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The Automatic Guideway Transit Experience in Cleveland, Houston, Los Angeles, and St. Paul

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ABSTRACT

Extensive interviews were held with participants in and observers of the automated transportation systems planning processes carried out in Cleveland, Houston, Los Angeles, and St. Paul while each of these cities was participating in the Downtown People Mover Demonstration Program (1975-1981). The purpose of these interviews was to document in detail the specific institutional, political, economic, and technical factors that were addressed and ultimately influenced each city's decision whether or not to continue in the demonstration program. Of particular interest were the factors that were unique to a new automated technology as opposed to factors that might be confronted by any large capital project. The results of this analysis can be used by the federal government in shaping new initiatives (irrespective of whether they are oriented to new technologies) and by local planners to aid in understanding the types of factors, nontechnical as well as technical, that must be faced in similar future projects.

In 1976 UMTA selected six cities to participate in the Downtown People Mover (DPM) Demonstration Program. Two of these cities--Detroit and Miami--were encouraged to consider using UMTA funds previously committed to fixed guideway systems to build downtown circulator systems. Four other cities--Cleveland, Houston, Los Angeles, and St. Paul--were declared eligible for newly committed federal funds to cover 80 percent of the cost of designing and imple-

menting automated circulation systems in their downtowns.

Early in the program, Cleveland and Houston decided to withdraw. Subsequently, St. Paul also chose to withdraw from the program and Los Angeles stopped its plans for an automated downtown circulator when federal funding of the DPM program was suspended. Although no longer part of a demonstration program, planning and construction of automated downtown circulators is continuing in both Miami and Detroit with federal participation.

In an effort to understand the local factors and circumstances that led to the withdrawal of four cities from the program, extensive case studies were conducted in each of these cities. The purpose of the case studies was to document in detail the specific institutional, political, economic, or technical factors that led to each city's decision and to attempt to distinguish which of these factors were unique to a new automated technology and which factors might have confronted any large capital project. The results of this analysis can be used by the federal government in shaping new initiatives (irrespective of whether they are oriented to new technologies) that may confront a similar set of factors at the local level and by local planners to aid in understanding the types of factors, nontechnical as well as technical, that must be faced in similar future projects.

The findings from all four case studies are synthesized in this paper. The issues that were common to all cities as they considered participation in the DPM program have been identified along with unique issues confronted in each city that still may have some significance at the national level.

The material in this paper has been drawn from a report to UMTA (1) that also includes full case studies for each of the four cities. The site visits were structured to include interviews with representatives from local, regional, state, and federal agencies as well as local and state elected officials, representatives of the business community,

journalists assigned to cover the project, and various community groups that were effective in supporting or opposing the project.

To integrate the major site-specific issues into a set of general conclusions of the institutional and political barriers to the implementation of automated guideway transit (AGT) systems in urban areas and the design of federal programs that will minimize the effects of these barriers, the site-specific issues have been grouped to reflect the following aspects of the DPM program:

- The construction of large-scale capital projects with federal funding in specific urban areas.
- The focus on local downtowns, their transportation needs and facilities.
- The emphasis on new transportation technologies.
- The design of the program as a demonstration of the effectiveness of automated technologies in urban settings.

These issues progress from those that generally apply to many federal programs to those that are unique to the DPM program. The issues related to each of these aspects of the program are discussed in the sections that follow.

LARGE-SCALE CAPITAL PROJECT ISSUES

In each of the four cities, the fact that a DPM system was a large public-sector-funded capital project led to a number of issues including the following:

- Difficulties in estimating capital and operating costs,
- Long lead times required for project completion,
- Conflicts in cost-effectiveness criteria, and
- Decision making in a complex institutional environment.

Estimating Costs

Fluctuating estimates of capital and operating costs caused problems as DPM planning progressed in each of the four cities, but the extent to which this issue was a significant problem varied directly with the amount of progress made before withdrawal from the program. Where active planning continued over a period of years, cost estimates were raised periodically, creating a problem for project supporters that was difficult to avoid.

