same way in which they have for highways, we will begin to see much of the confusion about the role of the states in transit programming disappear. What we have really been encountering is a call by the states for financial assistance to help them set up a capability to deal with the transit function, and this we have not been able to deliver.

We see no apparent reason for the state to act as our agent or as a designated authority to carry out projects, but neither do we object to the states' developing such a role—especially following commitments to 'buy in,' as in the highway program. We think it prudent to give heed to local mores in the appropriate development of state and local roles in relation to UMTA.

There is one exception: When states approach the $12^{1/2}$ percent limitation for receipt of capital grant assistance, they clearly should have a determining voice in further allocation of resources within the state. The states indeed provide a perspective often lacking at the metropolitan level and can help balance off conflicting claims over a wider area. But even this role is available, to an extent, within the A-95 process, buttressed by the provision of the Urban Mass Transportation Act calling for comments of governors.

The planning clearinghouse commentary can, of course, be just a ritual. In fact, we receive very few substantive comments. This can mean that some projects are adjusted locally before formal clearinghouse comments are made or that area-wide agencies do not want to (or as a practical matter, cannot because of the way in which they are supported) jeopardize the flow of federal dollars to the area. In the latter case, local and state authorities may consider themselves in league vis-à-vis the federal government.

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The perennial subject of financing is so broad and deep that we must subdivide it before we analyze it. The first question is obviously whether financing should include government assistance of some kind.

Generally, those most interested in public transportation have come to assume, almost without questioning, that government assistance is absolutely essential, but the rural electorate and the automobile clubs do not generally agree. These are important factors in the representative government process. Transit proponents, like myself, cannot expect government aid simply because we demand or need it.

The need for aid is not universal. In downtown Philadelphia, for example, there is a 15-cent loop bus line that uses city streets to serve 9,000 rides a weekday and grosses $1,350 on 7 buses that put in 76 service-hours. The rate of revenue is $17.75 per bus-hour. The full cost of bus operation, with capital recovery, does not exceed $13 per hour at Philadelphia's wage scale. The profit margin is handsome. Private enterprise could do the job without any kind of help except provision of the city street.

Similarly, in 1955, the Chicago and Northwestern Railway decided that its steam train commuter service with museum-piece rolling stock did not have to be a severe deficit operation. Management borrowed $50 million on shaky credit, bought air-conditioned gallery coaches (double deckers), revamped schedules, and set out to earn a series of profits with no government help. The success was broken only temporarily by the opening of the parallel Kennedy Expressway until Congress voted to give railway employees a 42 percent wage increase. The quality of service has been superior. There were years when freight deficits were mitigated by commuter earnings. Why should such success stories be clouded by bureaucratic oversight that might be more expensive with less quality?

With this introduction, let us look now to the question, How can urban public trans-
portation give mobility to those that need it and at the same time divert motorists from expensive overcrowded highways?

To give mobility, transit must offer ubiquitous service at costs less than those for automobile use. To divert motorists, transit must offer service that is no more costly than driving and equally expeditious or is less costly than driving and almost as fast. These facts have been determined and verified by so many independent transportation studies that I will take them as axiomatic. As soon as relations with the automobile are considered, the proper determination about government aid comes into focus. Private capital will no longer enter into the urban transportation business on a scale anything like the need. This is self-evident. Even the Chicago and Northwestern Railway was "spun off" by its stockholders. It now belongs to the more aggressive of its employees who obviously lack the capital to build new systems. Because transit must live side by side with the automobile and because the automobile not only has its taxes sequestered for its own benefit but also enjoys a direct taxpayer subsidy of nearly $4 billion per year, it is not possible to finance and operate a parallel transit system on a laissez-faire basis. Any attempt to leave urban public transit to private auspices will, all too often, result in situations such as those in Minneapolis, Los Angeles, Dallas, Scranton, and Portland, where Gresham's law applies to management as well as money.

