R.I.F.L.E.
REGIONAL IMPACT OF FACILITY
LOCATION ON THE ECONOMY.
USER'S GUIDE

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R. I. F. L. E.

Regional Impact
of
Facility Location
on the
Economy

User's Guide

Maryland Economic, Fiscal
and Social Impact
Assessment Model

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COASTAL ZONE
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Part I

Using RIFLE

INTRODUCTION

RIFLE (Regional Impact of Facility Location on the Economy) is a computerized version of the Economic, Fiscal, & Social Assessment Handbook, Volume 3 of the Maryland Major Facilities Study (henceforth referred to as the HANDBOOK).

The purpose of this Users' Manual is to assist the user of RIFLE in preparing the input data required to execute the system, as well as in choosing among the many options. The manual does not include any discussion of the theoretical aspects of the models contained in the system. References to the HANDBOOK will be provided, when appropriate, to assist the user in choosing the desired steps in running the various models.

It should be noted that in several cases, changes have been made in the model as presented in the handbook. In some cases, these reflected minor errors; in other cases, changes were made to increase the generality of the model. These changes are noted in Appendix Q.

RIFLE consists of ten models which can be used to analyze the impact of a major facility (See Appendix A) on any county in the region in which the facility is located. The first seven models are computerized; the remaining three are run with manual calculations in Part III. The impact of locating a facility is always analyzed for a 12-year period. The function of these models (with the corresponding sections in the HANDBOOK) is as follows:

1. Match labor force demand with supply and calculate the deficit, if any. Calculate the first round effects of building a major facility, including direct, indirect,

and induced income and employment (Section 1.1 through 1.6).

2. Calculate additional rounds of indirect and induced income and employment, and summarize the calculations presented in the first two models (Sections 1.7 through 1.9).

3. Determine inmigration to the county under study. This is part of Model 1, but may be run separately (Section 2.1).

4. Determine the demand for housing, divided up into various submarkets. Compare the demand in the various submarkets to the supply in those submarkets. Allocate deficits to other submarkets, if possible (Section 2.2).

5. Determine the number of persons to relocate into the county under study. Calculate the number of school children to relocate into the county under study.

6. Predict the increased revenue to state, county, and municipal governments generated both directly and indirectly as a result of locating a major facility (Chapter 3).

7. Assess government expenditures using average costing, and compare to the revenues predicted in Model 6 (Chapter 4).

RIFLE can be executed as a sequence of models, running from Model 1 through Model 7. When running models individually, it should be noted that many of the models rely on previous computations by other models, and that zeroes will be substituted for omitted calculations when necessary. The

requirements of each model are discussed in detail in the following sections of the Users' Guide.

The user of RIFLE has been provided with a wide range of options and flexibility in running the system. Required input has been kept to a minimum. For every option available to the user, a default operation has been assigned which represents the most common mode of operation. Unless instructed otherwise by the user, the default is executed. In the same manner, every coefficient, table, and parameter used by RIFLE in the various models may be changed by the user if desired. In addition, the user is provided with extensive control of the listing of output from the system.

RIFLE employs a semi-free format system for data entry. The system recognized keywords and numbers, each of which must be separated by at least one blank. In addition to the keywords, user-supplied names are recognized by using two slashes as delimiters, one before and one after the keyword. Any entry beyond column 72 will be ignored. Each card input is taken to be either an instruction to the system or a data input, and may not be continued to the next line, except where explicitly noted below. The instuctions themselves have been designed to be as close to the English language as possible.

Comments may be made on any card by placing a dollar sign after the last item on the card, and following the dollar sign with the desired comments. Note that comments may not be made on a card without a RIFLE instruction preceding them.

Data are stored in RIFLE's data base in three ways. Single numbers are referred to as parameters (See Appendix D). Other data are stored in one of two kinds of tables - explicit or derived. Explicit tables are those which appear as such throughout the HANDBOOK. Derived tables are those that do not. In RIFLE all tables are 3-dimensional, and thus a single

number is referred to by row, column, and page, as well as table name. Some tables will have only page. In this case, the page number may be omitted when referring to the table. Similarly, the row number may be omitted for tables with only 1 row. (See Appendix E for dimensions of tables). Note that all parameters are considered to have 1 row, 1 column, and 1 page, and that all tables printed as a simple list are considered to have 1 row and 1 page (with several columns).

RUNNING RIFLE

The basic procedure for running RIFLE is giving commands to the system. Each command requires a section of input, as described below. The four commands are $IDENT, $OPTIONS, $RUN, and $FINISH.

o $IDENT instructs the system that the identifying information about the facility, county, and cities to be studied will follow (see IDENT Section).

o $RUN instructs the system to run one or more of the models in RIFLE. In addition, the input(s) required for each model specified to be run will follow (see RUN Section).

o $OPTIONS instructs the system that one or more options will follow (see OPTIONS Section).

o $FINISH signals the end of the job stream, and should be the last input card.

IDENT Section

The first card in the ident section should be:
$IDENT

The second card should be:
*FACILITY

This instructs the computer that information about the facility to be studied will follow. The facility sub-section is as follows:

TYPE facility

where "facility" is the type of facility to be used, and should be chosen with great care (See Appendix A).

NAME / name /

"name" is the name of the facility, which in no way affects the operation of the model. Note - although up to 40 characters are allowed, on some forms only the first 20 characters will be printed.

YEAR num

where "num" is a positive integer (year number). This defines the starting year of construction for the facility.

After the facility sub-section, the following card should appear:
*COUNTY cname URBAN

or

*COUNTY cname RURAL

where "cname" is the name of the county in which the facility is to be located (see Appendix B). Choose URBAN if the facility is located within an incorporated municipality. Other-wise, choose RURAL.

After the county card should be the cities sub-section, as follows:
*CITIES NONE

or

*CITIES

or

*CITIES cname

In the third version of the CITIES card, "cname" refers to the name of the county under study. The third version should only be used if the county under study is <u>not</u> the same county as the one where the facility is located (see Option #1 below).

If no cities are to be studied, specify the first version of this card. If the second or third version of this card is specified, then the following four cards should be supplied for each city to be studied:

<u>CITY</u> n

<u>SUBAREA</u> m

<u>NAME</u> /ctname/

<u>POPULATION</u> pop

"n" is the number of the city, going from 1 up to the number of cities to be studied, in order. "m" is the subarea number in which the city is located. "ctname" and "pop" are the name of the city and its population. A maximum of ten cities can be studied in a single run of the model.

An example of a complete IDENT section follows:

$IDENT
*FACILITY
TYPE OIL-REFINERY
NAME /TALBOT REFINERY 3/
YEAR 1985
*COUNTY TALBOT RURAL
*CITIES
CITY 1
SUBAREA 2
NAME /BIGTOWN/
POPULATION 40000
CITY 2
SUBAREA 1
NAME /SMALLTOWN/
POPULATION 20000

CITY 3
SUBAREA 3
NAME /ONE HORSE TOWN/
POPULATION 50

RUN Section

There are two versions of the run card, which is the first of the run section. The first is:

$RUN M-N1 THRU M-N2

where "n1" and "n2" are the first and last models to be run, respectively.

The second version of the run card is:

$RUN M-N

where "n" is the number of the model to be run.

For both versions of the run card, the run section is completed by providing the input for all models specified by the run card, in the order in which the models will be run. For the specific input requirements of each model, see that model's detailed description below.

As an example, to run all 7 models, enter:

$RUN M-1 THRU M-7

OPTIONS Section

     The first card in the options section should be:
$OPTIONS
To complete the options section, the user should list each option he is interested in using. Most options consist of a single card.

     There are three basic types of options available under RIFLE. They are procedural options (selecting a procedure other than default), list options, and replacement options (replacing a data item in the system's data base with one provided by the user).

     There are ten Procedural Options,* as follows:

    1.   Analyzing the impact on a county other than that where the facility is located:

*COMPUTE EFFECTS ON cname
where "cname" is the name of the desired county.

    2.   Computing a fixed number of rounds of induced and indirect income and employment:

*COMPUTE n ROUNDS
where "n" is the number of rounds, to be positive and not greater than 6.

*Note: Options 4, 5, 6, and 10 are not used.

3. Compute rounds of induced and indirect income and employment until the percentage increase of employment over the direct employment is less than a specified level. This value is measured as the additional employment in a given round as a percentage of the initial, direct employment generated by the facility. For example, if the peak-year initial, direct employment is 100 persons and round 5 results in 10 persons hired, a 10% increase in employment has resulted.:

*STOP ROUNDS AT n PERCENT
where "n" is the desired level, to be greater than 0.0 and not greater than 100.0

Options 2 and 3 are mutually exclusive. If neither is specified, rounds will be run until the increase of employment from the previous round in the greatest year is less than the value of the parameter EMPL-CUTOFF-AMT

7. Define the housing market as "tight," rather than using the Housing Market Test (HANDBOOK, P.99). When the housing market is defined as tight RIFLE will use the value of the parameter HSG-TIGHT-VALUE (see Appendix D) for the number of workers per dwelling unit.

*TIGHT HOUSING

8. Define the housing market as "loose," rather than using the Housing Market test (HANDBOOK, P. 99). When the housing market is defined as loose, RIFLE will use the value of the parameter HSG-LOOSE-VALUE (see Appendix D) for the number of workers per dwelling unit:

*LOOSE HOUSING

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9. Omit the surplus-to-deficit calculations of Form 2-2(B)-(X), (in the HANDBOOK, Steps VI2-VI-6, Form 2-2(B), P. 111):

Options 7 and 8 are mutually exclusive. If neither is specified, the Housing Market test will be used to choose whether the housing market should be defined as tight or loose.

*OMIT SURPLUS-TO-DEFICIT

The List Options are as follows:

1. *LIST DEFAULT

This causes the printing of summary forms only, and removes any prior list options. If there were no prior list options, this list option will have no effect.

2. *LIST ALL

This will result in the printing of all forms run and all data (tables and parameters) used by RIFLE.

3. *LIST FORMS

Results in the printing of intermediate as well as summary forms (those used by RIFLE).

4. *LIST TABLES

Results in the printing of all tables (both explicit and derived) from which any information is used in the course of a run by RIFLE.

5. *LIST PARAMS

Results in the printing of all parameters encountered during the course of a run.

6. The user may direct RIFLE to list any particular form, table, or parameter as desired. The first card in this option should be:

*LIST FOLLOWING

Following this card should be a list of the desired items to be printed, one per card. For example, the following three cards will result in the printing of forms 2-1(A) and 2-1(B):

*LIST FOLLOWING

F-2-1(A)

F-2-1(B)

Several things should be noted when using the list options:

1. List options encounterd by RIFLE are cumulative. In other words, each item or class of items specified in a list option adds to the list of items to be printed. Only by specifying the default list option can items be removed from the output listing.

2. Summary forms are printed regardless of the list opitons specified and although RIFLE will accept the names of summary forms as items to be printed, whether they are specified or not will have no effect on the output listing.

3. Several forms will not be printed, even if they are specified by the user in a list option, if there has been no information generated on them. For example, if the user has not requested cities to be studied, the forms which apply to tax revenues collected by cities will not be printed regardless of the print options used.

4. Forms, except for summary forms, are printed as the information contained in them is completed. Summary forms, tables, and parameters are printed as the summary of each model, after all computations for that model have been completed. (The exception to this is Model 1, for which summary information is printed at the end of Model 2.)

The *DUMP option has been provided to allow the user to analyze changes made, or simply to print a given item, without running the model in which that item is used. The option is used as follows:

*DUMP reference
where "reference" is the item to be DUMPed.

For example, to have Table 1-1 immediately printed, the following should be used:

*DUMP T-1-1

The Replacement Options permit the items in the data base of RIFLE are replaced using the SET option. There are two versions of the SET option:

*SET reference TO number
and
*SET reference
list

The first version should be used for replacing a single number, and the second for a list of numbers. The "reference" is the name of a table or parameter, plus (optionally) an indicator of a row and/or column and/or page number. The syntax for specifying a reference is as follows:*

ROW num COLUMN num { PAGE num }

PAGE num

name COLUMN num PAGE num
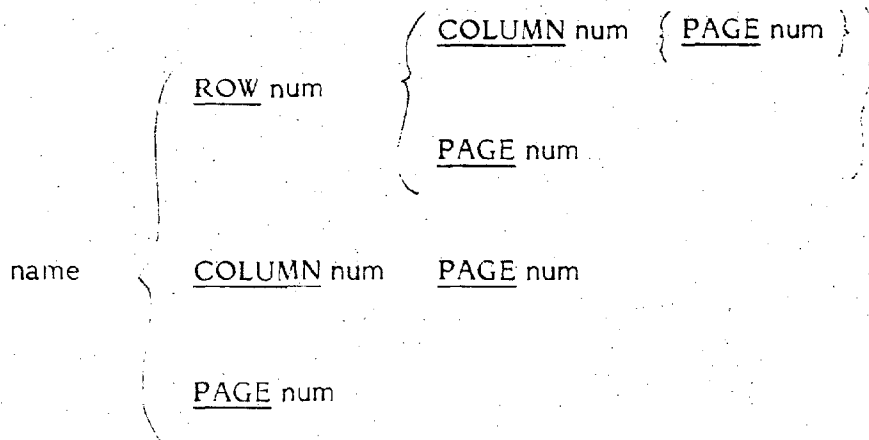
PAGE num

where "name" is the name of a table or parameter, and "num" is the index to a row, column, or page. The order in which the row, column, and page numbers is specified is important. For tables in which a row, column, and page number have to be specified, the user needs to specify the row number first, the column number second, and the page number third. For tables in which only a row and column number need to be specified, the user needs to specify the row number first and column number second.

