

Workshop on Investment and Financial Analysis Techniques

Workshop Summary: Investment and Financial Analysis in Transportation in the 1980s

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The workshop participants addressed the investment and financial issues in transportation in the 1980s. These included the perceived major issues for both highway and transit. Specifically, these issues were addressed in the light of current travel analysis methods to provide acceptable evaluations. For each issue a subjective determination was made as to the state of the art, the state of the practice, implementation barriers, and research needed for existing models available in the transportation field. The state of the art was defined as whether adequate models existed for use in the analysis of any given issue. A subjective determination rated the state of the art as good, fair, weak, or nonexistent. The state of the practice dealt with whether models that were available were in regular use in analyzing the issues. The state of the practice was subjectively rated to be widely used, limited, or not used. The state of the practice could be limited because of the need for large-scale computers, intensive training on the part of individuals using the models, or, perhaps, inadequate resources on the part of certain planning agencies for making models available to planners.

Implementation barriers limit the state of the practice and can be the result of a wide variety of reasons. Limited resources--money, personnel, or other things--could have an impact on implementation. In addition, a lack of information sharing at all levels of planning agencies could result in reduced implementation. The workshop participants also made a subjective evaluation as to whether additional research was needed to develop models for addressing the issues identified. As a part of its activities, the workshop prepared nine specific research statements, which were considered to be of a high priority in improving travel analysis methods for the issues listed.

The participants discussed the differences in analysis capabilities that existed between various levels of planning agencies. In general, the higher the level of planning agency (i.e., from local to federal government), the more resources are available for the use of improved analytical tools. Thus, the lower levels of planning agencies may not have access to or utilize specific models for analyzing issues, not because the models are not in existence, but because the resources of the lower-level planning agencies are limited. In addition, the lower-level planning agencies often have planners who have general expertise, whereas a higher-level planning agency may have specialists in specific areas. Many of the models available for the analysis of specific issues require a certain level of expertise often found only in specialists.

It was in the context of the above considerations that participants of the workshop outlined the major issues in investment and financial areas for the 1980s and reviewed the analytical tools currently available. Table 1 provides a summary of the major investment and financial issues in the 1980s considered by the workshop participants. In addition, Table 1 provides a subjective measure of the state of the art, the state of the practice, implementa-

tion barriers, and research needed for the analytical tools currently available to address these issues. Also, one can see from Table 1 that certain issues apply only to highways or transit, whereas others apply to both modes of transportation. The following discussion elaborates on the major issues listed in Table 1.

MAJOR ISSUES

Capital Investment Versus Long-Term Maintenance and Operations

In both the highway and the transit fields, it is necessary to analyze from an investment and financial aspect whether it is more appropriate to provide funds for capital investments or to use available resources for long-term maintenance and operations.

A planner should be able to differentiate between a return on investment that might be made in capital outlays and an investment in maintenance and operations. Although it is readily admitted that many planning agencies do not provide as much analysis as is really needed in this area, it was felt that the analytical tools in existence were good and that little or no research was needed to improve on these analytical tools. However, it was felt that the state of the practice was very limited in the use of available models. The workshop participants felt that neither local planning agencies nor even planning agencies at the state level provided analysis in this area on a routine basis. Thus, the state of the practice appears to be limited.

There are implementation barriers to the use of models in this particular area. A certain amount of data is needed in terms of maintenance and operations costs; these data are not always readily available at the state and local levels. The cost of collecting data can be quite extensive, and some of the data have never been collected, particularly in the maintenance area. In addition, the expertise that would be needed for a comprehensive analysis in this area may not be so readily available in local planning agencies as it might be in higher-level planning agencies with more resources.

Reduction in Standards

Reduction in standards primarily applies to the highway field and relates to the use of resources to construct new facilities or to maintain existing facilities at lower standards than current design standards. Because of the limited resources available for construction of new highway facilities as well as for the maintenance of existing facilities, there have been arguments that the geometric and safety standards of highways should be reduced in order to have more miles of facilities constructed or maintained.

The workshop participants felt that the models available to provide in-depth analysis in this area are generally adequate and available; that is, the state of the art is good. In addition, the participants felt that no major research is needed in this area. However, the workshop participants felt that

Table 1. Investment and financial issues in the 1980s.