Although this problem faces all large-scale capital projects, it was reinforced in the DPM program by the high rates of inflation in the years from 1976 to 1981 and by the uncertainties associated with the DPM technology. Cost estimates were relatively minor issues in both Houston and Cleveland mainly because they were overshadowed by other factors that led to early withdrawals of these cities.

In St. Paul increasing cost estimates exacerbated the difficulties in arranging for funding the local share of capital costs. In Los Angeles increasing costs did not become a factor until system supplier bids were received; then the earlier underestimates became evident, leading to revised estimates that were so high they were a significant factor in increasing local disillusionment with the project, which became evident just before the final withdrawal of federal commitments.

Lead Times

In each of the cities, the time required for DPM

planning and engineering was sufficiently long to allow related political or institutional trends to change significantly, always to the detriment of the DPM project. In each case the project itself was not the source or basis for these changes; instead the project was affected negatively by broader trends.

In St. Paul and Cleveland these changes were basically political--the composition of the state legislature and the city administration, respectively. In Houston and Los Angeles the changes were institutional--the formation of new entities responsible for transit planning and development. In each case the DPM project suffered almost inadvertently because of the shifts in priorities and interests that accompanied these broader changes. By carefully positioning itself with respect to these changes, the Los Angeles project team was successful in avoiding being overcome by related local events; however, even in Los Angeles this was becoming increasingly difficult in the final months. In each of the other cities, the project teams were not able to prevent delays caused by these broader political and institutional trends.

Cost-Effectiveness Criteria

In each city the controversy over whether or not a DPM system should be built focused partially on differing definitions of cost-effectiveness. System proponents claimed that only the local share of total costs was relevant--that the federal share would go elsewhere if a DPM system were not built. Opponents, on the other hand, saw federal funding for the DPM system in competition with UMTA funds for regional transit systems. Their cost-effectiveness criterion was therefore based on total system costs. In spite of whatever proponents or UMTA said about the independence of federal funding decisions for DPMs and regional systems, many would not believe that complete independence existed.

Complex Institutional Environments

In each of the DPM cities, as in all U.S. metropolitan regions, transportation decision making takes place within a complex environment of statewide, regional, county, and municipal agencies with varying responsibilities for the planning, implementation, operation, and regulation of transportation facilities and services. The DPM program could not avoid these environments, but it could have sought out an existing structure instead of allowing the areas to set up what were essentially new structures for the DPM program.

For example, if UMTA had required the local metropolitan planning organization (MPO) and the agency that would be responsible for system operation (usually the regional transit operator) to submit a joint proposal as DPM grant recipients in each area, the agencies usually responsible for transit planning and operations would have been encouraged to work together on the DPM project as they must in other areas of transit development.

Without organizational requirements such as these, a number of ad hoc institutional arrangements were set up that severely hampered DPM planning progress because even though they may have been ultimately workable, they required new and different institutional relationships to be defined. The results of these problems were especially evident in Cleveland and St. Paul, where municipal agencies found themselves in a new and uncharted role.

Los Angeles found itself in a similar situation but set up a new agency and carefully established

workable relationships with existing agencies. By avoiding the question of who ultimately would be responsible for system operation, Los Angeles was able to avoid the pitfalls discussed earlier, but not without significant effort. Houston's grant recipient, the transit operator, came closest to the model suggested. The transfer from a municipal to a regional agency during the DPM program, however, hampered the potential effectiveness of this choice of local leader.

DOWNTOWN CIRCULATION ISSUES

In each local area many of the questions debated as the DPM decision-making process unfolded were related to the context in which the systems were to operate--the downtowns. In each city the downtown area traditionally had been the center and highest concentration of retail and commercial activities. The types of issues falling into this category include the following:

- The extent to which problems were perceived to exist in the downtown that could be alleviated by building a DPM system.
- The relative effectiveness of the proposed DPM system as a means of meeting the downtown's needs.
- The limited groups of beneficiaries of a DPM system, in relation to the entire region's population and economic community.
- The problems of integrating the relatively limited DPM system with the much broader regional transportation system.

