

## A Scenario for Innovation

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### Introductory Note

The real significance of the Grant and Co-operative Agreement Act for stimulating technological change depends on its impact upon major problem areas such as energy, transportation, housing, sewage treatment and so forth. However, any scenario which attempts to deal realistically with one of these major problem areas from the assistance perspective established by the Act would constitute a major undertaking in itself. Furthermore, it would be necessary to delineate the similarities and differences in the hypothetical scenario relative to actual past or current efforts.

To avoid these difficulties, a problem of more modest dimensions that has no significant history of past efforts to deal with it has been chosen. Thus, it is the approach to a problem from the assistance perspective, rather than the problem itself, which the scenario presented in this appendix is intended to illustrate.

### A Scenario for Innovation

This scenario for innovation illustrates how a Federal agency has worked to foster a quiet revolution in the administration of bonded indebtedness by county and municipal governments. The description is hypothetical, although the problem providing the driving force for the innovation is not. The purpose of the scenario is to provide a context in which the several types of transactions between Federal and non-Federal entities, introduced in chapter 111 of this report, may be better understood. Five major concerns are addressed here to develop the needed context. They are:

1. A description of a significant civil sector problem;
2. How innovation goals were established to solve the problem;
3. Alternative pathways to achieving the innovation goals;
4. The transactions undertaken to foster the innovation; and
5. Outcomes and evaluation.

### The Problem

The Urban Observatory Network, originally established by the Department of Housing and Urban Development (HUD) approximately 10 years ago, presently involves six organizations operating in cities with populations of 500,000 or more. These observatories bring specialized research capability to address urban problems—sometimes working independently; sometimes through the coordinated efforts of the network. The Denver Urban Observatory, along with its several planning functions, operates a federally funded Public Technology program that brings the problem-solving resources of organizations in the metropolitan area into contact with city problems. The cost of bond- and coupon-accounting was one such problem, examined and reexamined over a 2-year period.

In the City and County of Denver, for example, a staff of six persons, excluding supervisory personnel, verify and catalog some 30,000 interest coupons and 400 redeemed bonds each month. With inflation figured in, the personnel costs are estimated at \$2 million over the next 20 years. To further **aggravate** the Denver situation, the city charter requires that the physical record of all coupons honored be maintained indefi-

nately —because any interest or bond redemption claim is payable after maturity, regardless of when the claim is made. And all such claims must be verified. The value of storage space for retired coupons and bonds is estimated at \$400,000 over the 20-year period; a similar dollar estimate was made for the cost of work space required for the six persons.

In the face of ever-expanding indebtedness (the present long-term obligations are more than \$300 million), Denver's Director of Finance was concerned about how to reduce the cost of bond-and coupon-accounting. The Denver Urban Observatory was examining technical, legal, and financing issues involved in a potential solution to this problem, when a Department of the Treasury/Securities Exchange Commission study team examined the Denver situation as part of a national survey related to the same problem.

One of the consequences of recent Department of Treasury involvement in avoiding default on New York City's municipal bonds was broad exposure to the accounting and control practices of non-Federal entities during the retirement of bonded indebtedness. This exposure made it apparent that State and local governments often were incurring large and continuing expense simply by administering the payout of the interest and redemption of general obligation bonds and anticipation warrants.

The Treasury found that the finance department of most large cities in the United States maintains a separate clerical staff to account for redemptions and to verify and catalog the stream of coupons representing interest payments to the owners of "bearer bonds." This did not seem like an important city problem until it was realized that a \$20 million bond issue, with interest payments due every 6 months for 20 years, would force a city to account for some 160,000 to 900,000 coupons, depending on the bond denominations. The scale of the problem began to emerge when it was considered that a medium-sized city might have \$200 million in debt-financing being serviced at any one time, and that nationwide, the cities have some \$60 billion in long-term debt being serviced, using essentially the same labor intensive methods of 50 years ago.

