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Interstate Conference on Water Problems/
U. S. Army Corps of Engineers

Workshops on Water Project Financing

October-December 1984

Water Project Financing Roundtable

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Digest of proceeding of four water project financing workshops and a water project financing roundtable co-sponsored by the U.S. Army Corps of Engineers and the Interstate Conference on Water Problems.

The digest of proceedings is based on policy views by senior State and Corps of Engineers officials, presentations by national water financing and investment banking experts on the technical topics, case studies of State and substate

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financing institutions, case studies of water project financing, State/Federal work group discussions, open discussion periods, pre-and-post workshop questionnaries, and roundtable discussions. Topics include management of the planning process; financial planning; project financing and financial assistance; and project implementation.

DIGEST OF PROCEEDINGS

Interstate Conference on Water Problems/U.S. Army Corps of Engineers

WORKSHOPS ON WATER PROJECT FINANCING

Raleigh, NC; Chicago, IL; Dallas/Ft. Worth, TX; Seattle, WA

October - December, 1984

and

WATER PROJECT FINANCING ROUNDTABLE

Washington, D.C.

April 1985

prepared by

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This report is not to be construed as necessarily representing the views of the Federal government or of the U.S. Army Corps of Engineers.

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SUMMARY

INTRODUCTION

Federal View

The Federal government has played a major role in meeting the water resources needs of the nation. The Federal government has finances project planning and construction to promote Federal objectives related to economic development, environmental protection, and human safety. Non-Federal project sponsors have traditionally provided lands, easements, and rights-of-way for certain types of Federal water resources projects, and have borne the costs of the vendible project purposes, in many cases repaying these costs over the life of the project.

Today, funds for investment in water projects are in short supply at both the Federal and non-Federal levels of government. Due to high interest rates and inflation, water project development is more expensive than in the past. At the same time, water projects face stiff competition with investment needs for other public purposes. The result has been a slowdown in the construction of water projects and a potentially serious shortfall in meeting our needs for the economic and environmental benefits related to water development.

The nation must find a way to meet its essential water management needs. Both the Federal government and the States have searched for solutions that will enable the most urgently needed water projects to be built.

For a number of years Congress and the Executive Branch have debated potential changes in traditional policies. The proposals that are under discussion are certain to bring significant changes in the historic roles of local project sponsors, State governments, and Federal water agencies.

Significant differences remain among the positions of the Administration, the Congress and the States on cost sharing and financing policies. Key issues involve cost sharing percentages or new projects and for project additions, modifications or reallocations; financing terms for new projects; the treatment of sponsors' financing capabilities in cost sharing and financing agreements; and the composition and magnitude of non-Federal planning cost shares. These differences must be resolved to end the water development impasse.

The Administration has recommended an approach which assigns more of the responsibility for project cost sharing and financing to non-Federal project sponsors. In general, the Administration has recommended that cost shares be consistent among sponsors for each project purpose, and that water development agencies negotiate reasonable financing arrangements with sponsors on a project-specific basis. Planning costs would also be shared.

The recommended cost sharing and financing program for the U.S. Army Corps of Engineers is an extension of the Administration's basic policies. Under the Corps' program, planning sponsors would bear 50 percent of all planning costs after a 12-to-18 month "reconnaissance" phase. The non-Federal share of project costs would be consistent for each project purpose. (The Corps of

Engineers' position is that variable cost shares might reward inefficiency or create problems in equity among sponsors.) Cost shares would be set at a level greater than or equal to the traditional level. Each agreement for project financing and cost sharing would explicitly recognize the ability of Congress to supercede the terms of the agreement.

The non-Federal share of implementation costs is to be in cash or in-kind during construction of the project, except that non-Federal contributions for flood damage reduction, hurricane and storm damage reduction, recreation, and agricultural water supply are to be consistent with the ability of the non-Federal interest to pay at the time project expenditures are made. The portion of the non-Federal contribution not contributed during construction may be repaid over the useful life of the project but in no event more than 50 years from the date of project completion. The interest rate charged will reflect the average yields on obligations of the United States with remaining periods to maturity comparable to the reimbursement period.

State View

The Interstate Conference on Water Problems (ICWP) has developed its own policy recommendations. ICWP is the national association of State, regional, and local water policy officials, and has been working on their behalf with Congress and the Federal agencies since 1959. ICWP supports the following principles as a basis for water resources development:

- Federal involvement in major water resources projects of national and Federal interest is necessary and must continue.
- Any requirements for up-front financing of Federal projects by non-Federal sponsors must recognize the practical limitations of financial capability faced by project sponsors.
- Project costs should be recovered from identifiable beneficiaries of vendible products to the extent possible, taking into account the limitations of administrative feasibility and financial capability.
- Cost-sharing and financing policies must be applied consistently and equitably for like project purposes by all Federal agencies.
- Flexibility is needed in project planning and development to reduce costs and delays in project completion.

ICWP recommends a new national approach to water resources development emphasizing the following elements:

- honoring prior Federal commitments to authorized, on-going, and completed projects;
- development of a new system of funding that distinguishes between national projects and State level projects; and

- development of a "national water financing authority" which would alleviate water project financing pressures on the Federal budget by financing water projects with revenue bonds secured by repayment agreements with the non-Federal beneficiaries.

Workshops

In the fall of 1984 over 300 representatives from the States, local governments, regional agencies, the Corps of Engineers, other Federal water management agencies , and the financial community gathered at four workshops on water project financing sponsored by the U.S. Army Corps of Engineers and ICWP.

The workshops were held in Raleigh, NC; Chicago, IL; Dallas/Ft. Worth, TX; and Seattle, WA. The purpose of the workshops was to discuss how water project financing problems can be solved and how the States and the Federal government can work in a partnership to meet the water management needs of the nation.

Each workshop featured the following elements:

- policy views by senior State and Corps of Engineers officials
- presentations by national water financing and investment banking experts on five technical topics
- case studies of State and substate financing institutions
- case studies of water project financing
- State-Federal work group discussions
- open discussion period
- pre- and post-workshop questionnaires.

Roundtable

As a logical follow-up to the workshops, a Water Project Financing Roundtable was sponsored by ICWP in the spring of 1985. Attendees at the roundtable included the Acting Assistant Secretary of the Army for Civil Works, the Director of Civil Works, the Commissioner of the Bureau of Reclamation, senior Office of Management and Budget officials, senior staff representatives from the House and Senate Committees on Appropriations, Public Works, and Interior, nationally prominent representatives from the investment banking community, and members of ICWP Board of Directors representing a cross-section of senior State and regional water policy officials.

The purpose of the roundtable was to bring to the attention of national water policy officials -- both in the Congress and in the Federal agencies -- the lessons learned in working with grassroots water officials during the workshop sessions. This process of bringing the concerns and problems and the potential solutions to bear on the development of national water policy decisions is a continuous and ongoing process.

Purpose

The purpose of this summary is two-fold: to summarize the digest of proceedings for abbreviated reading; and to highlight some of the challenges and opportunities now facing the nation in water project financing. The statements recorded and paraphrased in the digest of proceedings, including this summary, represent neither the consensus of workshop and roundtable participants, nor the position of the Federal government, the Department of the Army, the Interstate Conference on Water Problems or any State, regional agency or local government.

This summary is grouped into six major parts:

- o management of the planning process
- o Financial feasibility, non-Federal concerns and plan formulation
- o cost recovery strategies
- o financial planning
- o project financing and financial assistance
- o project implementation

MANAGEMENT OF THE PLANNING PROCESS

The Administration and members of Congress have proposed a greater non-Federal role in paying for and carrying out project studies. Non-Federal sponsors would be asked to bear a greater share of planning costs, and in turn would expect more control of the execution of planning tasks. These conditions would create new challenges in the management of the planning process. In general, closer cooperation would be required throughout planning among the Corps, States and sponsors.

The outcomes of planning are uncertain, both because the nature of the recommended plan cannot be known in advance and because there is no guarantee that the plan will ultimately be implemented. Planning sponsors will need reassurance that their contributions are being spent wisely. They will expect a shorter and less expensive planning process involving limited planning scope, early consideration of non-Federal capabilities and concerns, a limited number of plan alternatives and more decision-directed analysis and evaluation.

Non-Federal planning partners will also seek to play a greater role in the execution of planning tasks. The planning partners must agree upon the division of responsibilities and upon a method for assigning value to the services provided by each. Individual sponsors may be particularly suited for certain tasks, such as demographic studies or financial analysis. In addition, planning sponsors may expect a greater role in scoping, screening, evaluation and other tasks which affect planning costs.

Federal agencies typically use economic analysis in project evaluation. With broader non-Federal responsibilities for project financing comes the need to include both financial and economic analyses in project planning studies. Financial data and analyses will be used in non-Federal decision-making throughout the planning period. Consequently, financial analysis must be included in the planning process from an early stage, and financial data should be geared to continually support sponsors' financial decisionmaking.

States, the Corps and project sponsors all have something to contribute to the financial analysis of projects. The assignments of responsibilities for analysis will vary among project studies. The Corps of Engineers needs to conduct training and information transfer activities to enhance its professional expertise and organizational capabilities, both to perform financial analyses in concert with its economic analyses, and to assist non-Federal sponsors in conducting such analyses during the planning period. Furthermore, handbooks or manuals on water project financing and financial analysis should be prepared for use by the Corps in conjunction with the States and project sponsors.

FINANCIAL FEASIBILITY, NON-FEDERAL CONCERNS AND PLAN FORMULATION

In the future, projects will need to be both economically and financially feasible. This dual test of feasibility could have significant effects upon plan formulation.

Economic feasibility analysis is used to identify the project providing the greatest economic benefit to society; financial feasibility analysis is used to determine whether a project is affordable to the sponsor, how the project can be financed, and whether the project makes sense for the sponsor. Specifically, economic and financial analysis differ in four fundamental ways:

- Economic analysis addresses all monetized costs and benefits, including uncompensated gains and losses; however, financial analysis addresses only the benefits which are appropriated as revenues and the costs which result in cash outlays.

- The time pattern of revenues and outlays is critical to financial feasibility; economic feasibility is not as affected by cash flow.

- Whereas both economic and financial analysis recognize project-related risks and uncertainty, the financial feasibility of a project is more sensitive to risk and uncertainty for a number of reasons. Lenders are concerned with institutional or legal risks that can interfere with the ability to repay project debt. Lenders are unwilling to recognize projected benefits and revenues which are uncertain and subject to changes in the growth of demand, the sensitivity of demand to price, the cost of substitutes, or other factors. Traditional economic analysis for water projects often assumes marginal cost pricing, and does not adequately treat the effect of output pricing on project usage; financial analysis must project revenues based on actual prices. Together, these risks and uncertainties are considered in financial analysis as "credit risk."

- o Theoretically, the economic discount rate is a real charge for the use of capital; financial interest rates include this charge but must also compensate lenders for expected inflation, for credit risk, for the relative loss of liquidity and for interest rate risk, i.e. the risk that market rates will rise and reduce the value of their holdings.

The Principles and Guidelines (P&G) for water resources planning State that optimization of net national economic development (NED) benefits, consistent with protecting the environment, is the Federal water planning objective. The P&G also State that non-Federal concerns and the acceptability of the plan (which probably includes plan affordability) are to be considered in plan development. Although there was general agreement that non-Federal concerns and financial feasibility should be explicitly treated in planning, there was disagreement over the extent to which these considerations should constrain NED optimization in the formulation and selection of plans. It was noted that in some cases, a project with maximum net national economic development benefits may be--because of institutional or market reasons--unable to meet a financial feasibility test. The scope of the NED plan or the risks associated with a plan element may prevent non-Federal borrowing to finance that plan, but a non-optimal or down-scaled project may be financeable. Some workshop participants expressed concern that insistence on a NED plan which fails to meet the financial market test may lead to no project at all and, consequently, no economic benefits. It was suggested that implementing a project which can be financed but which may be less than optimal from the standpoint of NED will better serve national economic development objectives than doing nothing at all.

The scope of each project will come under scrutiny as it is measured against the concerns of non-Federal interests. Sponsors may encourage greater emphasis upon vendible outputs or limiting the number of project purposes. In that regard, the Corps may need authorization to study single-purpose plans for water supply in order to meet high priority water needs. Some sponsors may put greater emphasis on plan features which meet immediate local needs or which create desirable regional economic, tax, or employment effects. It may be difficult to balance competing Federal and non-Federal priorities and to reach a consensus on plan formulation.

Since non-Federal sponsors must be able to both obtain project financing and to recover costs sufficiently to pay debt service, they will expect project planners to design projects in such a way that costs are minimized or deferred at the sacrifice of non-immediate or uncertain benefits:

- o First, sponsors will expect planners to use conservative methods for estimating project benefits which are acceptable to the financial community and which involve careful consideration of the sensitivity of projected usage to price, demand uncertainty and other factors.

- o Second, sponsors will encourage cost savings and cost effectiveness in design. For example, project design may be modified to reduce scale, shorten design life, accelerate construction, make greater use of

nonstructural and demand management measures, or substitute recurrent costs for capital costs. As another example, the Federal standards, procedures and criteria for acceptable risk, environmental protection, coordination and other decision rules which are imposed upon the design of Federal projects and which may increase project cost can be modified. (Alternatively, added costs which result from Federal policy and which do not apply to non-Federal projects could be borne by the Federal government.)

- Third, separable project increments can be staged, both as a hedge against the failure of benefits to develop as expected and as a way to more closely match debt service, revenues, and borrowing capacity over time. For instance, staging has been recommended by the State of North Carolina for the development of recreation facilities at Randleman Lake.

A workshop case study of a proposal to deepen the lower Mississippi River illustrates these points. When conservative methods were used to re-estimate future navigation usage, a scaled-back, staged version of the project was recommended.

COST RECOVERY STRATEGIES

A major concern of sponsors is how to translate project benefits into revenues sufficient to finance and/or repay debt incurred for a project. Although there is a general correspondence between a high benefit/cost ratio and financial feasibility, design of an effective cost recovery strategy is essential. Under some circumstances, significant institutional changes at the State and local level, as well as the removal of Federal legal constraints, may be required to implement an effective cost recovery strategy.

Vendible Outputs

Theoretically, the use of project capacity and the investment schedule for project additions can be optimized by setting price equal to marginal cost. However, under most conditions, marginal cost pricing generates insufficient revenues to provide for operating costs and debt service. A cost recovery strategy must be developed based upon the sensitivity of demand to the price of project outputs. If the demand of most users is not sensitive to price, one-part pricing (e.g. price per thousand gallons) or two-part pricing (e.g. connection charge plus price per thousand gallons) is appropriate. If the sensitivity of demand to price varies among user groups or with time, variable pricing may be appropriate. Water and electric utilities frequently use such pricing: examples are declining block rate, peak load or seasonal pricing or pricing by customer class.

To firm up revenue streams, users who are the "captives" of a project, such as current users of port or water supply facilities, may be made to share in cost recovery. Alternatively, the sponsor can enter into leases or contracts with third parties who obtain from the sponsor the right to use project outputs. For instance, a workshop presentation on Skiatook Reservoir discussed

how public recreation facilities on lands leased from the Corps of Engineers could be financed with revenue bonds backed by revenues from subleases to residential land developers. Contracts which provide a guaranteed revenue stream regardless of whether the third party uses the project outputs are called a "take-or-pay" contracts.

If an otherwise vendible output creates widespread benefits, is costly to withhold from non-payers, or involves issues of equity among beneficiaries, the use of tax and assessment powers to complement pricing may be justified. Examples are as follows:

- o properties which have an increase in value incidental to development of a reservoir or navigable waterway may be assessed based on the value of the increment.

- o "complementary goods" such as barge fuel or sporting goods which are jointly consumed with project outputs may be taxed,.

- o general sales, income, or property taxes may be used to recover a portion of the costs of a project with significant overall effects on incomes or property values.

The theory of vendible products is tempered by institutional constraints on who can establish charges and collect from beneficiaries. In the case of a port, for example, the non-Federal sponsor (a State or local port agency) may not, in fact, "control" access to all port facilities for cargo handling, fueling or other essential services, or have jurisdiction over all interstate and international shippers using the port. With no admiralty jurisdiction or physical ability to restrain the nonpaying ship or to enforce fees against the out-of-area shipper, it is difficult to collect a general port use fee or tax based on quantity or value of cargo. Furthermore, in some cases State constitutions, various Federal laws and boundary compacts prohibit imposition by States of charges upon navigation. These constraints must be addressed, even for so-called vendible outputs, if a successful cost-recovery system is to be implemented.

The workshop case study of the deepening of the lower Mississippi River illustrated the cost recovery difficulties for vendible outputs. Even for a scaled-back, staged project, it was found that because ports are highly competitive a user charge on shippers sufficient to pay debt service and recurring costs would discourage use of the Lower Mississippi. Even with a lower initial charge and graduated increases, the project would not be self-sustaining for 22 years. The study consultants recommended some form of credit assistance backed by the full faith and credit of the State of Louisiana or the Federal government.

Non-Vendible Outputs

For non-vendible outputs such as flood damage reduction, instream flows and environmental amenities, the benefits cannot be witheld from any beneficiary. A sponsor needs a mechanism to compel beneficiaries to make their fair cost recovery payments. Three promising cost recovery mechanisms are value

increment taxes or assessments, general taxes, and taxes on complementary goods. Non-vendible outputs may also be cross-subsidized by sales of vendible outputs from the same project at market-based rather than cost-based prices.

As a means to recover the costs of flood control, properties can be assessed for benefits received. (The Miami Conservancy District is an excellent example of this approach.) A special service tax levied on benefited properties is a variant of the property assessment. General taxes can also be used, based on the rationale that many benefits are widespread and that collection of assessments or special taxes is difficult.

Selection of a Cost Recovery Strategy

The powers of the sponsor depend on its basic charter as a general purpose government, a State-chartered authority, a local special district, an investor owned utility, or a multigovernmental joint action agency. The effects of a sponsor's geographic jurisdiction; taxing, charging or assessment authorities; and constitutional or statutory limitations on cost recovery must be addressed on a case-by-case basis. In some instances, problems of legal authority and jurisdiction make the Federal government the most efficient collector of project user charges.

Furthermore, cost recovery must be examined from the standpoints of enforcement costs, revenue-raising effectiveness, and political acceptability. The method for assessing flood-prone properties adopted by the Miami Conservancy District met these criteria.

The planning of projects with multiple sponsors may involve complex and lengthy negotiations on design priorities, the allocation of costs, and the allocation of outputs. The Corps and the States can participate constructively in such negotiations.

As illustrated by a case study of the Northwest Municipal Joint Action Agency, joint ventures may be developed in order to achieve construction economies, to properly define relationships among the parties, and to provide the institutional mechanism to adapt to change. States which have not already done so should authorize the creation by substate units of intergovernmental joint action agencies.

Removal of institutional constraints, creation of new authorities, or institutional change is required if sponsors are to effectively recover project costs. The participation and cooperation of the States is essential to many of these modifications. Although the modification of a State constitution, State statute, or local ordinances takes considerable time, institutional change is possible when both water problems and the limitations of existing institutions are clearly recognized. The possibilities for change were demonstrated in presentations on the passage of the Ohio Conservancy Act in 1914 and on the creation of Natural Resource Districts in the State of Nebraska.

Multi-state projects will probably require new or modified interstate compact arrangements to negotiate a cost sharing agreement, requiring several years for State and Federal enactment. Congress could expedite and encourage

interstate cost sharing by enacting a law giving general approval and consent to such compacts.

Planning studies can support the development of cost recovery measures and institutional capabilities. The planner can focus on identifying project beneficiaries and documenting the distribution of benefits among user groups and geographic areas. The planner can analyze alternative cost recovery strategies based on financial and institutional considerations. The planner can communicate the benefits of a project to sponsors and beneficiaries in order to generate support for needed actions.

FINANCIAL PLANNING

Today's complex financial conditions require increased sophistication in financial planning and management by States and localities. Financial planning should evaluate various funding strategies from the standpoints of cost, risk, and financial flexibility. Because sponsors have limited revenue bases, water projects should be considered along with competing capital needs if general obligation debt is to be used.

Non-Federal sponsors of capital improvement projects such as water projects assemble a financing team to evaluate the feasibility of project development, establish the legal and organizational prerequisites for project financing, prepare a financing plan and prepare the necessary financial and implementation transactions. Principal members of the team are the design engineer, the financial advisor, and the bond counsel. The sponsor also retains general counsel, an independent consulting engineer, an auditor, and a bond rating agency. A bond underwriter purchases the bonds from the issuer and markets them. An insurance company or bank may provide credit support.

Although there remains some confusion regarding roles in project development, primary responsibility for financial planning and implementation should remain with project sponsors. States and the Corps can provide technical analyses and assistance. Furthermore, Federal and State water agencies have a responsibility to inform the public of the importance of water projects to the national economy.

Many States operate technical assistance and supervision programs for local issuers of debt. These programs are designed to facilitate bond issuance, encourage responsible debt management, and improve credit ratings. The programs of the North Carolina Local Government Commission and the California Districts Advisory Commission were described at the workshops. These programs examine plans, approve issuance of debt, monitor conformance with procedural requirements, supervise expenditure of bond proceeds, inspect projects, and/or audit the accounts of units with outstanding bonds.

Even in States which have such programs, the water agencies can assist local sponsors in identifying financing options, participating in intergovernmental negotiations, developing organizational capabilities, and working to remedy legal constraints to project financing. These constraints include statutory limitations on debt, taxation, expenditures, or contracts,

and deficiencies in the express or implied authorities of the particular sponsor or sponsors.

The Corps of Engineers can assist by adapting elements of its planning process to financial planning and implementation needs. Project design, sponsorship, sources of revenue and financing may be addressed in their interrelationships throughout planning. Planning methods may be developed and refined which jointly address engineering, environmental, economic, financial, and institutional opportunities and constraints.

Planning studies should provide data and analyses which are useful not only for Federal review and authorization purposes but also for use by the financial community. However, it is unlikely that greater attention in planning reports to the financial aspects of projects will eliminate the need for a bond issuer to retain a nationally recognized independent consulting engineer for bonding purposes.

PROJECT FINANCING AND FINANCIAL ASSISTANCE

Financing Innovations

Issuance of tax-exempt muncipal bonds is the most common method for financing public works. Traditionally, bonds are sold at face value, have long maturities and fixed interest rates, and retired principal on a regular basis.

General obligation (G.O.) bonds pledge the full faith, credit and taxing power of the issuer. Use of G.O. Bonds minimizes interest cost and marketing cost. However, a sponsor's ability to use G.O. bonds may be limited by its fiscal capacity, by limitations on taxation or debt, by requirements for approval by legislative bodies or public referenda, or by other legal limitations.

Revenue bonds pledge project or system revenues as security. Although subject to fewer restrictions, revenue bonds involve higher interest and marketing costs. Like revenue bonds, limited obligation bonds make a restricted pledge. Limited obligation bonds include dedicated tax bonds, special assessment bonds and special service tax bonds. Where revenues, special taxes or assessments are to be used for cost recovery, a general purpose sponsor may nonetheless choose to issue G.O. bonds in order to lower interest and marketing costs.

As financing responsibilities are shifted to non-Federal sponsors, the municipal bond market will provide a greater proportion of project funds than has been the case historically. While this shift reduces the Federal deficit, it does not reduce overall borrowing needs, and it increases the financial risks associated with project development.

Furthermore, this shift comes at a time when the municipal bond market has undergone dramatic changes. High and volatile interest rates have driven up financing costs. In response, bond issuers have developed creative financing techniques which reduce risk to lenders, thereby reducing interest costs.

One innovation is to use financing methods with short-term characteristics. These methods take advantage of the lower interest rates available for short-term debt. "Interim financing" uses short-maturity instruments for financing project development and construction; these instruments are refinanced at the completion of construction. Examples are bond anticipation notes (BAN's) and tax-exempt commercial paper (TECP). The risk to the borrower is that interest rates will rise or funds will not be available to refinance at maturity. A letter of credit (LOC) from a bank reduces these risks by providing backup credit security.

Other types of bonds with long maturities have features of short-term debt that appeal to investors:

- o "Put bonds" may be redeemed by the bondholder at stated intervals, thereby providing liquidity and protection against interest rate changes.

- o Variable rate demand obligations (VRDO's) pay interest at a rate which is pegged to market indicators and also give investors the "put" option, thereby providing similar protection.

Because of their short term features, these instruments offer interest savings, but involve risk to the bond issuer of cash shortfalls to cover "puts" or of unanticipated increases in interest payments.

As discussed in workshop presentations, both the Port of Oakland and the Massachusetts Port Authority have benefited from the use of short-term and adjustable-rate debt. Massport issued $23 million in TECP in 1982 and has "rolled it over" until the present, at an average interest cost of only 5 percent. Massport is planning to issue adjustable-rate put bonds, and expects to reduce the interest rate to 4 or 5 percentage points below ordinary long-term debt. The Port of Oakland issued BAN's in 1982 at a net interest cost of 6.6 percent. These were refinanced in 1984 with "ACES", or adjustable, convertible, extendible securities, at an initial interest rate of 6.1 percent, which has since declined.

A second financing innovation has been the use of zero coupon bonds. These bonds are sold at a deep discount from face value and pay no interest. Issuers use these bonds to load debt service into the out-years, thereby more closely matching debt service to the growth of revenues. This is important because bond maturities are usually 20 or 30 years, although useful project lives are 50 years and more. For the Mississippi River deepening project, it was recommended that the State of Louisiana issue a zero-coupon "assurance bond" which would be used to finance early-year deficits but would be recouped by out-year surpluses in time to repay the principal.

A third financing innovation has been the increased use of funding sources other than debt. The workshop examples of the Lock Haven flood protection project and the financing activities of the Trinity River Authority of Texas illustrated the creative use of multiple financing sources, including internally generated funds from existing facilities, grant receipts and in-kind contributions as well as bond proceeds.

One non-debt funding source is privatization. Privatization involves the participation of private interests in the financing, construction, ownership and/or operation of facilities which provide services to a public entity. Privatization is competitive with tax-exempt bond financing because it offers depreciation deductions (in the case of a lease or a service contract) or tax exemption of interest (in the case of a purchase contract.) Other benefits include cost savings on construction (through avoidance of public procurement requirements) and avoidance of debt restrictions. However, because privatized facilities must be separated from those involving public funds, privatization has little applicability except to finance adjunct facilities at a Federal water development project or as a substitute for Federal participation.

A fourth financing innovation is the expanded use of bond insurance. Bond insurance is usually cost-effective for issuers whose bonds are rated lower than AA by the rating agencies because bond insurers pool risk, whereas individual bondholders charge a "risk premium" reflected in interest cost.

The exemption from Federal taxes of interest on State and local debt is based on State sovereignty as delineated in the U.S. Constitution, and it continues to be a mainstay of non-Federal financing. Elimination or severe curtailment of this tax-exemption has at times been recommended; in fact, recent changes in the tax law have restricted the use of tax-exempt industrial development bonds (IDB's), and Internal Revenue Service guidelines may remove the tax-exempt status from certain projects. For example, a State or local sponsor may seek to secure its revenue bonds to finance water supply storage in a Corps reservoir through contracts with major utility or industrial users; IRS rulings threaten to treat these bonds as IDB's ineligible for tax-exempt status and, hence, to render them unsellable. Other IRS rulings threaten the status of State and local bonds used for projects jointly financed by the Federal government and non-Federal sponsor(s) for which there may be an implicit Federal repayment guarantee. Further restrictions on tax-exempt borrowing could dramatically increase non-Federal financing costs, compound financing difficulties and drive borrowers which are small or are lesser credit risks out of the bond market. Such restrictions could be subject to constitutional challenge.

Financial Assistance

A water projects sponsor's ability to float G.O. bonds depends on its creditworthiness; the ability to float revenue and limited obligation bonds depends on the certainty of the dedicated revenue stream. Access to the bond market and to the financing innovations discussed above is available only to issuers whose bonds are investment grade, i.e. rated BAA or better by the rating agencies. Whether due to limited geographic jurisdiction, restricted charging power, limited revenue base, flood-induced reduction of property values, exhaustion of borrowing capacity or other factors, some units of government would not be able to issue bonds to finance their participation in a Corps of Engineers project, or would not be able to do so at reasonable cost.