To give mobility requires ubiquitous service. By that, I mean 2-way schedules all day long at least 6 days per week and some evening service for shift workers. The lines must intersect with other lines so that trips can be made in more than one direction. Express bus service, particularly like that on the Shirley Highway, does not qualify as ubiquitous service because it is too limited. The fare for ubiquitous service should not exceed 25 cents for short rides; that is 15 cents plus 3 cents per mile or 8 cents per passenger-mile in the average city. To charge more is to far exceed the incremental cost of automobile operation. So many commercial and industrial activities subsidize free parking for automobiles that it is not possible to charge full cost for alternative transit. In fact, non-automobile-owning transit riders must pay retail prices to support free parking they cannot use. At 25-cent fares, routes and schedules must be laid out to serve 4 directions (east-west and north-south, for example) and to avoid both overloading and empty buses. Proliferation of direct service routes in all directions is to be avoided not only because cost is too great but because frequency of service suffers to the point of general inconvenience. Scheduling skill must be substituted for special purpose services that usually fail, even when dubbed successes by the public relations experts.

To divert motorists from crowded streets and to save central cities from debilitating decay, electric rail transportation on private rights-of-way is essential. Any new device that can do the same job faster at less cost would, of course, qualify, but I have not seen one yet. Monorail patents have been around for a century. Helicopters were promised for bus service a generation ago. The linear induction air-cushiontrain is too expensive but otherwise would qualify to meet my definition.

To avoid the criticism of being dogmatic, let me explain my recommendation of the electric railway. Obviously, it is pollution-free in the congested area. If powered from hydro or nuclear sources, it is largely pollution-free overall. Several large coaches can be operated by 1, 2, or 3 people, depending on trade-offs of investment versus operating expense. Even a 3-man train can move 500 seated passengers at speeds equal to anything yet proposed for urban travel, if a private right-of-way is available. It would take 20 bus drivers to do the work of the 3 train operators because of vehicle size and speed restrictions. True, buses can be operated on exclusive rights-of-way, but the question here is to divert motorists to public transportation. Research and field experience show that modal split is nearly 50 percent higher for rail than for bus, other factors being equal. When the bus must maintain its own right-of-way, it ceases to be economical. In Philadelphia, old-fashioned commuter rail service costs 8½ cents per passenger-mile, but bus service costs 12 cents. The Lindenwold rapid transit line operates for 5.7 cents per passenger-mile, with full cost at 16 cents including the capital cost. If the bus service had to similarly carry even half that
capital cost for an exclusive bus way, which was considered, the cost might reach 20 cents without full pollution and traffic relief. Remember, we must not devise a system more costly than the automobile itself if we are to solve this problem. In the Linden­wold corridor, automobile costs approximate 17 cents incremental and 25 cents fully allocated.

Lest I leave the wrong impression, I am all in favor of improving bus service by any means feasible as long as in so doing a better solution is not bypassed. There have been far too many simplistic pronouncements of late on urban transit solutions that have not had benefit of competent analysis. The world of reality is often left behind.

The federal-aid program is a case in point, at least so far. Congress, even now, is considering corrections. Anyone seeking to construct a new facility can, if qualified, obtain a federal grant for two-thirds of the cost. Demands on these funds are in the billions. But suppose an urban area already has the rudiments of a necessary facility, but needs operating expense assistance to support it. In that case, the service must be refused aid. Billions are provided to build, but nothing to save what we have. This is most unfortunate. Existing commuter lines can be saved and improved with federal aid of only 3 cents per passenger-mile if the 2-to-1 matching formula is followed. The new and successful Lindenwold line did not have federal aid; but if it had, it would have been eligible for 6 cents, twice as much as the cost of preserving existing service. The taxpayer cannot afford to treat past capital investments like Kleenex.

This leads, I think, into the series of questions assigned to us. What should be the mechanics of providing these subsidies?

Because of the income tax and the other aid programs, the federal government must, to be equitable, provide both operating and capital grants. Neither should be provided unless it is less costly than the other for a given service. To qualify would require that standards of simplicity and service at expected quality be met. The federal share should be stepped up to 75 percent because of tax sources. The local share must be required to ensure responsibility, but a tax on fare receipts should be permitted to prevent parochial jurisdictions from refusing aid and disqualifying their area. The states can and should assist with the local share; but many states are not urban oriented, so local input is important.

