

REGULATION OF BUSES IN CITIES

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This paper examines the main types of regulation—control of routes, rates, timetables, and standards—applied to the provision of bus services in cities and considers their effects in the light of the requirements of travelers. Conclusions are that controlling standards of safety, noise, and fumes to avoid the infliction of excessive costs on the public is generally desirable; regulating timetables, possibly in the form of subsidies to operators who keep to them, may have merit; controlling route operation and fares may not serve a useful purpose; and restrictions on the introduction of new bus services are not logical. The paper also discusses the case for bus subsidies and concludes that the need for subsidies does not justify the public operation or economic regulation of bus services. Grants related to passenger mileage on all or selected routes appear to be the most desirable form of subsidy, for they directly encourage the provision of services desired by travelers.

•THE 1972 National Transportation Report states (1):

The present regulatory environment in urban public transportation, including obsolete franchise limitations and market-entry barriers for taxicabs and jitneys, restricts the efficient operation of the urban transportation system. The removal of such regulatory constraints is likely to lead to more efficient use of the transportation system and increase the options available to its users.

What are the main regulatory constraints affecting buses in cities? To what extent are they in the public interest? Should any be relaxed?

REGULATIONS

Bus regulations may be classified as follows:

1. Control of routes—specification of a route or routes that may be served by an operator, including the power to deny entry to and terminate service on any route;
2. Control of fares—specification of maximum and sometimes minimum fares;
3. Control of timetables—specification of first and last buses and of service frequencies along different routes; and
4. Control of standards—specification of the type, safety, and appearance of vehicles and the competence of their drivers.

Classes 1 and 2 may be regarded as economic regulations in that they determine who may provide bus services and at what price. Classes 3 and 4 are not selective as between suppliers, but determine the quality of the service that may be offered to the public. They may be regarded as physical regulations, but they also have economic elements in that they affect the costs of the items controlled.

Control of Routes

Most city authorities take for granted that bus routes in their areas should be controlled in the sense that a municipal authority should have the power to decide which operators may serve any particular route. There are different kinds of control. In the United States, control is typically exercised by granting a monopoly franchise to one operator and requiring him to work certain routes as a condition of his franchise. In

some cities the control is exercised directly by virtue of municipal ownership. But route control as defined above requires neither municipal ownership nor a monopoly franchise to a private operator. A city can license any number of operators to serve any number of routes, and this is the typical pattern in developing countries. For example, in Bogotá in 1966 some 1,500 proprietors, organized in 19 companies, were licensed to serve 114 routes (2).

To what extent is route control necessary? To what extent are fixed routes necessary? Could the public be efficiently served if buses were to operate like taxicabs, with no fixed routes?

To take the last question first, a small group of people hiring a taxi have no difficulty in agreeing on its destination. On the other hand, 40 people hailing a passing bus would not likely agree on its routing. Let us therefore accept that bus routes are necessary, at least until the advent of demand-responsive systems with computer-controlled routing.

Travelers undoubtedly derive important advantages from the availability of fixed bus routes, but that in itself does not justify public route control. Some may argue that, if the operators understood that serving known routes at fixed schedules also serves their interests, public regulation is not required. But suppose the operator is stupid or fickle or greedy for quick profits or short-term advantages.

Route control is used not only to force existing operators to keep to their routes but also to protect them from competition from other operators and in particular to restrict the entry of other bus operators into the industry. Even the most rigid bus operating franchise, however, does not protect the operator from competition by other modes. Depending on their circumstances, travelers may have the option of walking or using taxis, jitneys, or their private automobiles. The latter alternative has particularly serious implications for public policy, and urban transport planners give high priority to measures that discourage the use of private automobiles, particularly for the journey to work.

