HIGHWAY BOND FINANCING IN IOWA:

An Examination of the Issues

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INTRODUCTION

Backround

The problem that faces the State of Iowa (as it does many other states) is that current revenues fall short of the amount necessary to achieve and/or maintain an adequate primary road system. This shortfall, caused by the system reaching an advanced stage of its life cycle and the decrease in the buying power of revenues due to inflationary pressures, forces state transportation officials to be faced with a very difficult decision; how to allocate insufficient funds between new construction, rehabilitation and maintainance of the system.

In 1983, the Iowa Legislature considered using bonds to improve the funding situation for the state highway system. Although Iowa never has issued state bonds to finance highways, county bonds were used to get Iowa "out of the mud" in the late 1920's and 1930's. A Bill was proposed but not enacted that would have given the Iowa Department of Transportation (DOT) authority to issue bonds to finance state highway and bridge projects.

The purpose of the Bill was to provide funds to construct a four-lane state highway linking Waterloo and Dubuque. In short, the Bill was intended to create jobs and stimulate economic development in Iowa -- two very high priority issues before the legislature. Generally, however, the main concern about Iowa's state highway system is not new construction. Because the system is considered to be more or less complete, the real issue now is rehabilitation and preservation, with limited extensions and new construction needs.

The purpose of this report is to examine the issues relating to highway bond financing in Iowa. This report consists of five major sections. The introduction contains a description of Iowa's highway financing problem. The second section discusses the concepts of highway bond financing including the different types of bonds and the conceptual framework of such public debt. The third section covers the practice of highway bond financing in the United States and Iowa. This section also examines the legal issues of bond financing and includes a discussion of the 1983 proposed legislation. The fourth section examines the impacts of highway bond financing and identifies the advantages and disadvantages of this fiscal management tool. The report concludes with a discussion of the policy implications of adopting this method of highway financing.

State Highway Financing Problems

Deterioration

The Quadrennial Need Study indicated that some 5,700 miles of Iowa's primary road were inadequate as of 1982 (Iowa DOT, 1983, P. 1-1). While these inadequacies range from relativelty minor deficiencies requiring resurfacing to total obsolescence calling for complete reconstruction, many additional miles will become inadequate due to deterioration and increased travel. Also, state bridge needs continue to increase on many parts of the primary road system as the system grows older, vehicular traffic increases in volume, and allowable load limits rise.

Of the state's over $6 billion in 20-year construction needs, 58 percent is classified as "backlog" or as having already accrued; and of the nearly $1.2 billion in 20-year statewide bridge construction needs, 45 percent is classified as "backlog" (Iowa DOT, 1983, Tables 1-B through 1-F).* The Iowa DOT (1983a, P. 72b) estimates that over the next 20 years, 160 miles of pavement must be replaced each year in order to retain the system's present status, while 295 miles per year must be replaced to catch up with the current backlog. The 1984 through 1989 program target is to replace only 48 miles of pavement per year. Instead of replacing pavement, the department is increasing the number of miles that are rehabilitated each year. Minor improvements postpone the work that needs to be done for about four to seven years. As highway officials are quick to point out, the problem doesn't go away - it only gets put off.

Inflation

State highway finace has been severely undermined by inflation during the 1970's and early 1980's. By whatever index one chooses, state highway income has dropped off precipitously (Cooper, 1982, p. 2). In the United States, highway-user revenue measured in real 1977 construction dollars has declined from $16.7 billion in 1970 to $9.7 billion in 1980 -- an erosion of 43 percent in the purchasing power. As Forkenbrock (1983, p.11) shows, between 1970 and 1981 Iowa annual motor fuel tax payments

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* 1982-2001 Iowa Needs Summary - Needs by Jurisdictional Responsibilty - (Based on 1982 Dollars)

grew by 55.1 percent, while highway construction and maintainance costs increased by 170.2 percent and 154.4 percent, respectively. An Iowa DOT study (1983, table 4-E) reports that projected state revenue for the 20-year period (in current dollars) of $7.975 billion has the buying power of only $5.022 billion.

