1-1979

# A Financial Planning Model for Institutions of Higher Education

Keith M. Peterson

# A FINANCIAL PLANNING MODEL FOR INSTITUTIONS OF HIGHER EDUCATION

by

KEITH M. PETERSON

B.A. in Economics, The Colorado College, 1971

An Independent Study Submitted to the Graduate Faculty

Of the University of North Dakota in Partial Fulfillment

of the

Requirements for the Degree

MASTER OF BUSINESS ADMINISTRATION

GRAND FORKS, NORTH DAKOTA

1979

A FINANCIAL PLANNING MODEL FOR INSTITUTIONS OF HIGHER EDUCATION

by

KEITH M. PETERSON

Approved:

_____ Date_____

Major Professor

ACKNOWLEDGEMENTS

I wish to extend special thanks to Vice-President Gerald Skogley for his help and inspiration throughout the course of this study. His suggestion of topic and valuable guidance made possible its completion.

I am very much indebted to other members of the staff and faculty of the university who have given their time and interest in support of my efforts. Especially, Al Lindem, for his expert assistance in the development of the computer programs, and Dr. Gene Kemper, for the creation of the reduction formula used in the bond program. I would also like to thank Dr. Paul Taylor, Al Hoffarth, and Lyle Beiswinger for their cooperation and advise.

LIST OF EXHIBITS

TABLE OF CONTENTS

# CHAPTER I

## INTRODUCTION

### 1. Purpose

Management of an educational institution involves the activities of planning, analysis, and control. Of these three activities the one least subject to the application of modern business methods has been the planning function. The plans of the organization "represent expectations about the environment, expectations about the capabilities of the organization, and decisions that have been made on such matters as allocation of resources and direction of effort. The quantified expectations are input variables for models used in planning." [1] The creation of a planning model is a significant step towards upgrading the planning process. The model accomplishes this improvement by: providing a first approximation of plans for the manager to examine; outlining different scenerios and the impact of present decisions on the scenerios; providing a communication mechanism resulting from more precise logic than use of random manual methods.

An important capability of the planning model is to deal with "what if" kinds of questions. The model's simulation power is enhanced by use of the computer. Specifically, the interactive mode which allows immediate input variations. The computer method is applicable for the following conditions:

1. complex manipulation of data;

2. large volumes of data to be analyzed;

3. several iterations before a plan is accepted;

4. frequent replanning. [2 ]

Both the manual method of analysis and the computer method of analysis may be included in the same model. Their respective use is determined by application of the above criteria.

The objective of this study is the development of a planning model for use by the University of North Dakota. The model is designed to evaluate expansion of the Auxiliary Enterprise System of the institution in terms of its effect on the rates and fees charged to the users of these enterprises.

## 2. Scope

The University of North Dakota is committed to providing supplemental services to its students along with the primary academic offering. These supplemental services are recognized as the Auxiliary Enterprises of the institution. They are comprised of entities such as residence halls, food services, married student housing, student unions, intercollegiate athletics, motor and aircraft pools, duplicating centers, bookstores, and laundry operations. The primary objective of these entities is to provide services on a self-supporting, break-even, or limited profit basis. Accomplishment of this goal in a fashion that is equitable to the institution and to the students, demands effective allocation of resources. Accordingly, the management of resources requires varied supplementary information such that a total information management system is necessary.[5 ]

The total costs of providing Auxiliary Services are currently

reviewed on an annual basis and the revenue sources are adjusted to provide for adequate coverage in the following year. This process is performed by manual calculations. Consequently, the capability of testing alternatives in costs has been cumbersome. Additionally, the examination of new cost dimensions has not been easily accomplished, if at all. This general problem has been articulated by Gordon B. Davis, Director of the Management Information Systems Research Center at the University of Minnesota. [1]

> "The limitations on humans as information processors put a fairly low limit on the amount of manual planning. The high processing time and high cost to manually prepare alternative plans and to manually prepare alternative courses of action severely constrains the possibility and benefits from planning. A major advantage of computer assisted planning is that it removes these constraints."

It is, therefore, the author's intention to develop a casual model which reflects the relationships between costs and the needed revenue of the Auxiliary Enterprise System. The proposed model has the capacity to test ranges of costs, additions of costs and deletions of costs as they affect needed revenues. The computer model is designed to be used in the interactive mode using VSPC Fortran IBM Level G and in the batch mode using Fortran IBM Level G.

The Auxiliary Enterprise System at UND includes the housing, dining hall, parking and recreational facilities for which specific fees and charges are assessed and then consolidated to cover operating expenses and service all outstanding debt of the system. Although the University has the capability to spread debt and operating expenses over the entire system, it generally matches the expense to a specific unit within the system. [6] For example, additional debt incurred by the construction of a new married student housing facility would be assessed

equally to the rates of existing married student housing facilities without affecting the rates of existing dormitory or dining hall facilities. This matching principal is a convention adopted by the University for the purpose of equity to the users of the Auxiliary Enterprise facilities. The institution is not limited to this convention by law or by covenant of the existing Bond Resolution.

The data base for testing the aforementioned model consists of the following sources of expenses and revenues for fiscal year 1978. [5 ]

REVENUES: 1) Room rent; 2) board charges: 3) apartment rent; 4) fees: University Center, Health Service, Parking, Ice Arena; 5) sales: food, banquet, vending; 6) intra-fund transfers; 7) state appropriations; 8) federal debt service grants.

EXPENSES: 1) salaries and wages; 2) fringe benefits; 3) operating expenses: travel, utilities, communications, insurance; 4) rents and leases; 5) office; 6) repairs; 7) supplies; 8) general; 9) equipment; 10) transfers; 11) merchandise for resale; 12) maintenance; 13) bond servicing; 14) extraordinary.

