

TAXIBUS : A SOLUTION TO DECLINING PRIVATE BUS SERVICES

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Abstract:

Steady decline of evening and weekend private bus provision has severe impacts on the mobility and expenditure of public transport captives. Government subsidies will be needed if public transport services are to continue where low patronage makes bus operations financially unviable.

The paper proposes a multi-hire, fixed route, fixed schedule Taxibus scheme and demonstrates its operational, user and cost effectiveness in replacing cancelled private bus services.

This paper presents the views of the author and in no way purports to represent the views of the New South Wales Department of Environment and Planning.

INTRODUCTION

The level of service offered by privately-operated bus systems has declined steadily in recent years, particularly in relation to evening and weekend services for which patronage is becoming insufficient for financial viability. Where no government subsidies are provided, operators under market conditions are forced to cancel uneconomic services to maintain overall profitability.

The steady decline of such services directly affects the mobility and expenditure pattern of those who are dependent on public transport and who are, therefore, already transport disadvantaged. Consideration should be given by government to the continued provision of low patronage services whose costs may justifiably be borne by the community.

This paper investigates the potential for utilising existing taxi fleets to provide such services by 'TAXIBUS', conventional taxis operating under the following conditions:

- * multi-hire mode, scheduled times, bus routes
- * passengers pay bus fares and board at bus stops
- * government subsidises the normal taxi charge and receives fares as revenue

Conditions in the Wollongong region of New South Wales are the basis of case studies demonstrating that the demand for off-peak services can be more efficiently satisfied by Taxibus at a lower level of subsidy than other options.

PRIVATE BUS INDUSTRY CONDITIONS

Decreasing patronage

Almost no reliable data is available for levels of patronage on private bus systems. However operating companies are aware of significant decreases in demand for evening and weekend services. Declining demand is attributed primarily to increasing car ownership, and partly to increased localised provision of facilities and amenities, reducing demand for leisure and shopping travel to CBD-oriented activities.

Cancellation of services

The normal pattern of cancellation occurs when patronage on individual services has declined to an observable average of less than 10. An application to cancel the service

is made to the controlling authority⁽¹⁾ and, after investigation by inspectors, is generally approved subject to a trial period during which complaints may be registered and considered. Complaints are rare, and this is assumed to be adequate proof that the service is no longer needed. It could be, however, that patrons have simply resigned themselves to a situation they see as inevitable.

Case study: Declining services in Wollongong

No government buses operate in the Wollongong region of NSW. Privately operated buses provide a cross and radial network which centres on the CBD and feeds to the spinal rail service of the Illawarra line.

Between January 1976 and June 1978 both the regional level of service and total bus kilometres decreased by 12%. In many suburbs of the region no buses operated on Sundays even in 1976, and by 1978 the average Sunday level of service was less than a quarter of that available on weekdays.

TABLE 1: WOLLONGONG BUS SERVICE DECLINE 1976 - 1978

Time period	Decline in number of services	Decline in bus kilometres
Mon - Fri 7 am - 6 pm	8%	9%
Mon - Fri other times	26%	20%
Sat - Sun	21%	18%
Total week	12%	12%

Source: Operating companies' timetables and route maps in force at January 1976 and June 1978.

Future decline

As services prove financially unviable progressive cancellation will occur until a 'plateau' is reached where profitability is feasible and no further cut-backs are required.

1 Department of Motor Transport

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Operators suggest that the present level of weekday services, between and including the am and pm peaks, represents ultimate feasibility. In many areas, however, the level of service between peaks is already poor and, as Table 1 shows, has been subject to considerable erosion.

Industry regulation

No subsidies are generally available to private bus, although reimbursements are made in respect of school children and pensioners travelling at concession rates. Government bus operations, on the other hand, receive not only these payments but also public funding to overcome massive operational deficits. Bus operations are faced with rapidly increasing maintenance, wages, replacement and fuel costs and private operators are not permitted to adjust prices under free market conditions, since the main thrust of controlling legislation is to regulate fares and define non-competitive areas of operation.

