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ABSTRACT

This talk is divided into two parts: Part one covers Planning, Programming and Budgeting for Capital Programs. Part two is a brief description of the Coho Salmon Program and how Program Planning and Budgeting in both the operation program and the capital phase was used to develop the Salmon Fishing Industry in Michigan. The planning process consists of ten steps: (1) the identification of needs, (2) the identification of broad objectives, (3) standards which will apply generally to all capital improvements, (4) the consideration of alternatives, (5) the comparison of the alternatives, (6) the selection of the preferred alternative, (7) the allocation of the state's resources, (8) the fiscal plan for the governmental unit, (9) the economic conditions of the community and (10) political priorities. The focus of the programming phase is on the resources needed. Two important items in the programming phase are: (1) the question of incremental development of a capital complex and (2) the whole problem of time phasing of a capital project. Design preparation is divided into three steps: (1) schematic drawings, (2) preliminary plans and (3) final plans and drawings. The budget should contain a series of analytical support documents containing (1) the economic and financial considerations used in making the decision, (2) the reasons for the time phasing and (3) discussion of the alternatives. (WH)

Influence of PPB on Capital Budgeting

by

Arthur E. Ellis
Chief Budget Officer
Eastern Michigan University

Paper presented at an Institute on Program Planning and Budgeting Systems for Libraries at Wayne State University, Detroit, Michigan, Department of Library Science, Spring 1968

Introduction

by
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The following paper was presented at an institute on Program Planning and Budgeting Systems for Libraries, held at Wayne State University under the Higher Education Act, Title IIB, in the spring of 1968.

The intent of the institute was to introduce administrators and finance officers of large libraries, public, state, and academic to the principles and procedures of PPBS.

Each participant in the institute brought with him the most recent budget document from his own library, and with the help of the institute staff, attempted to convert it into a PPBS presentation.

Influence of PPB on Capital Budgeting

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Arthur E. Ellis
Chief Budget Officer
Eastern Michigan University

This is the beginning of your ninth day here on the campus of Wayne State University. I have sat thro' more than one Institute on Program Budgeting and know that since the first Monday morning, you have heard more than your share of technical language on the techniques of Program Budgeting. This morning, we will talk about Capital Planning and Budgeting as much as possible in non-technical terms. The techniques that have been covered during the Institute are the same for Capital Budgeting as they are for the operating budgets; therefore, little time needs to be spent in defining terms or going through the jargon of budgeting.

The State of Michigan has one of the fine capital planning operations that is in existence today. Michigan, in each of the past three to four years, has appropriated between $75 and $100 million to finance pay-as-you-go capital construction programs. I will use examples from the Michigan scene as I progress with this talk.

I will divide my talk this morning into two parts. Part One will cover Planning, Programming and Budgeting for Capital Programs. We will then switch to a case example that is in the newspapers and over radio and television in this state and the nation: Coho Fishing. I will briefly show how the Coho Salmon Program came into existence in Michigan, and how Program Planning and Budgeting in both the operation program and the capital phase was used to develop the Salmon Fishing Industry in Michigan.

There are at least two items of an introductory nature that I want to emphasize this morning. First, buildings are built to service a particular operating program need. The days are long past when we build buildings simply because a department in a university wants a new building, or an agency in the government feels it is falling behind in the status that new buildings give to agency programs. Second, construction costs around the nation for buildings of a technical nature such as chemistry or biology and public buildings like the new Capitol Building that is being planned for Lansing, Michigan, are approaching $50 per square foot in construction costs. This means one thing: if public tax dollars are to be used to meet $50 per square foot costs, we must assure the public, the taxpayer, that he is getting $50 worth of value.

Let's begin with the Planning function. The all-important first step is the identification of needs. As operating programs are identified, the capital programs needed to implement the operating programs must also be identified.