Perception of Downtown Problems

In each of the cities there were individuals and groups who questioned whether downtown circulation per se was a real problem or was an issue with a priority high enough to warrant an expensive capital solution. The importance of the opposition of these individuals and groups to the DPMs, however, varied significantly from city to city.

In Cleveland this issue was a minor one, because for a number of years many in the city had recognized the need for a better way to distribute rail transit users to and from the single central business district (CBD) station. Also it was agreed that CBD development should proceed at a faster pace and that existing activities should be revitalized. DPM proponents in Los Angeles emphasized the impending lack of parking facilities where they were most needed and the need to link separate activity centers within the CBD.

Because of the downtown's rapid growth at the time, as well as its long walking distances, few disagreed with these statements of need. A number of opponents did, however, fail to accept the need for the DPM as an incentive to future development and revitalization when they observed that the parts of the CBD that would be served best by the system were already developing rapidly and that the parts most in need of revitalization would be poorly served.

In both Houston and St. Paul proponents placed significant emphasis on future transportation needs--the higher levels of congestion and the scarcity of parking expected in the future. In both cases, however, the consensus of the general public reflected its inability to accept these problems as real, in view of the minor degree to which they existed at the time. The relatively high levels of development going on at that time in each of these areas inhibited the perception of an urgent need to

use the DPM to promote more development. These failures to perceive the stated future needs in Houston and St. Paul were significant factors in their decisions to withdraw from the DPM program.

Relative Effectiveness of DPM Solutions

DPM opponents in each city were able to cite alternative systems that were considered to provide a more effective means of addressing their downtown transportation needs: skyways in St. Paul, loop buses in Cleveland, a bus priority system in Houston, and the downtown portion of a regional rail transit line in Los Angeles. In the first three cases these alternatives would be significantly less expensive than a DPM system. In Los Angeles this would probably not be true, but the regional rail system was believed by many DPM opponents to meet additional, higher priority transportation needs not addressed by the DPM.

None of the cities argued that improved bus or walkway systems would have a significant impact on CBD development or revitalization, but many doubted the claims of the effectiveness of the DPM systems in achieving these goals. In general, the DPM systems were viewed as having very high costs in relation to their expected benefits.

Limited Groups of Beneficiaries

Public sector investments in CBDs tend to provide direct benefits to a segment of the total regional population that does not represent many socioeconomic groups. The prototypical beneficiaries are thought generally to be high-income business and professional people who work downtown, CBD property owners, and large business firms with downtown offices.

Building a regionwide constituency in favor of added travel and development benefits for these groups often is difficult. Care must be taken to convince a broader constituency that investments designed to improve the health of the CBD will provide the entire region with valuable indirect benefits. Alternatively, trade-offs can be packaged that broaden the number of those directly benefited; this was one of the motivations for Los Angeles' Four Part Transportation Program, which included the DPM.

None of the local DPM projects was able to overcome completely the difficulties of building an effective and stable regionwide constituency, yet each needed regionwide financial (and hence political) support to provide the local share of capital and operating costs.

Integration of the DPM with the Regional System

To be effective downtown distributors, DPM systems must be tied in closely with regional transit systems. For a number of reasons this integration proved to be difficult in three cities and was not addressed fully in the fourth, Houston, before that city withdrew from the program.

Even in Cleveland, where a clear-cut need for a downtown circulator generally was acknowledged, no easy way to integrate the system directly with the downtown rail transit station was found before the project was terminated. In both St. Paul and Los Angeles the DPM project staff wanted to eliminate duplication of transit service by having many regional buses stop at DPM terminal stations; most bus riders would, therefore, be forced to transfer to the DPM to reach their CBD destinations. These plans

were not received well; both the public and the transit operators saw these plans as reducing the level of service for the entire transit trip to the CBD, thus tending to reduce use of the bus system.

