concepts in as many as 7 to 10 cities at the same time? Does it make sense that we take this serious risk in so many cities while the proven mode of LRT has been approved in only 2 of them?

The second goal, to make real progress in transit improvements, will be achieved if we not only provide transit systems with reliable hardware but also develop economical design and efficient operation. Our transit systems suffer from obsolete fare-collection methods, inconvenient scheduling, inadequate (or nonexistent) information for passengers, rampant vandalism, and strikes from which, often, no one benefits. Focusing on solutions to these problems may not be a highly glamorous task, but solutions to these problems are necessary if we are to offer reliable, comfortable, and economical transportation that passengers will accept and appreciate. We should never forget that it is the urban traveler for whom we are designing our systems and our urban population for whom we must provide better cities. The developments in Boston and San Francisco, which had difficult beginnings after years of neglect, show that LRT is one of the modes that, with the cooperation of various concerned agencies, can lead to major improvements at moderate costs. The need in many other cities is great, and urgent action is required.

REFERENCE

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# Issues in the Implementation of Light-Rail Transit

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A conference on light-rail transit (LRT) invariably seems to draw out a highly explicit discussion about car design, the existence of rights-of-way for construction, and the great disparities between European advances and those in the United States. This paper suggests that, despite the high degree of competence that the technical community can claim in advocating LRT implementation, it is all little more than an academic exercise if the local, state, and national political realities are not recognized as integral aspects of implementation. The discussion in this paper is based on a survey conducted on a national scale of the key political figures in those states or areas considering LRT, as well as many key members of the agency and consulting staffs. The paper calls attention to the essential weaknesses inherent in current efforts to revitalize LRT as a primary element in urban transportation.

I intend to single out in this paper two issues I believe are extremely important to the implementation of light-rail transit (LRT), even though I am dealing with one of the least developed aspects of LRT implementation. I hope that this particular orientation may serve to channel our efforts in the most productive way conceivable so that we all might improve our efforts to implement LRT across the country.

In preparing this paper, I examined the planning and engineering studies of all the cities in North America involved in the development of LRT. Noticeably absent from these abundant descriptions of rights-of-way and technical specifications of cars is an attempt to identify the political climate in which this work is taking place. Ultimately, most if not all of the studies are at least temporarily sidetracked because the plans do not fit into the political environment or because they have run into problems in receiving funding from the local community, the state or province, or the federal government.

Those of us involved in the planning of LRT systems, although we are professional in our standards, are invariably buffs on the subject and consequently talk mostly to each other. In our planning and engineering studies, we use slides and diagrams to illustrate all the virtues of a technology that we have already acknowledged is part of our justification for pursuing the implementation of LRT systems. But in this talking to ourselves, I think we have somehow missed a far more critical issue involved—that of using our combined expertise in talking to the public or its political leadership.

The fruition of our technical skills—the building of an LRT line or network—in some city or a number of cities depends not so much on whether the vehicle is articulated or the vestibule can be entered from both high-level and street-level platforms or on the number of trucks that the vehicle has but whether such a scheme to build an LRT system is compatible with the wants of the general public and with the political priorities for the expenditure of limited public funds as seen by the various political jurisdictions. The competition for funds with which to construct LRT systems has never been keener than it is at present in our mildly depressed economic environment. It therefore remains for us to recognize that the public's perception of government and its current levels of expenditure are primary concerns to the public and consequently primary concerns of our elected officials. Keeping this in mind, it is highly advantageous to recognize not only the ability on our part to design the most efficient and fastidious system conceivable for the public good but also to take clearly into account an accurate reflection of the existing economic conditions at all levels of government.

In trying to assess the best means by which to assemble an accurate statement on the political and institutional problems associated with the implementation of LRT systems, the obvious and easiest means by which to do so would have been to identify from one's own experience and research what such impediments are and how a rational program to resolve these roadblocks to implementation might be established. In the case of this research, however, I have chosen to recognize that the strongest sources for identifying the problems associated with the implementation of LRT are the political leaders and planning technicians involved in the planning, design, construction, and operation of the various systems currently in operation or proposed for operation in

various cities of North America.

To this end, contacts were made with key elected officials, people in the various operating agencies, people in the engineering community involved in the planning and design of such systems, and people in the various metropolitan planning organizations that have jurisdiction over the expenditure of public funds from the federal government at the local level. The response to this survey was exceedingly good. The process to be used in developing this paper seemed to be appreciated by the people involved from the various cities. There seemed to be a recognition that this was a better way to present the various points of view from all cities than to extrapolate a single point of view for all possible applications around the country. The following discussion is based on the identification of political and institutional problems at the various levels of government and jurisdictions from a broad cross section of operating properties and cities in which LRT has been proposed or is being operated in both the United States and Canada.

