test cases to demonstrate its utility and define possible revisions to meet project criteria. A plan for EIFS access was defined at three levels. Objectives and tasks for scenario refinement are proposed.

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INTRODUCTION

The general purpose of this project is to measure, in a timely, useful and valid manner, the economic impacts of a rapidly changing U. S. target base (see Appendix I). This task requires both macro- and microlevels of analysis. The macrolevel will focus on the national economy and federal budget. It is assumed that useful macroanalysis requires analysis and inputs more specific than just the generalized defense budget parameters. The assumption is made that the expense of military strategy may not only draw on federal revenues but also may contribute to productivity on a local, regional, and national level. Thus, microimpact analysis will generate information about the economic influences of specific responses to threat. It can also generate inputs from aggregated specific responses for macroanalysis.

SCOPE OF PHASE ONE

The "Statement of Work" for the first phase of this Economics Impact Study (see Appendix I) calls for three deliverables. The first is this document which is the progress report. The second is a design for EIFS access which is presented under Objective 4 of this report. The third is a plan for scenario refinement which is presented under Objective 6 of this report.

The development of the microanalytic process is the primary focus of Phase One of this project and of this progress report. This report describes the achievement of six objectives pursued to complete the first phase of micro-economic impact analysis:

1. Establish Criteria for the Analytic Orientation of the Project
2. Establish Criteria for the Selection of an Economic Impact Model
3. Select a Model Consistent with the Criteria
4. Establish and Describe Access to the Model
5. Through Use of the Model Demonstrate Its Utility
6. Define a Plan for Scenario Refinement for Model Application to the Task

Because this report is the first statement of project direction, in addition to describing Phase One results, there are introductory comments on the general focus and concepts of the overall task.

CONCEPTUAL BACKGROUND TO THE WHOLE TASK: A Rationale for Military Focus on the Impacts of Strategic Expenses and Productive Stimulus

Classic military strategy as developed by Clausewitz originally recognized logistical and operational dimensions (Howard 1983:7). Response to these dimensions in actual war or anticipation of threat based on these dimensions results in expenses related to defense, deterrence, and offense. In the past, the primary focus on the economics of these activities has been on their impact on the federal budget.

In the post World War II age of cold war and advanced nuclear weapons as tools of mass destruction, the concept of deterrence has taken the forefront in military and political strategy and has generated economic impacts of a major proportion. These impacts fluctuate with the vagaries of technological change and policy speculation. These conditions have led to a focus on two other critical dimensions of military strategy defined by Howard (1983): the social and technological factors.

Threat, while most empirically defined as offensive weapons systems potentially deployed at given home targets, is in the modern context, more complex. A defense strategy including the deterrence of theater nuclear weapons assumes the reality of both sides in an engagement inflicting terrible destruction not only to targets but also to homelands and peoples. This projection of massive human and environmental destruction for survivors on both sides highlights the importance of the social and technological dimensions of military strategy.

Targeting strategy has changed in this context of massively destructive weapons, particularly because of the potential impacts on both sides regardless of military success (Howard 1983:12-16). There is a shift from a WWII (and before) philosophy of counter-polity, counter-industrial attack to a current approach of counterforce attack.

To the extent that the counterforce philosophy dominates deterrence and defense strategy, then the target base becomes quite dynamic; varying with the rapid changes in weapons and defense technology and their locations and with policy positions about arms control and deployment.

Two interrelated economic concerns become central to military and foreign affairs policy. First, the ongoing debate in all nations of the portion of the national economy and federal budget to be focused on increasingly expensive systems of military power and the resultant impacts on the delivery of other governmental services. Second, the increasing recognition that the health of a national economy and its position within world productive balances is a fundamental dimension of political and military security (Kennedy, Melman, Nimroody, and Miller and Van Evera).

There is an assumption that economic health is critical to national and military power, and can be significantly affected by the size and type of investment in defense. To the extent that the cost of military power disturbs the economic balance between nations, military and political powers wax and wane. Thus, the economic impact of military strategy is an increasingly critical element; particularly in a time when the technology is so volatile.

The economic impact analysis of a changing target base is an element critical to decision-making about strategy and the evaluation of threat. There is an interaction. Investment in strategy not only results in federal expenses and international foreign policy impacts but also in local and regional economic growth and development. In turn, local and regional economic growth and development can be expected to have a significant impact on the health of the national economy.

Decisions about investments in military power have been dominated by political debates about the relative strategic value of systems and by the influence of politicians and corporations whose constituencies are affected by procurement outcomes. Economic impact modeling of alternatives will illustrate the decision issues of federal budget impact and the regional political role. Modeling will also address the critical questions of the development and balance of national and international productive capacity. The dimensions of military strategy are not just fourfold as defined by Howard (1983) (logistical, operational, social, and technological) but also economic. The dimensions of strategy planning must also include economic impact.

OBJECTIVE ONE

ESTABLISH CRITERIA FOR THE ANALYTIC ORIENTATION OF THE PROJECT

There are many potential avenues for impact analysis. If comprehensiveness and validity are the only criteria, those analyses that exhaustively collect primary data and provide a maximum time for analysis are likely to be the most reliable. However, because this task is by definition concerned with the dynamics of the strategic environment and alternative models of change, it seems appropriate to seek a mode of analysis that, while concerned with accuracy, also meets the real time demands of active decision-makers.

The goal is a management information system and modeling process that responds to questions about changing circumstances posed by those who are making decisions; they may not be experts in the analytic realm, but they need to make use of the best readily available data.

What is sought is a decision-support system mode of measuring target base impacts. Decision-support systems are information systems with the following characteristics:

Timeliness: They provide information in a real time mode to respond to the reality of the decision-making context; that is, that alternative responses to a circumstance must be selected regardless of whether ideal analytic processes have been completed.

Accessibility: The analytic tools and data are available to users within their decision-making contexts and without special new data collection efforts required each time a query occurs.

Friendliness: The process of inquiry and of interpretation of response needs can be initiated by persons without professional expertise in the area of analysis. The technology of the system (hardware and software) should be transparent to the user. The format of inputs and outputs should be informative rather than technical.

Discovery and Dialogue: Rather than isolating a single choice outcome, the system yields outputs that provoke questions, and provide for the definition of alternative simulations and "what-if" queries. This process provides an opportunity to use analyst insights and judgements in problem-formulation and solution-generation. The system isn't "hardwired" to provide an answer, but rather develops background information so that it is a part of but not the only element of the decision process.