Issue	State of the Art	State of the Practice	Barriers to Implementation	Research Needed
Capital investment versus long-term maintenance and operations (H, T)	Good	Limited	Yes	Minor to none
Reduction in standards (H)	Good	Limited	Yes	Minor to none
Revenue forecasting				
User fees (H, T)	Good	Wide	No	Minor to none
Related fees (H, T)	Good	Limited	Yes	Minor to none
Nonrelated fees (H, T)	Weak	None	Yes	Yes
Disinvestment (H, T)	Good	Limited	Yes	Minor to none
Interaction among demand, financing, and land use	Good	Limited	Yes	Minor to none
Maintenance investment impacts and sequencing (H, T)	Good	Limited	Yes	Minor to none
Life-cycle costing (H, T)	Good	Limited	Yes	Minor to none
Marginal reconstruction programs (H, T)	Good	Limited	Yes	Minor to none
Resource allocation to local areas (H, T)	Good	Limited	Yes	Minor to none
Cost reallocation (H)	Fair	Limited	Yes	Yes
Traffic operations improvements (H)	Weak	Limited	Yes	Yes
Highway system management (H)	Weak	Limited	Yes	Yes
Parking management (H, T)	Weak	Limited	Yes	Yes
Marketing (T)	Good	Limited to none	Yes	Minor to none
Deregulation (T)	Weak	None	Yes	Yes
Demand response to service changes (T)	Good	Limited	Yes	Minor to none
Equity (T)	Good	Limited	Yes	Minor to none
User-side subsidy (T)	Weak	Limited	Yes	Yes
Fragmentation of services (T)	Weak	Limited	Yes	Yes
Allocation of subsidy to state and local levels (T)	Good	Limited	Yes	Minor to none
Impact of alternative service options (T)	Weak	Limited	Yes	Yes

Note: H = highway, T = transit.

the state of the practice was limited because of the resources and expertise needed for in-depth analysis in this area. There are implementation barriers to the use of models in this area, primarily due to computer capabilities, data availability, and expertise required in lower-level planning agencies.

Revenue Forecasting

User Fees

Revenue forecasting applies to both highway and transit modes of transportation. Revenue forecasting from user fees would be related to fees collected from gasoline taxes and automobile registration and to other fees charged for activities related to the transportation field. The workshop participants felt that the analytical capabilities in this area are good and have been for many years. Very little research is needed to improve on revenue forecasting from user fees. The state of the practice in the use of these models is widespread, and there appear to be no major implementation barriers to the use of the analytical methods. Most federal, state, city, and county planning agencies or revenue departments annually forecast revenue that will be received from user fees. Normally, the forecasts are reasonably accurate and have provided adequate information in the past.

Related Fees

Related fees would be those fees that could be derived from other than direct user charges. These may be an assessment of taxes on increased value of land or other property adjacent to a subway station, an interchange, or other transportation improvement. The analytical tools available for forecasting fees that could be derived from related activities are good, but the state of the practice is very limited. The participants felt that additional research is not needed in this area, since there has been a substantial amount of work in developing models to forecast the impact of transportation improvements on various activities. There are bar-

riers to implementation, and again they are related to the resources available for a particular planning agency.

Nonrelated Fees

The nonrelated fees apply to both highway and transit modes of transportation. These fees might be derived from additional taxes placed on business activities that may have an increase in revenue due to the construction of a specific transportation facility or the improvement of an existing transportation facility. These business activities could be a wide variety of business concerns such as restaurants, shopping centers, movie theaters, or other revenue-producing business enterprises. The workshop participants felt that the existing tools available for analyzing the impact in the area of nonrelated fees are very weak. Although some minor work has been done in this area, it is not to the extent that would make the state of the art adequate to provide an in-depth analysis on the major issues. The state of the practice is in essence nonexistent, and a substantial amount of research is needed to develop better forecasting tools. In addition, there are many implementation barriers, which include not only the lack of resources but also the lack of adequate methodologies for analysis.

Disinvestment

Disinvestment would apply to both highway and transit modes of transportation. It is related to the discontinuance of a facility or an operation. An investment and financial analysis should include the alternative of abandoning a highway or transit facility or operation. The continuance of a transportation facility or operation may not always be in the best economic interests of the public. The workshop participants felt that the analytical tools were good at the current time, although the state of the practice was limited. There is not necessarily a need for research on developing models for analysis in this area. There are barriers to implementation that are related to resources as well as ex-

pertise available to utilize the existing analytical tools.

