

## **Session One-B**

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### **OBJECTIVES AND APPROACH**

ROBERT J. KIMLEY, Presiding

## **Problems in Formulating Highway Construction Programs**

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The problems involved in formulating highway construction programs are of several orders. In this paper some human relations issues are explored. To lay the groundwork for understanding the problems discussed, brief attention is accorded the nature and general structure of the highway budget—the basic management tool for efficient programing and economical use of highway funds. The summary does not follow the experience of any one highway department, but it should be reasonably applicable to most well-managed departments.

The paper reflects a diagnosis of construction programing problems viewing the central issue as one of attaining a climate which allows full management exploitation of budgeting. The problems are viewed from a positive angle; they are not treated as excuses for an inadequate programing job. The particular problems considered include the following questions examined constructively in relation to program development through budget practice:

1. How is budget administration leadership to secure departmental management unity in view of the traditionally predominant role of nonmanager personnel? In other words, how may a state develop excellent budget management in the light of the scarcity and modest position of professional management people in the typical state highway agency?

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1/ The basic writings on budgeting are illustrated by the following examples in English. Henry Carter Adams, "Science of Finance" (New York: Holt, 1898), especially pp. 178-191; A.E. Buck, "Public Budgeting" (New York: Harper, 1929) and "The Budget in Governments Today" (New York: Macmillan, 1934); Jesse Burkhead, "Government Budgeting" (New York: Wiley, 1956); Eugene R. Elkins, "Program Budgeting: A Method of Improving Fiscal Management" (Morgantown: West Virginia University, 1955); James W. Martin and Frank C.E. Cush, "Administration of the Turkish Ministry of Finance" (Ankara: Ministry of Finance, 1951); Frederick C. Mosher, "Program Budgeting: Theory and Practice with Particular Reference to the U.S. Department of the Army" (Chicago: Public Administration Service, 1954); National Resources Planning Board, "Long-Range Programming of Municipal Public Works" (Washington: Government Printing Office, 1941); Catheryn Seckler-Hudson (ed.), "Budgeting: An Instrument of Planning and Management" (mime.) (Washington: American University, 1944-1952), especially Unit IV; Herbert A. Simon, "Administrative Behavior" (New York: Macmillan, 1948); Arthur Smithies, "The Budgetary Process in the United States" (New York: McGraw-Hill, 1955); Rene Stourm, "The Budget" (New York: Appleton, 1917); J. Wilner Sundelson, "Budgetary Methods in National and State Governments" (Albany, J.B. Lyon & Co., 1938). On the particular problem of the management relationships among highway department personnel, perhaps the best book available is Edmund P. Learned, David N. Ulrick, and Donald R. Booz, "Executive Action" (Boston: Harvard University, 1951). Although these authors based much of their discussion on private business experience, the conclusions appear equally applicable to highway administration.

2. How can the planning agency of each highway department with cooperation from other departmental personnel be made keenly aware of its responsibility for recommending a wise and comprehensive program viewed simultaneously (a) by highway systems, (b) by geographical areas (districts), (c) by phase of work, (d) by routes, and (e) by classes of projects? How can this information, when approved as the official construction budget, be made of maximum utility in the total management of the department?

3. How can the dozen or two top administrators in a highway department be made keenly conscious of management needs and of the contribution budget administration can make toward meeting those needs? How can maximum efficiency in the dissemination of knowledge of how to use budget information be attained? From the viewpoint of programing, these questions may have special relevance to the planning and political personnel of the department; but the arrangements cannot be of maximum usefulness until the departmental supervisory personnel generally becomes enthusiastic for good management.

### THE HIGHWAY BUDGET

The management tool for formulating and executing a highway construction program is the budget. Budgeting involves both the current budget and the long-term plan or the capital budget. To build highways most effectively administrators must utilize both.

Differentiation between the capital and current budget is less important than understanding the comprehensive budget conception, that is, the idea inclusive of both long-range construction plan and the total plan for the current year. Supervisory personnel generally must understand that "To budget is to operate the total Department function within and according to a plan."<sup>2</sup>

The budget cycle has been conceived as involving (a) preparation of estimates by the highway department, (b) submission of them for approval, (c) legislative or other sanction, (d) execution, and (e) audit (or control). Programing literature has emphasized the issues which have to do with the preparation of estimates. It has stressed especially the determination of construction priorities even though often with inadequate consideration of the numerous classes of criteria which must be taken into account. And there can be no doubt that the establishment of a highway building program based on rational selection of projects is of critical importance.

However, the job is only begun when the estimates are prepared, that is, when, in the light of accurate cost figures, a construction program made up of top priority projects is integrated with a financial plan, for, say, six years<sup>3</sup> to constitute a long-range capital budget. Moreover, the development of such estimates involves some prior decisions of great importance to the conduct of an intelligent state highway service.