The need to discourage the use of the private automobile might explain the acceptance in many cities of competition to bus services by minibuses and shared taxis. For example, in Hong Kong, minibus operation in competition with the established bus operators was legalized in September 1969, after some years of illegal but popular operation. A year later 3,800 minibuses were carrying 1.2 million passengers daily. Fares were not fixed but remained fairly stable at about twice the level of the buses. The minibus drivers could switch from one route to another in response to demand. The cost of the original license to operate a minibus was equivalent to \$500 in the United States; but the number of licenses was limited, and their market value soon rose to about \$8,500 (3). Other cities in which shared small vehicles serve a major transport role include Singapore, Caracas, Lagos, Istanbul, and Mexico City. None of these cities allows similar competitive freedom to the operators of full-sized buses. An operator of minibuses in at least one of them is interested in running full-sized buses at the minibus fare, which is double the normal bus fare, but has been forbidden to do so.

Much can be said both for and against route control, and it is not the purpose of this paper to take a stand on one side or the other. It is suggested, however, that the following propositions might be accepted by all protagonists:

1. A case may be made for giving a public authority powers to prevent bus operators from arbitrarily abandoning routes on which they provide service;
2. This objective might be achieved in a number of ways and does not necessarily require the establishment of a monopoly operator, either municipal or private (for example, operators might be required to give a 6-month notice before abandoning or reducing a service); and
3. The logic of allowing competition from minibuses while prohibiting competition from full-sized ones is not clear.

Control of Fares

Bus fares are politically sensitive, and most city authorities regard it as their duty to control them. If a bus company has a monopoly, control of some kind is assumed to be in the public interest.

Unfortunately, because of the political sensitivity of this issue, fares are often insufficiently responsive to costs. Thus, many cities insist on a level of fares that is the same for short and long journeys so that the former are discouraged and the latter encouraged. Vickrey argued cogently that uneconomic pricing of this kind can be very damaging to the viability of bus and subway services (4). In a number of cases, fares are fixed at levels that are too low to allow the operators to replace their equipment, and only rarely can one find bus companies being allowed to charge an excess fare for the provision of high-quality services. A high-quality and high-price service is, however, being provided on the outskirts of Manchester and is proving to be successful.

An economist has difficulty resisting the argument that, given free entry into the business, control of fares is unnecessary and can be harmful. To the extent that there is no free entry into the industry, there is a case for controlling fares; but such control does not require the industry to be owned publicly or even by one operator (taxi fares are controlled in most cities, despite the competitive organization of the taxi business). Even if the level of fares were uncontrolled, fares could be publicly displayed and arbitrary and sudden changes prohibited.

Control of Timetables

The timing of bus services can be of crucial importance to passengers and operators alike: to passengers because regularity in service can bring about economy in waiting time and to operators because variations in timing can result in variations in loadings. Suppose, for example, that an operator provides a scheduled service that departs from a certain station always on the hour. If free competition were allowed, a competitor might be tempted to run his bus 5 minutes before the hour and collect most of the first operator's traffic. The first operator might react by advancing his schedule to 10 minutes before the hour, and the resulting confusion would deprive the public of dependence on a regular service. It is the need to protect the scheduled operator that has persuaded many people that competition in bus services is not in the public interest. However, there are methods of control that would allow an element of competition and yet give the public scheduled services. For example, operations along a certain route might be open to all comers provided that they fit into a timetable laid down by a scheduling authority. In that case, the second operator would be told that he had to provide the service at the half hour, or not at all. In that situation the public would enjoy a service every 30 minutes instead of every hour. In Calcutta a few years ago some bus routes were shared by 20 or more independent operators, most of whom owned just one bus. The group formed an association that allotted timetables to all its members, and operators who deviated from their timetables had to pay a financial penalty to the other members of the group.

An alternative to fining operators who do not keep to timetables is rewarding operators who do keep to them with subsidies. The subsidy, which has been compared to a club subscription (5), would reflect the public's preference for an operator to offer service on a scheduled timetable rather than when conditions seem to offer sufficient profit. In both cases, but especially if subsidies are paid, problems must arise in deciding whether an operator does or does not keep to his timetable, particularly when traffic is slowed by congestion. Where bus frequencies are high, for example, 5 minutes or less between buses, precise scheduling may not be important and regulation of timetables may be unnecessary.

