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FUTURE DIRECTIONS FOR TRANSIT PRICING

Proceedings of the September 1980 Conference on Transit Pricing Innovations

April 1981

U.S. DEPARTMENT OF TRANSPORTATION
Urban Mass Transportation Administration and
Research and Special Programs Administration
Transportation Systems Center

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U.S. Department of Transportation
Research and Special Programs Administration
Transportation Systems Center
Urban and Regional Research Division

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16. Abstract

This report contains proceedings of a conference on transit pricing innovations which was sponsored by the UMTA Service and Methods Demonstration (SMD) Program in cooperation with the Transportation Research Board. The purpose of the conference was to provide practical guidance to policymakers and transit operators on improved pricing policies and strategies. Evidence from recently completed UMTA demonstrations and research studies not only served to reveal deficiencies in current pricing policies but also provided the empirical basis for recommendations regarding future directions for transit pricing.

Despite the diversity of perspectives represented, there was unanimous agreement that current transit pricing practices are in need of much improvement. Largely due to social welfare concerns it has been general policy and practice to keep transit fares low and to rely increasingly on sources of funding other than the farebox to cover the rapidly escalating costs of service provision. However, empirical evidence from several free fare and fare reduction experiments illustrate that low fares are inefficient income transfer measures, since they give an unnecessary subsidy to more affluent transit riders and result in relatively small mobility gains for low-income and carless individuals. Moreover, prevalent policies favoring low fares and reduced service levels tend to penalize not only transit riders (who might prefer better service at higher fares) but also transit operators (who could be recovering more revenues out of the farebox).

Acknowledging the likelihood of dwindling subsidy funds, conference attendees concurred in the need for a more businesslike approach to transit pricing, encompassing: (1) a shift toward cost-based pricing, which would mean substantial fare increases for most transit services; (2) increased attention to the quality of the transit product and its efficient production; and (3) greater separation of transit and welfare system functions. The following were identified as critical to the implementation of improved pricing practices: a workable mechanism for mitigating the adverse impacts of fare increases on low-income persons; improved transit cost information on which to base fare policy; improved fare collection methods to permit more complex fare structures; and improved procedures for fare policy formulation and analysis.

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PREFACE

In recent years, transit pricing policies and practices have assumed an unprecedented degree of importance. Recognizing a common desire among policymakers and transit operators to develop and implement improved transit pricing strategies, UMTA'S Office of Service and Methods Demonstrations, in cooperation with the Transit Service Characteristics Committee of the Transportation Research Board, sponsored a conference on transit pricing innovations.

UMTA's Office of Service and Methods Demonstrations sponsors a program of research, development, and evaluation of new and improved transportation management techniques and services. A major aspect of the program is the development and application of innovative and cost-effective approaches for pricing transportation services. Throughout the gathering, recent experience and research of innovative pricing policies and techniques was shared among conference participants, who also provided guidance for future program initiatives.

The conference, held at the National Academy of Sciences Study Center at Woods Hole, Massachusetts from September 3-5, 1980, brought together approximately 75 experts representing a variety of perspectives on transit pricing. The conference was conducted in a series of plenary and concurrent workshop sessions. This organization is reflected in the proceedings contained in this document. The first part of the proceedings presents a summary of major conference findings and recommendations. The second part consists of transcripts of the opening morning plenary session presentations. The third part contains summaries of the three concurrent workshops dealing with transit pricing policy (I), implementation issues (II), and the impacts of price and service variations (III). Following each workshop summary is a list of participants and their affiliations. Many of the research studies and demonstrations which were the subject of informal workshop presentations are described in the references appearing at the end of the proceedings.

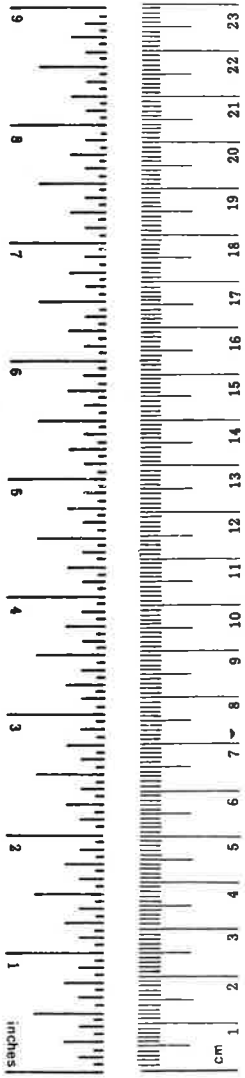
The Transportation Systems Center (TSC) of the U.S. Department of Transportation provided overall technical support for the conference. Under the auspices of the UMTA Service and Methods Demonstration Program, TSC conducts a broad program of demonstration evaluation, technical studies, and other research aimed at improving the efficiency and productivity of urban transportation systems. The conference was planned and managed by Howard Slavin and Carla Heaton with assistance from other members of TSC's Urban and Regional Research Division. Valuable guidance was provided by Ronald Fisher and Bert Arrillaga of UMTA's Office of Service and Methods Demonstrations. Logistical support for the conference was provided by Theresa McTague of TSC's Urban and Regional Research Division and by Les Foster and Susan Swain of the Raytheon Service Company.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

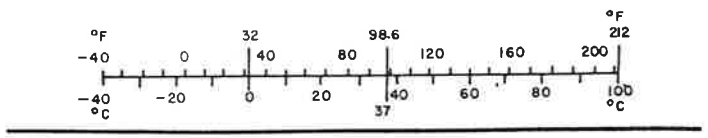
Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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CONFERENCE SUMMARY

FUTURE DIRECTIONS FOR TRANSIT PRICING

Howard Slavin and Carla Heaton, Transportation Systems Center

Against a backdrop of rising deficits and impending fiscal constraints, a diverse group of transportation experts from the public and private sectors participated in a conference held to consider future directions for transit pricing. The conference was intended to provide practical guidance to transit operators on pricing policies and strategies in light of transit industry problems and findings from recently completed experiments and research studies. Another objective was to provide feedback to policymakers, UMTA's Service and Methods Demonstration Program, and researchers on priorities for future work.

Despite the diversity of perspectives represented, a broad consensus emerged from the conference that there is a need for a more businesslike approach to transit pricing. The three principal elements of the approach recommended by conference participants are: 1) a shift toward cost-based pricing; 2) increased attention to the quality of the transit product and its efficient production; and 3) greater separation of mass transit and welfare system functions. These policy recommendations and their underlying rationale, which are discussed in the following sections of this summary, merit serious attention from policymakers and mass transportation providers.

Policy Directions

In recent years, fares have declined in real terms and have also declined relative to the price of automobile travel in most cities. At the same time, the costs of providing mass transit have increased dramatically, precipitating the current financial crisis. It has nevertheless been the policy of transit operators to keep fares low and to make increasing demands upon sources of funding other than the farebox.

There are many reasons for the long-standing resistance of transit operators to fare increases. Although the availability of federal, state, and local subsidies has clearly been an important contributing factor, an enduring reason has been the social welfare concern that transit service should not be priced beyond the means of low-income people. In effect it has been intended that publicly subsidized transit should serve as an income transfer mechanism. Also, Congressional and Executive Branch mandates as well as state and local government policies, dating from the era of public take-over of private mass transit systems, have directed transit operators to maximize ridership and to stabilize fares. These goals have typically been attractive to transit riders, auto drivers, transit management, and labor, especially when sources of revenue other than the farebox have been available. There are clear signs, however, that many transportation officials feel these objectives are no

longer desirable and that others feel that, even if desirable, the objective of maximizing ridership through retention of low fares is no longer feasible.

Current transit pricing practices are in need of much revision. Even the recent rash of fare increases has been in a reactive mode with insufficient attention to the underlying problems of rational pricing and service provision strategies. Rather, political, financial, or administrative expediency have been the principal determinants of current fare policies. Economic efficiency considerations, which many would envision as the cornerstone of pricing policy, exert little or no influence on either transit pricing policy or broader policy decisions regarding the level and sources of subsidy funds.

Although arguments about equity are often invoked by politicians and special interest groups, the equity implications of alternative fare and service policies are rarely understood and may often run counter to expectations. For example, empirical evidence suggests that flat fare structures lead to considerable cross-subsidies among different groups of travelers. Short-distance and off-peak travelers may often pay a higher proportion of the costs of their trips than long-distance and peak-period travelers. Also, flat fares may be regressive in that, in some cases, they effect income transfers from the less affluent to the more affluent.

Low fares, which are typically justified by the intent to aid low-income transit dependents, are inefficient as an income transfer mechanism because they give an unnecessary subsidy to more affluent transit riders. This point is illustrated by experiments with free-fares and fare reduction which have shown that fare policies are blunt instruments for aiding low-income individuals. Many of the beneficiaries of these measures are middle and upper income travelers. Importantly, in the recent off-peak fare-free experiments, smaller increases in tripmaking resulted for low-income and carless individuals than for transit travelers as a whole at great cost in revenues.

Acknowledging the likelihood of dwindling subsidy funds and increasing pressure for more efficient production and utilization of transit services, conference attendees reached almost unanimous agreement that transit fares should be based on the cost of service provided. While determining the appropriate degree of cost-recovery is inherently a local matter, it is important to reestablish the farebox as a legitimate source of revenues. Even at modest cost-recovery ratios, the fare provides what is, at least, a limited market test that operators produce services that consumers value.

A consequence of a fares-based-on-costs policy would be fare increases for most, if not all, transit services. The relative price of some services, however, might decline under this pricing policy. Based on all available evidence, these price increases would add to transit revenues. Perhaps of equal importance, more rational pricing would enable the transit industry to refocus its energies on the quality of the transit product and its efficient production. Another favorable outcome of this policy would be greater differentiation of service and fare levels resulting in the provision of services which are better matched to demand.

Fare and service policies are strongly interrelated, and current fare policies have prevented the transit industry from doing what it ought to be able to do best -- providing good transit service. Conference participants noted the tendency for fare policy to be regarded as the "given" which drives service decisions. This results in service levels, as well as fares, being targeted at the "lowest common denominator." Moreover, in the face of growing deficits, transit operators lean toward service reductions rather than fare increases or implement both simultaneously as a means of fiscal management.