The following factors, among others, must be taken into account in determining the need for capital improvement. First, the content and type of operating program. Is it a new program or is it intended to substitute for one already in existence? Can it utilize existing physical facilities or are new ones required? Does it require physical facilities of its own or can it share facilities with other operating programs? And, very important, is the operating program likely to be temporary in nature? Second, the size and implementation of the operating program. How large is the

program to be when it starts out and what is the program likely to look like five, ten, or twenty years on down the road? Will the program be operated from a central location? Or will the natural implementation of the program require scattered stations throughout the state? How many employees will be involved now and in five, ten, or twenty years? Third, are there state laws and policies which affect the operating program? For example, in education, there are specific statutes which govern the school year, the length of the school day. In the example I will refer to later, there are specific laws governing and regulating the fishing season and specifying the areas where it is legal to fish. Fourth, are there risks involved, or should we say, what are the risks involved? Fifth, what economic and social changes might affect the need for physical facilities for the operating program? I remember only too well three or four years ago, when we put the Title 19 Medicaid Program into operation in Michigan. I participated in one of the classic errors in budgeting that has been made in this state. Our original budget estimates were only $20 million off! No one foresaw the rapid growth of the Medicaid Program, the tremendous economic and social need that case workers would find. The costs ran right off the projection charts. There are risks involved with every program and lessons to be learned.

The second major item I wish to identify in the Planning process are the broad objectives which will identify the results that are desired from the operating program. These objectives must be stated in specific terms and given specific time periods in which the objectives are to be accomplished. I feel that the statement should be definitive and I reject the use of terms like "quality education" or "to provide the best possible education". These

pharases mean different things to different people, and nothing to a good many. The objectives should be stated so that everyone knows what they mean.

The third broad heading under the Planning process I'll call standards--standards which will apply generally to all capital improvements. First of all, standards of site selection, referring here to broad state policies which define a state's social, economic, and political goals that should be taken into account in the selection of a site. Standards of size: These standards prescribe the maximum and minimum number of people a building or a complex of buildings should be able to accommodate, what constitutes the most efficient placement of buildings in a complex, and the minimum support facilities which are necessary to be included in any complex of buildings, when and under what circumstances a one-storey, or a two- or more story building should be constructed, and, of course, whether permanent structures are necessary. Standards governing space utilization. These standards prescribe the maximum and minimum sizes of rooms for different purposes, such as an office, a classroom, or a laboratory, the maximum number of people a room should be able to accommodate, the optimum placement of fixtures in relation to the other, and rules relating to utilization of a room. We, in Michigan, have found that space utilization has become a most important tool in our planning system. The time and effort that goes into a good space utilization study will reward the state or the planning agency in dollar savings many times over. Standards governing construction: These standards should specify the kinds of material which are required for certain types of facilities and lay out minimum requirements which must be adhered to in

the design of physical facilities, and the minimum expectations in terms of workmanship and so forth that the state has laid down. Standards that are used to estimate cost: To know what you're doing, there must be some system for estimating cost in a standard and uniform manner. What costs are included in your estimating and what are excluded? Is the cost of equipment included in the building or is it in some other budget? This information will provide you with the guideline necessary to make comparisons with other facilities of a similar nature.

The fourth item under planning is the consideration of alternatives. There is more than one way to attain operating program objectives. There's an old saying that there are two sides to every question. Well, I'll mention four that should be considered when you're looking for alternatives to new construction. First, is it possible to have better utilization of existing facilities? This is obviously the cheapest way. Is it feasible or practical to remodel existing facilities? A third way may be to consider an addition to an already existing facility. In many cases, in many locations, the renting or leasing of facilities is practical. This should be considered when there is any likelihood that the program is temporary in nature. Finally, we consider the construction of new facilities.

The fifth item under Planning is a comparison of the alternatives. This is where the detail work really starts and when and where the analysis will really pay off. Each of the alternatives should be measured against each other in terms of costs, benefits, advantages and disadvantages. The methods of measuring costs and benefits have been explained by other speakers. Advantages and disadvantages are dependent on individual circumstances. In a state

like Michigan, it makes a good deal of difference in terms of fuel cost whether a building is constructed in Detroit, or say, in Marquette, up on the shore of Lake Superior. Speaking of advantages and disadvantages, in the mental hospitals of Michigan, we have discovered that in the Detroit Metropolitan area, doctors are easy to obtain and are willing to work in the mental hospitals, but it is very difficult to obtain patient help personnel. The working man in Detroit can simply make more money on the automobile assembly line than he can in the mental hospital ward. By the same token, in Upper Michigan or the rural areas of the state, we can find all the patient-care personnel we need. People from the small towns are only too happy to take civil service jobs, but in these locations, doctors are hard to come by. Highly-trained and skilled professional people simply prefer to live in the metropolitan areas. Advantages and disadvantages must be considered.