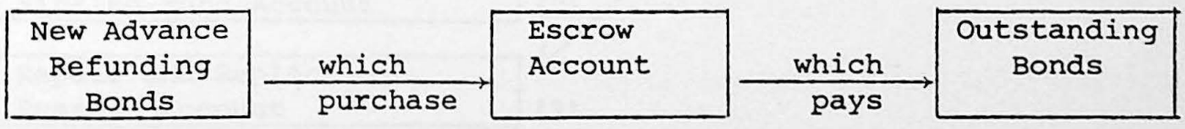
These are the factors that are reviewed on an annual basis and are adjusted to achieve a projected balance for the upcoming fiscal year.

The financial administration of these Auxiliary Enterprises, insofar as matching expected revenues and expenses, does not depend on cybernation. But investigation of alternative costs and changes in the bonding structure of the entity does require more sophisticated analysis.

Before examining the funds flow of the Auxiliary Enterprise System, a discussion of the bonding structure is relevant. There are two methods of financing applicable to these enterprises. Funds generated from the operation of each enterprise can be applied directly to the

expenses of that enterprise or the revenues can be pooled before covering expenses. The first method is to fund each enterprise separately by issuing a specific bond guaranteed by the revenues of that enterprise. This method requires that the rates charged the users of the enterprise be sufficient to: maintain an adequate reserve fund as specified in the bond issue; cover all operating expenses; service the debt; and provide for an adequate maintenance and replacement fund. These requirements may vary from enterprise to enterprise forcing a discriminating rate structure depending on the revenue need of each enterprise.

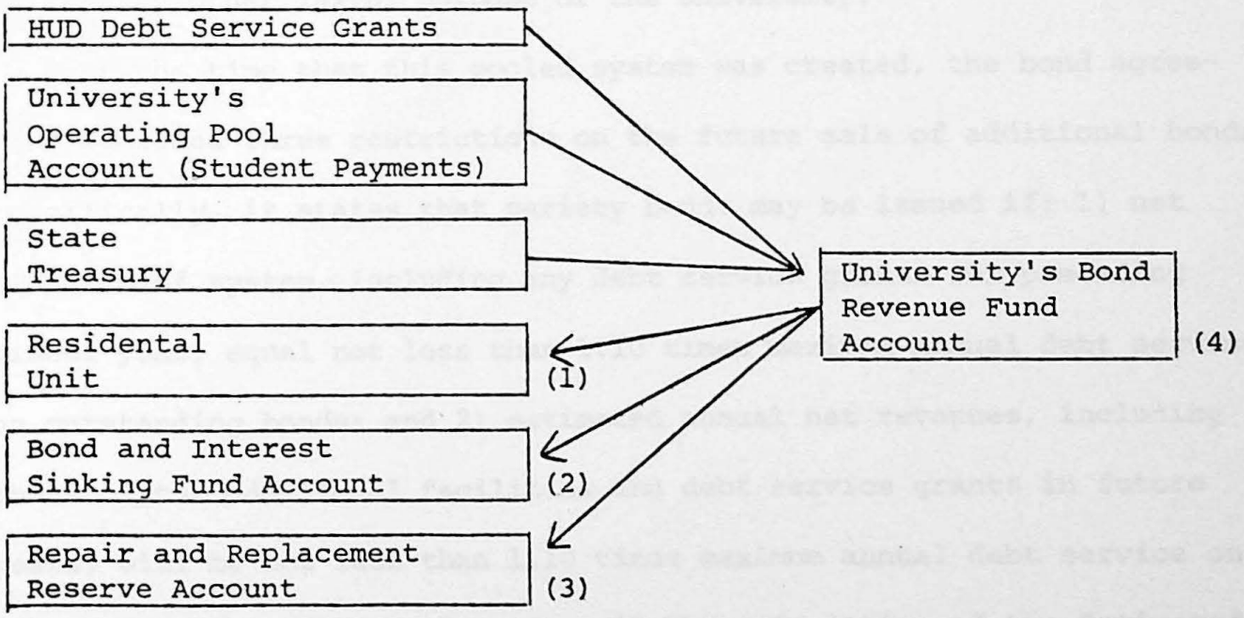
The second method of funding Auxiliary Services is by pooling the bonding requirements. This procedure is accomplished by: 1) issuing new bonds where no bonds have previously been used; 2) refunding or exchanging outstanding bonds upon their maturity; 3) issuing advance refunded bonds to replace the outstanding bonds prior to their maturity. The transactions described in alternatives one and two are straightforward. The third alternative, i.e., the sale of advance refunded bonds, deserves explanation. It is a procedure that provides funds for the purchase of securities which are placed in an escrow account. The proceeds from these securities, i.e., interest payments and the invested principal, are used for both debt service and the retirement of the existing bonds. The procedure is illustrated by the following:




Whichever alternative is used to achieve a pooling of funds, the results are similar. The pooling usually achieves one or more of the following objectives: 1) an equitable assessment of charges to occu-

pants of different facilities; 2) a rearrangement of yearly debt service; 3) a rewriting of restrictive covenants; 4) an increase of bonding capacity; 5) a streamlining of financing programs to better structure current debt service in anticipation of future financing needs; 6) a possibility of improving bond rating and increasing investor acceptance of bonds in the marketplace; 7) a reduction or change in service rates or charges; 8) an ability to add facilities in an inflationary environment and spread the cost throughout the System.