Control of Standards

Only public authorities can establish and police vehicle safety standards and safeguard the public from air, noise, and visual pollution. Thus, there are good reasons for cities to require operators to maintain their vehicles to acceptable standards of safety, cleanliness, quietness, and pollution-free operation and to employ competent drivers. To the extent that these regulations are designed to protect the interests of third parties, they should be applied to all vehicles using city streets. To the extent that they are designed to protect vehicle users, standards should probably be higher for vehicle operators serving the public than for vehicle owners who serve only themselves.

Summary

This brief review suggests that for municipal authorities to have powers to prevent bus operators from arbitrarily abandoning routes at short notice and suddenly raising fares and to control timetables may be in the public interest and to control standards of safety, appearance, noise, and pollution is certainly in the public interest. Cities can obtain these powers without having to operate bus services themselves or without having to appoint monopoly operators. But what are the financial implications?

UNREMUNERATIVE SERVICES

Many argue that bus services in cities have to be organized on a monopoly basis because only in that way can "essential" but unremunerative services be provided. The argument is as follows:

1. Some "essential" services can never cover their costs;
2. Therefore, they should be paid for by a process of "cross subsidization" whereby profits from remunerative routes are used to meet losses on unremunerative ones;
3. Therefore, some operators have the obligation to provide some loss-making services; and,
4. Therefore, those operators deserve protection that can only be provided by a monopoly franchise.

There are respectable arguments for subsidizing public transport in cities. In the first place, in the absence of congestion pricing, users of private automobiles are implicitly subsidized when traffic is congested in the sense that they are not required to pay the congestion and pollution costs arising from their trips. Sherman has pointed out that private automobile passengers are not required to meet all their costs and it may not be efficient to require bus passengers to meet theirs (6). Then there are economics of scale in urban public transportation. Mohring argues that, even in the absence of congestion, the time savings to passengers resulting from increased service frequency bring about substantial economics of scale that society should encourage by subsidies (7).

However, it does not follow from this that the subsidies should be provided by cross subsidization from the profits of remunerative services. Ponsonby (8), Hibbs (9), and others have shown that cross subsidization is a particularly inefficient way of supporting public transport, for it adds to the difficulties of the operators of the profitable routes. Furthermore, there is no reason why subsidies that may be justified for "weak" routes bear any relation to the profits earned on the "strong" ones. If there is a case for giving financial support to some routes, the subsidy should surely come out of the general revenues of those who demand it and not from the operators or users of other bus services.

Ponsonby illustrates the results of cross subsidization by considering the relation between the London buses and underground railways (10). Since the end of World War I and until fairly recently, the bus side of the underground group of companies (later the London Passenger Transport Board) made profits beyond what would have been required to keep them in business and used them to aid the underground railways. This meant that, for almost half a century, the road service side of the business had something to "give away" in the sense that bus fares were higher or the quality of bus service was lower (or both) than they could or would have been had the road services been developed apart and financially separate from the underground railways. No wonder the independent bus companies, unrestrained by the obligation to earn a surplus over and above the profit required to keep them going, found it easy immediately after World War I to expand at the expense of the old London General Omnibus Company (financially linked with the underground group) until their further success and expansion, in the central parts of London at any rate, were virtually brought to an end by the London Traffic Act of 1924. In this case, cross subsidization worked against the coordination of transport in the sense that it prevented the fullest possible development of all forms of transport.

How then should such subsidies be paid? A common method in the United States and in Britain is for a public authority to pay the difference between revenues and expendi-

tures of the entity being subsidized. This policy does nothing to encourage efficiency. Lenthall (11) reports that the Middlesex and Boston Bus Company had an operating deficit of \$34,000 in 1963. One of the first acts of the newly formed Massachusetts Bay Transportation Authority was to agree to subsidize it, and within 5 years the loss was running at around \$500,000, although the service had been cut by 15 percent.

It may, however, be desired to pay the subsidy not to bus travelers in general but to certain classes such as the unemployed, schoolchildren, old-age pensioners, or other groups deemed needful of special assistance. In that case the food-stamp program may provide a suitable analogy. When the U.S. government wishes to subsidize the nutrition of some sections of the population, it does not nationalize the food industry nor require that profits earned on some sales be used to offset losses incurred on others. The authorities distribute food stamps, which do not deprive the recipients of the opportunity to use their bargaining power as consumers to shop around and buy the items most suitable for them in the cheapest markets. This analogy suggests that one way of subsidizing the transport needs of particular classes of users would be to give them coupons of a certain value redeemable by bus companies, taxicab owners, and others providing transport to the public.

