# Neglected High-Achievement TSM Actions

*Donald A. Morin, Transit and Traffic Engineering Branch, Federal Highway Administration*

The purpose of this paper is to discuss ways in which we can promote implementation of high-achievement transportation system management (TSM) actions that have been neglected. If we can identify the reasons for this neglect, we may be able to develop effective ways to overcome it.

Perhaps it is best to begin by defining what I mean by neglected high-achievement TSM actions. I consider neglected high-achievement TSM actions to be those operational and policy actions that, although they have been shown, through actual experience or analytical work, to be capable of significantly improving transportation system performance, have not been widely implemented. Note that purely physical improvements to the system are not included in this definition. Actions such as channelization, new signal installations, construction of bus and carpool facilities, and so on certainly have their place in a well-designed TSM plan, but they cannot be thought of as neglected. These types of TSM actions have been accepted by the transportation profession and are found in every TSM plan. In this discussion, I will deal only with those transportation management policies and actions that have not received significant attention in existing TSM implementation programs but offer the possibility of high payoffs toward attaining mobility, air-quality, and energy-conservation goals.

## PRINCIPAL ACTIONS BEING NEGLECTED

### Ride Sharing

Although it is true that carpooling and vanpooling have received much attention in recent years, I argue that, in many localities, much more could be done to make these programs more effective. Ride-sharing programs generally do not have the active endorsement of high-level elected officials or major employers and are rarely based on providing incentives for ride sharing. Most such programs consist only of providing matching services. Thus, such actions as identifying ride-sharing coordinators in major companies, developing incentives, and removing institutional obstacles to ride sharing could greatly increase the effectiveness of an area program.

There have been few studies of the impacts of ride-sharing programs. One study (1), however, has estimated that doubling the expenditures for a typical ride-sharing program (from $200 000 to $400 000) could reduce the areawide vehicle travel (VT) by 1 percent, compared with a 0.2 percent VT reduction for the original program. This translates to a cost of 0.6 cent/vehicle-km (1 cent/vehicle mile) reduced (based on the VT levels in a hypothetical urban area of 1 million population), a very cost-effective strategy. In addition, the capability of a ride-sharing program to provide alternative means of transportation in the event of an energy contingency, as well as the important role such a program plays in energy-conservation programs, makes it a significant transportation action that should be implemented in most metropolitan areas.

### Traffic Control Strategies

There are several types of actions that significantly improve the operation of existing signal systems and the overall efficiency of street movement. One of the most effective actions in this category is signal timing optimization, a neglected facet of signal operation that requires periodic readjustment of signals after they are first programed. The "set it and forget it" approach should be abandoned. It is estimated (1) that a region-wide program of signal optimization can result in a 6 percent reduction in overall travel time at a cost of about 2 cents/vehicle-h saved. More advanced strategies such as signal interconnection, progression, and computerized networks offer incremental benefit above simple retiming, but a significant improvement to a system that is not monitored and adjusted regularly can result from simple timing changes (see Table 1).

Other traffic control strategies include improved freeway surveillance and incident detection, which improves response times to incidents (which in turn minimizes the impact of the incident on traffic) and can be instituted at relatively low cost. Sophisticated detectors and closed-circuit television systems are only one way of doing this. Improved communications among agencies and vehicles responding to freeway incidents can do much to reduce the impact of disruptions on traffic flow (4).

Traffic control strategies also include traffic restraint measures such as pedestrian and transit malls and neighborhood traffic restrictions. These types of actions address issues of congestion, encourage transit use, reduce transit delays, improve schedule reliability, and complement downtown revitalization efforts.