Summary

Assuming a 20-year pavement life, it is evident that Iowa's primary road system has reached an advanced stage of its life cycle. Also, Iowa's highway revenues have not kept up with the costs of operating the system. A major recommendation of the Govenor's Blue Ribbon Transportation Task Force Report (1982) was to shift program emphasis to preservation and maintainance rather than construction. In fact, for the period 1984 through 1989, nearly 75 percent of highway funds are to be allocated for preservation efforts (Iowa DOT, 1983a, p. 75).

A variety of policy actions are being studied in order to contend with the fiscal shortage that is precluding needed rehabilitation efforts. One is to reduce the size of the state's highway system by eliminating lesser used portions of the secondary road system. Other approaches include indexing motor fuel taxes to better keep pace with inflation, and implementing third structure (weight-distance) taxes for heavy vehicles. Whatever the case, it is apparent that the amount charged to users of Iowa's highway system must be increased if a more comprehensive rehabilitation program is to be achieved. Bond financing may be one way to increase revenue in current periods while spreading out debt payments over time.

HIGHWAY BOND FINANCING -- CONCEPTS

Types of Bonds

Definitions

In this section, bond financing is examined in relation to the type of bond used, or more precisely, according to the security underlying the debt. The three major types of bonds used for highway projects, as defined by McCallum (1963, p. 1) are described below.

General Obligation Bonds

> General obligation bonds, also known as guaranteed bonds or full-faith bonds, are obligations guaranteed as to payment of interest and principal by the State selling the bonds. The full resources and taxing power of the government are irrevocably pledged to meet debt payments.

Limited Obligation Bonds

> Limited obligation bonds, sometimes called tax bonds and often - erroneosly - revenue bonds, are obligations secured by a plege of the proceeds of a specific tax, usually road-user imposts, or revenues of a specified fund, but these bonds are not limited to earnings of the projects to be built. They carry no further guarantee or commitment by the issuing government in the event the pledged revenues prove inadequate to meet debt service.

Revenue Bonds

> Revenue bonds are obligations to finance alleged self-supporting toll facilities and are secured only by the tolls and other earnings of the project. Should these earnings prove inadequate, the sole remedy of the bond holders is to require an adjustment in toll rates designed to improve earnings.

It should be noted that revenue bonds are used to finance toll facilities. Since this report addresses the use of bonds to finance nontoll highways, revenue bonds are eliminated from the following discussions.

Security Pledged

Among the critical decisions in planning the financing of capital outlays through debt is selection of the security to be pledged. There are two conventional categories for a broad classification of the debt of state government on the basis of security pledged: guaranteed and nonguaranteed. The discussion to follow is derived from Moak (1982, pp. 111-116).

General Obligation Bonds -- Guaranteed

Advantages. It is frequently the strongest pledge available to the issuer and will usually produce the lowest effective interest cost. In using guaranteed debt there is usually less money required to be held in debt service reserves. Most guaranteed debt requires electoral approval, thus imposing a restraint on the exercise of discretion by public officers. The administrative aspects are simplified and frequently less costly than in most other forms of debt. Guaranteed debt also offers substantial flexibility in debt management.

Disadvantages. Exclusive reliance upon guaranteed debt can result in an unwise overburdening of the pledge and may lead to misconceptions on what is actually self-supporting debt in government enterprises. The political and legal requirements of issuing guaranteed debt can result in delay or long-term deferment of necessary capital financing. Large issues may be denied access to the bond market which will cause a greater risk. Also, guaranteed debt can impose a severe tax burden upon residents.

Limited Obligation Bonds -- Nonguaranteed

Advantages. Using nonguaranteed debt allows a government to raise money without resorting to the pledge of full-faith-and-credit. Ordinarly, the limits as to the amounts of such debt to be incurred are determined by the marketplace. Also, in the case of taxes that fall upon both residents and nonresidents, the special tax bond may provide a means of requiring nonresidents to participate more equitably in the development of facilities.