Fundamental to the success of highway construction programing is the comparatively neglected area of budget execution. In many state departments having defensible execution of the current budget, there is little or no effective management of construction projects from a budget angle. Thus, one of the technical issues which requires consideration is the means of marshalling construction progress in such a manner as to provide engineering supervisors and executive personnel the most effective tools for the day-to-day administration.<sup>4</sup> For adequate conception of budgetary technicalities, it is

2/ Charles R. Lockyer, "Project Statement: Machine Control of Construction Budgeting" (Unpublished memorandum, Kentucky Department of Highways, February 8, 1960). An effective current budget plan may be a practical prerequisite to efficient construction budget administration.

3/ Six years appears to be an appropriate period for the long-term highway budget. This is close to the maximum time required from the initial planning stage to final settlement for construction of major projects. Detailed planning much beyond this period of time becomes rather tenuous.

4/ Because this issue is of different order from the "problems" to be considered subsequently in this paper, it will be discussed in summary form incident to the descriptive analysis of the highway budgetary process.

important to emphasize that in current-year execution the construction budget is merged with and is a part of the operating program. To provide a basis for the execution of the construction budget—as well as to develop statistics which can aid in further programming—the highway department needs a project record as its construction budget is converted into new roads and streets. The record system should obviously be planned in such a manner as to produce both physical and financial progress reports for each project.

### Reasons for a Construction Budget

Although budgeting for current activities requires relatively minor emphasis on a long-term view, all highway construction necessitates advance planning if the program is to be handled economically.<sup>5</sup> This is the case for numerous reasons, some of which are enumerated:

1. Without such advance planning, in view of the long period required for the completion<sup>6</sup> of major projects, the considerations which determine priorities cannot be deliberately weighed.

2. Unless management can have a long-range plan, it cannot administratively make economical disposition of manpower and equipment. This is more true of highway work than of other general state construction because in the latter case the architectural and engineering labor is characteristically handled under contract. Moreover, while the right-of-way problem in highway work is technical and exacting, land procurement for other state construction may be entirely unnecessary or, in nearly all cases, administratively an easy task. The state highway department generally uses employed manpower and owned equipment—short of the actual construction—to a much greater extent. Thus, it must efficiently employ relatively more men and machines.

3. The plans must be formulated to capitalize on available resources and must look toward using them with maximum effectiveness. That Federal-aid is offered in categories makes necessary careful blueprinting for each system. And at the boundaries, certain considered decisions must be made in the interest of balance. For example, will an urgent suburban Federal-aid secondary street be constructed with urban aid or with Federal-aid secondary funds?

4. The program must not only provide for a balanced distribution of construction among the geographical areas of the state, but it must also be so planned that all classes of employees<sup>7</sup> will be fully and continuously at work with a minimum of transfer between administrative districts.

5. The program must be devised to facilitate management adjustments to seasonal requirements. For example, in those parts of the country where many construction activities must be discontinued in winter, the supervising engineers must be advised of all phases of the advance construction requirements to make possible the efficient planning of personnel assignment.<sup>8</sup>

6. While all these considerations are being examined simultaneously, the planners, partly in order to implement them, must take account of route development policy and must select kinds of projects (bridge, grade and drain, paving, and certain types of reconstruction) in the light of manpower and contractor resources available. This criterion in some cases depends on a careful examination of other public (and sometimes private) prospective building.

5/ On this point from the angle of a highway department head, see especially James W. Martin, "Programming Highway Construction," Proceedings of the Kentucky Highway Conference March 12-13, 1958 (Lexington: College of Engineering, University of Kentucky, 1958), pp. 11-15.

6/ The series of processes, location, field survey and design, preparation of working drawings and specifications, right-of-way procurement, contract procurements, construction, and final inspection and settlement constitute the productive process from plan to highway. They are all envisaged as necessary for completion of a project.

7/ For example, location engineers, field surveyors, road and structural design personnel, right-of-way workers, and construction men.

8/ The disposition of machines and manpower, particularly in the field, requires careful planning under over-all supervision.

## Work of the Budget Staff

As the budget is the handmaiden of general administration, the departmental budget staff needs to be in close association with the executive head of the highway administration. Its manpower should be composed mainly of professional management personnel with an intimate knowledge of the state government in general and of the highway organization in particular. The staff's success depends on an efficient working relationship with the personnel responsible for both planning and record-keeping.

Incident to the process of selecting construction priorities, for which the planning staff does the technical work,<sup>9</sup> the budget staff determines the resources available and does the detailed financial planning, advises the planning staff, and to the extent appropriate participates in policy conferences looking toward the establishment of, or addition to, the long-term construction program.

After program budget decisions are made final, the budget staff prepares the construction budget document and assists in following up for execution. Regardless of the method for handling construction project records, each periodic report and some special reports can well be signals for budget staff explanation, written and oral, as to exactly the meaning of the reports. In personal conferences the staff can aid in identifying the decision-making with the reports suggest for the various supervisors.