In the sixth step, we get to the selection of the preferred alternative. Once the analysis is completed and the comparisons of the various ways of assuring the availability of needed capital improvement is made, a decision, probably in rough form, is made and an alternative is selected. Such a decision, however, cannot be made unless and until it is known how much money is being allocated and for waht operating programs, and how much money for physical facilities will be allotted in the next fiscal year and in the succeeding four or five fiscal years. If you're operating at the state level, some political decisions have to be made by this point in time for the course of action now being plotted.

As the seventh item under Planning, we should mention the allocation of the state's resources. The resources of government are limited. Hard decisions have to be made as to which operating programs are to be funded and which capital improvements can be secured at a particular time. In our discussion of capital budgeting, we can limit our concern to how much money will be available for capital construction in the next fiscal year and in the next four or five years. Most major projects in this day and age are built over a period of years and funded in a like manner. In the last few sentences, I've mentioned a time span of five years twice. I assume that your speakers in the last week or ten days have emphasized the need in this total PPB System for planning over a period of years. My preference, especially in the capital area, is for five or six years. It is of fundamental importance that no capital construction project be taken into any serious consideration unless it has been through a planning process that assigns it some priority within a five-year overall plan.

The eighth step I wish to mention in the Planning process is the fiscal plan for the governmental unit. What is the cash position in the state? And what do revenue projections look like for the next one, two, or three years? In Michigan, we carry on a cash, pay-as-you-go construction program. With the rising economy and the particular tax structure of Michigan, we have been able to construct close to $100 million in new construction annually for the last three or four years and there is no sign in the future that this is going to let up; however, many states and governmental jurisdictions finance the capital construction program with bond issues, and at this point

in the Planning process, the constitutional limitation of indebtedness and any other legal restriction should be reviewed. Another important item is what is the status of the authorized backlog of construction projects? If unimplemented, capital improvement programs would be sitting on the drawing tables of state agencies, therefore, we should hesitate if there is little likelihood that action will be forthcoming in the foreseeable future.

In wrapping up the allocation of resources and fiscal plans of the future, we should give specific attention to the economic conditions of the community. What are the trends and the cost of construction? What is the level of construction activity? In the area of Ann Arbor, Michigan, where the University of Michigan, Eastern Michigan University, Washtenaw County Community College, and the Concordia College of the Missouri Sybod Lutheran Church all sit within a stone's throw of each other, the competition in the construction industry is fierce. Costs skyrocket, land values rise way ahead of the normal inflationary trends. When conditions like these are evident, be particularly careful to do you analysis of cost in terms of the economic conditions of the community, and be careful of using statewide or regional averages. The budget planner makes no friends by deceiving himself or others fro the anticipated cost influences how much capital improvement should be acquired in any given year.

The last item I list under Planning is quite simply political priorities. No matter what the textbook approach to planning is, in our form of government, the decisions are made by politicians. Five-

year plans obviously span one, and in some cases, two elections. What one governor might recognize as a great public need and set out as a goal for his administration to achieve may, perhaps, be viewed by the next governor as not very important at all. The planning process must be flexible enough to adjust to changes.

Let's switch to Programming. Programming, in the capital improvement planning process, results in the time table of action for the next five or six years. The time table spells out what action is to be taken, when and at what cost, to insure the availability of what capital improvement for which operating programs.

You will remember that a few moments ago, I spoke of the planning process in terms of five or six years. Most people would say that the planning process should encompass a good many more years than that. The point I wish to make is tha planning by any type of central agency, the Governor's Office, or the Bureau of the Budget, *simply is not effective* past five or six years. The long-range planning effort belongs in the agencies -- in the Department of Education, in the Department of Social Services, in the Department of Natural Resources, etc. Only those capital improvements on which some action is anticipated within the next five years should be programmed.