Disadvantages. The interest cost is likely to be higher for nonguaranteed debt. Frequently, strong reserve funds are required which will either reduce the potential benefits or increase the tax rate to a higher level. Nonguaranteed debt also will decrese flexibility since the pledged tax rate is usually for the life of the bonds.

Summary

It can be seen that general obligation bonds have certain advantages over other types of bonds. However, the political drawbacks are strong; especially in a state such as Iowa which has only issued general obligation debt twice in its history. The 1983 proposed Act called for the use of limited obligation debt secured by the state Road Use Tax Fund. Throughout the rest of this report, the instrument of debt is assumed to be limited obligation bonds.

Conceptual Framework of Bonding

Credit is the present delivery of something of value by a lender to a borrower in exchange for a promise to pay the equivalent in some form at a later date. The promise is a contractual obligation to repay upon maturity; the initial transfer is the credit, while the obligation to pay is the debt.

The reason these principals exist is because money has a time value. In other words, a dollar today is worth more than that same dollar one year from now. It is the interest charge that incites some to be lenders - those wishing to earn money from idle funds, and some to be borrowers - those willing to pay more in the future for present funds.

Two Conflicting Philosophies of Public Debt

Traditional Thinking. Traditional thinking is not friendly to the concept of public debt. David Hume, an 18th century English social and political philosopher, preferred to build a "reserve" in advance of war or emergency. Included in his arguments are; 1) public borrowing mortgages future revenue and burdens future generations, 2) costs increase due to interest charges, 3) public debt will always be subject to abuses, and 4) once nations begin to borrow they are unable to desist until they reach bankruptcy. Adam Smith stressed that public borrowing is a withdrawal from private productive capital, thus, "borrowing weakens any state". John Stuart Mill concurred with Smith's thinking on debt, except that he approved of government borrowing if the funds were provided out of "surplus capital" not needed by the private economy.

"New Philosophy" of Public Debt. The so-called "new philosophy" arose from the post depression era but actually predates Adam Smith. This way of thinking prefers the term public credit to public debt - credit meaning an asset to society. Public debt is viewed as facilitating the circulation of money in society creating a larger supply of money and credit. It is argued that increasing public expenditures stimulates economic activity and can increase productivity when the economy is stagnate. Thomas Robert Malthus, a population economist in the early 1800's, argued that government spending coupled with bondholders spending of debt interest would maintain consumption expenditures and thus help maintain prosperous conditions.

Major Issues on the Economics of Public Debt

Controversy continues between the traditional thinkers and the new philosophers. Their thoughts differ in many ways and are constantly at odds on the issues discussed below.

Public Versus Private Debt. The traditional view holds that public debt and private debt entail precisely the same principals and the same kinds of consequences. Whether public or private, borrowing is viewed as an alternative mode of acquiring additional present capital without undertaking a present cost. Proponents of the new philosophy recognize the technical similarities between public and private debt but emphasize the importance of the dissimilarities. The major difference they cite is that public debt is viewed as a policy instrument which can be used to control economic activities. In addition, government may have some

control on the interest rate it pays, and is said to have more flexibility in the bond market than do private investors.

Intergenerational Shifting of Debt Burdens. Perhaps the most vigorously contested issue - both in the past and the present - concerns whether the primary real burden of a public debt is borne by the generation which incurs the debt and the expenditure, or by later generations which pay the taxes to meet principle and interest on the debt.*

The traditional view, supported by modern conservatives, holds that the taxpayer in future time periods does bear the real burden of the debt. The rationale behind this argument is that the taxpayer must reduce real income in order to transfer funds to the bondholder, who, acting voluntarily, simply loans assets now in order to enjoy a larger volume of assets in the future. On the other side of the argument are the so-called "new economists" who maintain that a public debt incurred in a given time period is borne by those living in that time period. According to the analysis, government borrowing transfers current purchasing power from the lenders to the borrowers and thus, the primary real burden of the public expenditure cannot be shifted forward.