Interaction Among Demand, Financing, and Land Use

The interaction among demand for travel, land use, and the financing of the facilities applies to both highway and transit operations. The current ability to analyze these interactions is quite good. Although the state of the practice is limited, work done on these interrelationships has provided the analytical tools needed. There are barriers to implementation and, again, these barriers are related to resources and expertise required for utilization of existing models. Often, lower levels of planning agencies do not have the resources needed to provide for the analysis in this area.

Maintenance Investment Impacts and Sequencing

The allocation of resources to maintenance and the scheduling of maintenance projects are very important economic considerations in both the highway and the transit fields. The amount of maintenance performed and the intervals at which the maintenance is scheduled have a direct bearing on the total amount of resources that will be required for a given facility. The analytical tools are in existence and the state of the art is good for providing investment and financial analysis in this area. However, the state of the practice is very limited, even though very little research appears to be needed in this particular area. There are barriers to implementation, which, as in many of the other categories, are due to a limited amount of resources available at various levels of planning agencies.

Life-Cycle Costing

The rate of return on an investment is greatly influenced by the life-cycle costing of the item under consideration. Life-cycle costing applies to both highway and transit modes of transportation. Although there appears to be a limited amount of work done at this level in many planning agencies, the state of the art appears to be good for determining life-cycle costing. The workshop participants felt that no major additional research is needed; however, again there are barriers to implementation. It appears that adequate analysis in life-cycle costing is not readily conducted by all planning agencies.

Marginal Reconstruction Programs

The concept of evaluating reconstruction programs on a marginal basis applies to both highway and transit modes of transportation. This concept would also include combining improvements, which would tend to increase the rate of return on the investment of public monies. Often it is more economically advantageous to conduct reconstruction programs on a marginal basis by adding the more significant programs on a specific scheduling basis than to provide for an entire reconstruction project at one time. The analytical tools for conducting analysis in this area are considered to be good, although the state of the practice is limited. The workshop participants felt that little or no research is needed to improve analysis in this area. There are barriers to implementation, which again are related to resources and expertise available at various levels of planning.

Resource Allocation to Local Areas

One of the financial problems in both the highway

and transit fields has been the acquisition of resources at different levels of government. Generally, the higher level of government can collect resources (i.e., taxes) with more ease. Local communities often have difficulty in developing a financial base other than from property taxes. Thus, the allocation of resources to local communities from higher levels of government is important in the transportation field. In addition, the return on the investment of public monies can be greatly altered depending on the allocation of resources in a state or region.

The analytical tools for conducting analysis in this area are quite good, although the state of the practice has been limited. Much of the allocation of funds in the state is done on a political basis rather than on an economic basis; thus, there are barriers to implementation, not only from limited resources but from a political point as well. The workshop participants did not feel that substantial additional research was needed in this particular area.

Cost Reallocation

Cost reallocation is applicable primarily to highways; it addresses the issue of who pays for highways. This is to say what share of highway costs should be borne by such groups as the trucking industry, automobile drivers, and the many other groups that in some way use our nation's highways. This area is very important in the investment and financial analysis of highways and has a direct impact on the funds available for both construction and maintenance of highway facilities. The analytical tools available for analyzing investment and financial considerations in this area are considered to be only fair. There has been much work in this area in years past, but many of the studies have contradicted each other. The state of the practice is limited; some states do more than others in cost reallocation. There continue to be barriers to implementation, some of which are due to insufficient technical knowledge. Some are also due to a lack of data in this area. Additional research is needed to develop better procedures for cost reallocation as it applies to the highway field.

Traffic Operations Improvements

Traffic operations improvements apply primarily to the highway field, although there could be secondary impacts in the transit area. Investment of public monies in improving traffic operations can lead to a good return on investment; however, the workshop participants considered that the state of the art for conducting an economic analysis in this area is weak and that the state of the practice has been limited. Although one can generally quantify the benefits to motorists for a specific traffic operation improvement, it is difficult at this time to ascertain the total economic benefit to the community when the improvement is compared with other types of projects for investment. There have been barriers to implementation, as indicated above, due to resource limitations as well as to the expertise that might be available at different levels of planning. Additional research is needed to improve the techniques that could be used for analysis in traffic operations improvements.

