# CONFERENCE PAPERS

## DEFINITION, OBJECTIVES, AND IMPLICATIONS OF TSM

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**Transportation system management is a process for planning and operating a unitary system of urban transportation. Its key objective is conservation of fiscal resources, of energy, of environmental quality, and of quality of urban life. Broader implications of and issues raised by the TSM concept include (a) the need for a national policy on urban conservation (the federal government cannot set local land use policy, but it must restore locational neutrality to its programs); (b) institutional challenges (all elements of the urban transportation system cannot be treated in a unitary way unless the various governments cooperate fully); (c) federal support of TSM (UMTA may need transit operating funding to seed TSM operations); and (d) urban transportation and private ownership (UMTA should attempt some demonstrations of private ownership of multipurpose urban transportation systems).**

One of the problems with transportation system management is that it tends to mean all things to all people in the transportation business. It is the collective stew of transportation policy and has many cooks busily adding their own ingredients. To mix metaphors, but with no political symbolism intended, it is an elephant that all of us blind men are patting on different anatomical parts and then describing in whole in learned addresses and articles (or, more dangerous yet, in federal regulations and rules.)

What is TSM, aside from something in the category of "we know it when we see it"? The cowardly way to define it is to quote from the federal regulation:

> Automobiles, public transportation, taxis, pedestrians, and bicycles should be considered as elements of one single urban transportation system. The objective of urban transportation system management is to coordinate these individual elements through operating, regulatory and service policies so as to achieve maximum efficiency and productivity for the system as a whole.

That is not bad, for a federal regulation, though perhaps it is only a beginning. Let me try it a little differently.

First, TSM is preeminently a process for planning and operating. It is a way of thinking about the unitary system of urban transportation. It is not a fixed set of programs, but it must produce hard program applications to pass federal muster.

Second, its key objective is conservation, a term I prefer to "efficiency and productivity," for it connotes broader values than saving money. And it is conservation of several elements simultaneously—of fiscal resources, of energy, of environmental quality, and of urban quality of life.

There are also some things that TSM is not, and there has been a tendency to fuzz the definition in some of the departmental literature I have seen. It is not, for example, the same thing as the Annual Element of the Transportation Improvement Program. An area's TSM plan may be found in the Annual Element, but there is more to both TSM and Annual Elements than that simple equation implies.

Nor is TSM all transit operational planning. UMTA has been trying to reorient its section 9 planning funds and its metropolitan planning organization (MPO) work programs more toward short-range operational planning and away from an overemphasis on long-range plans and alternatives. But some operational planning may not be TSM oriented, and some TSM planning and programming are long range. So let us not make that mistake.

Nor is all action to increase internal transit management efficiency properly a part of TSM, even though the official Appendix to the Joint Planning Regulations implies otherwise. Here I think the federal language has gone too far in terms of adding ingredients to the stew. If improved transit cost accounting and other management tools or improved vehicle maintenance can be counted as TSM elements, then why not improved methods of roadside grass cutting or improved railroad work

rules? If TSM is to retain any core meaning, it has to be understood as something different from any and all actions involving better internal management.

Finally, it would also be a mistake to think of TSM—in alternative analysis terms—as the maximum bus alternative. Although it is true that one of the hoped-for benefits of TSM planning is to reduce unnecessary emphasis in transit planning on new high-cost fixed-guideway solutions, some maximum bus alternatives may not be responsive to the TSM conservation ethic of saving money, energy, environmental quality, and urban quality of life.

Well, whatever it is, it is taking hold worldwide. I was struck by this at an international conference on transportation and urban planning that the U.S. Department of Transportation hosted in Washington for the Economic Commission for Europe—a UN-sponsored group of some 20 east and west bloc industrialized nations. In country after country, the predominant theme was urban conservation and low-capital transportation planning that is responsive to it—TSM, in our terms.

Let me now proceed to some thoughts on the broader implications of, and issues raised by, the TSM concept. I offer four points.

## NEED FOR NATIONAL POLICY ON URBAN CONSERVATION

The preservation of urban centers and their quality of life are high national priorities. I have operated UMTA with an emphasis on this principle to an extent never approached before in the relatively short life of the agency. In fact, most of the principal innovations during 1967 and the latter part of 1975 have been responsive to this objective—funding of transit mall and automobile-restricted zone experiments, people-mover programs, stress on joint development and value capture opportunities, and the TSM policy itself. Where we have made commitments to new rail starts, it has been with important attention paid to the developmental and land use impacts of the proposal.