In Los Angeles rail transit planning and DPM planning were taking place concurrently, but the two agencies involved failed to develop a plan that would avoid a high level of duplication of service. In the plan the two systems had a number of stations within a block of each other. Clearly, using the DPM in addition to the regional system would provide only a marginal increase in the level of distribution in the CBD.

INNOVATIVE TRANSPORTATION TECHNOLOGY ISSUES

Because of the strong focus in the DPM Demonstration Program on innovative transportation technologies, local decisions to withdraw from the program tended to be interpreted immediately as repudiations of these technologies. More careful analysis reveals that although issues related to the technology to be implemented did enter into the decisions made, they were not the overriding concerns. Instead, as reflected in the structure of this summary, they merely represented one category of a broader range of issues. The types of issues falling into the innovative technology category include the following:

- The degree of local familiarity with AGT systems before the DPM program and the changes in this factor that occurred as the program continued.
- Concerns about the risks and uncertainties of implementing these systems in CBD settings.
- The credibility of patronage and induced development forecasts for the new systems.

Local Familiarity with AGT Systems

Of the four demonstration cities, only Houston failed to consider sufficiently in advance the application of new technologies in the CBD. This lack of advance planning was a contributing factor in Houston's subsequent lack of interest in remaining part of the DPM program. The planning that had taken place in each of the other cities--since the early 1970s in each case--was important not only in providing a basis for the DPM proposals to UMTA but also in providing a core group of advocates for the system.

As planning progressed, familiarity with the DPM concept increased in each local area, but the reputation of AGTs generally declined both nationally and locally because of the well-publicized high initial costs and operational difficulties of the Morgantown system. Additional negative impacts occurred in Los Angeles and St. Paul. In both cities systems at nearby recreational facilities provided many with the perception that some of the candidate systems were either toys, Toonerville Trolleys, or too unreliable for DPM settings. The unwillingness of both the local project staffs and UMTA to state that such systems would not be chosen further fueled negative reactions to the systems in both of these cities.

The deterioration of the general perception of DPM systems continued throughout the planning process in Cleveland, Los Angeles, and St. Paul and finally resulted in their being likened more to elevated railroads than to modern innovative systems. This occurred especially in Cleveland and Los Angeles, where opponents questioned why elevated DPMs should be constructed when other cities had been

tearing their elevated transit lines down for years because of their negative impact on communities.

Project staffs failed to create a sufficiently positive familiarity with the potential of AGT systems among the general population to provide the required level of support for implementation. It is not clear whether this could have been done in the light of the reputations and operational difficulties of some automated systems at that time.

It will be important in future new transit technology programs, however, to develop a more effective way to make local area constituencies familiar with the new technologies and their advantages over alternative solutions to local transportation and development needs. UMTA's continuing program to evaluate the Detroit and Miami circulator systems will provide a portion of the data base for such future efforts. This data base will consist of impact studies, assessments, costs, and reliability experience for the systems as implemented in urban settings.

Risks and Uncertainties of DPM Systems

UMTA's original design for the DPM program emphasized the reduction of technological risks by limiting the range of appropriate systems to those that had proved to be feasible in other regular passenger service settings--airports, recreational parks, or non-CBD activity centers. This requirement was relaxed later when suppliers were successful in obtaining UMTA's agreement that prior passenger service was not required and that only successful operation on a test track would be required. Concerns about the technical feasibility of the systems under normal operating conditions, however, were only a minor negative factor in any of the local areas.

Other concerns existed, however, that were related to the lack of previous experience with automated systems in the CBD settings and under winter climate conditions. These concerns focused on doubts about the levels of safety and personal security that could be assured without operators on board. Other concerns were visual effects and the effects of noise and dirt on occupants of nearby buildings as well as on pedestrians, automobiles, and bus users along the right-of-way of the DPM, and the effects on traffic flow and on-street parking in locations where existing street rights-of-way would be required.

These types of concerns continued to be critical in each of the local areas, in spite of efforts by the project staff to address them. These efforts varied in intensity from city to city, but the basic lack of existing examples to point to prevented even the best efforts from succeeding.

