

PUBLIC TRANSPORTATION: CHALLENGES AND OPPORTUNITIES

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Public transportation systems throughout the country continue to be confronted with numerous challenges and opportunities. Some of the major issues facing transit agencies today include reduced funding, responding to changing demographics and travel markets, managing and operating high quality services within tight budget constraints, responding to federal and state mandates, and many other concerns. At the same time, transit systems are being looked toward to help reduce traffic congestion, air pollution, and energy consumption, while at the same time meeting the mobility needs of diverse segments of society. Although these issues, many of which are not new, present numerous difficulties for transit agencies and operators, they also provide the opportunity for transit systems to play an ever increasing role in addressing the critical issues of concern in major metropolitan areas, small communities, and rural areas.

How transit agencies throughout the country respond to these challenges and opportunities will have a significant impact on the social and economic vitality of all areas. Transit can play a critical role in developing sustainable transportation systems that assist in enhancing the quality of life for all residents, that provide needed mobility and accessibility for all segments of society, and that assist in the development of more livable communities. Accomplishing these goals will not be an easy process, however. The combined efforts of transit and transportation professionals, policy makers, private businesses, public interest groups, and the public will all be needed to meet these goals.

This resource paper was prepared for the Transportation Research Board (TRB) *Workshop on Public Transportation Management and Planning in a Rapidly Changing Environment: Strategies for Survival*, held in Irvine, California, July 27 to July 29, 1995. The paper is intended to help facilitate the discussion of the challenges and opportunities facing public transit today, and to assist in the identification of approaches to address these critical issues. To accomplish these objectives, the paper is divided into seven sections following this

introduction. The major issues and opportunities associated with funding, changing demographics and travel markets, service applications, management, advanced technologies, and institutional arrangements are described next. The paper concludes with a summary of the major challenges and opportunities facing public transportation and the identification of areas for further discussion in the breakout sessions.

Funding

Ensuring that adequate funding is available for both transit capital and operating needs continues to be a major priority for transit agencies throughout the country. Recent Congressional actions indicate that reductions in federal funding for transit are likely. In addition, fiscal pressures at the state and local levels have resulted in declining support for public transportation in some areas. These trends are changing the nature of funding for transit. On a more positive note, the flexible funding provisions of the Intermodal Surface Transportation Efficiency Act (ISTEA) provide opportunities for new sources of funding for transit projects. There are potential concerns with the uncertainties associated with the flexible funding approach, however.

Transit agencies will need to continue to explore a wide range of funding sources to survive in this environment. The issues and opportunities associated with different funding sources are briefly described in this section.

Current Status of Federal Funding. Congress is currently working on the Fiscal Year (FY) 1996 budgets for all transportation modes. Although final action has not yet been taken on the FY 1996 appropriations, actions to date have not been favorable toward transit. Early discussions in both the House and Senate focused on major cutbacks or the total elimination of various transit capital and operating programs, as well as transit research and development initiatives, and other related projects. Although the current proposals are slightly more favorable, it still appears that federal funding for transit formal grants and operating assistance will be reduced (1).

ISTEA Flexible Funding Opportunities. The ISTEA provided new programs and greater flexibility in the use of funds from different programs to address local transportation problems and needs. The National Highway System (NHS), the Surface Transportation Program (STP), the Congestion Mitigation and Air

Quality Improvement Program (CMAQ), and other programs all provide greater flexibility in the use of federal funds for highway, transit, and multimodal projects (2). These provisions provide the opportunity for additional funding for transit projects. In 1992, approximately \$30 million was authorized for transit projects from the flexible funding programs. In 1994, this figure increased to some \$609 million, and the 1995 projections are for \$1.7 billion to be transferred to transit projects (3,4).

Future Federal Funding — ISTEA. The ISTEA provides programs and funding authorization for federal highway, highway safety, and public transportation programs for the six-year period from 1992 through 1997. Thus, 1995 represents the halfway point in the life of the ISTEA. The Administration, Congress, transit and transportation organizations, and other groups are initiating discussions on the next federal re-authorization bill. Many key issues that will be considered in the re-authorization process will affect transit. These may include the reorganization of the U.S. Department of Transportation, the specific programs and funding levels, the flexibility to transfer funds among programs, and the planning and project selection requirements.