For an effective working relationship with the state budget office, the departmental budget staff should be the highway department's liaison with the state agency.

In keeping with the budget calendar, which the budget staff, collaborating with other persons concerned, works out and publicizes within the highway department, the departmental staff must carry on other construction budget operations. Each year, the planning staff, in the light of changed conditions and of experience with the established program, must submit recommendations which will (a) revise the six-year program to the extent that the evidence indicates positively essential and (b) extend the planned program by one year to compensate for the lapse of time. The capital budget plan, with these suggested procedures,<sup>10</sup> is said to have built-in plans for revision.

Possibly the only circumstance which should bring about need for revision if the initial six-year program is well planned is amendment to deal with new problems and especially with schedule change to correct for error of estimate. An alteration in support policy may arise from either state or Federal legislation; it may be considerable. Similarly, cost estimates may prove systematically biased so as to necessitate changes in contemplated rate of progress. Although errors of either sort necessitate revision, the budget alterations can usually be limited to moving each stage of planned action toward construction to an earlier or a later date and, if appropriate, revising revenue or cost estimates in the process.

## PROBLEMS

### Securing Management Unity

The problem of securing management unity requires persistence in any business or governmental setting; in highway administration, it is doubly difficult. The situation is partly an outgrowth of history, partly one of personnel, and partly one of communication. It involves also other less obvious factors.

9/ Decision-making with respect to the highway investment program is a budget function. Because in highway development an already-established, sizeable, specialized staff is necessary for this work, there seems to be good reason for handling project priority rating in cooperation with the budget staff.

10/ As James O. Granum and Clinton H. Burnes have shown in an admirable address on "Advance Programming Methods for State Highway Systems" at the 1960 Highway Research Board meeting in January, some states simply work out a one-shot program. Such a plan seems less fortunate than that suggested in the text because (a) it is unduly rigid; (b) it implies too little confidence in the dynamic character of the future; and (c) it fails to provide an ongoing, continuous approach which appears to be fundamental in a dynamic society. Experience in Maryland in recent years is eloquent testimony on that point.

Fullest development and use of a continuous construction budget demand the skills of professional management specialists. This fact poses difficulties. The political department head, whether a board or an individual, the head of the engineering staff, and the chief accountant are all likely to think of themselves as managers—each of course from a different viewpoint. That the functions of the professional management man are so little differentiated in the minds of top-echelon highway department personnel means that his services are often unsought. Thus, lack of understanding may defeat budgeting at its best before it is fully initiated.

If the adequate-staffing hurdle is surmounted, however, the problem of fitting management specialists into the highway operating pattern still remains. In a department in which there are basically three classes of top-level line people—the political head, the engineering staff, and the accounting personnel—the acceptance of the budget staff in a management capacity becomes an issue of importance. And the issue is rendered even more serious by the fact that most of the bona fide management experts having the personality traits requisite for highway budget administration are employed in private businesses, usually at salaries out of reach of highway departments.

That one important phase of budget administration at the technical level is characteristically delegated to a planning staff operating in a cooperative capacity should simplify the construction programming and budgeting operation seems obvious. Yet in some states exactly the opposite may be true. Some of the highway planning agencies have been called on to do traffic, statistical, mapping, and inventory studies but have not been expected to plan project priorities in any sense of the word. They lack staff to take account of the variables which must be recognized for such planning. Some of them even lack any professional planners. Under these conditions, the specialized planning staff must be reworked or superseded, preferably the former, before it can contribute adequately to orderly programming.

Another difficulty is one of work habit. The emphasis in programming which has been placed on the selection of construction projects in some settings tends to suggest to responsible highway officials that efficient staff work in planning is a substitute for a construction budget administration. Programming activity in a planning agency functioning efficiently as a major contributor to capital budgeting nonetheless must be a continuous process that is subject to specific deadlines. If such over-all conformity with unified management must be newly developed, that fact may introduce a frictional element even with the most cordial cooperation between the budget staff and the planning director. Fortunately, some state highway planning agencies which have little or no development in bona fide project priority planning do have the continuity of operation and the respect for deadlines which are requisite for participation in the capital budgeting process.

Another problem in certain states, regardless of structural arrangements, has to do with the position of the planning agency in the departmental administration pattern. In some cases the office of the chief engineer and of the department head find little occasion to consult planning personnel to obtain the factual basis for decisions. Rather, they seek the impressions of field employees. This situation of course may result from the fact that the planning staff has little that is significant to offer. Sometimes, it is merely a practice which has survived the reason for it. Whatever the cause, failure to use planning information and analysis is a sort of "vote of lack of confidence" which must be overcome in the development of planning participation in the construction budgeting process.

The supervisors of highway design, of bridges, of right-of-way activity, and of construction as such, whether in the central office or in the field, are potential beneficiaries of efficient construction budgeting. But, before the institution of orderly programming, these people may have difficulty in visualizing any major contribution of an alleged "financial control" gadget to their own work. A real sense of participation must be developed before the capital budget can attain even a reasonable share of its potential. Thus, again, personnel outlook must be modified; and a unified management posture must be developed.