Credibility of Forecasts

The two major types of forecasts required in the DPM planning process were future system ridership and level of system-induced development. The preparation of these forecasts was made difficult both by the CBD setting and by the uncertainty of how travelers and developers would react to a new technology. The CBD setting made it difficult to use existing models and procedures oriented to the regional scale, but new approaches could be based on observations of existing travel and development behavior.

The need to focus on a new technology provided a more complex forecasting problem. There were no existing AGT systems operating in downtown settings

and thus there was no actual experience with how travelers might react to and use these systems. Planners found it necessary to project new patterns of traveler and developer behavior based on previous responses to systems, such as the Bay Area Rapid Transit in San Francisco and the Washington, D.C., Metro, which lacked the uniqueness of function and advanced technology of the DPM. An enhanced modal image was assumed to reflect these differences. The resulting forecasts of future DPM ridership at times called for as much as 10 times the existing use of bus routes providing downtown circulation; and, in addition, significant levels of system induced development were predicted.

The local population found these forecasts hard to believe. Where more detailed study of the ridership forecasting procedures was carried out, in Los Angeles and St. Paul, credibility was further weakened as assumptions of modal images, high rates of diversion of bus users to DPMs at transfer stations, and limitations of future increases in parking capacity at fringe locations served by DPMs were identified and reviewed publicly. Similar investigations of DPM-induced development potentials called into question the effectiveness, over and above existing trends, of the DPM systems.

ISSUES RELATED TO THE STRUCTURE OF THE DPM DEMONSTRATION PROGRAM

The final category of issues that affected the local DPM projects are those that arose specifically from the structure of the DPM Demonstration Program. Although these issues are unlikely to confront other federal programs, they provide valuable guidance for new technology demonstration programs that might be devised in the future. By learning from the problems that became evident in the local areas during the DPM program, UMTA can significantly enhance the effectiveness of such future programs.

Four types of issues have been identified in this category:

1. Conflicts and inconsistencies caused by the sequence of local activities,
2. Conflicting program objectives at the federal and local levels,
3. Issues related to the acceptance of ad hoc local institutional arrangements, and
4. The lack of effective program commitments at both the federal and local levels.

Sequencing Local Activity

The history of local DPM projects strongly suggests that there were two major problems with the sequence defined by UMTA for local planning and engineering activities:

1. Final selection of demonstration cities was based on hastily prepared proposals, and
2. System suppliers were not selected until after completion of preliminary engineering.

UMTA made a final selection of the cities to be included in the program based on proposals that had to be developed in just 3 months. Events proved that this provided the local areas with too little time to reach a consensus on whether or not they should build a DPM system and who should be responsible for leading the planning and implementation effort. By being forced to make these decisions in a short time, three of the four local areas later found it necessary to reverse themselves. In both Cleveland

and St. Paul this happened in spite of significant levels of new technology planning.

Choosing the DPM technology at this stage is inconsistent with the subsequent need for an objective look at alternative systems as Environmental Impact Statements (EIS) are developed. Houston, the only city to fulfill this requirement, later felt too constrained by looking at a single technology and ultimately withdrew because it concluded that a bus system was preferable to a fixed guideway system. If the program structure had been flexible enough to accommodate Houston's approach to preliminary engineering and alternatives analysis, the problems generated at both the local and federal levels by Houston's withdrawal from the program might have been avoided.

Before it withdrew from the program, Cleveland found itself in a tug-of-war between those who wished to see an unbiased feasibility study carried out and those who hoped to move directly to preliminary engineering of a DPM system. To a lesser extent, this same conflict existed in St. Paul and Los Angeles. In the latter city the conflict did not surface fully until after the draft EIS was completed and commented on in public hearings.

The timing of selecting system suppliers only after completion of preliminary engineering also created problems. This sequence of events was appropriate for providing an opportunity to specify carefully the desired system performance, thereby ensuring that local needs would be met. It was also consistent with the sequence of activities carried on in conventional transit system implementation programs. However, using these procedures for a new technology with more widely varying specific systems caused both technical and public relations problems. At the technical level, the local areas were required to keep limitations of aspects such as turning radii, support spacing, and guideway width general enough to avoid disqualifying too many systems and eliminating too many suppliers.