The Treasury's Office of the Comptroller sought the advice of the Securities and Exchange Commission (SEC) concerning its understanding of this situation and its knowledge of past initiatives to help reduce the cost of servicing State and local indebtedness. Although these debt obligation issues are excluded from regulation by the SEC, it was aware of past efforts by local governments to improve on this system. The SEC also was aware of the fundamental stumbling block that frustrated these past efforts. The investment community generally asserts that the vitality of the local debt-financing system lies in the nature of "bearer bonds:" that is, bearer bonds are highly negotiable securities with interest payable to the person having possession of the bonds. This means that there are no transfer fees or registration necessary when such bonds exchange hands. It is this feature that makes the bonds attractive to many investors, as well as to the diverse governmental units issuing the bonds; it is precisely this feature that has made it impossible to introduce computer technology to aid in the management and control of bond redemption and interest payments. Coupons, for example, are redeemed on demand by the issuing jurisdiction and/or cooperating banks as the interest becomes due and payable. No one has discovered a way of simplifying the process without some form of registration for the bonds, a step that would change the basic character of bearer bonds.

The interaction between the Treasury and SEC led to the competitive award of a jointly funded study contract to a major accounting firm. The study was designed to obtain a clear picture of just how much it costs State and local jurisdictions to service and account for bearer bond payments. The Treasury Department **was** concerned because the banking system is so intimately involved in the redemption of bonds and in the payment of interest coupons, as well as in the provision of accounting services for certain local jurisdictions. The SEC was concerned because of the importance of municipal bonds in capital markets. In the face of increasing local reliance on bonded indebtedness as a means of funding capital improvements (it is growing at the rate of 10 percent per year), the possibility of reducing the cost of servicing this debt could have impor-

tant long-term advantages to local governments, particularly in their ability to retire these obligations. The costs of bond- and coupon-accounting were found to be extremely high.

The study found that about half of the Nation's local governments maintain internal staff for bond- and coupon-accounting (usually as a result of local charter requirements or State law). The other half of the governmental units or jurisdictions rely on the services of cooperating and correspondent banks to develop administrative records, in addition to handling the actual cash payments made to bond owners. There are important savings involved in allowing the banking system to provide the administrative records, because the coupons and redeemed bonds are handled only once (by the bank). But there is, of course, the associated loss of control over the redemption and interest payouts—a situation **not** permitted by the statutes of most large cities and some States.

While the Denver experience is typical of jurisdictions maintaining systems for bond- and coupon-accounting, the situation encountered in the banks providing accounting services to local governments is similar in many respects. The coupon redemption system is basically a manual system that is burdensome to the banks because of its labor intensity. Consequently, the study showed, the banking system would welcome any improvement in handling the coupons that also would help jurisdictions reduce the cost of internal control. An idea to address the family of constraints was needed.

### Establishing Innovation Goals

The Denver Observatory appeared to be well along in the development of an idea, and exploratory meetings were held by Treasury and Observatory staff. The idea focused first on the essential requirements for mechanizing the handling of coupons after redemption. It **was** necessary to unambiguously associate a coupon with a specific bond, the bond issue of which the bond is a part, and the date after which the interest payment represented is due and payable. A code was visualized to accomplish this, not unlike that now being used on the labels of merchandise at supermarkets. Such a code, if printed

on the **back** of the bonds and coupons, could be read with an optical scanner and the data obtained processed by computer if suitable bond- and coupon-handling equipment were also designed.

The question was: Who designs the code and guarantees that no two bonds would ever have the same code? Further, if this uniqueness can be assured, how could the system be phased into city finance operations? The Observatory staff envisioned that a new institution would have to be created, perhaps along the lines of the title guarantee company found in the real estate field. The company would provide the codes used in new bond issues, perform the accounting functions for a large group of cities on a subscription basis, and guarantee the cities that the system would perform over the life of a bond issue.

Treasury's Office of the Comptroller began to pursue the idea, not fully recognizing that its role should be one of a catalyst for institutional development and not that of the technologist. Certainly technology was needed, and its development for this application could be undertaken consistent with Treasury R&D mandates. The basic question regarding institutional development was, how does the Treasury help put some group into the bond guarantee business no matter how indirectly and not be open to criticism—even though public benefits (i.e., reduced costs) must be present for the venture to work in the long run? This was a very clear insight into the inherent tension between assisting in technological change and the essential questions of equity that are always present. This issue was considered to be so serious, however, the whole problem **was** put on the "back burner" for almost 1 year.