Failure of authorities to plan

Regulation of the private bus industry by the Department of Motor Transport⁽¹⁾ has been carried out with little attempt at positive planning for the provision of public transport with respect to where, when or how often it is needed by the community. Rather, such decisions have been made by the operating companies, subject only to compliance with regulations and the avoidance of competition.

It is not therefore surprising that services are generally inadequate or nonexistent in low density residential areas. In the absence of adequate public transport, low income residents are forced to spend a disproportionately large slice of disposable income on private transport, or to reduce their discretionary travel.

AN ADEQUATE LEVEL OF SERVICE

It is argued by some that the declining patronages observed during evenings and weekends are sufficient indicators of falling demand, and that the provision of public transport may be allowed to decline in response.

From the bus operators' viewpoint, this market situation must be faced, and it would be unrealistic for planners and authorities to expect operators to continue services which run at a loss.

1 From 1 July 1980 the newly constituted Urban Transit Authority has the power to give directions to the Commissioner for Motor Transport concerning matters 'of a general policy nature' relating to private buses.

Low patronage services

There is a justification on transport and social equity grounds for the continued provision even of low patronage services for those who have no alternative to public transport - the young, the aged, families with no car, persons to whom the family car is not available (Oxlad 1979).

The low income profile associated with such groups implies that the costs of continuing to provide low patronage public transport on their behalf should be borne by the community.

OPTIONS

Broadly stated, future options for low patronage private bus services in the face of continuing decline, are as follows:

1. Allow services to continue declining in response to decreasing demand.
2. Offer travel subsidies directly to identified disadvantaged groups.
3. Subsidise the cost to operating companies of maintaining uneconomic services.
4. Subsidise alternative forms of transport to replace uneconomic bus services.

Do nothing

For public transport users, the implications are clear: as the level of service continues its decline, so will the level of disadvantage increase for public transport dependants. Increasing dependence on private transport will mean an increasing expenditure burden for low income families, in the light of rapidly rising petrol prices. Failure to provide or subsidise the provision of adequate public transport cannot assist government commitments to maximise energy conservation.

User subsidies

There is no simple mechanism available to identify those who will be directly disadvantaged by continuing bus service cancellations. For example, the low income group of social security and unemployed pensioners is readily identifiable, but includes many who are not public transport dependent, while excluding other low income earners and those under driving age.

This group, however, could constitute an approximate base for estimating the extent of a direct travel subsidy.

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In October 1978 there were 23,164 social security pensioners and 7,913 receiving unemployment benefits in the Wollongong region(1). The cost to government of subsidising one 3km taxi journey per week per pensioner would have been \$44,000 weekly in the Wollongong region alone(2), or \$54,400 at current taxi rates.

Transport subsidies

As alternatives to subsidising bus operators for the continued provision of uneconomic services, a number of para-transit options are available whose recurrent costs might be less than bus costs. However this paper does not consider options where a capital cost for the provision of new vehicles is involved, e.g. minibus.

It is therefore suggested that existing taxi fleets could be utilised to provide low patronage services efficiently in multi-hire mode, at the lowest level of subsidy.

MULTI-HIRE TAXI : SYSTEM OPTIONS

There is a wide range of options for multi-hire taxi operations, and I propose to examine the two extremes of totally demand responsive, and fixed route/fixed schedule.

Totally demand responsive

Taxis in their normal operation are fully demand responsive to both street hailing and telephone ordering. If a multi-hire taxi scheme were to operate under street hailing conditions as well as normal taxis, serious conflicts of interest and confusion would certainly arise(3).

On the other hand, a multi-hire scheme restricted to telephone ordering would be unavailable to public transport dependents who do not have easy access to a telephone. In fact such a scheme would in all probability exclude a large proportion of those most in need of its benefits. Furthermore, multi-hire taxis dependent on rationalisation of telephone requests for operational efficiency could generate long delays, particularly in low density, outer suburban areas.