This method will not confine the subsidies to unremunerative routes. This is as it should be and leads to another and more fundamental criticism of subsidies that are designed to close the gap between costs and revenues: If the reasons for subsidy are those put forward by Sherman (congestion) or Mohring (scale economies), the criterion of profit or loss becomes irrelevant. The services to be subsidized should be those that show the greatest excess of economic benefits over costs (strictly speaking, those services where marginal social benefits exceed marginal costs).

Because the excess of benefits over costs is likely to be greatest in situations of urban congestion and because some bus services in congested urban areas may be more profitable than some services in lightly trafficked rural areas, subsidies to profitable services may be more justified than subsidies to unprofitable ones (12).

If the object of the subsidy is to reduce the loss of passengers from public to personal transport, it should be based on passenger-miles carried by services that provide a substantial excess of social benefits over costs. If the timing of bus services is considered important, the subsidies could be confined to operators who provide regular services. Where fares are proportional to distance, a subsidy based on revenues would not differ from one based on passenger-miles. A subsidy based on operating costs would also be similar to one based on passenger-miles, but subsidies based on costs are likely to encourage wasteful expenditure. The implications of subsidies based on costs and revenues have recently been described by Nelson (13).

This brief review does scant justice to the problem of bus subsidies and does not deal at all with the question of the level of subsidies or their effects. Its main purpose is to suggest that the need to subsidize bus services is irrelevant to the problem of regulation, that subsidies can be paid as easily in competitive as in monopoly situations, and that they might be used to encourage operators who keep to publicly supervised timetables, although in conditions of congestion the control of timetables may be unnecessary and unenforceable.

SOME EXAMPLES

Before general conclusions are reached, it may be instructive to look at examples of bus operation and regulation in cities of several countries.

Istanbul

The dolmus (shared taxi) is generally indistinguishable from a taxicab, and drivers provide a dolmus service or taxi service according to fluctuations in demand. They may also switch from one of the recognized dolmus routes to another at will. The intending passenger has to shout his destination to the cruising driver who will stop if he is going that way, which is rather inconvenient for the passenger (and other motorists). In certain areas private buses operate in competition with the municipal system. A feature of these is that they are generally older vehicles and their condition varies

from the impeccable to the doubtful. At major stops the conductor descends and extols the virtues of his bus service to the bus queue.

Ankara

The dolmus follows settled routes, which are marked on the vehicles, and stops only at official stops. The service is therefore less flexible but easier for a stranger to understand. The municipal bus service does not attempt to compete on frequency, only on price. Much more than in Istanbul the bus is the "working class" convenience. Dolmus fares are graduated, starting at 50 percent higher than the flat fare of the buses, but they offer higher standards of speed and comfort. In Ankara any restriction on the dolmus would probably increase travel by private car rather than by bus. In both Ankara and Istanbul driving standards vary, but accidents are few. The vehicles have to be inspected for safety every 4 months.

Nicosia

A few years ago, urban passenger service vehicles, of which there were some 126 licensed, were owned by 32 different people. By far the greatest proportion of the owners failed to make an adequate return on their investment. There was an obvious need for new vehicles, there was pressure on the government for a substantial increase in fares, there were demands for subsidy, and there were inadequate services. The buses were licensed by route, by number, and by time of departure. The system had many of the restrictions without the advantages. By the formation of a company with monopoly privileges to provide the somewhat limited services required, a better service is now offered to the public, the company makes money, fares have not been increased for more than 3 years, and as financial provisions are made in the new company's accounts new buses are introduced. Cooperation exists where competition had failed, perhaps because of the restrictions placed upon it.