Distortions in transit service result from charging low fares for costly services. For example, low fares and high route subsidies are an obstacle to route rationalization and increased productivity. Low fares have also provided a disincentive to operators to produce better quality transit services which could in some cases recover or nearly recover their operating costs at higher fare levels. For much the same reason, low fares have similarly acted as a disincentive to the provision of differentiated service tailored to different transit markets where this would require higher fares.

As is evident, prevalent fare policies have had deleterious effects on transit service quality. This trend needs to be reversed or transit will provide a much less valuable public service and will lose many patrons even among those who are currently transit captives. This is because of the established fact that transit patronage is relatively insensitive to fares but is more sensitive to service quality. Empirical evidence suggests that even low-income transit dependents might prefer good service at higher fares to service cutbacks at "stabilized" fares.

Implicit in the recommendation that transit operators be allowed to focus in a more businesslike manner on the provision of good transportation services is the view that operators should be relieved of social welfare responsibilities. This should not be taken to imply that aid to the most needy is thought to be of little importance. Rather it is a reflection of the fact that many conference participants felt that better means are available to achieve this social goal. Recognizing the political reality that social welfare concerns would continue to be of importance in transit fare policy deliberations, much attention was given to workable approaches for mitigating the adverse impacts of fare increases on low-income persons. As will be discussed subsequently, there was considerable agreement that a narrowly targeted user-side subsidy mechanism could fulfill this need.

Implementation Issues

No matter how sound from an economic standpoint, improved fare policies will not be implemented unless approaches to overcoming potential operational and political obstacles are developed. The following four areas were identified as critical to implementation of improved pricing practices:

- a workable mechanism for targeting subsidies to individuals who meet eligibility requirements
- adequate transit cost information
- improved fare collection methods
- improved process for fare policy formulation and analysis.

It was generally agreed that UMTA's Service and Methods Demonstration Program was already making progress in several of these areas and that future demonstration, evaluation, and information dissemination efforts ought to be even more focused on assisting the transit industry's transition to more efficient pricing.

As noted above, one of the major conference recommendations was that any transit subsidies should be targeted to the most needy travelers rather than distributed to all transit riders independent of need. The user-side subsidy mechanism, an innovative financing concept developed and tested by the SMD Program, was felt to be a promising method for accomplishing this task. Under this scheme, individuals qualifying on the basis of appropriate criteria can use vouchers or prepaid tickets to obtain public transportation services at lower than normal fares.

On the basis of several SMD-sponsored user-side subsidy projects involving improved transportation services for the elderly and handicapped, this mechanism appears to be a workable and cost-effective means of targeting subsidies to specially designated user groups. Experience to date suggests relatively low program administration costs and negligible incidence of fraud. An especially attractive feature of a user-side subsidy in the context of transit pricing policy changes is its flexibility -- in particular, the ability to vary the level of discount by recipient, provider, and/or service type and to spread subsidy contributions across different funding agencies. It was felt that the existing welfare system could and should be used in order to minimize the administrative costs and operational difficulties of implementing user-side subsidies in conjunction with fare increases.

The second major implementation need identified by conference participants was improved cost information on which to base fare policy. In particular, it was felt that transit operators should upgrade current data collection procedures to obtain more detailed information on service levels, ridership characteristics, and costs at the individual route level. Moreover, participants supported the idea of transit cost studies to improve operator understanding of how costs vary with level of service, trip length, and time of day. It was felt that the development and application of improved cost estimation methods would be useful not only in establishing fare policies but also in improving operational and managerial efficiency.

Another major implementation issue addressed during the conference related to fare collection methods. Recognizing that cost-based pricing would undoubtedly mean more complex fare structures, there was considerable discussion, especially in Workshop II, about the practicality of collecting the appropriate fare from each traveler. Simplicity has been the single most important criterion used by transit operators in deciding among alternative fare structures. While there is no question that the costs and practical aspects of fare collection methods should be considered, there may be undue prejudice among transit operators against distance-based fares. Many systems in Europe and some in the U.S. routinely collect distance-based and other more complex fares, suggesting that reevaluation of prevailing views is warranted. Documentation and demonstration of workable procedures for collecting more complex fares would aid this process greatly.

During the conference there was much discussion of the potential of innovative strategies such as self-service fare collection and credit card postpayment systems. It is possible that these strategies would also facilitate the implementation of more complex fare structures. Under self-service fare collection, which is prevalent in Europe, travelers determine and pay the correct fare without constant monitoring by transit personnel or equipment. Spot-checking of passengers is used to promote compliance with the payment of the correct fare. Under a credit card postpayment system, travelers would be billed at periodic intervals for their transit usage. This requires reliable on-board equipment to compute and record fares. Existing automatic collection equipment has performed poorly in operating environments, indicating that further improvements may be required before credit card postpayment can be tried.

Some of the major research issues surrounding these two innovative fare collection approaches include their capital and operating costs and their impact on the degree of fare evasion. Forthcoming demonstration projects involving self-service fare collection were endorsed as a means of obtaining much-needed experience on hardware, institutional, and operational questions as well as measures of the impacts of such systems on travelers and operators. Over the longer term, as more reliable passenger monitoring equipment becomes available, alternative techniques such as credit card postpayment could be tested.

Transit fare prepayment was the subject of substantial debate in several workshop discussions. Although this concept does avoid the limitations of cash payment of transit fares, there was concern on the part of many that unlimited-ride instruments such as monthly passes have detrimental effects on operator revenue. These passes are typically sold at a discount and they are almost invariably purchased by riders making more than the "break-even" number of rides. Moreover, SMD project findings were reported which indicated that transit fare prepayment seldom results in the realization of frequently alleged operator benefits such as increased ridership, stabilization of ridership, or improved cash flow.

The final major implementation need identified at the conference was better procedures for formulating and instituting improved fare policies. It was agreed that sound empirical information on the response of different market segments to fare and service changes is critical to the analysis of alternative fare levels and structures. There is a further need for an understanding of the effect of exogenous forces such as changes in the price of fuel which may have larger effects on transit revenues and costs than many policy options. Participants also concurred in the need for better communications among transit managers, transit policymaking boards, funding agencies, and the public regarding the implications and impacts of fare and service changes. Finally, periodic fare reviews were recommended as a sensible management practice which could provide a framework for implementing improved pricing policy.

PLENARY SESSION PRESENTATIONS

Ronald J. Fisher, Director, Office of Service and Methods Demonstrations,
Urban Mass Transportation Administration

The Service and Methods Demonstration Program is constantly seeking guidance for its program of research which has been organized in three basic areas: Special User Group and Paratransit Innovations, Conventional Transit Innovations, and Pricing Policy. The first two areas involve the full range of public transportation service improvement possibilities and the latter area then focuses on setting a rationale for the fares one might charge users of these services.

The purpose of this conference is to provide us with guidance on the research needed to develop rational pricing policies. We first sought this guidance in March 1979 at Virginia Beach when a similar group was invited to meet on this issue. We believe it is again tiem to convene a group of leading thinkers to review the progress being made and again identify where our efforts should focus.

Many of the same people are in attendance here at Woods Hole. However, whether you are an "old hand" or a "newcomer" we are assuming that you are familiar with the work underway in SMD. Most of you are involved one way or another in our activities or at least using the research material. Because of this background and the feeling many of us had that we spent too much time reviewing SMD material at Virginia Beach, we have greatly reduced the presentations. There is much more time allowed for discussion in the workshops. You have been invited after all to be here because of the contribution we feel you can make, so you'll have more time for it. The only formal presentations will be given this morning in the plenary session as a means to energize your thinking as you go into the workshops. A few brief informal presentations have been staged for the workshops and the rest is up to you!

Summary of Where We Are in SMD

As a first step toward laying some groundwork for our workshops, let me try to focus a few of the major issues as they seem to have evolved from our meeting in Virginia Beach. I do not think there is a more complex undertaking in the public sector than the process of establishing a user charge for the services rendered. Clearly, there are a number of perspectives with differing motives when it comes to transit fares: the local taxpayer, the user, the transit manager, the transit employee, the local businessman or developer, the local, State, or Federal official. We have attempted to obtain some first-hand insights by inviting a mix of these people to the conference. Our featured speakers will initiate this effort. Keeping in mind these varying

perspectives, let's just skim over some of the larger concerns that have been highlighted for consideration in the process of setting public policy on fares.

Equity - Rapidly rising to the top of the list I believe is equity. Flat fares are certainly easier to understand and collect. However, the boundaries for many transit districts extend out many miles. Just how fair is it to be paying the same fare for a short ride in town as the long ride into town -- especially when the person taking the long ride may be much more affluent? Could this be a substantial source of revenue that is being overlooked? We have started research in this area since the Virginia Beach conference that will be discussed in the workshops.

Ability to Pay - Related to the issue of equity is the old social welfare concern for one's financial capability to purchase mobility in our auto-dominant society. We touched on this concern at Virginia Beach as most of us believed the farebox would be getting more attention--though none would have envisioned 50-cent fares in such cities as Atlanta, San Francisco and Boston in 1980! Now that these higher fares have arrived with good prospects of even higher fares in the future, it seems time to seriously review the alternatives to low transit fares for achieving certain social welfare objectives. I am concerned that we are adding substantially to the cost of providing transit in order to make it attractive to the wealthy commuter and usually not charging him very much for it. The improvements were made for such things as congestion relief and to assist national environmental and energy-related goals. Now that the cost of driving the auto is rising rapidly, it appears we may be able to use the farebox to get back more of these improvement costs. Should the low-income be made to share the cost of achieving these broad public purposes? Most low-income would have been happy with the old quality of service and since their riding habits are more even, the cost impact of commuter peak loads would have been absent. Now that our desire to improve public transportation so it will attract people out of cars is working and we've about eliminated low cost public transportation for lower income people, what tactic is left to reduce the negative impact of rising fares on these people? We have been experimenting in the SMD program with user-side subsidies for several years and many local areas are now choosing to help low-income elderly and handicapped people achieve mobility by directly subsidizing their travel budgets while using taxicabs. Perhaps a targeted subsidy for all low-income using transit is needed. But what area of government should be responsible? We are investigating the possibility of targeted subsidies with staff in Boston and Atlanta. It is noteworthy that legal actions against the recent fare increases have been taken on behalf of the low-income people in several major cities. I would just like to quote from the court statement concerning this in LA:

> "The court believes the rate increase is unfair and an impossible burden for the elderly, the handicapped and the poor. The court believes the Rapid Transit District can and should seek funding in areas not yet exhausted instead of passing operating costs on to those least able to pay."