In 1975, the University of North Dakota created a pooled system by issuing $6,410,000 advance refunding bonds ($3,350,000 Series I and $3,060,000 Series J) and exchanging $7,922,000 of existing Series A through H bonds for bonds held by the Department of Housing and Urban Development. [6] The creation of this system resulted in the following flow of funds: [6]




(1) The Residential Units are reimbursed for all operating and maintenance expenses. The amount forwarded includes monies for an

Operating Reserve to be maintained at an amount of up to 25% of prior year's current expenses.

(2) This account holds monies for semi-annual interest and annual principal payments. It also contains a Debt Service Reserve at amounts of maximum annual principal and interest to be used to pay debt service if needed.

(3) This account annually received 10% of the amount of debt service, to be built up to $1,000,000 or larger as required, and is used for improvements, renovations, repairs, and debt service if needed.

(4) Operating Reserve of Revenue Fund Account shall not exceed one-fourth of the operating and maintenance expenses of the Housing and Auxiliary Facilities System for the preceding twelve months. The remaining Revenue Fund monies are used to redeem bonds, cover any expenditures including debt service for improving or restoring facilities, or for any other lawful purpose of the University.

At the time that this pooled system was created, the bond agreement outlined three restrictions on the future sale of additional bonds. Specifically, it states that pariety bonds may be issued if: 1) net revenues of system, including any debt service grants for preceding fiscal year, equal not less than 1.10 times maximum annual debt service on outstanding bonds; and 2) estimated annual net revenues, including those of the additional facilities and debt service grants in future years, will be not less than 1.10 times maximum annual debt service on outstanding and additional bonds. 3) The calculation of the Estimated Net Revenues of all facilities under construction or to be acquired or constructed whall be predicated upon a utilization or occupancy rate of

not more than ninety per cent (90%). The absence of additional restrictions allows the University great flexibility concerning future expansion.

# CHAPTER II

# THE MODEL

## 1. Overview

The model is designed to forecast the annual usage rate charged for each Auxiliary Enterprise in the System. Accomplishment of this goal results from:

1. A manual compilation of current fiscal year costs of the System and a naive forecast of these costs one year forward.
2. A manual compilation of current fiscal year revenues of the System.
3. A computer-assisted examination of existing and alternative bond structures relevant to facilities within the System.
4. A summary which relates the projected costs, determined revenue needs, and applicable bond requirements to the user rate schedule.