The focus of the programming phase is on the resources needed. The emphasis of the programming phase is on the how and when to acquire the needed resources. We must concern ourselves with the sequence of events. Many of the items in the planning phase are repeated in a more precise manner in the programming phase.

First and most important, are the operating programs themselves, for there can be no planning for capital improvements unless there is real planning for operating programs. Programs must be reviewed for their content, their nature, and their size. At this point, we also look in detail again at the economic conditions of the state and the community and the resources of the governmental unit that are available for capital construction programs, and, again, probably because of my experience with the Legislature, the political priorities that are existent at this point in time as they may not be the same priorities that existed during the planning phase.

In the programming phase, we focus in more sharply on costs. Depending on the selection of the alternative or alternatives that are in a program, we look at the cost of acquiring, developing, constructioning, and maintaining the capital project. Maintenance costs should not be overlooked as a major item of concern in the programming phase. You build a building just onece, but you maintain it for ten, twenty, thirty, or forty years. Mistakes made in the planning and programming phase which add to maintenance costs place an unnecessary burden on the funds needed for operating programs in the future.

There are two items in the programming phase that I feel warrant the spending of some time. The first is the question of incremental development of a capital complex. Because the resources of the government are limited, we must face up to the fact of life that particular capital projects are too big to build all at once, and we must develop a plan to build it in increments.

Of course, we must decide what comes first. In considering that decision, there are several things to take into consideration: the number of people to be accommodated in the early phases of the program and the rate of increase that is expected in the program. Close behind this comes the question of support facilities. Once you make the decision to go on to increments, you have to face up to how much space is needed for administration, how much for cafeterias, how much for parking, how much for other service items that belong in the complex. The problem arises in that support and service facilities usually are necessary in the first step.

I have had experience with two capital programs that involved large-scale incremental development. One is the $14 million Dental Complex at the University of Michigan. This one fell into place quite logically and with little problem. The Dental Complex is still under construction; service and administrative facilities are in portions of the old Complex which will remain intact until a later date.

The other is the massive $40 million Capitol Development Complex that state government is building in Lansing. The broad plan of the Capitol Development Project called for underground parking for 2,000 cars in a four-square-block area, with three massive buildings set on top of this parking structure. State government was growing so fast that speed became the essential ingredient to the Capitol Development Project. Therefore, the decision was made to go ahead with the parking structure before the programming was completed on the building which were to be on top of the parking structure before the programming was

completed on the building which were to be on top of the parking structure. This was a mistake; we all know it today. Without spending a lot of time on this, the problem developed as follows. The specific space allocated to each car for parking and the spacing pattern of the parking structure was developed based on criteria for parking structures. It is easy to see that the basic design characteristics of the building were determined by the space required to park an automobile. The building had to be designed to set on the structural columns that were built into the parking structure. I do not wish to leave the impression that the Capitol Development Complex in Lansing is unworkable or anything of that nature. It is, by most standards, a fine development that will serve Michigan well for many, many years. I only use it as an example to illustrate that if the programming phase had been followed, or indeed, if at that point in time, we had had the programming phase in Michigan developed, we could have followed a careful sequence on the incremental development of the system of the Complex and we would be even better off than we are today. The state is embarking on the second phase of the Capitol Development Project which is thought to include, at this time, a new Capitol Building. This building will cost between $40 and $50 million and will be built again over a 2,000 car parking structure. I can assure you that the Capitol Building will be designed first and the parking will be put under the building, rather than the parking structure dictating the design of Michigan's new Capitol Building. The need here is for careful programming to allow incremental development.

The other major item I wish to mention in the Programming phase is

the whole problem of time phasing of a capitol project. I have learned to be a pessimist when listening to architects and planners predict when a new building will be ready for occupancy. On our own campus at Eastern Michigan University, we face, in the fall of 1969, a very difficult problem stems fundamentally from the time phasing of our new Science Complex.