I firmly believe fare policy is not a matter to be decided by the courts, but are we being effective as professionals and government officials, if we allow matters to degenerate to the point where they are taken before a court of law?

Cost-Effectiveness - While the final decision on fares must be a political one for many reasons, some already mentioned, the previous forum identified important areas where improved analysis methods would be useful.

One analysis area identified is the need to give better insight into the causes behind cost increases in a timely fashion. We are involved with two projects, one in Columbus, Ohio that Jim Reading may wish to comment on in his remarks since he's the local sponsor, and the other project is in Omaha, Nebraska. Both projects are aimed at improving our technique for measuring and estimating actual costs and benefits of current transit operations. A timely assessment of how well the current operation is performing against the local objectives should result. In addition, work is being done to sharpen analytical techniques to assess the impact of service and fare policy change strategies to guide selection of those strategies that might better meet the objectives for the transit operation. For example, what is the comparative cost-effectiveness of various types of conventional and paratransit services that could be chosen to respond to the various travel markets in a particular community?

Progress has been made in defining the elasticities for various market segments for service changes and fare changes. Most decision-makers are seeking guidance on ridership impacts of the various options for service modifications and fare strategies. We are conscious, as never before, of the trade-offs that can be made between the fare charged and the service provided for particular segments of the traveling public. We have given considerable attention to this since Virginia Beach. One output is a report recently done by Ecosometrics that I hope is a step in this direction. Limited copies of the draft report are available for conference participants.

Revenue Opportunities - Turning to another issue there was considerable discussion at our last meeting about the diverse array of revenue opportunities. Prepaid passes were just surfacing as a mechanism to market transit to employers. Now we have numerous examples of employers that not only market the passes to their employees, but give discounts of up to 100% for the passes. Legislation is even progressing through Congress to give tax credits that will encourage more of this and ensure that it doesn't result in a taxable benefit for employees. The pass also has potential for targeting subsidies for low-income. Other revenue opportunities gaining attention appear to involve peak differentials and premium services like express buses. There is also the whole array of paratransit-type services.

Sometimes success can be painful, though, and many transit properties are finding it difficult to keep up with the market demand for their passes. We are now looking to some exciting possibilities for involving the private sector, especially banks or grocery chains, for merchandising prepaid passes as another step toward relieving the transit operator of a function that is really not his specialty -- handling cash.

Speaking of cash, it was suggested at the last conference that we should be moving to a cashless fare collection system. One of the real burdens to a transit operator is the handling of fares. While fare-free services would quickly achieve this objective, it appears that except for limited time periods and geographic locations, it is not a likely outcome of the political process establishing fare policy. However, there have been some exciting developments over the past year and a half that point up the real possibility for eliminating cash handling for the transit operator while at the same time generating increased farebox revenue. One aspect is the growing use of multiple ride prepaid passes. Another is the growing use of articulated buses, and the return to light rail, which have added incentive to modify fare collection techniques. Finally, vast improvements by our banking industry are encouraging us to consider the private sector in new imaginative ways to take on the transit operator's cash-handling responsibilities. It is their specialty and it would seem they could do it more effectively and at less cost than the transit operator! It is very possible by the mid-80's, that some transit operators, through the use of self-service fare collection systems and prepaid passes, will have eliminated all direct handling of cash. We are working with San Francisco, Portland and Seattle in this area.

These are a few of the major concerns discussed at our Virginia Beach conference and a hint of what we've been doing about them. More details will certainly come out in the workshop discussions. It is really an exciting and challenging time to be involved in the development of transit pricing policy! I would also be remiss, however, not to close on one more major theme in our work. We don't believe transit fares can be viewed in isolation, set apart from public policy on the cost and use of the auto. We are impressed with the bold steps being taken to price auto parking to discourage commuter use in Madison, Wisconsin, Los Angeles, and Palo Alto, California. We may even see some form of corridor pricing emerge in Hawaii next year. Pricing techniques to discourage recreational traffic from parking in residential neighborhoods in Hermosa Beach and Santa Cruz, California are being implemented. The 80's look to us like an exciting decade for the development of a comprehensive approach to setting pricing policies to achieve desired public objectives in urban transportation!

Now it is my pleasure to introduce our first speaker who will provide a transit operator perspective on transit fare policies.

James Reading, General Manager, Central Ohio Transit Authority

I'm here representing the Transportation Research Board, TRB, and its Transit Service Characteristics Committee which is a co-sponsor with UMTA of this pricing forum. The executive director of TRB, Tom Deen, extends his best wishes for a successful workshop. He and other staff members of the Transportation Research Board are pleased that we could take advantage of this opportunity. They're just sorry that they can't be here with us.

The Transportation Research Board is the unit of the Commission on Socio-Technical Systems of the National Research Council, which is the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. From its beginning, in the early 20s, as the Highway Research Board, its purposes have been to stimulate research, to make known research findings, and to undertake special research where appropriate. The Board does not take positions on matters of policy, but rather acts as an objective source of facts on which others may base policy. The Board's program is carried out by some 250 committees, task forces, and panels composed of more than 3100 administrators, engineers, planners, social scientists, educators, and transportation professionals. All serve without compensation. Any of you who haven't had the opportunity to attend an annual meeting of the TRB should attempt to do so.

The committee I chair, A3B01, Transit Service Characteristics, is concerned with the identification of specific areas where the operation of transit systems could be more responsive to passenger needs, and the development of criteria useful to transit management, making transit operations more attractive to users, including transit user information elements such as service, routes, schedules, and fares.

I'm going to change hats and put on my hat as general manager of the Central Ohio Transit Authority. We call it COTA. A year ago today we raised our basic fare to 60 cents, from 50 cents, increased the express fare from 50 cents to 75 cents, and at the same time eliminated four routes. We had come off of a ballot asking the electorate for a half-percent sales tax to enable us to replace our aging fleet of buses, build a new modern facility, to add buses to the fleet and be able to expand our system to meet the ever-increasing needs of the local consumers. They had turned us down. We told them in advance that it would require higher fares, less service, or a combination of the two. The Board acted quickly and on September 3, 1979, increased fares. We had no choice. We didn't really have the opportunity to do a lot of studying about methods to be used or innovative fare structures. We only believed that with the conservative attitude of Central Ohio that the people in the suburbs had to pay more than the people in the city. That was the reason for our express trips going up 50 percent.

We were reported to the Council on Wage and Price Stabilization and there were editorials about it, but interestingly enough, a majority of the people and the media said we had done the right thing. And our ridership continued to increase. We reported that fact in the pages of Passenger Transport and I was

amazed at the phone calls of transit operators throughout the country. They had been holding up, worried and concerned about increasing fares. When they found somebody who had done it and lived through it, they decided they ought to do the same.

Those of you who read Passenger Transport, and those of you who have had it happen in your city, have noticed that there has been a rash of fare increases. And almost in every instance without a decrease in ridership. A copy of Transit Journal of a year ago has an article by Michael G. Ferrari of Simpson and Curtin, who are famous for fare formulas, on "Transit Price Elasticities Revisited." The old Simpson and Curtin formula no longer can be applied. It's a different ballgame we're in. Those of you who have watched with interest and maybe with some alarm at what Congress has been doing, and how UMTA has reacted to things that Congress has been doing, have noticed that there is no longer what frequently was referred to as a bottomless well. The amounts of money available are limited.

While a lot of systems lowered fares to 15 cents and 25 cents in order to encourage more riding, we now are placed in a position where we have to increase fares. The farebox has to supply a higher percentage of the total operating expense. It's for that reason that all of us working together must develop what we in Columbus call incentive fare plans. Part of our program in going to the electorate this past June was what we call an incentive fare program. And, we did not lower our basic fares. We're going to provide discounted ride opportunities through passes and other forms of incentive fare programs, without lowering the basic local and express fare. We hope that our research has given us what we need to make the right decision. At any rate, we went to the electorate on June the third, and they approved by over 57 percent the increase of local assistance from three million dollars a year through the property tax to eighteen million dollars a year with a half-percent sales tax. We're now going to be able to give them the level of service that they need and deserve in return for the money they're going to give us.

So it's very appropriate that we have, as far as those of us in Central Ohio are concerned, this workshop over the next couple of days so that we can make certain that we share with you, and you share with us, what is going on out there in the jungle. We have the opportunity to share experiences, knowledge and concerns, problems, so that we can face the future and do a better job. Thank you very much.

Donald Mazziotti, Former Deputy Assistant Secretary for Policy and International Affairs, U. S. Department of Transportation

It is a pleasure to be here today and I would like to extend my thanks to Ron Fisher of UMTA/SMD for asking me to speak to this group on matters related to the allocation of transit services through pricing mechanisms.

I would like to begin my discussion with the context in which Secretary Goldschmidt is addressing major issues in transportation, including urban transportation.

Many of you have now seen the recently-released document, "Transportation Agenda for the Eighties." This document was developed by the Secretary -- in consultation with public and private commentators and experts -- over an eight-month period to serve as the basis for establishing an agenda of action by the Department of Transportation. The document does that and should serve as the beginning of a dialogue on the key issues which face the nation and the transportation community.

The key areas of interest are not arranged by transportation problems; instead, the document and the Secretary have identified producitivity, world trade, transportation manufacturing industries, community revitalization, mobility, safety, air and noise, and energy as areas of concern -- within which we must consider the role of transportation.