State and Local Funding. Federal funding represents the largest share of funding for capital requirements in most areas, and provides an important component of ongoing transit operating expenses. In most cases, however, state and local resources comprise a larger share of operating assistance. State and local funds are also used to match both federal capital and operating funds. Thus, state and local resources represent a critical source of funds for most transit agencies. A wide range of funding sources are used at the state and local levels. These include general revenues, sales taxes, gasoline taxes, property taxes, lottery proceeds, and other sources. In many areas, transit agencies must compete with other governmental services and programs for limited funds. In other areas, the link to property or sales tax revenues, which are influenced by recessions and other economic factors, may result in reduced funding for transit, transportation, and other public services. Further, voters in some areas have recently turned down referendums for various major public transportation projects and programs.

Innovative Funding Techniques. Innovative funding techniques have been used in many areas to finance both transit capital and operating expenses. Approaches that have been used include various joint

development strategies, private sector subsidies of services or transit fares, multiple agency coordination, and other nontraditional approaches. The use of these techniques is not a easy process, however, as they require additional efforts to plan, implement, and operate.

Maintaining adequate funding for transit capital and operating needs will continue to be a critical issue for public transportation systems. A combination of funding sources will likely continue to be used in most areas. Topics for further discussion in the breakout sessions include identifying the appropriate mix of funding sources, the advantages and disadvantages of flexible funding provisions, and how transit agencies can utilize flexible funds, techniques to maximize private involvement, approaches to enhance coordination among all transit agencies and social service providers, and ways to obtain greater state and local support for public transit.

Changing Demographics And Travel Markets

The changes in demographics, socioeconomic characteristics, and travel behavior that have occurred over the last 30 years are well known. The three major trends that have influenced travel behavior over this time period are the worker boom, the suburban commuting boom, and the automobile commuting boom (5). An additional trend is that low income and transit dependent groups continue to reside primarily in the central city areas or older first ring suburbs. Many of these trends have had a negative impact on transit. Each of these trends is briefly highlighted in this section.

Worker Boom. Approximately 24 million new workers were added to the labor force in the United States between 1980 and 1990. About 10 million of this increase was due to population growth, while 14 million was due to the changing nature of the population. Further, approximately 60 percent of these new workers were women (4). The increase in workers means an increase in commuting trips. Although this trend would be good for transit if the new jobs were located in areas served by transit, as discussed next, they often are not. Further, the addition of significant numbers of women into the work force has resulted in more two-worker families and single parent households. As a result, two cars are often used per household for work trips and many work trips also must accommodate dropping off and picking up children at school or day care, grocery shopping, and

other errands. Recent studies have indicated that women have different commuting patterns, partly as a result of child care and other responsibilities (6). All of these trends tend to limit the potential use of transit.

Suburban Commuting Boom. Since World War II, there has been a steady trend toward the movement of both housing and jobs from central city areas to the suburbs. This has resulted in major changes in commuting patterns in most metropolitan areas. In the past, the suburb-to-downtown work trip represented the major commute pattern in most metropolitan areas. On a national basis this is no longer the case. The development of suburban office parks and edge cities has resulted in the suburb-to-suburb work trip being the dominant commute pattern in most metropolitan areas today. This trend has resulted in significant levels of traffic congestion on many suburban freeways and arterial streets. This travel pattern, which focuses on dispersed origins and destinations, is difficult to serve with public transportation. It is important to note, however, that the suburb-to-central business district (CBD) trip still represents an important — and in some areas growing — commute pattern that is usually well served by transit.

Automobile Commuting Boom. Automobile ownership, vehicle miles of travel (VMT), and the use of the single occupant automobiles all continue to increase. In 1990, the majority of households in the United States owned two automobiles. Only 13 percent of the households in the country did not have an automobile available, and 20 percent of these were in New York City (7). Thus, there are major trends toward higher automobile ownership and increased use of those vehicles. These trends have resulted in an increase in the use of the automobile — by a single driver — for commuting. According to the 1990 Census, the number of employed Americans who drive alone to work increased by some 9 percent between 1980 and 1990, while the number of carpoolers declined, and the use of public transit remained relatively constant (7).