---

*In this diagram, alternative choices are on different lines, and optional entries are denoted by brackets { } .

To replace the first element of Table 1-1 with the number 26, the user should enter:

*SET T-1-1 ROW 1 COLUMN 1 PAGE 1 TO 26

To replace the 12 items in derived table Pa-Hsehold-Inca use the following three cards:

*SET PER-HSEHOLD-INCRS
1.0 1.1 1.21 1.331 1.46 1.61
1.77 1.95 2.14 2.36 2.59 2.85

The user should take great care to note the dimensions (number of rows, columns, and pages) of the data item(s) to be referenced. By omitting a reference to a particular row, column, or page, the user is implicitly specifying all rows, columns, or pages of the table. For example, specifying

*SET T-1-1 ROW 1
list

will result in RIFLE expecting an entry for all 12 columns of Row 1, Table 1-1, for each of 20 pages, or a total of 240 numbers in the list to follow.

Note that, when providing a list of numbers after the SET card, the list may be continued over as many cards as needed (entries may not go past Column 72).

Special Note--When replacing an entire table which has more than 1 row, the rows of that table must be replaced one at a time.

To replace EMPL-CUTOFF-AMT with the number 20 (additional rounds of employment and income -- Model 2 --will not be run if peak-year employment is increased by less than 20 persons), the user should enter:

*SET EMPL-CUTOFF TO 20

On the other hand, specifying

*SET CORP-PARTNER-PCT ROW 1
list
will result in RIFLE expecting a total of onlly 2 numbers, since the derived table CORP-PARTNER-PCT has only 2 columns and only 1 page.

The user should take great care to note the dimensions of the item being SET, which can be found in Appendix E.

To replace page x of table ZZZ, enter:
*SET ZZZ PAGE x
... row 1 of page x of ZZZ ...
... row 2 of page x of ZZZ ...

To replace row x of page y of table ZZZ, enter:
*SET ZZZ ROW x PAGE y
... row x of page y of ZZZ ...

To replace row x for all pages of table ZZZ, enter:
*SET ZZZ ROW x
... row x of page 1 of ZZZ ...
... row x of page 2 of ZZZ ...

To replace column x of page y of table ZZZ, enter:
*SET ZZZ COLUMN x PAGE y
... column x of page y of ZZZ ...

To replace column x for all pages of table ZZZ, enter:

*SET ZZZ COLUMN x
... column x of page 1 of ZZZ ...
... column x of page 2 of ZZZ ...

To replace row x, column y, page z of table ZZZ with the number 42.3, enter:

*SET ZZZ ROW x COLUMN y PAGE z TO 42.3

Note finally that whenever the row, column, or page dimensions of an item is $\underline{1}$ (see Appendix E), the reference to row, column, or page may be omitted.

Part II

Models 1 through 7

MODEL 1

Model 1 includes Sections 1-1 thru 1-6 of the HANDBOOK. First supply of and demand for labor are determined. Second, the first round of indirect and induced effects are computed. Finally, income generated from direct and first round hiring is computed. Model 1 also runs Model 3 (Gravity Model), which is treated below.

Note that for power plants, the indirect effects are included in the employment profile, and therefore round 1 indirect effects are not computed for these facilities.

The input requirements of Model 1 are as follows. The first card should be:

*M-1 INPUT FOLLOWS

If the site is a boundary site (See HANDBOOK, P. 34) the user should enter the following card:

BOUNDARY cname
where "cname" is the name of the county closest to the facility (the boundary county). If the site is not a boundary site the BOUNDARY card should be omitted.

For each county within 15 miles of the site, the user should enter:

NEARBY cname
where "cname" is the name of the county. At least one NEARBY card must be included; as many as ten (10) may be. If the site is a boundary site, the county specified on the BOUNDARY card should not be repeated on a NEARBY card.

For parameters and tables associated with Model 1, See Appendices D and E.

When running Model 1, Model 3 will automatically be run before Model 1 is run. Therefore, when running Model 1, the input for both Model 3 and Model 1 must be specified, just as if they had both been explicitly mentioned in a run card.

MODEL 2

Model 2 includes Sections 1-7 thru 1-9 of the HAND-BOOK. First, additional rounds of induced and indirect employment and income are generated until the increase in employment is small (see OPTIONS Section, Part 1). Second, the information presented in Models 1 and 2 is summarized.

No information need be supplied by the user for running Model 2.

For parameters and tables associated with Model 2, see Appendices D and E.

Note: Model 2 should not be run without first running Model 1.

MODEL 3

Model 3 is the Gravity Model (Section 2.1, HANDBOOK). The Gravity Model computes the number of outside hires to relocate into the county under study, broken down by subarea and by consumption category.

Model 3 allocates outside hires to various locations around the vicinity of the facility; therefore, if there are no outside hires (see 7-1-1) Model 3 should not be run. Note also that if Model 3 is not run, Models 4 and 5 should not be run either.

Before the probabilities of workers relocating to each county are computed, the T_{ij} values, on which they are based, are computed. The user should be aware of the three methods for computing the T_{ij} values. First, if the user has used the *SET option to change (from zero) any of the values in T-2-1(B)-(X), that table will be used. The user should note that if even only one value is made non-zero, the entire table will be used.

If T-2-1(B)-(X) is all zero, one of the following three methods will be selected, depending on the facility type.

1.   Nuclear Power Plants - T-2-1(B) will be used.

2.   OCS Oil and Gas Facility - Form 2-1(D) will be used, which is based in part on the parameters GRAV-INMIG-OUT and GRAV-INMIG-DEF (See Appendices E,F).

3.   All other facilities - all outside hires will be used. This has the potential of overestimating the number of relocating employees, and therefore of overestimating the level of fiscal activity.

Note - In methods 2 and 3, the computer model does not distinguish between white and nonwhite workers.

The first input card for Model 3 should be:

*M-3 INPUT FOLLOWS

There are two types of inputs to Model 3. First, if the facility is a nuclear power plant, the user should choose the page number for Table 2-1(B) as follows (see Appendix E):

T-2-1(B) PAGE n
where "n" is th desired page number.

The second type of input is the set of distance factors for the gravity model. A distance factor is defined within RIFLE as the distance between the central place of a subarea and the facility site. To be valid, the distance factors must be not less than the parameter GRAV-MIN-DIST (preset to 5) and not greater than the parameter GRAV-MAX-DIST (preset to 55). For a discussion of the distance factors, see the HANDBOOK, p. 79. For each county for which distance factors are to be given, the following set of cards should be entered: The first card in the set defines the county:

COUNTY cname
where "cname" is the name of the county. In this case, the county may come from either Appendix B or Appendix H. The remaining cards in the set should be of the form:

SUBAREA m n MILES
     or
SUBAREA m n MINUTES
where "m" is the subarea number and "n" is either the number of miles or minutes (driving time) between the subarea and the site. The user may use either miles or minutes, but not both.

The SUBAREA card should be repeated for every subarea within
the given county for which distance factors are supplied by the
user. The entire set should then be repeated for each county in
which distance factors are supplied.

Example of a set of distance factors -
COUNTY DORCHESTER
SUBAREA 1 7 MILES
SUBAREA 2 20 MILES
SUBAREA 3 21 MILES
COUNTY CAROLINE
SUBAREA 2 39 MILES
SUBAREA 3 27 MILES

Up to 25 distance factors may be included. A distance
factor in excess of 55 miles will not be accepted by the model.

For Parameters and Tables associated with Model 3, see
Appendices D and E.

MODEL 4

Model 4 is the Housing Model (Section 2.2, HANDBOOK). Computed by the Housing Model is the housing stock deficit or surplus, by housing category, for each of twelve years.

Note: Model 4 should not be run without first running Model 3 (or Model 1, which runs Model 3).

The first card of user input should be:

*M-4 INPUT FOLLOWS

The next card should be:

T-2-2(A) PAGE n
where "n" is the user's choice for which page of Table 2-2(A) is to be used (see Appendix E).

The remaining input for Model 4 is the estimated supply of each of the 6 housing categories for each of 12 years:

HOUSE-OWN n n n n n n n n n n n n
HOUSE-RENT n n n n n n n n n n n n
APARTMENT n n n n n n n n n n n n
MOBILE-HOME-OWN n n n n n n n n n n n n
MOBILE-HOME-RENT n n n n n n n n n n n n
SLEEPING-ROOM n n n n n n n n n n n n

where "n" in each case is an integer number greater than or equal to 0.0. The numbers may be continued onto a second card, if need be, for each of the six cards.

For Parameters and Tables associated with Model 4, see Appendices D and E.

MODEL 5

Model 5 is the Population Model (Section 2.3, HAND-BOOK). It predicts the number of persons relocating into the county under study. It also predicts the number and grade breakdown of school children relocating into the county under study.

Model 5 requires no input on the part of the user.

For Parameters and Tables associated with Model 5, see Appendices D and E.

Note: Model 5 should not be run without first running Model 4.

MODEL 6

Model 6 is the Revenue Model (Chapter 3, HANDBOOK). It computes revenues going to state, county, and (optionally) municipal government. Revenues are separated into direct, indirect, induced, personal, property tax, miscellaneous, and (optionally) municipal categories.

As of the date of this printing, all values in the model are based on 1976 information. In the event the user wants to update this information to a more current year, he or she should contact the Maryland Department of Natural Resources for assistance.

In the computations of direct revenues, the inputs to the first three forms (3-1(A), 3-1(B)-(1), 3-1(B)-(@), 3-1(C)) will differ widely with the kind of facility being investigated. For power plants (both nuclear and conventional), land value and value of utility shares is taken from Table 3-1(A). For Oil-related facilities, tax information is taken from the derived table OIL-TAX-ITEMS. It should be noted that the tax information for OIL facilities is derived from Table 3-1(C), p. 127, HANDBOOK. The information for the Outer Continental Shelf (OCS) facility is based on the sum of the four kinds of facilities which compromise OCS. They are Pipeline Landfall, Tanker Terminal, Natural Gas Processing Plant, and OCS Onshore Operations Base. (These four terms are not meaningful within the RIFLE system; they are only provided as a reference to the HANDBOOK). For Industrial Parks (IDP), tax information is taken from the derived table IND-PARK-ITEMS. It should be noted that the tax information for IDP facilities is derived from Table 3-1(B), p. 126, HANDBOOK. The assumptions for LAND VALUE are the same as in Table 3-1(B). For IMPROVEMENT VALUE the figures provided in IND-PARK-ITEMS are based on 1 worker. The user should substitute site-specific information based on the actual number of workers. For Sand and Gravel

facilities, the information is taken from SAND-GRAVEL-ITEMS. For PRM (Port/Residential/Marina) facilities, the information is taken from LAND-VAL-IMPRV-ONLY. Finally, if the "OTHER" facility is used, the tax information is taken from the derived table NO-INFO-ITEMS.

In each case, the relevant page number of the table being used is determined by the tax page number (see Appendix A). It is up to the user to replace site-specific tax information which is preset to zeros in the tables above (see Appendices E and F). Note that any replacements made in tables used by Model 6 must be made in an OPTIONS Section preceeding the RUN card for Model 6.

The first card of input for Model 6 should be:

*M-6 INPUT FOLLOWS

The second card of input for Model 6 should be:

COUNTY PROP-TAX-RATE m PCT

where "m" is the county property tax rate. If no cities are to be studied in Model 6 (the IDENT Section specified *CITIES NONE) then only those two cards need be included. If cities are to be studied, the following set of cards should be included for each city specified in the IDENT Section.

CITY n

where "n" is the number of the city

PROP-TAX-RATE n PCT

where "n" is the municipal property tax rate

OTHER-TAXES m DOLLARS

STATE-SHARED m DOLLARS

LICENSE-PERMIT m DOLLARS

where "m" in each case is the amount of tax revenue collected in that particular category for the most recent year (see Form 3-7(C), p. 148, HANDBOOK).

When the revenue information is summarized (Forms 3-8(A)), the sources are numbered from 1 to 13. The user should refer to Appendix G for an explanation of the sources.

For Parameters and Tables associated with Model 6, see Appendices D and E.

For the most complete results, Model 6 should be run after running Models 2 through 5. This need not be done however, and RIFLE will insert zero values for any tax category for which a model has not yet been run.

MODEL 7

Model 7 is the Average Costing Model (Chapter 4, HAND-BOOK). It computes cost increases in educational and various non-educational areas of government. It also compares summarized cost information with summarized revenue information from Model 6.