Buenos Aires

The bus system provides saturation service to virtually every part of the area and accounts for 54 percent of daily trips. It is interesting to note that, after 30 years of public ownership, the bus system was returned to private ownership. Today the 14,200 buses in the metropolitan area are typically in the hands of owner-drivers, some buses having 3 owners. These owner-drivers form associations (empresas) to operate a given line. The empresas make schedules and provide some administrative services in return for a percentage of fares. Official regulation of rates and fares is provided at 3 levels: the Ministry of Public Works (for federal capital and interprovincial services), the Province of Buenos Aires (for intermunicipality services within the province), and municipal governments (for services within a municipality or partido). The proportions of the 14,200 buses controlled at these 3 levels are 73, 13, and 14 percent respectively. Fares are too low in relation to the rapidly inflating costs. Although a study by the Ministry of Public Works indicated that a 25 percent increase would be justified, the operators did not at the time raise their fares.

Calcutta

Bus services were nationalized in 1948 and vested in the Calcutta State Transport Corporation. For various reasons the corporation was unable to meet public demand, and 300 privately owned buses (mostly one-bus firms) were allowed to operate in the city in 1966 at the same fares as those of the state corporation. Although the state corporation had the best routes, it ran at a heavy deficit; the private buses made profits, and their owners clamored for more licenses. The comparative success of the private buses has been attributed to their superiority in repairing their vehicles and keeping them on the road and in collecting fares (bus crews are paid on a commission basis).

Manila

Grava (14) gives the following account of the Manila transportation system.

The mass transportation system of Manila consists basically of public utility bus and jeepney line networks, with the two services operating in almost complete overlap. Both run on all major streets, and there are only a few sections of the city where one or the other predominates. It is interesting to note that in Manila, unlike some other cities, the acceptance and use of both systems is completely equal, i.e., one does not have a higher social status than the other, and the fares are the same. Specific choices by passengers are quite personal, with the only difference being that jeepneys are recognized as faster, while buses are more comfortable on longer journeys. During peak hours, when all vehicles are overcrowded, such fine differentiation is not made. However, a consideration is that when a jeepney has an accident or breaks down, which is not a rare occurrence, the passengers are on their own; while under a similar situation with a bus there may be a following unit of the same company that will pick up the riders without the payment of an additional fare.

Since there is direct competition, the jeepney industry and its associations have a completely negative attitude toward the corresponding bus organizations. This feeling is fully reciprocated, and there is no cooperation between these two major components of the mass transit system, both of which consist of privately operated business ventures. Each side regularly makes proposals that the other should be eliminated.

Negative reactions do not come from the riding public but from owners of private cars who are inconvenienced by the general traffic situation and who also, of course, are in leading positions with access to official agencies and the mass media. It can also be surmised that many well-meaning government officials and local transportation administrators feel faintly embarrassed by the whole system because it does not resemble any of the standard modes found in industrialized countries, and because there is an air of improvisation and limited resources about it.

All investigators have noted that there are many problems associated with jeepney operations in Manila. These include deplorable driving habits and disregard for traffic regulations, lack of loading and unloading areas or their proper utilization, safety and insurance problems, abuses of labor practices, and many others. Yet, it is also apparent that these are not shortcomings of the system per se but can always be traced back to management and operational control. We have here a rampant free-enterprise endeavor that engenders cutthroat competition for fares on the part of drivers and operators alike. It would seem that proper policing, both on the street and of administrative factors, together with minimal physical improvements of channels, could go far in expediting the performance of jeepneys for the benefit of the riding public, the community at large, and the operators and drivers.

Singapore

In 1968 public transport in Singapore was provided by some 1,250 buses (operated by 11 private companies), 3,800 legally registered taxis, 5,000 illegal "private" taxis, 900 school taxis, and 222 school buses. In 1970 the government approved a public transport reorganization plan aimed at increasing the number of buses and reducing the number of operating companies, increasing the number of legal taxis and school buses, and eradicating the illegal taxis. These objectives appear to have been achieved, and in April 1972 Singapore was served by 2,000 buses operated by 3 private companies, 4,800 legal taxis, 186 school taxis, and 1,309 school buses (15). The illegal taxis have virtually disappeared from Singapore, but there is evidence that they operate intercity services between Singapore and neighboring cities (16). The school buses, all privately owned, generally provide door-to-door service. On the basis of private monthly contracts (the casual pickup of passengers is not permitted), 250 of the school buses are also allowed to transport commuters to work. (Working hours in Singapore do not coincide with school hours so that the same vehicles can serve workers and scholars on separate journeys.)