Transit Dependent Groups. Many of the groups that tend to rely heavily on transit as their main method of transportation — low income individuals, the elderly, and individuals without access to an automobile — still reside in central cities or first ring suburbs in many areas. Meeting the travel needs of these groups, and providing access to jobs, social services, and recreation activities — which are often located in the suburbs — will continue to be a priority for public transit. In addition, meeting the mobility needs of transit

dependent groups in rural areas and small communities will continue to be an important role for transit services.

The demographic, socioeconomic, and travel trends described in this section all offer serious challenges to public transportation. As discussed in the next section, planning and operating cost-effective and efficient transit services to meet these travel markets will not be easy. Issues for further discussion in the breakout sessions include allocating limited resources among suburban and central city services, the social service role of transit in meeting the basic mobility needs of individuals, and how the transit, land use, and transportation planning and decision making process can be better integrated and coordinated.

Transit Service Applications

Meeting the diverse travel needs of all segments of society is a challenge for public transit, especially in light of the trends described in the previous section. Identifying the traditional and the new markets for transit, developing services that meet the needs of these markets, and operating cost-effective services is not an easy process. Many transit systems throughout the country have tried different approaches for addressing these new travel markets, with varying degrees of success.

In addition to the regular or fixed-route services, other approaches that have been tried or are being used include paratransit and demand responsive services, premium express services, reverse commute routes, timed-transfer systems, suburban shuttle services, suburban crosstown routes, downtown and major activity center circulation systems, point deviation service, jitneys, and rural alternate day service. A few examples of these types of services are presented next.

Premium Express Service — Houston METRO. The Metropolitan Transit Authority of Harris County (METRO) operates premium express bus services out of a number of park-and-ride lots in the Houston area. Over-the-road coaches are used and the service operates on the high-occupancy-vehicle (HOV) lanes, providing significant travel time savings and travel time reliability. In addition, frequent service — with peak-hour headways averaging 2 to 3 minutes — is provided.

Multidestination Express Service: Community Transit. Community Transit in Snohomish County operates

express service from Everett, Washington and the surrounding areas to downtown Seattle, the University of Washington, and North Seattle Community College. The service, which originates from both neighborhoods and park-and-ride lots, uses the I-5 North HOV lanes to provide travel time savings and more reliable trip times.

Reverse Commute Services — Southwest Metro, Minneapolis, Minnesota, and Wheels Bus Service, New Jersey Transit. Southwest Metro operates express service into downtown Minneapolis and reverse commute service providing inner-city residents of Minneapolis with access to jobs in three southwestern suburbs. The Wheels Bus Service is oriented towards residents of Bergen and Passaic Counties who work in Newark. This is just one element of a program to increase nontraditional transit services. Other elements include providing more direct service to major suburban activity centers and linking shuttle services to major rail stations.

Suburban Circulator — Roseville Area Transit. This service, which is operated in the communities to the north of St. Paul, provides circulation service within suburban areas. The service is focused on Rosedale, a major suburban shopping center. This facility acts as a transit hub; it is both a major destination for many trips and provides riders with access to express bus service to both downtown Minneapolis and St. Paul. The system also provides connection to the University of Minnesota.

Crosstown Routes — DART. The Dallas Area Rapid Transit District (DART) has implemented a number of crosstown routes, many focusing on suburban areas. DART is currently reviewing its route structure to provide additional crosstown routes and feeder routes to the new light rail transit (LRT) line.

Point Deviation Service — Hamilton, Ohio. The Hamilton transit system provides fixed-route point deviation services. Buses operating on fixed route deviate to pick up passengers when requests are made.

Jitneys — Houston METRO. METRO has recently implemented a program using jitneys to provide service in some areas of Houston. Possible areas for the service were identified through a collaborative process between METRO and potential operators. METRO then issued a request for proposal (RFP) and selected operators for various areas. METRO sets the

fare levels and subsidizes the operators. The program has been in operation since the spring of 1995.

These represent just a few examples of the innovative approaches being used by transit agencies to meet changing travel patterns. Sharing the experience with these and other new services will be an important part of the breakout discussions. Generating new ideas for service applications, identifying areas for further research, and identifying ways to maintain existing low ridership routes that serve transit dependent groups represent other possible topics for discussion.