The input requirements for Model 7 are as follows. The first card should be:

*M-7 INPUT FOLLOWS

The second card should be:

COUNTY ED-EXPENDITURE n DOLLARS
where "n" is the current county operating expenditure for education (See Form 4-2(B), p. 168, HANDBOOK). The third card should be:

CURRENT SCHOOL-ENROLLMENT n PEOPLE
where "n" is the current school enrollment (See Form 4-2(B), p. 168, HANDBOOK).

If no cities are to be studied in Model 7 (i.e., the IDENT Section specified *CITIES NONE) then only these three cards need be included. If cities are to be studied, the following set of cards should be included for each city specified in the IDENT Section:

CITY n
where "n" is the city number

PER-CAPITA-BUDGET n n n n n n n n n n

where "n" in each case is the amount spent for the indicated city per capita in one of the ten budget categories. All ten must be included, and may be continued to a second card if needed. (See HANDBOOK, Section 4.1).

DEBT-SERVICE-PCT n

where "n" is the debt service percentage of operating budget for the indicated city.

For Parameters and Tables associated with Model 7, See Appendices D and E.

Note - Model 7 should not be run before running Model 5. If Model 7 is run without first running Model 6, then the revenues will be zero when cost and revenue are compared.

Part III

Models 8 through 10

EFFECTS OF POPULATION INCREASE ON GOVERNMENT SERVICES

In Model 7 we outlined a procedure whereby a user applied an average costing approach to obtain an overview of the governmental expenditures called for as a result of a major facility. In essence, as was noted there, this approach relies on determining per capita or per pupil expenditure levels and projecting them against the number of school children or total population being added to the community, be it a county or incorporated town.

. The alternative that was also described was to analyze the particular impact of the population on each service, based on detailed assessment of the particular local conditions affecting the service under consideration, rather than on average per capita expenditure levels.

This approach relies entirely on the ability of the user to exercise his or her judgment in the light of local information. From a model standpoint, we can provide the user with only two pieces of information: (1) the population or school enrollment increment that is to be expected in a particular geographic area; and (2) such "rule of thumb" factors as may be available to convert population into measurements more directly related to the service at hand (e.g., gallons of water used per person per day, or tons of solid waste disposed of per person per year). Beyond this, it is up to the user.

In these models we have provided a guide to the conduct of a case analysis of the effect of the population increase for each of eight separate service areas. The first section (Model 8) assists the user in establishing a number of parameters of potential value in the subsequent analysis of governmental

services. The second section (Model 9) deals with non-education services:

- Police services
- Fire and emergency services
- Water supply
- Wastewater (sewage) disposal
- Solid waste disposal
- Recreation and libraries
- Health services

Model 10 deals with public education.

The case analysis differs significantly from the approach adopted in the preceding models. For the most part the user was in a position to plug numbers generated by the model into a series of straightforward linear processes leading in turn to other numbers. Although individual judgment could be used, it was for the most part not required. In this section, it is essential. <u>The only way that service increments can be "triggered" is through an explicit user judgment that the increase in population or school enrollment calls for such an increment.</u>

Having decided that an increment is required, the user must then choose between available alternatives to select the way in which the county (or municipality) deals with the demand. In many service delivery areas, there are various alternative ways in which a given increase in demand can be met. For example, an increase in school pupils can be dealt with through construction of a new school or addition of a new wing to an existing school (to take advantage of the administrative infrastructure already there). Alternatively, it may be possible to meet the demand, if it will only exist for a short period, through the installation of temporary classrooms on school grounds.

The forms provided in Models 9 and 10 are designed to assist the user in measuring the fiscal implications of the choices he or she makes. Having decided that a particular action is necessary, the user can evaluate the capital cost involved, the operating costs associated with it, and the manner in which those costs will be assumed by the jurisdiction incurring them. The forms can also be used to assess the effects of actions that do not necessarily involve capital improvements.

One other point should be stressed. Unlike the average cost approach, which treated each jurisdiction (generally the county) as a single entity, the case analysis or marginal cost approach benefits by the finest breakdown of population increase by small area. Clearly, a group of people moving into an area with inadequate sewer service will require greater increments than a group moving into an area with more than ample service capacity. As has been noted, population models are limited in their ability to pinpoint the location of a population influx with precision. The population model used here provides for two levels of population breakdown within each county: (1) by subarea, with each county divided into a number of subareas around a central place, generally three or four per county; and (2) within subareas, distinguishing between the population within an incorporated community and the remainder of the population in the subarea outside the municipality. Population breakdown (1) by subareas is considered to be highly reliable. The breakdown into incorporated municipalities is somewhat more speculative, however, and should be applied with some care. It is valuable because many service delivery systems are concentrated in and around these towns.

Finally, the user may want to consider combining the case studies from this chapter with an overview of cost trends from Model 7 for a more comprehensive picture of fiscal effects. In that event, the user should use the average costing approach for

the following categories not dealt with in this chapter: general government, social services, corrections, natural resources, and other. In addition, the user should determine the level of public works expenditures other than those covered in this section (principally street and highway matters) and apply the average cost approach to them as well.

MODEL 8. ESTABLISHING PARAMETERS FOR SERVICE ASSESSMENT

The most important preparatory step for undertaking an assessment of any single service is to break down the population increment (and, if necessary, the school enrollment increment) by as small an area as is feasible and appropriate. This is done with Form 5-1. Information is taken from the gravity and population models and applied in this form. The baseline information on subarea and municipal population for most municipalities will be found in Table 5-1(A).[1]

The second table (5-1(B)) presents information on bonding ceilings for counties, which may be of concern to the user. Because it is likely that many service increments will require capital investment, the user may want to consider the feasibility of bonding capital improvement (i.e., selling county general obligation bonds to pay off the cost over a period of, most likely, 15 to 25 years). If this approach is contemplated, consideration must be given to the existing picture of the county with regard to bonded debt and bonding capacity.

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1. As previously noted, the user' should apply Form 5-1 to the smaller municipalities (under 1,000 population) with caution, recognizing that the numbers thereby obtained are only an approximation.

Although in practice this is not likely to be a major consideration, we have provided on Table 5-1(B) the current (1976) bonding statistics for the five counties (Anne Arundel, Baltimore, Harford, Prince Georges, and Wicomico) that are subject to a bond ceiling. It will be noted that all these counties have considerable capacity within their allowable bond margins. The user can reasonably rely on this table as a conservative guide for the foreseeable future, as during the past five years the total assessed valuation (on which the bond margin is calculated) in each of the five counties has risen faster than the amount of general obligation bonds outstanding. The result has been that the capacity of these counties to incur additional debt has been steadily increasing.

It should be noted that some incorporated municipalities also have legal ceilings on bonding capacity. This information is available in Local Government Finances in Maryland (1976 volume).

If the number of subareas in the county under study is greater than four, use additional copies of Form 5-1 as necessary.[2]

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2. The same comment applies to additional municipalities, and years 10-12.

County: _____
Facility: _____

FORM 5-1.   *Population Estimation for Small Areas*

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9

Enter county total immigration from gravity model FORM 2-1(C).

divided by

Enter immigration by subarea from gravity model FORM 2-1(C) and divide as shown to obtain % of total immigration in each subarea.

Subarea 1

2

3

4

=

Enter results in corresponding boxes.

Subarea 1

2

3

4

multiplied by

Enter population increase from FORM 2-3 and multiply as shown to obtain population increase in each subarea. Enter results in corresponding boxes.

=

Subarea 1

2

3

4

TO OBTAIN POPULATION INCREASE FOR MUNICIPALITY OR SERVICE DISTRICT
(municipality _____ in subarea number _____)

[ ] ÷ [ ] = [ ]

Total population of   Population of subarea   Municipal % of Subarea
municipality   from TABLE 5-1(A)

To obtain municipal population increase, multiply subarea population increase by municipal % of subarea.

-38a-

MODEL 9. ASSESSING NONEDUCATION SERVICE AREAS

The material in this section will provide the user with a basis for assessing each of the seven noneducation service areas cited at the beginning of this section. Each service area is first discussed briefly in the narrative below and is then the subject of one of the checklist tables immediately following the narrative. These checklist tables list all the more likely increments or alternatives that a user may want to consider in making the service assessment.

The sequence of forms provided here, Forms 5-2(A) through (D), is designed to "walk" the user through the process of choosing actions to meet service needs and assessing the cost implications of each action taken.

Form 5-2(A): Choosing Actions. Only the local user can fully assess the implications of the service needs that have emerged from the analysis. Using Form 5-2(A), the user should decide which facilities should be the focus of action, and what actions should be taken. Although the user is free to indicate any action that makes sense in the local context, we have suggested a list of most likely action alternatives on the checklists following the discussion of each service area.

Form 5-2(B): Establishing Cost Parameters. Having decided that a particular series of actions is going to be taken, the user must then determine the cost implications of these actions. Specifically, the user must make three determinations:
    -What the capital cost, if any, of the actions will be
    -Whether capital actions will be financed on the pay-as-you-go basis through the operating budget or will be bonded
    -What operating increments will be needed for the facility.
These three elements are entered onto this form.

Form 5-2(C): Defining Costs. The next step is to cost out the actions taken. Costs fall into three categories, each of which has differing implications.

(1) Constant Costs. The costs of rentals, where a long-term lease has been entered into, or of debt service on a bond issue, are constant costs in that although they recur, they do not change from year to year. The user, in the case of bonding, must make a judgment, based on current conditions, as to the relationship between the total amount bonded and the annual payment of debt service. (For example, a 20-year bond at 6% interest generates annual costs equal to 8.6% of the amount bonded.)

(2) Nonrecurring Costs. If the capital costs are covered entirely in the annual operating budget when they are incurred, they will not carry over into subsequent years. The user should include, if feasible, the cost of major permanent furnishings with this cost.

(3) Inflating Costs. These costs are subject to annual change based on a variety of cost-increasing pressures, including contract provisions, general inflation, promotions, etc. An annual increase factor of at least 5% should be used, although a look at a few years' budgets may give the user a basis for choosing a specific higher or lower figure.

Instead of calculating specific figures for benefits, overhead, and equipment, the user may want to simplify matters and assume that the ratio of direct personnel cost to nonpersonnel and indirect cost will remain the same as in the current budget. This can be determined from the budget by dividing nonpersonnel costs by personnel costs to obtain a percentage. If the percentage obtained thereby, for example, is .31, and the total salary figure is $130,000, then:

$130,000 x .31 = $40,300,

which is the amount of nonpersonnel costs (or indirect costs) to be added to the form.

Form 5-2(D): · Summary. The final step is to summarize the cost effects of the various actions on Form 5-2(D), following the instructions given there.

A major purpose of this sequence, of potential importance to the user, is that policy choices and their implications are made visible. The user may discover, after working through the fiscal implications of the policies and actions that he has chosen, that the costs likely to be incurred are substantially in excess of what may be realistic at the local level. In that case, the user can return to Form 5-2(A) and experiment with a variety of the other "packages" which may be capable of achieving adequate results at less cost.

The discussions below provide, where possible, some form of "rule of thumb" by which population can be converted into terms appropriate for each service (e.g., gallons of water used per day, or similar measurements). Some services are more susceptible to such measurement than others: police services, for example, do not lend themselves at all to any direct per capita conversion factor.

In addition to the discussion given here, the user interested in applying this section would be well advised to pursue the study of these services further, through review of the literature cited in Chapter 7 of the Handbook and through discussion with individual service providers in the county or town under consideration.

(1) POLICE SERVICES

The demand for police services tends to increase as a function of population growth, as well as a variety of other factors which cannot be anticipated with precision (population characteristics, overall economic activity, traffic, and so forth. Most of these, however, are closey linked to population increase.)

Given a level of population increase, a great deal of the response of the police department (or sheriff's department) will depend on the traditional pattern of services in the community. Generally speaking, urbanization or suburbanization of a community leads to an increase in police per capita, as increased specialization takes place and a more extensive chain of command comes into being. In addition, requirements for police officers tend to be upgraded, in turn leading to substantial increases in police salaries.

It is likely that the influx of population into incorporated towns will lead to a disproportionate share of the demand for additional police services landing on the smaller town police departments rather than the county police or sheriff's department. In any county in which there are incorporated towns with police departments and a substantial localized population influx, this should be given careful consideration.

(2) FIRE PROTECTION

A map of the county under consideration is an essential tool for the assessment of potential demand for additional fire protection services. The user should enter the population increment from Form 5-1 for each subarea and each municipality in the county on the map (one map for each year). The location of fire stations or fire companies should be entered on the map, and a service radius for each should be drawn with a

compass.[3] This will provide the user with a good image of the population increment affecting each individual fire station or company.

On the basis of this information, the user can then begin to make a series of judgments about future requirements for fire protection. These decisions must include consideration of the following areas.

-New equipment needed by each station or company (e.g., pumper trucks, hook & ladder trucks, tank trucks, and support vehicles such as staff cars).

-New facilities, either expansion of existing buildings to accommodate added vehicles or construction of new stations.