This limitation of viewpoint toward budgeting may pervade the staff responsible for accounting. So "selling" the idea of budgetary management among accounting

people is basic, especially if accounts must be adapted to provide the necessary reports. When construction budgeting is begun in any department, accounting adaptations are practically always essential, as general financial controls are not characteristically maintained on an adequate project basis and the usual cost records produce inadequate reports for budget administration.

### Budget Orientation

As has already been implied, budget orientation is especially urgent for the planning staff if, as is suggested, that staff is to make route and project priority recommendations. Fortunately, planning personnel is likely to be comparatively receptive to such an outlook. Nevertheless, it may be helpful to comment on some of the ingredients in the orientation.

First of all, the planning personnel must maintain continuing awareness of the numerous dimensions of the program which forms a basis for the capital budget. It must develop project priorities by classes of highways (highway system), by districts, by phase of work, and by character of project. Policy regarding particular routes, too, is reflected in the project selections. Continuously, also, the planning agency must make route studies and offer recommendations regarding route plans—all as an element in the background for project proposals in programing the capital budget.

In the second place, the planning staff must maintain a tolerant and flexible attitude toward the kind of evidence to be considered in determining priorities on each system in each part of the state. There is an understandable urge among some highway planners for the sort of definiteness in planning criteria that can be mathematically formulated. Sometimes even sufficiency ratings alone have been urged as a basis for establishing priorities. A more sophisticated, but still inadequate, suggestion contemplates that a formula-based benefit-cost or rate-of-return-on-investment analysis can supply the basis for project selection.<sup>11</sup>

Budget students experienced in comparative project-priority analysis appear to agree that such rigid approaches to project selection for budget purposes are altogether too much over-simplified (and too rigid) to be acceptable in practice. They insist that the criteria to be applied, although including considerations of a formulaic character, must also take account of dynamic factors which differ from place to place and are altered from time to time even in the same place. For example, assume that sufficiency ratings, traffic measurements, or benefit-cost analyses indicate that two urban expressways in a city are about equally urgent. Suppose the route in one case would pass through the edge of a series of parks and playgrounds to which local residents are both recreationally and sentimentally attached, but requires, incident to right-of-way acquisition, little disturbance of homes or businesses. Procuring right-of-way for the alternative route would uproot numerous family residences and business establishments. On which route in a period of slow business should projects be assigned highest priority?<sup>12</sup>

The kinds of factors which have a bearing on route or project priority determination (and in either case on programing) are numerous; but perhaps it is not possible to enumerate all of them for the reason that values change with the passage of time, for example, with changes in production plant locations and consequent alterations in transportation requirements.

Although the purpose at the moment is to emphasize the need for a flexible-minded

<sup>11/</sup> This generalization usually rests on a recognition of few of the remote effects of a project. Also it largely ignores the fact that a project for highway improvement is an arbitrarily severed part of a road or street. It is not an economic unit even in the limited sense that has been deemed to justify the mathematically-formulated benefit-cost criterion in application to water developments.

<sup>12/</sup> A kindred problem, which addresses itself only indirectly to project selection, arises when design considerations are about equal and the two situations described are alternative routes for the same expressway. This problem, like that posed in the text, can be solved intelligently only by weighing social considerations which, in part, are not susceptible of mathematical formulation.

planning staff approach, not to analyze the basis for investment decisions, it may be helpful to comment on two or three aspects of background for such decision-making.

1. In dealing with the concept of cost, to take an obvious example, is the planner concerned with current capital cost or with annual cost? It seems apparent that, although annual cost is far more meaningful for general comparisons, such as those incident to rate-of-return-on-investment or benefit-cost analysis, the planner on occasion may have to take account of out-of-pocket cost as well. This consideration of the aggregate cost of preconstruction engineering, of right-of-way work, and of construction as such may be a significant element in deciding whether field survey on a particular project for a given highway system should be fitted into the second or the last year of a six-year budget in the light of all other requirements on and off the system in that part of the state.

2. Political factors in some cases may constitute technical considerations of varying importance from time to time and from place to place. For example, one state which is heavily committed to recreational facilities, not only for reasons of providing diversions for its own people but also as an instrument for economic development, recently found that an overwhelming proportion of its out-of-state vacationers came from the states immediately to the north. The state's own population centers are mainly in the northern part of the state, and its recreational centers are southward. To the extent that the state wishes to emphasize the vacationer's use of its roads for recreational reasons, the highway planner may be called on to give substantial weight to traffic on the north-south main roads considered for replacement or reconstruction. In particular, this recreational objective may constitute one consideration in fixing interstate system priorities.