It is axiomatic -- but only lately recognized -- that transportation is surrounded by a larger social and economic context within which it exists. Furthermore, the behavior of the transportation sector greatly influences the larger context to which the Agenda document refers. The document makes clear that we must be acutely concerned with the relationship of transportation to the world-at-large and the great contributions we can make to that world.

Transit has a key role to play.

The Federal government has spent several billion dollars over the past decade in urban transportation -- highways and transit. The last decade has seen, in transit, massive funding for both capital and operating expenses for transit. The return on this investment has been the rebirth of transit in America, with great increases in ridership and the provision of an important alternative to the private automobile. Likewise, traffic congestion has been reduced, air quality improved, and mobility increased as a result of these investments.

At the same time it must be increasingly clear to you that the development of transit has brought with it new problems and challenges to be met by transportation planners and analysts. For example:

> Operating deficits in transit systems have increased by more than 500% in the past eight years.

The energy efficiency of transit has actually declined over the period 1970-1980 because of low load factors.

The continued development of low-density suburbs is now and for the next decade a challenge to conventional bus transit in the United States.

Ridership -- particularly at peak -- is no longer the friend of transit. Instead, great peak-hour demand increases force the utilization of expensive deployment and routing schedules.

Finally, the cost of transit is far less than the available alternatives -- simultaneous with continued increases in the federal share of operating costs.

These and other problems must be effectively addressed in this decade. If we fail in this respect, we may well see the decline of transit as an effective urban transport alternative.

Perhaps the greatest challenge -- both as a matter of policy and analysis -- is the peak. It seems clear that unless we are able to identify methods by which the peak in transit can be smoothed, in combination with other productivity increases, the future of transit is in serious question but for the most densely-populated areas of the country.

The Secretary has made clear his commitment to transit and his concern that these challenges be met in the first part of this decade.

You have gathered here to discuss various aspects of the peaking problem and related transit management issues in the broad sense of that term. Most of you have "hands on" experience with either the planning or operations side of transit. Most also have strong analytical strengths or backgrounds which should allow a mix of ideas and proposals. I encourage you to combine that mix and establish directions which you believe would be most productive.

Turning to the issue of immediate concern to you and this conference -- peak-hour service and pricing -- allow me to provide my thoughts on developments in this area.

First, as I have noted and as the Agenda document notes, it is essential that transit systems turn to the fare question immediately. The time is past when a system can be managed without a clear fare policy. Fares are, in general, far too low compared to the alternatives available. When fares are fifty cents and the auto alternative for the same trip is between three and five dollars, it makes little sense to suggest that increased fares will permanently reduce ridership and that well-worn argument ought be put to rest.

Second, limitations on management decisions related to operating costs, like the 13(c) provision, make less and less sense unless work rules are made more realistic. In my view, 13(c) is limiting the growth of the transit industry. As you know, the Secretary has called for an evaluation of 13(c) and its impact on transit service and growth.

Third, the federal government should not be expected to bankroll the rising operating costs of transit systems. It is also time to abandon the revenue-sharing approach to determining the federal share in operating assistance for transit systems. Our transit proposal would change this substantially and turn to a service and market area size (population) formula, with an "incentive" tier for increases in productivity.

Fourth, it is essential that we give increasing attention to service to low-density areas. In many cases, as I have noted, conventional bus transit is not a cost-effective approach, despite its continued use around the country. Likewise, the continued extension of service to low-density areas, frequently for patently political purposes, cannot be allowed to become the rule for transit planning. The role of ridesharing, carpooling and paratransit must be embraced or the fiscal position of transit systems will be put into serious jeopardy.

Fifth, and finally, we must find ways to manage the peak. Peak-hour pricing schemes appear to hold great promise. Efforts to influence the off-peak -- to pick up ridership in the off-peak -- are relatively unimportant compared to dealing with the peak side.

A part of the peak-hour problem -- time -- is clearly beyond our control; however, marginal cost pricing, private sector subscription service, and scheduling are tools which can and should be used in concert with peak-hour pricing to help solve this problem.

There are seven questions on which I believe research ought to be focused with respect to the peak problem and these include:

First, what is the role of public transportation in the United States? And I suppose we would have federal, state, and local answers to that question. And probably the private sector. In other words, what is the purpose of public transportation. What is it supposed to serve and rank it. Most important or least important.

Secondly, what are the assumptions of the research or the experimental design that you've come up with, both as a DOT for its programmatic concern, and as an individual project? Is transit always good? Most of the research that I see in transit assumes the transit is inherently, somehow, good. That it's a value that transcends questioning as to whether it is inherently good, and I think that we ought to attempt at least to relieve ourselves of much of the bias that is built into both highway and transit research, and instead ask the question, what assumptions are we really assuming as far as our research?

Thirdly, what are the standards or the criteria by which research or demonstrations are to be evaluated? Make them clear, make them explicit. They frequently are not. Or, they frequently are standards or criteria which, of however much academic interest they may be, or how nicely they might fit a x^2 test, are of absolutely no policy interest or political interest to the people who manage or have those responsibilities.

Fourth, what are the alternatives, and what are the comparative costs in fiscal or in past? Those are important issues which at least ought to be referenced if not dealt with. I understand that frequently scope of research, length of article, and amount of money provided for research does not allow complete analysis of these issues. However, it also does not allow the reader a proper understanding of the underpinnings of the research itself.

Fifth, what is the scale of the solution in terms of federal, state or local purpose? Said in another way, what is the return on the required investment compared against those alternatives? In other words, if you were the President or the Secretary, would you spend a billion dollars for enforcement of a 55 mile an hour speed limit, or would you spend a billion dollars on transit? And why, and with what return? It's very difficult dealing with research results which compare themselves only with a narrow set of purposes or a narrow set of purposes that are defined as part of the research. It ought to be broadened. Which investment gives you more of what you want in terms broader than, for example, transit.

Sixth, what are the social costs? What does it do in terms of air quality, congestion, equity, noise, other sorts of considerations which are difficult to measure but alleged to benefit or be costed by a transit decision.

Finally, what are the transaction costs? What are the costs of your solution or alternative in terms of time, complexity, management feasibility, administrative costs, institutional change? Those variables may in the end, regardless of how feasible your solution may be considered from a research standpoint, be the most important barriers to accomplishing what you propose. And without an understanding or at least an assessment of that relationship, it's difficult to become an advocate for your alternative, your solution, or your pricing policy. I guess the critical point in all of that is to understand that each of the seven factors, or questions, will be viewed differently by federal, state, and local private interest. We are turning our attention to defining more clearly what the federal purposes and the federal objectives are. That's what the agenda for the 80's document is about, and that's why I would urge you to examine that to come to understand where we're at.

Let me conclude this discussion by speaking about the future of highways, the automobile, and the implications for transit.

We are approaching the conclusion of the Interstate system. We must complete essential gaps and move on to maintaining the system in place, undertaking major improvements or extensions where productivity or other improvements provide a clear transportation investment justification. As the Interstate program closes, it becomes essential to work to unify highway and transit considerations into a coordinated transportation system.

If you are looking to the demise of the private auto, as some circles have done, I would advise against that course. Vehicle efficiency will improve dramatically in this decade, as will passenger miles. The issue is not auto versus transit. The question is how, and by what means and cost, do we combine the use of both in an urban setting to meet transportation needs.

Finally, let me add that the task is clearly feasible. If we meet the challenge of the peak for transit, as well as the other issues I have raised, in the next five years, you will have contributed to improvement in the overall system.

I wish you great success in your conference and once again extend my thanks to UMTA and SMD for the opportunity to share my thoughts with you.

Douglass Lee, Associate Professor, University of Iowa and Faculty Fellow, Transportation Systems Center

This conference is the third, that I am aware of, in which pricing has been explicitly mentioned as the focus of the conference. The first was about four years ago and that was the beginning of any recognition of pricing as a policy instrument in the transit field. This time it's my hope that Ron Fisher can put efficiency at the top of his list of what we thought was important, instead of equity. That doesn't mean we can forget about equity--it's just as important as it always was -- but equity needs to be placed in the context of efficient transportation. Pricing is one component of efficiency, the other being investment evaluation.

Two areas of efficiency seem important to me in regard to transit. The first is the need to improve the resource productivity of transit as a form of transportation. The second is the need to improve the efficiency of transportation in general, an effort that UMTA and the transit industry must actively join in.

A few decades ago, most properties were privately owned and operated, responding to whatever the market offered them and setting fares and designing service according to what patrons would buy. Gradually they became unprofitable and were taken over by the public sector. Somehow in that process the emphasis shifted toward supplying cheap transportation, which means both low price to the user and low cost to society as a whole. A caricature of this market is low quality service offered at a low price, low reliability, and generally low physical security. Many of the riders have a very low opportunity value for their time, and also place a low value on the trip. The Spear-Doxsey study that reviews some of the no-fare experiments indicates that just what you'd expect happens. People who don't care that much about the trip are out joy-riding, often causing trouble for other people. Thus the low-quality, low-price combination becomes self-reinforcing. Low price attracts more people and crowding, making for a more uncomfortable trip. It also attracts people who don't place much value on the trip, and makes the atmosphere less desirable to those who place a high value on the trip. Those people who want high quality service are then forced into other modes. The average peak rider, who is employed and has an income, gets the poorest service.

In addition, flat fares subsidize long trips, an effect which tends to defeat the income transfer objective of providing transit as income-in-kind for people lacking in mobility. Flat fares discourage short trips, which (according to Marty Wach's group at UCLA) yield better cost recovery than long trips.

So we can draw a few general conclusions. One we've known all along, which is that users are much more sensitive to quality than price. Jim Reading's example of designing service for quality and letting the price fall where it may is a good one. That may overstate it, but too often we have worried about

keeping the price down, when we should have been worrying about getting the quality up.

The second conclusion is that transit should be used for its transportation purpose and not primarily as a means for redistributing income or achieving other social goals. In my opinion efficiency and equity are not in conflict, and equity can be improved by improving the efficiency with which transit service is provided and priced. By concentrating more on the efficiency side, we can greatly clarify what it is we are trying to do in the way of equity, income transfers, or other social goals. The notion that "equity" means everybody pays the same fare, no matter what service they get, is silly.