Caracas

Caracas is distinguished by a relatively high level of private automobile ownership (1 automobile for every 10 persons) and a correspondingly heavy reliance on private automobiles and taxis for urban transport. It is estimated that 46 percent of daily

trips are made by private automobile, 16 percent by shared taxi, 30 percent by bus, and 2 percent by regular taxi. (During the 7 to 8 a.m. peak hour, 36 percent of trips are by private automobile and 22 percent by shared taxis.) Bus services are provided by 23 companies operating some 1,300 buses over 73 routes. Two of the bus companies are publicly owned and operate at substantial deficits, mainly as a result of poor fleet utilization caused by poor maintenance and old equipment. The 21 private companies, which transport 57 percent of bus passengers in 54 percent of the city's buses, earn enough to remain in business, but possibly not enough to make it worthwhile to replace their fleets. Of special interest in Caracas are the 11,000 taxis and 5,000 shared taxis. (During peak hours, many of the regular taxis operate illegally as shared taxis.) The shared taxis are organized into about 50 associations serving 85 different routes. The number of licensed taxis and shared taxis has been fixed, and the profitability of the business is reflected in the market value of licenses, which is equivalent to about \$1,500 in the United States. Most of the shared taxis are U.S. 6-seat sedans, but some of these have been replaced by 9-seat minibuses, which are much cheaper to operate and carry more passengers.

Lagos

Lagos City Transport Service, owned by the Lagos City Council, operates 380 buses and is the largest public transport operator in the area. Private buses are also allowed to operate in Lagos on the same routes as the public buses, except that only 200 private buses are licensed to enter Lagos Island. Minibuses of the Volkswagen type are used to provide service to passengers outside Lagos and are called *kia-kia* or *quick-quick* because they make their way with speed and dexterity between the larger and heavier buses. There are some 2,300 of these minibuses operating in Lagos state. Their drivers are all members of a powerful association that operates its own form of route licensing by requiring members to specify their route when they join. New applicants are charged a fee equivalent to \$70 for lifetime registration plus about 25 cents per vehicle per day for the use of vehicle parks provided by the union. Fares are fixed by convention and are sometimes lower than the bus fares. About 75 percent of the *kia-kia* buses are owned by their drivers. In addition, Lagos is also served by some 600 taxis and a large number of "molue" buses that are built locally on truck frames and have all-weather protection for approximately 25 seated passengers.

CONCLUSIONS

The first conclusion is that conditions vary so much from one city to another that no single solution to the problem of bus regulation is likely to suit all circumstances. For example, in the short term the establishment of a monopoly organization may bring substantial improvements to urban transport, particularly where the development of private services is hampered by fare ceilings or restrictions on entry. The success of a monopoly service is likely to depend to a large extent on the efficiency of the municipal administration in general and on the qualities of the bus administrators in particular. Hamburg and Stockholm, for example, are reported to enjoy excellent municipal services. But in the long term the disbenefits of such a monopoly often become more apparent as changes in demand are not reflected in services organized by a management that lacks the incentives of competition.

The second conclusion is that the use of shared small vehicles—taxis, minibuses, jitneys, or jeepneys—can make a very large contribution to urban public transport. By providing fast, flexible service and assured seats, these shared vehicles are not unlike the private car, and the fare is well below that of a taxi. This service is likely to appeal particularly to the dissatisfied bus passenger who is tempted to desert the bus for his automobile. It is, thus, potentially of great value in communities with a large and growing car-owning population.

Third, public transport controls that are likely to be in the public interest are the physical and not the economic ones. They do not usually require the granting of monopoly franchises, still less the operation of bus services directly by municipal authorities. The experience of many cities outside North America confirms the statement

quoted at the outset from the report of the U.S. Department of Transportation: "The present regulatory environment... restricts the efficient operation of the urban transportation system. The removal of such regulatory constraints is likely to lead to more efficient use of the transportation system and increase the options available to its users."

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