In recognition of this situation, the Corps of Engineers policy is that the non-Federal share of implementation costs is to be in cash or in-kind during construction of the project, except that non-Federal contributions for flood

damage reduction, hurricane and storm damage reduction, recreation, and agricultural water supply are to be consistent with the ability of the non-Federal interest to pay at the time project expenditures are made. The portion of the non-Federal contribution not contributed during construction may be repaid over the useful life of the project but in no event more than 50 years from the date of project completion. The interest rate charged will reflect the average yields on obligations of the United States with remaining periods to maturity comparable to the reimbursement period.

It should be noted that if tax-exempt bonds may no longer be used to finance a water project, the increased interest costs could necessitate that the non- vendible purposes at the project obtain Federal financing.

The States have a major role to play in assisting local sponsors in less extreme circumstances to lower financing costs or improve access to funds. With the reduced availability of Federal funds, State participation will become more important in meeting both State and local needs. States such as Pennsylvania and Washington have traditionally relied upon appropriations and debt to provide direct grant assistance for water and other needs. Many States now find that financial needs for all types of infrastructure investment exceed the ability of the States to market bonds without threatening their creditworthiness and bond rating. For instance, in Pennsylvania the non-Federal share of pending Federal water projects alone is on the order of $300 million.

Over time many States have developed mechanisms to stretch both State and local credit capacity further by acting as intermediaries between local borrowers and the financial marketplace. Loan programs are a basic form of intermediation; for instance, the Oklahoma Water Resources Board is authorized to sell revenue bonds and lend the proceeds to a blind pool of qualified local governments for water and sewer projects.

Other forms of intermediation are possible. The Utah Board of Water Resources purchases general obligation or water revenue bonds from political subdivisions of the State. States have created other assistance programs such as bond banks, which purchase local bonds and use them as collateral for debt floated by the banks. Some States guarantee local debt for qualifying water projects.

A recent development is the revolving loan fund, in which new loans are made as old loans are repaid. The funds are generally initially capitalized by some combination of appropriations and bonded indebtedness, and recapitalized by repayments, dedicated revenues continued appropriations or debt.

The State of Utah has two revolving water development funds which subsidize interest paid by local borrowers. In 1978, debt was used for the first time to provide principal for the fund; in 1983, the fund was used for the first time to provide collateral for other borrowings. However, dedicated revenue sources are needed to lessen reliance on debt and appropriations.

Oklahoma's water development revolving fund is funded by legislative appropriations. The primary purpose of the fund is to provide additional

security and collateral for revenue bonds issued through the Oklahoma Water Resources Board's loan program. The fund can be used to construct State water projects, to finance the State's cost share for Federal water projects, to make payments to the Federal government to fulfill existing State contractural obligations, and to fund water resources planning and research activities. Interest earned by the fund is used for emergency water and sewer grants.

Washington and New Jersey, among others, have developed proposals for infrastructure banks. Infrastructure banks are financing vehicles which are capitalized from multiple sources and which may apply their funds to a variety of uses, including revolving loans. The New Jersey bank would include Federal grant money, general obligation debt proceeds, appropriations, and dedicated project revenues as sources of capital. (Use of the Federal grant money would require changes in Federal law.) A number of single-purpose revolving loan funds would be set up within the bank. In addition, the bank could finance local cost shares of Federal projects by issuing debt on behalf of sponsor communities. While the New Jersey bank has not been established, the State has created a number of single purpose lending and project financing authorities.

PROJECT IMPLEMENTATION

Implementation of jointly financed projects involves diverse challenges to the Corps of Engineers, States, and sponsors. To implement projects, greater speed and certainty is needed in authorization, budget and funding schedules must be coordinated, and mutual assurances of project funding and performance must be provided.

Greater speed and certainty is needed in procedures for project review, authorization and initial funding. State and local sponsors need reassurance that the commitments they make in planning will be honored in the review process and that their efforts will result in a project in a reasonable period of time. This will assure both that current needs will be met and that sponsors will be willing to participate in planning and to make the the necessary legal, financial and institutional arrangements for financing. Most alternatives considered for accelerated authorization would provide greater discretionary authority to the Corps of Engineers to design and build projects, particularly small projects.

Before construction can begin, the Corps requires assurance that the sponsor's cash contributions for construction and project operation will be provided at the appropriate times. In States in which it is illegal to obligate future legislatures to appropriate funds, sponsors may have to place their cash contributions in an escrow account prior to the letting of construction contracts. However, under Federal anti-deficiency law, contracting officers must have the needed funds in hand before a contract can be let; consequently, sponsors cannot be credited with interest on the balance in the account. This problem can be addressed by adjusting the sponsor's cash contributions for the interest foregone under the assumption that the escrow account is drawn down at the same rate as the Federal appropriations. Alternatively, special double-trustee accounts can be authorized by Congress.

In States where long term contracts which obligate future appropriations are legal, a cash contribution could be provided in installments under an enforceable contract. However, the joint Federal/non-Federal financing of water projects requires coordinating budget and funding schedules. Securing non-Federal financing authority and approvals must often be obtained within limited "windows of opportunity" constrained by legislative sessions, election dates for referenda, and State and local budget cycles. The issuance of debt must be scheduled with other capital projects according to what the market will bear so that credit ratings can be maintained. One way to ease scheduling problems is to relax current statutory restrictions under which sponsors may be credited neither with project-related expenditures made prior to Federal authorization, nor with expenditures in excess of $1 million made prior to Federal appropriations. A second method, which is included in the Army's policy for financing Civil Works projects, is to consider a "grace period" for the initial installment. Such an approach was negotiated between the Corps and the State of North Carolina for the Randlemann Lake project.

In States where long-term contracts are legal, it is still essential to assure that sufficient funds are in hand before a contract can be let. This assurance can be provided by appropriating excess Federal funds (up to full funding) in order to cover the shortfall until sponsors' contributions are received, by phasing contracts where appropriate, or by assigning contracts for certain separable facilities to a Federal appropriation account and contracts for other facilities to non-Federal accounts.

Bondholders require assurance that a project to be financed will be completed and will perform and be operated as expected so that cash requirements for debt service can be met. Similarly, sponsors need assurance that they will not be saddled with debt without a project to show for it, and that they will not have to confront added costs due to funding delays, construction delays, or cost overruns. As a result, the Corps needs to assure not only that Federal funds for the project will be provided, but that the project will be completed on time and at the stated cost to the sponsor and that the project will be operated so that anticipated outputs (and revenues) will be delivered. These assurances may be provided in varying degrees by the full funding of projects prior to construction, by fixing the non-Federal share, by providing the Corps greater discretion to reallocate funds to assure project completion, by negotiating the operating rules for jointly financed projects, and/or by providing backstop credit support. Care should be exercised that such assurances do not constitute a credit guarantee which could eliminate the eligibility of sponsors' bonds for tax exemption.

CONCLUSIONS

General Issues and Opportunities

Significant differences remain among the positions of the Executive Branch, the Congress and the States on cost sharing and financing policies. Key issues involve:

- o cost sharing percentages for new projects and for project additions, modifications or reallocations
- o financing terms for new projects
- o the treatment of sponsors' financing capabilities in cost sharing and financing agreements
- o the composition and magnitude of non-Federal planning cost shares.

These differences must be resolved to end the water development impasse.

When confronted by limitations in a sponsor's capability to finance a water resources plan, the Corps of Engineers, the affected State and the sponsor may take one or more of the following general courses of action:

- o Modify the plan.
- o Modify the sponsor's cost share.
- o Modify the financing responsibilities of the sponsor.
- o Modify the financing opportunities and terms available to the sponsor.
- o Modify the institutional and legal conditions of sponsorship and cost recovery to enhance cost recovery opportunities.

Management of the Planning Process

In response to the needs of non-Federal planning partners, the Corps of Engineers should develop a shorter and less expensive planning process involving:

- o limited planning scope
- o early consideration of non-Federal financing capabilities and concerns
- o fewer plan alternatives
- o decision-directed analysis.

To facilitate State and local budgeting and assignment of personnel in developing a water resources plan, the Corps of Engineers must reach an agreement with its non-Federal planning partners on:

- o the division of planning responsibilities
- o the valuation of in-kind planning services
- o the scheduling of study elements

Financial analysis should be included in the planning process from an early stage.

Financial data should be geared to continually support sponsors' financial decisionmaking during the planning period

The Corps of Engineers should conduct training and information transfer activities to enhance its capabilities:

- o to perform financial analyses in concert with its economic analyses
- o to assist non-Federal sponsors in conducting such analyses during the planning period

The Corps of Engineers and States should develop manuals on water project financing and financial analysis for use by the Corps, States and sponsors.

Financial Feasibility, Non-Federal Concerns and Plan Formulation

As called for in the P&G, studies should explicitly consider the acceptability of alternative plans. Elements of acceptability should include the sponsor's capability to finance each alternative.

As called for in the P&G, planning studies should explicitly consider non-Federal concerns. These concerns may include:

- o plan outputs and features desirable to non-Federal interests
- o plans providing regional economic, tax, and employment effects
- o limited- or single-purpose plans meeting priority needs such as water supply.

In this regard, the Corps of Engineers may need new authority to study single-purpose projects.

Planning studies should conservatively estimate future project benefits in light of the sensitivity of projected usage to price and to demand uncertainty.

Planning studies should consider alternative plans which achieve construction cost savings by:

- o reducing scale or design life
- o accelerating construction
- o making greater use of nonstructural or demand management measures
- o substituting recurrent for capital costs

The Corps of Engineers should reevaluate decision rules which are imposed upon the design of Federal projects and which may increase project cost, e.g. standards, procedures and criteria for acceptable risk, environmental protection and coordination.

Planning studies should consider staging separable project increments, both as a hedge against the failure of benefits to develop as expected and as a way to match debt service requirements more closely to revenues over time.

Cost Recovery Strategies

Planning studies should focus on identifying project beneficiaries and documenting the distribution of benefits among user groups and geographic areas.

Planning studies should analyze alternative cost recovery strategies based on financial and institutional considerations.

Planning studies should communicate the benefits of a project to sponsors and beneficiaries in order to generate support for needed actions.

The effects on cost recovery opportunities of sponsors' geographic jurisdiction; taxing, charging or assessment authorities; constitutional or statutory limitations; and administrative cost and feasibility should be addressed on a case-by-case basis. In some cases it may be most efficient for the Federal government to recover costs from beneficiaries.

Projects with multiple sponsors may involve lengthy and complex negotiations on design priorities, the allocation of costs and the allocation of outputs. The Corps of Engineers and the States can participate in these negotiations and assist in developing interstate compacts, joint action agreements or other implementing mechanisms.

The States can play a major role in remedying institutional constraints to cost recovery; however, institutional modifications take several years to enact.

Financial Planning

Primary responsibilities for project financial planning should remain with project sponsors.

Federal and State water agencies have a responsibility to inform the public on the importance of water projects to the national economy.

States should assist the sponsors of water projects, among others, by establishing technical assistance and supervision programs designed to facilitate bond issuance, encourage responsible fiscal management practices, and improve credit ratings.

States should help sponsors to remedy legal constraints to financing, including statutory limitations on debt, taxation, expenditures, or contracts, and deficiencies in the sponsors' particular authorities.

Planning studies should provide financial data and analyses useful to the financial community; however, an independent consulting engineer is still needed for bonding purposes.

Project Financing and Financial Assistance

As financing responsibilities are shifted to non-Federal sponsors, the tax-exempt municipal bond market will provide a greater proportion of project funds than has been the case historically. While this shift reduces the Federal deficit, it does not reduce overall borrowing needs, and it increases the financial risks associated with project development.

Any curtailment of tax exemption for interest on public debt would dramatically increase financing costs and restrict the access of many borrowers to capital.

"Creative" debt financing techniques do not increase the availability of capital, but lower financing costs primarily by reducing credit risk (the risk that principal or interest will not be repaid) or interest rate risk (the risk that interest rates will rise, thereby reducing the value of the lender's bonds.)

Under Internal Revenue Service guidelines, interest in project debt which is explicitly or implicitly backed by a Federal guarantee of repayment (in the form of Federal ownership, joint development agreements, contracts involving Federal repayment, or Federal guarantees of project completion, performance and operation) may not be tax-exempt.

Under the 1984 Tax Reform Act, non-Federal project sponsors who seek to secure non-Federal financing of a portion of a Federal water project through contracts with utility or industrial beneficiaries may find the bonds treated as industrial development bonds and, hence, subject to severe limitations or ineligible for tax-exempt status.

The Corps of Engineers' policy on financing is that the non-Federal share of implementation costs is to be in cash or in-kind during construction of the project, except that non-Federal contributions for flood damage reduction, hurricane and storm damage reduction, recreation, and agricultural water supply are to be consistent with the ability of the non-Federal interest to pay at the time project expenditures are made. The portion of the non-Federal contribution not contributed during construction may be repaid over the useful life of the project but in no event more than 50 years from the date of project completion. The interest rate charged will reflect the average yields on obligations of the United States with remaining periods to maturity comparable to the reimbursement period.

If tax-exempt bonds may no longer be used in financing a water project, the increased interest costs could necessitate that non-vendible purposes of the project obtain Federal financing.

States should assist communities which are poor credit risks to obtain greater access to funds by creating financial assistance programs. Alternative forms of assistance include grants, direct purchase of bonds, bond banks, loans, revolving loans, loan guarantees, and composite "infrastructure banks."

Project Implementation

The Congress should expedite procedures for project review, authorization and funding so that current needs will be met and so that sponsors will be willing to contribute to project planning costs and to make the necessary legal, institutional, and financial arrangements for project financing.

A sponsor in a State which prohibits the obligation of appropriations by future legislatures will have to create an escrow account for its cash contribution prior to construction; however, under Federal anti-deficiency law, that sponsor may not be credited with interest earned on the balance in the account.

Because Federal and non-Federal schedules for funding approvals, budgeting, appropriations and debt issuance differ, the Corps of Engineers and/or Congress should provide sponsors greater latitude in the timing of their financial contributions, by giving sponsors credit for early expenditures and/or allowing "grace periods" for the contribution of construction funds.

Federal contracting officers must have sufficient funds in hand, whether from Federal sources or non-Federal, prior to letting a contract.

In order for a sponsor's revenue bonds or limited obligation bonds to be marketable, the Corps of Engineers and/or Congress should provide assurance that the project will be completed on time and at the stated cost to the sponsor, and that the project will be operated so that the anticipated outputs will be delivered. These assurances should be structured so that the sponsor's bonds remain tax-exempt.

THE CORPS OF ENGINEERS: PLANNING TO MEET THE FINANCING CHALLENGE

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The Civil Works program of the U.S. Army Corps of Engineers makes a unique contribution to the development of our nation through water resources planning, development, and management. Investments in flood control projects have prevented $146 billion in property damages at a cost of only $19 billion. Each year, 25,000 miles of waterways handle two billion tons of cargo, resulting in savings to consumers of about $1 billion over the next best transportation alternative. Corps' reservoirs provide 7.8 million acre-feet of municipal and industrial water storage, serving millions of people; associated hydroelectric plants provide over one-quarter of the nation's hydroelectric capacity and generate about one-half of the energy provided by all Federal power plants (fossil, nuclear, and hydropower). Nearly 4,000 recreation areas at over 600 Corps reservoirs provide recreation opportunities to citizens who make nearly 500 million visits to them each year.

Despite these notable contributions and the potential for additional productive investment, the development of new Civil Works projects is beset by a funding crisis -- there are simply insufficient Federal funds to start, finish, and operate all needed projects. In the future, those who benefit must pay a greater share of the costs.

Therefore, State and local governments are being asked to bear a higher proportion of the costs of project planning and construction and to provide these funds early--during the planning and construction periods. Local governments and other non-Federal participants will consequently demand a larger say in project planning and priority setting. Although this greater participation may result in more locally acceptable projects, it will require changes in the Corps of Engineers planning, design and construction processes.

Federal/Non-Federal Partnership for Water Development

Initially, Federal water development in the United States concentrated on navigation--to facilitate commerce and to "open the West." Over time, the Federal role has broadened and now encompasses virtually all aspects of comprehensive water resource development. Federal water development provides widespread benefits, minimizes risks to human life, and achieves social and regional development goals.

Due to the limited financial capability of non-Federal sponsors and the fact that water resource developments are typically long-term investments characterized by uncertainty in future conditions, demands, and revenue potential, the Federal government has traditionally assumed the financial risks of project planning and construction. Traditionally, local and State sponsors generally provided lands, easements, and rights of way; reimbursed some vendible outputs like water supply and hydroelectric power; and assumed some project operation and maintenance responsibilities.

Funding Cutbacks

Today, we live in an era of limited Federal funds, especially for water resources construction. Although the Corps' Fiscal Year 1985 budget is about the same as last year's and larger than several years ago, funding for new

project construction is about $1.1 billion. This is only 37% of the 1980 level and 25% of the 1967 level after adjusting for inflation.

There are several reasons for this decrease. Although the last authorization bill was in 1976, this Congress has not agreed upon and the President has not signed a comprehensive water resources authorization bill since 1970. The growing Federal deficit makes it unlikely that major new Federally funded water development can be undertaken today. There are competing demands for limited Federal dollars, including those needed for the operation, maintenance, repair, rehabilitation, and/or modification of existing projects. It is also unlikely that the trend toward smaller Federal investments in water development will be reversed. If urgently needed projects are to be built, the country requires new financing arrangements.

During the past decade, traditional water project cost sharing and financing (sponsor-provided lands, easements, and rights-of-way; reimbursment for vendible outputs over the life of the project) have been subjects of intensive scrutiny and divisive debate. The milestone report of the National Water Commission in 1973 recommended cost sharing policy changes. The Carter Administration reviewed cost sharing in the Ford Administration's "Section 80" study authorized by the Water Resources Development Act of 1974; and proposed, depending on the nature of the project purposes, that non-Federal project sponsors should provide an additional five to ten percent of project costs "up front." These proposals generated a great deal of controversy, and achieved no consensus on cost sharing and financing.

The era of turmoil characterized by a gradual loss of consensus between the Executive and Legislative branches on water priorities and Federal responsibilities resulted in a virtual halt in the Congressional authorization process for new water projects. Of the 106 on-going construction projects in the FY 85 Civil Works budget (down from 159 in FY 83), only six were begun after 1979. Meanwhile, there are about 200 projects involving about $13 billion of construction costs eligible for authorization; hundreds of projects, involving about $16 billion, already authorized, await funding for construction appropriations or de-authorization.

Policies for Project Cost Sharing and Financing

The period of turmoil may be about to end. An emerging partnership between the Federal government and the State and local sponsors of water projects provides the opportunity to forge a new consensus.

President Reagan, in his January 1984 letter to Senator Laxalt concerning water development said, "It is time to conclude the discussion and to establish a national water project financing policy so that we can get on with the job of completing projects where commitments already have been made and undertaking new construction starts to meet the country's future needs."

The President also spelled out his cost sharing and financing policies for water projects, and stated, inter alia, that the costs of project planning are to be shared with project sponsors. Consistency in cost sharing for individual project purposes is to be sought, so that all sponsors are treated

consistently and fairly; but each water agency is to negotiate reasonable financing arrangements with the sponsors of each project. Ultimately, Congress and the President, together, will decide cost sharing, financing, and cost recovery arrangements.

The Assistant Secretary of the Army for Civil Works, who oversees the Corps of Engineers Civil Works program, has recommended specific cost sharing and financing policies to the Office of Management and Budget.

With respect to the sharing of planning costs, the Corps' planning process has been divided into two phases. The policy proposes that the Federal government will bear the full costs of an initial 12 to 18 month "reconnaissance" phase. Project sponsors would provide 50 percent of the cost of a follow-up two to three year "feasibility" study for those "reconnaissance" studies deemed "winners". Up to one-half of the non-Federal cost may be services in kind.

With respect to project implementation, under Army policies, cost shares for each project purpose are consistent among projects, and almost invariably exceed traditional cost shares. Non-Federal sponsors will provide their share during construction rather than the traditional form of repayment with interest over the life of the project. We in the Army believe there should be set cost-sharing percentage formulas; however, there is a great deal of flexibility on individual, verifiable hardship cases for sponsors to extend their period of payment.

The Army recognizes that its proposed and currently voluntary cost sharing agreements reached with sponsors would be superseded by water resources legislation. If a sponsor (of certain outputs) is not able to borrow at favorable interest rates, the Army will consider financing those outputs and require repayment at the Treasury rate. This rate is currently about 11 percent and should not be confused with the Federal discount rate of 8-3/8 percent used in economic analyses of water projects. The Army is using these policies in negotiating voluntary agreements with non-Federal project sponsors--with the explicit understanding that Congress will ultimately decide the cost sharing issue.

A Light at the End of the Tunnel

The time is right for cost-sharing--financing can be found! The 1986 budget proposals submitted to OMB by Robert Dawson, Acting Assistant Secretary of the Army for Civil Works, and subsequently included in the President's budget, contained a total of 29 projects for which the Army has reached voluntary cost-sharing agreements with local sponsors. These projects include those for which the Assistant Secretary previously negotiated agreements in 1982, 1983, and 1984, as well as those negotiated by Corps field offices in 1985.

There is more good news. The Interstate Conference on Water Problems (ICWP) (and) with the Corps sponsored four regional financing workshops during the fall of 1984. Over 330 planners, engineers, financial consultants, investment bankers, and government officials shared ideas, problems and

success stories on water project financing. Topics included benefits and revenues, financing powers and limitations, financial planning, financial and economic analysis, creative financing techniques, and financial implementation. Dialogue has begun at the action level and there is genuine optimism for building a new intergovernmental partnership to break the water project funding logjam.

Challenges in Project Planning and Authorization

The sharing of planning costs, increased construction cost sharing by sponsors, and the participation of sponsors in financing during planning and construction will have significant impacts on the planning and authorization of Civil Works' projects. The Corps has already made significant changes in internal planning guidance to accommodate such impacts, but more remains to be done to effect viable local, State and Federal working partnerships. Faced with increased financial burdens and risks, project sponsors now fully expect that the planning and authorization process will yield cost effective plans that meet minimum local requirements in a timely fashion. The Corps must adapt to this situation through pragmatic and flexible approaches to project planning and implementation. There are at least three major challenges:

1. Adapt the cost shared planning process to allow greater sharing of planning tasks and a more specific focus on the needs of the sponsor and the financing community;

2. Address and alleviate non-Federal concerns which differ from Federal water development policy objectives;

3. Expedite review, administration approval, and Congressional authorization of feasible and financially sound project studies and projects.

Managing a Joint Planning Process

Management of a joint planning process requires adjustments in cost accounting and agreements on planning and engineering standards. Planning partners must agree upon the valuation of planning services provided by each, and must determine the services to be credited to each sponsor's planning cost share. Services in kind to be considered include data collection, surveys, projections, computer modeling, public involvement, hydrologic and engineering studies, participation in plan formulation, (analysis of) social and community impacts and financial analysis.

Sharing responsibility for construction of joint Federal/non-Federal projects could also affect the planning process. Frequently, local sponsors request that they be authorized to initiate construction of certain project features prior to Congressional authorization of the project -- with these expenditures being credited to the required local cost share of the project.

There are a number of ways that this might affect planning. Most require the consideration of ways to fix agreements made at the end of the feasibility planning process in order not to initiate a replanning cycle. If staged

construction increases total project costs and/or affects the economic justification of the last stage by increasing its costs, it will be necessary to adapt evaluation practices and financial arrangements to enable agreements to be made on the merits of the total project at the completion of feasibility planning. This will allow local sponsors to proceed with construction with assurance that the total project will be built when authorized. There will be many similar issues and challenges which will require a policy-making environment in which frequent evaluation and reassessment is the norm.

Another difficult issue to be resolved concerns the appropriate planning, environmental, and engineering procedures to be applied. The Corps must be willing to examine and adapt its planning practices in such areas as environmental protection or mitigation, public involvement, interagency coordination and degree of acceptable risk. It is important that planning partners agree on the scope and scale of planning components and all costs. The Corps will increasingly be asked to trade off among project purposes, and to formulate plans which are soundly engineered and financially viable from a local perspective.

Because public officials must demonstrate to their constituents that studies generate results consistent with needs and expenditure, Corps' planners must quickly provide a limited range of acceptable alternatives so that potential sponsors — along with the financing community — can evaluate possible financing alternatives. During the reconnaissance and feasibility phases of planning it is important to document the interjurisdictional effects of projects having widespread benefits, as these will likely require the development of new institutional mechanisms.

During reconnaissance planning, the States and the Corps will be called upon for data and advice on how multiple local interests can equitably share the costs of feasibility planning. This step is critical in assuring that affected interests pay fair costs and receive appropriate consideration in planning decisions. Therefore, even though the reconnaissance planning phase is done at Federal expense, a close working relationship demands the seeking out of potential sponsors to cost-share the subsequent feasibility study.

During the feasibility phase, interjurisdictional considerations are equally important, as sponsors will be sought to share construction costs. This will require a detailed accounting of the benefit and cost distribution across geographic areas and over time. Although detailed accounting of benefit and cost incidence is difficult, it is important that this task begin early as it is key to successful negotiation of joint planning and construction endeavors.

Addressing Non-Federal Concerns

To fully address non-Federal concerns without inappropriate deviation from the Federal water development objective, we need to take full advantage of the flexibility which is provided in the Federal guidelines for water project planning — Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, March 10, 1983. These are commonly referred to as the Principles and Guidelines or simply the P&G.

The Federal objective of water resources planning is to contribute to national economic development, consistent with laws and executive orders concerning the protection of the nation's environment. The P&G require each water resource development agency to develop a National Economic Development (NED) plan — that plan which maximizes national economic development benefits. A major concern of local sponsors is the ability to levy taxes or assess fees to project beneficiaries in order to obtain revenues to finance projects.

Planning studies typically address complex problem sets; they involve multiple needs, opportunities, project purposes, and jurisdictions. Frequently, the comprehensive plans formulated in this environment result in projects which are beyond the capability of local sponsors to finance, because of jurisdictional limitations, scale of project or vendibility of outputs. Additionally, there may be real disagreements over the value of certain elements of "Federal" plans -- for instance those that provide mitigation for valuable or scarce national resources which may be locally abundant.

The solution to this dilemma lies in the flexibility of the P&G — which state that each plan, including the NED plan, be formulated "in consideration of" four criteria: completeness, effectiveness, efficiency, and acceptability. The acceptability criterion includes acceptance of a plan by State and local interests. An acceptable project may involve considering a smaller scale; shorter design life; staged development of separable increments; enhanced use of mixed-strategy plans incorporating nonstructural and demand management measures; reduced environmental mitigation; increased emphasis on outputs creating regional or local employment or tax gains; and the substitution of recurrent costs for capital costs. Acceptability considerations may also raise the issue of lowering costs by modification of engineering and environmental procedures without significantly increasing risk where legally possible.

In effect, these criteria are constraints upon the range of feasible solutions. Therefore, the NED benefits should be maximized within these constraints. Consequently, the development and screening of plans could focus not only on net economic benefits and environmental effects but also on acceptability to the non-Federal sponsors and their ability to finance the projects.

Sponsors' concerns include: restrictions on debt; taxation limits; deficit spending; the obligation of future appropriations; the commingling of funds and scheduling of referenda to support planning and construction. Because of uncertainty in the outcome of feasibility planning as it impacts on these concerns; sponsor(s) may also need to consider temporary arrangements to alleviate financial constraints from the start of planning until the time when firm funding commitments for construction must be made. The information needs of sponsors, when considering such arrangements, will need to be anticipated as part of the planning process.

The P&G also enable the Corps to develop alternatives to the NED plan in order to address other Federal, State, local or international concerns which are not fully addressed in the NED plan. If it can be shown that the concerns which led to the development of an alternative to the NED plan provide an overriding reason for selecting that alternative, the Secretary of the Army may select that alternative for recommendation to Congress.

Streamlined Review and Authorization

A State or local unit of government committing funds to project planning must know that such expenditures will result in a quality project which can be built within a reasonable time. One of the major criticisms of current Federal water development is the inordinate time period between the beginning of planning and the completion of construction of a project. This time period can easily extend to 20 years, and results largely from lengthy reviews and sequential referrals to the Congress for authorizations and appropriations for each step of the planning, design and construction process. Adding the additional time to negotiate cost-sharing agreements with local sponsors can only lengthen an already unacceptably long process, unless a major revision of current practice occurs.