Unfortunately, such misunderstandings are not laughable. Once upon a time, I was told (by an UMTA official) that offering different services to different market segments was inequitable. Specifically, charging a higher price and offering a higher quality of service to, say, suburban commuters, while offering a lower quality of service at a lower price to inner-city or low-income travelers, was inequitable. Even if the price to the affluent riders was 150% of cost while the poor riders paid 10% of the cost per trip, it was still inequitable to provide different kinds of service. Regulations based on distorted conceptions of this sort are bound to be heavy-handed.

A number of possibilities exist for improving transit's contribution to transportation. According to the Meyer and Gomez-Ibanez (Harvard) study, there are major productivity gains which can be achieved in transit if we start working on the right incentives. Some of these relate to how subsidy funds are allocated to transit properties, both on the federal and state levels. If transit systems are rewarded for the size of their deficits or the population of the area they serve, no incentives are created to increase productivity. What we should be rewarding is performance, and performance means carrying passengers.

Another possibility is the targeting of service to market segments, which means creative marketing in the sense of understanding potential patronage groups and offering them the best combinations of price and service characteristics. This might result in fares that are graduated over distance, fares that are graduated by time of day, high-quality service for some markets and low for others and even, perhaps, multi-class service. Two-class service is available right now: you can get a seat or you can stand, but you don't get a lower fare by standing. The people who get the seats are those who arrive first, generally those making the longest trips. Not only do suburban commuters pay a lower share of costs, they get a higher quality service. The answer is not to force all service to the lowest common denominator, but to maximize benefits to the consumer relative to the costs of service.

A bus carrying 20 passengers at 20 miles per hour is doing a much better job than a bus carrying 40 passengers at 10 miles an hour, even though the same equipment is required and roughly the same costs are incurred; yet the first service is twice as good as the second. Speed can be increased through express service, skipped stops, and creative origin-destination routing. Improved comfort and reliability would help a great deal. The tendency for vehicles to bunch up can be corrected with some effort.

User-side subsidies should be based primarily on income which gets around the problem of in-kind income redistribution that transit is not very good at. Studies consistently indicate that, at best, transit redistributes income very poorly, and sometimes it redistributes income in the wrong direction. The way to achieve social goals is through direct subsidies to selected users, based primarily on income. Special demand-responsive services for elderly and handicapped can use vans and private taxis. Lots of options are available that we fail to utilize at their full potential.

Some of the things that, from my superficial review, are <u>not</u> very helpful in improving transit efficiency are reduced or free fares, promotion and advertising without service improvements, massive buses, novel technologies, subsidies to the nonpoor whether direct or in-kind transfers, and justification of transit subsidies on the basis of air pollution and energy savings.

The second of my two points is that improvements in transit efficiency can only have limited impact until we improve the efficiency of the transportation system as a whole. According to my own research, the subsidy to the automobile nationwide is at least five cents per vehicle mile. If that is true, it means that the subsidy to travel is on the order of $50 billion per year, which is certainly counterproductive to the subsidy of transit. Subsidizing one mode while subsidizing its competition leaves the balance more or less the same. In this case, however, reducing the price of both transit and auto leads people to choose the private automobile. It's only when the scarcity of resources -- the vehicle capacity of highways, and fuel -- is reflected in the price to the user that travel patterns will respond to the real cost of the resources. Modes which economize on those scarce resources will have a bigger advantage when the subsidies are removed. Transit would be better off if the prices for highway usage were greatly increased, and all users (including transit) paid them. The transit industry should be pushing for greatly increased highway user charges, and there is a strong technical basis for doing so.

With a mature transportation system, particularly the fully developed highway network, the long history of previous investment should be returning us an enormous profit. In other words, the revenues from highway users and transit users and other transportation system users should be enough to cover all the operating costs and also provide a return on investment, pay local property taxes, income taxes, and sales taxes, and still leave us a surplus in the treasury. Instead, transportation users are exempted from most of these taxes, and still more money is siphoned out of tax revenues and into transportation. My contention is that we will never have successful and profitable transit until highways at least recover their full costs. In the short run, by pricing highways below marginal cost, we fail to use the high-capacity modes (transit) efficiently, and we fail to use the highway capacity efficiently. In the long run, land use patterns develop that tend to reinforce the service characteristics of the automobile. The net effect of all transportation and related subsidies is to place the single-occupant auto in the dominant position. Obviously, anything that increases the time and money price of auto travel will help transit, but there is no need to discriminate against autos. So long as excess demand for highway capacity

takes the form of congestion, all travelers suffer the same time delay whether they are in a car or a bus. The bus has no advantage. But substitute a money price for the time delay, and the price can be split among the bus passengers. Bus users enjoy a scale economy because they share the cost for that vehicle, whereas the single occupant in the auto has to pay the full price.

Some of the less direct ways of improving multimodal transportation efficiency that are being tried are reserved lanes, exclusive rights of way for transit, signal preemption, auto restraints, parking surcharges, elimination of subsidized parking, zone permits, neighborhood parking permits, and priority access to selected facilities. These measures allow transit to be separated from other highway users, possibly increasing the speed of transit relative to the speed of other modes. As I'm sure you are aware, the political and operational problems involved in implementing policies of this sort are akin to walking a minefield. The fleeting Diamond Lane experiment in LA is one example.

An example of something that doesn't help much is ramp metering. I've seen people who would never run a red light anywhere else plunge through a ramp control with total impunity, and the implied transfers from who suffers to who benefits sound undesirable. Carpool lanes, another form of multi-class service, also don't do much good. They just substitute one kind of time for another kind of time. Squeezing congestion onto automobiles may serve some purposes but is likely to be counter-productive in the long run, and stimulate strong negative reactions.

So that is my pitch. It is clearly efficiency-oriented, and efficiency in a broad sense that says we should make the best use of the resources available to us to provide something of greatest benefit to the most people. My recommendations are two: use transit for transportation rather than for welfare, and participate actively in improving the overall efficiency of transportation, as well as transit. The future of transit depends upon how successful we are on these two fronts.

Philip Ringo, President, ATE Management and Service Co., Inc.

I really have four things I'd like to cover. I will be brief because we're running out of time. One, I'd just like to make you aware of my biases and philosophies regarding transit pricing and tell you where I'm coming from. Two, I'd like to relate some of our specific pricing experiences on the systems that we manage to those biases, and try to tell you what I see happening around the country. And third, do a little of what I call amateur psychoanalysis and try to identify some of the hang-ups that I think we collectively have in regard to fares. (I think they're hang-ups that could get in the way of a coherent transit pricing policy). And fourth, if I pick on everybody's hang-ups, including my own, let me see if I can identify some things I think we can do to cure those hang-ups. And if there's time, I'd throw in my acceptable pricing structure that I think makes sense for a medium-size transit system.

Let me outline, and these are really personal beliefs and philosophies regarding transit pricing. They echo some of what I think you've already heard. First, I very much believe in the value of the transit product. This means to me that a clean, comfortable, timely transit ride should be priced to reflect the value delivered. I don't think transit needs to demean itself by its pricing policies. I don't think transit needs free fares to succeed. And basically my philosophy is that transit ought to be priced to maximize fare-box revenue within the context of public policy. And I know that sometimes those are very conflicting things. I'm a believer in increased fares. Second, I believe in the free marketplace. I believe that the marketplace should determine the value of the transit product. I think if we leave it alone in more cases than we do, the marketplace, all those fancy curves, the elasticity curves, will come out right. And if we let that happen, I think transit will prosper. Don Mazziotti's talk cut through a lot of the fog. One of the problems that we have in dealing with some of the challenges he points out, is that from my experience in the last ten years, I think the public sector has great difficulty in dealing with complex issues like fare policy. It's one thing to challenge us as part of the public sector to resolve these things. It's another thing to recognize that process working in the public sector. Most often you get simplistic solutions to complex problems. And I'm afraid that's inherent in the public sector. Finally, I believe in transit service versus transit fares. People ride service, they don't ride tokens or tickets. So if there's a trade-off, I'm a strong believer in service. Not, again, lowering fares.

Let me give you some perspective from the 47 systems that we manage, and they're located all across the country, in 31 states. They range from small systems, like a 9-bus system in Reno, Nevada, 15 buses in Missoula, Montana, up to quite large systems, 1200 buses in Minneapolis-St. Paul. They're primarily bus systems, and I think they are fairly representative and seem to be a regional cross-section of transit systems in the United States. Let me talk about the fare policies on those systems in the last two years. Again, the number of systems is 47. The basic fare, the cash fare range, is from 25 cents to 70 cents. The average basic fare is 50 cents on those systems.

Forty of those systems have experienced fare increases since 1978. Thirty of them in 1980. So the trend on those systems, at least, and I have a curve that shows transit fares are going up, is obviously reflected on the systems that we manage. However, if you look at those figures, they're a little misleading because within what you would think to be consistent groupings of systems, either geographically or based on size, you would expect some consistency. It doesn't exist. I took five small systems: Reno, 9 buses, 60-cent basic fare; Missoula, 17 buses, 25 cents; Monroe, LA, 19 buses, 40 cents. Medium size systems: South Bend, 50 buses, 30-cent fare; Chattanooga, 70 buses, 60-cent fare; San Bernadino, 35 cents. Again, a scatter-shot of cash fares. The same in the large systems. Louisville, almost 400 buses, 60-cent fare; Memphis, 70 cents; Cincinnati, right up the river from Louisville, 35 cents. Baltimore and Minneapolis, I think more coherent, both of them 50 cents.

Now, if you look at those figures, you can draw some conclusions. One is you could say, well, ATE does not impose policies on their managed systems, and that's in fact the case. We deal within the context of local policies. But the other conclusion could be that there's a broad spectrum of public policy regarding fares. There's a rational decision-making process out there. There could be, and I think more likely another conclusion, and that is perhaps there's no real coherence to fare policies in the United States. And I'm afraid that may be the case.