3. In certain states considerable population is found in remote areas more or less cut off from urban and other social centers. In such a case, reduction of social isolation may be an objective considered in comparing certain projects for access roads with others where the traffic might be expected to be heavier but where there is now no problem of isolation. The weight given to such a consideration may or may not depend on general state policy. For example, a state wishing to provide consolidated schools in the area which is cut off might place greater emphasis on reducing social isolation than would be proper under other conditions.

A third programing factor is that highway planners in some states may give more emphasis to engineering considerations<sup>13</sup> than the relative importance of such factors justifies.<sup>14</sup> Aside from the whole gamut of general economic factors, there are special influences which may bear on costs or on the rate at which construction-focused activities can be carried on, such as availability of specialized manpower, of road construction resources, and of road materials. Some of these may bear on priorities directly; others may affect the definition of feasible projects and therefore indirectly influence priority determinations. Then, there are general social as well as governmental factors. The impact of road construction may affect not only the rate of economic progress nearby and on alternative routes, but also the activities and costs of local government, the relative prosperity of different communities, and many general social aspects of community life. Some of the influences grow out of right-of-way actions; others grow out of the services of the completed road. None of these issues may be deliberately ignored in planning a highway construction program.

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13/ Priority planning rests on basic assumptions as to cost. In turn cost depends on the kind of improvement undertaken; hence the necessity for clearly-defined planning assumptions as to design. Any project, after advancement to the design stage, should doubtless be referred to planning for a review of priority-rating if the actual highway-improvement plan departs from the assumed one sufficiently to affect costs materially.

14/ One of the most stimulating discussions of this line of enquiry is the work of an eminent engineer known to all participants in the present conference. See M. Earl Campbell, letters to Harry Schwender, September 28, October 1, October 21, December 4, December 28, 1959, and January 21, January 25, and March 21, 1960

Finally, the planning staff in its priority-rating capacity needs insistently to maintain its position as a staff agency. The planning relationships to the budget administration on the one hand and to the officers who finally approve planning recommendations, on the other, must be kept on a cooperative and advisory footing, respectively.

Although technically-complex project priority ratings are a basic output of the planning staff, that staff does more in relation to the budget staff than provide this phase of budget work. The planners, to make their own output most useful, must adhere carefully to work schedules planned by the budget staff (with collaboration from other administrators). In particular, the former must meet prescribed deadlines. Again, from experience in budget execution, the planning staff can have a statistical basis for scheduling rates of progress toward highway construction which are in line with practice rather than merely with what planners think progress should be.

### Understanding Budget Data

In the typical state highway department, nearly all administrative positions are filled by personnel advanced because of functional achievement. In the case of construction branches, the top men have usually demonstrated capacity in building production as such. The director of structural design, for example, has usually won his administrative position by the production of an unusually large number of exceptionally high quality bridge designs. Supervisory personnel throughout the department have secured their positions for kindred reasons having to do with technical excellence in the work they now supervise. Such a plan for the selection of upper-echelon personnel is widely commended.

It is clear, however, that this generally-preferred method presents difficulties in terms of assuring that administrators have some background for understanding the significance of budget data and methods for their use. The administration of the highway department budget thus involves a problem of diffusing budget lore not only to the department head, usually a layman (in relation to budgetary management as well as to highway engineering), but also to the several other supervisors of departmental activities.

Responsibility of the budget staff for making all branches of the highway administration aware of management knowhow deserves great emphasis.

1. One budget-staff obligation is to aid colleagues toward an operating understanding of budget processes. This obligation is urgent in general; it is still more pressing in the case of the construction than of the current budget because the former is more generally of operating concern to all construction-oriented supervisory personnel.

2. Awareness throughout the highway department of budget execution information and of its management significance is peculiarly urgent. As data processing equipment now makes possible full detail regarding both the operational advances of, and the expenditures for, each project, the budget staff opportunity to aid all construction-focused administrators is many times as great in this respect as it would have been without such adequate report-producing apparatus.

3. The opportunity of the budget staff to contribute to a pervasive sense of departmental unity is much enlarged by the use of a construction budget.

4. The budget staff in connection with the responsibilities already noted must discharge its obligation to show that its own activities are basically of a service character. The budget staff worth its salt knows that a department of highways does not exist to prepare or execute budgets. Rather, its job is to aid other administrators.

As has been observed, "The highway department budget is for highway engineers."