Precedents exist for Congressional recognition of the need for speedy review and authorization. Under Section 201 of the 1965 Rivers and Harbors and Flood Control Act, projects under $15 million may be authorized by resolution of the House and Senate Public Works Committees rather than by enactment of specific project legislation. Also, under the Continuing Authorities program, the Chief of Engineers has the discretion to plan and construct small projects (for instance, less than $4 million Federal costs for flood control and less than $2 million Federal costs for navigation) without referring to Congress or the Committees for approval. Finally, Congress has also authorized the Corps to continue planning and engineering for projects which have been submitted for authorization but (are) not yet authorized, although this authority has limited application.

Other alternatives have been proposed to streamline the development process. These include resuming the use of Section 201 which was discontinued in 1978; expanding the dollar limits of the Continuing Authorities Program; providing for concurrent authorization of projects and appropriation of funds; authorizing the Corps to review and participate in implementation of plans developed by non-Federal governments — much as in the fashion of the Soil Conservation Service; and providing for concurrent and shared review of plans by local, State and Federal partners. Streamlined planning and construction is perhaps the most difficult and yet the most important issue to be faced if the new cost-sharing partnership is to succeed.

Meeting the Challenge

It is clear that the emerging new partnerships between Federal, State and local governments in developing the nation's water resources provide the impetus and resolve for solving the significant challenges facing wise and needed water resources development. We believe that all partners are willing to examine critically (the) existing relationships and methods for financing the planning and the construction of water projects.

The Corps is committed to rethinking our procedures. Planning responsibilities and planning costs both must be shared. We will more flexibly apply the standards and criteria which have evolved over the years. We will apply uniform cost-sharing formulas, but will assure equitable financing arrangements based upon need and ability to pay. We will continue to work closely with non-Federal sponsors in finding ways to formulate the "right" project and to develop financing packages. These include critical analysis of criteria -- provided an acceptable balance between risks and safety is maintained -- and sizing projects to facilitate cost-sharing.

The Administration and Congress will need to work together to determine the exact cost-sharing percentages by project purposes. In the interim, the Corps will continue to adapt to changing times and through its decentralized organization will work closely with the units of government with which it shares water development responsibilities. Together, as we establish closer working relationships, we will build a new and wiser consensus for meeting tomorrow's water needs.

THE STATE PERSPECTIVE ON WATER PROJECT FINANCING

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Public Infrastructure Investment Needs

The nation's public works infrastructure is in a state of decline and substantial public investment is needed to overcome the problems attributed to deterioration, technological obsolescence and insufficient capacity to serve future growth. An analysis of public infrastructure needs conducted by the Congressional Budget Office, Public Works Infrastructure: Policy Considerations for the 1980s, April 1983, estimated that annual capital outlays by all levels of government, under policies then in place, would have to increase from the current level of about $36 billion to about $53.4 billion during the years 1983 to 1990 to maintain and improve seven critical infrastructure categories including highways, public transit, airports, air traffic control, wastewater treatment, municipal water supply and water resource projects (dams and navigation). These seven categories were selected for analysis as they are capital intensive projects that have traditionally been funded by all levels of government and are critical to the national, as well as the local, economy.

Of the total of $53.4 billion in annual investment in infrastructure needs, about $28.2 billion would be expended to repair, rehabilitate and replace existing facilities and $25.2 billion to construct new facilities to meet growing demand. In the three water infrastructure categories - wastewater treatment, water supply and water resources - $12 billion annually would be required to maintain existing systems and $6.4 billion would be needed to construct new water projects. It should be pointed out that the overall large apparent demand for construction of new projects in all seven categories reflected the orientation of then current project funding policies, instead of the expected reduction in demand that may result from proposals for increased non-federal cost sharing.

Despite the massive water infrastructure investment needs of the nation, the spending by the key federal agencies responsible for water resource development has actually declined in recent years. Of about 25 federal agencies concerned with water projects, four - the Corps of Engineers, Bureau of Reclamation, Soil Conservation Service, and Tennessee Valley Authority - account for about 70 percent of all federal expenditures on water resources. Since the mid-1960s, when these four agencies spent more than $6 billion per year, their joint spending level has dropped steadily to a 1983 combined appropriation of less than $4 billion, or a 40 percent reduction (in 1982 dollars).

In response to reductions in federal spending for water development, the states have initiated programs to maintain existing facilities and to construct new facilities to accommodate local and regional growth patterns. A CBO study, Current Cost Sharing and Financing Policies for Federal and State Water Resources Development, July 1983, reports the following financing techniques were used by states in 1982 to fund water projects.

Source of Funds	Number of States	Amount Financed
General revenues	36	$490 million
General obligation bonds	27	$2.4 billion
Tax dedication or user fee collection	26	$275 million
Revenue bonds	11	$737 milion

Cost Share and Cost Recovery

The subject area of the four workshops sponsored by the Interstate Conference on Water Problems (ICWP) and the Corps of Engineers was water project financing; however, it is evident that the levels of non-federal funding of water projects that will be established by cost sharing formulas set by the Congress will be a major determinant of the future financial burden to be carried by states and communities to fund water projects and to recover costs from project beneficiaries. In light of this close relationship between cost-sharing and cost-recovery, it is important that the state position on cost-sharing, as presented by the ICWP, be included as part of this discussion of the state perspective on water financing.

The ICWP is the national association of state and regional water administrators. The ICWP's Statement of Policy for years 1984-1985, which addresses the issue of water project cost sharing, asserts that the federal government has an important role in defining and reflecting the national interest; however, the states have the primary responsibility for managing all our nation's water resources, both quality and quantity aspects, and for defining water rights. National water policy and effective water management must evolve from a partnership in which the states, regional agencies and the national government all have a continuing role.

The ICWP Statement of Policy recognizes the need to comprehensively reform the current system of water resources project selection, financing and development. The following principles should be applied in the reform process:

1. Establishment of cost-sharing and cost-recovery levels is a matter for Congressional decision rather than administrative action.

2. Federal involvement in major water projects of a national interest is necessary and must continue.

3. A mechanism for initial capital formation based upon long-term payback is necesssary for non-federal participation in project cost-recovery.

traditional uses as streets, schools, hospitals and other corporate infrastructure responsibilities, that local units of government will put increased pressure on state governments to assume a significant share of the non-federal costs.

State Perspective of the Federal Role in Water Project Financing

Traditionally, perhaps the most important role performed by the federal agencies in water project development, besides providing the federal share of project costs, has been the economic analysis which assigned a benefit/cost ratio to each project. This analysis became the single most important factor in determining project feasibility and in selecting those projects that would be federally funded. However, in the presence of increased non-federal funding of water projects, it is important that projects be evaluated using both economic analysis and financial analysis techniques. Economic analysis determines who benefits from a project and who may suffer adverse impacts, without regard for who pays for the project. Financial analysis, on the other hand, is concerned with how to finance a project and the determination of the cash flows to the sponsor and the impacts of cash outflows or costs on the feasibility of the project itself and on the financial condition of the sponsor.

From the state perspective, it is important that federal water agencies continue to conduct economic analyses as part of feasibility studies; however, in light of growing non-federal funding requirements, the federal water agencies should provide the necessary data that will enable financial analyses of projects to be conducted by local sponsors. Or, as an alternative, the federal water agencies could conduct financial analyses along with economic analyses.

The determination of the feasibility of water projects and the decision-making process used to select projects for implementation should be based upon the findings of both economic analyses and financial feasibility analyses. While the determination of a project's contribution to national economic development is a consideration to the federal water agencies, the analysis of financial feasibility will be critical to the local sponsor in selecting a project from among a number of alternatives and in determining the size of the project to be implemented. With the requirement for increased non-federal funding of water projects and the financial burden placed on local sponsors, it is important that careful financial feasibility analyses be conducted early in the planning process.

Another state concern, which may result from increased non-federal funding of water projects, involves the inability of some local sponsors to raise the amounts of capital required up-front for project construction to begin. This may necessitate that projects be built incrementally, in keeping with the ability of the sponsor to raise capital and with the phased increase in project use or demands by consumers. The water planning process conducted by federal agencies and the federal implementation schedule should be responsive

to these possible changes in local project funding and the need to construct projects in increments. This awareness by federal agencies and cooperation in adjusting to these factors will expedite water project development in the future.

State Role in Water Project Financing

The shift to increased non-federal cost sharing will require new approaches to state involvement in the planning, selection, authorization, financing and construction of water projects. One major role for the state will be to serve as the local sponsor for water projects, particularly those such as flood control which involve non-vendible outputs or benefits that cannot clearly be assigned to specific individual users or beneficiaries. Another major role for the state will be to serve as an intermediary between or in cooperation with federal agencies and local project sponsors to assist in all aspects of project development, with an emphasis on project financing.

The future role of the states in water project development may include the following steps:

1. Determination of Water Needs

   The state should have a thorough understanding of the existing water resources in the state, future maintenance needs of existing facilities, new construction required to serve growing demand, and an assessment of state level and local financing authorities and their capabilities to fund needed water projects.

   Because not all states have single agencies with full responsibility for water resources, an inter-departmental task force might be needed to develop a state water plan to determine the water needs of the state. Two examples of this type of activity have been used in New York and Illinois. New York created a Water Resources Planning Council, responsible for developing an inventory of water resources needs, conducting a review of existing statutory and constitutional provisions for financing water suppply facilities, and compiling a list of communities which are unable to finance water project deficiencies based on an assessment of their financial capabilities. In Illinois, 12 state agencies worked together to develop the Illinois State Water Plan. The plan addresses 10 critical issues that are identified as statewide problems which have either received inadequate attention or have been recognized as new problems. A number of other states have taken similar steps as part of a coordinated planning process.

2. Authorize and Assist Local Sponsors of Water Projects

   The local public sponsor of a water project can be a state or other local unit of government that possesses the managerial, legal, planning and financing capabilities to undertake a specific project. Local units of

government include counties and municipalities, and, in addition, states may create independent water districts or authorities and may establish procedures for the creation of special purpose water, flood control or soil conservation districts by means of a referendum in an area to be designated as a special district.

New water development projects will frequently involve overlapping community boundaries and one or more special purpose water districts. To expedite the implementation of these projects, the state can assist the potential local sponsors by conducting an analysis of future project benefits, distributing the benefits among the affected communities and special districts, assigning the project costs and cost recovery shares in relation to benefits received, resolving legal or perceived constraints to joint project participation, and, where needed, assisting in the actual financing of the project.

3. Remove Legal Impediments to State and Local Financing of Water Projects

Because debt financing may become the prevalent means of obtaining investment capital for water project development by states and by communities, existing state statutes that may pose legal impediments to debt financing for water projects should be modified or removed.

Following is a list of some of the significant legal provisions, as contained in state statutes, that may limit the use of debt financing by the state and other potential local sponsors of water projects.

- Debt may not be issued for water projects.
- Debt may be issued for water projects, but only for specific types of projects.
- The state may be approaching statutory limits or ceilings on the amount of outstanding state debt.
- The types of debt financing for capital investment may be restrictive.
- Regulated interest rates on new debt may not be responsive to current market conditions.
- State or other local sponsors may have limited authority to tax, levy charges or make assessments to recover project costs from beneficiaries.
- There may be restrictions on the types of inter-governmental agreements that may be entered into with other public units or private entities for project funding, management and operation.

4. Conduct Financial Analyses for Debt Generated by Bonds

While the financial advisor to a project, generally a private sector firm with expertise in bond financing, is responsible for financial evaluations of project feasibility and bond marketability, the state should be in a position to provide basic financial analyses for use by the state and local sponsors. This capability, by a state agency responsible for water development, can assist in project planning, evaluation of alternatives and in the preliminary selection of projects for detailed financial evaluation. In addition, this process could be used to provide a firm direction for the involvement of the financial advisory company and possibly reduce fees that may not be included in bond proceeds.

The type of financial evaluation used to determine the feasibility of a water project will differ for projects financed by revenue bonds and by general obligation bonds. Projects financed by revenue bonds are backed by revenues from vendible water projects such as water supply and hydropower. Projects financed by general obligation bonds, which are backed by the full faith and credit of the issuer, are more applicable for projects with non-vendible outputs such as flood control, environmental enhancement and, in cases, recreation. The types of analyses that could be performed by a state agency as part of a financial evaluation of a water project to be debt-financed are as follows:

a. Revenue Bond Financing

- Rate structure needed to service the debt and cover O&M costs.
- Anticipated demand for project outputs and the flow of revenues over the term of the bonds.
- Anticipated net revenues over the useful life of the project.
- Impacts of the rate base on existing water facilities and other planned projects.
- Potential impacts on project revenues from such variables as the effects of water conservation, changes in demographics and regional development, changes in demand resulting from substitute sources or facilities and impacts of inflation on project demand, operating costs and revenue flows.

b. General Obligation Bond Financing

- Determination of existing taxes, tax rates and total community outstanding debt.
- Adequacy of the current and future tax and revenue base to support debt service requirements for planned infrastructure

improvements and, specifically, for the proposed water development project.

- Impact of a financed project on local taxes and the ability of the community to pay additional taxes.

- Ability of the local sponsor to administer debt based upon its debt and fiscal management practices, overall financial condition and procedures used in the planning and budgeting of capital improvements.

5. Develop Innovative Financing Techniques for Water Projects

Besides becoming a local sponsor for water projects having regional or statewide benefits, an important future role for the state in water project development will be in providing technical and financial assistance to small communities and water districts that may lack both a track record for financing capital improvements and a credit rating for issuing debt obligations. Because smaller prospective sponsors lack experience and expertise, the state role may involve direct financial assistance to reduce the project cost and to reduce the risks for small communities in dealing with financial markets, and the technical expertise of the state can be utilized by local sponsors in defining debt financing options and in negotiating with the finance industry to secure favorable interest rates, payback requirements related to revenue flows and other financial terms and conditions.

For states considering the establishment of water project financing programs, the following types of financing may enhance the capabilities of local sponsors to issue debt for needed water projects.

a. Revolving Loan Program

A revolving loan program involves the creation of a special state fund which make loans to local sponsors, and the repayments on the loans are returned to the special fund for the purpose of making loans on future projects. The state legislature creates the fund and appropriates funds, generally over a period of several years to minimize the financial impact on the state budget, for the purpose of making loans to local sponsors for the non-federal share or to reduce the local share to be financed by the local sponsor. The funds are loaned at favorable rates, usually at the cost of money to the state, for a long-term period of years. As the communities make payments on the loans, the receipts are placed in the special water project fund for the purpose of making future loans. In this fashion, the state funds initially appropriated are used repeatedly by local communities to undertake needed water projects, and the state is not burdened by the need to make annual appropriations or to issue bonds for the purpose of financing water projects.

b. Guaranteed Loan Program

Although local units of government and many types of special purpose water districts have the authority to issue revenue bonds, the ability to use this financing authority has in cases been constrained because the local sponsor may lack a track record or bond rating. A state loan guarantee program could offset this problem by placing the state in the position of guarantor for local bonds, and thereby minimizing the risk to bondholders of a project defaulting and not meeting scheduled debt service payments. In addition, by receiving the backing of the state, the local sponsor issuing the debt may be able to obtain a lower interest rate, approaching the rate to the state on long-term debt.

For a state considering ways to assist local sponsors in financing water projects, a loan guarantee program offers the advantages of placing no additional burden on the state's debt limitation while assisting local sponsors in gaining necessary managerial expertise in bonding and dealing with financial markets. This may enable the sponsors to be more self-sufficient in financing future development projects.

The creation of a loan guarantee program, like a revolving loan program, may involve the establishment of a special fund. However, whereas a revolving loan program fund requires substantial amounts of state funds over a period of several years to provide a capital pool for project loans, the loan guarantee fund would require that the fund receive an appropriation sufficient to cover the debt service on the financed projects receiving the state guarantee. A risk analysis would be conducted to determine the amount to be appropriated to the special fund, generally being adequate to cover the debt service on at least several major projects for a period of up to one year.

c. Interest Subsidy Program

Water projects financed by debt issued by communities in commercial bond markets will generally have a term of 20 to 30 years; however, the projects may have useful lives of up to 50 years. Under the provisions of an interest subsidy program, the state would assume the local costs of the debt service and would require the community to reimburse the state over the useful life of the project with debt service adjusted to the extended repayment term.

d. Credit Enhancements

A credit enhancement involves the purchase of a state's AAA credit rating by a local unit of government that plans to finance a project by a bond issue, and the state commits to pay the debt service in the event the project fails to produce adequate revenues to allow the

sponsor to meet a scheduled payment. By obtaining this type of backing for its debt, the local sponsor is usually able to obtain a lower interest rate.

Credit enhancements, like loan guarantees, are intended to assist local water project sponsors in issuing debt, generally at a lower rate of interest. One difference between these programs is that the state may charge a service fee for the credit enhancement, in an annual amount slightly above the lower debt service obtained as a result of the credit enhancement. A drawback to the use of credit enhancement, under current economic conditions, is that some states do not have AAA credit ratings.

e. State Bond Banks

A water project bond bank is a state financial institution created for the purpose of reducing the costs of debt financing for local project sponsors by pooling the risk and by underwriting the costs of debt issues. The state would purchase the water project bonds of local units of government and special purpose water districts that might otherwise have difficulty in marketing their bonds, and the bank, in turn, would sell its own highly rated bonds in the financial markets, using the pool of local bonds as collateral for the bank's debt.

Conclusion

The shift to increased local cost sharing for needed water development projects will require the creation of a new partnership among federal water agencies, the states and local communities to ensure the timely planning and implementation of water projects. This paper has presented the perspective of the role of the states in this process.

States will be in a position to expedite water project development and to ensure that funds are made available for debt-financed projects by determining the water needs of the states, assisting local sponsors in assessing their financial capabilities and in removing legal impediments to use of debt for financing water projects and by developing innovative financing techniques to reduce costs to local sponsors of issuing debt and project debt service costs.

BENEFITS, REVENUES AND COST RECOVERY

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Introduction

The Federal government's historical commitment to paying the major portion of costs for water development projects has been vigorously debated during the last decade. At this date, cost sharing responsibilities among the Federal government and non-Federal interests have not been finally established. The Administration has proposed cost sharing policies for planning studies, construction and continuing operations and maintenance. Alternative cost sharing plans were proposed during the 1984 session of Congress. Although differences in Administration and Congressional reform proposals do exist, the message is clear: non-Federal responsibility for the costs of water project planning and development will be increased. Indeed, recognition of this reality, in conjunction with the long term hiatus in starts of new Corps of Engineers projects, has encouraged non-Federal sponsors of several projects to agree to the terms of the Administration's cost sharing. Some of these projects have been recommended in the President's FY 83, 84, and 85 budgets. Several more have been included in the FY 86 budget.

As the inevitable move toward increased non-Federal cost sharing continues, the design of innovative strategies for cost recovery from project beneficiaries becomes of increased importance. The premise of this paper's discussion of cost recovery can be stated as follows. If benefits of a project are real, that is, if people are willing to pay for the project outputs, and if benefits exceed costs, there is, in principle, an adequate revenue base for non-Federal interests to recover costs from project beneficiaries. This argument is especially valid since proposed non-Federal cost shares are below 100% of allocated cost for several purposes.

Complicating the cost recovery challenge are requirements for upfront payments made necessary by the need to relieve current pressures on the Federal budget. Since project benefits are realized over

time, payments toward cost recovery will be realized over several years. Upfront payments by project sponsors will typically require them to sell bonds; repayment of bond debt would then be spread over some period of project life. As a result, financial planning assumes a role of parallel importance to economic analysis. Consideration will need to be given to such questions as what form of bonds will be sold and what revenue sources will be used to retire the debt. Of course local and state governments have always confronted these questions when expanding municipal water supply systems and other local public works.

The movement to cost recovery will require a broadened approach to water project planning and analysis. In its August 2, 1984 issue, Engineering News Record offered the term "financial engineering" to describe this new challenge. Financial engineering must become an equal partner with traditional engineering activity in the process for designing and scaling new projects. In this paper we will discuss one dimension of the financial engineering challenge: development of innovative strategies for the collection of revenues in some relation to project benefits as the basis for repayment of bond debt.

Revenue Collection Vehicles: Principles and Practice

Two forms of revenue collection vehicles are available: prices or fees and taxes. A price is a direct charge for a good or service paid voluntarily by the consumer; failure to pay the price results in exclusion from use of the product. In contrast, taxes are required payments to a government entity, enforced by threats of sanction for nonpayment rather than by denial of a service. Taxes therefore require prior consent of taxed parties to subject themselves to future levies. Pricing and taxing strategies will be discussed in turn.

The economics literature suggests use of the marginal cost principle for pricing outputs of Federal water projects. Prices of project outputs should be set equal to the cost of providing the last, or marginal, unit of output. This marginal cost pricing rule insures that the marginal consumer of a product pays the cost for the provision of the product, but no more than that cost; typically all consumers would be expected to pay the same price for the output. Marginal cost pricing assures that at all times existing capacity is utilized. As congestion occurs prices should rise to ration capacity until new investments are made. Rising prices signal the possible need for capacity expansion, the timing of and implementation of which would be determined by economic and financial feasibility analyses.

However, strict adherence to a marginal cost pricing rule to assure optimal capacity use and timing of expansion creates an

obstacle for cost recovery at water projects when the marginal cost is less than a coverage cost over the relevant range of output. This result can be expected whenever initial production has a high capital cost component, but once the capital is in place, only variable costs need to be incurred to add additional users. In its simplest terms, once a service is provided to one user, additional users can be served at near zero marginal cost and at near zero price. In this case marginal cost pricing provides little contribution to recovering costs of the project and either general revenues or divergences from strict marginal cost pricing will be required so that adequate revenues will be available to pay for the project.

To a certain extent, the historical reliance on the Federal revenue base to pay for much of the cost of water projects permitted a near zero price to be charged for project output. Indeed some authors have suggested that the extensive Federal contributions were justified in order to maintain marginal cost prices for these types of investments.

However, when there has been no Federal revenue available, non-Federal interests have adopted an array of pricing strategies to collect adequate revenues to pay for water projects with these cost characteristics. What is clear is that once adherence to strict marginal cost pricing is abandoned, there are numerous practical and widely used pricing strategies for collecting revenues to recover project costs. It is this wide array of pricing strategies that must be analyzed and evaluated in planning reports for consideration by non-Federal water project sponsors. However, the desirable properties of marginal cost pricing might be retained.

Another concept that should be understood when setting prices for cost recovery is "price inelasticity of demand." When demand is price inelastic total revenue increases with higher prices because the positive revenue effects of the higher price more than offset the negative revenue effect of the reduced consumption. The more price inelastic the demand, the less price needs to be raised above marginal cost to attain a given level of revenue. A price inelastic demand is typically the case where the user feels that the good or service is a "necessity", where there are few alternative sources for the good or service and when there are few substitutes for the product. For example, the demand for household water use for washing and cooking is more price inelastic than is the demand for lawn watering. As another example, the demand for barge transportation will be more price inelastic if there are few transportation alternatives available.

With these two principles in mind a brief discussion of cost recovery pricing strategies can be offered. The simplest cost recovery pricing strategy is average cost pricing. Total costs, including construction debt service and variable operating costs, are summed and divided by the number of customers (or output of the project) to compute a price to be charged. Municipal water systems often use this type of pricing approach with prices quoted as "cents per 1000 gallons". Ton-mile fees for shallow draft navigation are another example of average cost pricing, as are prices set per kilowatt hour of electricity. As long as the demand for the output is price inelastic, prices can be raised until revenue equal to cost is forthcoming. If demand is highly price inelastic, capacity utilization will be close to that achieved with marginal cost pricing.

Two part pricing requires the user of the project output to pay a fixed fee to gain access to the output; then a second price is charged which varies with levels of use. The fixed charge is usually associated with capital outlays where investment does not vary with use levels and the variable change follows marginal cost. An example of this strategy is the use of one time connection charges for water supply systems with monthly charges varying with the amount of water use. Another example would be a case where use of a park would require an annual pass plus an entry fee for each park visit. Carefully designed two part pricing can reconcile the optimal use of capacity and the need to recover costs.

Variable pricing or discriminatory pricing is charging "what the market will bear." Rather than tying prices to costs, prices are set in relation to the price inelasticity of demand of different classes of users of project outputs. Different classes of users would pay different prices for similar services, with higher prices charged in the markets with the more inelastic demand. As long as the users are separated (e.g. no resale between users is possible) it is possible to pursue this pricing approach to recover costs while minimizing divergences from optimal capacity use. Examples of pricing by this approach are numerous: increasing block pricing and peak load pricing for electricity or water, variable lockage fees for navigation and vessel draft fees or commodity based use fees at ports are all possible uses of variable charges.

A second general principle that is often discussed, along with marginal cost, when designing revenue collection vehicles is the "cost of exclusion". When costs of exclusion are high, the good must be provided to others at zero price. Attempts to charge a positive price are thwarted because failure of the user to pay cannot be penalized by denying them the service. In the water resources field the best example is flood hazard reduction. If flood hazard reduction is pro-

vided to one land parcel, it must be provided to an adjoining parcel. If the owner of the adjoining parcel fails to pay for the flood control service, it is not feasible to withhold the service for nonpayment. The individual can "free ride" on others' payments. Based upon this logic, flood control has been provided by government, usually the Federal government, and paid for with general tax revenues.

The free rider problem is the basis for arguing that flood control is non-vendible, that is, that voluntary price-like payments will not be made by beneficiaries. However, the taxing power of government can be used, in principle, to extract payments from flood control beneficiaries according to benefits received. The increment in value to land which will result from reduced flood risk can be identified and taxed to generate revenues for flood hazard reduction projects in proportion to benefits received.

This free rider argument also can justify the use of general increases in local sales or property taxes as a revenue source for cost recovery. If projects increase economic activity in the region area businesses and properties directly and indirectly benefit from the project. However, the owners cannot be easily excluded from these benefits if they do not make payments toward project cost. These benefits can, in part, be repaid by the collection of general sales, property or income taxes.

Another strategy to overcome free rider behavior is to tax goods and services whose use is required in order to gain the benefits of the project. This is done by attaching special taxes to services that will be used jointly with project outputs such as sporting goods supplies as necessary for recreation or storage space at wharves near transshipment points.

Numerous alternative pricing and taxing strategies are available for collection of revenues. Tables 1 and 2 provide a more complete categorization of strategies and offers illustrative examples of the cost recovery (pricing and taxing) strategies available for alternative purposes of water development projects. While each cell in tables 1 and 2 include examples of a cost recovery strategy that might be employed, numerous other possibilities may exist for each purpose. The challenge for the water resources planner is to fill in the cells in these tables for a particular project and then to assist in the selection of a mix of strategies for cost recovery.

Selecting a Cost Recovery Strategy

Selection of a cost recovery strategy must be based upon financial

analyses, assessment of political acceptability and the institutional setting. Financial analyses will be concerned with bonding strategies and estimation of cash flow. These types of concerns are discussed elsewhere in the program of this workshop. However, we want to stress some analytical challenges which follow from the previous discussion in this paper.

First, if prices are used for cost recovery, analytical studies must be concerned with the likelihood that projected use levels will in fact occur. Uncertainty over future use levels translates into uncertainty about future revenue levels. Reducing uncertainty will require careful consideration of factors, including price, which will affect future demand for project outputs; that is, "market analyses" paying particular attention to the price elasticity of demand must receive high priority in planning reports. To illustrate, the potential revenues from a variable tonnage fee at a port will depend upon the competitive position of the port over time. Specifically, in this new environment, the concern for accuracy of projections must be more than an abstract exercise because establishing the marketability of bonds and the ability of non-Federal interests to repay bonds will be based upon projection estimates.

Second, cost recovery pricing for increased non-Federal shares of water project costs will require that plans be more sensitive to limits imposed by the financial capacity of non-Federal sponsors. Implications include: (1) the need to design smaller scale projects which rely upon demand reduction, staging of construction and local land use controls to address identified problems; (2) the need to reevaluate standards for such factors as minimum levels of flood protection; and, (3) the need to include analysis of alternative revenue collection strategies early in planning process to help establish a test of financial feasibility for alternative plans.