There is no single conclusion to this issue of shifting burdens. What seems to be clouding the issue are the questions of aggregate versus individual burden, and real versus financial burden. Different kinds of burdens should be recognized and appraised accordingly in assessing the degree of any intergenera-

* For a complete discussion of this issue see Buchanan (1958) and Fergusson (1964).

tional shift of debt burden.

Some Reasons for Borrowing

It is a common belief that the appropriateness of public borrowing depends on the purpose for which the loan is to be used and on the conditions which surround the need for its use. Anderson (1973, p. 238) identifies four basic purposes that are generally recognized as valid for borrowing in the public sphere: 1) to meet emergencies, wars, and depressions, 2) to finance capital assets with which to perform recognized public services, 3) to finance capital assets for self-liquidating public enterprises, and 4) to finance current expenditures in anticipation of reasonably certain tax collections.

A distinct feature of capital improvements (highways, sewage plants, school plants) is that they yield returns that stretch into the future. Debt financing is used because capital improvements can be very costly and may require more funding than the current taxpayers are willing to provide immediately out of increased taxes. When public projects require a substantial initial investment but have benefits that are small (relative to the investment) per year but of a long duration, debt financing is acceptable and equitable. The essential point to note is that borrowing permits the allocation of the costs of capital to those who will benefit from the improvement. This, however, in theory only holds if the costs of the improvement are spread over the life of the facility.

Rehabilitation is a very broad term. Using the federal terminology, rehabilitation is part of "4R" highway projects (resurfacing, restoration, rehabilitation, and reconstruction). Bonds are usually used to finance construction of new highway facilities. Since this report focuses on using bonds to finance "rehabilitation" projects, it must be clarified that the concept of bonding most closely applies to reconstruction or replacement projects, not ordinary operating and maintenence projects such as fixing pot holes, etc.. In other words, the concept of bonding would apply for major capital projects, not current operating expenditures.

HIGHWAY BOND FINANCING -- PRACTICE

The United States and Iowa Experiences

Bond Financing in the United States

Ever since the first highway construction programs, borrowing in anticipation of future tax revenue has been an important method of financing highways. In recent years, total state highway bond sales have ranged from $500 million to $2 billion a year. Nontoll state bond issues averaged close to $1 billion annually for the period 1966-70 and $1.3 billion annually from 1971 through 1976 (Cooper, 1978, p. 30). Since then, bond sales have fallen off principally because massive authorizations (New York and Pennsylvania) have been exhausted and voters have refused to endorse new authority.

Zettle (1979, p. D-24) observes that debt financing may not have been a good bargain, at least on an aggregate basis. For the 20-year period 1956 to 1976, bond proceeds for state governments were about $23 billion against a debt service of $21.5 for a net "gain" of $1.5 billion. But the interest cost was nearly $10 billion and indebtedness increased by more than $11 billion - indicating much more interest to come. Zettle (1979, P. D-25) contends that while these are rather bleak numbers, they are "aggregates which may mask a good many situations where debt financing was a perfectly rational course of action". It must be noted that the use of debt financing and its consequences varies a great deal from state to state.

Data reported by Cooper (1978) portray debt service in relation to user revenues over the four-year period from 1973-76. For the 43 states servicing debt, bond interest and retirement costs equaled 14.9 percent of net revenues. However, nine states were in the fortunate position of having no highway debt service and, in an additional nine states, debt service amounted to less than 5 percent of user revenues. At the other end of the scale, however, five states expended one-third or more of user revenue on debt service and three of these surpassed the 50 percent level at least once. All of these states were in the East.

Cooper's concern about "over-reliance on debt financing levels" leads him to conclude that:

> ... when one-half of all current revenue is absorbed in debt service, a state's capital program might be considered in jeopardy. Clearly, such practices can restrict state flexibility and responsiveness to sudden shifts in need.

> ... bonding plays an important role in the majority of states and the debt service burden is adding to the plight of highway administrators. In fact, to some states capital program continuation is dependent upon issuance of new bonds since current revenue is totally committed to noncapital costs, including debt service (Cooper, 1978, p. 5, 31).