OBJECTIVE TWO

ESTABLISH CRITERIA FOR THE SELECTION OF AN ECONOMIC IMPACT MODEL

Economic impact analysis is an attempt to assess the economic and financial effects of an external stimulus on a specific political or geographic area. The stimulus serves to disrupt the existing economic relationships and may be positive or negative; the result of an increase in economic activity or the result of a decline in activity. Typical stimuli are the entrance of a new business or activity into a local economy or the closure or removal of an activity from the area. Regardless of the nature of the stimulus or the size of the region involved, the objective is the same: to estimate the size and direction of the impact of the stimulus.

The advantage of knowing economic impacts is that economic activity typically leads to jobs and income(s), which in turn lead to higher revenues and changes in the productive balances between competing units. Thus, stimuli which increase economic activity will typically lead to a higher standard of living for the population in the area affected by the change. If activity declines, jobs are frequently lost, household and governmental incomes are lower, and the local area or community suffers a decline in economic well-being (at least temporarily).

Economic impact is not limited to the changes in household well-being; the impact is also reflected in tax receipts of the local government units. If the economic change is a decline, the government units must adjust their budgets and the resultant levels of service to lower levels of income. If the change is an economic expansion, the government may experience increases in tax revenues which are accompanied (or even preceded) by increases in demand for governmental services. The services may range from a need for temporary police or fire services to a permanent need for streets, sewer, water, and similar services. In either case, anticipating the demand for additional services will allow the governmental unit to respond in a more orderly manner. An economic unit may be a political subdivision or a geographic area which includes several economic and/or political units.

CRITERIA FOR THE ECONOMIC IMPACT ANALYSIS MODEL

Given the importance of changes in economic activity, it is desirable to assess the likely impact of proposed changes in economic activity. Specific changes which occur on a regular basis are the expansion and/or closure of private business plants, the expansion of governmental operations, and/or the completion of government projects which leads to the closure of facilities. All of these changes lead to either short- or long-term impact(s).

There are various types of economic stimuli that may be divided into categories. There are one-time stimuli such as developmental activities contrasted to ongoing activities such as operation of a system or military installation. There are research and development projects and weapon-system production projects. There are expansions of existing programs and eliminations, terminations, or down-sizing of programs. Each of these stimuli may be expected to have a different impact and the ideal model will adapt to each.

To estimate the short-term and long-term impact of such changes, it is desirable to have an estimating procedure which allows the user to identify the characteristics of the stimulus and the geographic area which is likely to be affected. The procedure must be adequate to provide the estimate in a timely manner and within a reasonable margin of error. The procedure must also be able to provide this estimate on the basis of a limited amount of data as an input. The resulting report should be presented in a readable, decision-oriented format which lends itself to easy interpretation by a non-computer, non-economics expert.

To the extent that there is an ideal microeconomic impact DSS, the system will be based on some form of theoretical model. The entire DSS will consist of the theoretical model and assumptions, the database utilized by the model to generate the output on which decisions can be made, and the conversion of the output from the model into a format which is most easily utilized by the decision-maker. To evaluate the appropriateness or validity of a specific DSS it is necessary to evaluate each of the component parts: the model, the data requirements, and the applicability of the final data presentation in terms of format and content. Criteria for the microimpact model are:

Definition of the economic unit: It is necessary to begin with a definition of the specific unit which is to be the focus of the study. If we are to look for the economic impact of an act or change, the logical question is "the economic impact on whom or what?" The definition of the economic unit to be studied will have a major impact on the availability of data. Data that is easily generated for metropolitan areas may not be available at a reasonable price and/or on a timely basis for other areas. In addition, it is important that the data be available on a consistent basis for all areas which may be studied.

One time stimulus: The typical DSS will be expected to estimate the "one-time" impact of the stimulus to be analyzed. The "ongoing" cost and/or impact of the continuing operation would require a separate calculation from the impact of the original stimulus. In the event that a stimulus was expected to occur over an extended period of time, the model would still be usable, but could require more than a single calculation. Nevertheless, each of the varying situations could be accommodated by the DSS if properly designed and implemented.

Database: The DSS will combine user inputs with some established database which describes current economic and demographic conditions. The various models to be studied or chosen may use different data for their analysis and projections. This database will have to be directly integrated with the model. Data should be easily accessible, cost-efficient to retrieve, timely, and there should be a reliable process for updating the base information. If the required data is not available and/or cannot be provided on a cost-efficient basis, the model becomes less desirable.

Valid and Reliable Assumptions: The model should use theoretical assumptions about microeconomic behavior that are professionally credible and tested in longitudinal studies. The assumptions should be appropriate to the kinds of decision circumstances defined for this task and for an orientation to decision-support processes.

Adaptability and Expandability: It is frequently desirable to adapt and expand the application of a model to include other factors or circumstances which were not originally anticipated. Is the model a unique characterization which can not be expanded or modified? Is it a generic model which is susceptible to adaptation or modification or expansion? Obviously, the greater the flexibility, the more valuable the model. In all likelihood, the model selected will be expanded in the near future to include social and political impacts, including demands on the infrastructure of the communities affected by a proposed project.

Reliability and Credibility of the Model: The older and more seasoned the model, the longer the track record available to be evaluated. If the model has a longer, more accurate record, it is more likely to continue to perform in an accurate manner. The extent to which a model has had sustained use is an indirect measure of its professional credibility and acceptance. The margin of error of the results should be acceptable not only for the proposed application but also to meet the expectations of specialist and non-specialist impact analysts.

User-Friendliness and Decision-Support: The purpose of the model is to provide a timely and accurate estimate of the economic impact of specific proposals in a non-specialist, decision-making context. Therefore, it is important that the model be easy to use and that the output from the model be in a format which lends itself to the decision-making process. If the model is not already configured for such use, it is important that it be adaptable in a cost-efficient manner.

Access: The model should be available to non-specialist users in a physical, temporal, and technical context that meets their real time and decision context constraints. Ideally, the model will require relatively inexpensive, off-the-shelf equipment being either personal computer based or accessible through telephone lines using a personal computer and friendly communications software to an on-line service. The costs of system use (line charges, software, system access) should be reasonable under circumstances of sustained use. The system should be available at any time.

Inputs: The format and detail of the input data about the projected economic stimulus should be such that it meets the known characteristics of the stimuli and the reality of limited data. Ideally, the model could adapt to differing levels of data detail, recognizing the reality of the potential for highly aggregated data inputs on projects that are in a preliminary decision-making stage.

Timeliness: The model turnaround time including input of stimulus information, configuration for analysis, run time for analysis, and print-out of results should be brief and fit the limitations of a decision-making framework. There should be a fast enough sequence of events that repetitive iterations seeking new simulations can follow almost as fast as new inputs and/or scenarios are defined.