## PROCEDURE

There are, no doubt, unique institutional and political problems associated with the implementation of LRT but, by and large, those problems would not differ measurably from problems of implementing a conventional rapid transit system. This seems to be the opinion commonly held by respondents in the United States and Canada to my query as to what political and institutional problems were identified in cities operating, constructing, engineering, or planning an LRT system. The areas contacted were

1. In operation: Pittsburgh, Toronto, San Francisco, Chicago (Skokie Swift), New Orleans, Cleveland, Boston, and Philadelphia;
2. Under construction: Edmonton and Vancouver; and
3. In the planning stage: San Diego, Santa Clara County, Detroit, Rochester, Denver, Aspen, Dayton, Portland, Oregon, and Los Angeles.

Although this did not cover all cities, it was felt that those included would offer a sufficient cross section for the purposes of this presentation.

In each city, various agencies were contacted to provide a multidimensional frame of reference, i.e., transit operators; metropolitan planning organizations and their consultants; and the local, regional, and state political leadership associated with their respective projects. Not all responded, but the responses received provided an excellent foundation for the paper and confirmed my suspicions about the role to which we have heretofore relegated the political and institutional realities of implementing a transit guideway project, LRT in this case. Most respondents replied in depth, indicating that the query had struck a tender spot that they had identified in their process of attempting to plan for or implement such a system.

Because of the nature of the questions posed, it is politic at this point to refer to the responses without naming the individuals concerned, their organizations, or possibly even their cities. The nature of the responses puts numerous cities, organizations, or individuals at odds with the Urban Mass Transportation Administration (UMTA), and I would not want this paper to further impede their relationship with that organization.

## SPECIFIC INSTITUTIONAL PROBLEMS AFFECTING LRT IMPLEMENTATION

There is a rather wide range of problems of an institutional nature, ranging from those seen as purely local to those perceived as major roadblocks put in place by UMTA. The most commonly identified institutional problems related to the implementation of LRT were the following.

### UMTA Administrative Procedures

The feeling was implicit in the problems identified by the respondents that UMTA has a very strong bias in favor of existing rail properties. UMTA is perceived as having a philosophy that it is more important to upgrade transit in order to help upgrade such cities as New York than to create new rail networks to help hold the line against the deterioration of various other cities.

UMTA is also considered shortsighted in preferring that various cities around the country develop expensive bus grids rather than create rail networks. The argument is made that UMTA may be using too short a range in comparing the advantages of bus and rail. If 1980 or 1985 is viewed as the horizon year, then the more capital-intensive rail network will not outweigh the cost advantages demonstrated by a bus network. On the other hand, if 1990, 1995, 2000, or some point beyond that (which is still well within the scope of the development of such a project) is used, then the longer period for amortization of the rail network offsets the higher capital cost. Simultaneously, the lower cost per unit of labor greatly favors the rail system as well.

UMTA is also seen as the "mighty bureaucrat of the East" that has little comprehension of the real problems associated with differing technologies or implementation strategies at the local level. It is seen as developing solutions to problems that are not themselves thoroughly understood, using technologies that have little practical adaptability. UMTA is also viewed as having an inadequate staff at the regional level, especially in certain parts of the country; the staff is not considered capable of working with the cities in each region in an effective way to help guide them.

One respondent noted that "there appears to be a constant flow of new federal requirements to justify expenditures for capital funding." A new set of buzz words is issued as the new official language of the federal government, and the cities are then all expected to proceed through a new set of hurdles to justify the inability of the federal government to come to grips with the true scale of the problem. The complex funding relationship between the local and state governments and UMTA is entirely too cumbersome and slow a process to be effective in terms of helping to solve urban problems. This slowness clearly has the effect of damaging the sensitive balance that local decision makers are often able to achieve among the various factions that are at odds in their communities. The long lead time often then breaks that cohesion down and puts that urban area back at square one in the process. One respondent expressed the opinion that, although that may sound terribly injurious to the local level, it does have the effect of deferring any judgment at the federal level.

The joint development of a transitway within the right-of-way of a highway has been proposed for a number of cities throughout the country, but this is an extremely difficult process to implement since distinctly different applications for funding are required by UMTA and the Federal Highway Administration.