Bond Financing in Iowa

As mentioned earlier, Iowa never has issued state bonds to finance highways. However, county bonds played a very important role in the building of Iowa's state highway system.* In the early 1900's. Iowa had been widely known as a "mud road state". At a time when many states were successfuly speeding up construction of primary road systems, Iowans were strongly in opposition to state bonds. The sale of millions of dollars of Liberty bonds in the state during World War I helped to change the minds of many people. Legislation in 1919 authorized counties to issue bonds to speed up the construction of hard-surfaced primary roads. The principal was to be paid out of the county's share of the Primary Road Fund, and the interest derived from a special county property tax.

The county bonding plan of 1919 failed to produce the funds anticipated. No counties voted in favor of bonds until 1926, when 13 counties authorized a total of $18.5 million in bond issues. In 1927, the Shaff Act assured counties that all obligations would be payable out of the Primary Road Fund. This Act, along with the introduction in 1925 of a two-cent per gallon gasoline tax to strengthen the Primary Road Fund, greatly encouraged further bond

* The discussion of county bonding is derived from May (1965).

issues.

Support for a state bond issue had grown and a $100 million state bond proposal submitted to the voters in the general election of November, 1928 was approved by a 2 to 1 majority. However, the following March the Iowa Supreme Court ruled the 1928 Road Bond Act to be unconstitutional.* This decision did not prove to be a serious setback to the completion of the primary road system. Raising the legal limit of a county's indebtedness stimulated 18 counties which had already issued bonds to vote additional bonds and 18 others to vote new issues. Thus, county authorizations in 1929 were nearly equal to what the state could have raised with the bond proposal. Eventually, every county except Louisa voted for bonds with a total of over $118 million being obtained from 1919 to the end of the 1930's. By November 1, 1950, all bonds had been retired.

Constitutional Restrictions and Iowa Law

General Restrictions

The present constitutional limitations on state borrowing in the U.S. are extremely varied and individualistic. States can be divided into three major groups according to the methods used to regulate borrowing (Heins, 1963, PP. 28-30). The constitutions of 22 states flatly prohibit borrowing with the usual exceptions for such purposes as meeting causaul deficits, and defending the state. In each of these states, a proposal involving borrowing

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* The bases for unconstitutionality are discussed in a later section.

must be authorized by a constitutional ammendment approved by the general electorate. In the 17 states in the second group, borrowing can be accomplished by approval of a popular referendum. In the 11 states in the third group, the authority to incur debt is vested in the Legislature; popular approval is desirable but not required.

Iowa Law

Iowa falls into the second group described above - it is a referendum state. Article VII, Section 5 of the Constitution of the State of Iowa contains the following provisions pertaining to issuing bonds by the state:

1. Such bonds or debt must be authorized by some law.
2. The law must be for a single object.
3. The object must be distincly specified in the law.
4. The law shall provide for the collection of a direct annual tax sufficient to pay the interest as it falls due.
5. The law shall provide for the discharge of the principal within twenty years.
6. Such a law shall not take into effect until ratified at a general election by a majority of the votes cast.
7. Such law shall be published three months before the general election.

It should also be noted that Iowa law provides for the issuance of revenue bonds by the DOT for financing toll bridges (Chapter 313A, Iowa Code) and by the State Board of Regents for financing educational facilities (Chapter 262, Iowa Code).

1929 Supreme Court Ruling

As mentioned above, the 1928 Road Bond Act provided for the state to issue bonds for the construction of primary highways. The Iowa Supreme Court in 1929 in the case of State v. Executive Counsil of State, 223 N.W. 737, held the Road Bond Act to be unconstitutional on three bases.

The first basis on which the Act was unconstitutional was that it extended beyond the 20 year limitation provided in Article VII Section 5 of the Iowa Constitution. Actually, the life of the bonds in the Road Bond Act was 26 years. The second basis for unconstitutionality was that the Act obligated the future General Assembly as to the use of the Road Use Tax Fund. At that time the Legislature could do with the Fund as it deemed appropriate. In 1943, however, the 18th Ammendment to the Iowa Constituion obligated the Road Use Tax Fund as follows:

Ammendment 18

> Motor vehicle fees and fuel taxes. (Sec. 8) All motor vehicle registration fees and all licenses and excise taxes on motor vehicle fuel, except cost of administration, shall be used exclusively for the construction, maintenance and supervision of the public highways exclusively within the state or for the payment of bonds issued or to be issued for the construction of such public highways and the payment of interest on such bonds.