Highway System Management

Management of the highway system applies to the highway field, although again there could be indirect benefits in the transit area. There has not

been major attention given in the United States to the efficient management of the highway system. Generally, the highway system has been viewed as a facility without a need for overall system management. The way in which the highway system is utilized and allocated for use by various groups will have an impact on the economic conditions of a state or the country. However, little work has been done in analysis in this area in the past, and the analytical tools are considered to be weak. Additional research is needed to improve the analysis capabilities in this area. The state of the practice has been limited or nonexistent, and there are, of course, barriers to implementation. Part of the reason for the barriers is the different political jurisdictions that have control over the highway system as well as the lack of expertise to analyze the investment and financial considerations in this area.

Parking Management

The management of parking, whether in a CBD or in other urban areas, is important to both highways and transit. The availability of parking and the way in which it is allocated and managed have a very definite impact on the demand for modes of travel as well as on private businesses. Little work has been done except for some analyses of parking-management strategies as they would affect the investment of public funds. The analytical tools in this area are considered to be weak, and the state of the practice has been very limited. Additional research is needed to improve the analytical capabilities in this area. There are barriers to implementation, some of which are related to resources and expertise that are required. Other barriers are related to the fact that many of the parking issues are decided in the political arena rather than on an investment and financial basis.

Marketing

Marketing applies primarily to transit and includes many activities other than advertising. The workshop participants felt that in the transit field, there has been a severe lack of planning, research, product development, product testing, pricing, and advertising, which would tend to improve the return on investment in the transit field. Admittedly, there are many transit agencies that have had promotional or advertising programs; however, without the planning, research, product development, product testing, and pricing, the advertising is of little benefit. The state of the art in the marketing field is good and has been well established for many years. It is readily accepted and used in most businesses in the private sector; but marketing has been almost nonexistent in the transit field. The participants felt that no additional research was needed in this area, since the marketing field is well established. There have been barriers to implementation. Many of the barriers deal with a lack of resources as well as the expertise in local transit operations to develop comprehensive marketing programs for their operations.

Deregulation

Deregulation includes a variety of activities such as the provision of alternative services, differential fare structures, revenue, pricing, and many other activities that apply primarily to the transit field. The emphasis on deregulation has increased substantially in the past few years in the airlines industry as well as in railroads and trucking. How-

ever, deregulation has not been considered to any great extent in the urban transit area, and very little work has been done. Therefore, the workshop participants felt that the state of the art for analysis in this area is weak and that the state of the practice does not exist. Much research is needed to be able to know the impacts that various areas of deregulation would have in the urban transit field. There are barriers to implementation, some of which are directly related to the infrastructure of the transit field. An attitudinal change must occur in the transit field in order for more work to be done in deregulation. However, the potential for improvements in the investment of public monies through deregulation analysis and implementation could prove to be substantial.

Demand Response to Service Changes

Demand response to service changes applies primarily to the transit field. The workshop participants felt that the state of the art of the analytical tools in this area is good, particularly for those areas in which service changes have been made. There has been a reasonable amount of work done in this area, although the state of the practice is considered to be limited. At the local levels there has not been a reasonable amount of analysis regarding demand response to service changes. There are barriers to implementation, and some of these are due to the infrastructure in the transit field. Even though there could be an improvement in the investment of public monies through various service changes, the ability to make changes is often determined on a political basis rather than on an economic one. The participants felt that no additional research was needed to improve the analytical tools in this area.

Equity

Equity applies primarily to transit operations. The issue is concerned with the equity in which funds are utilized for the total population. Often the benefits of transit are not equitably distributed throughout the urban area. The state of the art of the analytical tools in this area is quite good, although the state of the practice has been limited. It does not appear that a substantial amount of research is needed to improve the analysis capabilities in this area. There are barriers to implementation, some of which are imposed by regulations placed on operators of transit properties. In addition, political considerations are often prominent in the allocation of transit resources.