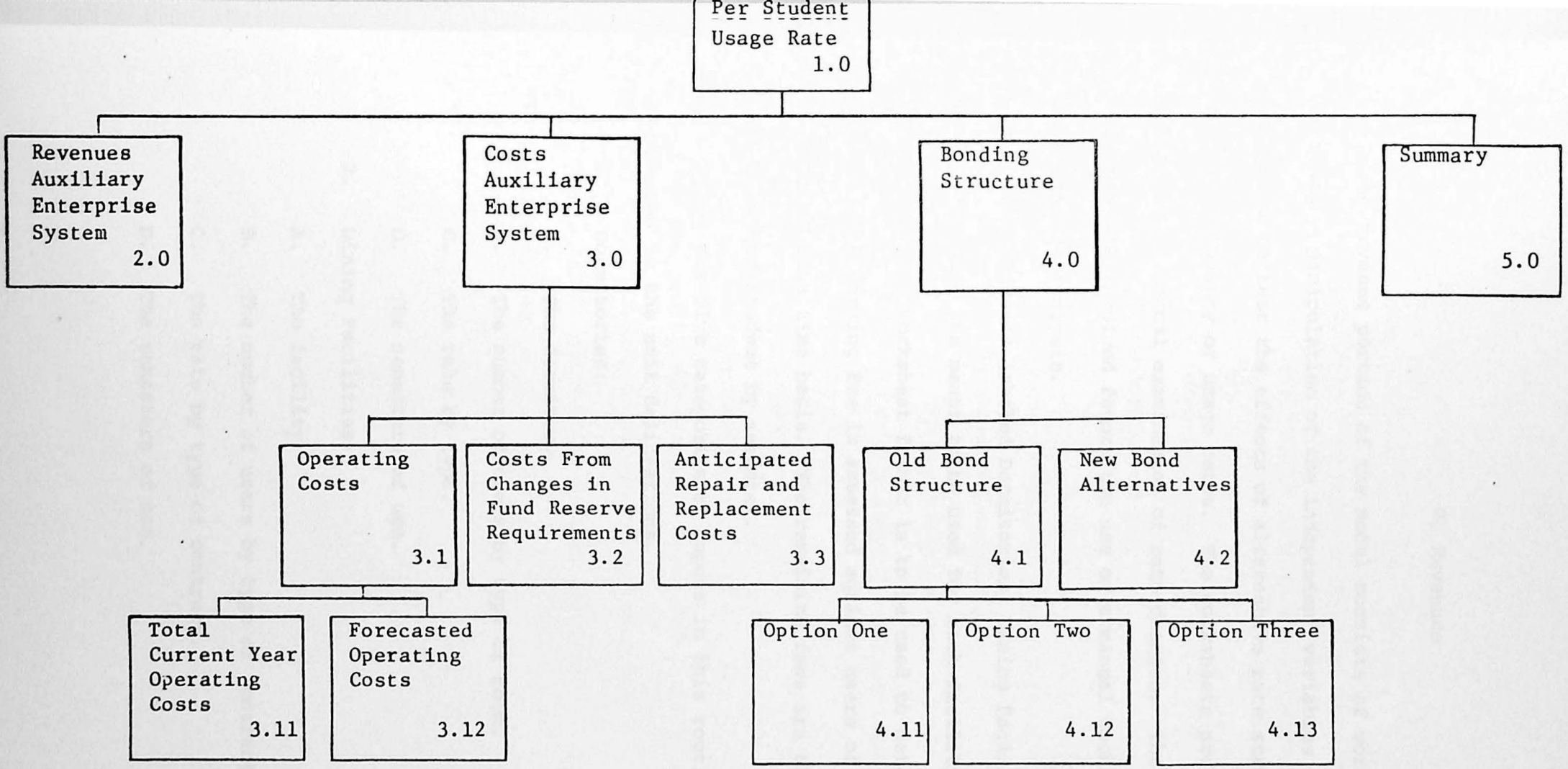

Per Student Usage Rate 1.0
Revenues Auxiliary Enterprise System 2.0
Costs Auxiliary Enterprise System 3.0
Bonding Structure 4.0
Summary 5.0
Operating Costs 3.1
Costs From Changes in Fund Reserve Requirements 3.2
Anticipated Repair and Replacement Costs 3.3
Old Bond Structure 4.1
New Bond Alternatives 4.2
Total Current Year Operating Costs 3.11
Forecasted Operating Costs 3.12
Option One 4.11
Option Two 4.12
Option Three 4.13

Exhibit 1

## 2. Revenues

The revenue portion of the model consists of worksheets designed to allow a manipulation of the independent variables (rates and number of users) to test the effects of alternative rate structures and varying occupancy or usage rates. The worksheets provide a method for an organized manual examination of rate changes. The simplicity of the calculations involved favors the use of a manual technique over a computerized analysis.

The worksheets labeled Dormitories, Dining Facilities, and Married Student Housing are meant to be used for each facility in the respective unit. The same worksheet format is to be used to determine the unit totals. The Parking Fee is assessed against users of the parking facilities on a time basis. The remaining fees are charged against each enrolled student by semester.

There are five categories of inputs in this routine. The categories correspond to the unit delineations.

1. Dormitories:
   - A. The dormitory.
   - B. The number of users by type of room.
   - C. The rate by type.
   - D. The semesters of use.
2. Dining Facilities:
   - A. The facility.
   - B. The number of users by type of contract.
   - C. The rate by type of contract.
   - D. The semesters of use.

3. Married Student Housing:

   A. The facility.

   B. The number of users by type of facility.

   C. The rate by type of facility and option.

4. Parking Fees:

   A. The number of users.

   B. The semesters of use.

5. Fees:

   A. The number of users by type of facility sponsored.

   B. The semesters of enrollment.

The output of the revenue analysis consists of:

1. Gross revenue of Auxiliary Enterprise System.

   A. Facility totals.

   B. Unit totals.

   C. System totals.

The worksheets are designed to determine the gross revenues of the system given specific rates and usage. They are meant to be used as an aid in evaluating alternative pricing structures of the Auxiliary Enterprise System.