CRITERIA FOR EVALUATING THE DATABASES

The availability of current data is critical to the success of the effort to provide a timely estimate of the economic impact. If the data available are not current, are not available in a timely manner, and/or cannot be retrieved in the necessary format, the analysis cannot be completed within the real time requirements. To the extent that current and accurate data is not available in the required detail, the accuracy of the analysis is jeopardized.

OBJECTIVE THREE

SELECTION OF A MODEL

The logical starting point is the evaluation of the alternative models which might be utilized against the criteria enumerated above. Then the data elements required and/or available should be evaluated. When the preliminary selection of the computational or analytical model has been completed and the data elements have been selected, the third step is to determine the appropriate format and content of the output report which is to be used by the decision-maker.

TYPES OF MODELS TO BE CONSIDERED

Several different approaches or economic models have been used to estimate the impact of changes. Each of the models has specific strengths and limitations. There are two primary types of models: econometric and input-output. Both types of models have been in use for at least twenty years, and are now usually computerized. Econometric models typically consist of a series of equations which attempt to describe the economic relationships which form the economy; whether national or regional.

Input-output analysis has been utilized for more than twenty years. Prior to the availability of inexpensive personal computers for the processing of voluminous data and calculations, the input-output analysis procedure was considered to be too time-consuming to be used cost-effectively. Only recently has it been used extensively as a tool for regional analysis. The input-output model is based on the assumption that for a specific economy a stimulus will create changes that will flow through the economy in a manner that is proportional to (and consistent with) the economic relationships that existed prior to the stimulus. The use of computerized input-output analysis has become an important tool in regional economic analysis.

Some analysts refer to a third type of model called an "economic base" model. Such a model tends to have the characteristics of an econometric model, an input-output model, or some of both. An example of such a model is the EIFS model discussed below. The EIFS model has an input-output multiplier calculation but it is referred to as an economic base system. Because many of the computerized models operate as a "black box" with data entered and results produced as output, the internal operations are of less concern to the user/operator. The user may not know or care about technical distinctions between models. These distinctions have more to do with assumptions and calculations than with meeting user information needs.

DESCRIPTION AND FUNCTIONAL CRITIQUE OF THE ALTERNATIVE MODELS

Econometric Models

DRI: The DRI model is appropriate for a national impact analysis, but would be of little value for local/regional impact analysis. This model is a computerized model of the U.S. economy consisting of about 800 equations. Although the model has a long history and a reasonably accurate track record, it has other limitations. First, it is intended to represent the entire U.S. economy, not geographic regions. As a result, it would be cumbersome to use for local or regional economic impact analysis. At the national level, the model is among the best for macroanalysis and would be appropriate for later phases of this project; for local or regional analysis, it would be improperly used and of questionable value. It would also be quite expensive. Given the nature of the model, it is not easy to use, does not provide quick "turnaround," and is not decision-oriented.

Input-Output Models

Several models were reviewed to determine their usefulness for this project and a limited number were selected for further study. Appendix II is a list of the models which received preliminary study. The models receiving further study are described below.

EIFS: The three Economic Impact Forecast System (EIFS) models are all variations of input-output analysis. Whether called I-O, location quotient, shift-share, or otherwise, they all use a form of input-output and multipliers. The major difference is in the procedure for generating the multipliers. Although the estimating procedures vary, the multipliers usually do not. The major variation in multipliers comes from the number of Standard Industrial Classifications (SIC) used.

EIFS Forecast Model: This is a computerized I-O model which uses the "location quotient" (LQ) or measure of relative employment relationships to generate economic base multipliers within the program. This model accepts relatively aggregated inputs and gives relatively aggregated outputs.

EIFS Automated Input-Output Multiplier System (AIMS): This is a computerized I-O model which performs in a manner similar to the LQ model but demands much more disaggregated information about stimulus by commodity, industry, and employment on a local and national basis. This model gives much more detailed results detailed for commodity, industry, and labor force.

EIFS Air Force Region of Influence Model (AFROI): This model is used to estimate the geographic area which is likely to be affected by a specific economic stimulus.

ADOTMATR Input-Output: The conceptual basis for this model is not significantly different from the ETIS models. The mechanical process and the external data requirements are somewhat different, but it is a basic

input-output model. This program offers certain advantages over many of the other models in that provision is made for the "importation" of selected data elements. The ability to bring in these inputs from outside the model allows further refinement of the model and corresponding increases in the accuracy of analysis. This model is personal computer based but requires input of the analytic database as well as the stimulus inputs.

SELECTION OF EIFS

Each model was reviewed and compared with the enumerated criteria. Several models were found lacking and the cluster of EIFS models was selected as the model for this project. EIFS is operated by the U. S. Army Construction Research Laboratory (CERL) at the University of Illinois, Champaign, Illinois. The systems were developed following the advent of the National Environmental Policy Act which obligated national agencies to complete environmental, cultural, and socioeconomic impact effects of military activities. According to CERL, the goal of EIFS is:

"to be a user-oriented, inexpensive, and systematic approach to meeting NEPA requirements. EIFS points out potentially significant problems early in the decision-making process so that alternatives may be considered."

The EIFS model has been used for military, public works, and other applications. A number of analyses of the model have been published (Bloomquist 1977; Bloomquist and Webster 1987) and its reliability, validity, and credibility, while not unquestioned, seems substantial.

The EIFS system includes three models that allow inputs to vary from relatively aggregated information to very disaggregated. The outputs vary in detail with the inputs, but include information on stimulus impacts on employment, income, business volume, government expenditures, public school attendance, local population increases due to military action, and housing demand.

EIFS is accessible by personal computer with off-the-shelf communication hardware and telephone lines. A password is required and engagement with the system establishes access to an interactive, conversational mode that does not expect previous experience in computer use.

It should be noted that the economic impact of an expansion project is not the exact opposite of an economic contraction. The model or procedure for estimating the impact of a positive stimulus may not be reversible to determine the impact of a contraction or withdrawal of economic activity. Thus, the EIFS model may not be appropriate for this purpose. Two separate models may be required; one to estimate the impact of an expansionary stimulus and another to use for negative stimuli.

Thus, the EIFS model meets most of the DSS and economic impact model criteria and seems the best choice for this project. There are some aspects of the model that fall short of an ideal configuration; these are explained below in the section on model utility and addressed in the section on scenario refinement.

SELECTION OF THE DATABASE

The EIFS database is compiled from a variety of sources (see Appendix III), but primarily U. S. Department of Commerce information including the decennial census. Data units are available for a diverse number of units including the 34,000 counties of the U. S., the standard metropolitan statistical areas, the numerous U. S. military installations, and Bureau of Economic Analysis Economic Areas.