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- 1 Source: Department of Social Security
 - 2 Taxi rates at 1 November 1978
 - 3 Multi-hire for all normal operations could certainly be given serious consideration in the light of energy conservation and transport cost reduction potential; however such consideration is not within the scope of this paper.

Taxibus

The system proposed would utilise spare capacity in the existing taxi fleet (non-revenue running time or taxis not operating because of low demand in off peak periods) to provide services which have proved financially unviable for bus operation. The controlling authority⁽¹⁾ would contract with the taxi industry to provide a service under the following suggested conditions:

1. TAXIBUS is a taxi operating in multi-hire mode on existing bus routes.
2. Time schedules are fixed, preferably with memory headways.
3. Passengers board and alight at bus stops⁽²⁾.
4. The taxi carries a distinguishing sign when operating as Taxibus.
5. A simplified fare structure should be devised, not less than but not significantly higher than bus fares on the corresponding bus route.
6. Fares are collected by the taxi driver who issues tickets to passengers (ie the driver is accountable for fares).
7. The Taxibus services are subsidised by government, the level of subsidy amounting to the flag fall and kilometre charge for each run.
8. Fares collected are government revenue but a proportion is retained by the taxi driver (as an incentive to participation in the scheme).

The potential exists for a Taxibus scheme to be established, initially to replace recently cancelled evening and weekend services. The Urban Transit Authority has the power to contract, co-ordinate and control an operation of this nature.

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- 1 The Urban Transit Authority has statutory powers enabling it to make contractual arrangements for the provision of public transport services.
 - 2 However there is considerable scope for flexibility in this condition since it is reasonable for a taxi to stop at many places unsuitable for buses. There could be many advantages for say aged or infirm passengers.

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TAXIBUS OPERATION

It is envisaged that for each route approved, a contract would be made with the taxi company to provide a service at the agreed scheduled times. The taxi company would then treat each run similarly to a normal booking, and put out a radio call for drivers to accept the particular run. Since Taxibus operations are proposed only for non peak times and days, delays should be minimal.

Excess demand

If on any individual run more than 5 passengers (taxi capacity) demanded the service, it would be a simple matter for the taxi driver to radio his base and request an additional taxi, which could be made available with little delay.

Should excess demand be observed to occur frequently for any particular service, this would be a clear indication that a larger vehicle would be warranted, and possibly even the re-introduction of a bus service.

Under such circumstances, the particular service could be contracted to a suitable operator on the basis of competitive tendering, using the relevant taxi cost as a level of guaranteed subsidy.

Incentive to drivers

It is possible that drivers might be unwilling to participate in a scheme which they might see as interfering with normal operations and hence their income-earning potential. For this reason the suggestion is made that a proportion of fare revenues could be offered as an incentive to drivers to participate, in addition to the normal taxi charge which will be repaid by government subsidy.

Alternatives

The suggested operation described above is not, of course, the only possible method of operation. The taxi company might prefer, for example, a regular arrangement with certain drivers committed to particular schedules.

It is suggested that the range of options should be a matter for discussion between the controlling authority and the taxi company contracting the scheme. Alternative methods of operation could then be tested and monitored for efficiency during a trial period.

Controlling authority

The operations of both private bus and taxi are presently under the control of the Department of Motor Transport and the familiarity of this authority with operational details suggests that certain controlling functions in respect of Taxibus should be its responsibility:

1. Recommendation and approval of routes and schedules suitable for Taxibus.
2. Payment of taxi costs and supervision of revenue collection.
3. Advertising and other requirements for public comprehension of and familiarity with Taxibus.
4. Control of distinguishing signs for taxis operating as Taxibus.

However the Urban Transit Authority, in its policy making role, should undertake the broader planning and regulating functions:

1. Regional studies to analyse public transport needs and inadequacies.
2. Development of regional forward plans, in consultation with planning authorities, community groups and representatives of the private bus and taxi industries, for the introduction of Taxibus.
3. Initiation of legislative amendments necessary for multi-hire taxi and in relation to taxi signs, route restrictions etc.
4. Determination of fare structure.
5. Monitoring the performance of Taxibus via passenger counts, survey of passenger characteristics, scheme accounting.
6. Investigating and proposing scheme variations.