Management

Managing public transportation systems continues to be a challenging occupation. Transit managers and senior staff are faced with numerous issues today including those focusing on providing quality service in a time of budget austerity, dealing with a diverse work force and union-management concerns, meeting the requirements of federal and state regulations, and promoting a customer-oriented service approach. Further, these and other issues must be addressed in a political environment and often include working with other local, state, and federal agencies and policy groups. A few of the more pressing issues associated with transit management are highlighted next.

Doing More with Less. Like many other public agencies, as well as private companies, most transit systems are faced with pressures to maintain or reduce budgets. Maintaining high quality services in this fiscal environment is difficult. Transit agencies and operators are utilizing numerous techniques to deal with budget reductions. These include downsizing, contracting for various services, trimming unproductive service, and numerous other techniques. Downsizing and eliminating unproductive services are often hard to do because of union contracts and political and community pressure to maintain service.

Dealing with a Diverse Work Force and Union/Management Concerns. Transit managers must deal with a diverse work force that includes operators, maintenance personnel, and office staff. Developing and maintaining personnel policies, salary structures, and other management programs for these groups can be difficult. Further, in many cases, transit systems include a mix of union and nonunion personnel. Developing and maintaining good union-management relations is an ongoing challenge, as noted by some of

the recent strikes by unionized operators at a few transit systems.

Federal and State Requirements. Transit managers must address numerous federal and state laws and regulations. Examples of a few of these include the Americans with Disabilities Act (ADA) of 1990, the various purchasing, reporting, and contracting requirements of the Federal Transit Administration (FTA), the provisions of the Clean Air Act Amendments of 1991, and various state requirements.

Customer Service Orientation. Transit management also requires a customer-oriented focus. This approach includes not only defining the various markets and providing the appropriate services, but also ensuring that all operating and support personnel are customer oriented. One rude bus operator or telephone information representative can negatively impact the whole system.

One of the sessions at the workshop will focus on a more detailed discussion of labor-management cooperation and other management concerns. The panelists in this session will help identify additional issues and opportunities related to transit management for further discussion in the breakout groups.

Intelligent Transportation Systems (ITS) And Advanced Technologies

A major focus of recent transportation research and development activities has been on a variety of technologies being examined under the general heading of intelligent transportation systems (ITS). Intelligent transportation systems include the application of a wide range of advanced technologies that share the common goal of improving the efficiency of the overall surface transportation system. More specifically, ITS technologies are directed at improving mobility and transportation productivity, enhancing safety, maximizing current transportation facilities, and enhancing the environment. These efforts are being supported by federal and state policy directives, private industry groups, university research institutes, and others.

Many of these technologies are being utilized with public transportation systems. Additional applications are being considered and research and development activities are examining the use of new and emerging technologies with all types of transit services. These efforts are focusing on enhancing customer

information, improving the delivery of transit services, and enhancing the efficient provision of these services through ITS technologies.

Two different classification schemes are being used to describe ITS technologies. The first divides ITS into six broad categories focusing on general applications and the second considers a user perspective (8). Advanced Public Transportation Systems (APTS), which focus on the use of advanced technologies to improve the delivery of transit services and to enhance the cost-effective and efficient provision of these services, is one of the six ITS categories. Transit systems may benefit from the Advanced Traffic Management Systems (ATMS), which include the development and operation of advanced transportation surveillance and monitoring systems to provide detection, communications, and control functions in major travel corridors. Transit can also benefit from the Advanced Traveler Information Systems (ATIS), which includes the provision of pretrip and in-vehicle information to motorists on current traffic and other conditions and real-time guidance on route information. A number of the user services also relate to public transportation, including pretrip travel information, traveler services information, ride matching and reservation, travel demand management, public transportation management, personalized public transit, and public travel security. A few examples of transit ITS projects underway throughout the country are summarized next.

Transit Integration with Advanced Transportation Management Systems (ATMS). Starting in the 1960s, many metropolitan areas began developing traffic management systems and centers. The intent of these systems was to increase the roadway capacity, maintain travel speeds, reduce accidents, and improve air quality levels. Over the years, existing and newly developed transportation management systems have become much more complex and sophisticated. First, ITS and other advanced technologies are being used to expand the monitoring, detection, and response capabilities of these systems. Second, some systems encompass not only freeways, but also entrance ramps and adjacent roadways. Third, the inclusion of other modes — such as transit and emergency services — is occurring.