Public relations during preliminary engineering also were made more difficult by the aspect of the program that required this sequence of implementation. The local project staffs could not say with authority that specific existing systems that had bad reputations because of operational difficulties or cost overruns elsewhere would not be eligible for selection as the local DPM. As a result local staffs were hampered in their ability to deal effectively with an important concern of the local population before it generated additional opposition to a DPM system. If federal procurement regulations had allowed UMTA to foster the early formation of joint ventures, each consisting of a system supplier and a local area, these types of problems could either have been reduced or limited to only those joint ventures that involved a system supplier that had experienced problems with its previously implemented systems.

Conflicting Program Objectives

In the DPM Demonstration Program, the primary federal objective was to demonstrate that automated transportation technologies could serve local transportation needs effectively and promote downtown development and revitalization. In the local areas, however, there was a greater focus on serving transportation needs and promoting CBD growth than there was on new technology. There was no inherent conflict in these varying emphases, but experience indicates that a strong potential for conflict did exist. After being selected as DPM cities, there were varying degrees of interest in each local area

in carrying out feasibility studies or analyses of alternatives to determine what transportation systems should exist downtown instead of proceeding immediately to DPM preliminary engineering. Many wanted to determine the most cost-effective way to meet future CBD needs after considering all alternatives, not just DPM systems.

Each city viewed being a laboratory for what was considered a federal experiment as more likely to be negative than positive. Thus, for example, UMTA's requirement that three different system suppliers be selected by the first three DPM cities was considered a conflict with each city's desire to obtain what it considered to be the best system for its needs.

Local Institutional Arrangements

Both the short time available for the local areas to prepare their DPM proposals and the systems' limited service areas resulted in selection of lead DPM agencies that were inexperienced in working with UMTA and that had to develop new sets of working arrangements with other transportation planning and operating groups in their regions. This was especially true in Cleveland, where the proposal was prepared by the mayor's office, and in Los Angeles, where the Community Redevelopment Agency prepared the proposal.

In St. Paul the joint city and Metropolitan Transit Commission (MTC) proposal included the regional transit operator but required the transit operator and the city to work out the terms by which they would cooperate. Subsequently, the state legislature failed to provide the funding required for MTC to continue its involvement in the project.

Houston's proposal by the transit operating agency within the city government initially prevented the type of problem confronted in the other cities, but the subsequent transfer of DPM planning activities to a new regional transit authority resulted in significant time and effort being devoted to organizational issues.

It is not clear whether UMTA could have adopted program guidelines that would have significantly reduced potential local organizational and political conflicts. A requirement that both the regional municipal planning organization, or a designated representative agency, and the intended DPM system operator be parties to the planning and implementation process would, however, appear to have merit. Also, in future programs of this type, UMTA should be careful to evaluate both the present and expected future organizational and political support for a local project before selecting the local areas to be funded. Cities proposing to use institutional arrangements that have proved to work well in the past for system planning, implementation, and operation should be favored over those defining completely new relationships.

As the DPM program progressed it became increasingly clear that the private sector--downtown employers and property owners--had a significant stake in the local projects. The innovative public and private arrangements partially worked out in St. Paul and Los Angeles represented important firsts for UMTA-funded projects. In both cities, however, involvement of the private sector was too late and too indefinite.

This suggests that it would be desirable in future DPM-like projects to require that a plan for private sector involvement be outlined in the original proposal or application and to require that it receive final approval early in the planning process. This would allow UMTA to select cities after considering

the likelihood of successful private sector participation and also would help the local areas to tie down this participation as early as possible in the planning and implementation process.

Lack of Program Commitments

At both the local and federal levels, the DPM program suffered from lack of commitments that were strong enough and long-term enough to complete the local projects. At the local level some of these commitments involved multiple agencies, but the more critical lack was in getting commitments of financial participation from the private sector. St. Paul was the most successful in arranging such commitments, but there the commitments did not come in time to avoid the defeat of local DPM funding at the polls.