Demand uncertainties

Analysis of applications to cancel bus services suggests that patronage levels on Taxibus replacements would be in the range 0-6, which would be compatible with efficient taxi use. However it may be that demand has decreased since (and possibly because of) cancellations.

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A well-publicised and rigorously monitored Taxibus trial scheme would be the most effective indicator of likely demand. Again using Wollongong as a case study, trial routes have been selected on the basis of suggested criteria, and estimated costs compared with bus costs.

Trial scheme criteria

1. Recently cancelled evening or weekend bus service with patronage level around 5 persons when cancelled.
2. Route originating from the CBD preferred for maximum availability of taxis and patrons.
3. Route and schedule preferred which do not coincide with any current bus service, eg a route currently offering no Sunday buses.
4. For monitoring potential it would be advantageous to select two separate routes serving different locations.

On the basis of these criteria, two routes were selected for a trial Taxibus scheme to operate on Sunday.

Trial routes

Both routes originate from the CBD and do not coincide with current bus services:

Route A: 16.5km round trip north-west of the CBD

Route B: 11.5km round trip south-west of the CBD

Schedules for the trial routes provide the same level of service as the cancelled bus service which they are intended to replace. However times have been rationalised to memory headways and for costing purposes the former bus schedule has also been rationalised.

Route A: 4 round trips at 2 hour intervals

Route B: 8 round trips at 1 hour intervals

For the purpose of cost comparison between bus and taxi operation of the trial, a bus schedule combining the two routes is also presented (Schedule A+B, total). This combination is then rationalised to achieve minimum total driver hours, and thus the most conservative cost estimate (Schedule A+B, rationalised).

Trial scheme cost estimates

Taxi costs are estimated on the basis of current charges, effective from 21 December 1979, with a 10% loading on kilometre charges to allow for wait time at pickup/setdown points. In this exercise costs have not been offset by estimated fare revenue.

Bus costs represent a far more complex problem. These should be estimated specifically in relation to proposed routes and schedules, since differences in shift hours and driver schedules can significantly affect the estimated cost.

Private bus operators' annual returns to the DMT show unacceptably wide variations in average costs. Without accurate information on cost breakdown and rostering systems, marginal costs cannot be estimated with confidence.

For this reason costs have been extrapolated from the Adelaide Bus Costing Study (Travers Morgan 1980), and inflated from September 1977 to current prices. No allowance has been made for depreciation or interest since it can be assumed for this exercise that these costs will not be affected appreciably by marginal additional services. For private bus operations, a low and high range are estimated at 50% and 65% of government bus costs (Wallis 1979).

These cost comparisons are made for routes run on Sunday, when the cost advantage of taxi over bus is greatest. It should be made clear that this advantage is much less significant for weekday evening services. The provisions of the award (NSW 1979) and roster schedules are crucial to relative costings, in that it may be possible at times to rationalise schedules to minimise penalty rates and so considerably reduce the bus/taxi cost differential.

However, a cost exercise relating to shared taxis replacing weekday evening government buses in Perth indicated a potential saving of 21% in favour of taxis for the route studied (Director General of Transport, WA 1977 ; Koltasz 1979).

Table 2 breaks down the cost components for government bus and for taxi. Bus driver hours and rates are estimated on the basis of optimum shift schedules allowable under the provisions of the relevant award (NSW 1979) and the most recent amendment, effective from 14 July 1980.

Table 3 shows government bus costs and the low and high range of private bus costs for the trial schedules, as percentages of the estimated taxibus cost as base.