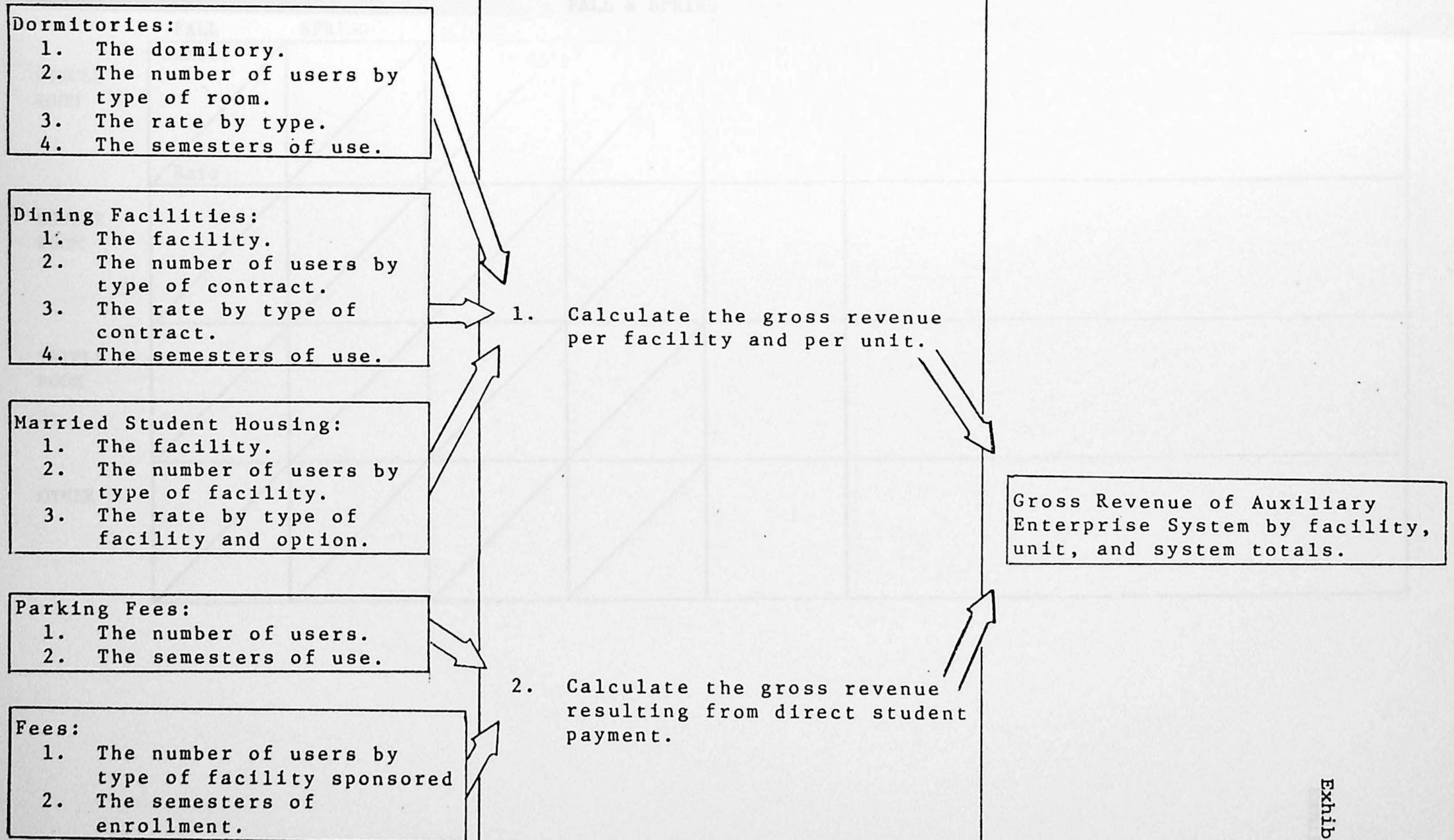

Dormitories:
1. The dormitory.
2. The number of users by type of room.
3. The rate by type.
4. The semesters of use.
Dining Facilities:
1. The facility.
2. The number of users by type of contract.
3. The rate by type of contract.
4. The semesters of use.
Married Student Housing:
1. The facility.
2. The number of users by type of facility.
3. The rate by type of facility and option.
Parking Fees:
1. The number of users.
2. The semesters of use.
Fees:
1. The number of users by type of facility sponsored
2. The semesters of enrollment.
1. Calculate the gross revenue per facility and per unit.
2. Calculate the gross revenue resulting from direct student payment.
Gross Revenue of Auxiliary Enterprise System by facility, unit, and system totals.

Exhibit 2

| | FALL | SPRING | SUMMER | FALL & SPRING COMBINED | TOTAL NUMBER | TOTAL AMOUNT |
|---|---|---|---|---|---|---|
| SINGLE ROOM | Number / Rate | | | | | |
| DOUBLE ROOM | | | | | | |
| TRIPLE ROOM | | | | | | |
| OTHER | | | | | | |



Exhibit 3

| | FALL | SPRING | SUMMER | FALL & SPRING | TOTAL NUMBER | TOTAL AMOUNT |
|---|---|---|---|---|---|---|
| FIVE DAY FOOD CONTRACT | Number / Rate | | | | | |
| SEVEN DAY FOOD CONTRACT | | | | | | |
| TEN MEAL FOOD CONTRACT | | | | | | |
| OTHER | | | | | | |



Exhibit 4

| | U | F | AC | G | F & AC | F & G | F, AC & G | AC & G | Number | Total Amount |
|---|---|---|---|---|---|---|---|---|---|---|
| One Bedroom (Number / Rate) | | | | | | | | | | |
| Two Bedroom | | | | | | | | | | |
| Three Bedroom | | | | | | | | | | |
| Trailer | | | | | | | | | | |
| Other | | | | | | | | | | |

U = Unfurnished
F = Furnished
AC = Air Conditioned
G = Garage



Exhibit 5

| | SPRING | FALL | SUMMER | FULL YEAR | TOTAL NUMBER | TOTAL AMOUNT |
|---|---|---|---|---|---|---|
| FACULTY AND STAFF | Number / Rate | | | | | |
| STUDENT | | | | | | |
| OTHER | | | | | | |

Exhibit 6

| | FALL | SPRING | SUMMER | FULL YEAR | TOTAL NUMBER | TOTAL AMOUNT |
|---|---|---|---|---|---|---|
| UNIVERSITY CENTER | Number / Rate | | | | | |
| ICE ARENA | | | | | | |
| HEALTH SERVICE | | | | | | |
| OTHER | | | | | | |



Exhibit 7

## 3. Costs

The cost portion of the model subdivides into three identifiable areas: operating costs; changes in fund reserve requirements; and repair and replacement costs. The calculation of costs in each area is a straightforward procedure, one that does not require computer application. Therefore, the offered methodology for tabulating these costs is the application of worksheets which correspond in form to the Income and Expense Statements of the institution.

The operating costs of the system are compiled from the current year's Income and Expense Statements of each enterprise. The level of detail is selected. For example, all personnel expenses may be discussed as one category or they may be broken down into: salaries and wages; salaries and expenses-support staff; fringe benefits; etc. Once the level of detail is determined, totals per unit and system are tabulated. The totals are projected by a naive forecast. That is, the cost figures are projected one year forward by applying a subjective percentage adjustment. The forecast results are the output for this portion of the model.

The changes in reserve requirements result from two occurrences. First, the reserve requirements increase with the addition of new debt to the system. Second, the reserve requirements decrease with the retirement of debt from the system. The amount of change is determined by the reserve requirements imposed by the appropriate bond resolutions. Therefore, no specific worksheet form is recommended. The output of this portion of the model is the amount of the change.

The third segment of the cost is the amount pledged each year to a

repair and replacement fund. This fund usually requires a minimum balance as specified in the bond resolution. Payments into the fund are specified as a percentage of the outstanding debt. Further payments may be included at the discretion of the financial planner of the institution.