### Alternative Work Schedules

By removing time constraints on working hours, many employers have encouraged employees to join carpools or vanpools or to match their workday to the schedule of the transit that serves their home and work locations, thereby easing site-specific congestion points while also improving employee morale. Greater acceptance of alternative work hours by employers could not only help to alleviate the transportation problems of specific

Table 1. Improvements in average speed due to changes in traffic signal timing.

| Location | Type of Area | No. of Intersections | Time of Day | Avg Speed (km/h) Before | Avg Speed (km/h) After | Increase in Avg Speed (%) |
|---|---|---|---|---|---|---|
| San Jose, California | Central business district | 46 | 4:00-6:00 p.m. | 24.6 | 25.1 | 1.9 |
| Los Angeles, California | Innercity | | | | | |
| | Broadway-Figueroa | 26 | 3:00-4:00 and 5:30-6:00 p.m. | 27.8 | 33.0 | 21.1 |
| | | | 4:00-5:30 p.m. | 24.6 | 30.2 | 22.7 |
| | Pico Boulevard | 6 | 2:30-3:30 p.m. | 33.8 | 39.8 | 18.0 |
| | | | 4:30-5:30 p.m. | 32.3 | 34.4 | 6.4 |
| | Wilshire Boulevard | 45 | Morning peak | 21.0 | 23.0 | 9.9 |
| Macon, Georgia | Central business district | 54 | 7:45-8:45 a.m. | 20.3 | 23.0 | 13.4 |
| | | | 4:45-5:45 p.m. | 18.7 | 21.9 | 17.1 |
| Inglewood, California | Citywide | 60 | 7:00-10:00 a.m. | 36.6 | 49.4 | 35.0 |
| | | | 3:00-6:00 p.m. | 35.2 | 48.0 | 36.0 |
| Montgomery, Alabama | Central business district | 50 | Morning peak | 26.10 | 32.38 | 24.1 |
| | | | Off peak | 30.54 | 32.42 | 6.1 |
| | | | Afternoon peak | 28.70 | 31.79 | 10.8 |
| Charlotte, North Carolina | Central business district fringe | 10 | 5:00-6:00 p.m. | 12.29 | 14.18 | 25.8 |
| Washington, D.C. | Central business district | 40 | Off peak | 19.15 | 21.15 | 14.4 |
| Fort Worth, Texas | | 130 | Morning peak | | | 1.9 |
| | | | Off peak | | | 13.8 |
| | | | Afternoon peak | | | 19.7 |
| Santa Barbara, California | | | Morning peak | | | 15.0 |
| | | | Afternoon peak | | | 7.0 |
| Unweighted avg (all locations, all time periods) | | | | | | 15.8 |

Notes: 1 km = 0.62 mile.
Derived from data given by Wagner (2) and Pinnell-Anderson-Wilshire and Associates (3).

individuals but could also address congestion problems in the overall transportation system. However, employers frequently are slow to implement alternative work schedules. One reason for this is the scarcity of information on how to implement such programs and the confusion surrounding the differences between the two major types of alternative work hour programs—staggered hours and flextime. Staggered hours have been shown to benefit transit when the problem is one of insufficient capacity to handle the peak-period demand but may negatively affect ride-sharing efforts. Flextime can be complementary to both (5, 6).

## Parking Management

Effective management of the supply, location, and operational policies of downtown parking has great potential as a TSM action. Control of convenient, inexpensive parking for the 1 person/automobile commuter could be successfully used to encourage modal shift. The federal government is now attempting to face this issue by phasing out subsidized employee parking (7).

Enforcement of curb parking restrictions, especially during peak periods, can significantly improve the flow of vehicles, particularly transit vehicles that operate in the curb lane. Strong enforcement of parking restrictions is thus essential to the success of any parking program. The District of Columbia Department of Transportation has recently adopted an extensive program that includes a large civilian ticket-issuing corps, a towing program, booting of ticket scofflaws, simplified parking adjudication, and residential parking permits.

Parking rates can be structured to favor the short-term shopping trip downtown over the all-day commuter trip. Preferential parking locations for high-occupancy vehicles (HOVs) can also encourage more-energy-conscious trip making and can increase the person-carrying capacity of the system.