The EIFS database is the only standardized set of databases containing information for all of the geographic areas and political subdivisions required. If the economic analysis is to be applied to small economic and political units such as counties or small communities, it is necessary to have data sources which provide for disaggregation at the appropriate unit level. Although EIFS seems to meet this criteria and be the "best" available, this achievement is the result of a lack of competition. This conclusion does not imply that the EIFS database is not adequate, but only that a comparable (competing) data set meeting the criteria for economic unit disaggregation has not been found. Nevertheless, the EIFS data set has limitations. Several of the data sets need to be updated more frequently. The "age" of data sets is not consistent, raising the possibility for inaccurate outcomes.

OBJECTIVE FOUR

DESIGN FOR ACCESS TO THE MODEL

The design for access to the EIFS can occur at any of three levels, perhaps scheduled as phases. First, to use the system as it is currently configured. Second, with EIFS modified to the design criteria enumerated above. Third, with the development of an interface with threat databases.

At the first level, access is currently established and meeting phase one project needs. As reported above, access can be achieved with a personal computer with a standard communications software package. An account, logon name, and password are established through the Environmental Technical Information System (ETIS) Program Office at the University of Illinois, 907 Nevada Street, Urbana, Illinois, 61801, telephone number (217) 333-1369.

EIFS is an application system that is part of an ETIS shell operated by the University of Illinois based on the UNIX operating system. An "EIFS User's Manual" and a system description, "ETIS and Its Subsystems," are available from the Program Office. Direct access with EIFS does require some preparation of inputs. Comments on the EIFS access process are in Appendix IV.

The design for EIFS access at the second level calls for revision of the EIFS input and output formats. The DSS criteria for this project argue for a non-specialist, user-friendly input-output format. If pursued, these criteria would require a version of EIFS with minor modifications that provide language for the interactive sessions and report results in such a format that meets the special needs and focus enumerated above. If these changes were made for only one version of EIFS accessible by certain users, new questions of access to this modified system could arise.

The third level of access design would be that of directly interfacing EIFS with Los Alamos National Laboratory threat databases or through some intermediary translation program. This would develop a DSS that starts with the modeling of the threat and target base, and receives inputs directly from either EIFS or LANL to an economic impact analysis system. Presumably such an application would create new problems of access and control. Other problems would relate to systems compatibility, input-output formats, and communications.

The design for the second and third levels of access is assumed within the objective for scenario refinement.

OBJECTIVE FIVE

DEMONSTRATE MODEL UTILITY

As a measure of the utility of the EIFS Forecast Model, five case studies were selected to be tested. The group consists of an already planned Strategic Defense Initiative project, two existing defense installations, a Department of Energy project, and a simulation of a second SDI type of installation.

Each case involves a situation where the installation is in a relatively isolated setting. The purpose of this selection criterion was to present a comparatively independent activity for economic analysis. The more dramatic effects on the local and regional economies stand out more clearly in these type examples.

The EIFS Standard Forecast Model was applied in each case because it can be used with minimal data inputs, and because it lends itself so readily to changes in plans. The EIFS AIMS input-output model was also applied to the final simulated case to compare results. The running time for the two models is roughly the same, but the Standard Forecast Model yields final results in less than one-fourth the time required in the AIMS model. This is a result of less input time and less post-run analysis time required with the Forecast Model.

INTERPRETING THE TEST RESULTS

Each case begins with a narrative description of the activity or project. For economic impact analysis, this activity or project is perceived as a stimulus to the local economy. The narrative description is followed by a table of data related to the stimulus.

To demonstrate the analysis of the test results, the Cannon Air Force Base (CAFB) case will be reviewed. The CAFB case is based on the assumption that the facility does not presently exist and is being considered for implementation. In this way, the total economic impact of the installation can be examined. The first three data elements in the summary describe the specifics of the proposed project.

TEST RESULTS

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Cannon Air Force Base 1987 Economic Impact

Actual 1987 Total Expenditures: \$108,965,344

Actual 1987 Payroll: \$81,000,728

Actual 1987 Employees: 4,517

	<u>Sales</u>	<u>Jobs</u>	<u>Income</u>
Curry County, NM	\$105,399,000	5,794	\$ 92,630,000
Base Region	119,292,000	5,594	90,134,000
Amarillo BEA Region	155,738,000	5,674	92,997,000
State of New Mexico	164,711,000	6,297	100,245,000

The total cost/expenditures of the project (for 1987) would be \$108,965,344. Of this amount, \$81,000,728 would be spent for the payroll associated with 4,517 employees. Simple arithmetic yields a total of \$27,964,616 (total budget less the payroll cost) to be spent for supplies and other services.

The second part of the data set is the projection of the economic impact on the surrounding area of the expenditures associated with the project. The four geographic areas named in the data are representations of our alternative economic areas or units which are likely to be affected by the expenditures at CAFB.

Curry County is the first economic unit to be reviewed; the county in which the facility is located. The estimated economic impact on this area is:

Increase in Total Sales Volume	\$105,399,000
Increase in Total Employment	5,794
Increase in Total Income to Households	\$ 92,630,000

The variation between total expenditures at CAFB and the impact on the county is a reflection of the "leakages" or the flow of funds from the area studied to somewhere outside the area. This is a normal situation because it is quite likely that CAFB and individuals receiving payments from the facility will make purchases outside the area being studied. As purchases outside the area under study increase, the leakages increase, and the impact of the stimulus on the local area will decline.

Reversing the process, as the area under study increases in size, it may be expected that the volume of purchases outside the area (leakages) will decline, and the impact of the stimulus on the local area will increase. In this instance, as the second economic unit to be studied increases to the "Base Region," the geographic area under study is increased to four counties (Curry and Roosevelt, NM, and Parmer and Bailey, TX). As the data demonstrates, this change in area results in a larger impact on the total dollar volume of sales in the area, but employment and household income decline. This is explained by the fact that more of the stimulus (the original expenditure) is spent within

the area studied. Although the second area is a larger geographic unit, there will still be individuals who commute to work within the area, but who live outside the study region. These individuals are projected as employees living outside the study area. Their incomes are projected at their homes, not their places of work.

The third economic unit is defined as the Amarillo, TX, BEA economic region. It is made up of 33 counties in northeastern NM (including Curry but not Roosevelt), the Texas Panhandle (including Parmer County but not Bailey County) and the Oklahoma Panhandle. Again, the expansion of the region to include a metropolitan area (Amarillo, TX) and a larger geographic base may be expected to reduce the leakages, and thereby increase the impact on the area under study. As expected, the total sales volume is higher than either of the prior areas, the employment is higher than in the Base Region, but lower than in Curry County, and the total dollar income for the area is higher.