But, as has been said repeatedly, an urban transit program oriented to preservation and conservation needs to be part of a broader effort at all levels of government. Well-intentioned transportation policy alone is obviously not enough. If a region's housing and business locational patterns and markets continue to stress suburban sprawl and low-density development, conservation-oriented transportation policy is obviously going to have limits. New roads will have to be built; new bus or paratransit service will have to cope with low densities. Transportation policy, in the face of these surburban development trends throughout the country, has become compensatory in character. We use improved transportation infrastructure to compensate for the long distances that have to be overcome for us to suit our preferences in residential and job location.

The situation is akin to other kinds of compensatory programs we operate. Take federal aid under the Elementary and Secondary Education Act—called "compensatory education." Because we chose to live in patterns of economic, social class, and racial segregation, we created conditions of inferior educational opportunity in inner-city schools. But rather than dealing with the cause of the problem, we seek to compensate for it by putting extra money into those schools to raise their quality. The same is true of most of the human resources, block grant, and revenue-sharing programs the federal government operates; they are attempts to compensate for the consequences of the spatial living patterns our society has adopted.

Federal aid to urban transportation infrastructure has been no different. In building new commuting highways and radially oriented transit and commuter rail systems, we have made it easier for people to live longer distances from their jobs. The transportation system is part of both the cause and cure for the land use problem.

Having recognized this character of our program, perhaps the question then becomes, Is it wrong? What social policy should guide the urban transportation program? Should the federal government adopt a policy stressing high-density, economically integrated living patterns? Should we discourage people from living in single-family dwellings on half-acre suburban lots? Here I must quote Adlai Stevenson to the effect that, in a democracy, the leaders cannot be smarter than the people. And the fact is, for the foreseeable future at least, the people seem to want it that way.

I believe that change is coming, but that it will come incrementally and slowly and in response to economic factors. Above all, it must come locally. The federal government simply cannot, as a pragmatic political matter, set local land use policy contrary to the wishes of the electorate. But, at the very least, it would seem fair to ask that federal policies be more or less neutral as to residential and business location decisions between cities and suburbs. In the past, I do not think they have been. Highway programs, transit programs, water and sewer grants, housing mortgage guarantees—all have facilitated outmigration of people and jobs from cities.

What we need at the federal level is a conscious effort to restore locational neutrality to our programs. In transportation terms, that seems to me to involve devoting funds to highway and transit capital plant maintenance in cities. It means focusing new transit fixed-guideway infrastructure, with its positive developmental and tax base impacts, on central cities and close-in neighborhoods that choose redevelopment and high density. And it means UMTA being prepared to give preferences to communities and regions that, at their own volition, develop urban conservation strategies cutting across transit and other functional areas. It means that suburban residents will have to help pay for the problems that suburban life-styles leave behind in the central cities and that the federal income tax is one way for that geographic resource reallocation to take place.

I do not want to imply, with this bit of social philosophy, that TSM policies are not needed in a setting of increasing suburban sprawl. It is simply a matter of observing that they will not work so well. They will not be assisted by locational patterns that tend to reduce the number of trips. In such settings there remains a strong need to get the maximum capacity out of our infrastructure to accommodate increasing trip generation. But the broader goal of urban conservation, in such settings, is likely to have to await changes in regional land use patterns.

## INSTITUTIONAL CHALLENGES OF TSM

The second point I want to make has to do with the intergovernmental institutional challenges raised by the TSM philosophy. It is impossible to treat all elements of the urban transportation system in a unitary way unless the various governmental bodies that control those different elements are cooperating fully.

At the local level, I believe that TSM strengthens the rationale for the role of the MPO as a forum through which local and state governments can work out common plans. City traffic departments, municipal parking authorities, state highway and transportation departments, and public and private transportation agencies must all be part of the picture. The tactical basis for the MPO strategy is the idea that all the participants can cooperate best on some neutral territory that is not strictly the province of one level of government. The weakness of MPOs derives from the same principle, however;

since the MPO represents no level of government, it has no direct powers of implementation.

From the federal point of view, I continue to think that the MPO is the best of a series of less than satisfactory alternatives through which to encourage the kind of cooperative planning that TSM requires. Moreover, the federal government is probably wise to stay out of questions of the structure of MPOs and to continue to leave to local decision making the issues of relative voting strength among jurisdictions, the direct participation of the state government or the transit authority, and the like. We are for whatever works—the output, not the structural input. At the same time, though, UMTA will be placing increasing emphasis on the pass-through of planning funds from the MPO to state and local governments and the transit authority. They are the real actors and must be directly involved in the planning and committed to it; therefore, they must have a large share of the money. Probably the greatest enemy of a cooperative TSM plan and an effective MPO is the creation of a large MPO staff that develops a life of its own and that is not responsive to the wishes of the public agencies it serves. I do not envy the lot of the MPO director; it is a narrow line he or she must walk.