In Pennsylvania, we match whatever the local areas provide for capital grants, and we provide 2-to-1 matching funds for operating expenses. With federal participation, we would go 50-50 with the local areas, according to current thinking.

There must be a limit, of course. Most automobile trips enjoy a 10-cent 1-way parking subsidy, plus a $40 a year subsidy from local tax sources. If the urban transit rider were given the same, he would be entitled to $90 a year or 18 cents a ride. On a 4-mile average, that would be 10 cents plus 2 cents per mile, or 6 cents plus 3 cents per mile. Beyond this, urban public transit must look to the fare box, or the local voters. In many congested areas automobile costs are much higher than average; in these areas, transit aid should likewise be higher to cope with pollution, congestion, and economic problems. A trust fund type of source should be established out of a pro­ration of general revenues so that transit does not go to the precipice at the turn of each fiscal year. This is tremendously important. No organization can enter the next budget period without knowledge of what its budget will be.

Other specific questions that were assigned relate to the following areas.

1. Subsidies could have an unfortunate impact on collective bargaining. To avoid this, the criteria suggested above must be applied to establish limits. Voluntary com­pulsory arbitration should also be reestablished in more areas. New York and Boston have suffered gravely where added subsidy, without criteria, has been used to finance collective bargaining agreements. This turns taxpayers against transit.

2. The deficiencies in present subsidy efforts have already been alluded to. Capital grants should be equal to and not have priority over operating assistance. Automobile subsidies should not exceed transit subsidies on a per trip basis. Standards must be applied to limit subsidies and ensure quality of service.

3. Incentives to earn subsidies are essential. However, the suggested compensation
per passenger basis is upside down and backwards. With enough passengers, no sub-
sidy is needed. Longer lines cannot operate on the same passenger payment as short
lines. With every region now having a comprehensive planning process, the reimburse-
ment must be on a study-determined, passenger-mile basis with a ceiling at 25 percent
over average costs. Management quality, however, is the only real answer to this
question. It must be developed.

4. The fare box must remain the keystone of the financing plan. It not only produces
revenue but also measures and arbitrates demand. With the theoretical subsidy of 18
cents a ride, the fare box would have to produce about 30 cents per ride, 25 cents on
short rides and as much as 60 cents or more on longer lines. Transit is too expensive
to provide except on some basis related to revenue.

5. Transit costs do not necessarily relate to quantity or quality. I want to dispute
any absolute relation between spending and results. The best system, in my opinion,
is a low-unit cost producer of superior quality and quantity, except at the peak of the
rush hour. Some of the poorest systems have the highest unit costs. Good maintenance
costs less per passenger than shoddy maintenance. More passengers cost less to carry
per unit than fewer passengers. Capital investment is necessary for both quality and
quantity and, if measured on a passenger-mile basis, should reduce costs overall. High
investment costs, even high vehicle costs, are often related to low per passenger unit
costs if management is doing a superior job.

6. Thomas Jefferson insisted that "government that governs least is best"; but,
when federal, state, and local transit support is needed to keep abreast of other aided
forms of transportation, funding as discussed previously is essential. Standards must
be set to ensure achievement of objectives and to permit equitable distribution of public
funds among the many transit agencies. Once standards are met, higher levels of
government must leave the administration to the closest point to the actual operation
that can handle it. Neither state nor federal government can adequately administer
local transit. Neither can local government. Transit is an operating organization and
must be administered in the same manner as a private utility if costs are to be held
down and service standards kept up. The integrity and authority of the chief executive
officer are paramount.

7. In spite of what I have said, public operation should be avoided wherever private
operation is reasonably feasible. Ownership is another matter. Private capital is
seldom available, but private operation is, or can be, preferred. Long Beach and San
Diego have created nonprofit corporations to handle transit, and both are doing an
exemplary job. Because the surest way to short-term profit is to raise fare and cut
service, growth and dividend-seeking private corporations can only decimate transit;
but nonprofit corporations and management contractors for public authorities have a
very real place where the organization is structured for them.