When the fourth economic unit is defined to be the State of New Mexico, sales volume, total employment, and total income all increase. Although one might question the precision of any of the projections, the pattern is consistent with what one would expect, a priori.

A similar analysis may be applied to the test results for each of the individual projects that follow.

TEST CASE ONE: OROGRANDE, NEW MEXICO

The contract has been announced for this remote site midway between Alamogordo, NM and El Paso, TX on the White Sands Missile Range. It has been planned as a multi-year project to evaluate the capabilities of such a laser as a defensive weapon against earth- and space-deployed threats. Almost all of the technologically sophisticated equipment will be constructed off-site and shipped to Orogrande, reducing the local economic effect. Significant local labor will be involved, however, during construction phases.

TEST RESULTS

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Ground-Based Laser Project Proposed for Orogrande, NM

Projected Total Expenditures: \$280,000,000

Projected Total Payroll: \$101,400,000

Projected Annual Employees: 1,205 (construction and operations ave.)

	<u>Sales</u>	<u>Jobs</u>	<u>Income</u>
Otero County, NM	\$289,368,000	5,915	\$146,582,000
White Sands Region	421,471,000	6,948	149,000,000
White Sands-Ft. Bliss Region	599,407,000	7,377	163,424,000
State of New Mexico	722,266,000	8,930	184,602,000
New Mexico-El Paso, TX	760,979,000	9,112	185,608,000

As in the instance of Ft. Huachuca, AZ, the Orogrande project shows increased employment in the region when either the White Sands or the Ft. Bliss Regions are used. Orogrande is included in both regions as are metropolitan areas (El Paso with Ft. Bliss and Las Cruces with White Sands). The residential income factor does not greatly increase until the Ft. Bliss (El Paso) Post Region is added. Note that the smaller number of employees generates larger expected numbers of supported jobs because of the potentially higher salaries for these more highly skilled employees.

TEST CASE TWO: CANNON AIR FORCE BASE, CLOVIS, NEW MEXICO

Cannon Air Force Base located near Clovis, in east central New Mexico, houses the 27th Tactical Fighter Wing of the Tactical Air Command. The F-111D aircraft is utilized by the Wing in training and combat readiness activities. The base has a major housing unit as well as a significant plane maintenance function. In 1987, there were 3,793 military personnel and 724 civilian employees of the base. Cannon is the largest employer in its region.

TEST RESULTS

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Cannon Air Force Base 1987 Economic Impact

Actual 1987 Total Expenditures: \$108,965,344

Actual 1987 Payroll: \$81,000,728

Actual 1987 Employees: 4,517

	<u>Sales</u>	<u>Jobs</u>	<u>Income</u>
Curry County, NM	\$105,399,000	5,794	\$ 92,630,000
Base Region	119,292,000	5,594	90,134,000
Amarillo BEA Region	155,738,000	5,674	92,997,000
State of New Mexico	164,711,000	6,297	100,245,000

The effect of the spreading of jobs (and resulting income) over the Base Region, instead of concentrating them in Curry County, is a reduction in the total jobs in the area because of increased commuting allowed from outside the region. Income is based on the place of residence in all examples. In sum, this data indicates that Cannon supports 1,077 jobs (5,594-4,517) in addition to the jobs on the Base. This, in turn, has a \$90,134,000 impact on the income of residents of the Base Region.

TEST CASE THREE: FORT HUACHUCA, SIERRA VISTA, ARIZONA

Fort Huachuca is located in Cochise County in extreme southeastern Arizona. The Fort is home to the Army Information Systems Command and Army Intelligence Center, and has major communication functions. There are 6,880 military, 5,234 civilian employees of the Fort, and it is the largest employer in the region.

TEST RESULTS

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Fort Huachuca 1987 Economic Impact

Actual 1987 Expenditures: \$498,700,000

Actual 1987 Payroll: \$261,900,000

Actual 1987 Employees: 12,114

	<u>Sales</u>	<u>Jobs</u>	<u>Income</u>
Cochise County, AZ	\$ 579,597,000	19,962	\$317,726,000
Post Region	961,091,000	24,745	383,689,000
Tucson, AZ BEA Region	966,521,000	24,818	382,299,000
State of Arizona	1,318,380,000	26,306	414,618,000

In this instance, the employment adjustment in the Post Region is a result of the fact that the Post Region includes the Tucson metropolitan area. Thus, the impact of Ft. Huachuca on its Post Region is a little more than a doubling of supported jobs with added income to Post Region residents of \$121,789,000.

TEST CASE FOUR: WASTE ISOLATION PILOT PLANT, CARLSBAD, NEW MEXICO

The Waste Isolation Pilot Plant is the major experimental, about to become operational, underground nuclear waste permanent storage facility. Excavated in deep, dry salt deposits from an ancient ocean by Westinghouse Corporation, the primary contractor, this project is sponsored by the U. S. Department of Energy. It is located in extreme southeastern New Mexico, Eddy County, near Carlsbad, New Mexico. The project employed 334 people by the end of FY 1987.

TEST RESULTS

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WIPP 1987 Economic Impact

Actual 1987 Expenditures: \$36,402,851

Actual 1987 Payroll: \$11,826,851

Actual 1987 Employees: 334

	<u>Sales</u>	<u>Jobs</u>	<u>Income</u>
Eddy County, NM	\$50,218,000	906	\$16,952,000
Eddy-Lea Counties, NM	52,846,000	757	16,310,000
El Paso, TX BEA Region	81,633,000	1,183	19,957,000
State of New Mexico	93,698,000	1,347	22,643,000

The effects of this case are similar to that of Cannon AFB in relation to the Base Region. When Lea County, NM, is added to the Eddy County area, once again the expected additional jobs and related income decline. It should be noted

that the residential income is affected both by fluctuations in employment and by sales volume. The latter is included as a function of the profit margin on sales.

TEST CASE FIVE: ZIA RAY I SIMULATED SPACE-BASED WEAPON COMMAND CENTER, CANNON AIR FORCE BASE, NM

This is a simulated case in order to model a projected defense facility operated in cooperation with Cannon Air Force Base, Clovis, NM. The project is planned over five years, from initial construction through the first year of full operations. The mission of the simulated project would be to serve as a control center for space-based deterrents. It would require large amounts of sophisticated electronic equipment manufactured largely outside of New Mexico. The construction phase is modeled to employ up to 2,000 civilians during the second year of the project. At full operational levels, up to 1,200 military and 2,100 civilian employees would be required. Construction costs are estimated at \$127,412,500 for materials and construction contracts.