After almost a year, following the passage of the Federal Grant and Cooperative Agreement Act of 1977, the issue was reexamined in light of the distinction between Federal and non-Federal use of research results. A new perspective was gained by examining the reasons the private sector was not already providing this service. While the idea itself was significant, it also appeared that the most important single factor was the need to aggregate a market for the idea. Cities, for example, have different procedures and traditions that would have to be accommodated; the

promise of future savings is not necessarily the only criterion for adopting a technology. For this reason, the Federal role was determined to be one of supporting the aggregation of the municipal market through the development of detailed knowledge of city procedures and requirements, conducting a thorough demonstration of the concept, and in consultation with the SEC, developing guidelines for coupon coding. These guidelines were considered necessary to ensure that the coding concept, when used in conjunction with future municipal and possibly other types of bond issues, would conform to basic standards and not upset existing systems.

Even though new equipment was required, the Comptroller's Office was satisfied that it should be assumed 1) the technology resided within the capability of the manufacturing sector and 2) this capability could be directed to the problem through the workings of the marketplace, rather than through direct Federal support of R&D. Further, it was recognized that the consequences of fostering the introduction of this innovation should include private gains for "bond guarantee and accounting services" that might emerge from their initiatives. In fact, such gains are crucial to the change sought, and the challenge to the Treasury was really one of assuring equity rather than avoiding private gains.

### **Alternative Pathways To Achieve Innovation Goals**

With this rationale as a starting place, the Comptroller's Office began a series of planning conferences, bringing together the wide range of interests in bond- and coupon-accounting to develop a strategy. These interests included the American Bar Association, representing the law firms specializing in municipal bond issues, city finance officers, the National Association of Security Dealers, and the American Association of Commercial Banks. The initial meetings dealt with institutional issues almost exclusively, but the results were monitored closely by representatives of the electronic data processing trade media. This monitoring was encouraged as being essential to future involvement of manufacturing firms in the demonstration phase of the effort.

The broad outline of the program that emerged from these planning meetings was as follows:

1. A corporation was to be formed by the directors of the six Urban Observatories operating in major U.S. cities. The corporation was to be wholly owned by the Urban Observatory System, a corporation chartered in the State of California. The corporation would service only the 48 largest cities and be sold to private interests at the end of a 10-year operating period. All Federal monies would be recouped with the sale. Any excess from the sale would be divided between the cities that were charter subscribers to the service.
2. The corporation was to be profitmaking, with all unretained earnings divided between the observatories to further support their basic city planning role.
3. Each of the observatories was to be given a \$20,000 planning grant to develop a charter for the corporation and coordinate with the management consulting firm (see below), with their respective city administrations, and with the Department of the Treasury.
4. A management consulting firm was to be competitively selected to provide market and risk analysis, design the services of the corporation, plan the demonstration phase, and oversee the equipment specification and evaluation.

The approach to development of the equipment needed to process the coupons and redeemed bonds followed the same pattern of conferences used earlier in the institutional planning effort. Instead of the typical bidder's conference format, however, these conferences focused on the potential commercial demand for the equipment that would be functionally specified by the management consulting firm. The reason for this emphasis **was** to set the stage for a rather unique invitation for industry involvement in equipment development. The equipment manufacturers were promised the opportunity to participate in the demonstration phase of the program, if in-

dustry would establish the technical and cost criteria for competitive selection among the interested firms.