### Shortage of LRT Expertise

State departments of transportation have been identified as principal sources of difficulty in having LRT considered as a potential solution in urban areas in various states. First of all, the state departments of transportation are regarded as purely highway oriented, even though they have gone through the metamorphosis of a name change to enhance their images. In many cases their staffs do not have the resources to work effectively on LRT in its current state of development. In many cases, it was reported, even "consultants brought in by these organizations to bolster their own staff weaknesses are inadequate to meet the challenge, since many of the senior professionals are basically unfamilar with this technology."

A similar lack of familiarity with modern LRT technology is widely found among key decision makers. As a consequence, the stigma of the image of streetcars, overhead trolley wires, and safety problems militates against its application in many locations.

### Proliferation of Political Entities

In most urban areas, the number of government bodies or other entities that have a voice in the decision-making process for transit is a critical factor in the problem of expediting the process. This heightens the problem of achieving consensus on any given transit proposal in general or, more specifically, on the technology to be applied within a given strategy.

A similar problem is found in several areas in which the regional authority empowered to provide a regional transit network has jurisdiction only within some parts of the region and not in the whole region. For example, the regional operator may have a political mandate to consolidate all transit service within its broadly defined jurisdiction, but the practical ability to achieve this goal is withheld by one of the key political figures in that area. If this person is committed to one particular transit strategy, even though a basic consensus has been achieved by virtually all other political entities within that region for a different strategy, he or she is, in effect, holding any transit project in the area ransom until such time as his or her own particular philosophy prevails.

### Restrictiveness of Regulatory Commissions

Both commerce commissions and public utilities commissions produce institutional problems when they try to apply yesterday's control measures to the implementation of a new transit strategy. The excessively low speed limits these commissions prescribe in various jurisdictions and their requirements for drop gates and warning devices create a very difficult condition for the implementation of LRT. These limitations impair the range of benefits this unique mode has to offer. Railroad criteria have been used to evaluate applications for LRT operations at grade and in areas that would have at-grade crossings. Use of railroad standards implies an analogy between LRT and either high-speed, highly infrequent intercity passenger trains or the slow and cumbersome freight operations that also operate in these situations.

### Transit Versus Highway Funding

The traditional split in funding between highways and transit is clearly an institutional problem in the implementation of LRT. The level of funding accorded to the potential development of LRT or even to research, especially at the state level, in many cases is grossly inadequate to foster this particular urban alternative.

### Appointive Representation

A number of respondents in this investigation reported that the governing board of the operating authority had an imbalance between the city and suburbs, or at least a perceived imbalance. This imbalance or perceived imbalance creates an ideologic split between the city and the suburbs in relation to the distribution of funding and the generation of the local matching requirement. When the state was a partner in funding the local matching requirement for obtaining federal funding, the state was almost always perceived as having too much control over local decisions as a consequence of its involvement.

### Conclusions

Some of the problems related to institutional considerations of implementing LRT are caused by misconceptions, including the fear by local traffic engineers that the free flow of automobile traffic may be impaired as a consequence of the at-grade operation of this mode. As one respondent wrote, "Carrying this perceived problem to the next step of absurdity suggests that the air quality of the region, or more realistically the subregion, may be jeopardized as a consequence of the impairment of automobile traffic at transit grade crossings. In the case of California, if this were a real problem, the project would then have to be justified to the Air Resources Board in terms of the California Air Quality Act."

The desire on the part of all elected officials and most planning technicians to provide an accesible transportation system for the entire population may well militate against the implementation of LRT. In the case of California, this presents a very real threat, since the state department of transportation has identified a need for full accessibility, which may well prohibit the development of any project that uses guideways.

Contrast some of these problems of U.S. cities with the situation in at least one Canadian city, in which transit is viewed as a city operation with full liaison among various city departments. The provincial government has provided two-thirds of the cost of construction with virtually no strings attached. This leaves the determination of options, routes, and strategies to the local decision makers. The other governmental entities involved in this process actually helped the local government rather than dictating additional or overlapping controls to the project.

## SPECIFIC POLITICAL PROBLEMS AFFECTING LRT IMPLEMENTATION

These institutional problems, however, represented no more than minor roadblocks to the implementation of LRT when compared with the political problems associated with its implementation. The principal point of this research is to dramatize the fact that a recognition of the political environment is clearly the most significant factor to be weighed by the technicians involved in attempting to implement LRT. The key political factors identified by the respondents throughout the United States and Canada included the following.