So having said that, let me go on and try to identify some of the things I think are causing that lack of coherent fare policy. And this is my amateur psychoanalysis, the hang-ups I think we have. First the transit operator. I think there's an unfortunate fear on the part of many transit managers and transit operators of the "downward spiral" of raising fares and cutting service. This was the phrase of the late sixties and the early seventies. I think as a result, many transit managers shy away from talking about fare increases. And I think that's very inappropriate. Second, I think there's a tendency on the part of transit managers, an unwillingness, and in some cases the technical inability to take the basic fare issue and present alternatives to policymakers in an understandable and timely basis. It's very easy to fuzz it so that the policymakers never address the issue. And I think that happens all too often. I think it's the responsibility of management to present those alternatives to policymakers and, if necessary, to hold their nose down until they really come to grips with it. But all too often, we don't do that. We cop out.

In terms of transit planner or researcher hang-ups, I see all too often a fear of using what I call someone else's ideas or something that's been used elsewhere. If it's not new and innovative, it's not good. And let me tell you, and I think you all know this, transit pricing policy and techniques and tricks, they've been going on for 70, 80, 100 years. I don't think there's anything new or very innovative that hasn't been tried previously. I think there's a tendency to ignore basic techniques because they are old and go out and try to find something new. And I think that's folly. I think there's also a tendency on the part of researchers and planners, to not take current data, analyze it, and get it in the hands of the users. There are many fare innovations going on right now, and I think those are the things we need to

focus on, not what happened in the free-fare demonstration three years ago. I'm not poking at the people in this room because I think this group does take a good shot at that. However, I think we could improve and we could move quicker. Not wait for that grant to come through .... Get the data, analyze it, and get it in the hands of the policymakers.

The policymakers. They don't get off totally without my analysis here. One, I think that there generally is a fear among policymakers of offending interest groups, and accordingly to take a simplistic approach to fare policy. They go to the lowest common denominator. And they want to target the transit dependent, so they cut the fare for every group and they throw away a substantial amount of farebox revenues as a result. And the second thing, that Don talked about, I'm not quite sure how we get there, is an inability to define objectives. It's one thing to challenge management to manage efficiently, it's another thing to manage efficiently without knowing what the objectives of your policymaking board are. For example, I look at Bill Herman and I look at the dilemma that Washington faces continually in having three different basic objectives and jurisdictions that he's trying to manage. I don't know how you put together a coherent fare policy when you have three what, in many cases, are totally conflicting objectives.

Finally, I guess we all have a hang-up, I think, about the value of the transit product. Again, my basic premise, is that if transit can provide an attractive, dependable, safe, timely product, primarily in the peak, I think we ought to get over any feeling we have that what we present to the public does not have a worth. Okay, that's enough of analysis, or psychoanalysis. But I think the result of those hang-ups in many cases is that one of the basic elements of a business strategy -- pricing -- is dealt with in an unplanned, inconsistent crisis basis. I don't see in most transit systems pricing being dealt with in the manner it should be, the businesslike manner it should be. Okay, what can we do about this, if I'm right? Together, collectively, I think we can review, analyze and understand what we've experienced over the past ten years. There's been a lot of money spent, and a lot of money spent, I think, quite well, particularly, as far as I'm concerned, I think we can look harder at what we learned about market segments. At the demand and the price elasticity for specific market segments. Because that tends to lead to some very quick decisions. Second, I think we can do some more looking and analysis at product availability versus fare. I'm confused by the peak, off-peak situation. I don't know which way to jump. And I think there needs to be more analysis done in that regard as to what is the true value in off-peak fare. Does off-peak service make a lot of sense? I think the answer is out there somewhere. I think we're all wrestling with it.

Transit operators, I think, need to understand the local dynamics of the pricing situation. He or she needs to perform an annual fare alternatives analysis. Needs to do a rigorous analysis of the fare structure, and present alternatives to the policymaking board. And then, once that's done, I think the operators and the managers must force the policymaker to address it. And that can be done. Planners and researchers, I think, need to try to speed up analysis and evaluation and get it to the user. I think that's got to be done. Because things are moving fast. And second, and this goes back to

Don's list of criteria for analysis, be tough in the evaluation. All too often I think we all see analysis and research, and they're self-fulfilling prophecies. They really aren't rigorous. And I think we all know that.

I think we need to be more honest with ourselves. Policymakers need to be tougher. They need to bite the bullet in regard to setting objectives. If they have a special user group they want to reach they should target that group and then, we've got to then give them mechanisms to get that group. As far as I'm concerned, we need to focus harder on fare policy. You heard what Don, speaking for the federal government, said, and I think he's right. There's clearly going to be a greater dependence on the fare box. We have got to be able to deal with that one fact. We've got to deal with it quickly, and we've got to deal with it in a realistic manner. Those are some of the things that I wanted to say, maybe because it gives me a kick.

Let me give you my -- if I were the policymaker sitting on the other side of the table. My basic premise in putting together a fare structure is one, to maximize farebox revenue within the context of public policy. And two, and this goes back to what Jim Reading said, to provide incentives to contact and hold regular riders. In other words, to reward the regular rider and to penalize, in terms of getting in the person's pocketbook, the irregular or inconsistent rider. So right now if I had a 150-bus system in the Midwest, I'd put a 50-cent cash fare on it, I would have a discount to regular riders of 20 to 25 percent, 40 cents, 35 cents, through either a strip ticket or a punch ticket, or possibly a defined-use pass. I have some problem with unlimited-use passes because I think they get abused. I wouldn't have a transfer charge because I think transfers penalize people for the inequities of the system. It's an interesting concept off-peak; I'm not sure where I come out on that. I would have a surcharge of 75 cents for express service. If I had to, I'd have a simple zone system based on distance or some equitable political values, 10 cents, 10 cents. I would design special user targeting through prepaid tickets. Again, a strip ticket is a good way to target special users if you want to provide subsidies to specific groups. This approach also provides incentives to employers to buy tickets and pay for them directly or at a discount. I would have a free CBD zone, and by that I mean not special CBD service, but a zone within the CBD where you can ride transit free. Buses going through the CBD generally are going through with low ridership, especially during the mid-day. It's another way to get people to try the product. I would utilize free or reduced price promotion of new service and that goes to the next corollary. I'd use price as a marketing tool, use it as one of your weapons. Finally, I'd wrap all this up in specific fare and service standard policies that are absorbed and endorsed by the board and the policymakers and that are utilized by management. And I'd have an annual review of fare and service.

The one thing I haven't spoken to is the off-peak. I'm wavering on off-peak fares at this point. A year ago I would have said cut the off-peak fares to 50 percent. I can't tell you quite why but my sense says that maybe that isn't very efficient. Maybe all we're doing again is lowering the product, demeaning the product. Maybe that's a topic for some debate. So those are some of the things that I wanted to say. I thank you for listening to me.

WORKSHOP I

TRANSIT PRICING POLICY

Leader: Gerald Kraft, Charles River Associates, Inc.
Recorder: Martin Wachs, University of California at Los Angeles
Workshop Summary Authors: Carla Heaton and Howard Slavin,
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The goals of this workshop were threefold: first, to examine the objectives and other normative considerations underlying current transit pricing policy in the United States; second, to identify desirable directions for change in transit pricing policy and explore the political, operational, administrative, and fiscal implications of such changes; and, third, to recommend possible research and development initiatives which could be undertaken by UMTA's Service and Methods Demonstration (SMD) Program with a view toward improving transit fare policy formulation at the local level. By virtue of its broad charter and diverse group of participants, this workshop was able to examine transit pricing policy in a comprehensive fashion, covering its practical aspects as well as its theoretical underpinnings from the perspectives of the planner, operator, researcher, and policymaker.

Assessing current transit pricing practices, workshop participants agreed that transit service and fare objectives are generally not well articulated and, as a consequence, there is little rational basis or focus for transit fare policy formulation. For the most part, the rash of transit fare and service changes of the past year or two have been implemented in a crisis or reactive mode, with inadequate interest in or opportunity for a careful consideration of alternatives. Expediency is the major force driving current fare policies -- not only political expediency ("survive the next election"..."satisfy the politicians and special interest groups") but also fiscal expediency ("cover the deficit") and administrative expediency ("fare structure simplicity for both user and operator"). Economic efficiency considerations, which many would envision as the cornerstone of pricing policy, exert little or no influence on either transit pricing policy or broader policy decisions regarding the level and sources of subsidy funds. Although arguments about equity are often invoked by politicians and special interest groups, the equity implications of alternative fare and service policies are rarely understood and may often run counter to their espoused objectives.

Noting that transit fares have been declining in real terms over the past few years, workshop members explored the reasons for the long-standing resistance, especially on the part of transit operators, to fare increases. Although the availability of federal, state, and local subsidies has clearly been an important contributing factor, the most enduring reason, it was agreed, has been the social welfare concern that transit service should not be priced beyond the means of low-income people and that publicly subsidized transit should in fact serve as an income transfer mechanism. Also cited were Congressional, Federal, and local mandates, dating from the era of public

take-over of private mass transit systems, to maximize ridership and to stabilize fares. Many participants felt that these mandates were no longer desirable and others felt that, even if desirable, the objective of maximizing ridership through retention of low fares was no longer feasible.

Workshop members discussed at length the efficiency, equity, and service implications of current transit fare policies. Empirical evidence was presented which confirmed a long-held view that flat fare structures result in considerable cross-subsidies among different user groups (with short-distance and off-peak travelers paying a higher proportion of the cost of their trips than long-distance and peak-period travelers) and may be regressive (effecting income transfers from the less affluent to the more affluent). Participants noted the tendency for fare policy to be regarded as the "given" which drives service decisions. This results in service levels, as well as fares, being targeted at the "lowest common denominator." Moreover, in the face of cutbacks in local subsidy funds -- an increasingly common prospect as a result of Proposition 13-type referenda -- transit operators lean toward service reductions rather than fare increases as a deficit-constraining strategy.