Third, analytical studies must pay more attention to identification of who benefits and by how much, according to user group and locality, so that an acceptable basis for assessment of prices and taxes can be established. Nonetheless, an analytical framework that assists in meeting the need for increased cost recovery must go beyond strictly tying charges to clearly identifiable beneficiaries. Particular attention should be paid to the possibilities of raising revenues from the sale of highly vendible outputs such as elective power and industrial water supply at market value based, as opposed cost of production based, prices. In this way it may be possible to pay for the cost of non vendible outputs and more easily recover total project cost. It must also be acknowledged that some users are "captives" of the project by the nature of their demand and the limited available substitutes; that is, their demand is highly price inelastic. Consider, for example, the commercial harbor

user who will use the port whether the channel is improved or not. Even though the user does not benefit from the channel improvement, he still may be made subject to a charge to pay for that improvement. This may sound like an unacceptable practice, but it is, in essence, what is done whenever new water system capacity costs are divided among old and new customers of the system.

Political acceptability also will affect the choice of cost recovery strategy. Local familiarity with the price or tax vehicle is likely to increase its acceptance. Thus, a more common tax base, such as real property, may be more acceptable as a charging vehicle than an alternative such as special sales taxes on recreational equipment. Perceptions of fairness will also affect political acceptability. Fairness arguments have two dimensions which will interact in unpredictable ways. In one dimension fairness will dictate that charging strategies should insure that beneficiaries pay for services received. In another dimension, fairness will dictate that consideration be given to ability to pay, permitting a cross subsidization between project beneficiaries, for example, using revenues from sales of industrial water to repay costs for flood control.

Institutional tractability may dictate that certain prices or taxes be eliminated from consideration. Enforcement costs may make it impractical to collect certain types of fees or taxes at a local level; for example, local taxes on sporting goods could simply shift business outside the community. The legal authority to pursue certain strategies such as value increment taxes, or to sell bonds of a certain type, may not be available to the non-Federal sponsor. This may require formation of special districts, regional authorities, or an extension of charging and spending powers of existing governments. Institutional changes to overcome these obstacles are possible, but require their own careful analysis and tests of political feasibility

A Tale for Today: The Miami Conservancy District*

In March of 1913 the land along the Miami River in Southwestern Ohio was inundated by a record flood event. The devastation was widespread, and a consensus emerged among the Valley residents that action was necessary to protect the entire valley from future flood flows of this magnitude, as well as from lesser flood events. Engineering studies proceeded, and it became clear that actions confined to individual properties or to separate political jurisdictions would be either ineffective or far more costly than a valleywide solution. However, no existing political jurisdiction or combinations of jurisdictions had the necessary taxing, spending and land use powers to carry out the basinwide solution of detention reservoirs and channel improvements. Such powers did reside with the State; however, the State of Ohio was unwilling or unable to provide the funds from

general revenues for a flood protection project that would benefit only a few of the State's 88 counties. One might argue that this reluctance to provide the full cost of flood protection for a local area is analogous to the Federal reluctance to spend money for local flood control during this last decade.

The coincidence of four factors---a recognition of the flood threat, the definition of a multijurisdictional solution, the reality of the limited planning and spending authority at the local level and the unwillingness of the State government to provide funds---created a climate for institutional reform. The first step was the passage of the Ohio Conservancy Act (OCA) in 1914. The Act permitted the jurisdictions in the Miami River basin to establish a special conservancy district with powers of eminent domain, the power to tax both individuals and jurisdictions within the borders of the conservancy district, the authority to sell bonds, and the legal authority to undertake projects such as the dam and channel improvement program. Organizational arrangements and working rules were established by the OCA, but are not of interest for this discussion. In addition, how the MCD proceeded to implement its plan for flood control is a fascinating but tangential topic here. What is of immediate interest is the mechanism by which the district, once established, collected revenues for payment of project costs and bond debt.

The plan for flood protection was designed to provide protection from flood flows equal to 140% of the flows of the 1913 flood. The challenge was to assess the benefits individual land owners and jurisdictions received from the plan. This would be the basis for setting land taxes at a level high enough to insure project cost recovery. The principle was clear: that land values would rise with flood protection in place and a tax could be placed upon that value increment to pay for the project.

Clearly the success of the program depended upon the acceptability of the analysis upon which the tax would be based. Today real estate appraisal has become a complex analytical process relying upon sophisticated statistical models and large data bases on land sales. In 1913 the analytical process for flood control benefit estimation was in its infancy. However, it is instructive to consider how the analysis proceeded and to speculate on why, as crude as it was, it was accepted by the affected individuals and jurisdictions. A benefit appraisal method was developed which would be both understandable and accepted by the citizens of the valley. Benefits were assessed for individually held properties, community property and utilities.

To assess benefits for individual parcels property holders and representative real estate experts were consulted to determine the

decline in property value which would result if flood protection was not secured. It was agreed that a fully damaged property would suffer a loss of 40 per cent in preflood property value. Post-flood property values could not be used to estimate this loss because they had risen in anticipation of protection being provided.

Because all property did not sustain full damage in the 1913 flood a "flooding factor" was developed which related the expected extent of damage to the depth of flooding. Table 2 displays the flooding factors used. As a result the final benefit estimation formula for fully protected property was: Benefit = (.4) x (Pre-1913 Property Value x (Flooding Factor). Adjustments were made when property was not fully protected.

Because there was a belief that benefits were widespread throughout the communities, the individual political jurisdictions made contributions to the project from their general tax revenues. The bases for these jurisdictional assessments varied, but prior to the formal assessments an agreement was negotiated on the assessment procedures that would be used. It is worth nothing that a similar approach to a negotiated estimate of benefits was followed for large manufacturing establishments and public utilities. In this way necessary data were acquired as needed and few disagreements ultimately occurred when final benefit estimates were made.

Based upon these benefit estimation procedures, project benefits were $100 million while costs were $25 million. Therefore beneficiaries were required to pay approximately one-fourth of their benefit as a lump sum, or pay over a 30 year period at an interest rate of 5%.

Two lessons can be drawn from the brief discussion of this complex history. First, institutional reforms were possible when the threat of flooding was clear in the citizens' minds (e.g. benefits were clear) and when the possibility that the State (or Federal) government would act was remote. In today's setting the responsible federal and state water resources planner must be able to communicate effectively what the true benefits of a project will be and must continuously stress the declining Federal commitment to fully fund water development. Such responsible actions can motivate local interests to pursue the institutional reforms needed to share the increased costs to develop justifiable water resources projects.

Second, it is possible to find acceptable procedures for assessing beneficiaries of even the non-vendible outputs of projects. Public acceptance of the crude procedures used in 1913 was high. More sophisticated analytical procedures available today should further

encourage acceptance. Of particular importance was the open nature of the assessment process where both the procedures themselves and the final estimates of benefits were subject to appeal. In the final analysis this increased the respect for and confidence in the final results.

Conclusion

This brief summary of strategies for cost recovery illustrates the variety of options available to non-Federal interests. The striking feature of these many strategies is that at various times and places nearly all the approaches have been used. The key issue in water project cost recovery is not whether the various pricing and taxing strategies can be used, but rather is how to select the best strategy for any given situation.

Beyond the technical analysis of mechanisms for cost recovery the challenge for water resource planners is the encouragement of institutions that can make capture of revenues acceptable and possible. The obstacles to cost recovery are not in the nature of the outputs of water projects, but rather are in the political and institutional constraints on non-Federal cost recovery.

In the final analysis, the individuals who planned the Miami Conservancy District had never heard of terms such as "price elasticity", "marginal cost pricing," "cost of exclusion," and "vendibility." Techniques of benefit measurement were crude and data was sparse. Yet those individuals were able to deal with their cost recovery problem through institutional adjustments and political negotiation in a manner which would be innovative even today. Clearly the sophistication of planning processes and analytical tools have advanced during the last seven decades. Water resources professionals need to get on with the job of using our more advanced skills and tools to deal with the cost recovery and financing challenges of this era.

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* The brief discussion of the Miami Conservancy District is based upon two more extensive descriptions: (1) Arthur Morgan, The Miami Conservancy District, New York: McGraw Hill. 1951; (2) Giertz, J. Fred. An Experiment in Public Choice: The Miami Conservancy District, 1913-1922. Public Choice. 1975.

TABLE 1

ILLUSTRATIVE PRICING STRATEGIES FOR COST RECOVERY

Purpose	Unit Cost	Two-Part	Variable
Water Supply	$/1000 gal	connection fee plus $/1000 gal	block rates; peak load; seasonal pricing
Hydropower	$/kwh	connection fee plus $/kwh	block rate; peak load
Shallow Draft	ton-mile fee	license fee plus ton-mile fee	locking fee
Deep Draft	tonnage fee; storage fees; dockage fees	license fee plus tonnage fee	vessel draft fee; commodity based charges
Flood Hazard	-	-	-
Recreation	entry fees; use fees	annual pass plus entry fee	peak use entry fee surcharge

TABLE 2

ILLUSTRATIVE TAX STRATEGIES FOR COST RECOVERY

Purpose	Value Increment	Tax on Complements	General Taxes
Water Supply	differential assessment/service area	-	sales, income, property
Hydropower	-	-	-
Shallow Draft	differential assessment/ waterfront property	fuel tax	-
Deep Draft	differential assessment/ waterfront property	tax on wharf storage	sales, income, property
Flood Hazard	differential assessment/ protected property	-	sales, income, property
Recreation	differential assessment/ park adjacent property	tax on sale or rental of sporting goods; marine fuel tax	sportsmen's licenses; non-game checkoffs; sales, income, property

TABLE 3

- MIAMI CONSERVANCY DISTRICT -

- FLOOD CONTROL BENEFIT ANALYSIS (1913) -

DEPTH OF FLOOD WATER IN 1913	FLOODING FACTOR
1/2 foot	14%
1 foot	23%
2 feet	30%
3 feet	51%
4 feet	65%
5 to 6 feet	91%
7 feet	95%
8 to 9 feet	98%
10 or more feet	100%

DEVELOPING AND IMPLEMENTING A WATER PROJECT FINANCING PLAN

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DEVELOPING AND IMPLEMENTING A WATER PROJECT FINANCING PLAN

What is the plan?

What are the entities financing the plan?

What are the sources of cost recovery and credit security for the plan?

What methods are to be used to finance the plan?

These questions--design, sponsorship, revenue sources and financing method--must be addressed in their interrelationships throughout project planning, authorization, advanced design, funding and implementation.

The individuals who made presentations relating to the development and implementation of a water project financing plan were asked to address three specific topics: financial planning; the relationships between financial analysis and economic analysis; and financial implementation. To summarize the remarks of the contributors, the discussion which follows is divided into sections:

- The financing team
- Project sponsorship
- Financial analysis versus economic analysis
- Financial evaluation and planning
- Project authorization and implementation considerations
- Conclusions

THE FINANCING TEAM

The participants in financial analysis, planning and implementation play a variety of roles. Some roles, such as those of financial advisor or guarantor, may be played by more than one type of participating entity. The major roles for a project financed with debt are described below.

1. The Corps of Engineers.

2. The project sponsor(s)/issuer(s) of debt.

3. The design engineer. The roles of the design engineer are to plan and design the project, provide cost estimates for construction and operation, assist in obtaining permits and approvals, prepare bid and contract documents, assist in awarding the contracts, and supervise and inspect construction. These functions are performed by the Corps of Engineers and/or architect/engineer contractors.

4. The issuer's general counsel. The issuer's counsel participates in all phases of project planning and implementation, including preparation of financing contracts, adoption of enabling ordinances, land acquisition and regulatory approvals. Counsel is paid on a fee basis.

5. The financial advisor. The financial advisor assists the issuer until the bonds are sold. The financial advisor is a key actor who provides financial planning services and performs financial evaluations (see "Financial Evaluation and Planning," below). Financial advisory services may be provided by a financial advisory firm, an investment banking firm and/or a consulting engineering firm. The financial advisor may be paid on a fee basis or from bond proceeds.

6. Bond counsel. Bond counsel reviews the powers and limitations of the issuer(s) to form a financing entity, enter into the necessary contracts and issue debt. Bond counsel assists in securing the necessary authorizations and drafting the necessary documents so that the financing may proceed. The end result of bond counsel's work is a written opinion, which constitutes part of the bond offering statement, that the bonds to be issued are valid and exempt from Federal and State taxes. Bond counsel is paid from bond proceeds.

7. Independent consulting engineer. To obtain greater market acceptance of its bonds, the issuer retains an independent consulting engineer (which is neither the design engineer nor the Corps of Engineers) to review project cost and design. If revenue bonds are to be issued, the consulting engineer issues a Feasibility Report which is included in the bond offering statement. The Feasibility Report reviews factors affecting the ability of the project to provide revenue sufficient for debt service and other cash needs and to meet coverage requirements and other bond covenants. The consulting engineer is paid from bond proceeds.

8. Accountants/auditors. The issuer retains an accounting firm to provide financial statements as part of the bond offering statement. For general obligation bonds, the auditor may opine that the issuer has levied and set aside tax revenue sufficient to meet current debt service obligations. The auditor performs periodic audits of the issuer after issuance of the bonds.

9. Guarantor. The issuer may obtain external credit enhancements in the form of a letter of credit issued by a bank or bond insurance issued by a bond insurance corporation. Fees to the guarantor must be paid prior to issuance of the bonds.

10. Rating agencies, such as Moody's or Standard and Poor's, rate bonds according to their credit risk. They are paid from bond proceeds.

11. The underwriter, such as a bank or an investment banker, purchases the bonds from the issuer and remarkets them to investors. The profit to the underwriter comes from the underwriter's discount, the amount by which the reoffering price exceeds the price paid to the issuer. Bonds are sold to the underwriter through either competitive bidding or, when the same investment banking firm serves as financial advisor and underwriter, a negotiated sale; in either case the underwriter bears the risk that he will not profit on the remarketing. The underwriter oversees the bond closing, printing of the official statement and delivery of the bonds. The underwriter also retains counsel to assist on disclosure requirements, securities laws, and preparation of the official statement.

12. The registar registers the bonds with the Securities and Exchange Commission.

13. The trustee is a bank which acts as paying agent for payment of principal and interest to bondholders, and is empowered to act on the bondholders' behalf in the event of non-payment by the issuer.

PROJECT SPONSORSHIP

The sponsor or sponsors of a water project must have the organizational and legal capabilities to undertake the project. One task of financial planning and implementation is the selection of sponsors and the establishment of the needed capabilities.

The most common types of sponsors are 1) general purpose units of government such as States, cities and counties; 2) independent authorities, districts or commissions created by State legislation; 3) special districts, such as levee, drainage or soil conservation districts, created by local referendum under procedures established by State law; and 4) investor-owned utilities.

The legal and organizational capabilities of the sponsor should be subject to scrutiny from an early stage in project planning, and deficiencies should be overcome prior to project financing. Among potential constraints are the following:

1. limitations in statewide statutes on magnitude of debt, tax rates, level of expenditures, interest rates on debt, floating rate debt, obligation of future appropriations, commingling of funds, purposes of public expenditures, purposes of debt, joint ventures with private interests or contracts with banks;

2. deficiencies in the express or necessarily implied legal authorities of the sponsor, e.g. financing and debt issuance authorities, assessment powers, authority to accept and use grants, eminent domain powers, control of water rights, ability to create special financing entities and districts, or ability to enter into joint ventures;

3. limitations in geographic jurisdiction;

4. regulatory restrictions on rate setting and generation of 'excess' revenues;

5. restrictions contained in existing bond covenants;

6. referendum requirements for issuance of general obligation debt; and

7. technical and managerial capability to accomplish all financing and cost recovery activities.

A presentation on the financing activities of the Miami Conservancy District of Ohio revealed how significant can be the limitations imposed by statewide statutes and by deficiencies in financing and cost recovery authorities. Under the Ohio Conservancy Act, the District's revenue raising powers are limited to assessing properties for flood benefits. Secondary benefits which accrue to recreation users and properties adjacent to project lands cannot be recovered except indirectly thorugh land leases to the Dayton-Montgomery County Park District, which has taxing powers, and through payments to the Miami Conservancy District by general purpose governments. Creation of new cost recovery authority will meet stiff voter resistance. Furthermore, Ohio statutes set a cap on interest rates, which in 1979 and 1980 stymied project financing until the statutes were revised. Even today, project-specific exceptions to the law are occasionally needed. As another example, Ohio municipalities have a debt limit of 5 1/2 percent of assessed valuation. Finally, public bodies in Ohio and elsewhere are conservative in interpreting their powers, and attempt to identify specific authorization for their financing practices.

During project planning it is important to identify project beneficiaries and to document the distribution of benefits among constituencies and geographic areas. Such documentation is important not only to fairly allocate planning costs, but also to fairly allocate project costs, financing responsibilities and outputs among the prospective project sponsors. Detailed accounting of benefit incidence may prove difficult and has not traditionally received much emphasis in Federal project planning.

Once sponsors and their benefits have been identified, alternative institutions for financing the project, allocating outputs and recovering costs can be studied. Sponsors with interlocking jurisdictions or revenue bases can be encouraged to cooperate. Sponsors should take a number of steps to prepare for project funding. These steps can include the creation of a new financing entity, the adoption of ordinances or statutes to enable cost recovery or financing methods or to eliminate financial limitations, the retirement of debt to create borrowing power, and the development of contracts and agreements.

The States and the Corps of Engineers can assist in arranging for project sponsorship by accounting for benefits, working to remedy sponsorship constraints, and participating in multiparty negotiations.

FINANCIAL ANALYSIS VERSUS ECONOMIC ANALYSIS

The differences between economic and financial analysis are not ordinarily a subject of discussion. Water resources projects are usually subjected to one type of analysis or the other, depending upon whether the principal project sponsor is the Federal government or a non-Federal entity. However, expanded non-Federal responsibilities for cost sharing and financing of Civil Works projects necessitate that projects meet both Federal economic criteria and non-Federal financial criteria.

Economic analysis views a project from the standpoint of the nation's economy, and asks whether society will be better off with or without the project. Economic analysis may address equity (the distribution of benefits and costs) as well as economic efficiency. Financial analysis, on the other hand, is conducted from the standpoint of the project owner, and is concerned with the owner's direct cash outlays and receipts. The purpose of the financial analysis is to determine whether and how the project can be financed and whether to do so makes sense for the owner. There are four major differences between economic analysis and financial analysis: risk; interest rates; cash flow; and the scope of benefits and costs considered. These differences in turn have differing implications for project design.

Risk

The risks which are addressed by economic analysis are those project-related risks or uncertainties which would affect the achievement of anticipated benefits at anticipated costs. These include factor (input) price uncertainty, uncertainty of future demands, the effects of hydrologic uncertainty upon project outputs, and the risk of technical failure of the project. Economists differ over whether these risks and uncertainties should be addressed in the planning of each project, or be considered pooled among water projects or among public investments.

Financial analysis addresses any risk that affects the ability of the project to recoup the owner's investment costs. If debt has been used to finance the project, the financial risk at issue is called credit risk, and is defined as the risk that the project owner will not repay principal and interest for whatever reason. Credit risk involved in a project reflects not only project-related economic risks and uncertainties but also institutional, legal, political, technological, contractual and regulatory factors which can interfere with fulfillment of debt service obligations.

Interest Rate

The interest rate used in economic analysis is called the 'discount rate.' The discount rate is a real, risk-free interest rate based upon social time preference and social risk. The discount rate is not affected by taxes or inflation (prices are also projected in real terms). It is the real charge for the use of capital.

Financial interest rates are very different. The financial interest rate has five components: a real charge for the use of capital; an inflation premium (although inflation is also included in financial projections of price); a liquidity premium; and two risk premiums. One risk premium is for credit risk, as discussed above. The other risk premium is for market risk, and compensates the lender for the risk that changes in interest rates will adversely affect the value of notes or bonds he holds. In addition, financial interest rates are affected by the tax status of the project owner.

It should be noted that the 'discount rate' used in the analysis of Federal water projects is not theoretically correct. It is based upon the cost of long-term Federal borrowing in financial markets. This 'discount rate' improperly includes an inflation premium and a market risk premium.

Cash Flow

Cash flow is not relevant in economic analysis. All values are discounted to present values and compared on that basis. Costs are measured at the time that resources are displaced, not at the time that financial expenditures are made. In financial analysis, however, the time pattern of cash receipts and outlays is critical. Non-Federal sponsors need to maintain liquidity (positive cash flow) at all points in time to meet cash needs and fulfill bond covenants. This is difficult for projects which are capital-intensive, have long construction periods and which provide benefits which grow slowly over time.

Benefits and Costs

In economic analysis, benefits and costs are included no matter to whom they accrue. Benefits to others than the sponsor and costs which are not financially compensated are considered. In financial analysis, only benefits which can be appropriated as revenues by the sponsor or its constituents are considered. Limitations in the sponsor's jurisdiction or ability to price outputs and collect revenues affect appropriability. The only costs which are considered are those which result in financial outlays after adjustment for the effects of taxes.

Design Implications

The best project from the economic standpoint is not necessarily the easiest to finance. In fact, financial considerations may have significant effects upon the characteristics of projects which are ultimately implemented. Overall, costs may be reduced or deferred at the sacrifice of non-immediate benefits. Projects may be of smaller scale or extent; involve shorter design life, accelerated construction or staged development; employ more nonstructural and demand management measures; substitute recurrent costs for capital costs; emphasize revenue producing outputs or outputs which create regional or local employment or tax gains; or use engineering and design standards which trade off cost savings with increased technical and hydrologic risk.

FINANCIAL EVALUATION AND PLANNING

Financial evaluation is the use of financial analysis principles to evaluate the feasibility of project development. Ultimately the consulting engineer, the financial advisor, the insurer and the rating agency all become involved in financial evaluation.

Financial planning is the selection of the sources and uses of capital for the project. Financial planning attempts to optimize funding from the standpoints of cost, risk and financial flexibility.

Financial evaluation and financial planning are interdependent and are conducted concurrently with one another and with the establishment of sponsorship arrangements. The type of financial evaluation procedure used depends on the type of financing. In turn, elements of a financing plan are adjusted based upon the results of evaluations.

The major elements of financial evaluation and planning are described below.

Financing Objectives

The financing objectives of the prospective sponsors are defined. Basic decisions involve mix of funding sources (e.g. debt, up-front or anticipatory payments, equity) and form of revenue and debt repayment (e.g. general obligations, assessments, project or system revenues, dedicated taxes.)

Cost Analyses

Cost analyses involve determining funding requirements for construction, land rights, interest during construction, fees, and contingency and debt reserves. Next, annual costs for operation, maintenance, repairs, debt service, capital improvements, working capital, and sinking funds as appropriate are computed. Costs, project outputs, and financing responsibilities are allocated among the sponsors.

Financial Evaluation -- Revenue Bonds

For projects backed by a pledge of revenues, rate analyses are performed which specify the rates and rate structures sufficient to meet annual cash needs and satisfy coverage requirements. (Issuers of revenue bonds must customarily demonstrate that revenues minus the costs of operation and maintenance will exceed debt service payments by some proportion, called "coverage.") Impacts on the cost of service, the rate base and the operation of existing facilities are assessed. Opportunities to market outputs and assure revenues through contracts are investigated, and the provisions of such contracts are spelled out.

The flows of revenues and financial outlays over time are compared. The sensitivity of cash flows to uncertainty is assessed. Variables in the sensitivity analysis include growth of demand, price elasticity of demand, interest cost, prices of substitutes, operating costs, contingency allowances, inflation, timing of project development, and rate design.

Sufficiency of rates is reviewed. A determination is made whether bonds can be marketed and whether the after-tax rate of return is sufficient. The implications of the cash flow analysis for project scale, scheduling, design life, features, and output mix are discussed.

Fiscal and Credit Analyses -- General Obligation Bonds

For projects backed by general obligations, the adequacy of the current revenue base to support debt service is examined. Alternative revenue measures (e.g. commodity charges, taxes, assessments) are examined from the standpoints of the sufficiency of authorities, revenue-raising effectiveness, collection cost and political acceptability.

Financial evaluation of general obligation debt focuses on the fiscal conditions and trends affecting the issuer's ability to pay debt service. A number of areas of investigation are pursued. Economic analyses quantify the tax or revenue base and the comparative tax rate, assess the diversity of the revenue base and the stability of employment, review population characteristics and income and wealth per capita, and assess economic performance and prospects. The magnitude, maturity structure, debt service requirements and burden per capita of existing debt are quantified. Competing unfunded obligations, capital improvements, and replacement needs are identified.

The quality of financial administration is reviewed, including the assignment of financial decision-making powers within the unit; legal and organizational limitations; procedures for capital improvement planning, debt management and tax collection; the quality of services; and fiscal management professionalism and competence. Expenditures and debt service are compared to revenues, and post-project debt and debt service to pre-project conditions.

A determination is made whether general obligation debt to finance the project can be marketed. The implications of the fiscal analysis for project scale, schedule, design life, features and output mix are discussed.

For general obligation debt, the sponsor has the added challenge of examining the project in light of competing capital needs, borrowing capacity and anticipated funds from external sources. The sponsor must decide whether and when it wishes to develop the project.

The Department of Army's policy on the timing of non-Federal financial contributions for new project construction is designed to remedy limitations in a sponsor's ability to finance certain less-than-fully vendible outputs. The non-Federal share of implementation costs is to be in cash or in-kind during construction of the project, except that non-Federal contributions for flood damage reduction, hurricane and storm damage reduction, recreation, and agricultural water supply are to be consistent with the ability of the non-Federal interest to pay at the time project expenditures are made. The portion of the non-Federal contribution not contributed during construction may be repaid over the useful life of the project but in no event more than 50 years from the date of project completion. The interest rate charged will reflect the average yields on obligations of the United States with remaining periods to maturity comparable to the reimbursement period.

Financing Plan

The financing plan spells out recommendations for the security pledge (collateral), maturity structure and other features of the bond issue. Development of the financing plan involves trading off financing cost, risk and financial flexibility.

The security to be pledged for debt service depends on the revenue base of the sponsor, restrictions imposed by existing covenants and obligations, the credit risk involved in the financing, the requirements of lenders and the availability and cost of external credit supports such as letters of credit and bond insurance.

The maturity structure of the sponsor's debt is the time pattern for payment of interest and principal. Maturity structure of new debt should be dovetailed with existing debt.

Other features of the financing are included in the financing plan. Recommendations are made regarding interest rate variability, bond redemption features, method of sale and the interim use of proceeds and surplus funds.

Once the financing plan has been developed, financial evaluation steps are repeated to reflect changes in anticipated interest costs, the cost of credit supports, the magnitude of reserve funds, etc., and the plan is revised as necessary. If construction has been funded with interim financing, long term project funding is obtained according to a final financing plan. To implement the plan the financial advisor assists in obtaining bond ratings, advises on the timing for sale of bonds or notes and, for a competitive sale, reviews the prices and terms of underwriters. Delivery of funds enables construction to begin.

AUTHORIZATION AND IMPLEMENTATION CONSIDERATIONS

Under conditions in which water projects are jointly financed by the Federal government and non-Federal sponsors, it is important to resolve the complexities involved in project authorization, funding and implementation which may affect the prospects of an otherwise financially feasible project.

Greater speed and certainty is needed in Federal procedures for project review, authorization and initial funding. State and local sponsors need reassurance that the commitments they make in planning will be honored in the review process and that their efforts will result in a project in a reasonable period of time. This will assure both that current needs will be met and that sponsors will be willing to participate in planning and to make the necessary legal, financial and institutional arrangements for financing. Most alternatives considered for accelerated authorization would provide greater discretion to the Corps of Engineers, particularly for small projects:

1. resuming the use of Section 201 of the 1965 River and Harbor and Flood Control Act, under which projects costing the U.S. less than $15 million and complying with existing law may be authorized by the House and Senate Public Works Committees rather than by the full House and Senate;

2. expanding the dollar limit of Section 201;

3. Epanding the dollar limit of the Continuing Authorities ("Small Projects") Program. Under this program the Chief of Engineers has the discretion to plan for and construct small projects (for instance, less than $4 million Federal cost for flood control and less than $2 million Federal cost for navigation) without referring to Congress or the Committees for approval;

4. authorizing the Corps of Engineers to review and participate in the implementation of plans developed by non-Federal governments, much as the Soil Conservation Service does;

5. providing for the automatic authorization of projects once a certain period of time has elapsed after submittal of a report to Congress without action by Congress; and

6. expanding the authority of the Corps of Engineers to modify authorized projects.