In Los Angeles, tacit agreement of the private sector's willingness to participate in tax increment financing was obtained, but the details were never completely worked out. The Cleveland business community contributed toward DPM planning costs but resisted making commitments to provide funds for capital or operating costs. In each case the planning process would have proceeded more smoothly if firmer commitments could have been obtained, even if the ultimate no-build decision could not have been changed.

As the only originally chosen city in the DPM program at the time it was suspended, Los Angeles was the only city affected by the federal government's difficulty in making multiyear commitments. The understanding that UMTA was committed to a Los Angeles DPM was proved wrong when Congress eliminated the program funding (all multiyear government commitments are subject to annual approval by Congress). Because this reality had not been stressed previously, it was extremely difficult for proponents of a DPM system in Los Angeles to understand how this system could have been halted so quickly.

Changes in federal initiatives that would address the need for stronger commitments earlier at both the local and federal levels may be difficult to achieve. The private sector can be expected to propose contributing at low levels, or not at all, until they are convinced by events that more support will be required. Future programs are likely to benefit, however, from the precedent of obtaining private sector funding by mechanisms such as tax incentives and joint development, which are now common in transit projects. At the federal level, strong support for specific systems will have to be maintained for long periods of time.

A final program structuring strategy that would address many of the problems identified throughout this section would be to integrate a program such as the DPM Demonstration Program into the standard transit planning and funding process. This would require UMTA to provide a high level of staff support and information to local areas considering alternatives involving automated technologies in high-activity urban areas. Also, UMTA would clearly state to local area transit and CBD planners that if innovative transportation system technologies were preferred for their CBD, UMTA would consider funding such a system under one of its normal discretionary capital grant programs. After UMTA approval of such a grant, the local area could form a joint venture with a system supplier for final engineering, construction, and initial operation.

By making such a grant conditional on an acceptable and impartial consideration of a full range of alternatives, UMTA could minimize the likelihood

that system suppliers would prematurely oversell their particular technology. The local area would also be encouraged to formalize private sector funding arrangements at this stage. UMTA would provide specialized help, as required, to the local area in all aspects of planning and implementation related to the use of innovative and therefore unfamiliar technologies.

To encourage further the acceptance of new technologies, UMTA would also provide 100 percent funding for any costs above those required for planning and engineering a conventional system, as well as the full costs of evaluating the innovative systems to provide guidelines for other DPM systems. Federal grants toward construction costs, however, would require the same local cost sharing that is required for conventional systems.

By integrating new technology demonstrations in this way into well-established transit planning and funding programs and at the same time encouraging local areas to consider these technologies as potentially viable alternatives, UMTA could improve its encouragement of applying new technologies in urban settings in the following ways:

1. Existing planning and implementation procedures, and the local institutional arrangements used to carry them out, would be retained as much as possible.

2. Enough time would be provided for the local areas to be relatively sure they had a sufficiently strong commitment to an innovative technology alternative before UMTA would be asked to contribute to the project.

3. System suppliers could be selected early enough in a project to minimize costly unnecessary engineering work. UMTA could decide whether or not to fund a system in a given city based partly on which system supplier was involved, or could withhold final approval until a joint venture was formed. (Note that revisions in the federal procurement regulations may be necessary to allow such joint ventures to be formed.)

4. Federal demonstration objectives would be added to local objectives only after the local area had selected a new technology, and their added costs would be fully paid by federal grants. This should prevent conflicts due to differing federal and local objectives.

5. Private sector involvement would be sought

and finalized as early as possible in the planning and implementation process.

Although all of these factors should be considered in designing any new federal initiative, it should be stressed that no single factor led to the decision by any of the four cities to withdraw from the DPM program. In the case of Los Angeles, however, the decision not to proceed with DPM planning was clearly forced by an overriding factor: the suspension of federal funds.

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