The findings in studies of methods of disseminating budget information<sup>15</sup> are unequivocal in certain respects: (a) the clearing process must be continuing; (b) it must be made a matter of record; (c) it necessitates oral discussion on each occasion;

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15/ Compare Learned, Ulrick, and Booz, loc. cit., for example, which clearly develops the evidence.



and (d) the task of seeing that such discussions are held must be the responsibility of a designated individual. In line with these findings and of the nature of programing administration, a specific suggestion is set out for making the budget function—especially the construction budget function—a generally-appreciated tool.<sup>16</sup>

Once the construction budget idea is accepted and formal arrangements made for operation, including the designation of a competent budget director placed in the administrative framework readily accessible to the department head, specific plans can be formulated to make management a going concern. The budget staff should develop a budget manual for department head promulgation, including a calendar for preparation of current and capital estimates (backed up with a calendar, previously agreed upon, of planning staff work and reporting), for approval of the estimates, for various steps in the execution process, and for audit and report. That staff should receive all budget accounting reports for distribution. It should immediately prepare explanatory memoranda for all the departmental personnel which have or may have an interest. In the case of current budget reports, the departmental budget staff, the state budget officer, and the head of the department of highways may be the only personnel immediately and urgently concerned. In this case, the memorandum will be directed to the department head. It will be submitted to him with the statements attached at the earliest opportunity. This report will not be sent to the department head but will be delivered by the budget director in person; the latter will give a full oral explanation of the implications. The department head or an aide will cross-question the director as fully as he wishes. The budget staff will discuss issues with such additional department personnel as the top administrators direct.

In the case of construction budget reports, the procedures are similar but are designed to serve the greater number of administrators typically concerned directly. The departmental personnel involved will include the same individuals as in the instance of the current budget, chief highway engineer, and the individuals in charge of each major construction-focused activity. It will also include the director of planning. An individual memorandum is prepared for each of these persons, and each is personally visited by the budget director (or a subordinate). In many cases, once the program is in full swing, the directors of functional activities will wish their subordinates briefed by the budget staff. If this is the case, especially if traveling is involved, budget staff personnel generally will have to be employed in interviewing. And subordinate budget staff members may conduct some interviews, even with major departmental officials, once the procedure is established. Delegation of interviewing to subordinate staff members should prove constructive both in the budget staff and in its relationship to other departmental manpower once the prestige of the budget director becomes secondary to the service rendered.<sup>17</sup>

If the budget staff adequately reflects management capacity to achieve the best use of scarce resources<sup>18</sup> and if the outlined procedures are followed, the highway department top manpower can be greatly aided. Personnel can be rendered enthusiastic for management use of budget data and techniques to the maximum extent. By the same token they can easily become enthusiastic contributors to the programing process.

The budget staff relationships to the department head and to the planning staff under such an operating program can rapidly become intimate and can complement the work of the latter in a happy fashion. The inflow of information, the interchange or loan of personnel between the production-focused administrators and the planning staff, and other forms of intra-departmental budget-inspired cooperation can bring the planning staff recommendations of priorities to a level of promptness and acceptability not otherwise possible.

16/ This in turn should contribute to better cooperation by departmental manpower with the planning, accounting, and budget staffs in programing activity.

17/ The budget staff, as far as circumstances permit, will interview subordinate staff personnel in the presence of the immediate line supervisor. Compare Learned, Ulrick, and Booz, *op. cit.*, chap. 13.

18/ Compare John D. Millett, "Management in the Public Service: the Quest for Effective Performance" (New York: McGraw-Hill, 1954), especially p. 224.

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*Discussion*

**Granum.** —Do I gather that basically what is being suggested here is that a budget staff be the programming agency of a department?

**Martin.** —Yes, and no. I suggest that the establishment of priorities, the analysis of factual data which goes into the establishment of priorities, the whole planning process, should be a function of planning. In state highway departments, unlike most of the cities, there is a separate planning agency already established. And in most of the states that planning agency has a professional atmosphere that places it in the strategic position for the establishment of priorities.

Circumstances in different states differ widely. But I have suggested that the budget staff emphasis is primarily a management emphasis and secondarily a financial emphasis. Consequently, the task of integrating the established priorities set up by the planning agency with the financial plan, which is developed by the budget staff, or developed by the budget staff in conjunction with appropriate administrators, is a separate task. Of course, in some states the budget function is to all intents and purposes lodged in a planning agency.

I am not disagreeing with that operation. There are two functions to perform, and whether they are lodged together or separately is of secondary importance. I think they are likely to be more successful, however, if separate.

**Granum.** —You are emphasizing the financial aspects of integrating planning and money to get ultimately a construction program. Regardless of whether you might call it a budget office or a programming office, is it not true that there are many aspects, other than money, which need to be considered? For example, the budgeting of available manpower in a department to produce plans? Where would this fit in?

**Martin.** —The distribution of manpower is a function of line administrators rather than of either planning people or budget staff; and budget information can contribute heavily to that process; but there is no substitute for the engineering staff of a highway department determining the disposition of engineering equipment and engineering personnel. The budget function should thus be considered as a helping function.

Primary emphasis should be on management in the budget process with secondary emphasis on the fiscal side of the operation. It appears to me that the shortages in highway departments have been primarily shortages of professional management personnel and professional management know how, and in that respect highway departments suffer much more heavily than other business organizations of similar size and character. This condition ought to be relieved.

It can be relieved most effectively, in the initial sense, by focusing on the products of financial administration and planning administration. Products of financial administration means basically reports of exactly what has occurred.

I emphasized the basic importance of dovetailing financial information and engineering information. It is possible to bring this information together only by the use of data processing equipment.