Joint Federal/non-Federal financing of water projects requires coordinating budget and funding schedules. Federal and non-Federal budget cycles are different. Securing non-Federal financing authority and approvals must often be obtained within limited "windows of opportunity." The issuance of debt must be scheduled with other capital projects according to what the market will bear so that credit ratings can be maintained. On way to ease scheduling problems is to relax current statutory restrictions under which sponsors may not be credited with project-related expenditures made prior to Federal authorization or with expenditures in excess of $1 million made prior to Federal appropriations. Another method, in States where long term contracts are authorized, is for the sponsor to agree to provide its share of construction funds after a "grace period."

Before construction can begin, the Corps requires some assurance that the sponsor's cash contribution will be provided during construction. In States in which long term contracts are illegal, the funds may have to be provided prior to construction and placed in an escrow account. In other States, construction payments may be made in installments under an enforceable agreement.

Bondholders require some assurance that a project to be financed will be completed and operated as expected. Sponsors need assurance that they won't be saddled with debt without a project to show for it, or that no delays due to actions of the Federal government (such as delays in funding) will increase the interest on construction and subject the sponsor to the arbitrage restrictions of the Internal Revenue Service. (Under these restrictions the funds raised by a tax-exempt entity for a project may, with certain exceptions, be invested in taxable securities so long as construction is begun within six months and completed within three years.)

As a result, the Corps may need to provide assurances that Federal funds for the project will be provided, that the project will be completed on time and at the expected cost to the sponsors, and that the project will be operated so that anticipated outputs (and revenues) are produced. These assurance may be provided by the full funding of projects prior to construction, by fixing the non-Federal share, by providing the Corps greater discretion to reallot funds to assure project completion, and/or by negotiating the operating rules for jointly financed projects.

CONCLUSIONS

Project design, sponsorship, sources of revenue and financing must be addressed in their interrelationships throughout project planning and design. Table 1 on the following page summarizes the steps in project financing, their relationships to project planning and construction, and the major participants in each step.

TABLE 1
FINANCIAL PLANNING AND IMPLEMENTATION: STEPS AND PARTICIPANTS

PROJECT PLANNING & CONSTRUCTION	PROJECT FINANCING	PARTICIPANTS*
Planning		
Problems, opportunities, objectives	Financing objectives	Financial advisor
Inventory & forecast	Assess cost recovery & financing authorities	Design engineer
Formulate plans	Cost & revenue analyses	
Evaluate plans	Financial evaluation	
Select plan	Prelim. financing plan	
Review and Authorization		
Review and authorize plan	Budget for AE&D	
Advanced Engineering and Design		
AE&D	Detailed financial evaluation	Financial advisor
		Design engineer
	Budget for construction	Bond counsel
	Establish needed entities, authorizations, contracts & agreements	
Funding and Implementation		
	Funding for land rights and fees	Financial advisor
		Bond counsel
	Obtain Federal appropriations	Consulting engineer
Construction	Construction funding	Auditors
	Final financing plan	Guarantor
	Financing documents and bond ratings	Underwriter
		Rating agencies
	Issue bonds and invest or disburse proceeds	Registrar & trustee
Startup and operation	Revenues and debt svc.	Contractor

*Other than issuer, Corps of Engineers and issuer's counsel

Compared to traditional methods, the joint financing of water projects by the Federal government and non-Federal sponsors faces the sponsors with numerous challenges and risks. To meet these challenges a sponsor assembles a financing team to evaluate the feasibility of project development, establish the legal and organizational capabilities for project financing, prepare a financing plan and conduct the necessary financial and implementation transactions.

Nonetheless cooperation between the Corps of Engineers, the States and sponsors is crucial to successful project planning and development. A number of steps may be taken to promote cooperation:

1. enhancement of the Corps' professional expertise and organizational capabilities for financial evaluation;

2. a more active State role in technical assistance;

3. development of a shorter and less expensive planning process;

4. refinement of methods to jointly address engineering, environmental, economic, financial, and institutional opportunities and constraints;

5. refinement of methods to address non-Federal concerns, financial considerations and acceptability constraints;

6. renewed emphasis on analysis of the distribution of benefits among geographic areas and constituencies; and

7. expanded production of planning data and outputs which may be used by the financial community.

A number of steps are also possible in the areas of authorization, funding and construction; however, many of these steps depend upon the action of Congress.

WATER PROJECT FINANCING ALTERNATIVES

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WATER PROJECT FINANCING ALTERNATIVES

A water project sponsor's first decision on water project financing is to determine the sources of funds. Alternatives include debt, current revenues, grants and the involvement of private parties in contractual or leasing arrangements. Traditionally, debt has predominated as the financing method.

If debt is to be used as a funding source, the sponsor must determine what security can be offered to bondholders. Basic alternatives are general obligation bonds, which are supported by the full faith, credit and taxing power of the borrower, and revenue bonds, which are supported solely by revenues anticipated from the project or system. Variants are possible, and external sources of credit support are available from banks, insurance companies and, in some cases, States.

A sponsor which uses debt must also determine how debt service (payments of principal and interest) shall be structured. Decisions to be made include the term of the bonds, the repayment schedule, the variability permitted in the interest rate, and options for the bondholder to redeem the bonds or for the issuer to repurchase the bonds.

The contributors to the discussion of water project financing alternatives focused primarily on debt and secondarily on financing by private interests. To summarize their remarks, the discussion which follows is divided into sections:

- o Capital financing trends
- o Revenue sources and bonding alternatives
- o Debt structure
- o Privatization
- o Conclusions

CAPITAL FINANCING TRENDS

Historically most financings of capital improvements, including water projects, have been accomplished with long-term bonds issued prior to construction. General obligation bonds were the most common type of bond; however, for many revenue-producing facilities, revenue bonds might be issued. These bonds typically had a number of common features: they had long maturities; they were sold at par (face value); they paid interest at a fixed interest rate; debt service was nearly level over time; and principal was retired on a regular basis.

Recent trends in the market for municipal tax-exempt securities have altered many of the relationships underlying the historical model and have elevated interest rates to sustained levels for which there is no historical precedent.

Financial (market) interest rates have five components: a real charge for the use of capital; a premium for anticipated inflation; a liquidity premium; a premium for credit risk (the risk that payments of interest and principal will

not be made); and a premium for market risk (the risk that changes in market interest rates will reduce the value of the securities held by the lender.)

Recent conditions have affected each interest component. The demand for capital has risen due in large part to great growth in the use of public debt for non-traditional purposes (such as industrial development) and to a rapid rise in the national debt. At the same time, the supply of funds has been restricted by the reduced profitability of traditional investors such as banks and insurance companies, and by the development of alternatives to municipal bonds, such as Individual Retirement Accounts, which shelter income from taxes. As a result, the basic charge for the use of capital has risen.

Defaults or near-defaults by New York, Cleveland and, most recently, the Washington Public Power Supply System have damaged the perceived creditworthiness of all municipal bonds. At the same time, the market has been dominated since 1980 by individuals, who are relatively risk-averse. While holdings of bonds by banks and insurance companies more or less held constant, the holdings by individuals and mutual funds doubled in the two years from the end of 1980 to the end of 1982, to $162 billion. Ninety percent of net new bond purchases in 1983 were by individuals and mutual funds. In response, risk premiums on bonds have risen, and the use of supplementary credit enhancements on new issues has grown dramatically.

Concurrently, financial markets have been beset by inflation and interest rate volatility which are extraordinary by historical standards. Consequently, the premiums for anticipated inflation and for market risk have also risen.

Issuers of bonds have adapted to these conditions with creative financing techniques. First, they have taken advantage of the lower interest rates on short-term debt by adopting financing methods with short-term characteristics. Examples are short-term financing for construction and the use of variable-rate or adjustable-rate notes and bonds. Second, they have increased their reliance on credit enhancements to make their bonds more attractive to investors. Third, they have increased their reliance on non-debt financing techniques, such as pay-as-you-go financing and privatization. Finally, they have increased their sophistication in the use of financial planning and management to structure their debt and time their entry to the market.

REVENUE SOURCES AND BONDING ALTERNATIVES

Before a project can be financed, the source of revenues to be used to finance the project or to provide security for debt must be identified. In fact, the principal differences among bonding alternatives are determined by the types of revenues which are pledged as security.

Revenue Bonds

For a project (or a particular sponsor's participation therein) which is to be self-supporting on an enterprise basis, the anticipated revenues are capitalized into debt. Typical revenue sources are user fees and commodity charges.

If the project is part of a self-supporting system, there are additional opportunities to use system revenues to partially or wholly finance the project. Temporary surpluses, rate stabilization funds and one-time charges or contributions may be applied to project cost. Systems involving more than water, such as multimode port authorities, may cross-subsidize water development.

Revenue bonds pledge project or system revenues as security. Revenue bonds are not usually subject to debt ceilings or referendum requirements. Their use for enterprise projects preserves general obligation bonding capacity for other, non-revenue producing projects. The administrative advantages of revenue bonds include pricing which reflects cost of service; expensing of depreciation; provision of a secure source of funding for operation, maintenance and repairs; and relative insulation of rates from political pressure. On the other hand, revenue bonds involve greater credit risk, interest cost, marketing cost, and complexity than general obligation bonds. In addition, bond covenants may limit the sponsor's financing flexibility. Such covenants may set formulas for rate-setting so that revenues net of operation and maintenance exceed debt service by a given proportion, say 20 to 50 percent, or may require a debt service reserve fund equal to, say, one year's debt service.

Credit security for revenue bonds may be strengthened through third-party contracts, which pledge a third party to pay for project outputs and provide a firm revenue source for the issuer. "Take or pay" contracts obligate the purchaser to pay for outputs whether it uses them or not, whereas "take and pay" contracts obligate the purchaser to pay for only what it uses.

General Obligation Bonds

If the project is not a self-supporting enterprise, a revenue source must be identified which can be used to provide the funds for project construction or to secure a pledge to repay debt. General revenues are the most common revenue source for these purposes.

General obligation bonds pledge the full faith, credit and taxing power of the issuer. Because such a pledge is the strongest form of security to a lender, G.O. bonds involve the least interest cost. They also involve the least costly and complex marketing. However, the ability of a sponsor to use general obligation debt is limited by its fiscal capacity, by referendum requirements and possibly by tax limitations, debt ceilings or other legal limitations.

Special Tax and Special Assessment Bonds

Special tax bonds, also known as dedicated tax bonds, are a variant of G.O. bonds which offers a particular tax source as security for a non-enterprise project.

If the project benefits a particular geographic area, additional forms of revenue production and bonding are possible. Special assessments and special service area taxes are two such methods to generate revenues within the benefited area.

Assessments are levies against property for local improvements. They involve costly and complex implementation procedures and may be used only for local improvements. Because the assessments are not taxes, the property owner may not deduct his payments on his Federal tax return. An alternative is the special service area tax, which levies a special tax on properties in a designated area for special services they receive. It is quicker and less costly to implement, and is deductible. However, it may count against municipal debt limits.

Where dedicated taxes, special service area taxes or special assessments are to be used to raise revenue, the sponsor may nonetheless choose to make a G.O. pledge on the bonds to lower their interest cost.

Credit Enhancements

Credit enhancements involve purchasing the commitment by a AAA-rated third party to pay debt service in the event of the issuer's inability to do so. In effect, the issuer purchases a AAA credit rating. Credit enhancements broaden the market and lower interest costs for issuers. Because the spread between a AAA rating and a BAA rating (the lowest investment grade rating) exceeds one percent, credit enhancements are likely to be cost effective for bonds which would be rated in the lower investment grades.

The most common form of credit support is bond insurance, available from a variety of sources, among them AMBAC, MBIA, FGIC, BIGC and USFIG. Insurance fees are approximately 1 to 2 percent of total debt service.

States have also provided credit enhancements in the form of guarantees for certain types of projects.

State Intermediation

States have often acted as intermediaries between the financial markets and local borrowers. Loan programs and bond banks are two forms of intermediation.

A State loan fund is capitalized by general obligation bonds, appropriations and/or revenue bonds backed by repayment contracts or dedicated revenue sources. Interest rates may be subsidized under a State loan program. A creative example of a loan fund is a local development authority which provides loans to local governments, using as collateral the anticipated allotments of State-collected taxes to those governments. The loan fund may be set up to be self-perpetuating, providing revolving loans. "Infrastructure banks" usually include a revolving loan fund, but are authorized to conduct other financial activities (e.g. grants, sponsoring projects, floating debt on behalf of local units) as well.

Bond banks purchase the bonds of local governments and sell their own bonds, using the pool of local bonds as collateral. Bond banks reduce costs by pooling both risk and underwriting cost. The security of a bond bank's bonds may be enhanced by reserve funds capitalized by fees or State appropriations.

State Technical Assistance and Supervision

Technical assistance and supervision programs are designed to facilitate bond issuance, encourage responsible debt management and improve credit ratings of State and substate issuers. The North Carolina Local Government Commission and the California Districts Advisory Commission are examples of two programs which provide extensive assistance and supervision services.

DEBT STRUCTURE

Due to high interest rates, debt service is now a more significant component of project cost than has traditionally been the case. This creates two challenges for the issuer of bonds.

The first challenge is to reduce overall interest cost. Many issuers have achieved such a reduction through the use of short-term financing or of financing techniques which have short-term characteristics. (Due to the liquidity preference of bondholders and the increase in interest rate risk which comes with longer maturities, interest on short-term debt is nearly always less than interest on the long-term debt of the same issuer.)

The second challenge is to reduce debt service requirements during the early years in a project's life when benefits and revenues are still growing. Many borrowers have more closely matched payment obligations to revenues by including in bond series some bonds which load principal and interest payments into the out-years.

The methods used to meet these challenges are described below.

Short-Term Financing

Short-term, or interim, financing is the use of short-maturity financial instruments to finance project development and construction. Upon completion of project construction, the interim financing would be refunded (refinanced) with long-term bonds.

Bond Anticipation Notes (BAN's) carry a fixed interest rate and a maturity of from one to three years. The IRS allows a portion of the proceeds to be invested on an interim basis in high-yielding Federal securities. (The practice of reinvesting inexpensive borrowed money in a higher-yielding security is called "arbitrage.") Underwriting fees for BAN's are about 1.5 percent of the total proceeds.

Similar notes may be issued in anticipation of grants (GAN's), taxes (TAN's), revenues (RAN's) and disbursements (DAN's.)

Tax Exempt Commercial Paper (TECP) is a shorter-term interim financing alternative with maturities usually of 15 to 180 days. Issuance costs are low because little documentation is needed; however, there are recurrent fees and administrative costs. TECP provides an issuer with great financial flexibility to "roll over" the paper until a suitable market for long term debt develops. TECP is available only to entities with high credit ratings.

Both BAN's and TECP command low interest rates and reduce the volume of borrowing in the short term. Minimum volume is $20 to $25 million. Both involve interest risk to the borrower, i.e. the risk that in the future short term rates will rise above the long term rate that could have been obtained at the outset.

More important, both BAN's and TECP involve liquidity risk to the borrower, i.e. the risk that the funds to pay principal and interest at maturity will not be available. For this reason, both require a form of credit support: the letter of credit (LOC). For an annual commitment fee of about .5 percent, a AAA-rated bank irrevocably agrees to make funds available to the issuer at an agreed-upon rate in order to pay principal and interest. If the issuer has difficulty obtaining funds to refund the short term debt, it can draw on the LOC, and a loan from the bank is created. A LOC usually expires in 5 to 10 years.

Bonds with Short-Term Characteristics

The financial community has developed long-term bonding techniques with certain features of short-term debt which appeal to investors.

"Tender option" bonds, also known as "put" bonds, allow investors to "put" or redeem the bonds with the issuer at stated times, in effect reducing the investor's interest rate risk and providing greater liquidity. For a project with a three-year construction period, put bonds can be issued which provide the put option after three years and annually thereafter. If rates do not rise, the bonds provide financing for the construction period and beyond at reduced cost. If rates rise, refinancing is required after construction; consequently a LOC is needed.

"Variable rate demand obligations" (VRDO's) and closely related adjustable-rate securities appeal to investors who are concerned with interest rate risk, who value liquidity, or who think market rates will rise. VRDO's are issued for periods of up to thirty years. The interest rate paid on the VRDO's is pegged to a market index or administratively adjusted at fixed intervals. Investors are also given the put option, but are unlikely to excercize it if the interest rate is adjusted properly. Issuers of VRDO's require a LOC to cover liquidity risk in the event of numerous puts, and a remarketing agreement to remarket VRDO's which are put. Issuance of variable-rate securities must be authorized by State law.

The minimum amount for variable rate and put bonds is about $20 to $25 million. Both offer savings not only on interest costs, but potentially on issuance cost and refunding cost as well; however, both involve increased transaction costs and fees. Both involve liquidity risk (shortfalls in cash to cover puts) and interest rate or budgetary risk (risk that future debt service payments will exceed those anticipated.) Budgetary risks can be addressed by appropriating funds that would have been required for traditional debt service, using the savings to "call" (repurchase) VRDO's.

Time Structure of Payments

In recent years "original issue discount bonds" (OID's) have been created. The interest rate in the coupon payments on these bonds is low; consequently they are sold at a discount from par to provide a suitable return to investors. " Zero coupon bonds" involve no interest payments and a full discount from par. "Compound coupon bonds" resemble OID's in time structure; however they are issued at par, with the interest payments being deferred to maturity. Inclusion of a series of OID's or compound coupon bonds in an issuer's bond series will enable the issuer to match payment obligations more closely to the growth of revenues by loading debt service into the out-years.

PRIVATIZATION

Privatization involves the participation of private interests in the financing, construction, ownership and/or operation of facilities which provide services to a public entity. There are three basic forms of privatization: the conditional sale lease; the true lease and its variant, the finance lease; and service contracts.

Under a true lease, a finance lease or a service contract the private interest retains ownership for tax purposes and can claim accelerated depreciation. The owner under a service contract may also claim the Investment Tax Credit. The Internal Revenue Service has numerous guidelines which owners must follow in demonstrating that the lease or service contract is genuine and not solely for tax purposes.

The conditional sale lease is basically a long-term sales contract in which the lessee (purchaser) has the option at the termination of the lease to purchase the property for a bargain price. Although the lessor cannot claim accelerated depreciation or tax credits because the lessee is the owner for tax purposes, the interest component of the lease payments to the lessor is tax-exempt.

Possible benefits of privatization include cost savings on construction (due to avoidance of procurement requirements and union labor laws), cost savings from tax benefits, avoidance of debt limits and referendum requirements, preservation of general obligation debt capacity and predictability of rates. Potential hazards include loss of control over operation except through contract clauses; legal restrictions on long-term contracts, procurement and use of non-union labor; and political opposition.

Until recently the tax benefits of privatization alternatives could be compounded through the use of industrial development bond (IDB) financing. A third-party public entity would float the bonds to finance up to 80% of the facility, using as security a conditional purchase lease with the private owner-to-be. The private party would thereby obtain tax-exempt financing without loss of depreciation writeoffs and investment tax credits. This benefit was curtailed by tax reforms in 1984 which limited each State's per capita IDB financing, stretched out IDB depreciation schedules and restricted tax credits for IDB-financed projects.

Because facilities financed with private funds must be separated from those involving public funds, privatization has limited applicability to projects in which the Corps of Engineers is a financing participant. However, privatization may be considered by a sponsor as an alternative to joint Federal/non-Federal public financing, or as a means to finance facilities associated with a Civil Works project, thereby increasing the sponsor's financing flexibility for the project itself.

CONCLUSIONS

Currently the municipal bond market is beset by high interest costs and a great degree of uncertainty. In response, municipal issuers have developed creative financing techniques which take advantage of lower short term rates, strengthen credit security, and utilize non-debt resources. Throughout project planning and design and financial evaluation and planning, the Corps, the State and the sponsor must keep in mind financing opportunities which are available.

STATE TECHNICAL AND FINANCIAL ASSISTANCE PROGRAMS

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STATE TECHNICAL AND FINANCIAL ASSISTANCE PROGRAMS

The State role in funding public works investments in general, and water resource development in particular, is growing throughout the United States. The States are tackling the problem of raising investment capital for water projects in a variety of ways. For instance, New Jersey and Washington have approached water development financing as one component of a broad-based infrastructure investment program. California and North Carolina have mechanisms that provide oversight and technical assistance for financing by local units of government. Oklahoma and Utah have developed or are developing financial assistance methods and institutions targeted on water-related needs.

Several speakers at the four workshops presented papers on statewide technical or financial assistance programs in these six States. The papers did not encompass all of these States' programs, but rather illustrated some of the potential State roles.

CALIFORNIA

One of California's programs for financing public services is a technical assistance and supervision program for local special districts managed by the California Districts Securities Commission. These districts are given broad powers under California law, including the authority to issue debt. In 1931, because some of these districts had incurred too much debt, the Commission was created to supervise the long term debt of certain classes of district. In 1969 the duties of the Commission were transferred to the State Treasurer and are now administered by the Districts Securities Division.

Over the years, the State Legislature has increased the District Securities Division's jurisdiction. The number of districts has also increased by 13 percent over the past decade, due in part to recent changes in the tax code and continued local support for special governments. Approximately 2000 districts are governed by County Boards of Supervisors or by City Councils and are not subject to the Division's supervision. However, the majority (approximately 3200) are governed by other elected or appointed boards and may be subject to the Division's oversight, depending on the amount and type of debt they wish to incur. Districts may also request approval of their debt voluntarily.

The basic statute providing for financial supervision of districts is contained in Division 10 of the California Water Code. Rules for implementation of the program are set forth in the California Administrative Code. Over the years, efforts have been made by State administrators and legislators to consolidate districts, or to reduce or combine codes. Although some consolidation has taken place, these efforts have largely failed.

Throughout most of California's history the predominant form of debt has been general obligation (GO) bonds or, for enterprise districts, revenue bonds. In 1978, Proposition 13 limited general obligation bonding power and thereby changed the traditional way of doing business. The State's AAA rating dropped to AA and the capital financing activities of all local governments were curtailed. Although the Attorney General of California opined that water

districts could still approve and issue general obligation bonds irrespective of Proposition 13, other classes of districts have had to increase their reliance on higher cost revenue bonds rather than the preferred and lower cost general obligation bonds. In addition, bond insurance, letters and lines of credit and other such "credit enhancements" are now more extensively used to improve bond ratings and the acceptance of the securities in the marketplace.

On November 6, 1984, Proposition 36 failed. This initiative would have plugged loopholes in Proposition 13 and curtailed the issuance of revenue bonds. Restoration of the ability of local governments to issue GO bonds, if approved by a two-thirds vote in the Legislature, will be on the statewide ballot in 1986.

The State Treasurer is responsible for two other assistance programs. Under a cash management program called the Local Agency Investment Program, local governments may pool their money with the State for short-term (even overnight) investment. The California Debt Advisory Commission in the Treasurer's Office provides a calendar and record of all debt issued by units of government within the State. This publication, called "Debtline," lists the issuer, the issue date, the principal amount, the type of bid, the interest rate, the bond counsel, the financial advisor, and the underwriter/purchaser. Issuers may also obtain advice from the Commission on market conditions. The Commission also conducts workshops and seminars on financing and investments for local governments.

The Districts Securities Division's supervision of districts under its jurisdiction includes an examination of the overall plan, the engineering, and the economic and financial feasibility of the proposed debt. The Division also confirms the completion of procedural requirements such as for environmental clearances, applicable permits and licenses, and auxiliary agreements and contracts (e.g. for credit enhancements). In short, the examination assures that nothing remains to be done which will delay or prevent the project from being completed and paid for as planned.

The Division staff report is submitted to the Districts Securities Advisory Commission, a body of seven citizens appointed by the State Treasurer. A public hearing is held. The Commission then makes a recommendation to the Treasurer, who signs a written order either denying or authorizing the district to proceed.

The Division then supervises the expenditure of bond proceeds to assure that the funds are used for authorized purposes. Division engineers periodically inspect the projects to assure that the project is completed as planned and that it is operating properly. As a result, the State assures investors that the financial condition of the district remains sound as long as the certified securities are outstanding.

The goal of the Division is to provide expertise and guidance so that the districts may find ways to build needed projects within their ability to pay. Since this oversight work began in 1931, there has been no default in payment of principal or interest due on securities approved by the State. The benefits of this program include: 1) the disapproval of unsound financing proposals;

2) checks on the creation of new indebtedness as a protection to investors; 3) assistance to the districts in improving the feasibility of their projects; and 4) enhancement of the financial soundness of issuers, resulting in better ratings and lower interest costs.

NEW JERSEY

The State of New Jersey has been very aggressive in developing financing techniques for public facilities because of its small size, unique environmental problems, and rapid growth and economic development. Following the Amendments to the Clean Water Act in 1981, which cut EPA's wastewater funding level by one-half, the State proposed legislation to create the New Jersey Infrastructure Bank. Although this legislation never passed, many of its features have been made law. The following discussion will focus on the rationale for the proposed Infrastructure Bank.

New Jersey faces large infrastructure needs. Growth in over 200 communities growth is restricted by sewer bans, and approximately 240 wastewater treatment projects amounting to an investment of about $3 billion are on EPA's priority list. Yet at current Federal funding levels, only two of these projects would be funded per year. While voters have approved $350 million in general obligation debt for water supply, it is estimated that by the year 2000 investment needs for water supply will amount to $1.3 billion. Since there is virtually no land left for sanitary landfills, investment in resource recovery technologies is expected to be about $1.6 billion over the next 10 years, yet the voters have approved only $50 million in general obligation bonding authority for that purpose. Finally, transportation investment needs over the next 5 years are estimated to be $5 billion. The needs are so many and diverse that the need for a broader approach to the general infrastructure problem was recognized.

The New Jersey Infrastructure Bank was conceived with four goals in mind:

- to leverage public financial resources more effectively than had been done in the past
- to supply a predictable and stable source of long term funding
- to minimize the local impact of any changes in State financing and financial assistance procedures
- to reduce the reliance of the State on the issuance of general obligation (GO) debt

When study for the proposal began, the State had $1.6 billion in GO bonding authority, but could issue only $200-300 million per year and still keep its AAA rating. Therefore, the authorization of new GO debt was not a practical or realistic option. The study determined that dedicated revenue monies were needed to secure further debt.

The proposed Bank was to have no programmatic responsibilities and would not be in a position to set priorities among projects. Those responsibilities would stay with the departments and agencies that had always had them. The bank would be capitalized (funded) from four sources of funds:

- o Federal grant money
- o general obligation debt proceeds
- o certain State appropriations
- o specific revenues dedicated to the Bank for particular purposes.

The Bank would function in three primary ways. First, it would establish a revolving loan fund for each type of project (e.g. water supply, wastewater, transportation.) These funds would be used to make low interest loans, relending the principal and interest as it was repaid to provide financing for additional projects. Second, the Bank could provide funds for a local sponsor's cost share of a State or Federal project. The bank would issue debt on behalf of those sponsors, even financing an entire project if necessary. Third, the Bank could issue revenue bonds backed by anticipated dedicated revenue streams.

Even though increased user charges would be necessary, local impacts would be minimized by limiting the increase to 30 percent above what would have been the local charge if Federal funds had been used.

One advantage of the revolving loan program would be a high degree of certainty in planning. The Bank could commit funds to the projects of local governments 5 or 10 years in advance. This would enable the local governments to issue low cost short-term debt, and to begin project construction before costs become inflated, knowing that at some point the State would provide a "take-out" at a lower interest rate. This type of procedure is now impossible under the Federal grant program and is prohibited by the State Legislature because the commitment would obligate future Legislatures to appropriate funds.

For the Bank to work more effectively, restrictions on the use of Federal grant money for loan programs must be removed. Several legislative proposals were made during the 98th Congress to allow this procedure. The change may be made by the 99th Congress in reauthorizing of the Clean Water Act.

In lieu of passing the Infrastructure Bank legislation, New Jersey set up several revolving trust funds. One, called the "green trust," purchases open space. Another is a revenue-backed transportation trust. A third, the environment trust fund, not only operates a revolving loan fund but can issue debt on behalf of communities for wastewater, water supply, and resource recovery facilities. Finally, the New Jersey Water Supply Authority has begun to operate a revolving loan fund for the rehabilitation and repair of water supply facilities, and is authorized to use Federal grants for loans and as collateral for additional Authority debt.