-Personnel requirements. The most straightforward are the hiring of additional professional firefighting personnel. In most cases, however, the fire companies are voluntary. The user should assess the situation to determine whether there may be a need to add one or more paid and professional firemen to an otherwise all-volunteer company, or to convert a mixed (volunteer/paid) company into a completely paid company.

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3. Although it varies somewhat from area to area, a standard widely used is that the effective radius of a fire station be no more than 3 miles if there is a public water supply, and no more than 5 miles if water must be carried to the site of a fire.

(3) WATER SUPPLY

Demand for public water service is a function of either population increase in areas served by public water systems (or adjacent to such areas) or increase beyond the level that can be accommodated by private wells outside those areas at present being served by public water systems.

The initial step is for the user to assess information regarding demand for any area of concern. This is done by utilizing the population data for the area under consideration (derived in Form 5-1) and converting it into water demand on the following basis:

Gallons per Person per Day

Metered service or individual wells	75 gpd
Unmetered service	150 gpd

For each district the added demand can be compared with present and projected demand (where available) as well as present and projected system capacity. Where deficiencies between capacity and demand are noted, the user should use his or her judgment to determine what added facilities will be needed in the service system and should enter them on Form 5-2(A). This procedure should be repeated for each existing system.

Finally, the user should assess the additional volume of water that will be required outside existing service districts. It is possible that as a result of a population increment, a decision may be made that is no longer sound to rely on individual wells in such areas. As a result, the user may want to expand an existing system through pipeline extensions, etc., or may want to begin construction of a new water service system to an area

not at present serviced by a public system. This last situation may arise when a community has been considered a borderline case for expansion or creating a new system, regardless of whether or not a major facility were to be located in the area. The influx from the major facility could easily tip the balance.

Another approach would be through density. Experts recommend the following:

Density of Population	Need for Public Water
$2500^+/mi^2$	Definite
$100-2500/mi^2$	Probable
$500-1000/mi^2$	Unlikely
Under $500/mi^2$	Very unlikely

The user can assess the overall population density (including the new influx) in the subarea outside existing water service districts as an aid to making a decision.

(4) WASTEWATER TREATMENT AND DISPOSAL

Wastewater disposal demand is similar to demand for water supply, as it is a function of the population increment into any sewer service district, as well as the demand for any new service outside areas at present served. As a general rule of thumb, initial wastewater disposal demand is equivalent to 70% of the water service demand.

Principal sewer service requirements in areas of existing service are the upgrading and/or expansion of treatment plants. Users should be careful to compare requirements over time with planned expansion and upgrading of local systems, so as not to attribute costs that would be incurred in any event to the major facility.

Judgments must be made to determine whether areas not at present in sewer service districts should be sewered due to population increases. If individual systems (septic tanks) appear to be no longer acceptable, there are a variety of options: extension of service through construction of interceptors, creation of new community-scale sewerage treatment facilities, and installation of small package treatment plants.

(5) SOLID WASTE COLLECTION AND DISPOSAL

More than most services, solid waste collection and disposal will vary in cost on the basis of the nature of the system adopted by the county or municipality. In the classic solid waste system, waste is collected door-to-door, generally by specially designed compactor trucks. These trucks then transport the waste to a sanitary landfill site or, in many cases, to an intermediate transfer station from which a smaller number of large trucks transport the waste to a landfill site (often distant from the transfer station).

In many cases, however, rural counties do not provide this type of service. At the most rudimentary, solid waste disposal may be accomplished by each person carrying his or her trash to a dump, hardly even worthy of designation as a landfill site. An intermediate system is that in which a collection route is established, with central collection points at which containers are located for residents of the vicinity to dump trash and garbage. These collection boxes are served by trucks and a landfill site. A collection system can provide either a large number of small collection boxes (each containing space for one to eight cubic yards of waste), or a few larger transfer stations. In either case, this type of system is an intermediate form of solid waste disposal. It should be apparent that the choice of system will strongly influence both the service increments needed as a result of population influx and the cost of providing the services needed.

Each person, under current standards, can be expected to generate 3 pounds of solid waste per day. This figure can be used to convert the population increase into a solid waste load increase. Given this information, the user must assess need for service increments in light of the system in operation. In doing so, a number of "rules of thumb" for solid waste systems may be useful.

A compactor truck can carry between 10 and 30 yds^3 (cubic yards) of solid waste in each trip. 475 lbs of solid wste represent one yd^3 of _compacted_ solid waste. (175 lbs represent one yd^3 of _uncompacted_ solid waste.) For example, if the system provides for two pickups/week, and the vehicle carries 12 yds^3 of compacted waste, the effect of 1,200 people on a county would be as follows.

		1,200	people
Daily volume		3	lbs/person
solid waste =		3,600	lbs
Solid waste/		4	days
pickup =		14,400	lbs
		475	lbs/yd^3
Pickup =		30.3	yds^3
Truckload =		12	yds^3
Truckloads/			
pickup =		2.5	yds^3

Assuming that the service district operates on a double schedule (i.e., some parts of the area have pickup on M and TH, others on T and F), this represents an increase of 1.25 loads in each day of service. This, in turn, should be compared against the number of loads each compactor truck handles per day. a function of the route layout and the degree to which the trucks are filled up in their routes. Through such an analysis it becomes possible to determine whether new trucks, as well as additional crews, will be needed.

Additional costs are likely to be generated by the need for container facilities. Local collection boxes, as noted, generally contain between one and eight yds^3. Containers utilized at more central transfer stations contain 40 to 50 yds^3 of storage space.

In addition to the above considerations, it may be necessary to acquire land either for sanitary landfill or for transfer stations. Not only must land be acquired, but the site must be prepared, and (in the case of a landfill site) expensive machinery must be obtained to operate the site. The user should carefully analyze the implications of any policy decision with the agency responsible for carrying out solid waste management in the county.

(6) RECREATION AND LIBRARY SERVICES

Provision of recreation and library services by local government tends to be highly variable, as there is no explicit minimum standard (as there is, for health purposes, with sewer service) governing the provision of them. The fact remains, however, that these are services much in demand, services that are likely to be heavily used by inmigrating populations, who may have high standards and expectations with regard to this service area. As a result, it may be incumbent on local government to expand and upgrade the level of services in response to substantial inmigration associated with a major facility.

Tables 5-2(A) and (B) (reprinted from Managing the Social and Economic Impacts of Energy Development, EDRA, 1976) provide some customary rules of thumb regarding the level of recreational facility needed as a function of population. Many communities and counties will find, when assessing the present recreational infrastructure, that it is well below national standards for the present population, not to mention that figure plus

anticipated inmigrants. As a result, the county may want to consider a wider level of upgrading and expansion than might be required by the inmigrant population. It should be stressed that local preferences and characteristics may lead to situations that legitimately vary widely from the generalized figures in the table.

The same principles hold true for the local library. In this case, however, most pressure for new facilities comes not from the need for a library facility in itself, but from the inability of the existing library system to upgrade its holdings or services within the present facility. Again, the local government must assess the present condition of holdings and services and make a judgment as to the importance and priority of this service area.

(7) HEALTH CARE

Those health services provided as a general rule by county or municipal government are not likely to experience sharp or sudden impacts as a result of major facility location. There may be effects on primary health care and institutional resources in the county, however. A substantial increase in population in a small community can strain that community's resources with regard to availability of physicians, hospital beds, and specialized services.

Standards for physicians per capita are highly variable. The national average in the United States is 538 people per physician, while on the Eastern Shore it is 1,611/physician. The former number contains, of course, a much larger number of specialists than does the latter.

The U.S. Public Health Service, under the national Health Service Corps, has designated that an area with less than 1 doctor to 4,000 people has "a critical manpower health shortage" (provided, however, that no contiguous county or area has

less than 2,500 people per physician). Thus, we can assert that the latter (2,500/physician) represents a threshold in terms of available capacity for treatment. In terms of this model, it can be argued that unless the population increase will bring the ratio below 2,500 to 1, there is no urgent need for additional care.

This is complicated by intercounty relationships. For example, Caroline County has a ratio of 3,311/physician. This is very low. This county, however, obtains a great deal of its medical services in Talbot County, which has a high level of 900/physician. The average is 1,339/physician, which is acceptable. Nonetheless, these coefficients provide a rule of thumb for planning that may be useful.

In addition to such quantitative concerns, there are a number of potentially severe medical problems that may arise from major facility location, and have been noted in past experience. (1) Significant alcoholism problems were noted among workers at Calvert Cliffs. This is likely to be a problem on all such similar large construction projects involving transient workers. (2) There may be mental health problems associated with relocating families experiencing problems of adjustment and isolation in new surroundings.

Occupational health, however, is not likely to be a serious concern to the community, as major construction sites will invariably have on-site facilities. A representative nuclear power construction project maintained an infirmary with two full-time registered nurses and a half-time physician on its staff.

The following tables present specific health service coefficients for Eastern Shore counties (Table 5-2(C)) and a generalized approach to calculating bed needs from an increase in population (Table 5-2(D)).

TABLE 5-2. Checklist of Frequently Occurring Public Service Increments

(1) Police Services

Capital/Facility	Operating/Equipment
New police station	Hiring additional uniformed officers for patrol
New police substation in growing part of county or town	Hiring additional officers because of demand for specialized police services (e.g., youth bureau, detective bureau, narcotics bureau, etc.)
Expansion of police quarters/work area in existing station or substation	Promotion of officers to supervisory positions as a result of overall increase in number of officers
Expansion of holding or correctional facilities	Hiring additional part-time or special personnel (e.g., special patrolmen, crossing guards, etc.)
New correctional facility	Hiring additional non-uniformed personnel (e.g., secretaries, dispatchers, etc.)
New garage for police vehicles	Purchasing additional police vehicles (principally patrol cars, but may also include trucks, vans, and motorcycles for various purposes)
Expansion of existing garage for police vehicles	Purchasing additional equipment for new facility
	Upgrading equipment (e.g., radio system) because of increased use and demand

TABLE 5-2. Checklist of Frequently Occurring Public Service Increments

(2) Fire Protection

Capital/Facility	Operating/Equipment
New central fire station or headquarters	Adding uniformed personnel to existing professional fire department
New local area fire station or substation	Adding paid professional personnel to existing volunteer fire department
Expansion of central fire station or headquarters	Adding specialist or supervisory personnel (by promotion or outside hire)
Expansion of local fire station or substation	Purchasing additional fire department vehicles:
Construction or expansion of facility from which ambulance services are provided (if distinct from fire service facility)	Ladder trucks
	Pumper trucks
	Other trucks
	Cars, boats, etc.
	Purchasing additional emergency vehicles (principally ambulances but in some cases including heavy rescue vehicles, etc.)
	Purchase of other equipment including radio systems, alarm boxes, etc.

TABLE 5-2. Checklist of Frequently Occurring Service Increments

(3) Water Supply

Construction of dam and/or major conduit to provide for massive increase in available water supply _____

Construction of well to provide for modest increase in water supply _____

Extension of water pipes into areas not at present serviced by public water system (cost varies with distance and size of pipe) _____

Replacement of existing water pipes with larger sizes in order to increase carrying capacity _____

Construction of pumping station to make possible non-gravity-dependent flow _____

Construction of filtration plant relative to source of water supply _____

Note: It is unlikely that there will be any increment of personnel or operating costs in water service, except as a direct result of a specific capital/facility increment.

TABLE 5-2. Checklist of Frequently Occurring Service Increments

(4) Wastewater Treatment and Disposal

Construction of new sewage treatment facility (capacity and level of treatment required will affect cost)	___
Expansion of existing treatment facility to handle additional wastewater volume	___
Upgrading of existing treatment facility to provide secondary (or if existing facility provides secondary treatment, then tertiary) treatment of wastes	___
Installation of package treatment plant for small area not feasibly connected to major treatment facility	___
Construction of sewer interceptor lines (major regional lines connecting local lines with treatment facility)	___
Extension of local sewer lines to areas not at present served by public sewer system	___
Replacement of existing sewer lines with larger sizes in order to increase carrying capacity	___
Construction of pumping stations to make possible non-gravity-dependent flow of wastewater	___
Construction of other wastewater treatment facilities, such as lagoons, spray irrigation, etc.	___

Note: It is unlikely that there will be any increment of personnel or operating costs in
        sewer service, except as a direct result of a specific capital/facility increment.