**Burnes.** —Are you suggesting the use of performance budgeting, from the viewpoint of financial control? It has been my experience that it is absolutely necessary to coordinate finance and planning in formulating long-range or short-range programs. Are you leaning toward the need for performance budgeting, which would include a control on the construction program as well as the other accounting activities?

**Martin.** —Performance budgeting, as the concept is usually understood in municipal practice, where it is best developed, grew out of program budgeting. The first stage

of development is program budgeting. Performance budgeting is a further development.

In much of the highway industry, the states have not reached the data producing basis for performance budgeting in the sense in which that term is used in local government. Moreover, performance budgeting focuses on the preparation of estimates but it does not exclude other aspects of budgeting.

I am trying to focus on the execution of the estimates, rather than the preparation of them. I am not doing that because I think one is more important than the other, but simply because the execution process is the process where I think it can be shown very readily that all supervisors in a highway department can profit enormously from budget activity; and because the area of execution has been relatively neglected in highway discussions.

The answer to your question, as formulated, is yes or no. It can be either program budgeting as such, or it can be, from certain points of view, more refined performance budgeting. At the present time in most state highway departments true performance budgeting would be premature.

**Babcock.**—What do you feel is the relationship and responsibility of a state budget officer in the budgeting of a highway department or a highway commission?

**Martin.**—In some states, none at all. That is a situation heavily dependent on the situation within the particular state. In some states, the state budget office has been developed to such a degree that it is of very substantial assistance to the state highway department. In this particular matter Oregon has gone further than any of the other states, as a practical proposition. There, the highway department and the state budget office have worked together to implement the assistance that the state budget office can render to the state highway department; so that to whatever extent it can render assistance, within financial limitations, it is being done.

There are different legal relationships. There are different practical relationships in the various states. I am not suggesting any alterations in those relationships. In some states the general budget office can be of help to the state highway department. In other states, it cannot be of very much assistance. Far more states are probably in the latter category than in the former.

**Babcock.**—Do you think the state budget office should have control over the highway budget, and control the execution of it?

**Martin.**—I think of a budget staff as what the military would call a staff agency. It is an outfit set up to help other administrators and not one to deal finally with problems in the sense of control in an administrative relationship. If the attitude and the outlook of the state budget office is one of assisting the agencies of state government, then we need to recognize that the state highway departments need all the assistance they can get. If it is one of exercising administrative control over the state highway department, then it seems the less of it we have, the better.

**Babcock.**—In North Carolina, according to our law, we have a rather detailed budget, about 1500 pages, adopted by the General Assembly. And that budget, comes under the authority of the state budget officer to over-see. We have to go through him for every allocation of funds.

Is that a common practice in most states? Are state budget officers given control, or are highway departments given great latitude?

**Martin.**—Our survey indicates that the practice has varied widely on that score; but it also indicates that in a good many states, where the law is as it is in North Carolina, the actual operation of the allocation process and the approval process is more or less perfunctory. The director of the budget of the state approves what he is asked to approve if the request comes from the state highway department. That is not invariable, but that flavor exists to a very considerable extent.

**Kimley.**—Seeing that we do have representatives from two municipalities present, and this is supposed to be applicable to all units of government, do you feel that your procedure would be equally as applicable to municipalities as it would be to a state government?

Martin. —The answer is yes, but with several reservations. Many of the cities have developed effective over-all planning agencies covering many facets of government responsibility. If there is an agency in the city government having such diversified functions, including adequate planning for construction, as is the case in many cities, then by and large, what I have suggested would apply almost exactly in the same way to cities as to states.

In some of the other planning-conscious cities, the long-term planning function is lodged in a budget-related office. The planning function is integrated with the rest of the budget activity, both of these functions being in one office. Usually, where a combined budget-planning office exists, the situation is likely to be a happier one than exists in the state government because the city operation is dominated by a management outlook, rather than by a planning outlook or an engineering outlook.

Most of the functions of either state or city highway development are jobs for engineers and you are bound to get an engineering point of view from the engineers. The engineers need to be assisted by having brought to them management considerations that are also important in their decision making. By and large, however, the states will be better advised to develop budget and planning as two separate operating units, because there is so much in planning that does not have a budget relationship.

Granum. —Your discussion seems to indicate that the chief engineers and the other traditionally active heads of departments are not, in your opinion, managerial people in the professional sense. Do you think that is a fair statement, broadly speaking?

Martin. —That will vary from one state to another, and I do not have the knowledge to give an answer to that categorically. Comptrollers and chief engineers both are people whose assignments are primarily management assignments. The comptroller has usually come up through an accounting process. He is a professional accountant in many instances. The chief engineer is a professional engineer.

You need people whose background and emphasis has been management as such, operating not in a decision making capacity, but operating in a capacity that will assist the chief engineer and subordinate engineers as well as comptrollers and other people in making decisions.