The EIFS Forecast Model was implemented for the five year period, from initial construction through one year at full operation. Estimates were derived for impacts on the host county, the Cannon Economic Impact Area (plus De Baca County, NM, which is adjacent to the proposed site for the complex), a combination of the three Bureau of Economic Analysis (BEA) Economic Regions (Amarillo, TX, Lubbock, TX, and Albuquerque, NM) which intersect at Curry County, NM, the State of New Mexico and the United States as a whole.

The results of the projections are given below:

TEST RESULTS

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Curry County, NM (Home County to Cannon Air Force Base)

FIRST YEAR - Initial Construction Phase:

Construction Expenditures	\$21,660,125
Local Amount of Expenditures	\$11,376,178
Construction Jobs	500
Operations Expenditure	0
Operations Jobs (civ)	0
Operations Jobs (mil)	0

Forecast Changes in the local economy for the first year:

Increased Sales	\$47,547,000
Increased Jobs	1,076
Additional Income	\$17,643,000
Additional School Children	299

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SECOND YEAR - Main Construction Phase:

Construction Expenditure	\$84,092,250
Local Amount of Expenditure	\$44,165,249
Construction Employment	2,000
Operations Expenditure	\$10,000,000
Operations Employment (civ)	100
Operations Employment (mil)	100

Forecast Changes in the Local Economy for the Second Year:

Increased Sales	\$165,436,000
Increased Employment	3,704
Additional Income	\$ 64,895,000
Additional School Children	987

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THIRD YEAR - Reduced Construction, Increased Operations Phase:

Construction Expenditure	\$21,660,125
Local Amount of Expenditure	\$11,376,178
Construction Employment	500
Operations Expenditure	\$40,000,000
Operations Employment (civ)	800
Operations Employment (mil)	800

Forecast Changes in the Local Economy for the Third Year:

Increased Sales	-\$28,565,000
Increased Employment	-466
Additional Income	-\$ 3,040,000
Additional School Children	-269

These are lower levels
in relation to the
previous year.

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FOURTH YEAR - Construction Phase Ended, Further Increase in Operations:

Construction Expenditures	\$ 0
Local Amount of Expenditure	0
Construction Employment	0
Operations Expenditure	\$60,000,000
Operations Employment (civ)	2,100
Operations Employment (mil)	1,200

Forecast Changes in the Local Economy for the Fourth Year:

Increased Sales	\$40,167,000
Increased Employment	1,687
Additional Income	\$33,345,000
Additional School Children	598

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FIFTH YEAR - Fully Operational:

Operations Expenditure	\$80,000,000
Operations Employment (civ)	2,100
Operations Employment (mil)	1,200

Forecast Changes in the Local Economy for the Fifth Year:

Increased Sales	\$24,212,000
Increased Employment	293
Additional Income	\$ 2,619,000
Additional School Children	0

This chart illustrates the fluctuations that would take place through a five-year cycle on construction and phased-in operations. The total impact on the community over the five years in cumulative increased sales, employment, and income are shown below:

Total Increased Sales	\$248,797,000
Total New Jobs	6,294
Total Increased Income	\$118,198,000
Total Additional Pupils	1,615

In sum, the Zia Ray I Project would potentially result in a little more than \$248 million in increased sales in Curry County over a five year period. It would generate over 6,000 new jobs which would result in more than \$118 million in additional income to the community over the five year span. By the time stabilization was achieved at full operational level, the Curry County schools would have 1,615 additional pupils.

By comparison, when the study area is expanded to the Cannon Air Force Base Economic Impact Area of five counties, an additional \$322 million is added to sales and 6,206 additional jobs, resulting in \$130 million more income.

The impact of this project on the three BEA economic regions (Albuquerque, NM, Amarillo, TX, and Lubbock, TX) which meet at the western edge of Curry County would be \$521 million in increased sales and 7,663 new jobs with \$137 million new income.

With New Mexico isolated for study, the impact would be increased sales of \$454 million, 8,206 new jobs with \$140 million in new income to the State.

The national impact can be estimated to be \$2,431 million total new sales and 22,264 new jobs with \$334 million in new income.

The model indicates that the greatest impact will be in Curry County, NM. The surrounding counties would benefit to a lesser degree. New Mexico as a whole would benefit more than would the combination of the two Texas BEA regions, with the Albuquerque region in the area of job creation and income production.

As an additional point of comparison, the researchers used this fictional case to produce an analysis using the EIFS input-output model known as AIMS. The results of that assessment of impact are shown below, based on the entire five year start-up phase for the project:

TEST RESULTS

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Zia Ray I Simulated Space-Based Weapon Commands Center, CAFB, NM

Projected Total Expenditures: \$414,412,500
 Projected Total Payroll: \$287,000,000 (5 years)
 Projected Total Employees: 5,300 (over 5 years)

	<u>Sales</u>	<u>Jobs</u>	<u>Income</u>
Curry County, NM	\$ 918,330,000	6,294	\$407,984,000
Cannon Base Region	1,166,000,000	6,206	447,000,000
Albuquerque, Amarillo and Lubbock BEAs	1,928,000,000	7,663	487,000,000
State of New Mexico	1,680,000,000	8,206	503,000,000

This summary is included for comparative purposes with the first four cases. A detailed year-by-year example would provide a more thorough view of the effects of the project.

There are some discrepancies which are best explained by the fact that AIMS measures more exactly which types of goods and services are available in each region. Where such detailed information on industry breakdowns of cost data is available, AIMS is probably the more precise model. It takes approximately three times as long to compute the results with AIMS as with the Standard Forecast Model. Both utilize the EIFS databases.

OBJECTIVE SIX

SCENARIO REFINEMENT

Scenario refinement can occur at several levels in this project. It is hard to separate issues of model development from issues of project analysis and the relationship of the project(s) to the threat and target base. Each issue of refinement will be discussed separately.

REFINING THE INPUTS

During the four months of this project, the research team has endeavored to obtain detailed pre-project budgets on a wide variety of pending or approved military projects to use as test cases. Hampered by the late initiation date of the project and the pending security clearances of the research team, the search has not been exhaustive; however, the project personnel have reached a tentative conclusion. Most projects that are at the decision-alternative stage

do not have a significant amount of detailed, cost information that can be used for effective economic impact analysis.