Transit agencies in Montgomery County, Maryland, Houston, San Antonio, Minneapolis, Seattle, and numerous other cities are currently involved in various ways with the development and operation of ATMS

and ITMS (9). Transit systems can benefit from inclusion in ITMS through the provision of real-time information on roadway conditions, travel times, incidents and accidents, and any other special conditions. This information can be used to better manage all types of transit services by diverting vehicles around trouble spots, and thus improving on-time performance, schedule adherence, and service efficiency. In addition, transit vehicles equipped with automatic vehicle location (AVL) or advanced radio systems can provide information on traffic conditions on arterial streets to the ITMS. Further, providing the real-time traffic and transit information generated by these systems to commuters may help encourage greater use of transit modes.

Fare Payment Systems. Enhancing and simplifying fare payment methods has long been a priority of transit systems. A number of transit agencies are developing, implementing, and considering Smart card fare payments systems, which utilize a prepaid electronic card. Smart cards could be used with one system, with multiple transit systems, and the potential also exists to use these cards for other purposes, such as banking or consumer purchases, as well as for airline or railroad tickets. Ultimately travelers may be able to use one Smart card to pay for taxi or transit service to the airport, their airline ticket, connecting ground transportation at their destination, dinner, and local transit services.

Currently, the Washington Metropolitan Area Transit Authority (WMATA) has implemented a Uniform Fare Technology Demonstration Program called the *Go-Card System*. The demonstration is using a proximity card technology for prepaid fare transactions. Riders are able to use the *Go-Card* for fare payment on the Metrorail system, Metrobus service, and WMATA park-and-ride lots. Currently, the *Go Cards* can only be used at selected rail stations, park-and-ride lots, and bus routes (10). GO Transit in Toronto, Ontario, and Mississauga Transit are developing a contactless Smart card system for deployment in the metropolitan Toronto area. The initial test of the *Combo Cards* is scheduled for the summer of 1995. The prepaid electronic fare cards can be used on multiple transit systems in the Toronto area (11).

Automatic Vehicle Location (AVL) Systems. Automatic vehicle location (AVL) systems provide a method for monitoring the movement and location of transit vehicles. AVL systems, which include both

ground-based and satellite-based systems, provide a number of benefits for transit operators and transit passengers. AVL systems generate a great deal of information that can be used for a variety of purposes. For example, information obtained from AVL systems may enhance transit safety and management, produce energy savings and greater fuel efficiency, improve on-time performance, upgrade customer information capabilities, and improve route planning and scheduling. Further, AVL systems can assist in providing real-time traffic and travel time information to agencies and to the general public in congested corridors. Currently, AVL systems are in use or in development by transit agencies in Baltimore, Milwaukee, Denver, San Antonio, Houston, Dallas, Kansas City, Seattle, Minneapolis, and other areas (12).

Enhanced Information Systems. A number of transit systems are testing and using a wide range of technologies to provide enhanced information to transit riders and potential customers. These include interactive kiosks, electronic maps, cable television, and the World Wide Web and Internet system. For example, *Riderlink* is an electronic information system developed through the cooperative efforts of King County Metro and the Overland Transportation Management Association. *Riderlink* provides information on Metro bus routes and schedules, rideshare services, ferry schedules and freeway traffic conditions on the Internet World Wide Web. Individuals in the Seattle area — and throughout the world — can access *Riderlink* through personal computers, including those at the Seattle Public Library. Planned expansions to the system include adding information on Community Transit, Pierce Transit, and other operators (13). The Houston *Smart Commuter* Operational Test is examining the potential for increasing the utilization of high-occupancy commute modes, shifts in travel routes, and changes in trip departure times through the use of advanced technologies. One element of the Operational Test will provide real-time traffic and transit information to commuters in the I-45 North Freeway corridor to enhance commute mode decisions. ITS technologies are being utilized to collect and disseminate the real-time information to commuters (14).

These represent just a few examples of the application of ITS technologies to enhance the cost-effective and efficient delivery of transit services. The experience with these and other projects, as well as the appropriate role for advanced technologies with public

transportation systems can be discussed further in the breakout sessions.