Granum. —No one could take exception to the need for that in an assistance capacity, but somehow I get the impression that you feel that the solution to the problems we have would involve predominantly a professional management group to tie in and coordinate these various activities. The achievement of that professional management operation in a department might vary a great deal. For instance, the engineer and the accountant could be educated in good management techniques.

I would disagree with any assumption that it is necessary to bring in a layer of professional management personnel to resolve highway problems per se. It seems that it is more than just a professional group of people that is involved here, it is a professional attitude that should be involved throughout. Is that not true?

Martin. —Yes. I indicated some agreement with the very point that you make, and proposed a specialized group for providing assistance in the development of that pervasive attitude that you refer to.

Babcock. —In North Carolina there are two appointive officials, one the director of highways, and the other the comptroller. By law, the comptroller is actually the business manager who is responsible for all audit systems and reports. Is that the type of operation you are referring to?

Martin. —No, I do not refer to that, because that has to do with the operating side of the department.

Babcock. —The comptroller also assists in the preparation of budgets.

Martin. —Well, in many states, in practice, the comptroller's function includes the budget work. But the function or operation I refer to should be a high level type of management activity on a helping basis, and not on a control basis as the typical comptroller exercises it.

The comptroller makes decisions within his realm of interest that are akin to the decisions made within the purview of the chief engineer in his bailiwick. That is as it should be, but the comptroller's decisions should not be mixed up with budgeting as such. Budgeting needs to be on a helping basis and not on an operating management basis. Budgeting needs to be pervaded by a professional management outlook.

One of the things that may not have been sufficiently emphasized is the coordination between the comptroller, and the engineering staff. The prevailing attitude is too frequently that of, "I will look after my business to the extent that I can, and I will let the other people look after theirs." The engineers are likely to take this attitude toward the comptroller's job. The comptrollers are likely to take it toward the engineers. That is not the best way to run a railroad. All should be working toward the same end. So it seems necessary, as is true in other businesses, to have somebody whose functions are management liaison, among other things, to assist the top level officials in bringing together these two professionally different groups of people, both absolutely essential to getting a job done.

Johnson. —Is that not actually the chief administrator's function in the department? In management literature, for example, we learn that the function of a manager or of a chief administrator particularly, is to plan, organize, and control. That is his main job.

It seems to me that there is the coordination, the linkage between these various things. We have operations-oriented people, unfortunately, in some of these top jobs in the departments, rather than people that are oriented towards all phases of this particular problem of developing an adequate highway system, to put finances and budgeting and planning in its proper relationship to all of the other things. These become orphan children in the department, rather than the essential job of top management in the department.

Donnell. —Your idea is that the planning and engineering personnel should advise the management or budget group of their needs. Then the budget group should tell the planning group how much funds are available for them to work with. Is that your recommended approach?

Martin. —It seems to me that the problem of estimating money availabilities, which has been rather poorly done in the state highway departments, is a fairly sizeable undertaking in itself.

The formulation of a budget document and the assistance to the top level administrators in making that budget document a living instrument for management is a joint function of planning and budget administration.

I have indicated that those two functions may be administered by one function, or they may be administered by more than one. The budget-management approach is likely to be a totally different approach than establishing priorities system by system. This whole approach is a collaborative process and actually involves the collaboration of personnel other than highway planners or budget personnel. It is a collaboration process that involves the entire operating department.

The matter of estimating revenue availabilities and establishing priorities, constitutes a dynamic process to which there is no end. And the process basically seems to me of necessity one of collaboration.

Livingston. —I think that the estimate of available revenues is a vital part of the planning function. But then, after estimate of revenues is tied to the construction program, we get part of the budgetary team on both the pre- and post-audit function, where they join up. But it would seem to be practically impossible to do a proper planning job unless the estimate of revenues is geared to the priority schedule.

I do not suggest that it should not be a team, but I would like to define the functions of planning and budgeting as being professionally carried out on both sides. Usually, the people who work with budgets do not have the statistical information to prepare the estimates and the forecasts of revenues that will be available for a long period of time.

Martin. —If you emphasize the budget process, as the literature for a hundred years

has done, as including the process of formulating the estimates, the process of submission for approval, the process of actual formal approval of whatever sort is required, the process of executing the plan, and the process of checking up on that executed plan, then the budget function should include all of the estimating and forecasting.

Now, in highway work, the part of it that has to do with the preparation of the estimates is pulled out and to a considerable extent handled by the planning agency. The job of exercising that function is one that ought to be collaborative between budget staff and planning staff, if they are separate; but not separate and distinct.

The planning staff secures its information from sources which reveal highway needs, basically. The budget staff secures its information from the other operating agencies of the department, as well as from the statistics and other information that reveal highway needs. These pieces of information need to be brought together, rather than separated, in the process.

The task is one of collaboration. They are two parts of one thing and need to be so considered. Generally, it would be a mistake to assume that highway planners know more about the finances than the financial people do.