There are three possible ways to resolve this problem. First, perhaps continuing pursuit of this information in the future months of the project will identify a source, as yet unknown. Second, those proposing alternative projects for decision-review, could be required to provide projected cost information in more detail. A standard format appropriate to impact analysis could be established for this purpose.

The third, and perhaps most feasible alternative, would be to develop a standardized estimating model which, given certain generalized information, could allocate the projected costs. This would add another step of inference to the process, but allow the current EIFS models to be used with little or no modification of the project proposal process. This kind of system would require a study of completed and/or contracted projects where adequate budget detail exists to build a systematic disaggregation rationale with a defined database. It is likely that such a model would classify projects into a few general categories where disaggregated costs are generally similar such as: research and development projects; first installation projects; base openings and expansions; weapons systems procurements, etc..

REFINING THE OUTPUTS

The output format of EIFS uses specialist terminology and formats that do not fully meet the decision-support system criteria enumerated above. In addition, the outputs are provided without reference to either base economic circumstances prior to the projected stimulus or comparison with outcomes from a different simulated stimulus.

If the DSS goal is to be met, the EIFS output format and terminology would have to be modified and some input adjustments made. These would not require a change in the analytic model or in the EIFS database. Presumably, they would require rather minor modifications for the report routines of EIFS.

REFINING THE DATABASE

The EIFS relies on decennial census data and other commerce data collected and made available in ten or five year cycles. This means that analyses made in years further and further from the collection date, have an increasing probability of inaccuracy. EIFS is attentive to this fact, and does attempt to update the databases at more frequent intervals. However, for certain kinds of data, especially national census and commerce data, it is beyond the current resources of EIFS or the U. S. Department of Commerce to correct this deficiency. This problem needs further evaluation including some estimate of the cost of operating a specialized data collection process for certain more critical data elements, and/or the cost of more frequent updates of the database(s).

REFINING THE STRATEGIC SIMULATION

For Phase One, the focus has been on identification and development of the microeconomic impact model and the use of readily available cases to test the utility of and access to the model. No attempt has been made to assemble some overall set of cases that represent a given year's decision context. The exigencies of this phase of the project have prevented access and appraisal of the Los Alamos National Laboratory threat databases as a basis for refinement of the strategic scenario. To be more effective, the impact model should be applied to a contrasting and comprehensive series of alternatives. The definition of these alternatives needs more than economic information. At least, basic microinformation about political and sociocultural impact should also be utilized as inputs.

THE PLAN FOR SCENARIO REFINEMENT

The plan for scenario refinement has several objectives with accompanying specific action tasks to meet the objective. The objectives are based on the project goal to "measure the economic impacts of a rapidly changing U. S. target base."

Objective 1. Develop procedures for interfacing Los Alamos National Laboratory threat databases with EIFS.

Task 1. Complete security clearances of project personnel.

Task 2. Arrange with LANL personnel to familiarize project personnel with threat databases.

Task 3. Develop formats for retrieving information from threat databases as simulated economic stimulus inputs to EIFS.

Task 4. Work with LANL and EIFS personnel to determine the technical feasibility and requirements of either a soft or hard interface between LANL threat databases and EIFS.

Task 5. Acquire the resources to interface the two systems.

Objective 2. Adapt the inputs and outputs of EIFS to a format and language that meet the criteria for an effective decision-support system and impact model.

Task 1. Consult with prospective users of the proposed DSS to identify: Desired input and output formats, appropriate economic analysis units, and other suggestions for system adaptation for this project.

Task 2. Consult with CERL-EIFS to determine the feasibility and expense of system adaptations.

Task 3. Acquire resources, develop user-approved designs and implement system adaptations to achieve DSS goals.

Objective 3. Improve the economic impact input detail for proposed military deterrent and defense projects.

Task 1. Further develop project personnel knowledge of the sources of information and process of formulation of cost information on proposed projects through visits to appropriate agencies and institutions.

Task 2. Determine the feasibility, and, if appropriate, design a model to simulate disaggregated project costs based on parameters of previous projects studied by class of activity.

Task 3. If feasible and resources are available, create the database, and design and apply the model.

Objective 4. Enhance the economic impact analysis by coupling it with similar models of political and sociocultural impact analysis.

Task 1. Survey the existing models of political and sociocultural impact analysis, develop criteria, and either select or develop models.

Task 2. Select or develop the databases to support political and sociocultural impact analysis.

Task 3. Test the political and sociocultural models on cases that will parallel economic analysis by the EIFS.

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APPENDICES

APPENDIX I

STATEMENT OF WORK

Economic Impacts Study

The subcontractor shall measure the economic impacts of a rapidly changing U.S. target base. This task includes:

Developing procedures for interfacing Laboratory threat databases and preliminary modeling scenarios with the U.S. Army Corp. of Engineer's Economic Impact Forecast System (EIFS). The result shall be a set of refined scenarios for threat evaluation.

Deliverables are as follows:

1. A progress report due 9/30/88
2. A design for EIFS access due 9/30/88
3. A plan for scenario refinement due 9/30/88

APPENDIX II

ALTERNATIVE INPUT - OUTPUT MODELS AND CHARACTERISTICS

The Economic Impact Forecast System (EIFS) is a computerized modeling and information system to support regional economic impact analysis. EIFS is physically located at Champaign, Illinois at the U.S. Army Construction Engineering Research Laboratory (CERL). EIFS operates within the shell program ETIS which is maintained and supported by the University of Illinois, Urbana, Illinois. EIFS contains three separate models which may be utilized for similar purposes. The three EIFS models are all variations of input-output analysis. Whether called Input-Output (I-O), Location Quotient (LQ), Shift-Share, or otherwise, they all use a form of input-output and/or multipliers; the major difference is in the procedure for generating the multipliers. Although the estimating procedures vary, the multipliers usually do not. The major variation in multipliers comes from the number and detail of SIC classifications used.

ETIS MODELS

1. EIFS: This model will be referred to only as EIFS or as the forecasting model. The model uses a Location Quotient technique (LQ) or relative employment relationships to generate economic base multipliers within the program. Some writers/users will refer to EIFS as an input-output model, while others will call it an economic base model.
2. EIFS Automated Input-Output Multiplier System (AIMS): This is a computerized input-output model which performs in a manner similar to the LQ model, but demands much more disaggregated information about stimulus by commodity, industry, and employment on a local and national basis. The model also provides more detailed results.
3. EIFS Air Force Region of Influence Model (AFROI): This computerized model is used to estimate the geographic area which is likely to be affected by a specific economic stimulus.