Thus, the 18th ammendment probably eliminated the second basis of unconstitutionality that was held to exist in 1929. The third basis of unconstitutionality was that the Act substituted an indirect tax (license and gasoline taxes) for a direct tax (such as the property assessment).

1983 Proposed Legislation

Legislation proposed as part of Senate File 548 but not enacted was known as the "Iowa Economic Development Highway Bond Act". Senate File 548 contained numerous elements proposed to create employment and stimulate economic development. The Bill passed in both the House and Senate, however the Govenor vetoed the division which contained the highway bond proposal. There were numerous reasons why the proposed Bill was not enacted into law. A main concern was wether the highway was really needed. Also, the actuall number of jobs that would have been created was questioned, and there would have been no guarantee that it would be Iowans who got the jobs. Another problem was that a time lag of one or two years would have been involved. This section will describe the fundamental characteristics of the proposed Act and discuss the legal ramifications thereof.

Fundamental Characteristics

This Act would have

> authorize(d) the department to issue bonds to finance the improvement of existing highways and bridges and to reconstruct, construct, and improve these highways as necessary for the health, safety, economic development, prosperity and well being of the citizens of Iowa (Senate File 548, p. 43).

The proposed Act stipulated that a bond commission authorize bonds by a resolution which provides the purpose of the bonds and all debt service thereof. The Act also stated that

> The bonds are limited obligations of the department payable solely from those road use tax funds credited to the highway bond fund and are not general obligations of the state ...

> Funds from the general fund of the state shall not be used to pay interest or principal on the bonds if revenues deposited in the road use tax fund are insufficient (senate File 548, pp. 46, 53).

The Act would have called for the creation of a "highway bond fund" to which funds are deposited from the Primary Road Fund in order to meet all debt requirements. The Act stated that the life of a bond shall not be more than ten years after the date of issuance.

The Act further stated that

> Courts of record in this state have jurisdiction to issue all original and remedial writs necessary for the determination of the validity or constitutionality of this division (Senate File 548, p. 56).

The Act specified that the total amount of bonds oustanding at any one time shall not exceed ten million dollars. If the supreme court determined that this Act was not in violation of the State Constitution, then the amount of bonds outstanding at any one time would be increased by $100 million dollars. Among other characteristics, the Act controls for the issuance of Bond Anticipation Notes (short-term debt) and for refunding of obligations.

Legal Ramifications

It is important to restate that the Act provided for judicial review of its constitutionality. Referring back to the reasons given above for the unconstitutionality of the 1928 Road Bond Act, the legal implications of the 1983 proposed Act can be examined. The ten-year maximum bond term as provided by the 1983 Act would not have violated the 20 year limitation, and, because of the 18th Ammendment, future General Assemblies would not have been unlawfully obligated.

The requirement of having direct taxes would appear to present the greatest legal barrier. The portion of the of the registration fee based on value would appear to be a direct tax on the vehicle but the portion based on the weight would be more questionable. It is doubtful that the "excise taxes on motor vehicle fuel" as stated in the 18th Ammendment would be considerd a direct tax. However, Ammendment 18 does provide for the use of "Registration fees and all licenses and excise taxes on motor vehicle fuel . . . for the payment of bonds issued or to be issued for the construction of such public highways and the payment of interest on such bonds". Since the 18th Ammendment seems to take into account all constitutionality components, it would be up to the courts to decide the validity of the statute which gives the authority to issue bonds.