8. Discipline, lines of authority and responsibility, and promptness of action all
commend the private form of operation that must live by its wits and is free to act ac-
cordingly within reasonable limits. Public authorities range from excellent to the op-
posite extreme, but the check and balance element does not function so well as it does
privately. Accordingly, the board of direction and the management of public transit
authorities must be selected with unusual care, insight, and discretion. This has not
always been the case.

9. Supplementary sources of transit revenue are not worthy of policy determination,
except in the smallest operations, but they are sources of revenue that can reduce tax
support as much as 25 percent. Cards and advertising seldom generate 1½ percent of
revenue, but, judiciously handled, not only raise a little money but also give the vehicles
a livelier appearance. On the other hand, these traveling billboards may well give transit
such an offensive connotation that revenue would suffer from discretionary revenue
passengers. Social acceptance has been the theme and watchword of North America’s
most successful system. Charter service is not only a service to community groups
but also a source of revenue and added earnings for hard-pressed drivers. It should
always be operated at a profit. Not only is a loss unfair to other transit operators, but
it is unfair to the taxpayers and fare payers. Vending machines, newsstands, snack
bars, and other concessions are a distinct problem. The Shaker Heights Rapid Transit Line converted its affluently located prime suburban car-stop shanty into a creditable food service activity and waiting room with plaudits all around. On the other hand, boarded up newsstands, leaking drink machines, and litter are evidence that simple rentals from these claptraps are insufficient to justify them. It is a matter of proper discretion, management, and supervision. The last 20 lean years for transit may have eliminated too much management and supervision from the ranks. The overhead of North America's most successful system is higher than that of most of the other systems, even though its cost per passenger is lower.

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In analyzing potential transit riders, we must recognize that there are 2 types of people: those with access to the automobile and those without such access. The former group can be expected to choose transit only when the service being offered, in terms of all of its aspects, is superior to that available from the automobile. To compete with the automobile for a particular trip, transit must provide a product that is superior in the eyes of the consumer. Each trip is a discrete occurrence in time, and a person who chooses to use the bus, train, or automobile for a particular purpose, such as to go shopping, will not necessarily make the same choice for another purpose, such as to go to work or to visit relatives.

The other group presents an entirely different type of problem. Those persons do not have alternative means of transportation and are unable to drive an automobile by reasons of age, income, or personal handicap. They must look to public transportation for mobility, and they are finding that their mobility is declining. If there were no public transportation network, a substantial portion of the population would be deprived of the means to travel to workplaces, shopping areas, medical facilities, and places of recreation. Many people also find it more economical to use public transportation than to maintain an automobile solely for occasional trips.

Because transit serves 2 basic markets, the questions are, How do we keep viable the systems that we have? How do we improve them? Should we expand them or, where appropriate, build new systems? To proceed with any of these courses presumes a public policy decision that some form of public transportation is a desirable or essential service for urban areas.

For approximately two-thirds of our nation's history we have had public transportation services in our cities. These have included horse-drawn omnibuses and rail cars, cable cars, electric streetcars, trackless trolleys, gasoline and diesel buses, subway and elevated trains, and even monorails. Transit has been around for as long as 145 years and has frequently shaped the development of cities.

Public transportation throughout the nation has declined, however, since the early post-World War II period. The decline actually began as early as the 1920s and 1930s, when transit companies recognized that they were losing their monopolistic position with increasing automobile ownership and rapid development of paved streets and highways.

During World War II, the high level of industrial activity and the shortage of automobiles, tires, and gasoline for civilian use forced people to return to public transportation in large numbers. Despite shortages of equipment, parts, and personnel, the transit industry was able to mobilize its resources to meet the demands for service. Most of the transit operations were privately owned during this period, and most operations were profitable and remained so for several years after the war ended.

The trends that affected the role and use of public transportation in the prewar period