NORTH CAROLINA

The State of North Carolina's overall involvement with the fiscal health of its units of local government characterizes its approach to financing public works projects. The State Treasurer participates in the issuance of all State and local debt. State general obligation debt must be authorized by the General Assembly and the Local Government Commission (a part of the Department of the State Treasurer) and approved by the voters. The State takes great care to ensure that its bond rating remains AAA. During the last 8 years, all of the State's GO bonds sold for less than the Bond Buyer Index.

Any North Carolina city, county, sanitary district, metropolitan water district or water authority that wishes to issue debt can do so only after approval by the Local Government Commission. All of these units except the water authorities have the statutory authority to issue GO bonds. The Local Government Commission must determine if the issuer has the ability to market the proposed bonds at a reasonable interest rate. The Commission makes a point of exploring general obligation financing, since that is the least expensive method of borrowing money. Having the full faith and credit of the issuer behind the bonds, however, does not mean that the debt will necessarily be repaid with tax funds. Revenue-producing projects, such as water facilities, are expected to be operated as an enterprise and should be fully self-sustaining, covering debt service as well as operation and maintenance costs.

The State's General Statute (G.S. 159-34) requires that "each unit of local government and public authority shall have its accounts audited as soon as possible after the close of each fiscal year by a certified public accountant. At a minimum, the required report shall include the financial statement prepared in accordance with generally accepted accounting principles...and the audit contract must be approved by the Secretary of the Local Government Commission. The finance officer shall file a copy of the audit report with the Secretary (of the Commission) for his approval. It shall be unlawful...to pay or permit the payment of such bills or claims without this approval."

Each unit's audit is carefully reviewed to determine financial weakness, and letters are written to elected officials with suggestions for strengthening areas where weakness appears. These letters are often followed by a visit from one of the Commission's accountants. The audits are kept for 5 years along with a complete financial file on each unit, which includes a record of its debt.

The result of these policies is that North Carolina has more units rated AAA by both Standard and Poor's and Moody's than any other State. A large majority of the cities and counties have ratings, and these are watched closely. The Commission also provides assistance to local units when they obtain bond ratings, and has often been successful in getting ratings improved. The North Carolina Municipal Council also rates small local units that are unable to obtain a rating from the national rating agencies.

The strategy of the State in coping with the increased financial responsibility for its public works expenditures is to protect its good credit standing. Where fees and charges are used to recover costs, it is essential

that they be kept within an affordable range through good management and the wise use of resources.

OKLAHOMA

In 1974 the Oklahoma legislature gave specific statutory authority to the Oklahoma Water Resources Board to develop an Oklahoma Comprehensive Water Plan. The recommendations of the Plan made clear the need for some kind of financial assistance program targeted to water supply and sewage treatment projects. The Board's Financial Assistance Program (FAP) and Statewide Water Development Revolving Fund are outgrowths of this recommendation. Implementing these programs has involved years of political battles and legal challenges.

The initial legislation, passed in 1979, created the FAP, authorizing the Board to sell revenue bonds and to lend the bond proceeds to local public entities for water development projects. Each project was limited to $1.5 million in State funds. In a 1980 amendment, sewage treatment projects became eligible for loans. In addition, the Board was authorized to issue grants of up to $50,000 per entity per fiscal year. Funding for these grants was to come from appropriations, but no appropriations were made and thus no grants were actually issued.

The issuance of the revenue bonds for the loan program was held up because of legal uncertainty. The Attorney General, who must approve all State bond issues, failed to rule on the constitutionality of the Board's bonds. After waiting 10 months for a ruling, the Board decided to ask the District Court for an opinion, and the Court ruled that the program was constitutional. A proposed bond sale was then drawn up and sent to the Attorney General in 1981. Again, the Attorney General failed to act upon its approval. As a result of the Attorney General's failure to either approve or disapprove the bond proceedings, in early 1982 the Board petitioned the Oklahoma Supreme Court to assume original jurisdiction and mandamus the Attorney General to act. The Court declined to assume jurisdiction in the matter, which in effect left the program in limbo.

Also in 1982, the State Legislature enacted SB 145, which substantially enhanced the original financial assistance program. SB 145 contained several key provisions aimed at strengthening the State's capability to meet water project financing needs. First of all, the new legislation cleared up the legal and technical problems with the initial statutory language. Second, it removed the $1.5 million ceiling on each project, thereby allowing the Board to undertake medium- and large-sized projects. It added sewer collection and distribution facilities as eligible projects and created the Statewide Water Development Revolving Fund. Subsequently, the Legislature appropriated $25 million into the Revolving Fund from surplus funds. According to SB 145, the monies in the revolving fund can be used for three principal purposes: 1) to produce interest earnings to finance the small grants program (now up to a $100,000 limit); 2) to serve as security and collateral for the investment certificates issued to finance loans to local governments; and 3) to make expenditures, subject to legislative approval, for water resource planning and research activities, State cost-sharing on Federal water projects, construction

of State water projects and repayment of water supply storage contracts between the State and the Federal government.

From the beginning, some people believed there was a possibility that the security and collateral feature might constitute a violation of Article X, Sections 14 and 15, of the State Constitution. Section 14 prohibits the State from assuming the debt of any political subdivision of the State, while Section 15 prohibits the lending of the State's credit to any other political unit in the State. To help clear up this question, the Legislature requested the public to approve this practice through State Question 558. When put to vote, SQ 558 was narrowly defeated by the voters in November, 1982, due at least in part to misleading wording of the ballot title. However, under two subsequent separate opinions rendered by the succeeding State Attorney General in 1983, both the loan and grant portions of the program were declared constitutional. The Board subsequently moved ahead to implement both facets of the program.

Though a feasibility study estimated funding needs for water/sewer improvements to be $250 million, the Board decided to take a conservative approach and considered the early issuance of $50 million of bonds to be secured with $7.5 million from the Revolving Fund. The first task, getting a rating from either Standard an Poor's or Moody's, turned out to be difficult. The Board was told that the bonds were unratable, primarily because the loans using the proceeds would be a blind pool: investors could not evaluate the creditworthiness of loan recipients because it was not known who they would be. Many of the program participants would, in fact, be unratable entities. Furthermore, Oklahoma itself did not currently have a rating because it had not been to the bond market in several years. Standard and Poor's, however, agreed to give the Board a rating if it did two things, namely 1) put limitations on loan applicants, and 2) buy insurance. After agreeing to buy $1 million of insurance and satisfying the loan requirements, the Board obtained an AAA rating.

In January, 1984, the Board took bids on a $50 million blind pool revenue bond offering and obtained an exceptionally low interest rate of 9.32 percent for 25-year bonds. However, before the Board could complete the sale, officials from five communities filed a suit in the Oklahoma Supreme Court questioning the constitutionality of the program.

The Court, overturning one of the 1983 State Attorney General's opinions, ruled that use of the $25 million Statewide Water Development Revolving Fund as collateral would be an unconstitutional assumption of debt and a pledge of credit by the State, thus voiding the sale. Consequently, the Oklahoma Legislature approved a joint resolution which would let Oklahomans again vote on the issue.

The proposed constitutional amendment, State Question 581, was placed on the ballot and was passed in August 1984 by an overwhelming margin. SQ 581 resolved remaining issues over the legality of the bonding program and the use of the revolving fund as collateral.

It is felt that SQ 581 passed handily for four reasons. First, the Governor put his full backing behind approval. Second, the wording on the ballot was more favorable than the wording on the previous State Question. Third, voting was held in August rather than November. And fourth, the SQ was

voted on in a primary election, in which voters tend to be more dedicated and familiar with the issues.

One final obstacle remained. The Attorney General ruled in October 1984 that financial advisors are not professionals and that the retention of financial services is subject to Oklahoma's Central Purchasing Act, which requires competitive bidding. Procedures to procure financial advisory services are now underway.

Though the Financial Assistance Program has faced many frustrating and unanticipated obstacles since its statutory basis was first laid in 1979, passage of SQ 581 has finally put to rest all questions concerning the validity of the program. The Board is consequently laying the ground work for another $50 million bond issue, and will hopefully be in a position to make the bond offering early in 1985.

UTAH

The State of Utah has used a revolving fund for water development since 1947. The Legislature intended the law to be liberally applied to develop every water resource within the State to its "highest beneficial service." The program was originally proposed as a modest fund, lent at zero interest, to help construct projects that were too large for local irrigation companies to finance, but too small for consideration by the U.S. Bureau of Reclamation. Over 50 percent of all irrigated lands in the State receive waters developed under the program.

The Board of Water Resources, within the Utah Division of Water Resources, administers the funds. The Board conducts studies, plans for the full development of the State's water resources, and enters into installment purchase agreements with sponsoring organizations. These agreements generally have a 20-year repayment period, but can be longer depending on the community's ability to pay. The Board is given complete discretion with respect to selecting eligible projects, determining priorities, and distributing appropriated funds.

In 1974 the State Legislature, in response to the sharp growth in the population of small communities due to energy development, created the Cities Water Loan Fund. It authorized the Board to purchase general obligation or water revenue bonds from political subdivisions of the State for the development of water supply systems. The Board has the authority to establish repayment terms and criteria for the use of the funds. Most of these projects have been jointly funded with other State agencies or with the Farmer's Home Administration. Presently, the demand for loans exceeds the program's resources.

In 1977 a severe drought occurred, which prompted the Governor to propose the sale of $25 million in State GO bonds for water development. The Legislature approved this proposal and created another revolving fund called the Water Resources Conservation and Development Fund.

The 1978 bond sale was the first use of general obligation debt in the State's history, and proved so popular that the Board has gone back to the market two more times, in 1980 and 1983. The year 1983 was also the first time the fund was used to leverage other borrowings. Bond proceeds are not deposited directly into the fund, but are invested until they are actually needed for project construction.

However, the needs are so great that the general obligation capacity of the State cannot be considered a long-term solution. Dedicated revenue sources are needed to lessen State indebtedness and to avoid reliance on unpredictable infusions of State appropriations. For this reason, the Water Resources Conservation and Development Fund is capitalized not only by appropriations, but also by net revenues from the sale of water and power, by Federal mineral lease funds, and by annual repayments from project sponsors. The Fund is used to finance moderately sized projects ranging from $1 to $20 million. The general rule of thumb for interest charges is 3 percent for agricultural water projects, 5 percent for purely domestic water, and 7 percent or more for industrial water. The maximum repayment period is 50 years, but has been as short as 10 years, depending on ability to pay.

In 1985, greater flexibility in the use of credit enhancement vehicles will be sought. Interest "buy downs" such as bond insurance, reserve set-asides, and letters of credit will be considered. The biggest problem is agreeing on additional dedicated revenue sources to be used to provide leverage for funding projects that are included in the State's water development plan.

WASHINGTON

Washington State is in the process of developing programs to meet emerging infrastructure needs. In 1983 the State Legislature instructed the Department of Community Development to develop a comprehensive inventory of the critical public works needs of State and local governments. The Department analyzed State and local financial capability, surveyed innovations in other States, and prepared an in-depth report to the Legislature. Washington is one of the first States ever to have undertaken such a comprehensive assessment.

The needs assessment was accomplished with the cooperation of various interests throughout the State, and was designed to answer three basic questions. First, what are the repair and reconstruction needs of existing public facilities? Second, how should the State participate in the funding of local infrastructure needs? And finally, what methods will help plan and manage those facilities to stretch those increasingly scarce dollars as far as possible?

The study found that the State faced $4.3 billion in critically needed repair and replacement projects for the next 5 years. Local governments anticipated being able to finance about $2.3 billion, or approximately 53 percent of the total.

This study induced local jurisdictions to consider their public works needs in a comprehensive fashion and stimulated continued interest in the capital

improvement planning effort. Perhaps the study's most important function was to expose the public to the public works issue and to attract media attention. In response, the State Legislature passed a bill authorizing a Public Works Trust Fund, a revolving loan program. This was a major move away from the use of statewide GO bonds, formerly a popular method of raising funds for distribution as local grants, but one that is inadequate in light of the State's current statutory bonding authority and financial capability. This Fund is an attempt to stretch resources as far as possible for leveraging new debt from a variety of dedicated revenue sources.

In December 1984, the Washington State Department of Community Development published a report entitled "Financing Public Works: Strategies for Increasing Local Investment." This report recommended establishment of a trust fund to provide loans for repair and replacement of existing systems only. In the 1985 legislative session, the Washington State Legislature enacted Substitute House Bill 461, which sets up the trust fund as recommended in the report.

SUBSTATE WATER DEVELOPMENT AND MANAGEMENT INSTITUTIONS

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SUBSTATE WATER DEVELOPMENT AND MANAGEMENT INSTITUTIONS

Four examples of substate water development and management institutions were presented at the workshops. The presentations on the Port of Oakland and the Massachusetts Port Authority illustrated the creative financing techniques used by enterprise authorities. Presentations on the Trinity River Authority of Texas and the natural resources districts in Nebraska emphasized the financing powers and problems of substate institutions for multi-purpose water resources development.

THE PORT OF OAKLAND

Public investment in ports is unique among water resource development projects because ports operate in a highly competitive environment. For many shippers, the geography of the port of entry is only one of several considerations taken into account when selecting a port; price is a major consideration. The Western ports, including all the California ports, are fighting to get their share of essentially the same market. Most of the cargo that is exported through the West Coast is generated from east of the Rocky Mountains, and can just as easily go to Los Angeles, Long Beach, Portland, or Seattle as to the port of Oakland.

The Port of Oakland is a part of the City of Oakland, but is a financially autonomous department governed by a seven member Board of Port Commissioners nominated by the Mayor and appointed by the City Council. The Port is financially self-sufficient, and neither has taxing authority nor receives appropriations from the City. City general obligation funds have been used twice for financing port facilities: once for the harbor, and once for use in developing the airport. While both of these bonds were retired from tax monies, the Port has repaid the City the entire debt for the airport bonds and has almost repaid the harbor bond debt.

The City Council has given the Port jurisdiction over about 19 miles of shoreline from the northern border of the City south to the Oakland Airport. Operations of the Port fall under three general areas: Maritime, Aviation, and Properties. The Maritime operation is the largest single activity, generating approximately fifty percent of Port operating revenues. The Port does not operate the marine terminals but rather is a landlord, leasing out the various berths to steamship lines under preferential assignments, or to terminal operators for those terminals designated as public. Oakland was one of the first ports to recognize the emerging growth of container shipping, which has become its most successful enterprise.

The Port of Oakland is the operator of two separately managed airports which are contiguous; one is entirely devoted to general aviation and one to commercial airlines. The Oakland Airport is now experiencing tremendous growth in both passengers and air freight. A new terminal is being built, requiring an investment of about $40 million.

The lands and properties not directly used by either the maritime operation or by the airports are under the control of the Port's Properties Department. The Properties Department serves both Maritime and Aviation by negotiating and administering facility leases. It also oversees the planning and development of the various properties owned by the Port. For instance, the Department has plans to develop the Jack London Square area for major office space, shopping and hotel facilities.

The major sources of funds for development of Port assets have been its retained earnings and the proceeds from the sale of bonds. The Oakland City Charter limits the Port's debt financing authority to the issuance of revenue bonds. The mainstay of Port financing prior to 1984 has been its series of fixed-rate senior lien bonds (1957 series) that require rates and charges to provide a 50 percent cushion over the amount needed to retire the debt. These bonds can be issued as long as the Port maintains the required debt service coverage (1.5 to 1) and fulfills other covenants. In addition to these senior bonds, a series of junior lien bonds were bought by the Economic Development Administration during the 1960's. In recent years, the California Department of Boating and Waterways has provided loans to help develop marinas and other waterfront activities along the Oakland Estuary.

In 1980, when interest rates were headed upward, a measure was placed before the voters that would remove the 9 percent cap on the rate the Port could pay on any bonds it sold, and, most importantly, would permit the Port to sell Bond Anticipation Notes (BAN's) with a maximum life of two years. The passage of this measure was very important because funds were needed in 1982 to construct a second terminal at the Oakland Airport. Interest rates at that time would have been so high that the charges needed to cover debt service and operating expenses would have put the Port at a competitive disadvantage. Fortunately, the Port was able to sell $35 million of BAN's at net interest cost of 6.6 percent. Had traditional bonds been sold, the rate would have been at least 11 percent.

In 1984 the need for additional outside financing became evident. The rates on the traditional bonds were still considered too high, so the Port decided to investigate the possibility of issuing a variable rate bond. What the Port ultimately sold was an $85 million issue of what are called "ACES", or Adjustable, Convertible, Extendable Securities, subordinated to all other revenue bonds outstanding by the Port. To make this possible, the Port contracted with the Sumitomo Bank, Limited, to provide a 10-year Letter of Credit (LOC).

Because of the current yield curve for municipal bonds, the Port selected a 7-day pricing, 7-day put option as the initial financing mechanism. The interest rate is set weekly and the bond holders have the right to put their bonds back to the trustee and remarketing agent on 7-days' notice and receive the par value of their bonds. In bond issues such as this, the risk of market fluctuations is transferred from the bond buyer to the bond issuer. The Port was willing to accept this risk because of the substantial difference in interest rates between 7-day paper and long term bonds, even when interest rates were at their height in 1981-82. The initial interest rate was 6.1 percent, but has since declined.

There are other costs associated with the issuance of a bond like this. There is a charge from the LOC bank (5/16th of 1 percent) and a charge from the remarketing agent for any bonds that are put back and must be resold (1/8th of 1 percent). The trustee also has a fee which is related to the amount of activity but is very small; the total of all the charges is approximately 1/2 of 1 percent.

To provide additional protection to the bond holders, the Port agreed to maintain a debt service coverage ratio of 1.25 to 1 on the ACES after providing for all bonds senior to them, and to observe certain other covenants regarding Port payments and expenditures. The option is available, if the yield curve changes, to extend the time for interest rate setting from 7 days to some longer period. The Port also has the option to convert these bonds from an adjustable rate to a fixed rate. The fixed rate would be set at the time of conversion based on the remaining life of the bonds, which mature in the year 2014. The interest rate would be set based on the market at that time. There is also a provision for a mandatory conversion to a fixed rate in the event the LOC is ended; the LOC terms can also be renegotiated with Sumitomo after five years.

The Port management believes that this recent bond issue gives it flexibility in financing, at affordable interest rates, to permit the attraction of tenants in a competitive market. Keeping the Port reasonably profitable will provide sources of employment for the people in the area, and will provide a higher tax base so that the general community will continue to prosper.

MASSACHUSETTS PORT AUTHORITY

The Massachusetts Port Authority (Massport) is a semi-autonomous revenue bonding Authority of the Commonwealth of Massachusetts. Massport has no taxing authority and receives no public appropriations. The Authority is governed by a seven member board of directors whose members are appointed to staggered seven year terms by the Governor of Massachusetts. The Authority's enabling legislation established guidelines governing its organizational, operational and financial character.

Massport was established in 1956 with the express purpose of assuming the control, management and development of various existing transportation-related facilities located within metropolitan Boston. These facilities include the Tobin Memorial Bridge, Logan International Airport, and Hanscom Air Field. Maritime facilities on Boston Harbor, together with additional maritime properties and leaseholds acquired since operations began in 1959, comprise the Port of Boston.

Massport has relied heavily on external sources to finance its capital projects. In fact, a full 73 percent of the current physical plant has been financed with either bond proceeds or grant receipts. The current development plan calls for use of a larger proportion of internally generated funds. Massport's investments in its aviation and bridge facilities have generated

most (approximately 83 percent) of its operating proceeds. Maritime operations, however, have sustained operating losses. Competitive pricing pressures, high labor costs, and variable volume port operations have produced a cumulative deficit over the most recent 5-year period. Given their historical financial performance, it is not surprising that maritime capital projects are the least leveraged of Massport's facilities.

Massport's continued investment in its maritime facilities, however, is important because of their regional economic impact. It has been estimated that the direct economic impact of the Port of Boston on the New England region exceeds $155 million annually, that over $22 million in transportation savings are realized annually through use of the Port by New England shippers, and that over 3,600 jobs in the region are Port-dependent. As the owner and operator of the Port's public cargo handing facilities, the Authority has subsidized maritime operations.

Given its long-term perspective on maritime operations, the Authority has undertaken efforts to generate a more appropriate financial return from maritime activities and to provide low-cost financing for its port facilities. This two-sided approach involves cost containment, compensatory pricing, and marketing efforts on the operational side, and the development of modern maritime facilities and redevelopment of obsolete facilities for producing income on the capital side. Both internal and external funding sources will be used to support these efforts. Clearly, the Port is fortunate that the Authority has adequate revenue sources to cover the operating deficit.

To minimize the level of subsidy required by maritime operations, the Authority has undertaken a massive development effort involving more than seven of its harbor properties. This program calls for the development of four directly maritime-related facilities and the redevelopment of three obsolete maritime facilities to economically viable uses. The current 5-year plan calls for the expenditure of an estimated $75.9 million on these facilities. The sources of funding for these port projects are quite varied. They include bond proceeds, grant receipts, internally generated funds, and third party private development funds.

Unlike Oakland, Massport is authorized to issue tax-exempt commercial paper. Its first issue was in 1982 for the principal amount of $23 million. Due to the overall financial strength of Massport, its use of credit support, and its use of general revenue rather than project-specific debt, the paper was rated A-1/P-1 by the investor services and has been successfully rolled over to the present time. Because of its short maturity and strong rating, the paper has produced substantial debt service savings over its three years of use, with an average interest cost over that period of approximately 5 percent. Although the Authority assumes additional interest rate risk by financing long term assets with short term debt, cash flow and liquidity projections are of such strength as to warrant this gamble in return for substantially reducing the cost of capital for capital facilities. When rates are favorable, the commercial paper will likely be retired and the assets financed with traditional long term debt.

Massport is currently involved in the preparation of a new $49 million issue of adjustable rate, tax-exempt "put" bonds. Approximately $20.7 million of the proceeds from this issue will be used to finance several maritime projects. Adjustable rate bonds are noteworthy because the debt is carried on the balance sheet as a long term liability, whereas the bonds actually may be "put" to the Authority periodically, at intervals usually less than a year. By issuing adjustable rate bonds and implementing certain financial safeguards, an issuer is able to enjoy the security offered by the stable debt service of long term, fixed-rate debt, while taking advantage of the traditional yield curve, thus enjoying considerable interest cost savings.

The adjustable rate bonds have periodic interest and maturity dates, which may not coincide. At each interest date, holders of the bonds are notified of the effective interest rate for the following interest period. The rate is indexed to some market measure. Holders then have the option of tendering their bonds if they are dissatisfied with the new rate. A back up credit facility is required in the event that a large block or all outstanding bonds are tendered at the same time. By putting a cap on the payable interest rate, amortizing the issue at that interest rate, and establishing a reserve fund to invest the difference between actual debt service requirements and the amortization rate, the issuer is able to shield itself from large increases in short term rates. It is anticipated that Massport's adjustable rate bonds will yield an interest rate 400 to 500 basis points (4 to 5 percentage points) below the prevailing long term rates.

A final example of Massport's innovative financing of projects involves the use of private investment to finance the rehabilitation of obsolete maritime facilities. Rather than allow continued deterioration of waterfront property, and as an effort to enhance the financial strength of its maritime operations, the Authority sought alternative uses for these facilities. The prospect of prime waterfront locations, Boston's surging economy, and long term leases attracted several development proposals. As a result of these efforts, Massport will invest $10.7 million for bulkhead and apron rehabilitation and related site preparation to leverage over $120 million from private developers. The development plans call for the construction of a high-tech market and prime office/commercial space. The development will retain the maritime flavor of the original structures, with passenger and water taxi berthing at one site and a marina at another. The positive cash flow generated from these two facilities as a result of increased rents and decreased operating expenses will serve to bolster the financial strength of the Authority's overall port operations.

As a result of several innovative financing techniques, the Massachusetts Port Authority is able to sustain its commitment to the Port of Boston while effectively reducing the financial burden of its port operations. The successful implementation of the current maritime strategy and capital plan will result in the continued provision of modern public maritime facilities which, taken as a whole, approach financial self-sufficiency.

THE TRINITY RIVER AUTHORITY OF TEXAS

The Trinity River Authority of Texas (TRA) is an independent political subdivision created by the Texas State Legislature in 1955. It is capable of participating in a broad array of water-oriented enterprises as specified by the Legislature.

The Trinity River basin contains 17,865 square miles extending from seven miles south of the Oklahoma Border to the Trinity Bay in the Gulf of Mexico. TRA is governed by a 24 member Board of Directors appointed by the Governor. The members represent specific geographical areas within its political jurisdiction. TRA, which has no taxing powers, operates as a governmental utility and is responsible for managing a growing group of financially independent enterprises. TRA completed FY 84 with assets in excess of $364 million.

When TRA was created by the Legislature it was given three principal duties. The first was to develop and implement a Master Plan for basin-wide development. In the original document adopted by TRA's Board in 1958, proposed elements of the ambitious Federal Trinity River Project were principal features of the Master Plan. After failure of a TRA-sponsored basin-wide tax and bond election in 1973 (which would have generated the local share of funds necessary for the Trinity Project) both the Authority and the Corps of Engineers began to reassess priorities and projects. In 1976, TRA completed a comprehensive review and revision of the Master Plan which was more conceptual in nature than the original document.

A second duty is to provide local support and sponsorship for Federal water projects, and a third is to provide services within TRA's territory.

Almost all of TRA's enterprises are financed through a combination of tax-exempt revenue bonds, grants such as from EPA, and local contributions. In all TRA projects, the purchasers of project outputs pay a pro rata share of capitalized debt as well as annual operation and maintenance (O&M). The Authority's current fiscal year budget is $42.5 million, of which 47 percent is dedicated to wastewater systems and 34 percent to various types of water supply systems. TRA is the local sponsor of several Corps multipurpose reservoirs and contracts for the ownership of the water supply storage. It then enters into agreements for water delivery with municipalities. TRA is also involved with irrigation delivery services, the sale of treated effluent, generation of hydroelectric power (feasible since the rise of oil and gas prices), flood control, and the provision of recreation on its lakes.

Recreation investments are substantially assisted by contributions from the Texas Parks and Wildlife Department. The need for local interests to assume larger responsibilities in funding these projects has become evident in the last decade. In 1971, for the first time in Texas history, TRA used revenue bonds to develop a park; user fees were pledged to support repayment. In 1975, TRA became the first entity to execute a recreation contract with the Federal government in which the local sponsor agreed to assume responsibility for repayment of 50 percent of recreational capital costs over a 50-year period, and 100 percent of recreational O&M.

Sound management of the Trinity River basin's soil and water resources becomes more critical each year. Reductions in Federal programs has made financing on the local level more challenging, but TRA is optimistic about its ability to meet emerging demands.

NATURAL RESOURCE DISTRICTS IN NEBRASKA

For States and local governments to successfully develop water projects in the future, there are important steps that must be taken. First, there must be some mechanism to to identify potential projects. Second, there must be a system to analyze such projects according to applicable standards and criteria. Third, the capability to design acceptable projects must be developed. Fourth, adequate financing must be arranged. Fifth, the projects must be constructed. Finally, the projects must be operated and maintained. Any weak link in this progression will defeat or seriously hinder development of water projects.

In Nebraska, the strong links are clearly at the beginning and the end of the progression. It has created institutions to identify water projects and to construct, operate and maintain those water projects. These institutions, called Natural Resource Districts (NRDs), are empowered to sponsor projects for purposes including flood control, drainage, water supply, recreation, and fish and wildlife enhancement. The NRD's also have the authority to regulate the use of groundwater and make application for instream flow appropriations.

The NRD's have several other features that make them effective. Jurisdictional disputes among them are minimized because their boundaries are based largely on hydrologic rather than political boundaries. Each NRD also has a Board responsive to its general public. They maintain full time staff, many of them professionals in a variety of fields. More important, they are empowered to identify special benefit areas and to assess the actual beneficiaries for the costs of the projects to the extent such special benefits exist. These elements make NRD's ideally structured to sponsor the kind of multipurpose, innovative projects that will be needed in the future.

The middle links in the water project development process, namely the analysis, planning, design, and financing of projects, are much weaker. NRD's are able to perform these functions for small or intermediate-size projects, but are not equipped to handle these steps for major water projects. The Nebraska Natural Resources Commission has the authority to plan and design major projects, but has never been adequately funded to do so.

Financing of large projects remains an important obstacle. Most NRD's cannot finance a major project on their own. Each is able to levy up to one mill in property tax, which yields $100,000 per year in the district with the lowest property valuation and $3.5 million per year in the district with the highest property valuation. Only two of the districts can raise in excess of $1 million per year through property taxes alone. Although the NRD's are authorized to issue revenue bonds for water retention and impoundment structures, that authority has limited use for the project purposes Nebraska is anticipating, namely flood control and irrigation.