The Department of the Treasury, on a cooperative basis with the new corporation, promised to place \$250,000 in escrow for the purchase and trial of at least two separate systems for city coupon- and bond-accounting. It was up to industry itself to decide on the ground rules for competitive selection of industry participants,

The industrial firms, through the Western States Electronic Manufacturers Association, offered the following proposal, which subsequently was adopted:

1. A date would be set (by industry consensus), at which time all interested firms must be ready to demonstrate their respective equipment systems.
2. The systems would be rated against the functional specification and participation awards made on the basis of highest ratings. In the event that many systems qualified functionally, a cost/performance formula would be employed as a second selection criterion.
3. The rating was to be performed by an independent board involving industry and city representatives.
4. An additional \$50,000 was to be placed in escrow to ensure that operating and maintenance expenses incurred by manufacturers with the prototype equipment would be reimbursed.
5. The Department of the Treasury was to pay the expenses incurred in implementing the industry proposal.
6. In the event that the code standards were not promulgated on a timely basis, the \$250,000 would be forfeited to the industrial firms incurring development expenses as a result of the Treasury initiative.

## The Transactions

The main reason that the Urban Observatories were selected as the focal point for the organization of the corporation was to capture their long-

standing relationships with the city government. Further, by working through the observatories, it was possible to emphasize the profitmaking dimension of institution building and yet have these profits flow back to the cities—first, in an indirect manner by supporting the observatories in their normal functions, and then through the liquidation of the corporation **after** the 10-year period. The arrangement ensured that both the observatories and the subscribing cities would have a “vested interest” in the success of the project.

The initial study by the accounting firm on the costs to State and local governments of servicing bearer bond payments was obtained through a procurement contract. This instrument was used because the study was primarily to serve the planning needs of the Federal agencies.

The \$20,000 planning grants were chosen as the mechanism for funding the activities involved in establishing the corporation because the Department of Treasury had no reason to be directly involved in the arrangements being made by the observatories either individually or by the observatory network. The Treasury was interested only in the establishment of the corporation, and that its charter conformed to the plan.

Subsequently, the Treasury entered into a cooperative agreement with the corporation, to (1) financially support the start-up operations, (2) ensure that the demonstration phase was properly completed, and (3) discharge its responsibility for the development of code standards together with SEC. The latter two responsibilities required Treasury involvement during performance of the assistance activity.

The management consulting firm was awarded a procurement contract on a competitive basis that equally weighted technical competence and cost factors. A procurement contract was the instrument chosen for the transaction, despite the fact that the purpose was primarily assistance. The Comptroller's Office was, in effect, procuring the services of the consulting firm for use by the new corporation. Furthermore, the Comptroller's Office had to ensure that the consulting firm would be responsive to its needs, particularly in the demonstration phase and in developing code standards. Making the award on a competitive basis also was important; the winning firm would

be in a unique position to help in the introduction of the concept into bank operations and other State and local settings. Thus the use of the procurement process was appropriate in this specific instance.

Finally, the Treasury and the corporation entered into a cooperative agreement with the Western States Electronic Manufacturers Association to implement the industrial proposal. This joint activity led to the selection of two participating manufacturers who subsequently contracted with the corporation to provide and maintain equipment. Similarly, the corporation entered into contracts with the charter member cities to provide bond and accounting services for new bond issues.

### Outcome and Evaluation

The rest is history. The corporation began working with 16 cities on a backup basis—that is, duplicating the accounting work routinely performed on new bond issues employing the code system for a 3-year period. By the time this experience was gained and the system adopted as the primary accounting method for all new bond issues, 21 other cities also had subscribed to the service. In addition to the two firms participating in the demonstration, three other firms have established bond-accounting systems in the com-

mercial banking field, and 13 firms have been formed to provide bond-accounting services to States, local governments, and corporations on a national and regional basis.

The Treasury estimates that the corporation will be worth \$4 million to \$6 million when it is liquidated in 6 years. This net worth will easily provide funds for recovering the \$900,000 (plus interest) of public money involved. The fact that other firms, with private funds, have entered the bond and accounting field, and that the Treasury Department is getting out of the business provides the most useful form of project evaluation.

### Comment

In preparing this scenario for innovation, probably the most difficult challenge was to find a plausible basis for Federal involvement in the solution of bond- and coupon-accounting problems. It is not easy to place a State or local problem on the R&D agenda of a Federal agency. Attempts to solve such problems frequently are sidetracked as agencies perform their regular duties. This situation may be the fundamental limitation in the effectiveness of the Federal R&D policy tool—at least in terms of R&D expenditures used to stimulate desired technological change at the State and **local levels**.

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