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TABLE 2 : TRIAL SCHEME COMPONENT COSTS

SCHEDULE:	A only	B only	A+B total	A+B ration- alised
UNITS				
Kilometres	66	92	158	158
Bus hours	4	5½	9½	9½
Driver hours(1)	7	7¼	14¼	10
COSTS				
	\$	\$	\$	\$
<u>Government bus</u> : (3)				
Driver : \$12.70 /driver hr	88.90	92.08	180.98	127.00
Overheads: \$4.23 /bus hr	16.92	23.27	40.19	40.19
Running : \$0.098/kilometre	6.47	9.02	15.48	15.48
<u>Taxibus</u> : (4)				
Flag fall: \$0.55 /taxi run	2.20	4.40	6.60	3.30
Meter : \$0.44 /kilometre	29.04	40.48	69.52	69.52
TOTAL COSTS				
	\$	\$	\$	\$
Government bus	112.29	124.37	236.66	182.67
Private bus high (65%) (5)	72.99	80.84	153.83	118.74
Private bus low (50%)	56.15	62.19	118.33	91.34
Taxibus	31.24	44.48	76.12	72.82

- 1 Estimated from award provisions (NSW 1979).
- 2 It is assumed that some rationalisation of taxi schedules as well as buses can be achieved, reducing the total number of runs and hence flag fall charges.
- 3 Driver costs: current award rate \$5.83/hr with 100% penalty loading. Additional leave costs etc. extrapolated from Adelaide Bus Costing Study (Travers Morgan 1980).
Overheads: *ibid.*, inflated from September 1977 to March 1980 by NSW average weekly earnings per employed male unit (ABS 1980b).
Running costs: *ibid.*, fuel/oil component inflated from September 1977 to June 1980 by NSWPTC diesel fuel rate.
- 4 Source: NSW Taxi Council, rates effective from 21 December 1979. Kilometre charge increased by 10% for wait time.
- 5 Wallis 1979

TABLE 3 : COMPARATIVE COSTS, TAXIBUS AS BASE

SCHEDULE :	A only	B only	A+B total	A+B ration- alised
	%	%	%	%
Taxibus	100	100	100	100
Government bus	359	280	311	251
Private bus high	234	182	202	163
Private bus low	180	140	155	125

TAXIBUS : THE FUTURE

The trial scheme cost estimates indicate that, even under the most advantageous schedule for bus operations, the level of subsidy for private bus would be 25% to 63% greater than for Taxibus (1980 prices) and for government bus the subsidy might be 2½ times as great.

A rough calculation on the basis of these cost estimates indicates that the subsidy cost to replace with Taxibus all weekend and evening services⁽¹⁾ cancelled in Wollongong between 1976 and 1978 would be \$1,160 per week.

As an indication of the possible level of fare revenue to offset this subsidy, a patronage level of 2½ passengers per service, each paying a flat 50¢ fare, would provide a weekly revenue of \$450, leaving a net subsidy of \$710 weekly, equivalent to an average annual per capita subsidy of 16¢ (2).

It is not suggested here that a Taxibus operation of this type would solve Wollongong's public transport deficiencies; however it is suggested that this type of service could be very much more effective for public transport dependents than, say, direct user subsidies. Certainly the

1 Excluding some long-distance line-haul services on the highway which would not be recommended for Taxibus.

2 Estimated population of the Wollongong Statistical District at June 1979 was 223,950 (ABS 1980a).

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net \$710 weekly subsidy estimated above is a very much more attractive proposal in feasibility terms than the \$54,400 estimated for a pensioner based user subsidy in Wollongong (see page 5).

Extension of Taxibus trial scheme

It is suggested that a trial scheme of Taxibus along the lines indicated should be implemented, either in Wollongong or in one of the many other areas where private provision of bus services has been declining steadily.

Since the usefulness of a trial would lie primarily in its potential for discovering the level of demand for such services, the trial period would need to be long enough to allow potential users to become familiar with the operation and for general acceptance to develop.

The controlling authority should develop evaluation criteria before and during the trial period relating to levels of demand, performance of the taxi industry in meeting scheduling requirements, public acceptance and avoidance of conflicts with normal taxi and bus operations.

The future of Taxibus would depend on the success achieved during a trial, and it is suggested that extensions to the scheme should be incremental, made on the basis of regional studies evaluating potential routes and the possibility of further rationalisation.

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