HIGHWAY BOND FINANCING -- IMPACTS

This section examines the general impacts of highway bond financing. Hypothetical bonding programs are given in order to determine favorable conditions for bonding and to identify the advantages and disadvantages of bond financing. Therefore, the assumption is made that a law exists authorizing the Iowa DOT to issue bonds. In addition, it is assumed that bond proceeds will be allocated to fund reconstruction and major rehabilitation projects as discussed above (see page 12).

General Impacts

There are two general impacts associated with using bond proceeds to accellerate the state's highway rehabilitation program. These impacts are: 1) the effect on the state's economy, and 2) a reduction in vehicle operating costs. Forkenbrock (1984, pp. 37-45) examines these impacts in depth and the following discussion is derived from this analysis.*

Bonding may stimulate the state's economy by creating jobs in construction-related industries, which in turn would further stimulate the state's economy by creating jobs within domestic industries (the "multiplier effect"). Furthermore, since rehabilitation projects would occur statewide, the jobs created would be spread accross the state. The number of jobs created would depend on the amount of bonds issued and the type of work to be done. The problem with bonding, as related to the above mentioned analysis, is that the term of the jobs would probably depend on the continuance of bonding, and would therefore not be permanent.

Another impact of increased rehabilitation projects is lower motor vehicle operating costs. The argument is that as highways deteriorate, motor vehicles experience lower fuel efficiency and higher wear. The amount of savings brought about by increased rehabilitation efforts would depend on the previous condition of the pavement. It is difficult to estimate how substantial the annual cost savings would be in future years. One way to view the

* Forkenbrock (1984) analyzes the impacts of an annual $100 million increase in revenue to be brought about by implementing third structure taxes (weight-distance) for heavy vehicles operating in the State of Iowa.

situation is that as the system continues to deteriorate, operating costs will rise increasingly, thus, "... avoidance of cost increases to users of the Iowa highway system in future years could be substantial, if a program of restoration were emborked upon at the present time" (Forkenbrock, 1984, pp. 44-45).

Another impact that has both economic and social aspects is that a strong rehabilitation program could strengthen Iowans' confidence in the state highway system, and portray a positive image for Iowa as an attractive place in which to do business. A strong commitment by the state to provide a well-maintained highway system could provide a more favorable business climate. While, on the other hand, a visibly deteriorating highway system could negatively affect business location decisions.

Hypothetical Bonding Program

Hypothetical examples are given in order to analyze two different types of bonding programs to finance improved highway facilities in the state. The first bonding example would be to issue a constant amount of bonds every year for a specified period of time (eg. $50 million a year for 10 years). In this example, bond proceeds would be used to increase the number of pavement miles replaced per year. The second example would be to issue one amount in a given year (eg. $100 million in 19XX). In this example, bonds proceeds would be used to finance reconstruction of a given set of bridges that are functionally obsolete. Also, it is further assumed that these bridges would not be replaced until some time in the future (as funds become available).

These two bonding program examples have very distinct differences. If it is assumed that each program has the same interest rate, then the interest charges would be the same (relative to the bond issue). At issue here is not what the bonds are used for, but rather in the way in which the bond programs are structured. In the first example, debt financing and tax financing are for all purposes equivalent. This is the because capital expenditures are continuous and of a constant amount. In the second example, while funding needs may be continuous, the bonding program is established for a specific, clearly defined object.

Favorable Conditions for Bonding

There are two basic conditions in which bonding would be advantageous. These conditions are: 1) when interest costs are less than the rate of inflation, and 2) when benefits of the improvement exceed the interest cost. These are general statements, and cannot alone determine when bond financing should be used. The are other qualifications which must be brought to attention when the decision to implement bond financing is considered.

One qualification is that the specific goals and objective to be achieved by the issuance of bonds should be clearly defined and delineated. Any bond issue should be specifically dedicated to a certain functional highway system or portion of a system. Funds derived from this source should not be considered as merely supplemental funds to carry out the normal program. In other

words, bond proceeds should not be placed in the Primary Road Fund in order to increase its entitlement. Rather, proceeds should be directed to specific, well defined projects that have been analyzed and approved.

Another important qualification is that concurrent with the authorization to issue bonds should be the authorization to increase some current tax source to amortize those bonds. If any other course of action is followed, then it becomes necessary to reduce the program in future years when the payments of the bonds are due.