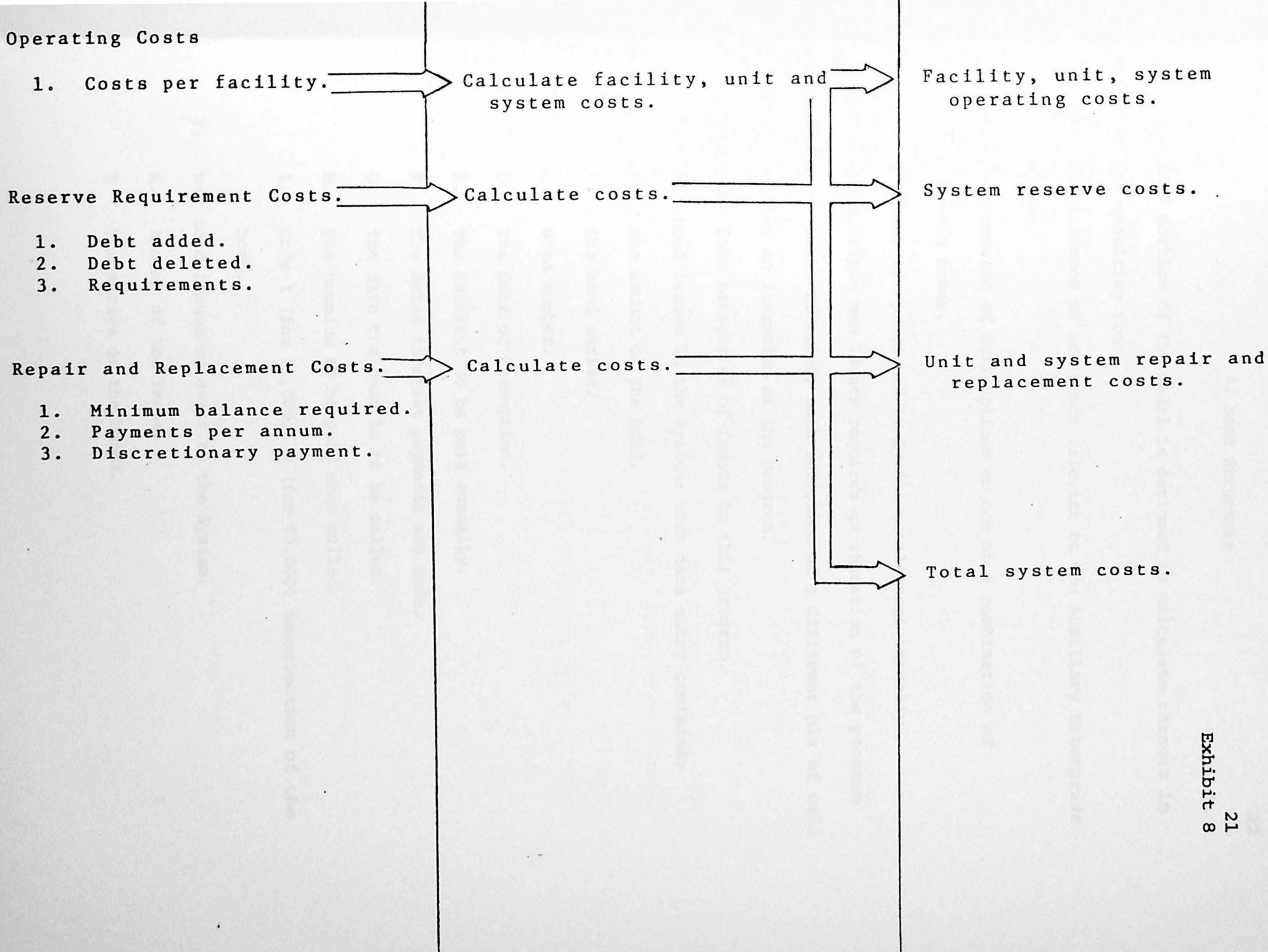

Operating Costs
1. Costs per facility.
Calculate facility, unit and system costs.
Facility, unit, system operating costs.
Reserve Requirement Costs.
Calculate costs.
System reserve costs.
1. Debt added.
2. Debt deleted.
3. Requirements.
Repair and Replacement Costs.
Calculate costs.
Unit and system repair and replacement costs.
1. Minimum balance required.
2. Payments per annum.
3. Discretionary payment.
Total system costs.

Exhibit 8

## 4. Bond Structure

The bond portion of the model is designed to calculate changes in cash outflow resulting from:

1. The issuance of new bonds relevant to the Auxiliary Enterprise System;
2. The exercise of call options on one or a combination of existing bonds.

The case outflows are presented as System totals semi-annually. Inclusion of multiple new issues requires an iteration of the program for each new issue. Likewise, each selection of a different mix of call options requires an iteration of the program.

There are four categories of inputs to this program.

1. Old bond issues in the System: each data entry contains:
   - A. The amount of the bond.
   - B. The bond series.
   - C. Bond number.
   - D. The date of redemption.
   - E. The interest to be paid annually.
   - F. The dates interest payments are made.
   - G. The date the bond is to be called.
   - H. The premium to be paid when called.
   - I. Code 1 (for $1,000), 5 (for $5,000) denomination of the bond.
2. New bond issues relevant to the System:
   - A. Amount of the issue.
   - B The series of the bonds.

C. The date of issue.

D. The average annual interest on all bonds in the series.

E. The dates interest payments are made.

F. The date each year that bonds are to be redeemed.

G. Code 1 (for $1,000) or 5 (for $5,000) denomination of bond.

3. User ID for the table.

4. Choice of payout.

A. Option 1: to equalize payments. Select number of years of new bond issue.

B. Option 2: to select amount of constant cash outflow.

C. Option 3: to select the amount of cash outflow during selected years. To equalize payments for the remainder of the issue. Select the number of years of new bond issue.

The output of the bond program consists of the following:

1. PRINT BACK INITIAL CONDITIONS

A. Old Bonds

(1) Total amount outstanding.

(2) Total amount outstanding by series.