User-Side Subsidy

The user-side subsidy issue applies to the transit field. Some work has been conducted in analyzing the impacts on investment with user-side subsidies; however, the state of the art in analytical tools is considered to be weak. In addition, the state of the practice has been very limited, and research is needed in this area. There could be great potential for improving the investment in the transit area through user-side subsidies, but without the capabilities of good financial analysis, it is difficult to indicate to decisionmakers the potential impacts of this type of subsidy.

Fragmentation of Services

Fragmentation applies to the transit field and is concerned with the impact of providing a wide range of services that are not necessarily under a central

management scheme. This issue is related, to a certain extent, to the deregulation issue. Some would argue that if deregulation occurs, there would be such a fragmentation of services that the consumer would then be at a disadvantage in securing transit services. However, there has been little evidence that this indeed might occur. Unfortunately, the state of the art in analytical tools is considered to be weak for analyzing the impacts on the community that would occur should a collective group of services be available but not be a part of any coalition or central management. The state of the practice in this area has been very limited, and additional research is needed to improve the analytical capabilities. There are barriers to implementation due to a lack of data, analytical tools, and expertise. In addition, the infrastructure for transit is not conducive to promoting comprehensive analysis in this area.

Allocation of Subsidy to State and Local Levels

The manner in which subsidies are allocated to state and local levels of government applies to the transit field. The return on the investment of public funds could be greatly increased, depending on the method of allocation. Often allocations are made on a political basis rather than on economic investment considerations. The state of the art in analytical tools is considered to be good for conducting analyses in this area, although the state of the practice is considered to be limited. The workshop participants did not feel that additional research is really needed. There are barriers to implementation. Some of the barriers are, of course, related to available resources and expertise, but many of them are related to the political concerns for allocating subsidies to any level of government.

Impact of Alternative Service Options

This issue applies primarily to the transit field and is concerned with the impact of alternative services such as vanpools, carpools, express bus services, and subscription services that could be made available in the public transportation field. The state of the art in analytical tools in this area is considered to be weak, and the state of the practice has been very limited. Additional research is needed in improving the methodologies for analysis. There have been barriers to implementation, which are partly due to resources and expertise available at different levels of planning. The potential for improving the investment of public funds in public transportation appears to be good through the provision of alternative service options. However, without adequate capabilities for analysis of the impact of alternative service options, it is difficult to provide the level of information needed for decisionmaking.

RESEARCH NEEDS

The workshop participants developed nine statements of research needs that should lead to the improve-

ment in analysis in the investment and financial areas. These are summarized below:

1. Deregulation of urban public transportation services,
2. Evaluation of investment in traffic operational improvements,
3. Alternative services--introduction of new service,
4. Estimation of highway goods-movement demand,
5. User-side subsidies to increase revenues and service diversity,
6. Impact of ridesharing on transit revenues,
7. Financial impacts of highway management,
8. Estimation of land value changes as the result of transport investment by using demand-analysis principles and tools, and
9. Analysis of the financial impacts of parking-management strategies.

As can be seen above, the research needs statements tend to support those areas in Table 1 that indicated the need for additional research. Statements were prepared that addressed issues in deregulation, alternative services, goods movement, parking, and highway system management, as well as others.

SUMMARY

From the foregoing discussion it is seen that relative to the issues of investment and financial analysis in the highway and transit field, the analytical tools are generally good, although there are weak areas. In addition, the majority of areas do not need substantial additional research. Two of the more critical assessments in reviewing these issues are the conclusions that the state of the practice is limited in almost every area and that there are barriers to implementation in all areas except one. This indicates that, even though there has been a reasonably good level of development of analytical tools in addressing critical issues, the technology transfer has been so poorly conducted that the analytical tools are almost never utilized, particularly at the local level. In addition to the lack of technology transfer, the analytical tools that have been developed often require such enormous computer and resource capabilities that local planning agencies simply are unable to use them. In addition, the models have not routinely been made readily available through time sharing or other means of gaining access to the analytical tools.

It would appear from the discussion of these issues that more emphasis in the 1980s should be placed on technology sharing than, perhaps, on the development of new models or analytical tools, although there are some needs in this area. It would therefore seem appropriate that a major emphasis be directed in the 1980s to increasing the state of the practice of the various analytical tools in the transportation planning area to enable adequate analysis in the investment and financial areas of highway and transit modes of transportation.