TABLE 5-2. Checklist of Frequently Occurring Public Service Increments

(5) Solid Waste Collection and Disposal

Capital/Facility	Operating/Equipment
Land acquisition for landfill site	Purchase of compactor trucks for solid waste collection (trucks used solely to perform local pickup and delivery to transfer station are usually smaller than those used to transport garbage to more distant landfill sites)
Land acquisition for transfer station	Purchase of equipment to operate landfill site, including bulldozer, loader, and pickup truck, as well as necessary fencing, road paving, etc.
Construction of incinerator (rare)	Purchase of containers for transfer station
	Purchase of containers (smaller than above) for intermediate collection points
	Hiring of crews for solid waste collection routes
	Hiring of landfill crew

TABLE 5-2: Checklist of Frequently Occurring Public Service Increments

(6) Recreation and Library Services

Capital/Facility	Operating/Equipment
Purchase of additional land for recreation facilities	Purchase of recreational/athletic equipment for use in open space areas (playground equipment, fixed and movable athletic equipment, etc.)
Development of open land for specific recreation activities:	Purchase of furnishings for indoor recreational and community facilities
Passive recreation (nature walks, picnics, wildlife observation)	Replacement of equipment and furnishings in order to upgrade existing recreational facilities
Active use (ballfields, lake for fishing or boating, etc.)	Hiring of trained personnel for conduct of recreation and athletic programs in recreation facilities
Construction of outdoor facilities (e.g., tennis courts, swimming pools, playgrounds)	Hiring of personnel for maintenance and security functions in recreation facilities
Construction of community center facility	
Acquisition of existing building and conversion to community center facility	
Rental of existing floor space for use as recreational facility (e.g., teen center)	
Construction of new library building	Acquisition of additional book holdings
Expansion of existing library building	Acquisition of nonbook holdings (records, films, objets d'art, etc.)
Acquisition of existing building and conversion to library use	Acquisition of equipment (phonographs, film projectors, microfilm viewers, etc.)
Rental of existing floor space for library use	Hiring of additional library personnel (professional librarians, aides, specialists, maintenance and security personnel)

TABLE 5-2. Checklist of Frequently Occurring Public Service Increments

(7) Health Care

Capital/Facility	Operating/Equipment
Expansion of inpatient hospital facilities (number of beds)	Hiring of additional physician(s)
Establishment of general purpose outpatient facility (clinic, health center) through new construction or conversion of existing structure	Hiring of support personnel for general medical facility (nurses, orderlies, technicians, clerical personnel)
	Hiring of counselors, guidance and mental health personnel
Establishment of special purpose outpatient facility	Hiring of public health personnel (for health education, school health, immunization, etc.)
Alcoholism	Hiring of environmental health personnel [public establishment inspection, environmental (water and air quality) monitoring, etc.]
Drug abuse	Purchase of equipment for health facility (general furnishings, general hospital equipment, and specialized medical treatment equipment)
Mental health	
Maternal/child care	

TABLE 5-2(A). Standards for Recreation Facilities

Facility	Ages Served	Space Needed	Service Radius	One Acre Serves Total Population of:
Play lot	Preschool	1/8 acres	1 block	800
Playground	5-14	3 acres	1/2 mile	1,000
Neighborhood Park	All	2 acres	1/2 mile	800
Playfield	Teenage and Adult	12 acres	City	800
Community Park	All	30 acres	City (Community)	250
Playground	Children	3.25 acres	Community of 2,000, 450 children	
	Children	4.00 acres	Community of 3,000, 600 children	
	Children	5.00 acres	Community of 4,000, 800 children	
	Children	6.00 acres	Community of 5,000, 1,000 children	
Hiking Trails	All over 5	25 miles	50,000 persons	
Cycling Trails	All over 5	25 miles	50,000 persons	
Bridle Trails	All over 5	5 miles	50,000 persons	

Source: National Park and Recreation Association.

TABLE 5-2(B).   Recreation Demand for Specific Types of Facilities

Specific Activity	Average Population Served
Swimming pool	3 percent of population at a given time (12 square feet of water per swimmer)
Golf (18-hole)	50,000
Recreation building (1-3 acres)	20,000
Tennis courts	1 court per 2,000
Baseball	1 diamond per 6,000
Softball	1 diamond per 3,000

Source: Voorhees Associates, June 1975, "Interim Guide for Environment Assessment" (Washington, D.C.: HUD).

TABLE 5-2(C).   Coefficients for Calculating Health Care Demand

	Population per Doctor	Bed-Years Available[1]	Patient-Days per Capita[2]	Patient-Days Available[3]
Cecil	2606	41.3	0.89	16937.6
Caroline	3311 >1339	25.1	1.08	8482.9
Talbot	900			
Dorchester	1396	13.8	1.13	4458.5
Kent	1258 >1768	33.0	0.97	12417.5
Queen Annes	2708			
Somerset	2338	11.8	0.87	4950.6
Wicomico	1213	52.3	0.87	21942.0
Worcester	1760			

Note: 1. Bed-years represent total beds x annual percentage not utilized (e.g., Somerset County has 36 beds with a 67.1% utilization level. Available bed-years is 36 x 32.9% = 11.8).

2. From A Primary Health Care Plan for the Eastern Shore of Maryland, 1975 (Health Planning Council of the Eastern Shore).

3. Available patient-days for each hospital represents bed-years x 365 ÷ patient-days per capita.

TABLE 5-2(D). Example of Calculation of Hospital Bed Needs
for Project Population

1. Multiply projected population by patient days for all age groups to get total projected patient days.

Age	Projected Population		Present Patient Days for 1,000 Population		Projected Patient Days
Under 15	500	x	315	=	158
15-24	200	x	745	=	149
25-44	350	x	700	=	245
45-64	300	x	1,350	=	405
65+	150	x	1,900	=	285
	1,500				1,242

2. Divide projected patient days by number of days in year to get projected average daily census.

$$\text{Average Daily Census} = 1,242 \div 365 = 3.4$$

3. Calculate projected bed need by adopting the local planning agency occupancy goal. The projected bed need is the average daily census (0.85 in this case) divided by the occupancy goal.

$$\text{Projected Bed Need} = \frac{3.4}{0.85} = 4$$

4. The total number of short-term, general beds needed by the project is therefore four.

Source: Voorhees Associates, June 1975, "Interim Guide for Environment Assessment" (Washington, D.C.: HUD).

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FORM 5-2(A). *Actions to be Taken to Meet Service Demand*

County: _____
Facility: _____
Service
Area: _____

	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Year 1 Activity: ___ Action:					
Year 2 Activity: ___ Action:					
Year 3 Activity: ___ Action:					

INSTRUCTIONS: *Under "Activity" enter name or other identifying mark (location, etc.) of activity undertaken. The form contains space for five separate service increments or activities in each year. For multiyear projects, continue vertically through number of years in which project is carried out.*

County: _____
F-cility: _____
Subarea: _____
Functional
Area: _____

FORM 5-2(B). *Establishing Cost Parameters for Actions Taken*

Year	Action	Capital Yes/No	IF YES, Estimated Capital Cost	Bonding Yes/No	Personnel Required	Other Requirements
			$			
			$			
			$			
			$			
			$			
			$			
			$			
			$			
			$			
			$			

INSTRUCTIONS: Enter actions from FORM 5-2(A) and complete form. Other Requirements column includes furnishings, equipment (both operational and instructional), and supplies.

FORM 5-2(C). Defining Costs for Action Taken

County:_____
Facility:_____
Subarea:_____
Functional
Area:_____
Year:_____

*Enter cost information only in categories applicable
to action being considered.*

	Action 1	Action 2	Action 3
Enter nature of action being taken from FORM 5-2(B).			
A Annual Current Expense	$		
B Annual Debt Service Cost if Bonded	+		
C CONSTANT COSTS (sum of A + B)	$		
D Capital Cost in Operating Budget (NONRECURRING COSTS)	$		
E Salary Breakdown			
Total Salaries	$		
Fringe Benefits and General Overhead	+		
Furnishings, Supplies, and Equipment	+		
Facility Maintenance	+		
F INFLATING COSTS (sum of E categories)	$		
G TOTAL COST IN YEAR OF ACTION TAKEN	$		

For all actions taken in the same year, sum costs by category below:

$_____ $_____ $_____

CONSTANT   NONRECURRING   INFLATING

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FORM 5-2(D). Summary of Expenditures

County: _____
Facility: _____
Subarea: _____
Functional
Area: _____

		Year 1	Year 2	Year 3	Year 4	Year 5
Year 1	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 2	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 3	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 4	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 5	Nonrecurring					
	Constant					
	Inflating					
	Total					
TOTAL						

INSTRUCTIONS: (1) Enter costs incurred in first year [from FORM 5-2(C)] in left-hand box corresponding to year first incurred. (2) Carry costs left to right as follows: (a) constant costs are carried across as they appear in initial year [e.g., if they are $30,000 in year 1, enter $30,000 in year 2, year 3, etc.]; (b) inflating costs are carried across with the addition of an annual inflation factor (an increase of 5% per year may be reasonable [e.g., if inflating costs are $30,000 in year 1, they will be $31,500 in year 2, $33,075 in year 3, $34,725 in year 4, and so forth. We suggest that numbers be rounded. Nonrecurring costs, of course, are not carried across]. (3) After all costs have been carried, sum each year's costs first into subtotals, and then sum subtotals vertically to enter grand total in bottom row.

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MODEL 10. ASSESSING PUBLIC EDUCATION SERVICES

The basic premises for a case analysis approach to education cost effects are that (1) marginal education costs are generated by deficits in available capacity relative to school enrollment; and (2) a county school district has reasonable flexibility in reallocating available capacity around a subarea within each county, if not across the county as a whole. As a result, when we evaluate the effects of an influx of school children, we can make that evaluation on the basis of a group of geographically related schools rather than a single school. The assumption is thus that if pressures on a particular school are extreme, they can be relieved by adjustments in school boundaries and reassignment of children to other schools when capacity exists, before it becomes necessary to build additional schools or add space in other ways.

The sequence of Forms 5-3(A) through (F) is designed to "walk" the user through the process of assessing deficits in capacity and choosing actions to remedy those deficits. Each of these forms is described in detail below.

Form 5-3(A): Computing Capacity. The first step is to estimate the available capacity to accommodate new enrollment in the local schools by grade level. It is usually a simple matter to obtain figures from the local school district for planned or design capacity of each school and for current enrollment. Available capacity, which is entered in Form 5-3(A), is the difference between the two. In some cases it may be a deficit and should be entered as such. We have assumed (in the absence of any specific information to the contrary) that as a general rule, available capacity in each grade will be the result of Available Capacity in School divided by Number of Grades, i.e., if a 6-9 school (four grades) has a total available capacity of 60 spaces, each grade will have a capacity of 15 spaces.

If the school district plans no increments to capacity during the period for which the model is being run, one Form 5-3(A) is all that is needed. If, for example, a new school will open in year 4 of the facility development, it becomes necessary to compute Form 5-3(A) once for years 1 through 3, and again for years 4 through n.

Form 5-3(B): Determining the Deficit. Given the available capacity measured above, the user should now add the cumulative school enrollment increase predicted by Form 2-3 and previously analyzed in Form 4-2. This will enable the user to identify the grade levels and areas for which deficits in capacity exist. It is these deficits which, based on our working assumption, trigger the need for facility expansion.

Form 5-3(C): Choosing Actions. It is at this point that it becomes necessary to make policy choices. Only the local user can fully assess the implications of the enrollment/capacity relationship that has emerged from the analysis. Using Form 5-3(C), the user should decide which schools should be the focus of action, and what actions should be taken. Although the user is free to indicate any action that makes sense in the local context, we have suggested a list of most likely action alternatives, on the checklist following this discussion. These range from no action, which may be chosen if the apparent deficits are not too drastic and the financial constraints are, to construction of a new school building. The user must determine which is most appropriate.

Form 5-3(D): Establishing Cost Parameters. Having decided that a particular series of actions are going to be taken, the user must then determine the cost implications of these actions. Specifically, the user must make three determinations:

-What the capital cost, if any, of the actions, will be

-Whether capital actions will be financed on a pay-as-you-go basis through the operating budget or will be bonded

-What operating increments will be needed for the facility (e.g., teachers, administrative or support personnel, furnishings, etc.)

These three elements are entered onto Form 5-3(D).

Form 5-3(E): Costing. The final step is to cost out the actions taken. Costs fall into three categories, each of which has differing implications. (1) The costs of rentals, where a long-term lease has been entered into, or of debt service on a bond issue, are constant costs, in that although they recur, they do not change from year to year. The user, in the case of bonding, must make a judgment based on current conditions as to the relationship between the total amount bonded and the annual payment for debt service. (For example, a 20-year bond at 6% interest generates annual costs equal to 8.6% of the amount bonded.) (2) If the capital costs are covered entirely in the annual operating budget when they are incurred, they will not carry over into subsequent years. The user should include, if feasible, the cost of major permanent furnishings with these nonrecurring costs. (3) Inflating costs are costs subject to annual change based on a variety of cost-increasing pressures, including contract provisions, general inflation, promotions, etc. An annual increase factor of at least 5% should be used, although a look at a few years' school budgets may give the user a basis for choosing a specific higher or lower figure.

Instead of calculating specific figures for benefits, overhead, and equipment, the user may want to simplify matters and assume that the ratio of direct personnel cost to nonpersonnel and indirect cost will remain the same as in the current school budget by dividing nonpersonnel costs by personnel costs in order to obtain a percentage. If the percentage obtained

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thereby is .31 (for example) and the total of teacher and other salaries is $130,000, then:

$130,000 x .31 = $40,300,

which is the amount of nonpersonnel costs (or indirect costs) to be added to the form.