Acknowledging the likelihood of dwindling subsidy funds and increasing pressure for more efficient production and utilization of transit services, workshop members reached almost unanimous agreement that transit fares should be based on the cost of service provided. The major implication of this "fares-based-on-costs" policy would be substantial fare increases for most, if not all, transit services. The relative price of some services, however, might decline under this pricing rationale. Thus, a favorable outcome of this policy should be greater differentiation of service and fare levels and a possibly strengthened competitive edge for transit in the eyes of the diverse target markets it now attempts to attract with a low-fare, low-quality service.

The one dissenting viewpoint was that of the labor representative, who advocated low-fare or free-fare transit supported through taxation. Although he concurred with other workshop members regarding the pressing need for major improvements in transit productivity, he saw the objective of any productivity gains as being to deliver more transit service rather than to reduce the resources (particularly labor inputs) utilized in the provision of transit service.

Underlying the majority viewpoint that transit fares should be related to costs was a basic notion that the transit operator should be relieved of social welfare responsibilities and allowed to focus, in a more businesslike manner, on the provision of good transportation services. However, workshop participants recognized the political reality that social welfare concerns would continue to be of importance in any transit fare policy deliberations, and that some workable approach was needed for mitigating the adverse impacts of fare increases on low-income persons and other target groups which society deemed deserving of low-priced public transportation service. There was considerable agreement that a user-side subsidy mechanism could fulfill this need.

The user-side subsidy mechanism is an innovative financing technique developed and tested in the context of UMTA Service and Methods Demonstration projects involving transportation service improvements for elderly and handicapped persons. Under this concept, eligible individuals use vouchers or pre-purchased tickets to obtain transportation services at a discount from the normal fare. Transportation providers then redeem the vouchers or tickets for their full face value from the subsidizing agency(ies). Aside from permitting the targeting of variable levels of subsidy to specific individuals (identified on the basis of income, mobility needs, or other criteria), user-side subsidies may provide considerably greater incentive than conventional subsidies for transportation providers to tailor services to demand in the most efficient manner, since the volume of the subsidy depends on the number of trips served.

Evaluation findings from several SMD user-side subsidy projects were presented on three topics -- administrative costs, fraud, and target group mobility impacts -- considered to be relevant to the possible application of the user-side subsidy mechanism in conjunction with a fare increase. Encouraged by the experience to date suggesting that user-side subsidies are a workable and cost-effective means of targeting mobility benefits and cost savings to special user groups, workshop participants concurred that the SMD Program should undertake further demonstration and evaluation efforts to expand the application of this mechanism to low-income transit users. It was noted by UMTA and TSC that discussions were already underway with local officials at several sites to initiate this type of user-side subsidy experiment. A companion recommendation was that user-side subsidy initiatives should make use of the existing welfare system including its funding sources, organizational structures, and administrative procedures. In this way, the costs of user-side subsidy program administration could be minimized. Additionally, transit operators would then be free to concentrate on service provision.

Another obstacle to cost-based pricing which received considerable attention throughout the day and a half of workshop meetings was the absence of adequate and reliable cost information on which to base fare policy. Although it is generally recognized that transit costs vary according to level-of-service, trip length and direction, and time of day, transit operators have insufficient data to estimate these cost differences. It was recognized that adequate cost estimation methods and concepts have already been developed by economists, but that their effective application in the transit industry requires more detailed data than transit operators typically collect. Specifically, information is needed on service levels, ridership characteristics, and costs at the route level for the peak and off-peak periods. An important contribution of a recent UMTA-sponsored research project was to demonstrate the importance and practical utility of cost studies for assessing the efficiency and equity implications of alternative fare structures. Workshop participants concurred in the view that transit cost studies are a high-priority need, not only to enhance fare policy formulation, but also to promote improved transit management practices and investment decisions.

In the course of examining conceptual and practical issues associated with cost-based pricing, there was extensive discussion regarding the costs and benefits of transit fare prepayment. Although instruments such as monthly passes and discounted ticket books were acknowledged to be effective mechanisms for softening the impact of fare increases and allowing third parties (i.e., employees, social service agencies, and welfare agencies) to subsidize the cost of transit for their constituents, there was considerable skepticism about the discounts implicit in some of these mechanisms. For example, a monthly pass priced at the cost of 32 one-way transit trips gives a discount to the high-frequency, regular rider who typically travels most during the peak (high-cost) period. Other issues raised by workshop members concerned the impacts of transit fare prepayment on operator costs and revenues and the appropriate duration and price of various prepayment instruments. It was recommended that the SMD Program explore these issues through additional evaluative studies.

A final fare policy implementation issue on which consensus was reached was the need for more effective communication among the various groups responsible for or affected by fare policy decisions. Workshop members noted that a considerable amount of valuable information regarding the feasibility and impacts of fare and service changes had been generated and disseminated through the SMD Program and other research efforts, but that this information could be more effectively used by transit operators, funding agencies, and elected officials. In particular, the group cited problems of communication between transit managers and their policymaking boards about the implications and impacts of fare and service changes. This is not a problem which can be solved by more or better publications. Rather, there was general agreement that some form of technical assistance would be a highly cost-effective means of enhancing the fare policy formulation and implementation process at the local level.

Better public relations concerning transit fare and service policies were also recommended. Many commented on the unfortunate coincidence of fare increases with service cutbacks. It was further noted that the public is rarely given much warning of impending fare and service changes. A more orderly process of informing the public could be implemented.

A related concern was the need for more objective and representative public input. Transit operators pointed out that participants at public hearings were often highly unrepresentative of the transit market and often gave the press and politicians a distorted view of the public response to transit system changes. Representative consumer panels of transit users and non-users were suggested as a straightforward mechanism for obtaining public inputs and assessing community reactions. Future demonstration projects could integrate this activity into demonstration design and evaluation activities.

The proposal put forth by one of the keynote speakers for periodic fare policy reviews was also endorsed by the workshop. Such reviews were thought to be a sensible management practice. It was felt that these reviews could offer a mechanism for implementing many of the recommendations suggested by workshop participants.

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WORKSHOP II

IMPLEMENTATION OF TRANSIT FARE POLICIES

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Recorder: Patrick Mayworm, Ecosometrics, Inc.
Workshop Summary Authors: Elizabeth Page and Bruce Spear,
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This workshop focused on the mechanics of fare policy implementation and addressed issues relating to the practicality and acceptability of operationalizing various fare structures and fare payment mechanisms. Four major topic areas were discussed in depth: transit fare prepayment, alternative fare structures, fare integration and transfer policies, and innovative fare collection techniques. A central theme running through each of these discussions was the trade-off between the complexity of payment mechanisms and the impacts on revenues and costs.

A substantial share of the workshop's time and energy was spent debating the merits of transit fare prepayment. This concept is neither new nor particularly innovative, except as it may relate to the involvement of the private sector. It has been widely adopted by many transit properties as an alternative to cash fares for the convenience of frequent riders. Recently, however, it has been suggested that more extensive use of fare prepayment could increase ridership and revenue, stabilize fluctuations in ridership, improve vehicle operating efficiency by speeding boarding times, generate significant cash flow savings, and reduce cash management costs.

Empirical evidence was presented from the SMD demonstration projects and individual transit system programs which indicated that many of the alleged operator benefits are not commonly realized through prepayment programs. For example, experience to date indicates that a fare prepayment program, in and of itself, neither increases overall transit ridership nor helps to stabilize fluctuations in ridership. Revenue impacts of prepaid tickets were found to be negligible, while the use of unlimited-ride passes appears to have significant detrimental effects on revenue. Small cash flow savings have been realized in various fare prepayment demonstrations, but all evidence suggests that these savings are heavily dependent upon the effectiveness of the specific administrative procedures which were used.

Workshop participants discussed at length how best to price transit fare prepayment instruments. It has been observed that small decreases in the price of transit fare prepayment relative to cash fare typically generate large increases in the share of riders using prepayment. Purchasers of unlimited-ride passes are typically frequent riders, who are saving money by using the pass. Several participants cited studies where monthly pass users reported making 52 one-way trips by transit per month, but few localities price passes at such a high level. Even if they did, pass purchasers would still tend to be those who ride more often than the break-even price. Therefore, the benefits of having a large share of riders using prepayment

(e.g., lower cash management costs) must be carefully weighed against the revenue loss realized by offering a discount on prepayment.

There was considerable disagreement among the participants on the merits of fare prepayment discounts. One transit operator in the workshop stated that their objective is to reward and retain regular riders by offering monthly passes at a slight discount. Some participants pointed out that regular riders, and more specifically, commuters, exhibit the most fare-inelastic demand for transit during that time of day when service is most expensive to provide. Moreover, since there is evidence that pass purchasers are typically more affluent than the average transit rider, other participants expressed a concern about the equity implications of reducing transportation costs for those who are most able to pay. The provision of any discounts, especially to commuters, was repeatedly questioned, suggesting that this practice might be reevaluated.

The administration of fare prepayment programs was also of interest to the workshop participants. It was generally agreed that employer-sponsored distribution of passes offers significant benefits to the operator, since the employer absorbs some of the administrative costs and performs some of the promotional functions which would otherwise be the responsibility of the operator. Employer pass programs also provide the institutional framework for establishing an alternative transit funding source if employers bear some of the cost of transit usage by their employees. Unresolved issues regarding administration of a pass program include: the revenue impacts of transferable passes, ways to promote employer subsidy of passes, the payment of commissions to retail and commercial sales outlets, and the cost and practicality of offering pass sales through the mail.

The next major topic addressed by the workshop concerned the implementation of complex fare structures. For many years, most transit operators used simple, flat-fare structures -- each passenger paid the same rate regardless of distance traveled, or the time of the day that the trip was made. It has been recognized, however, that flat-fare systems are often inefficient and inequitable. Since the fare bears no relation to the cost of the service provided, riders making short trips or trips during the off-peak hours are penalized. When it was learned that changes from flat-fare to distance-based fare structures could lead to both patronage and revenue increases even if the average fare paid did not change (because of differences between passenger-trip and passenger-mile elasticities), some operators instituted zonal charges. However, to retain some simplicity in fare collections, few operators developed more than three or four zones, and many have been reluctant to adopt differential time-of-day pricing.