## High-Occupancy-Vehicle Incentives

Although large-scale HOV treatments are not applicable to smaller metropolitan areas, there are several HOV actions that can be used in many areas. Park-and-ride lots have recently received interest, both as transit pickup points and as staging areas for carpool formation. Leasing arrangements with shopping centers or churches have proved a very cost-effective way to provide these lots. HOV preference on arterials in the downtown area can also be effective. Ramp metering combined with HOV bypass and HOV bypass of bottlenecks on mainline facilities could also be more widely implemented. In many instances, the effort is focused on how to provide a continuous HOV lane when the need is only to find a way for HOVs to bypass a short, congested bottleneck point. One of the important points to consider in examining HOV alternatives is, therefore, adjusting the scale of the solution to the scale of the problem.

## Transit Operations

Efforts to improve transit operations, management, and service planning (such as improved scheduling, marketing, maintenance, public relations, fare collection, and routing) have too often become lost in arguments over financing. Simple actions such as monitoring and adjusting service and operations can significantly contribute to maintaining a high level of service and transit patronage. For example, the application of the run cutting and scheduling program to improve route scheduling can result in direct savings in system operating cost of 2-4 percent (8). Provisions for rehabilitation and stockpiling of buses are also now being emphasized as an important way to prepare for future energy contingencies. Although a number of unique, specialized transit services have been developed that demonstrate a capability to capture automobile commuters, for the most part metropolitan planning organizations and transit operators have not taken advantage of the results and expanded such services to other areas.

## Urban Goods Movement

Planning for the movement of goods and for facilities for

trucks has generally been neglected in the traditional urban transportation planning process. Lack of facilities for truck loading and unloading can cause bottlenecks and severe disruptions to traffic flow in the central business district area. Simple regulatory, policy, or enforcement changes to ensure that truck-loading-zone areas are available for their intended use can lead to significant improvements, although longer-range actions such as truck-oriented streets and underground loading areas could also be considered (9). Improving the position of urban trucking in the overall transportation system will require close coordination, cooperation, and support from elected officials, administrators, and private-sector executives. Fleet operators should be encouraged and assisted in improving the efficiency of local pickup and delivery operations. Reductions in VT of more than 20 percent have been achieved where route efficiency has been analyzed and changes made (10).

### Pricing

Pricing actions to encourage HOV use, reduce congestion, and restrict commuter parking have not been implemented to any degree in this country, although studies have shown such actions capable of some of the highest payoffs available (11). Area licensing schemes and road pricing in general are quickly labeled as politically infeasible. Parking surcharges are frequently discussed as a particularly effective TSM action and, indeed, analysis has shown them to have significant potential impacts on VT, but there are many problems in instituting such increased charges. Parking facilities are most often privately controlled and run completely separate from other transportation services and policies (12). Fear of possible adverse economic effects on downtown merchants also clouds any serious study of the institution of pricing actions. When one realizes that nationwide more than 90 percent of automobile work-trip commuters park free and that even in large downtown areas such as Washington, D.C., or Manhattan significant percentages park free (13), it is evident that considerable underpricing of automobile commuting exists. Emphasis should therefore be directed at encouraging employers to eliminate employee parking subsidies and at reducing the amount of free or low-cost street parking for commuters. An example of the potential impact of such efforts can be found in Ottawa, Canada, where, when federal employee parking rates increased from free to $20/month, there was a 23 percent decrease in automobile work trips ($1.00 Canadian = $0.85 1979 U.S.) and transit ridership of such employees increased by 16 percent (14).

## WHY ARE THESE ACTIONS NEGLECTED?

In examining these actions and asking why they have not been implemented to any significant degree, I note several common points.

First, many of the actions are politically sensitive. The highest payoff actions are those that restrict individual automobile mobility in some way, either by physical restrictions or by pricing increases. These include parking management, traffic restraint, some HOV incentives, pricing, and goods movement to a degree. Most elected officials, corporation executives, and agency administrators are wary of supporting such actions and, without their support, the actions will generally not succeed. This is the most important single reason why transportation supply-limiting actions are not being actively implemented.