### Funding Split Between City and Suburbs

A problem found in each of the cities analyzed in regard to implementing a guideway project was that of allocation of funds between the predominant city and its suburbs. The split between city and suburbs on the question of

transit construction stems in large measure from the fact that any increase in taxation to fund such a construction program would be levied uniformly throughout the taxing district but would be allocated in disproportionately large share to the urban center. As a consequence, the suburban fringe pays for a larger share of the project but receives a smaller share of any such construction, if it receives any at all. The central city sees in this split a disruption of the urban center in order to create ways for the suburbanites to get from their middle-class and upper-middle-class neighborhoods to downtown. The suburbanites see the split as a means to promote the black exodus to the suburbs.

In the case of at least one major urban center pursuing the implementation of a fixed-guideway project, for which one clear alternative is the implementation of LRT, the proposal for subway construction in the heart of the downtown area is viewed as another wedge being driven between the city and the suburbs. The suburbanites see the construction of a subway segment in the downtown area as providing a disproportionately larger share of the funding to that part of the urban area that is least capable of supporting such a system. The view is quite frequently expressed that the suburbs would like to have a fund allocation program that uses a formula based on the local tax revenues.

In one case in which the central city is pursuing a subway segment and the suburbs fear a consequential loss of funding for an extension to serve them, a coalition has formed to block the tax increase measure for it in the state legislature. Such divisiveness is quite common throughout the country. The suburban counties in this case have even gone one step further and produced a study of their own. It emphasizes the high cost entailed in conventional rapid transit construction and has consequently called for an expansion of the bus system throughout the suburban district and the urban core; LRT lines would be used as the principal arteries along existing railroad rights-of-way.

This kind of rift between the city and suburbs over who pays for public transportation and who receives the services makes it extremely difficult if not totally impossible to bring about a regional public consensus. This raises the question of whether there is a political mechanism by which the appropriate tax can be levied over the whole urban area but approved in two distinct ballot processes. The central city could vote on its tax increase in light of the particular benefits that would accrue to the central city. The suburban population would vote on a similar tax increase that would pay not for the central-city segment of the construction but only for the suburban segment of the total regional program; the two parts, of course, would come together.

This approach may also be able to provide a resolution to a conflict entailed in the view that regional transit is often proposed as the principal investment scheme for an urban area without a clear identification of how the potential rider will get to the regional transit system. The two-part approach could simultaneously address the question of who gets construction first—the city or the suburbs. The most common approach to the construction of a subway, rapid transit, or even LRT line is to begin in the urban core or the downtown area and build outward to the suburbs in increments. The suburbs are wary of this alternative since the funds may well run out long before they realize any benefit from the system. Whether that is the case or not, the benefit to be realized is so far removed in time that the perception of not receiving anything for their tax dollars is very clearly there.

## The Ultimate Decision

As I have noted previously and as the reader is well aware, the ultimate decision is political. It is to be hoped that the political decision will be informed by technical advice, but this advice is often simply bypassed. The sensitivity to this issue is most clearly manifest when the government issues a strict set of guidelines that could divide the community but that are not only met but form the basis for a public consensus. If government does not then itself abide by those rules, the local consensus breaks down, and the animosity toward government, usually at the federal and state levels, becomes a paramount issue.

In one western region, the various political entities at the local, state, and congressional levels had reached a broad consensus for the development of a fixed-guideway LRT project in their principal city. But the congressional delegates from this area were low in seniority and apparently unable to bring influence to bear. When decisions were made near the time of the 1976 national election on funding a flurry of projects, this region did not get the needed funds, even though the project may well have been justified.

Another problem area involves the laborious process of alternatives analysis required by UMTA as a prerequisite for the funding of preliminary engineering studies, final design, or any construction. One urban area received a large amount of money (in comparison with the total amount available for distribution) without ever having done any of the prerequisite alternatives analysis. Los Angeles, on the other hand, which has studied every possible form of rapid transit for 50 years and participated in every UMTA-funded study program, had its application denied on the basis that it had to do yet another alternatives analysis.

## SUMMARY

Those of us involved in implementing LRT systems may suffer a certain myopia because of our strong conviction about the capabilities of this mode of transit. We must broaden our list of advocates to include elected officials at all levels of government and simultaneously involve the people in programs that can open their eyes. It is a prerequisite to our success that both of these groups recognize that there is a limit to petroleum reserves. We must act as a catalyst to change the public's perception of the utility of the automobile. And then, after this groundwork has been laid, we can become LRT planners once again.