A comment that surfaced repeatedly during the discussion of alternative fare structures was the operational difficulty of collecting the proper fare from each individual. One participant stated that his system was considering changing back from a distance-based to a flat-fare system, recognizing that the latter is more inefficient and inequitable. He stated that even the drivers don't understand the fare system, much less the passengers and visitors to the city. Workshop participants agreed that an important research priority is to explore the trade-offs between the complexity/efficiency and

ease of understanding of alternative fare structures. Several participants stated that complex fare structures may not be practical within the constraints of exact-fare systems. More innovative approaches, such as self-service fare collection, may facilitate to the adoption of these complex fare structures.

The third major topic of discussion in the workshop concerned transfer charges and fare integration. Many transit properties require passengers to pay an additional fare when transferring between vehicles, modes, or operators. These charges are usually defended on the grounds that they serve as proxies for a distance-based fare system, by generally increasing the fare for individuals who travel longer distances. On the other hand, the very act of transferring typically involves a time loss and added inconvenience to the traveler. Thus, a transfer charge tends to further penalize those who are already receiving a relatively poor level of service, and may provide sufficient disincentive to the choice rider to discourage transit use altogether.

Transit fare integration attempts to deal with the problems of transfer charges by creating a consistent fare structure for all transit trips in a region. A critical element in the development of a regionally integrated transit fare system is the issue of transfer charges, or alternatively, the implementation of a distance-based fare structure. While most workshop participants agreed that a distance-based fare system is theoretically more appealing with respect to both equity and efficiency considerations, it was recognized that various technical problems and local political constraints may force operators to adopt transfer charges as their only practical means of fare integration.

Transit fare integration in regions with more than one operating agency, and more importantly, more than one political jurisdiction, is not a technical problem as much as it is an institutional problem. The participants suggested that future studies should focus on the institutional and implementation issues which have thwarted transit fare integration efforts to date.

The final topics discussed in the workshop involved innovative fare collection strategies, most notably, self-service fare collection and credit card postpayment. In self-service transit operations, the passenger is responsible for determining and paying the proper fare for his or her trip. Complete monitoring or control of proper payment is not performed by drivers, station attendants, or automatic equipment. Instead, the responsibility for fare enforcement falls to special personnel who randomly check compliance. With credit card postpayment, frequent travelers establish an account with the transit agency and are billed on a periodic basis for trips that they have already taken.

Credit card postpayment systems were seen to have a number of potential benefits for passengers and transit operators alike. Specific benefits included convenience and payment deferral for the passenger, and for the operator, the ability to implement fine-grained, distance-based fare systems and third-party billing arrangements. The major drawback to these systems is their heavy reliance on automated on-board fare monitoring equipment.

Automated fare equipment has, thus far, had a relatively poor service record under actual operating conditions. It was generally agreed that hardware integrity remains the top research priority in the area of innovative fare collection systems.

The role of self-service fare collection in facilitating transit integration and the institution of differentiated fares was stressed by a workshop participant from Europe, where self-service fare collection is commonplace. Many felt that until more reliable fare collection equipment is available, self-validated fare payment was possibly a practical way of collecting differentiated fares. However, several U.S. participants raised questions about the operational feasibility and public acceptance of self-service fare collection in the American transit environment. Specific unresolved issues include the magnitude of fare evasion under a self-service system and its impacts on total revenues, legal and institutional barriers to the implementation of fare enforcement policies, and the capital and operating costs of establishing self-service fare collection on existing transit systems. It was noted that these issues will be explicitly addressed in several forthcoming demonstration projects sponsored by the SMD Program.

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WORKSHOP III

PRICE AND SERVICE VARIATIONS

Leader - David Hartgen, New York State Department of Transportation
Recorder and Workshop Summary Author - Lawrence Doxsey,
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This workshop explored empirical evidence on the consequences of alternative fare and service policies. Activities included assessing the scope and limitations of current knowledge and determining the most fruitful directions for new research. On the latter point, the workshop gave some attention to the approaches and methods most suited to fare policy research.

Empirical knowledge provides the only sound basis for evaluating policy alternatives. If policies are to be judged in terms of their impacts, then judgment and policy choice require sound and comprehensive knowledge about the outcome of each policy option considered. From the operator's immediate perspective, the revenue and cost implications are paramount. However, much deliberation on the merits of policy alternatives involves the comparative impacts on transit users. Specific issues include identifying which segments of the ridership population are affected adversely and which are affected favorably. An example is the recurring concern for the mobility of low-income people in the face of fare increases. Further questions involve identifying differences in the nature and magnitude of impacts on different market segments.

The entire range of empirical results explored in the workshop provide a means to ensure that selected goals are indeed attainable and that intended policies are appropriate to their attainment. Clear understanding of the linkages between policies and consequences encourages a focusing of the policy decisionmaking process on feasible and efficient alternatives. It can aid both in eliminating objectives which are unreachable through available policy tools and in paring away policies which do not bear on chosen objectives.

Over the course of the workshop, a general consensus was evidenced on each of three fundamental empirical questions: first, that ridership is relatively unresponsive to changes in fare level; second, that it is inappropriate to segregate fare from service policies; and third, that factors exogenous to the transit planning process may well have greater influence on transit usage than do the traditional tools of transit policy.

Workshop participants brought together evidence from a broad range of sources on the consequences of fare changes. They included the SMD-sponsored, year-long free-fare projects in Denver, Colorado, and Trenton, New Jersey, a series of fare increase case studies initiated through the SMD Program, and the results of a comprehensive survey of the empirical literature on the impacts of fare and service changes. Each of these sources strongly supported the conclusion of inelastic demand for transit service. Put simply, this means

that transit fare changes induce less than proportionate changes in ridership. The conclusion has several important implications for policy formulation. First, one can reliably predict that fare increases will increase revenue while fare reductions will reduce revenue. Second, because the impact on total usage is small, it follows that the impact on the mobility of transit users is likewise small. Third, and last, fare policy can be said to have limited influence on the aggregate level of ridership and, therefore, ought not be looked to as a means for inducing large ridership changes.

Research into the disaggregate impacts of fare or service changes has been less extensive. One workshop recommendation was to focus future research on the differences in response among user groups. The two free-fare demonstrations mentioned above, together with an SMD downtown free-fare zone project in Albany, New York, did provide the workshop with substantial insight into the disaggregate impacts of fare decreases. They strongly suggest that no user group can be singled out as particularly more or less responsive than others. This, in turn, implies that manipulation of basic fare level can not be used to direct benefits to select user groups.

The second area of consensus involved the interaction of fare and service levels. Inasmuch as response to a change in fare depends on the level of service, and vice versa, neither fare nor service can be treated in isolation. This conclusion holds both for policy purposes, in setting fare and service levels, and for research purposes, in analyzing the effects of alternative fare and service policies. Through the course of discussions, several implications of fare/service interactions were brought to the fore. First, relative to what is known about the effects of fare changes, knowledge on service changes is limited. The evidence which is available indicates that ridership is substantially more responsive to service changes than to fare changes. By implication, service changes offer considerably greater potential for broadening the transit market than do fare changes. Participants agreed that more thorough identification of the effects of specific service policies was an appropriate direction for the SMD Program. Research emphasis should consequently be redirected from additional analysis of fare changes alone toward analysis of both service changes and service and fare policies structured jointly. Doing so will not only improve understanding of the effects of fare and service policies, but can as well provide the empirical basis for a broadened and sounder approach to transit decision-making. Second, from what is known about fare and service interactions, certain high-grade services can be successfully provided at fares requiring little or no subsidy. Further, through proper tailoring of service throughout a system, the total level of subsidy can be greatly reduced.

There was considerable discussion regarding the role of promotional pricing strategies such as limited-period fare reductions and token reimbursement schemes under which transit patrons are offered discounts on goods and services. The intent of these strategies is to increase general public awareness of transit and to encourage people to experiment with (and then continue to use) transit. Several workshop participants expressed concern that these promotional strategies, by effectively reducing the perceived price of transit, represented an attempt to "hype" what might be an inferior service. Their feeling was that these strategies would not be cost-effective

in the long-run unless preceded by whatever service improvements were needed to transform transit into a viable and attractive alternative.

The last major thrust of this workshop involved consideration of the influence of exogenous factors on transit ridership. Particular trends discussed included changes in energy cost and availability, trends in the demographic composition of the population, and changes in economic indicators such as labor force participation rates and the level of personal income. Together, these and other factors provide the context within which transit policy decisions unfold. Because their influence is strong, flexibility for adjustment to changes in exogenous factors needs to be incorporated into the transit policy formulation process. Otherwise, a policy carefully wrought for one combination of external conditions may be severely undermined by a change in conditions.

From a research perspective, two complementary requirements arise. First there is a need to understand not merely the responses to policy changes but both the direct impacts of changes in exogenous factors and the interplay between policies and these factors as well. Doing so provides an effective basis for the flexible approach to policy which was discussed above. Second, in order that the direct effects of policy impacts be isolated, thereby providing some degree of context independence and allowing generalization, the effects of exogenous factors should be screened out in the process of empirical research.

Meeting either requirement involves application of more exacting experimental and statistical techniques than has been customary in the planning and evaluation of transit fare and service changes. Application of available tools of experimental and quasi-experimental design, together with appropriate analysis procedures, will allow drawing more comprehensive and more robust information from demonstration projects. Within the SMD Program, there has been considerable progress in obtaining accurate and unbiased measurements of behavioral, level of service, and operator impacts and in understanding the causal mechanisms at work. Moreover, some transit properties have already made steps in this direction. Indeed, within the workshop, one transit operator voiced considerable enthusiasm based on personal experience with applying relatively sophisticated tools of time series analysis to the problem of isolating policy effects. Workshop participants agreed that further strides in this area are needed, and that the SMD Program represents a logical focal point for developing and applying more advanced techniques.

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