(3) The annual per cent interest paid per bond. (i.e., Series J bonds numbered 1-8, 8.00%, Series J bonds numbered 9-16, 8.25%)

(4) List bonds called, dates of call, premiums paid, total amount called.

B. New Bonds

(1) Total amount of issue.

(2) Total by series.

(3) Average interest to be paid on issue.

2. PRINT BACK CHOICE OF PAYOUT.

3. PRINT BACK TABLE HEADINGS.

4. PRINT BACK TABLES.

OLD SCHEDULE

| | Year | Series Bond Number | Amount Redeemed | Int. Amount | Year of Call | Bond Number | Amount Called | Call Premium | Old Bond Total |
|---|---|---|---|---|---|---|---|---|---|
| Column | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

NEW SCHEDULE

| | Year | Old Bond Expense | New Issue Interest | New Issue Premium | New Issue Total | Combined Old and New Total |
|---|---|---|---|---|---|---|
| Column | 1 | 2 | 3 | 4 | 5 | 6 |

The bond program is based on two assumptions:

1. The redemption schedule of the existing bonds does not consist of a one year balloon payment.

2. The new bonds are tested at a single interest rate for each series.

The program is designed to suggest a new bond structure consistant with the restraints imposed. The suggested redemption schedule represented by the table is meant to be an aid to capital budgeting and to be a tool for evaluation of bonding capacity.

Exhibit 9

REDUCTION FORMULA USED IN CHOICE OF PAYOUT OPTIONS ONE AND THREE [ 3 ]

For Year $\kappa$:

$$T_\kappa = K_\kappa + R_\kappa + I_\kappa$$

Where:

$K_\kappa$ is The total of all prior commitment payments in year $\kappa$,

$R_\kappa$ is The amount of new bonds to be paid in year $\kappa$,

$I_\kappa$ is The interest on new bonds to be paid in year $\kappa$,

Notation:

N is The number of years of bond,

p is The annual interest rate on The bond,

B is The amount of The bond,

$P = p + 1$

$\Delta_\kappa = K_{\kappa+1} - K_\kappa$

Computation:

$$R_1 = \{B + \sum_{\kappa=2}^{N} P^\kappa \left(\sum_{j=1}^{\kappa-1} P^{-(j+1)} \Delta_j\right)\} / \sum_{\kappa=1}^{N} P^{\kappa-1}$$

$$R_{\kappa+1} = PR_\kappa - \Delta_\kappa \quad , \kappa = 1, 2, 3, \ldots, N - 1$$

**Old Bond Issues:**

1. The amount of the bond.
2. The bond series.
3. The bond number.
4. The date of redemption.
5. The interest to be paid annually.
6. The dates interest payments are made.
7. The date the bond is to be called.
8. The call premium.

1. Calculate Old Bond Expense.

Old Bond Schedule showing cash outflow at specified dates including call options.

**New Bond Issues:**

1. The amount of the issue.
2. The bond series.
3. The date of issue.
4. The average annual interest on all bonds in the series.
5. The dates interest payments are made.
6. The date each year the bonds are to be redeemed.
7. The number of years of the issue.

2. Calculate the new bond amount to be redeemed each year to equalize total payout over the life of the new bonds.

New Bond Schedule including total cash payout on specific dates each year.



Exhibit 10

INPUT | PROCESS | OUTPUT

Old Bond Issues:

1. The amount of the bond.
2. The bond series.
3. The bond numbers.
4. The date of redemption.
5. The interest to be paid annually.
6. The dates interest payments are made.
7. The date the bond is to be called.
8. The call premium.

1. Calculate Old Bond Expense

Old Bond Schedule, showing cash outflow at specified dates including call options.

New Bond Issues:

1. The amount of the issue.
2. The bond series.
3. The date of issue.
4. The average annual interest on all bonds in the series.
5. The dates interest payments are made.
6. The date each year the bonds are to be redeemed.
7. The amount of cash payout each year.

2. Calculate the number of years for which the new bonds should be issued, given the constant amount to be paid out each year.

New Bond Schedule including total cash payout on specific dates each year.

Exhibit 11

| INPUT | PROCESS | OUTPUT |
|---|---|---|
| **Old Bond Issues:**<br>1. The amount of the bond.<br>2. The bond series.<br>3. The bond number.<br>4. The date of redemption.<br>5. The interest to be paid annually.<br>6. The dates interest payments are made.<br>7. The date the bond is to be called.<br>8. The call premium. | 1. Calculate Old Bond Expense. | Old Bond Schedule, showing cash outflow at specified dates including call options. |
| **New Bond Issues:**<br>1. The amount of the issue.<br>2. The bond series.<br>3. The date of issue.<br>4. The average annual interest on all bonds in the series.<br>5. The dates interest payments are made.<br>6. The date each year the bonds are to be redeemed.<br>7. The years payment is selected.<br>8. The amount of payment in selected years.<br>9. The number of years of the issue. | 2. Calculate the new bond amount to be redeemed each year to meet the limits imposed for certain years, and to equalize the payment each year for the remaining life of the issue. | New Bond Schedule including total cash payout on specific dates each year. |

Exhibit 12

## 5. Summary

The purpose of the summary segment of the model is to consolidate the outputs of the other segments and to translate these outputs into usage rates for each auxiliary enterprise in the system. This purpose is accomplished by use of the following equations.

1. Projected Revenue Needs = Projected Total Costs + Projected Debt Service

2. Projected Revenue Needs - Current Revenue = Revenue Variance

3. Revenue Variance ÷ Number of Users = Rate Change/User

The above equations may be applied to system figures, unit figures, or facility figures. Changes in rates are assessed equally to each category of user. That is, a ten dollar increase in dorm rates increases the single, double and triple rates each by ten dollars.