ADOTMATR INPUT-OUTPUT

The conceptual basis for this model is not significantly different from the ETIS models. The mechanical process and the external data requirements are somewhat different, but it is a basic input-output model. This program offers certain advantages over many of the other programs in that provision is made for the "importation" of selected data elements. The ability to bring in these data elements from outside the model allows further refinement of the model and corresponding increases in the accuracy of the analysis. The ability to bring in outside data also increases the complexity of the model for the user and increases the level of knowledge necessary to install and implement the model. The model is PC-based, but requires the input of the analytical database as well as the data related to the stimulus (input data).

OBERS

The OBERS model was used in the early stages of its life as an economic impact estimation technique. This was a joint effort of the U.S. Department of Commerce Office of Business Economics and the Economic Research Service of the U.S. Department of Agriculture. The present activity levels are focused on projections of economic activity and population for the nation and the states. Although the projections are well thought of, the Department of Commerce does not maintain a comprehensive database, and they no longer attempt to estimate economic impacts. OBERS is now a function of the Bureau of Economic Analysis in the Department of Commerce.

IMPLAN

IMPLAN is a computerized input-output model developed and used by the U.S. Forest Service to assess economic impact as a part of their land and resource management planning program. The program allows the user to access the Fort Collins computer to input data and receive responses on-line. The program is operated as a mainframe application, but the conversion to a PC-based system is in progress.

RIMS II

RIMS II was developed in the mid-70s under the auspices of the Office of Economic Adjustment, Department of Defense. This office operates the Defense Economic Adjustment Program (DEAP). The purpose of DEAP is to assist communities by predicting and resolving problems caused by defense program changes, such as the creation or expansion of military installations or the reduction and/or closure of defense facilities. RIMS II provides multipliers for all counties in the U.S.

APPENDIX III

EIFS DATABASES AND DATA CURRENCY

The purpose of this appendix is to indicate the types of data which are available through the ETIS system and the extent to which the data is current.

EIFS is the acronym for Economic Impact Forecast System, a computerized modeling and forecasting system. The system was originally designed to assist military installation planners in supporting regional economic impact analysis. The system and database(s) are now being used for other purposes. The EIFS databases come from a variety of sources and have been computerized to enable the user to quickly identify and retrieve the pertinent data. Unfortunately, converting the raw data to a computer file is a time-consuming and expensive process. As a result, much of the data is not as current or timely as would be desirable. There is more current data available, but it has not been validated for correctness and it is not in the computer files. The data that is available in the computer files is generally (but not always) available at the county level, allowing the detailed analysis that is frequently desired. The EIFS system also has numerous pre-identified economic areas which may be commonly used for economic analysis. These units include locations of military installations and SMSAs. The system also allows the user to identify and define economic units which may be the subject of analysis at a future time. The pre-identified regions can then be given names and preserved for future use. The table below is a representation of a similar table found in an EIFS publication which describes the data sources of the EIFS database (CERL).

TABLE I
DATABASE SOURCES

DATA SOURCE	YEAR	FREQUENCY OF UPDATE
U.S. Bureau of the Census:		
Census of Housing & Population	1970, 1980	10 years
County Population Estimates	1970, 1980, 82, 84	Annually
Census of Government Finance	1982	5 years
Census of Wholesale Trade	1982	5 years
Census of Retail Trade	1982	5 years
Census of Service Industries	1982	5 years
Census of Manufactures	1982	5 years
Census of Agriculture	1982	5 years
County Business Patterns	1977, 1982, 1985	Annually
U.S. Bureau of Economic Analysis:		
Employment by Division Industry	1969-1984	Annually
Earnings by Division Industry	1959-1983	Annually
Farm Income and Expenditures	1969-1983	Annually
Detailed Transfer Payments	1959-1983	Annually
U.S. Bureau of Labor Statistics:		
Local Area Unemployment Data	1976-1983	Annually

APPENDIX IV

ACCESS AND INPUT PROCEDURES FOR EIFS STANDARD FORECAST MODEL

Contact with ETIS (Environmental Technical Informational System) is initiated by telephone call. The telephone number is (217) 333-1369. Also required for access to the system is an account with CERL (for billing purposes) which will result in an account number and name. The user will also need to establish a password.

1. Contact with ETIS is initiated by telephone call and a modem connection to a computer. The call may be dialed manually or the more frequent user may choose to acquire an automatic dialer.
2. When contact is made, a number ("5" for example) will come on the screen in the upper left-hand corner. Press "return" when that number appears.
3. When the prompt "login" appears, type your login title as approved by ETIS. Follow the same procedure when "password" appears as a prompt. If this is done correctly, a dollar sign ("\$\$") prompt will appear. Type "ETIS" at the prompt.
4. Some descriptive information about ETIS will appear on the screen. Then, the user is asked "What Program?" For EIFS (Economic Impact Forecast System), type "4".
5. Again, initial information about EIFS appears before the prompt "First County or Region?" At that point, type in the county name and standard state abbreviation separated by a comma (e.g., Roosevelt, NM). EIFS then prints out the population and land area of the selected area. "County" can also be a region (defined as a collection of counties,) a state or states, or USA for the entire country.
6. After printing the county or region population information, which is added together at the bottom of the list, the prompt "What Section?" appears. Type "1" for Forecast Models.
7. When the prompt "What Profile?" appears, type "1" for Standard EIFS Forecast Model. This will bring up the prompt "Project name."
8. Type in whatever name will best identify this particular exercise.
9. The model then allows the user to insert price deflators by typing "d" or to accept the default deflators (1987 for Producer Price Index [PPI] and for Consumer Price Index [CPI]) by pressing "return."
10. The user is then told that if the study is using total expenditures for the project to type "1". If the study is using only local expenditures, the user should type "2". Then enter the dollar amount of change in expenditures for services and supplies for the project. If the user has indicated these are total figures, the model automatically calculates the amount estimated for local expenditures.

11. The user then enters the change in civilian employees, followed by the average salary of these employees. If there are military employees, this number must be entered along with average salary information. A figure is then requested for percentage of military employees residing on-base.
12. The model then calculates an estimate of the number of public school students the projected change would affect. The user may override this figure if actual figures are available. Once this step is completed, the Forecast Model proceeds to list the following items based on user input and information accessed from the supporting databases:
 - Export employment multiplier
 - Export income multiplier
 - Export sales multiplier
 - Changes in local sales volume
 - Changes in local employment
 - Changes in local income
 - Changes in local consumption
 - Changes in local investment
 - Changes in the number of local school children
 - Changes in local property values
 - Changes in local government revenues
 - Changes in state and federal aid to local schools
 - Changes in local government expenditures
 - Net change in local government revenues
13. An option to given to print the results or to save them to a file
14. To exit the program, type "q" for "quit."