I have outline five items that should be considered in the time phasing part of programming. You must allow time for the site selection and this is more important than many people are willing to recognize. The question should not be, "Can we put a building on this spot?", but more properly, "Is this a logical and proper place to construct a building to carry on this particular operating program?". Too often, a decision is amde arbitrarily by administrators without consulting their architect or master planner. Allow time for the acquisition of the site, especially if there is some question as to the legal authority of the governmental unit to acquire the necessary land. Condemnation in the courts is a time-consuming process.

The third item in time phasing is the formulation of the development scheme. This scheme should consider, among other things, the placement and functional relationships among buildings included in the project, the development work required on the site, the space and use requirements of each room, the fixtures required in each room, and the initial equipment needs for each room.

The next step is design preparation. We divide design preparation

into three steps that we all know. The first, schematic drawings; the second, preliminary plans; and the last, the final plans and drawings. Schematics are the development scheme laid out in diagram form. The buildings in the project are shown in simple drawings showing the functional relationship among the buildings and the rooms therein. Preliminary drawings are the first attempt to put down on paper the development scheme in multi-dimension layout for the guidance of the contractor. Such things as the elevation of the buildings, the excavation of the site, demensions of rooms and so forth are shown in some detail. Preliminary drawings may, or indeed, should require several revisions and together with the drawings, a set of detailed specifications regarding the buildings are prepared. I personally think that the preliminary planning stage is the most important in the late phasies of the system, for it is here where mistakes can be made that you live with forever more. Don't be afraid to argue with your architects. Many architects still design buildings as they would like to see them aesthetically as well as functionally, but the person who is paying for the building is the person who should have the final say. With the final drawings should come another updated cost estimate.

We are now ready for the contract letting and construction phase. These are highly specialized and technical parts of the system and I see no reason to discuss them here. The real important part of this phase is the inspection during construction.

We now turn to the budgeting phase itself. Dr. Jesse Burkhart, who is a Professor of Economics at Syracuse University, in a recent article

entitled, "The Theory and Application of Program Budgeting to Education", said that budgeting, as a science, finds its roots in economics where decisions must be viewed as matters of choice. He defined a public budget as an economic document, a reflection of resource allocation decisions, with program objectives structured by the amount of resources available. He also said that a budget is, in a sense, a public relations document and a work plan for the organization. You've spent plenty of time on budgeting, so I will mention merely three items, with a few sub-topics, as budgeting applies to capital construction.

First, again, a cost of updating of five-year projections in terms of the budget.

Second, identify the source of the financing for capital projects. Be specific whether they are General Fund monies, bon funds, Federal funds or any combination thereof. Once again referring to the experience of Michigan, our programming and planning process has led us to a system whereby we make a determination whether or not a building is needed based on an analysis of the operating program and the long-range goals and needs of our society. We then look around for every bit of Federal money or any other type of money that is available. In the final analysis, however, we simply dip into the General Fund to build this building once the decision is made that the building is needed. In other words, the availability of non-state money does nct dictate when and where capital construction takes place in Michigan.

The budget should contain a series of analytical support documents containing at least these three items: first, the economic and financial

considerations that were taken into account in making the decision; second, the reasons for the particular time phasing and the incremental concept, if it is appropriate to the recommendation; and third, some discussion of the alternatives that were rejected, so that the Legislature, as it reviews the executive budget, has some knowledge, without starting from scratch, of the grounds that were covered and the quantity of work that went into the decisions that are presented in the executive budget.

Let us turn our attention now to the roles of the Executive Branch and the Legislative Branch as they apply to the PPB System. The Executive Branch has the major responsibility for the basic preparation in the whole PPBS area. I am not sure what the real reasons are, but the textbook approach is quite clear. They have the time, the staff, and the information available. I think another reason it plays such a dominant role is that over years, the Legislative Branch of government simply did not meet its responsibility in these areas. Nevertheless, inside the Executive Branch, at leas three staff functions must be in existence, and function effectively, for our system to work. The Central Planning staff must lay out for the Governorsthe long-range goals of his administration, the objectives, what the programs are aimed at, and how they are to be designed to meet goals. We need a Fiscal Affairs staff or Bureau of the Budget, and we need a Capital Improvement or a Building Division or whatever name it might be called. I'll talk a little bit about staff at the very end, for there are a few lessons that we all learned which should be passed on.