The Natural Resources Commission administers two funds for water project development. Over the past 10 years, many NRD projects costing $5 million or less have received grants or loans of up to 75 percent of project cost. However, appropriations to the two funds have been too low to support major projects.

For its part, the State will have difficulty acting as the sponsor of major projects. First, Nebraska is a conservative State and has a strong "pay as you go" tradition: total State indebtedness is limited by the Nebraska Constitution to $100,000. Second, the Constitution prohibits the Legislature from obligating future legislatures to make appropriations. This prevents State agencies from signing long term contracts—a significant problem for projects involving Federal agencies. Finally, Nebraskans must rely solely for their State revenues from sales and income taxes; there is no oil, gas or coal revenue.

Institutional change is needed to create the financing capability for major projects. Nebraska water project proponents may have to accept increased reliance on user fees. Not only will there be user fees of the traditional type, i.e., fees paid by the direct beneficiaries of the water projects, but there may also have to be statewide fees paid by all water users for the continued privilege to make use of the water supply. As an alternative, the State may have to increase the general taxing ability of the NRD's. Approval of such a step would be extremely difficult, but it may be possible to win this approval if the increased revenues are earmarked for construction only and not for administration.

Others feel that the State will have to amend the Constitution to authorize greater indebtedness. A resolution to place a proposed amendment on the ballot was introduced in the Legislature in 1984 but was defeated by a slim margin. Efforts to have the issue considered again are expected in 1985. However, until the Federal government decides what the cost sharing and financing rules will be for Federal water projects, State decision-makers may not be convinced to approve the referendum or make cost-sharing commitments.

CASE STUDIES OF WATER PROJECT FINANCING

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CASE STUDIES OF WATER PROJECT FINANCING

Six project case studies were presented at the four workshops. Each case study provided a lesson or lessons in project planning, financial analysis, intergovernmental cooperation, financial planning and creative financing. The case studies are as follows: the Galloway project study, Idaho; a Lake Michigan water supply project in Illinois; deepening of the Lower Mississippi River, Louisiana; the Randleman Lake project, North Carolina; recreation at Skiatook Reservoir, Oklahoma; and the Lock Haven flood control project, Pennsylvania.

GALLOWAY PROJECT, WEISER RIVER BASIN STUDY, IDAHO

The Galloway project as currently planned will be a 320-foot dam which stores 900,000 acre feet and costs $276 million to build. Its benefits include low flow augmentation for downstream anadromous fish runs, hydropower generation, flood control, irrigation and recreation. Fishery benefits comprise a major part of the project's benefits, and a key challenge in financing the project is how to turn those benefits into a revenue stream.

One financing alternative under consideration is State funding with revenue bonds. Under this alternative, the costs of non-reimbursable purposes must either be borne by other beneficiaries or provided by the Federal government; in the latter case some assurance that the Federal funds will be provided will be needed for the bonds to be marketable.

The second alternative is for the State to appropriate from the general fund. However, this alternative is not realistic: the project's financing requirements are half the size of the State's annual budget.

A third alternative is for the Federal government to develop the project as part of the lower Snake River fisheries conservation plan; however, changes in the plan's authorizing legislation would be required.

A fourth alternative is a traditional Federal project financed by Congressional appropriations. This alternative is acceptable to the State but involves great risk of delay in authorization and funding.

A fifth alternative, also being actively investigated by the State, is to fund the project as an element of the fisheries program of the Northwest Power Planning Council. The Pacific Northwest Power Planning Act gave authority to the Bonneville Power Administration to construct and finance fishery flow enhancement facilities. BPA could participate by selling bonds for a joint State/Federal project. As an alternative, BPA could enter into a contract with the State to pay over time for costs allocated to fishery enhancements. However, the contract may be construed as a Federal guarantee of debt service payment, in which case the tax-exempt status of the State's bonds would be lost.

In the future, feasibility reports such as the report for the Galloway project may serve a dual role to satisfy both the Congress and the financial community. Rating agencies and investors require feasibility reports to be

prepared by nationally recognized consulting engineers. It was suggested that if the Corps' independence is accepted in the financial community, the Corps can perform this function in the interest of efficiency and cost saving, in addition to preparing traditional economic and engineering analyses. The Corps would also participate actively in meetings with rating agencies and underwriters.

Part of the feasibility report's dual role would involve investigation of relevant legal issues, long term financing alternatives, credit enhancements and measures to coordinate the timing of appropriations and bond issuance.

The Galloway project is an example of the financing challenges to be addressed throughout the planning process.

INTERGOVERNMENTAL COOPERATION TO ACQUIRE LAKE MICHIGAN WATER IN NORTHEASTERN ILLINOIS

A system of canals dating from 1900 diverts water from Lake Michigan to the Illinois River. Domestic water pumped from the Lake is also returned to the canals. Under a 1967 Supreme Court decree, diversion of water from Lake Michigan by the State of Illinois is limited to 3200 cubic feet per second (cfs), or about 2.1 billion gallons per day. Computation of this diversion must include not only deliberate diversions for domestic pumpage and wastewater dilution, but also uncontrollable losses from navigation lockage, water leakage through locks and the diversion of stormwater that would drain to the Lake.

The State of Illinois first allocated the 3200 cfs in 1977 for a 4-year period. In 1980, the Supreme Court modified its decree to allow the use of a 40-year running average in accounting for diversions rather than a 5-year running average. Since the average over 40 years deviates from expected value less than a 5-year average, this change enabled the State to allocate an additional 143 cfs that had been previously allocated to navigation lockage and leakage and stormwater diversion as a hedge against the occurrence of a series of wet years. A new allocation order issued in 1980 allocated water for the first time to 86 suburban communities, in addition to 112 users which had received allocations under the 1977 order.

The allocation was based on the following principles:

- to maintain reasonable water quality in the Chicago Sanitary and Ship Canal
- to require that all domestic users receiving an allocation adopt a water conservation ordinance or plumbing code and meet standards for the control of leakage and unaccounted-for losses
- to facilitate efficient use of Lake Michigan water in light of competing demands and transmission cost constraints
- to assure that the limited groundwater resources in Northeastern Illinois are available to the communities which do not receive Lake water

- to make long-term (40 year) allocations so that communities receiving Lake water for the first time can secure the financing for construction of transmission systems

One unintended result of the State's long term allocations is that many communities have used their allocations as the basis for the design of transmission systems. Approximately $500 million will be invested in new transmission systems. Financing these systems poses an intergovernmental challenge.

Over the past few decades mechanisms for intergovernmental cooperation have been adapted to the increasing complexity associated with Lake Michigan water use. The original form of cooperation was individual sale contracts between lakeshore communities and their inland neighbors. More recently, Illinois law has authorized the creation of intergovernmental commissions such as the Northwest Water Commission. Under this form of cooperation, each participating municipality appoints one member and the County Executive appoints one member. Some commissions of this type have recently been granted the authority to levy taxes and to issue general obligation bonds.

Most recently, seven municipalities northwest of Chicago created a Joint Action Agency, as authorized by Illinois' 1970 constitution and intergovernmental cooperation laws. The participants had a great deal of latitude to design the Agency's governing structure, thereby defining the relationships among the parties and the possible financing alternatives. Under the governing agreement approved by each Agency member, the Agency will operate like a super public works department: its structure includes a Board of Directors, comprised of municipal mayors and council presidents; an Executive Committee, comprised of municipal managers; and a staff. The Agency will float $130 million in revenue bonds backed by take-or-pay contracts with each Agency member.

The Agency members faced significant decisions concerning system design, cost allocation and cost recovery. Regarding design, the members decided that the pipe would be sized for projected ultimate use within the allocation period, but that pumping capacity would be added in increments.

Allocation of costs among members was difficult because of differing community growth rates, water allocations and pumping distances, and because not only initial investments but also future investments needed to be addressed. The financial advisor and design engineers developed a formula to allocate costs among the members.

The enforcement of the take-or-pay contracts (and consequently marketability of the bonds) would be assured by a number of provisions. First, the governing agreement provided that water could be cut off in the event of default. Second, the purchase contracts and revenue bonds include rate covenants. Third, the bonds also include a "step-up" provision whereby other Agency members agree to cover the obligations of a purchaser in default, entering a claim against the defaulter for back payments. Finally, each Agency member has deposited one month's advance payment with the Agency.

From 1980 to 1985 the cost of water to the Agency members will have risen, on average, from $1.15 per thousand gallons to $2.84 per thousand gallons. The wholesale cost of the Lake Michigan water is approximately $2.04, and local system costs fall to $.80 due to savings on pumping costs. Adjusting rates and rate structures to accommodate this huge increase was a difficult political challenge for each Agency member. Two basic choices were rates based on use and taxes based on assessed valuation. Rates based on use are not deductible from Federal taxes and would recover 82 percent of costs from residential users in member communities. Taxes based on assessed valuation are deductible from Federal taxes and would recover only 55 percent of costs from residential users in member communities.

The Joint Action Agency members confronted these issues directly in formulating its governing agreement and the individual purchase contracts. Resolving the issues enabled the Agency to proceed with financing a wholesale water transmission system which will achieve economies of scale in providing for the water needs of the members into the foreseeable future. The creation of the Agency offers an example of the creative use of intergovernmental institutions to achieve shared objectives.

MISSISSIPPI RIVER DEEPENING, LOUISIANA

The lower Mississippi River handles 20 percent of the nation's foreign waterborne trade, including nearly half of its grain exports. It is blessed with a strategic location and numerous available industrial sites. In 1981 the Corps of Engineers completed a study of deepening the lower Mississippi from its mouth to Baton Rouge to a depth of 55 feet, and found that such a project was economically justified, with a high benefit/cost ratio. However, the State of Louisiana, recognizing that cost sharing for port and navigation improvements is likely, commissioned a study of river deepening alternatives which could be financed.

The two principal concerns of the study were whether a project could be financed and whether reasonable user charges could be imposed to recover capital and recurring costs. Because it was important that the study be credible in the financial community, conservative methods were adopted in the projection of a deepened project's usage and benefits. The methodology differed from that used by the Corps of Engineers in a number of respects: only 21 percent of the cargo was assumed to shift to deeper-draft vessels; cost savings were attributed only to the cargo so shifted and to 40-foot vessels which would be able to remain fully loaded during times of low water; the Panama Canal was assumed to be deepened; different world fleet size distributions were assumed; and the methodology for projecting cargo growth over time was different.

The study consultants found that most of the near-term benefits of deepening accrued with an increase in depth to only 45 feet. The development of private topping-off facilities for grain in mid-stream and for coal in the Gulf of Mexico would create additional benefits and would accelerate the establishment of a pattern of trade involving deeper-draft

vessels. If the growth of cargo exceeded the conservative estimates, then a 55-foot project would eventually be justified.

Most of the benefits from a combination of deepening to 45 feet and topping-off would be in the form of cost savings to projected cargo due to the larger ships' economies of scale. However, there would also be some diversion of traffic, particularly coal, from other ports and some new traffic induced by increased demand for lower-cost exports. Savings would be on the order of $2.50 per ton, with crude oil enjoying the greatest savings per ton and coal enjoying the greatest total savings. The ratio of savings to costs would be about 3.6 to 1.

Assuming a non-Federal cost share of 50 percent, a bond issue of about $57 million would be required for the 45-foot project. User charges for each commodity were assumed to be proportional to the per-ton savings for that commodity. However, it was found that in order to pay debt service from user charges, initial charges would have to exceed $1 per ton. Such a charge would act as a disincentive to shippers to take advantage of the deepened channel and would constrain the growth in benefits and revenues.

A preferable approach would be to institute a graduated system of charges which grow over time. However, the issuer of the bonds would develop a cumulative cash shortfall of up to $47 million and would be "in the red" for the first 22 years of operation. It was suggested that the shortfall be covered by general revenues or by the issuance of an "assurance bond," a form of deep-discount bond with a 30-year maturity. Bond proceeds would be invested; at first the interest would be applied to cover the operating deficit; in later years surplus revenues would be deposited in the investment fund to provide sufficient principal and interest at maturity.

Because most port operations are highly leveraged, (i.e. they have a high ratio of debt to assets or income), and because the State would derive approximately $1 million per year in added tax revenues from the 45-foot project, the river deepening study recommended that the State provide the revenues or the assurance bond to cover the shortfall.

In light of the cash flow difficulties encountered in financing even the 45-foot alternative, some form of Federal guarantee was recommended for the non-Federal debt incurred for Federal port and navigation improvements. Continuation of Federal financial participation in port and navigation improvements, equitable Federal user charge policy, and fast-tracking of port development permits were also recommended.

The Mississippi River deepening case study clearly illustrates three points. First, in financial analysis the uncertainty and sensitivity to price of future project usage are treated very differently from the way they are treated in economic analysis. Second, cash flow, which is virtually ignored in economic analysis, is critical to financial feasibility. Consequently, to enhance financial feasibility a project should be staged, both as a hedge against the failure of anticipated usage to develop and as a way to reduce early debt service burdens. Even so, it may be necessary to develop creative financing techniques.

RANDLEMAN LAKE, NORTH CAROLINA

Randleman Lake is a recommended dam project on the Cape Fear River, near Greensboro, North Carolina. It will provide water supply, recreation and flood control. Recent studies of the project resulted in a reallocation of storage and costs among project purposes: water quality storage was reallocated to water supply pursuant to the Federal Clean Water Act, and recreation facilities were scaled down. Of 108,000 acre feet of storage, 46,000 are to be allocated to flood control and 50,000 to water supply.

Of the $109 million construction cost, $61 million is to be borne by non-Federal interests. Of the non-Federal cost, $8.5 million is for recreation and $48.8 million is for water supply.

Under an agreement negotiated with the Corps of Engineers, the non-Federal construction cost share would be provided in an escrow account which would be drawn down as construction progressed. However, due to the difficulty in coordinating design, construction and funding schedules, a two year grace period was provided during which the Federal government would finance construction. The sponsor would be charged interest on deferred payments, but would retain rights to the interest earned in the escrow account.

The State of North Carolina is willing to be the recreation sponsor because recreation sites are needed in the region, the project represents a great opportunity to meet those needs, and another sponsor is highly unlikely. Because the State would have great difficulty providing its share of recreation costs at one time and because few facilities are cost-shared by the Federal government, the Corps of Engineers agreed to scale back recreation development from a level supporting 1.5 million visitors per year to one supporting 900,000 visitors per year. As demand develops, additional facilities can be developed on a pay-as-you-go basis. The State will also contract with concessionaires to develop revenue-producing facilities, but the concessionaires' investments cannot be included in the State's 50 percent cost share.

There are six local governments interested in obtaining water supply from Randleman. The State and the Piedmont Triad Council of Governments participated in the negotiations among these local governments concerning the allocation of the water and the assignment of responsibilities for the design, financing, construction and operation of local treatment and transmission facilities. Because of its experience in coordinating among local governments and in working with congressional representatives, citizens' groups and the press, the COG was particularly effective in facilitating understanding and eliciting timely decisions.

Alternative institutional arrangements were evaluated for purchasing water supply storage and for financing local treatment and transmission facilities. For the purchase of storage, the State agreed to contract with the Corps of Engineers for the water supply, and to sign subcontracts with each of the participating local governments. If conditions changed, it would be necessary to renegotiate the contracts. Under the State's Federal Water Project

Development Act, the North Carolina Environmental Management Commission is authorized to make the commitment of future appropriations for the water supply payments to the Corps of Engineers. Due to the magnitude of the commitment, however, the General Assembly would be asked for specific authorization in any case.

For local treatment and transmission facilities, some form of intergovernmental cooperation is required. A joint venture or water authority would provide the flexibility to adapt to changing needs and to construct joint facilities, but would not be sufficiently responsive to local control. A larger local unit could take the lead, but would find it difficult to gain the confidence of the smaller units. One promising alternative is for a major purchaser to operate the facilities under the auspices of an intergovernmental board.

The Randleman case study clearly illustrates the complexities involved in negotiating the financing of a multipurpose, multi-sponsor project.

RECREATION AT SKIATOOK RESERVOIR, OKLAHOMA

Skiatook Reservoir is a Corps lake in Oklahoma with 10,500 acres of water and 9,500 acres of adjacent lands. Because the Corps' policy essentially requires that non-Federal interests pay the entire cost of new recreation facilities at existing projects (at least 50 percent up-front and the remainder by assuming equivalent Federal operation and maintenance expenses), public agencies and recreation development interests have been evaluating alternative methods to
finance recreation improvements at the reservoir.

An early proposal suggested that the Corps of Engineers lease recreation lands to a development company; however, a public agency is required as sponsor of recreation improvements. Consequently, a second proposal suggested leasing the land to the Osage County Soil and Water Conservation District for development of recreation, residential and commercial facilities.

The proposal currently under consideration involves developing 577 acres at two sites (Osage Park and Twin Points) for public recreation, public for-fee golf and private residential development. The sponsor would be the Public Works Authority of Osage County, a trust authorized under Oklahoma statutes. The advantages of the trust as a sponsor are that it can issue revenue bonds and that it can enter into long-term leases to support public activities. With the recent election of two County Commissioners, the trust was created and a consultant retained to negotiate for the lease of lands.

The proposal for Osage Park involves development of 47 acres for general use recreation, including boat ramps, a swimming beach and picnic and camping areas, and 53 areas for residential development. Recreation site preparation and facilities would cost $870,000. Residential site preparation and construction would cost from $11.8 million to $14.1 million for five to six units per acre.

The proposal for Twin Points involves 27 holes of for-fee public golf and a golf clubhouse occupying 186 acres and costing $2.6 million; 135 acres of public recreation, including boat ramps, a swimming beach and camping area and costing $820,000; 146 acres of residential development costing $25.2 million to $46.6 million; and a motel occupying 10 acres and operated by a commercial concessionnaire.

The trust would sign a 99-year lease with the Corps of Engineers. Residential lands would be subleased to a developer or developers which would in turn construct the housing, sub-subleasing the lands and selling the units. Recreation facilities would be developed beginning in the first phase at each of the two sites. Initial recreation capital costs could be financed by up-front payments from developer sublessees or by revenue bonds which would be paid off from sublease income. Subsequent recreation capital costs and operation and maintenance costs would be financed by income from the residential subleases.

In effect, recreation costs would ultimately be financed by the purchasers of residential units, at no cost to the Corps or the trust. The Corps would exercise quality control by approving designs and plans, reviewing financing plans and upholding "hold harmless" provisions in the lease agreements. While the proposal from the trust has not yet been accepted by the Corps, it is an example of creative financing which would capitalize on the value of reservoirs to recreation users and beneficiaries.

LOCK HAVEN, PENNSYLVANIA

After the 1936 flood of record, four reservoirs were built on the Susquehanna River upstream from Lock Haven, Pa. Although these reservoirs reduced flood inundation in the 1972 Agnes flood by 3.5 feet, the city was nonetheless inundated by 11 feet of water during that flood. Local protection was called for. A local flood protection plan was developed which would cost $80 million and would include nearly six miles of levees and floodwalls.

In 1980 the Baltimore District of the Corps of Engineers completed the Phase I general design memorandum. By 1982 local governments and two major industries had formed the Flood Protection Planning Board and had hired a program director. By early 1983 the City of Lock Haven and Clinton County had each signed a letter of intent to share project costs and to finance their shares. Completion of design under the Corps' Continuation of Planning and Engineering program is targeted for 1987. Authorization of the project is needed.

Lock Haven and Clinton County now realize that the local protection project is a vital part of their efforts to revitalize and stabilize the area's economy. For instance, a proposed enterprise development zone would encompass the entire project area. At the same time, however, these units of government must rely on an eroded property tax base to finance their share of project costs.

The Pennsylvania Department of Environmental Resources has traditionally contributed half of the non-Federal costs for lands, easements, rights of way and relocations for Federal projects. These funds were appropriated from the general fund, and ranged up to $1.3 million per year. However, this method of funding is not feasible when the non-Federal cost share for just one project is tens of millions of dollars, as it would be for Lock Haven under the Army's cost sharing policy. In fact, under this policy the total non-Federal cost share for Corps projects now pending in the Commonwealth of Pennsylvania is on the order of $300 million.

One alternative available to the Commonwealth is to float project-specific general obligation bonds; however, the State would have to own and operate the project.

A second alternative is the complex process of referendum bonding. The steps take 18 to 24 months, and are as follows: a joint resolution is passed by both houses of the Legislature and signed by the Governor; the referendum is scheduled for the next primary or general election; if the referendum is approved by the voters, enabling legislation is passed and signed; the bond issue is planned and marketed. Political factors must be taken into account in the design of the referendum so that the projects to be funded have widespread appeal; this can lead to "Christmas tree" referenda. Finally, even if the project is approved by the voters and authorized, the issuance of debt must be scheduled with other capital needs according to what the market can bear so that the Commonwealth's credit rating is maintained.

Assuming that the Commonwealth can provide half of the non-Federal share, the City and County must still provide $10 million or more in cash and land rights for construction, and must find a source of funding for operation and maintenance. In anticipation, the City has retired its debt and is now debt-free. In addition to bonds, a multitude of possible funding sources have been identified, including grants from the Department of Community Affairs; Urban Development Action Grants; small communities funding; donations of easements, rights of way, buildings, lands and construction materials; recreation grants; and in-kind services. For the City and County to fully utilize these alternative sources, the statutory restrictions governing credit which sponsors receive for investments prior to construction need to be relaxed. The current restrictions limit creditable expenditures to $1 million and require that those expenditures be made after project authorization by Congress.

The efforts of the Flood Protection Planning Board to exploit multiple sources of funds for financing the non-Federal share is an excellent example of creative financing and intergovernmental cooperation.

SUMMARY OF WORK GROUP PROCEEDINGS, QUESTIONS TO SPEAKERS AND OPEN DISCUSSIONS

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SUMMARY OF WORK GROUP PROCEEDINGS, QUESTIONS TO SPEAKERS, AND OPEN DISCUSSIONS

At each of the four regional Water Project Financing Workshops, the participants took part in work groups to share project financing problems and experiences and to discuss possible solutions. Workshop participants were also able to ask questions of each speaker during the technical program. Near the end of each workshop, the moderator led an open discussion period for the entire session.

There were several major recurrent themes highlighting the discussion in these three forums. For instance, nearly all discussion groups expressed concern about the importance of finalizing the Federal cost sharing rules for water projects, and there was overall agreement that many changes must be made in the traditional ways of doing business in the water resources development arena. This section, however, attempts to summarize the more specific problems, solutions, and concerns repeatedly suggested by the workshop participants.

COST SHARING AND FINANCING POLICIES

Some work group discussion and open discussion focused on overall Federal cost sharing and financing policies. Some participants believed that flexibility is needed in the cost sharing provisions themselves, but with consistency across agencies to eliminate "shopping around." One suggestion was to use both national economic development (NED) analysis and regional economic development (RED) analysis to determine the cost shares to be borne by the Federal government and the local sponsor.

Major General John F. Wall reiterated the Corps' position that the cost share for each project purpose should be consistent across economic circumstances. He believes that a cost sharing policy which takes each sponsor's ability to pay into account would be difficult to implement because it would create contention. Instead, flexibility will be employed in the financing arrangements: the Federal government would finance certain less-than-fully-vendible outputs and require repayment at the interest rate of long-term Treasury obligations if the sponsor cannot find more favorable financing in private capital markets. In effect, the Federal government would shoulder the financial risk of lending to sponsors with limited ability to pay.

Cost shares for project additions and modifications were also discussed. To many, it is unfair that the Federal government require repayment for its existing assets as part of the local cost share. They argue that the original benefits have been achieved and that the original project is fully depreciated; consequently, sunk cost should not be recovered. Others feel that marketable goods, regardless of whether the original investment has been retired, should be priced at a near-market price in order to cross-subsidize the production of non-vendible goods or to promote conservation. One work group recommended that this issue be resolved by Congress.

COST RECOVERY AND FINANCING CONSIDERATIONS AND CONSTRAINTS

The Future of the Tax-Exempt Bond Market

For many workshop participants, the workshops were an introduction to the tax-exempt bond market. Because the interest on State and local bonds is exempt from Federal taxes, interest on these bonds is generally lower than on corporate bonds. Because this advantage is shared by all public debt, it does not distort choices among public investment as would a targeted subsidy. The legal basis for the tax exemption of State and local government bonds is "reciprocal immunity," under which the Federal government and State and local governments do not tax each other.

Concern was expressed about the future of the tax-exempt bond market in light of proposed changes in the tax laws. Participants from the financial industry felt that the use of these bonds for some purposes may be limited, but that elimination for traditional public purposes such as water delivery is highly unlikely. According to George D. Friedlander of Smith Barney, Harris Upham and Co., a proposal which drastically reduces public borrowers' access to the tax-exempt bond market would probably be challenged on constitutional grounds.

Ability to Raise Funds

Much discussion focused on the difficulties encountered by sponsors which have limited jurisdiction or are revenue base or constrained by legal limitations in raising the funds to contribute to project construction and operation. There is also a widespread perception that many communities need assistance to obtain the best terms for their debt. The possibilities for sponsors to enhance their revenue bases or for States to assist these units of government were widely discussed.

According to many workshop participants, increased non-Federal cost-sharing and financial responsibilities will test the ability of poorer communities to finance their share of costs, especially for non-vendible project purposes such as flood control. For a community which has experienced adverse economic conditions or flood-induced property devaluation, the decline in the local revenue base reduces the community's borrowing power.

A number of financial advisors and investment bankers present in the work groups advised that small communities without a track record but in good financial condition may be able to issue general obligation bonds without too much difficulty. They may, however, have to pool their debt with other small communities or buy insurance to get a favorable interest rate. The more innovative techniques may not be available to these communities.

Sometimes communities which would otherwise have the borrowing power face legal barriers to raising the necessary funds. For example, many States require local governments to abide by debt and tax limitations that may not reflect the sponsor's financing capability.

Another difficulty in issuing debt is that the cost of bringing a bond issue to market is very high. This is especially true of revenue bonds, for which extensive documentation is required.

A number of revenue raising devices were suggested. First, special tax districts or taxing authorities can be created. For example, the Miami Conservancy District was empowered to assess properties for flood damage reduction benefits received; a simple sliding scale for assessments was adopted based on damages sustained in the 1913 flood. Second, revenues could be collected from secondary beneficiaries, such as property owners whose assets are made more valuable as a direct result of a public investment. Examples are properties adjacent to reservoir recreation lands or to a beach erosion control project. Finally, if equity becomes an intractable problem, it provides a legitimate basis for increased use of general taxes on property, sales or income.

Many work groups concluded that States are going to need to become more active in assisting sponsors to finance projects and to reduce their financial risks. States can provide technical assistance to communities with limited market experience by defining financing options or negotiating for the best financial terms. States can consider modifying debt and tax limitations, or can help sponsors to understand and adjust to them. In addition, States can provide financial assistance to communities with financial constraints through a variety of techniques. These include bond banks, which purchase local government bonds and pool them as collateral for the bank's own bonds, and revolving loan programs or guaranteed loan programs, perhaps involving interest subsidies. Finally, States can act as project sponsors themselves.

Long-Term Economic Return Versus Short-Term Financial Repayment

The financing of water project outputs, particularly nonvendible outputs such as flood control, is made difficult by the long-term payback of the outputs. Even though the benefits of a flood control project may not begin to accrue immediately, the Army's financing policy requires that the funds be made available during construction. If the source of these funds is bonded indebtedness, the bonds must be paid back in 20 to 30 years even though the project's life may be 50 years or more. Debt service on the bonds used to finance these up-front costs appears prohibitive to many workshop participants, even though the Federal cost share would still be as much as 65 percent.

Several possible solutions were suggested for projects whose benefits grow over time. First, financing can be structured to delay debt service payments, for example, by capitalizing the interest or construction, or by including deep-discount bonds in a bond issue. A second suggestion for easing the immediate financial burden is to design the project to be built in stages; bond sales can be scheduled to coincide with construction increments, thereby lessening the cash needed at the outset. Third, non-vendible project purposes can be cross-subsidized by surplus revenues raised by charging market-based prices for the products's vendible goods. The cross-subsidy may both meet equity objectives and assist in alleviating financing constraints. This

strategy is used by the Bureau of Reclamation in its basin accounts for irrigation and hydroelectric power. Finally, it was suggested that States operate relending programs, under which the States would borrow funds with a 20-year payback and lend them to local sponsors for repayment over 50 years.