Form 5-3(F): Summary. The final step is to summarize the cost effects of the various actions on Form 5-3(F), following the instructions given there.

A major purpose of this sequence is that policy choices and their implications are made visible. The user may discover, after working through the fiscal implications of the policies and actions that he or she has chosen, that the costs likely to be incurred substantially exceed what is realistic at the local level. In that case, the user can return to Form 5-3(C) and experiment with a variety of other "packages" that may be capable of achieving adequate results at a lesser cost.

TABLE 5-3. Checklist of Frequently Occurring Education Increments

Capital/Facility		Operation/Equipment	
Construction of new school building	___	Hiring of additional school teachers	___
Construction of additional wing or other expansion of existing school building	___	Hiring of additional school support personnel (principal, secretary, maintenance and security personnel, etc.)	___
Acquisition of mobile or temporary classrooms and installation on school board property	___	Hiring of educational specialists (guidance counselor, psychologist, audiovisual specialist, etc.)	___
Acquisition of existing nonschool building and conversion to education use	___	Hiring of central administrative personnel (staff with duties or authority beyond a single school facility	___
Development of outdoor facilities for athletic and recreational use in conjunction with any of the above	___	Purchase of general school equipment (desks, blackboards, educational supplies)	___
		Purchase of specialized educational equipment (audiovisual equipment, language labs, etc.)	___

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FORM 5-3(A). *Computing Available Capacity in Local Schools—Design Capacity*

County: _____
Facility: _____
Subarea: _____

Divide available capacity by number of grades served by school.
Enter results in boxes under each grade served by school.

K	1	2	3	4	5	6	7	8	9	10	11	12

Enter all schools in selected subarea.

School Name	Available Capacity	Grades Served

TOTAL AVAILABLE CAPACITY [ ]

ELEMENTARY SCHOOL CAPACITY [ ]

SECONDARY SCHOOL CAPACITY [ ]

Capacity indicated is from year ____ to year ____

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FORM 5-3(B). *Deficit in Available School Capacity.*

County: _____
Facility: _____
Subarea: _____

Elementary

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Enter available capacity from FORM 5-3(A).									
*Subtract added school enrollment in subarea (from FORM 5-1).**									
SURPLUS or (DEFICIT)									

Secondary

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9
Enter available capacity from FORM 5-3(A).									
*Subtract added school enrollment in subarea (from FORM 5-1).**									
SURPLUS or (DEFICIT)									

Note: *To obtain elementary and secondary enrollment by subarea, use FORM 5-1 to compute total enrollment by subarea (similar to total population, from FORM 2-3), and multiply figures thereby obtained by .66 to obtain elementary enrollment and by .27 to obtain secondary enrollment. Enter products above. Note that the same procedure can be used to deal with schools accessible to the population that will be moving into a specific municipality, rather than an entire subarea.

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County: _____
Facility: _____
Subarea: _____

FORM 5-3(C). *Actions to be Taken to Meet Capacity Deficit*

	School	School	School	School	School
Year 1 Name: ___ Action: ___					
Year 2 Name: ___ Action: ___					
Year 3 Name: ___ Action: ___					

Notes: Major Potential Actions: (1) no action; (2) addition to existing school building (specify capacity); (3) rental or purchase of temporary classrooms and installation on school grounds; (4) rental or lease of space in building at present not in school use; (5) acquisition of existing building and conversion to school use; (6) construction of new school. In each case, specify capacity.
Use additional sheets of FORM 5-3(C) for additional years.

FORM 5-3(D). *Establishing Cost Parameters for Actions Taken*

County: _____
Facility: _____
Subarea: _____

Year	Action	Capital Yes/No	IF YES, Estimated Capital Cost	Bonding Yes/No	Teachers Required	Other Personnel Required	Other Requirements
			$				
			$				
			$				
			$				
			$				
			$				
			$				
			$				
			$				
			$				

INSTRUCTIONS: Enter actions from FORM 5-3(C) and complete form. Other Personnel Required column includes principals, other administrators, professional support personnel, maintenance staff, etc. Other Requirements column includes furnishings, equipment (both operational and instructional), and supplies.

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FORM 5-3(E). Defining Costs for Action Taken

County: _____
Facility: _____
Subarea: _____
Year: _____

Enter cost information only in categories applicable to action being considered.

	Action 1	Action 2	Action 3
Enter school and action being taken from FORM 5-3(D).			
A Annual Rent Cost	$		
B Annual Debt Service Cost if Bonded	+		
C CONSTANT COSTS (sum of A + B)	$		
D Capital Cost in Operating Budget (NONRECURRING COSTS)	$		
E Teacher Salaries	$		
Other Salaries	+		
= Total Salaries	$		
Fringe Benefits and General Overhead	+		
Furnishings, Supplies, and Equipment	+		
Building Maintenance	+		
F INFLATING COSTS (sum of E categories)	$		
G TOTAL COST IN YEAR ACTION TAKEN (sum of C + D + F)	$		

For all actions taken in the same year, sum costs by category below:

$ [_____] $ [_____] $ [_____]

   CONSTANT   NONRECURRING   INFLATING

County: _____
Facility: _____
Subarea: _____

FORM 5-3(F). Summary of Education Costs

		Year 1	Year 2	Year 3	Year 4	Year 5
Year 1	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 2	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 3	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 4	Nonrecurring					
	Constant					
	Inflating					
	Total					
Year 5	Nonrecurring					
	Constant					
	Inflating					
	Total					
TOTAL						

INSTRUCTIONS: (1) Enter costs incurred in first year [from FORM 5-3(E)] in left-hand box corresponding to year first incurred. (2) Carry costs left to right as follows: (a) constant costs are carried across as they appear in initial year [e.g., if they are $30,000 in year 1, enter $30,000 in year 2, year 3, etc.]; (b) inflating costs are carried across with the addition of an annual inflation factor (an increase of 5% per year may be reasonable)[e.g., if inflating costs are $30,000 in year 1, they will be $31,500 in year 2, $33,075 in year 3, $34,725 in year 4, and so forth. We suggest that numbers be rounded. Nonrecurring costs, of course, are not carried across]. (3) After all costs have been carried, sum each year's costs first into subtotals, and then sum subtotals vertically to enter grand total in bottom row.

Part IV

Appendices

APPENDIX A - Facilities

Name	Number*	Type	Tax Page No.**	List No.***
NCL-PWP-UES	1	NPP	1	1
NCL-PWP-LES	2	NPP	1	2
FSL-FUEL-PWP	3	FPP	2	3
OCS-OIL-AND-GAS	4	OIL	1	4
OIL-REFINERY	5	OIL	4	7
PLFM-FAB-YARD	6	OIL	2	5
LNG-TERMINAL	7	OIL	3	6
MARINA	8	PRM	2	15
SAND-AND-GRAVEL	9	SAG	1	12
FOOD-PROCESS	10	IDP	1	8
CHEMICAL	11	IDP	3	9
STONE-CLAY-GLASS	12	IDP	4	10
METALS	13	IDP	2	11
PORT	14	PRM	3	13
RES-DEVEL	15	PRM	1	14
OTHER-FACILITY****	16	OTH	1	16

Types

1. NPP - Nuclear Power Plant
2. FPP - Fossil Fuel Power Plant
3. OIL - Oil Related Facilities
4. IDP - Industrial Park
5. SAG - Sand and Gravel
6. PRM - Port/Residential/Marina
7. OTH - Other

* T-1-1 index
** See Revenue Model Description
*** Index for all tables except T-1-1
**** The OTHER-FACILITY is included for the user's convenience. It may be used to construct a facility which has none of the characteristics of the other facilities. Note that the default values for all tables associated with the OTHER-FACILITY are always zero.

On the previous page, four notes were given. A more detailed version of these notes follows:

1.   The T-1-1 index refers to the order in which the facility appears in Table 1-1. This is particularly important if the SET option is used for Table 1-1, as it is the page number which is specified in the SET option which determines which facility's data is changed. The facility number in column one on the preceding page should match the number on the SET option chart.

2.   The tax page number refers to the order in which the facility appears in the tax tables in the revenue model. Each of the different 3-letter types listed on the previous page will use a different tax table. For example, all IDP facilities use a single tax table and the individual IDP facilities (food-process, chemical, stone-clay-glass, and metals) each use one page from this table.

3.   The index for all tables except T-1-1 refers to the order in which the facilities appear in all tables except T-1-1 and the tax tables. Again, this should be noted when using the set option to change data for a given facility.

APPENDIX B - Counties

Name	List No.
ANNE-ARUNDEL	1
BALTIMORE-CITY	2
BALTIMORE	3
CALVERT	4
CAROLINE	5
CECIL	6
CHARLES	7
DORCHESTER	8
HARFORD	9
KENT	10
PRINCE-GEORGES	11
QUEENE-ANNES	12
ST-MARYS	13
SOMERSET	14
TALBOT	15
WICOMICO	16
WORCESTER	17

Note - Counties 18 through 30 are not used.

APPENDIX C - SUMMARY FORMS

FORM*		RIFLE MODEL
F-1-9(A)	-	Models 1 and 2
F-1-9(B)	-	Models 1 and 2
F-1-9(C)	-	Models 1 and 2
F-1-9(D)	-	Models 1 and 2
F-1-9(E)	-	Models 1 and 2
F-2-1(C)	-	Model 3
F-2-2(C)	-	Model 4
F-2-3(B)	-	Model 5
F-3-8(A)	-	Model 6
F-3-8(B)	-	Model 6
F-3-8(C)	-	Model 6
F-3-8(D)	-	Model 6
F-4-4(A)	-	Model 7
F-4-4(B)	-	Model 7
F-5-1	-	Model 8
F-5-2(D)	-	Model 9
F-5-3(F)	-	Model 10

*Forms are numbered as in the Handbook.

APPENDIX D - LIST OF PARAMETERS

PARAMETER NAME, PLACE USED	INTERNAL PROGRAM NAME	DEFINITION
Integer		
1. DEFAULT-YEAR (IDENT)	PADY	default initial year of facility construction or operation
Real		
1. BND-COUNTY-PCT (MODEL 1)	PABCP	percentage allocated to the home county if there is a boundary county
2. BND-OTHER-PCT (MODEL 1)	PABOP	percentage allocated to nearby counties if there is a boundary county
3. BND-BND-PCT	PABBP (MODEL 1)	percentage allocated to the boundary country
4. NBD-COUNTY-PCT (MODEL 1)	PANCP	percentage allocated to the home county if there is no boundary county
5. NBD-OTHER-PCT (MODEL 1)	PANOP	percentage allocated to nearby counties if there is no boundary county
6. GRAV-MIN-DIST (MODEL 3)	PAGMID	minimum distance factor accepted as gravity model input
7. GRAV-MAX-DIST (MODEL 3)	PAGMAD	maximum distance factor accepted as gravity model input
8. GRAV-EXPONENT (MODEL 3)	PAGE	exponent value in the gravity model
9. HSG-LOOSE-VALUE (MODEL 4)	PAHLV	number of employees per household when the housing market is not tight

10.	HSG-TIGHT-VALUE (MODEL 4)	PAHTV	number of employees per household when the housing market is tight
11.	PERS-PER-HOUSEHOLD (MODEL 5,6)	PAPPH	number of people per household (Population model)
12.	ST-CORP-TAX-PCT (MODEL 6)	PASCTP in	corporate tax rate for state, percentage terms
13.	ST-INC-TAX-PCT (MODEL 6)	PASITP	state income tax, in percentage terms
14.	ST-SALES-TAX-PCT (MODEL 6)	PASSTP	state sales tax, in percentage terms
15.	LTL-CHG-CUTOFF-PCT (MODEL 6)	PALCCP	smallest percentage of inmigrants generating new housing which will be considered a moderate change in the housing market
16.	MJR-CHG-CUTOFF-PCT (MODEL 6)	PAMCCP	largest percentage of inmigrants generating new housing which will be considered a moderate change in the housing market
17.	TOWN-SHR-TAX-PCT (MODEL 6)	PATSTP	percentage of taxable income received by a town
18.	COST-INCRS-RATE-PCT (MODEL 7)	PACIRP	the inflation rate
19.	EMPLOY-CUTOFF-AMT (MODEL 1)	PAECA	the number of employees generated by induced and indirect economic effects, below which another round will not be triggered

APPENDIX G - TAX SOURCES IN FORM 3-8(A)

A. Real Property Tax (County)
    1.   County Tax Revenues, Form 3-1(A)
    2.   Cumulative Property Tax Revenues, Form 3-5

B. Real Property Tax (State)
    1.   State Tax Revenues, Form 3-1(A)
    2.   Cumulative Property Tax Revenues
         (See Special Note #2, APPENDIX Q)
    3.   State Property Taxes, Form 3-5
         (See Special Note #6, APPENDIX Q)