Institutional Arrangements

Transit agencies do not operate in a vacuum. Rather, transit systems must interact with numerous agencies, private business, and groups at the federal, state, and local levels. The institutional arrangements and the working relationships with these groups have always been important for transit. The ISTEA and other factors have made establishing even stronger cooperative relationships with these groups more important, however. A few of the issues and challenges associated with institutional arrangements are highlighted next. These include the metropolitan transportation planning process, enhanced cooperation with social service agencies, public/private initiatives, transit organizational structures, and the potential federal reorganization.

Metropolitan Transportation Planning Process. The metropolitan transportation planning process has historically included transit agencies and transit planning issues. The ISTEA provided metropolitan planning organizations (MPOs) with new roles and responsibilities, however, and strengthened the inclusion of transit within the transportation planning process. How transit agencies, MPOs, state departments of transportation, and other groups work together to accomplish these new responsibilities will be a critical element in meeting the transportation needs of urban areas. Ensuring that transit agencies are represented on MPO boards and committees will be a critical factor in the planning and project selection process. MPOs can also serve as a forum for the ongoing discussion of issues associated with enhancing coordination among land use and transit and transportation planning, addressing the mobility needs of all groups, and improving the ongoing coordination with state departments of transportation, local governments, and other groups.

Social Service Agency Coordination. Developing closer working relationships with health and human service organizations may be an important approach to dealing with funding reductions and specialized service concerns. Coordinating the provision of services and sharing funding may help maximize the resources of all groups and ensure that duplication of service does not exist.

Public/Private Partnerships. Different types of partnerships have been used between transit agencies and private businesses and developers in a number of areas. These partnerships have focused on joint developments, business subsidization of transit passes, private sector support for new services, and other projects and programs. There continues to be a good deal of interest in establishing public/private partnerships to help support a wide range of transit initiatives. In addition to the types of projects noted previously, private sector involvement is viewed as one of the key components of the ITS program. Given the budget and financial limitations described previously, exploring innovative public/private partnerships should continue to be a high priority among transit personnel.

Transit Organizational Structures. A variety of transit organizational structures are used throughout the country. Further, the roles and responsibilities of these agencies vary. Although previous TRB conferences have examined transit organizational arrangements, it may be appropriate to reexamine the various advantages and limitations of different organizational approaches given the changes that have occurred over the past few years in areas such as Minneapolis-St. Paul, Los Angeles, and Seattle. In addition, consideration could be given to broadening the functions and services that transit agencies provide. For example, a current Transit Cooperative Research Program (TCRP) research project is examining the role of transit agencies as mobility managers.

Potential Federal Reorganization and the Reauthorization of the ISTEA. Discussions have already been initiated on the reauthorization of the ISTEA, which expires in 1997. Further, the Administration presented a plan for reorganizing the U.S. Department of Transportation earlier this year. Although Congress did not act on the Administration's plan, it appears likely that reorganization of the Department will be considered further as part of the reauthorization process. The involvement of transit agencies and transit organizations will be important in both the reauthorization process and in any discussion of reorganizing the Department.

There appear to be numerous opportunities for transit agencies to establish new partnerships and to develop new institutional arrangements to enhance public transportation services. For example, the ISTEA has broadened the metropolitan transportation planning process and has provided greater opportunities for the

involvement by all groups, including transit agencies and operators. Further, the flexible funding provisions of the ISTEA give more authority to local areas to implement priority transportation projects. The various ITS activities will also require greater cooperation between public agencies, as well as with private sector groups. Further opportunities for partnerships with private businesses will be needed to address increasing levels of traffic congestion and environmental concerns.

Conclusions

This resource paper has described some of the challenges and the opportunities facing public transit agencies today. Issues were described in the six general areas of funding, changing demographics and travel markets, service applications, management, advanced technologies, and institutional arrangements. Additional information on these issues and other concerns will be presented by speakers in the various sessions and panels.

Although there are significant concerns in each of the three areas of management, planning, and funding, there are also major opportunities for transit. As noted in this paper, the ISTEA provides numerous opportunities for transit agencies and operators to become more active in the metropolitan transportation planning process, in the development and operation of ITS projects, and with other programs. Further, many transit systems are taking on new roles and responsibilities, broadening the types of services offered to better meet the needs of diverse markets, and exploring innovative partnerships with other public agencies and with private sector groups. Meeting these diverse challenges will continue to be an exciting time for transit agencies and other groups committed to maintaining vital transportation alternatives for all segments of society, as well as prompting sustainable transportation systems and livable communities.

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