Privatization

In privatization arrangements, private interests can build and/or operate and maintain a publicly-owned facility, or can own the facility themselves.

By taking advantage of provisions in the tax code and construction economies available to the private sector, privatization can drive down the cost of services by 30 percent, according to Ted Swick of Prudential-Bache Securities, Inc. This information needs to be communicated to the public at the outset to help build widespread community support. Public acceptance is important because sometimes there is resistance to public projects from which investors will make a profit.

Numerous questions and concerns about privatization were raised. In response to one question, Mr. Kevin G. Quinn of Alex. Brown & Sons, stated that State or Federal money cannot be used in these privatized projects unless there is some statutory authority for it, and that projects involving privatization must be broken down by component parts to separate the portions financed with public funds and operated as a traditional public enterprise.

A second concern is ensuring adequate performance when the facility is privatized. Performance assurances can be achieved through privatization contracts which spell out enforceable performance requirements. As a final recourse, a unit of government with the power to eminent domain can use it to protect public health and safety.

PLANNING AND PROJECT ANALYSIS

The use of financial and economic analysis in planning was one major item of concern in the discussions. While there is no doubt that financial feasibility will be a major factor in future decision-making, there was disagreement about the relative importance of the two types of analyses.

The financial markets require assurances of a project's financial viability that address issues very different from those addressed in the typical benefit-cost framework. Economic analysis is not independent of financial analysis. For instance, economic analysis can be used to identify beneficiaries in the design of a cost recovery strategy. As another example, economic analyses can be provided in the planning process to non-Federal interests as a basis for their financial and other evaluations. Nonetheless, the two should be kept separate, according to Dr. Leonard Shabman of the Office of the Assistant Secretary of the Army for Civil Works. For instance, the World Bank analyzes project feasibility from both standpoints. According to Dr. Shabman, economic analysis can be used to identify the best course of action, and financial analysis to assess the feasibility of putting the plan in place.

A further difference between economic and financial feasibility is that financial feasibility is affected by conditions in the financial markets. However, during project planning, certain basic assumptions about financial methods and interest rates can be made, according to Ted Swick of Prudential Bache Securities, Inc. Consideration of what a community can afford should not be burdened by fluctuations in short-term conditions, but when the time comes for marketing debt, the optimal financing plan can be selected.

One of the most commonly heard opinions was that financial analysis of plans and of sponsors' financing capabilities should be performed early. Sensitivity analyses were recommended to determine the range of financially feasible projects, but many thought that overemphasis on this analysis might be harmful to social and environmental concerns. However, there may be financially creative ways to alter private incentives to encourage investment which contributes to these concerns.

Early financial analysis can help to determine whether regional solutions offer significant economies of scale. If benefits are spread throughout several different jurisdictions, the merits of creating an intergovernmental entity may be evaluated. It can be difficult, however, to negotiate an agreement on the allocation of cost shares.

Another concern was the role of the Corps of Engineers in financial analysis. There was divergence of opinion. At one extreme, some felt that the Corps should limit its activities to providing engineering and economic expertise; they reasoned that since non-Federal entities are responsible for paying for a project, those entities should be the ones responsible for conducting the financial analysis. Others thought that the Corps should enlarge its study process to include evaluation of the local sponsors' financial capabilities, but many questioned the Corps' capability, in terms of both manpower and expertise, to do this work.

At the other extreme, some felt that the Corps should fulfill one role of the independent consulting engineer, namely, "certifying" to the financial community that a project is viable. This could reduce the sponsor's front-end costs for floating debt. However, since the Corps would be responsible for constructing the project, there may be a conflict of interest in the eyes of the financial community. According to John E. Cheney, of Alex. Brown & Sons, Inc., the consulting engineer is "an independent party who is paid to be objective about the project costs and the feasibility of the project. He does not represent the purchaser of the bonds or user of the project." According to Major General John F. Wall, Director of Civil Works, the Corps may nonetheless need to recast its feasibility studies so that they are understandable to the financing industry and help to assure that the project will deliver as planned.

A final planning concern involved the management of a cost-shared planning process. How will in-house services contributed by planning sponsors be identified and assigned a value? Can planning sponsors receive credit for in-house financial analyses? How will planning sponsors make sure that their funds are being spent wisely by their Federal counterparts? The answers to these questions are not yet clear, but there is a willingness on the part of the Corps leadership to discuss unresolved issues.

PLAN FORMULATION

Design Standards and Acceptable Risk

Largely because they may increase costs, Corps of Engineers design standards were widely discussed. It was noted that the issue of acceptable risk is currently a matter of public policy debate across the various missions and levels of government. In fact, the Corps is currently participating with other Federal agencies in a study of dam safety risk assessment to address this issue.

Some participants felt that design standards are too inflexible and prohibit the Corps from designing projects which address local needs and conditions. An example was cited of an urban area which needed protection from frequently recurring floods which were of little threat to life and safety; although the project was feasible, the Corps' requirements for freeboard allowances and other measures to prevent project failure placed the project's costs beyond local capability or willingness to pay.

On the other hand, others felt that there is some flexibility in design standards, but that the Corps' Engineers should not be expected to design a project that violates their professional judgment of risk. At the least, a mutually acceptable treatment of risk can be negotiated and included in plans which are recommended for authorization.

To the extent that there is latitude in design standards, it would be difficult to reconcile competing Federal and non-Federal priorities in project design. For instance, the size of the spillway on a multipurpose reservoir is important to the recipients of downstream flood protection because it determines the risk from a possible overtopping. The larger the spillway, the less chance of catastrophic disasters. On the other hand, those who are financing the dam for water supply or hydropower very likely will not be the ones receiving the flood protection, and will desire to maximize the vendible outputs. Negotiating among these interests will be a difficult challenge.

The NED Criterion and Non-Federal Concerns

Many work groups reiterated the need to make optimal use of project sites. This principle is embodied in the Principles and Guidelines (P&G) for water planning, which call for maximizing national economic development (NED) benefits in excess of NED costs, subject to Federal requirements for environmental protection.

Nonetheless, there was also widespread concern that the Corps of Engineers be more receptive to the concerns of local sponsors and State officials as the project components and purposes are decided upon. There was widespread concern that the P&G or other requirements limit the Corps' ability to design projects that are acceptable to non-Federal interests. Naturally, since non-Federal interests are required to pay more, they wish to have greater input into the

project design process. State or regional priorities my differ significantly from Federal priorities, and the local importance of project benefits may differ from the value assigned in analysis under the P&G.

Early and significant involvement of sponsors in planning will enable the planning partners to focus on what is a good mix between local needs and the Federal NED plan. One possible outcome is the inclusion of particular project features, such as recreation add-ons, which are not justified under Federal guidelines.

A second possible outcome is "affordable" small-scale or single-purpose projects. Dr. Robert Leone, of Putnam, Hayes and Bartlett, argued that "the incentives for smaller scale projects....lead to greater economic efficiency. But the incentives towards single purposes or projects which.... strictly have vendible outputs leads to less economic efficiency. After all, it attacks the fundamental rationale for Federal and governmental projects in the first place." Some participants agreed that the Corps of Engineers should be authorized to implement single-purpose projects because such projects are responsive to non-Federal concerns and because the Federal agencies can provide a technical pool of expertise unavailable in many States.

AUTHORIZATION AND FUNDING

Another major problem facing project implementation is the long elapsed time from feasibility study, to project authorization, to project construction. During this period, inflationary effects can increase costs, and the agreed-upon plan may be modified in the Federal review process or in response to changed economic conditions. This is largely a problem of Federal/non-Federal relations; the financing community can adjust to these changes as long as the benefits and revenues are secure.

Suggestions to accelerate authorization include the use of Section 201 of the 1965 River and Harbor Flood Control Act, under which projects costing less than $15 million and complying with existing law may be authorized by the House and Senate Public Works Committees rather than by the full Congress. This dollar limit could be expanded to reflect today's costs. Expanding the dollar limit of the Continuing Authorities Program ("Small Projects Program") is another suggestion. Under this program the Chief of Engineers has the discretion to plan for and construct small projects, for example, flood control projects for which the Federal cost is less than $4 million, or navigation projects for which the Federal cost is less than $2 million.

While awaiting Federal authorization or funding, non-Federal sponsors may wish to make investments which contribute to ultimate implementation. One problem from their standpoint is that they receive credit for the investments only after Congressional authorization of the project and only up to a limit of $1 million.

Another funding problem which was widely discussed was the need to coordinate Federal and non-Federal funding schedules. Such coordination is difficult because Federal and non-Federal budget and funding cycles differ and

because future appropriations are uncertain. The uncertainty surrounding funding could be lessened if projects were fully funded by the Federal and non-Federal participants at the beginning of construction. Sponsors could place their funds in an escrow account, to be released when Congress appropriates its share.

PUBLIC AWARENESS

Water projects will face increasing competition with other types of public works expenditures for the scarce investment dollar. One of the most common concerns expressed was the need to educate the public-at-large and political leaders on the importance of water projects and the growth of non-Federal financial responsibilities. The Corps of Engineers, which cannot actively market its services and projects as the private sector does, may extend its efforts to encourage early public involvement and cultivate more widespread support in accordance with the direction given by Congress and the Executive Branch. States can also assist sponsors to develop public support for projects and their funding. An investment banking firm, when it is acting as both financial advisor and underwriter in a negotiated sale, has an interest in bringing a project to fruition and will actively participate in a public education program as well.

SUMMARY OF RESPONSES, WORKSHOP QUESTIONNAIRES

SUMMARY OF RESPONSES, WORKSHOP QUESTIONNAIRES

This chapter is a summary of the questionnaire results from the four workshops. The chapter is broken down into six parts.The issue ranking summarizes the results of a questionnaire filled out prior to the workshops. The following is a breakdown of pre-workshop respondents by agency affiliation:

51	Federal Field
68	Non-Federal
4	Interstate
35	State
29	Substate
12	Federal Headquarters
7	Other
138	Total

The remaining sections describe the results of a more detailed questionnaire completed after each workshop. The following is a breakdown of post-workshop respondents by agency application:

74	Federal (Field and Headquarters)
38	Non-Federal
4	Interstate
19	State
15	Substate
7	Other
119	Total

ISSUE RANKING

Prior to each workshop, the attendees ranked the following issues by importance:

- o Project cost sharing
- o Project financing (timing and methods of providing funds)
- o Sharing of costs/effort in project planning

Among the respondents representing Federal and non-Federal units of government (the few responses by academics, consultants and investment bankers were separated), 45 percent believed project financing to be the most important issue, 35 percent project cost sharing, and 20 percent sharing of planning costs. 44 percent thought that sharing of project planning costs was the least important issue of the three. Results are as follows:

	Rankings:		
	1	2	3
Project cost sharing	35%	36%	29%
Project financing	45	28	27
Sharing planning cost	20	36	44

After careful analysis, the respondents were grouped by affiliation into three groups: Federal Headquarters, Federal Field and Non-Federal. Federal Headquarters and Non-Federal respondents ranked the issues generally as follows: 1) project financing; 2) project cost sharing; 3) sharing planning cost. Federal field respondents, however, ranked project cost sharing as most important, with project financing and sharing planning cost of approximately equivalent secondary importance. Regional differences among responses could be attributed to differing proportional representation by Federal Field respondents.

ROLES IN FINANCIAL PLANNING AND IMPLEMENTATION

Respondents were asked to identify the appropriate principal roles of the Corps, States, sponsors, consultants and financial advisors in (a) developing financial information and analyses during planning, and (b) developing and implementing a financing approach.

The consensus was that ultimate responsibility for the financial arrangements rests with the project sponsor, but that the Corps of Engineers should provide analytic support.

Corps of Engineers

Many respondents (52) believe the Corps should provide analytic services including cost estimates, technical advice, and feasibility studies. Sixteen respondents felt that the Corps should take the lead role in developing financial analyses. Only three felt that the Corps has no role in financial analysis. As for implementing a financial package, many (46) also felt the Corps should provide a support role, whereas only two said it should take the lead, and ten said there was no role for the Corps.

State

Nine respondents stated that the States should take the lead role in developing financial analyses and seven said that State should take the lead role in implementing the financial package. Advisory roles were also stressed for the States. Some felt the States should act as sponsors or co-sponsors. Many felt that State budget and community development agencies should make assessments of financial capabilities. Revolving and guaranteed loan programs were mentioned as forms of State assistance.

Local sponsors

Most respondents indicated that the local sponsor should take the lead role in implementing the financial package, since it is responsible for financing the project. The sponsor also needs to provide information necessary to develop financial analyses. Many feel that the appropriate State should become more involved if the local sponsor is unable to provide the leadership needed.

Consultants and Financial Advisors

Most of the respondents believe that outside financial advice is necessary throughout the planning and development process.

USE OF FINANCIAL ANALYSIS

Asked to indicate at what point financial analysis should begin, more than three-quarters of respondents replied that the analysis should begin when plans are formulated or screened. Replies were as follows:

	Federal	Non-Federal
Formulation of plans	41 (56%)	18 (47%)
Screening of plans	14 (19%)	12 (32%)
Evaluation of final candidate plans	11 (15%)	5 (13%)
Selection of a plan	3 (4%)	3 (8%)
After planning is completed	5 (6%)	0 (0%)

Respondents were asked at what point in the planning process financial analysis is needed for decision-making. They could mark more than one answer. The results are as follows:

	Federal	Non-Federal
Formulation of plans	24 (33%)	14 (37%)
Screening of plans	27 (38%)	13 (34%)
Evaluation of final candidate plans	31 (43%)	17 (45%)
Selection of a plan	28 (39%)	21 (55%)
Allocation of financing responsibilities among Federal and non-Federal interests	14 (19%)	9 (24%)

Only one-third of the respondents felt that financial analysis is necessary for decision-making at the earliest stages of planning, even though about half believe that financial analysis should begin during plan formulation. Many respondents contend that financial analysis will force the affordability question at the outset, resulting in a project scoped to be more responsive to local needs and not necessarily the NED plan.

Respondents were asked whether financial feasibility should count more than economic efficiency in plan screening and selection. Responses are as follows:

	Federal	Non-Federal
Greater role for financial feasibility	24 (33%)	22 (60%)
Lesser role for financial feasibility	29 (40%)	6 (16%)
Equal roles/both considered	19 (27%)	9 (24%)

The responses of non-Federal attendees seem to reflect the attitude that economic efficiency makes little difference if the project can't be implemented. Federal respondents seemed more concerned about optimizing use of a site and complying with the Principles and Guidelines (P&G). Many Federal respondents felt that projects should not be built simply because they can be paid for but are economically inefficient or involve lowered engineering standards. Arguing that many outputs from public works projects are not easily paid for from benefit-generated revenue streams and that there are good arguments about where the economic/financial priority may lie, many respondents held that the two analyses are of equal importance, or at least that both should be taken into consideration when decisions are made.

ISSUE ANALYSIS

The answers to four interrelated questions were analyzed to identify recurrent themes. The questions are as follows:

- Briefly State your views regarding both the short-term term and long-term implications of increased non-Federal cost sharing and financing responsibilities for water development projects.

- For a particular water project, what would be the major difficulties in coordinating the actions of the Corps of Engineers, the non-Federal sponsor(s) and other parties to finance and construct the project? Major opportunities?

- Please specify what you consider to be the principal barriers to financing new water projects under existing authorities. For each barrier, specify the action or actions needed to remove the barrier. For each action, specify the level or levels of government which should take the lead responsibility.

- What new opportunities may be created by the above actions?

Summary statements were prepared which paraphrase a number of individual responses of closely related content. (In some cases a complex response may be paraphrased by two or three summary statements.) The summary statements were

then classified into seven broad categories. The summary statements are presented below with numbers at the left representing the number of responses or partial responses paraphrased.

Level/Pace of Water Resources Planning and Investment

31 - In the short term, the outlook for water development projects is not good. Development will proceed slowly while adjustments are made to new conditions.

23 - New methods or sources of funding may break the log jam of authorized new starts and give the Corps a more active role in water development than in the recent past.

22 - In the long term, there will be a slowing of water resource development and many good projects may be delayed or not implemented.

8 - Cost sharing of studies will decrease the number and quality of studies completed because of non-Federal unwillingness to pay.

6 - Projects with high benefit-cost ratios will still be implementable.

3 - The impact of increased cost sharing for water projects will depend on the terms enacted by Congress.

Roles and Interrelationships of Federal and Non-Federal Interests in Planning and Implementation

40 - Since State and local involvement in the planning process must increase, the management of relations between levels of government will be more complicated. The prospect for a "new partnership" presents an opportunity to achieve closer cooperation.

40 - The Corps of Engineers needs to be a resource not only for its engineering expertise but also for helping sponsors to obtain financial assistance.

33 - Federal involvement will be increasingly limited to technical assistance. As the Federal role diminishes State involvement will become more important in meeting local needs.

23 - There is currently confusion regarding Federal, State and local roles in water development. Who should be the sponsor? Who takes the lead?

Non-Federal Financial Constraints

34 - Over the long term, many innovative financing techniques (or new sources) will be developed to fund water projects.

22 - Legal debt and tax limitations are a barrier to financing and must be addressed at State and local level.

21 - Water development projects will increasingly be directed to those areas where cost sharing and financing can be achieved. Wealthier communities will do better; the poorer may suffer.

15 - In the short term, it will be extremely hard for local sponsors to obtain financing.

10 - There is a need to make the cost sharing and/or financing provisions flexible according to ability to pay.

Characteristics of Future Projects; Planning Considerations

46 - Planning and design of projects will be more cost-effective and responsive to non-Federal concerns.

37 - Changes must be made in Federally mandated planning procedures and technical criteria.

20 - Non-Federal financing will heavily impact the scope of projects, and the net result will be fewer, smaller, limited purpose projects.

18 - Early consideration of financial capability and community concerns should lead to a shortening of the water development time frame.

17 - Increased cost sharing will result in the slowing of projects with non-vendible outputs; i.e., the priority will shift to projects yielding vendible products.

4 - Interstate compacts make projects more efficient.

4 - There will be difficulties in reformulating authorized projects that become subject to new cost sharing requirements.

4 - Regional economic development must be addressed in planning.

3 - Much more financial data will be necessary in the beginning of the planning studies.

3 - Negotiating a mutually acceptable plan will be difficult for the parties involved.

2 - The Corps of Engineers needs authorization to study non-traditional project purposes or single-purpose projects.

2 - Sharing of planning costs will result in efforts to solve short term, crisis-oriented problems at the expense of finding long term solutions.

2 - Even though the Federal share of costs will be smaller, it does not necessarily mean that the project will be less costly.

2 - There is an opportunity to lower Federal costs.

Authorization, Funding and Implementation

47 - The Corps needs clear legislative direction before the water development impasse is resolved.

33 - It will be difficult to coordinate State and Federal actions. The timing of appropriations from different governments will seldom coincide.

8 - There is an opportunity to develop a new system (outside of traditional politics) to build sound water projects.

2 - Interstate compacts will be difficult to achieve.

Public Education and Political Support

14 - When the local financial support is increased, there will be more unified local support for a water project, and after a plan is agreed upon, there will be a better chance for authorization.

9 - The importance of water development (e.g., the risks of flood damage) is not well perceived by the public; therefore public education is needed to convince the public of the need to finance projects.

5 - Efforts should be made to broaden the political support for water development because it is in the Federal (public) interest.

FOLLOW UP ACTIONS RECOMMENDED

Respondents were asked to identify follow-up activities which they felt should be conducted.

Fifty-three respondents supported the development of a financing handbook. The numbers of respondents supporting particular applications were as follows:

The Corps in working with States: 44
The Corps in working with local governments: 45
The States in working with the Corps: 29
The States in working with local governments: 26
Local governments in developing projects: 33

Other suggestions included sub-regional workshops, feedback from the Office of the Chief of Engineers on successes, applied research, and exposure of Corps study managers/engineers to financial analysis.

Among potential applied research topics, equity issues and the determination of financing capability were mentioned most often. Other research ideas included long term impacts of policy changes, real budget

implications of current policies, the suitability of current Corps authorities in light of increased cost sharing, financing mechanisms, timing of payments, cooperative research on projects; and guidelines to incorporate financial analysis in project planning.

Some respondents mentioned that clarification was needed on many policy issues, especially what the Federal cost sharing policy should be and how flexible such a policy should be.

SUMMARY

The comments made by the questionnaire respondents represented a broad range of opinions. The statements below summarize some of the major themes which were addressed in questionnaire responses:

- The Corps should provide financial analyses and advice, but the sponsor is responsible for developing and implementing a financing plan.
- Financial analysis should begin early in the planning process.
- New financing and cost sharing requirements will reduce the number of plans developed and the level of water resources investment.
- Better coordination among the Corps, States and sponsors is needed.
- Financing of water projects will challenge sponsors' ingenuity, but over time effective financing methods will be devised.
- In the future, projects will be scoped and formulated to be more responsive to non-Federal concerns, financing capabilities and criteria.
- The coordination of funding timetables will be a challenge.
- The Corps needs clear legislative direction on cost sharing and financing.
- Public awareness and support of water resource development is needed.
- A financing manual is needed for the Corps, States and sponsors.

APPENDICES

APPENDIX A

GLOSSARY OF TERMS*

Ad Valorem Tax:	A tax based on the value (or assessed value) of property.
Adjustable Rate Bond:	A bond for which interest paid is adjusted periodically by the issuer to reflect changes in market interest rates.
Arbitrage:	Use of bond or note proceeds financed at tax-exempt rates for reinvestment at higher taxable rates. Vigorously regulated by the Internal Revenue Service.
Basis Point:	1/100th of 1% in bond yield or interest rate. The difference between 10% and 10.25% equals 25 basis points.
Bond:	A written promise to repay a debt at a specific date or maturity with periodic payments of interest (customarily every six months).
Bond Anticipation Note:	A note which the issuer intends to refinance with a bond.
Bond Bank:	A state-chartered organization which purchases the bonds of local governments and secures its own debt with the pool of local bonds.
Callable Bond:	A bond which is subject to redemption prior to maturity at the issuer's option.
Compound Coupon Bond:	A bond for which payment of interest is not paid on a regular basis but is deferred and compounded until the maturity date of the bond.
Conditional Sale Lease:	A lease in which the lessee has the option of applying lease payments to purchase of a facility for a bargain price. The lessee is owner for tax purposes. For public lessees, also called a Tax Exempt Lease.

*Courtesy of John Nuveen & Co. Inc.

Coverage:	The ratio of project revenues (net of operating and maintenance costs) to debt service payable in a fiscal year.
Covenants:	Specific provisions contained in all bond resolutions and trust indentures of an issuer to assure maintenance of continued financial and operating performance.
Credit Risk:	Risk of default.
Credit Support:	Guarantee of debt and timely payment of principal and interest provided by third party (bank or insurance company) in return for a fee. Also called Credit Enhancement.
Debt Limit:	The statutory or constitutional limit on the amount of debt a municipality may issue or have outstanding. Also called a Debt Ceiling
Dedicated Tax Bond	A bond secured by pledge of the revenues from a particular tax source.
Debt Service:	Required payments for principal and interest for retirement of a bond or note.
Default:	Failure to pay principal or interest when due.
Demand Bond:	A bond which the holder may at his option "put back" or "tender" to the issuer prior to maturity. Also called Put Bond or Tender Option Bond).
Discount:	The amount, if any, by which the principal amount of a bond exceeds the market price.
Double Barrelled Bonds:	Bonds secured and payable from both project or system revenues and taxes or general revenues.
Financial Plan:	An approach to financing capital improvements which optimizes the sponsor's funding sources and uses of capital from the standpoints of cost, risk and financial flexibility.

Fixed-Rate Bond:	A bond for which the interest rate paid is fixed from the date of issuance to final maturity.
General Obligation Bond:	A bond secured by pledge of the issuer's full faith, credit and taxing power.
Industrial Development Bond (IDB):	A bond secured by pledge of lease revenue from publicly-owned industrial facilities. Also called Industrial Revenue Bond (IRB).
Insurance:	A guarantee of timely payment of principal and interest by an insurance company. Municipal bond insurers are AMBAC, MBIA and FGIC.
Interest Rate:	The interest payable each year, expressed as a percentage of the principal amount.
Interim Financing:	Short term financing of project development and construction.
Lease:	A contract under which a lessee agrees to make periodic payments to a lessor for use or benefit of a facility.
Letter of Credit:	Contractual obligation by a bank to pay principal and interest in the event of issuer default. Bank is usually AA or AAA-rated.
Liquidity Risk:	Risk of a cash shortfall; in particular, risk that cash will not be on hand to redeem bonds tendered by bondholders.
Liquidity Support:	Contractual obligation (by a bank or insurance company) to assure refinancing of bond or note principal upon demand by a bondholder at maturity.
Market Risk:	The risk to bondholders that changes in prevailing market interest rates will adversely affect the price of the bonds they hold.
Maturity:	The date when the principal amount of a bond is due and payable.

Note:	A written promise to repay a debt and interest thereon at a specific date or maturity, usually short term (one to three years).
Official Statement:	A document prepared by a financial advisor or investment banker describing the legal and financial terms of a financing and pertinent financial, economic and engineering information about the issuer and the project. It is used to offer bonds to investors.
Original Issue Discount Bond:	A bond, repayable only at maturity, which bears a reduced interest rate and is sold at a discount to provide a return to the investor. Also called "Capital Appreciation Bonds" or "Deep Discount Bonds."
Par Value (or Principal):	The face amount of a bond, usually in $5,000 denominations.
Premium:	The amount, if any, by which the price exceeds the principal amount of a bond.
Rating:	A designation used by analysts in investor's services to represent the relative quality or credit worthiness of a bond issue. Moody's ratings range from the highest, Aaa down through Aa, A, Baa, Ba, B, etc. Standard & Poor's uses the symbols AAA for its highest rating, then AA, A, BBB and BB, etc.
Rate Covenant:	A trust indenture to maintain rates and charges sufficient to pay all operating and maintenance expenses, annual debt service and reserves and to provide a specific level of coverage.
Refinancing:	Repayment of a debt with the proceeds of a new debt instrument. Also called Refunding.
Revenue Bond:	A bond secured solely by a pledge of project or system revenues, without recourse to any tax support.
Secondary Market:	The trading market for outstanding bonds.

Serial Bond:	A bond of an issue which has maturities scheduled annually or semi-annually over a period of years.
Sinking Fund:	A fund accumulated over a period of time for retirement of debt.
Special Assessment Bond:	A bond secured by pledge of the revenues from payment over time of special assessments for local improvements.
Special Service Area Bond:	A bond secured by pledge of the revenues from a special service tax applied to a limited geographic area.
Take and Pay Contract:	A contract obligating a purchaser to pay for a good or service to the extent that it uses the good or service.
Take or Pay Contract:	A contract obligating a purchaser to pay for a good service whether or not it uses the good or service.
Tax-Exempt Commercial Paper:	Short-term debt, with maturities usually ranging from 15 days to 180 days, payable from revenues or refinanced by issuance of additional notes, bonds or paper.
Term Bond:	A bond of an issue which has a single maturity.
Trust Indenture:	The contract between bondholders and an issuer securing the repayment of debt. It sets forth how all moneys of issuers will be applied to pay operating cost,repaying debt, funding reserves and using surplus revenues and construction funds. The document also specifies all covenants of a issuer. The trustee represents the bondholders in assuring compliance with the terms of the indenture. Also called a Bond Covenants.
Variable Rate Bond:	A bond for which interest rate paid changes periodically according to a prescribed index or specific formula which reflects changes in market prices and interest rates.

Variable Rate Demand Note: A note with a variable interest rate which may be tendered by the holder prior to maturity. See Demand Bond, Variable Rate Bond.

Yield: The net annual percentage of income from an investment. The yield of a bond reflects interest rate, length of time of maturity and write-off of premium or discount.

Yield Curve: A graph which reflects the market yields on bonds of various maturities from 1 to 40 years. Typically, the yield curve "ascends", showing progressively higher yields on longer maturities.

Zero Coupon Bond: A non-interest bearing bond, repayable only at maturity, sold at discount to provide a return to the investor. The ultimate original issue discount bond.

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APPENDIX D

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