Advantages of Debt financing

The major advantage of issuing bonds to finance highway improvements is the extent to that an increase in current revenue would allow capital improvements to be realized sooner than they would be under the "pay-as-you-go" basis of financing improvements out of current revenues. Debt financing, or the "pay-as-you-use" approach, is a financial policy in which a government allocates the cost of capital outlays among the users of each "generation".

1. Debt Management

Debt financing becomes a profitable alternative to immediate tax financing when the added returns of accelerated improvements exceed the interest cost involved with bonds. Therefore, in theory, if user charges are priced in accordance with benefits received, than any improvement(s) that provide greater returns than the cost of interest should be finance with bonds.

2. Cost Savings by Avoiding Inflation

Because of inflationary trends in the general price level of highway construction costs, the ability to accelerate improvements would create costs savings. Put simply, building now cost less than building some time into the future. Another way to view the impact of inflation is that it offsets the interest charge on the bonds, i.e., a 10% effective interest rate in a 6% inflation world is a 4% real interest rate. What this means is that debt is paid off in the future with dollars that have decreased in value.

3. Reduced Transportation Costs

The main transportation benefits that arise out of improved highway facilities include savings in operating costs and reductions in travel time and number of accidents. The magnitude and timeliness of such benefits depend directly on the improvement(s) to be made.

4. Greater Economic Stimulant

To the extent that improved highway facilities stimulate economic development activities, a more rapid improvement of an adequate system will produce greater benefits for Iowa's economy. There are also direct and indirect benefits of employment opportunities to be gained by increasing the amount of construction activities.

Disadvantages of Debt Financing

1. Cost of Interest Charges

the use of bonds created the obvious interest obligation. Such an obligation necessarily raises the nominal dollar expenditures for construction and places a constraint on the future tax burden.

2. Need for Additional Revenue Sources

Debt is issued in anticipation of future revenue based on the assumption that forthcoming revenue will be sufficient to pay both principal and interest in a time pattern more closely matching the flow of benifits. The result is that if bonds are issued today to avoid increasing taxes, then future taxes will have to be increased to maintain the improved system and cover the cost of debt service. If future rates are not increased, the the future program will have to be reduced so as to be compatible with the expected revenues. In this respect, a bond issue may simply be a postponement of the current problem.

3. Restriction of Alternatives

The long-term contractual nature of bonds limits future adaptability. If bonds are issued little can be done to meet major unanticpated changes in the nature of highway demand, without incurring higher costs due to outstanding bonds.

CONCLUSIONS AND POLICY IMPLICATIONS

Using bonds to finance state highway projects would be an important shift in public policy in Iowa. Bond financing of municipal and county highway facilities are a common experience in Iowa. At the state level, however, the issuance of public debt (especially general obligation debt) has had limited applications. The purpose of this report has been to examine the issues involved with highway bond financing in Iowa.

It has been emphasized in this report that bond financing would be used to increase revenue in order to accelerate major rehabilitation projects in the state. It can be concluded that while bond financing would not be a complete solution, there are merits in considering this approach under certain conditions. These conditions are: 1) there be a law which authorizes the Iowa DOT to issue limited obligation bonds, 2) that bond proceeds be used for specific, well-defined projects that have been analyzed and approved, and 3) there be an increase in some current tax source to meet debt service requirements.

The entire issue of highway bond financing raises many legal and political controversies. The decision to implement bond financing rests in the hands of state lawmakers and ultimately in the Courts. At this time, Iowa highway officials are concerned about the fiscal shortage that is precluding needed rehabilitation efforts. However, the condition of the state highway system has not reached the stage that warrants a major policy redirection such as bond financing.

Finally, this report does not prove that bond financing is or is not a viable alternative; rather, it has scratched the surface of the issues that are involved in highway bond financing. Further studies which take into account legal issues and financial impacts are needed to determine the feasability of bonding as a fiscal management tool to reduce the state's annual revenue shortfall.

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