C. Personal Property Tax (County)
    1.   County Tax Revenues, Form 3-1(B)-(1)

D. Personal Property Tax (State)
    1.   State Tax Revenues, Form 3-1(B)-(2)

E. Personal Income Tax (County)
    1.   Total County Income Tax Revenues, Form 3-4

F. Personal Income Tax (State)
    1.   Total State Income Tax Revenues, Form 3-4
    2.   Personal Income Tax Revenue, Form 3-2 (Round 1)
    3.   "   "   "   "   Form 3-3 (Round 1)
    4.   "   "   "   "   Form 3-2 (Round 2)
    5.   "   "   "   "   Form 3-3 (Round 2)
    6.   "   "   "   "   Form 3-2 (Round 3)
    7.   "   "   "   "   Form 3-3 (Round 3)
    8.   "   "   "   "   Form 3-2 (Round 4)
    9.   "   "   "   "   Form 3-3 (Round 4)
    10.   "   "   "   "   Form 3-2 (Round 5)
    11.   "   "   "   "   Form 3-3 (Round 5)
    12.   "   "   "   "   Form 3-2 (Round 6)
    13.   "   "   "   "   Form 3-3 (Round 6)

G. Corporate Income Tax
    1.   Corporate Income Tax Paid, Form 3-1(C)
    2.   Corporate Income Tax Revenue , Form 3-2 (Round 1)
    3.   "   "   "   ", Form 3-3 (Round 1)
    4.   "   "   "   ", Form 3-2 (Round 2)
    5.   "   "   "   ", Form 3-3 (Round 2)
    6.   "   "   "   ", Form 3-2 (Round 3)
    7.   "   "   "   ", Form 3-3 (Round 3)
    8.   "   "   "   ", Form 3-2 (Round 4)
    9.   "   "   "   ", Form 3-3 (Round 4)
    10.   "   "   "   ", Form 3-2 (Round 5)
    11.   "   "   "   ", Form 3-3 (Round 5)
    12.   "   "   "   ", Form 3-2 (Round 6)
    13.   "   "   "   ", Form 3-3 (Round 6)

H. Sales Tax
    1.   Sales Tax Revenue, Form 3-2 (Round 1)
    2.   "   "   "   , Form 3-3 (Round 1)
    3.   "   "   "   , Form 3-2 (Round 2)
    4.   "   "   "   , Form 3-3 (Round 2)
    5.   "   "   "   , Form 3-2 (Round 3)
    6.   "   "   "   , Form 3-3 (Round 3)
    7.   "   "   "   , Form 3-2 (Round 4)
    8.   "   "   "   , Form 3-3 (Round 4)
    9.   "   "   "   , Form 3-2 (Round 5)
    10.   "   "   "   , Form 3-3 (Round 5)
    11.   "   "   "   , Form 3-2 (Round 6)
    12.   "   "   "   , Form 3-3 (Round 6)

APPENDIX E - Table Indeces

Note: The first dimension given is the number of rows, the second dimension given is the number of columns, and the third dimension given is the number of pages. If only one dimension is given, then there is one row and that number if the number of columns (the number of pages is also one).

REAL TABLES

T-1-2(C)   Dimensions -   (11,5)

Row #   - Labor Force Component
(Appendix J)

Column # - Type of Construction
1 = Heavy construction
2 = 7/7 Workers
3 = 5/2 Workers
4 = General Manual
5 = Nonmanual

T-1-4(A)   Dimensions -   (20,3)

Row #   - Facility List No.
(Appendix A)

Column # - (See HANDBOOK, P.47)

T-1-4(B)   Dimensions -   (20,17)

Row #   - Facility List No.
(Appendix A)

Column # - Indirect Sector List No.
(Appendix K)

T-1-4(C)   Dimensions -   (30,17)

Row #   - County List No.
(Appendix B)

Column # - Indirect Sector List No.
(Appendix K)

T-1-4(D)   Dimensions -   (17)

Indirect Sector List No.
(Appendix K)
APPENDIX E - Cont.

T-1-5   Dimensions -   (17,3)

Row #   - Indirect Sector List No.
(Appendix K)

Column # - HIGH/INTER/LOW Income

T-1-6   Dimensions -   (30,6)

Row #   - County List. No.
(Appendix B)

Column # - Consumption Type
1 = FOOD
2 = AUTO
3 = OTHER
4 = PERSONAL
5 = SHELTER
6 = WHOLESALE PCT. OF RETAIL
SALES

T-1-8(A)   Dimensions -   (17)

Indirect Sector List No.
(See Appendix K)

T-1-8(B)   Dimensions -   (12,2)

Row #   - Year No.

Column # - 1 = NPP
2 = FPP

APPENDIX E - Cont.

T-2-1(A)   Dimensions -   (10,6,40)

Row #   - Subarea No.

Column # - H # (See HANDBOOK, P.82)

Page #   - County Index
             1-30 = County List No.
             (Appendix B)

             31-40 = Outside County List
             No. (Appendix H)

T-2-2(A)   Dimensions -   (2,12,6)

Row #   - NONMANUAL/MANUAL

Column # - Year No.

Page #   - 1 = UES
             2 = LES
             3 = OTHER
             4,5,6 = NOT USED

T-2-2(B)   Dimensions -   (14,12)

Row #   - Calendar starting year of facility

Column # - 1 = Starting Year
             2-12 = Years 1-11 of the facility
             (Year 12 of the facility is set
             to 1.0)

APPENDIX E – Cont.

T-2-3   Dimensions –   (4,4)

Row #   – Population Factor
1 = School Children per family
2 = Grade school %
3 = High school %
4 = College %
(2,3,4 are breakdown of school children)

Column # – Type of Construction
1 = Power Plant
2 = 5/2 Workers
3 = 7/7 Workers
4 = Conventional

T-3-1(A)   Dimensions –   (2,12,5)

Row #   – 1 = Land Assessment
2 = Utility Shares

Column # – Year No.

Page #   – Tax page No.
(For power plants)

T-3-1(D)   Dimensions –   (31,6)

Row #   – 1-30 = County List No.
(See Appendix B)
31 = State

Column # – Taxes
1 = Urban Real Property Tax
2 = Rural Real Property Tax
3 = Personal Property Tax on FOOD facilities (MFG)
4 = Personal Property tax on NON-FOOD facilities (MFG)
5 = Personal Property Tax (NON-MFG)
6 = Manufacturing Inventory

tax

APPENDIX E - Cont.

T-3-2(A)-(1) Dimensions-   (20)

    (taxable income share for   - Facility List No.
    corporations broken down   (See Appendix A)
    by facility)

T-3-2(A)-(2) Dimensions-   (17)

    (taxable income share for   - Indirect Sector List No.
    corporations broken down   (See Appendix K)
    by indirect sector)

T-3-2(A)-(3) Dimensions-   (6)

    (taxable income share for   - Aggregate Sector List No.
    corporations broken down   (See Appendix L)
    by aggregate sector)

T-3-2(B)-(1) Dimensions-   (2)

    (taxable income share for   - W&R Trade/Services
    partnerships and propri-
    etorships, broken down by
    W&R trade and services)

T-3-2(B)-(2) Dimensions-   (6)

    (taxable Income Share for   - Aggregate Sector List No.
    Partnerships and propri-   (See Appendix L)
    etorships, broken down by
    aggregate sector)

APPENDIX E - Cont.

T-3-5   Dimensions -   (30,3,3)

Row #   - County List No.
(See Appendix B)

Column # - HIGH/INTER/LOW

Page #   - Change type
1 = Little Change
2 = Moderate Change
3 = Major Change

T-3-6   Dimensions -   (31,4)

Row #   - 1-30 = County List No.
(See Appendix B)

31   = State

Column # - (See P.143, HANDBOOK)

T-4-1(A)   Dimensions -   (30,10)

Row #   - County List No.
(See Appendix B)

Column # - Government Sector List No.
(See Appendix M)

T-4-1(B)   Dimensions -   (10,2)

Row #   - Government Sector List No.
(See Appendix M)

Column # - (See P.159, HANDBOOK)

APPENDIX E - Cont.

T-4-1(C)   Dimensions -   (30)

                              - County List No.
                                (See Appendix B)

T-4-2   Dimensions -   (30,3)

                              Row #   - County List No.
                                         (See Appendix B)

                              Column # - (See HANDBOOK, P.166)

T-4-3   Dimensions -   (30,2)

                              Row #   - County List No.
                                         (See Appendix B)

                              Column # - (See HANDBOOK, P.170)

APPENDIX E - Cont.

INTEGER TABLES

T-1-1   Dimensions -   (12,12,20)

Row #   - Labor Category
1 = HIGH - LOCAL
2 = INTER - HIRE:
3 = LOW   - MANUAL

4 = HIGH - LOCAL
5 = INTER - HIRE:
6 = LOW   - NONMANUAL

7 = HIGH - OUTSIDE
8 = INTER - HIRE:
9 = LOW   - MANUAL

10 = HIGH - OUTSIDE
11 = INTER - HIRE:
12 = LOW   - NONMANUAL

Column # - Year No.

Page #   - Facility Number (Not List No.)
(See Appendix A)

T-1-2(A-B)   Dimensions -   (30,11)

(Combination of   Row #   - County List No.
Table 1-2(A) and   (See Appendix B)
Table 1-2(B),
PP.39-40, HANDBOOK)

Column # - Labor force component
1 = Unemployed, male
2 = Unemployed, female
3 = H.S. Grad, male
4 = H.S. Grad, female
5 = Women entering labor force
6 = Farm Laborers, male
7 = Farm Laborers, female
8 = nonfarm laborers, male
9 = nonfarm laborers, female
10 = operatives, male
11 = operatives, female

E-8

APPENDIX E - Cont.

T-2-1(B)   Dimensions -   (6,12,5)

                        Row #   - H # (See p.84, HANDBOOK)

                        Column # - Year No.

                        Page #   - 1 = NPP-UES
                                          2 = NPP-LES
                                          3,4,5 not used

T-2-1(B)-(X) Dimensions -   (6,12)

                        Row #   - H # (See p.84, HANDBOOK)

                        Column # - Year No.

This table is the final TIH values used by RIFLE. If the user wishes to substitute TIH values for other than NPP facilities, the user should make the changes in T-2-1(B)-(X).

The table indicates the number of outside hires that will relocate to the area. The default assumption for non-nuclear power plants is that all outside hires will relocate. If the user wishes to change that assumption, he or she will need to use the set option for T-2-1(B)-(X).

T-2-2(B)-(X) Dimensions -   (6,6)

(on p.100, HAND-   Row #   - Housing Demander Categories
BOOK, the Housing   (See p.100, HANDBOOK)
Preference Chart)

                        Column # - Housing Choices
                                        (See p.100, HANDBOOK)

Note - Asterisks (*) are represented by zeroes (0)

T-3-7   Dimensions -   (30,10)

(from Table   Row #   - County List No.
5-1(A), the   (See Appendix B)
population of
subareas only)

                        Column # - Subarea No.

APPENDIX E - Cont.

DERIVED TABLES (All Real)

FILTER-PCT   Dimensions -   (5)

    (Form 1-2, p.42, HANDBOOK)   - Year No.

    The percentage of the labor supply which is available in each of five years

JOB-GEN-LAG-PCT   Dimensions -   (4)

    (Form 1-5(C), p.55, HANDBOOK) - Year No.

    The percentage of total jobs created which are in fact created in each of four years

LEVL-ANNL-CONS   Dimensions -   (6,3)

    (Form 1-6, p.59,   Row #   -Aggregate Sector List No.
    HANDBOOK)   (See Appendix L)

                     Column # - HIGH/INTER/LOW

    The dollar value of consumption in each aggregate sector, broken down by consumption level

JOBS-PER-THSD   Dimensions -   (8)

    (Form 1-6, p.59, HANDBOOK)   1 = Retail Food
                                  2 = Wholesale Food
                                  3 = Retail Auto
                                  4 = Wholesale Auto
                                  5 = Retail Other
                                  6 = Wholesale Other
                                  7 = Personal Services
                                  8 = Shelter

    Jobs per $10,000 of consumption, broken down by wholesale and retail aggregate sectors

APPENDIX E - Cont.

HIGH/LOW-PCT   Dimensions -   (3,3)

   (Form 1-6, P.59)   Row #   - 1 = W&R Trade
                                     2 = Services
                                     3 = Shelter

                   Column # - HIGH/INTER/LOW

Percentage of jobs by consumption level for each of three sectors

SECTOR-VALUE   Dimensions -   (3)

   (Form 1-7(A), P.62)   - 1 = W&R Trade
                                       2 = Services
                                       3 = Shelter

Ratio of Value Added to Direct Income for each of three sectors

SECTOR-COEFF   Dimensions -   (17,3)

   (Form 1-7(A), P.62)   Row #   - Indirect Sector List No.
                                         (See Appendix K)

                   Column # - 1 = W&R Trade
                                     2 = Services
                                     3 = Shelter

Coefficients for indirect income from induced income broken down
by indirect sector for each of three sectors

EMPLOY-COEFF   Dimensions -   (17)

   (Form 1-7(B), P.62)   - Indirect Sector List No.
                                         (See Appendix K)

Employment coefficients from indirect income, broken down by indirect
sector

APPENDIX E - Cont.