The basic mission of the Legislature is to express its decisions in the form of laws -- and appropriation laws are the basic vehicle through which a legislative body expresses its decisions in reference to capital construction. Theoretically, the Legislature reviews the goals and objectives that are presented to it by the Governor and provides high-level decision-making. If we have time at the end, I would like to tell you a bit at length about the Joint Capital Outlay Subcommittee of the Michigan Legislature an how the Legislature in Michigan has moved head and shoulders into the program and planning function of this state.

On Monday, when Mr. Charles Sturtz of the Michigan Bureau of the Budget spoke to you on the difference between conventional budgeting and PPB, he told you the story, at least briefly, of how Michigan nearly lost program budgeting over a boat. That boat was the "Steel Head" which is the finest research ship in the Great Lakes today. In the interest of a little change of pace and in talking about an operating program and following it through to the necessity for capital construction, perhaps we can briefly illustrate how this whole system can work.

The public need was identified as a necessity for returning the Great Lakes into a recreational asset. The problem was quite simply that the game fish were gone and in its place were tons of trash fish. 80% by weight of all the fish in Lake Michigan were the 6" alewife.

The planning phase of the operation budget was long and thorough. There was a good deal of research conducted by the Department of Con-

servation and much cooperation from fish specialists in other parts of the country (especially Washington and Oregon). The planning process identified three alternatives: the Coho Salmon, the Chinook Salmon, and the Striped Bass. The selection of the alternatives singled out the Coho Salmon was having the best chance for success. The programming phase of the Coho Program, was we mentioned, focused on the resources needed, and the emphasis was on how and when to acquire the needed resources. We can skip over a lot of the operating programs as that's not our subject today. I merely wish to point out that the PPB System was used in developing the Coho Program.

The careful planning and programming produced one overwhelming problem. The Coho Salmon is an anadromous fish, that is, a fish that hatches in fresh water streams, migrates out to large bodies of water, and in three years returns to the place of its birth to spawn and die. The Coho could not reproduce itself and sustain the type of fish population that was desiragle in the Great Lakes. The answer, as produced by the system, was to help the fish in its reproduction process with a hatchery program. The need for hatcheries was identified plurally in the whole sequence of events, so the planning for capital construction went on concurrently with the planning and programming for the operating program.

Earlier, we identified ten items to be considered in capital planning -- the needs, the objectives, standards, alternatives, the comparison of alternatives, the selection of a preferred alternative, the allocation of resources of a five-year-plan, a fiscal plan for the state, economic pro-

jections, and political priorities. All these were analyzed concurrently in the early stages of the program. The fish were donated free by Washington and Oregon and were planted, and we had three years to put together a workable hatchery program. Hence, the time-spacing sequence worked backward, and in effect, dictated the rest of the program.

I mentioned two thing under programming for capital that I consider to be important and different from the operating part of PPB. One was time phasing. Time phasing dictated to this program. The site selection was carefully considered. Consultants were brought in from the West Coast and detailed analysis of water quality of the various streams of Michigan was made. The Platt River was selected as the site for the first hatchery. Site acquisition proved to be no problem; the state owned the land on the river. The development scheme was started. Again, no short cuts were taken, and a good, thorough job was done. The result was that the first Coho was spawned before we could have the hatcheries to handle them. Temporary facilities and manpower did the job. The design preparation proceeded systematically and thoroughly, and the decision was made to have an incremental development was the second item that I emphasized under programming for capital improvement.

Several sites had been selected for hatcheries in Michigan: (1) in the Platt River, (2) Jordan River, and (3) Little Ministee in Lower Michigan, and the Fox in the Upper Peninsula. This total program represents an investment of something approaching $25 million. So, again, our rule applies that governmental resources are limited and choices have to be made on what to develop first. In making the decision, we had to