Second, the visibility of these projects to the public in general is quite low. Traffic control adjustments, transit planning, some ride-sharing activities, and programs for alternative work schedules are not generally considered glamorous projects. This disinterest can also lead to a lack of high-level support; decision makers generally like to be associated with visible improvement projects, such as highways and transit capital purchases.

Third, most of the actions are labor intensive. They are not projects that can be constructed once and then forgotten, but require a continuing commitment of local funds, usually at a higher local-matching level, even if federal money is available. The frequent unavailability of federal support puts these projects at a distinct disadvantage in competition with highway and transit capital-facility projects. This is especially significant in the current era of fiscal conservation at all levels of government.

Fourth, many of these actions require extensive interface and cooperation between public agencies and private entities. Local business leaders and leadership from local governments (mayors and county officials) often have goals that do not interrelate with TSM goals. The perceived political and economic impacts of TSM actions are difficult to deal with, when such varied interests are involved.

Fifth, these actions often require coordination among a large number of entities such as traffic, transit, judicial, and police agencies. For example, enforcement of HOV treatments and complementary parking requires a close working relationship between the traffic and police agencies, along with a willingness of the local judicial system to adjudicate violations. Jurisdictional turf problems and the effects of the actions of one agency placing additional demands on another can cause friction and thereby obstruct project development.

## HOW CAN WE IMPROVE IMPLEMENTATION?

These impediments to TSM—lack of a constituency, the need for extensive interagency coordination, competition with capital projects, political sensitivity, and funding difficulties—indicate why the development of TSM programs has not been as rapid as most transportation planners would like. Nothing we can do will immediately change the situation, but I think we can accelerate the slow, but definite, movement toward many of these types of actions.

First, there are a number of success stories that could be disseminated to serve as models for other metropolitan areas.

Second, the energy effectiveness of TSM actions is impressive, as shown by a recent analysis of a number of potential TSM actions in terms of fuel savings (15). We should capitalize on this obvious attention-getting aspect of TSM.

Third, we must be better prepared to recognize and respond to the perceived political and public reaction to TSM actions and do much more to convince mayors and council members of the true value of these actions. Additional time and effort to assess the economic and social effects will certainly be necessary in responding to political and public concerns. We should be undertaking these analyses now.

Fourth, funding sources other than the normal ones should also be sought. State and federal legislatures should be made more aware of the benefits of these actions through more-effective contact or by direct lobbying. The recent automobile-use management initiative, a part of President Carter's energy initiative, is an example of federal efforts to change

legislation so as to increase funding for TSM actions. This could be supplemented by similar state actions.

Fifth, federal leverage could also be used through categorical funding programs, added inducements in existing programs, specific TSM project goals or targets in each urbanized area, or regulatory changes. This approach is frequently used to promote federal objectives although, in the case of TSM, it clearly would be more effective to begin with a local commitment to the concept.

Sixth, further technical-assistance efforts from the states and federal agencies should be made. Many localities do not have the capability to retime signals, design alternative work-schedule programs, design park-and-ride lots, upgrade transit management, or design HOV treatments. An aggressive, competent state-level technical-assistance program could prove very effective. Federal efforts in technical assistance are continuing, and we encourage your ideas as to where we can be most effective.

And finally, a more-critical look at the local and regional organizational roles relative to TSM planning and implementation and interaction among agencies is indicated. There is no one right way to organize for TSM planning and implementation; each metropolitan area will be different. But high-level local leadership will have to be made a necessary part of the organization if we ever expect to have effective project implementation.

As transportation experts, we cannot hope to implement the neglected high-achievement TSM actions alone. More and more, we must become involved in the political and economic processes in the local area. The TSM actions we are looking at do not affect transportation only but cut across a wide range of other local and national concerns.

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