<u>JOBS-BY-LEVEL-PCT</u>   Dimensions - (17,3)

    (Form 1-7(C), P.64)   Row #   - Indirect Sector List No.
                                            (See Appendix K)

                         Column # - HIGH/INTER/LOW

Percentage breakdown of jobs by consumption level for each of 17 indirect sectors

<u>GRAV-INMIG-DEF</u>   Dimensions - (2)

    (Form 2-1(D), P.93)   - 1 = 5/2 workers
                                  2 = 7/7 workers

Proportion of local labor deficit that will inmigrate for each of two labor categories

<u>GRAV-INMIG-OUT</u>   Dimensions - (2)

    (Form 2-1(D), P.93)   - 1 = 5/2 workers
                                  2 = 7/7 workers

Proportion of outside hires that will inmigrate for each of two labor categories

<u>MAR-STAT-CONV-PCT</u>   Dimensions - (4)

    (Form 2-2(A), P.110)   - 1 = nonmanual single
                                  2 = nonmanual married with families
                                  3 = manual married with families
                                  4 = manual single

Percentage breakdown by marital status of manual and nonmanual workers

APPENDIX E - Cont.

HOUSING-COEFF-PCT   Dimensions - (6,4)

    (Form 2-2(B), P.111)   Row #   - Housing Category List No.
                                 (See Appendix P)

                             Column # - 1 = nonmanual single
                                       2 = nonmanual married with families
                                       3 = manual married with families
                                       4 = manual single

Percentage breakdown of housing demand by housing category for each of four worker types

NO-INFO-ITEMS   Dimensions -   (12,7)

    (Revenue forms,   Row #   - Year No.
    Chapter 6)   Column # - 1 = land value, urban
                                           2 = land value, rural
                                       3 = improvement value
                                     4 = mfg. equipment
                                       5 = nonmfg. equipment
                                     6 = inventory
                                     7 = gross income

Tax information for the OTH facility

SAND-GRAVEL-ITEMS   Dimensions - (3,12,3)

    (Revenue forms,   Row #   - 1 = land value
    Chapter 6)   2 = mfg. equipment
                                       3 = inventory

                         Column # - Year No.

                         Page #   - Tax Page No.
                                     (See Appendix A)

Tax information for SAG facilities

APPENDIX E - Cont.

IND-PARK-ITEMS   Dimensions -   (6,12,8)

(Revenue forms,   Row #   - 1 = land value, urban
Chapter 6)   2 = land value, rural
                                          3 = improvement value
                                          4 = mfg. equipment
                                          5 = nonmfg. equipment
                                          6 = inventory

                         Column # - Year No.

                         Page #   - Tax Page No.
                                       (See Appendix A)

Tax information for IDP facilities

LAND-VAL-IMPRV-ONLY   Dimensions - (3,12,5)

(Revenue forms,   Row #   - 1 = land value, urban
Chapter 6)   2 = land value, rural
                                          3 = improvement value

                         Column # - Year No.

                         Page #   - Tax Page No.
                                       (See Appendix A)

Tax information for PRM facilities

OIL-TAX-ITEMS   Dimensions -   (5,12,10)

(Revenue forms,   Row #   - 1 = land value, urban
Chapter 6)   2 = land value, rural
                                          3 = improvement value
                                          4 = mfg. equipment
                                          5 = gross income

                         Column # - Year No.

                         Page #   - Tax Page No.
                                       (See Appendix A)

Tax information for OIL facilities

APPENDIX E - Cont.

PCT-TAXBL(DEPR)   Dimensions -   (12)

    (form 3-1(B), P.130)   - Year No.

    Percentage of equipment taxable, due to depreciation, in each of
    12 years

CORP-PARTNER-PCT   Dimensions -(2,2)

    (form 3-2, P.135;   Row #   - 1 = W&R trade
    form 3-3, P.136)   2 = Services

                    Column # - 1 = Corporations
                               2 = Partnerships

    Percentage breakdown of firms by Corporations and partnerships
    for each of two sectors

AVERAGE-EARNINGS   Dimensions - (3)

(form 3-4, P.138)   - HIGH/INTER/LOW

    Average earnings for each of 3 consumption levels

TAXABLE-PERCENTAGE   Dimensions - (3)

    (form 3-4, P.138)   - HIGH/INTER/LOW

    Percentage of income which is taxable for each 3 consumption levels

ST-LEVEL-ITAX-PCT   Dimensions - (3)

    (form 3-4, P.138)   - HIGH/INTER/LOW

    State income tax rate for each of three consumption levels

APPENDIX E - Cont.

PIGGYBACK-TAX-PCT   Dimensions -   (30)

   (form 3-4, P.138)   - County List No.
                                                    (See Appendix B)

   County income tax as a percentage ("piggyback") of the state tax

PER-HSEHOLD-INCRS   Dimensions - (12)

   (Revenue forms,   - Year No.
   Chapter 6)

   Cumulative inflation multiplier for each of 12 years.

ELEM/SEC-ENROLL   Dimensions - (2)

   (form 4-2(A), P.167)   1 = Elementary
                                                  2 = Secondary

   Number of pupils by level

WING-FACTOR   Dimensions -   (2)

   form 4-2(A), P.167)   1 = Elementary
                                                  2 = Secondary

   Weighting factor to get weighted pupils from number of pupils in
   public school

APPENDIX H - OUTSIDE COUNTIES

NAME	LIST NO.
NEW-CASTLE,DEL.	1
SUSSEX,DEL.	2
KENT,DEL.	3
WASHINGTON,D.C.	4

APPENDIX J - LABOR FORCE COMPONENTS

NAME	LIST NO.
UNEMPLOYED MALE	1
UNEMPLOYED FEMALE	2
H.S. GRAD., MALE	3
H.S. GRAD., FEMALE	4
FEMALE L.F. ENTRANTS	5
FROM FARM, MALE	6
FROM FARM, FEMALE	7
FROM NONFARM, MALE	8
FROM NONFARM, FEMALE	9
FROM OPERATIVES, MALE	10
FROM OPERATIVES, FEMALE	11

APPENDIX K - INDIRECT SECTORS

NAME	LIST NO.
MINING	1
CONSTRUCTION	2
FOOD-PROCESSING	3
PAPER-PRINTING	4
RUBBER	5
CHEMICALS	6
STONE-CLAY-GLASS	7
PRIMARY-METALS	8
METAL-CONTAINERS	9
MACHINERY	10
TRANSPORTATION	11
COMMUNICATIONS	12
ELECTRICITY	13
W-AND-R-TRADE	14
FIN-INS-AND-RE	15
PERSONAL-SERVICES	16
BUSINESS-SERVICES	17

APPENDIX L - AGGREGATE SECTORS

NAME	1-8 LIST NO.	1-6 LIST NO.
RETAIL-FOOD	1	1
WHOLESALE-FOOD	2	4
RETAIL-AUTO	3	2
WHOLESALE-AUTO	4	NONE
RETAIL-OTHER	5	3
WHOLESALE-OTHER	6	5
SERVICES	7	6
SHELTER	8	NONE

APPENDIX P - HOUSING CATEGORIES

NAME	LIST NO.
HOUSE-OWN	1
HOUSE-RENT	2
APARTMENT	3
MOBILE-HOME-OWN	4
MOBILE-HOME-RENT	5
SLEEPING-ROOM	6

APPENDIX Q - SPECIAL NOTES

1. T-2-2(B)

   When changing this table using the set option, the user should note that the first column in each row is the starting year for construction for which that row applies. This is part of the table, and not just a label. Note also that years 10-12 are disregarded, and year 9's values are used for years 10-12. However, years 10 and 11 must be included when changing an entire row, since the full dimensions for the table are (14, 12).

2. F-3-1(B)-1 and F-3-1(B)-2

   These two forms are taken from Form 3-1(B) in the HANDBOOK. The tax rates used are from T-3-1(D), and in each case are a combination of the actual tax rate and percentage taxable for that item. For example, the Manufacturing/Inventory tax for St. Marys County reflects 50% taxable and a tax rate of 2.4% to give an adjusted tax rate of 1.2%.

3. T-3-2(A)-(1), T-3-2(A)-(2), T-3-2(A)-(3)

   These tables are taken from Table 3-2(A) (HANDBOOK, p. 133). Those coefficients which are in these tables but are not found in the HANDBOOK should be used only if better information from another source is not available.

4. T-3-2(B)-(1), T-3-2(B)-(2)

   These tables are taken from Table 3-2(B) (HANDBOOK, p. 134). Those coefficients which are in these tables but are not found in the HANDBOOK should be used only if better information from another source is not available.

5. F-3-5

   The discrepancy between the tax rates computed and the summary at the bottom is as follows:
   (a) If deflated revenue (Year n) $>$ deflated revenue (Year n-1) then deflated revenue (Year n) is used.
   (b) If deflated revenue (Year n) $\leq$ deflated revenue (Year n-1) then deflated revenue (Year n-1) is used.
   (c) The deflated revenue is then inflated by Year n's inflation factor.

6. F-3-8(A) - Real Property Tax (State)

Source 2 is cumulative Property Tax Revenues for the State. It is derived from the County Cumulative Property Tax Revenues via the following formula:

State Tax = (State Tax Rate/County Tax Rate) X County Tax, as shown on the bottom of Form 3-5

7. Inflation Rates

Some forms use an inflation adjustment; some do not. To account for this, the user must either inflate those calculations with no inflation adjustment by hand, or use the SET option to change the inflation factor to zero. The following forms use the twelve-element inflation vector PER-HSEHOLD-INCRS:
>   F-3-5
>   F-3-6
>   F-3-7(C)
>   F-4-2(B)
>   F-4-3
The following forms use the parameter COST-INCRS-RATE-PCT in conjunction with T-4-2(B) (see Table 4-1(B), p. 159, HANDBOOK):
>   F-4-1(A)
>   F-4-1(B)

8. For Form 4-2(A), the percentages printed for Number by Level are incorrect in the case of the OCS facility. However, the calculations and the actual Number by Level are correct.

9. The OCS-oil-and-gas Facility is actually comprised of the following four facilities:

>   1. Pipeline Landfall
>   2. Tanker Terminal
>   3. Natural Gas Processing Plant
>   4. OCS Onshore Operations Base

This composition is particularly important to note within the context of the various tax sources presented in Model 6.

10. Non-power-plant facilities are appraised for half of their land value. Therefore, the resultant total taxable in Form 3-1(A) is half of what it would appear to be from the indicated calculations.

11. Indirect Round 1 for power plants.

In the event that the user substitutes his or her own employment profiles in lieu of those in Table 1-1 for power plants, the user will have to manually calculate the indirect round 1 employment. The following procedure should be used.

a) Estimate the indirect purchases by year for Table 1-8(B) where local (in the county where the facility is located) purchases average 8 percent of total material purchases, which in turn represent 45 percent of the total construction cost of the facility.

b) Convert indirect purchases by year into value added, using the conversion coefficient 1.33 for wholesale and retail trade shown in Table 1-8(A). For example, if indirect purchases in Year I are $6 million in the county of interest, value added equals

$$\$6,000,000 / 1.33 = \$4,511,000$$

c) Convert value added into the number of jobs by multiplying the value added by jobs per ten thousand of value added in Table 1-4(D) for wholesale and retail trade. For example, as of 1976, there were .48 jobs generated per ten thousand of value added. Therefore:

$$\$4,511,000 \times 0.48 / 10,000 = 217 \text{ jobs generated in Year 1}$$

d) Multiply the number of jobs generated in Step C by the reciprocal of the proportion of local hires that are hired in the county of interest. For example, if the site is not a boundary site, then 65% of the local hires are filled by workers in the county in which the facility is located (see p. 34 of the HANDBOOK):

$$(1/.65) \times 217 = 334 \text{ jobs}$$

e) The number of jobs generated is converted to jobs by consumption class using the data in Table 1-5 for the wholesale and retail trade sector:

(334) (0.22) = 76	High consumption jobs
(334) (0.23) = 77	Intermediate consumption jobs
(334) (0.55) = 184	Low consumption jobs

f) The jobs derived in Step D are added to the direct employment generated by the facility for Year I by consumption class for the local non-manual sector.

12. For power plant facilities, the user can assume that some of the indirect round 1 purchases made for the power plant can occur in counties other than the county in which the facility is located. To make this assumption, the SET option would be used for Table 1-8(B).

   CARD 1: SET T-1-8(B) Column I (1 or 2)
   CARD 2: 12 items for years 1-12

   Note that the item for each year is the user's estimate of indirect round one purchases made for the power plant in the county of interest.

13. The fiscal impact calculated for the State of Maryland contains the following deficiencies:

   a) The model does not estimate sales tax revenues resulting from purchases of materials and supplies occurring in the State of Maryland, but outside the county being studied.

   b) If the county of interest differs from the one in which the facility is located, the model does not estimate state property taxes generated by the facility.

   c) The model ignores state expenditures except for education aid and selected other grants-in-aid. To the extent that all of the workers relocating to the vicinity of the facility are from Maryland and state expenditures per capita for public services do not vary from one part of the state to another, this assumption is reasonably valid. In other cases, this approach underestimates state expenditures.