TSM also poses a challenge to the organization of the federal government and the Department of Transportation. Given the separate existence of UMTA and FHWA, and with rail and airport planning outside of either, we are not structured to facilitate a unitary approach to urban transportation. I am convinced that most aspects of UMTA and FHWA programs should be merged and the administrations consolidated, but that this must be done incrementally and carefully. We need more and better coordination with our TSM allies in the Department of Housing and Urban Development, the Environmental Protection Agency, and the Federal Energy Administration as well.

Finally, there are two other institutional issues that good TSM planning must face. One is the need to plan for goods movement, a subject constantly overlooked. The other is the need for broad citizen input. I left this to last, but it may be the most important. One of the conclusions that emerged from the international conference I referred to earlier was the observation that citizen involvement almost always had a conservative impact on transportation planning. It may be that the most important self-executing device to facilitate TSM planning is to closely involve citizens who do not wear the jurisdictional blinders or have the high capital preferences evidenced by many transportation planners.

## UMTA SUPPORT TO TSM

A third question has to do with how the federal government should support, encourage, and evaluate TSM activities at the state and local levels. I am struck by the fact that we may have to devote some targeted money to the job, at least at the outset, rather than hope that TSM planning and implementation can be accommodated within existing funds.

From the planning point of view, there is less of a problem. I believe that planning funds from UMTA and FHWA can support most necessary TSM planning if priorities are set properly. Transit operations are another matter, however. Most transit authorities simply cannot—in the face of their spiraling deficits and funding agency pressures—free UMTA section 5 funds for innovative TSM implementation, especially where there is additional front-end cost involved. Nor is it possible for UMTA, through the research and demonstration program under section 6, to stimulate direct TSM activity throughout the country. The appropriations will never be large enough to permit that.

The answer may be for the Congress in 1977 to give UMTA some transit operating funding (in a new subpart of section 5) that can be awarded on a discretionary basis and in sufficient magnitude to seed TSM operations broadly throughout the country. Such a discretionary federal operating assistance program might also include among its objectives furtherance of other federal priorities, such as increased energy efficiency and service to the elderly and handicapped. In short, our experience with section 5 to date raises serious questions about the extent to which it can function as a change agent in our current context of rapidly rising operational deficits. As much as I generally dislike new categorical programs, we may not be able to stimulate improved transit efficiency and productivity without devoting some earmarked federal resources to the task.

## URBAN TRANSPORTATION AND PRIVATE OWNERSHIP

Finally, I want to deal with an issue that is raised in part by TSM considerations, but that has broader implications as well: Should we make some effort to reverse the trend toward public sector delivery of urban transportation services?

With the arrival of the UMTA capital program in the 1960s, the federal government assisted in the conversion of the transit industry from one characterized by multiple private owner-operators to monopolistic public ownership and operation. Faced with the need to get tax subsidy into the transit capital and operating accounts, we seem to have assumed that could only be done by converting the industry to public ownership, even though public subsidy and public ownership are potentially quite different.

In accomplishing this change, we have exacerbated the situation in at least two respects. First, it seems to be the case that some of the incentives for cost-conscious operation have gone out of the transit picture. By that I do not mean that public managers are inherently less efficient than private managers—although that is an interesting debate in itself. It is not so much internal management as it is external pressure. Transit has been opened up to a series of political influences on fare policies, service policies, and labor work rules and pay scales that have had the result of vastly increasing operating deficits. Things just seem to cost more when they are run by government.

The 1976 Study of American Opinion Concerning Public Attitudes Toward Business and Government, conducted for U.S. News and World Report and based on a random sample of about 7000 household heads, asked the following question: What would happen to costs if government ran the railroads, airlines, and buses? Seventy-three percent of the respondents said costs would go up, and 30 percent put the increase at 25 percent or more.

Second, public takeovers of transit services have created problems in terms of coordination of urban transportation services between the public and private sectors. This is a TSM-related problem. Where the public sector controls passenger movements on buses and trains while the private sector predominates in automobile use, van pooling, parking, taxis, and goods movement, there are obvious ownership barriers to the TSM objective of managing urban transportation as a single unitary system.