The inputs to this segment of the model are the outputs from other parts of the model. They are:

1. Current revenue.

2. Projected total costs.

3. Projected debt service.

The output of the summary analysis consists of:

1. Rate changes for the Auxiliary Enterprise System.

   A. Facility rate changes.

   B. Unit rate changes.

   C. System total changes.

INPUT | PROCESS | OUTPUT

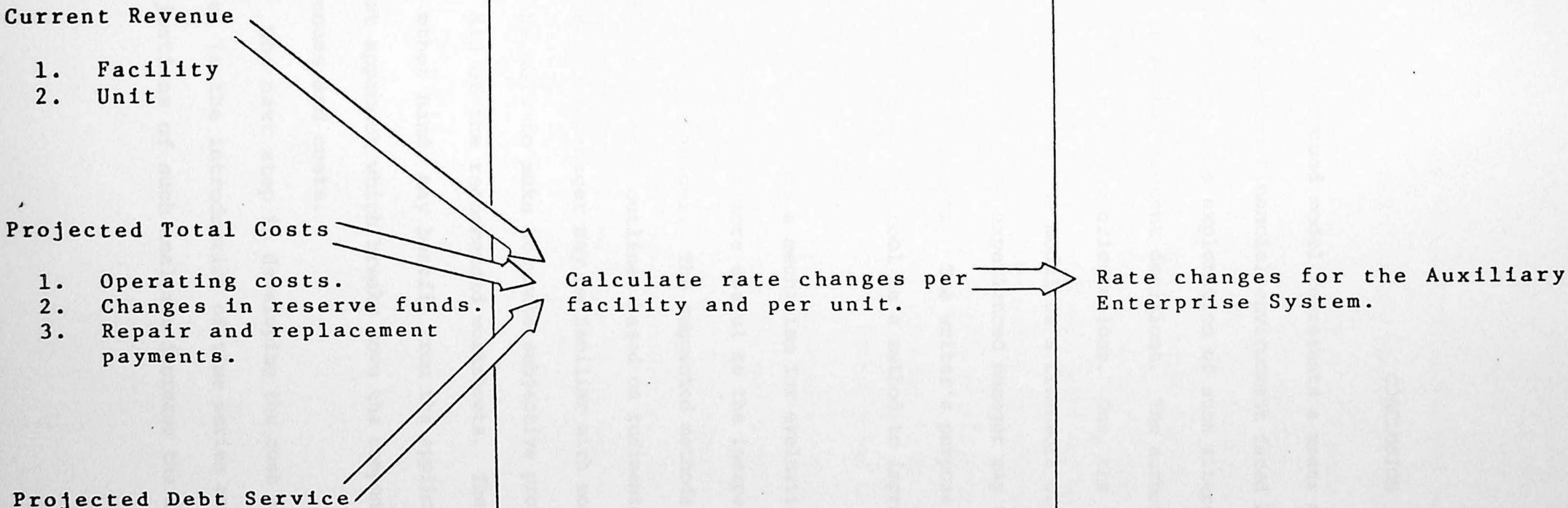



Exhibit 13

# CONCLUSION

The proposed model represents a means of articulating future changes in the financial environment faced by the higher education institution. The exploration of such altered environments increases the data base for present decisions. The author suggests that this capacity is valuable to two orientations. One, the inexperienced financial manager may use the model as a framework of analysis, exclusive of other sources. Two, the experienced manager may use the model to quantify intuitive judgements. The writer's purpose is to encourage a broad application of the tool as a method to improve the planning capability of the institution.

The model, as a mechanism for evaluation of operational revenues and costs, may be more useful to the inexperienced manager than the experienced manager. The suggested methods of tabulating revenues and costs are simple outlines based on rudimentary calculations. The experienced manager may be familiar with more efficient methods, or may be able to make accurate subjective projections of costs without the aid of the recommended worksheets. The inexperienced manager, on the other hand, may benefit from the application of the organized worksheet approach which breaks down the component parts of the operational revenues and costs.

The next step in developing the cost and revenue portions of the model is the introduction of time series analysis. Quantified projections of such analysis increase the data base of the decision

maker. However, examination of the cost benefit relationship of the use of such a method is recommended prior to its adoption.

Regardless of their degree of experience with planning, financial managers of higher education institutions have not had the capacity to quickly evaluate different bond structures as they affect the costs of auxiliary enterprises. The bond portion of the proposed model provides this capability. The method developed, i.e., batch and interactive computer analysis, provides the manager with the power to instantaneously examine changes in costs resulting from changes in the input variables. This ability to simulate alternative structures is an original contribution of the model to the planning function.

The usefulness of the entire model is an open question. It will be determined by actual application. The author has suggested that there is immediate desire for such a tool at the University of North Dakota. Interest in the model as a marketing tool has been expressed by the investment banking community. The author hopes that other institutions will see value in the use of the proposed model.

maker. However, examination of the cost benefit relationship of the use of such a method is recommended prior to its adoption.

Regardless of their degree of experience with planning, financial managers of higher education institutions have not had the capacity to quickly evaluate different bond structures as they affect the costs of auxiliary enterprises. The bond portion of the proposed model provides this capability. The method developed, i.e., batch and interactive computer analysis, provides the manager with the power to instantaneously examine changes in costs resulting from changes in the input variables. This ability to simulate alternative structures is an original contribution of the model to the planning function.

The usefulness of the entire model is an open question. It will be determined by actual application. The author has suggested that there is immediate desire for such a tool at the University of North Dakota. Interest in the model as a marketing tool has been expressed by the investment banking community. The author hopes that other institutions will see value in the use of the proposed model.

# APPENDIX