I would like to see UMTA attempt some demonstrations of increased private ownership of multipurpose urban transportation systems as a response to these problems. For example, could we not experiment with

urban transportation companies that offered a variety of products and used a variety of vehicles—a company that, through greater versatility, avoided the labor waste between peak periods that is at the heart of the labor inefficiency of transit? Could we not hypothesize a company that combined bus and taxi functions—one that used bus drivers in the off-peak period to drive taxis and other paratransit vehicles or that took on off-peak movement functions such as mail and parcel delivery and distribution of newspapers to outlying delivery points?

Such a company would not have to be shut off from public subsidy. Many or most of its vehicles could be bought by public authorities and leased to the company at little or no cost. Operating subsidies could be provided subject to public utility type of controls.

The point is that, if the TSM view of urban transportation as a single system is sound, should not our institutional delivery system move in that direction and, it is hoped, be under private ownership?

## CLOSING REMARKS

I hope I have helped to clarify the meaning and some of the implications of transportation system management. If one is still not sure what it means, then I can only say that—whatever it is—it is the most important program direction UMTA is emphasizing.

# HEADING IN THE RIGHT DIRECTION

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**This paper discusses how the Federal Highway Administration arrived at the policy of transportation system management, why FHWA thinks TSM is important, and just how it will contribute to improving urban transportation.**

In the past 25 years, the federal and state governments have jointly responded to the nation's need for increased mobility by constructing more roads for automobiles, trucks, and buses to get into, through, and around urban centers. The result is that Americans today are the most mobile people in history and have many choices of where to live, work, or relax. But the effort has not been an unqualified success, especially in many urban areas. Traffic congestion still exists on urban streets and has recently become compounded by the twin problems of environmental pollution and unrestrained energy consumption. Obviously, relying solely on the "more-roads" approach to give urban areas some moving space is not the answer.

At the Federal Highway Administration, we have come to realize (as have the people in the Urban Mass Transportation Administration) that we can no longer say that we will solve urban transportation problems in the future and expect people to endure those problems in the present. While doing long-range planning, we must also direct our attention, skills, and resources to the daily problems encountered now by people who live, work, shop, and move around in urban centers. As managers of a transportation network that is impressive both in terms of size and cost, transportation professionals, transit operators, and public officials must cope directly with the problems resulting from the inefficient use of this public and private investment.

We cannot settle for a posture that looks only to the distant future for capital-intensive, long-term methods of improving urban transportation. Rather, acting together, we have the responsibility—and the capability—to take the initiative in implementing short-range as well as long-range solutions to transportation problems. And in doing so, the objectives of mobility improvements, energy conservation, and urban environment enhancement must be weighed, not as competing pressures to be dealt with independently or traded off against one other, but as the mutually related forces they indeed are.

## FOCUS OF TSM

Many individual TSM strategies are not new and, in fact, are the bases of good traffic engineering. Techniques such as channelization, signalization, and computerized traffic control systems can significantly help to accommodate traffic demand. Progress has been good in improving highway efficiency by using these techniques and further improvement will certainly be made, but our accomplishments will be limited if we take only those actions that improve the capacity of the highway to handle the ever-growing traffic.

We must also concentrate on ways to decrease that traffic. Several TSM strategies, such as preferential treatments for transit and car pools, have convincingly demonstrated their effectiveness to do this. For example, the reversible exclusive bus and car-pool lanes on the Shirley Highway (I-95) in northern Virginia during rush hours serve three times the number of persons per lane at an excellent level of service as the normal lanes do at a badly congested service level. Before being suspended (a court ruled that environmental assessment procedures had not been followed properly), the controversial Diamond Lane in the Santa Monica Freeway was serving the same number of persons in approximately 10 percent fewer vehicles.

These accomplishments were brought about by dramatic increases in car-pool and bus riders. Other preferential treatment projects for car pools and buses in places as diverse as Honolulu, Seattle, Portland, San Francisco, Miami, and Boston are confirming our conviction that such efforts can reduce traffic congestion and thus increase the efficiency of urban highways.

## AUTOMOBILE-RESTRICTED ZONES

I would like to single out one particular TSM strategy—a relative newcomer to the American urban transportation scene—that can also change the nature of user demand and that, I believe, will become a common feature in many of our cities. That strategy is the automobile-restricted zone (ARZ).

Automobile-restricted zones in downtown areas have a special appeal to a large number of people for many reasons. Redesigning the use of urban space and making walking a more pleasant experience can help resolve