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THE COSTS OF OPERATING DIAL-A-BUS, MINIBUS  
AND CONVENTIONAL BUS SERVICES

by

P H Martin

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THE COSTS OF OPERATING DIAL-A-BUS, MINIBUS  
AND CONVENTIONAL BUS SERVICES

ABSTRACT

A comparison is made of the costs of operating dial-a-bus, minibus and conventional bus services. The costs are based on the standard NBC costing of the experimental dial-a-bus service in Harlow and the fixed route services which succeeded it, but are analysed in such a way as to pertain to the general question of whether to operate minibuses or conventional buses. It is concluded that, although a minibus fleet can be operated at about 80 per cent of the cost of a fleet of conventional buses, small vehicles generally cannot be employed during the peak hours. Thus even an off-peak minibus service must bear the full standing costs of the vehicles. This effect more than offsets the lower unit cost of the small vehicles for the operation of off-peak services. Because of their small capacity, it is unlikely that minibuses could achieve sufficient productivity to cover their operating costs from revenue. The necessary provision of spare vehicles was found to represent a high standing cost for the operation of small minibus fleets. In addition, the control costs for a small dial-a-bus service resulted in costs of between 25 and 65 per cent more than an equivalent minibus service. In all cases, the resource costs of operating a bus service were found to be greater than the operator's costs.

1. INTRODUCTION

As part of the TRRL research programme into the operation of unconventional bus services<sup>1</sup>, an experimental dial-a-bus system was set up in Harlow in August 1974. This was replaced by a fixed route minibus service in September 1976, which, after six months of operation, was replaced by a conventional fixed route service. The present analysis was originally undertaken to provide operating costs for the assessment of these services<sup>2</sup>. However, with the increasing interest in the use of small vehicles to provide better penetration into residential areas, a comparison of the costs of operating minibuses and conventional buses has more general significance. The findings will therefore be of interest to operators and local authorities who are considering operating minibus services.

Although the comparative costs derived in this report are based on the actual costs of operating the Harlow services, care has been taken to ensure that the comparisons are generally applicable to services provided by a major bus operator. However costs vary quite widely between operators and even between depots of the same company. Thus, although the relative costs are

generally applicable, it is important that local costs be used when assessing services in a particular area.

The unit costs of bus operation are presented in Section 2 and the actual costs of operating the three Harlow services are described in the following three sections. The reader is warned against making direct comparisons of these costs since they relate to different operating hours and fleet sizes. Comparable costs are derived in Section 6.

As is appropriate in a paper concerned with the supply of bus services rather than the demand for them, the basis of costing is per bus rather than per seat, even though differing bus sizes are involved - in fact the standard NBC costing formula<sup>3</sup> is used. Costs are at January 1977 prices.

## 2. THE COST OF VEHICLE OPERATION

The costs of vehicle operation were calculated using the unit costs shown in Table 1. The figures in the main body of the table were obtained by averaging the cost of operating the dial-a-bus service over a period of two years, after correcting for inflation using the retail price index. These figures are therefore appropriate for the costing of services which employ 16-seat vehicles. Where different, the estimated unit costs of operating a conventional bus are shown in parenthesis.

It is emphasised that the latter are not necessarily the costs incurred by the operator of the dial-a-bus service, London Country Bus Services, but are estimates of the average costs of an NBC subsidiary.

## 3. THE DIAL-A-BUS SERVICE

The details of this service, which operated from 31 August 1974 until 3 September 1976, have been described elsewhere<sup>4</sup>. The service employed a fleet of five 16-seat Ford Transit vehicles. It operated from Monday to Saturday from 06.58 until 23.42. Three vehicles were used until 19.40 with one vehicle for the rest of the evening, giving a total of 249 bus revenue operating hours per week. Averaged over the 105 weeks of operation, the service required 284 standard hours and 2908 vehicle miles per week.

TABLE 1

Unit costs for vehicle operation (January 1977 prices)

|  | £/standard hour | £/mile        | £/peak vehicle /week |
|--|-----------------|---------------|----------------------|
| <b>VARIABLE COSTS</b>                  |                 |               |                      |
| One man drivers                        | 2.62            |               |                      |
| Vehicle servicing*                     | 0.20            |               |                      |
| Fuel                                   |                 | 0.014 (0.031) |                      |
| Tyres                                  |                 | 0.009         |                      |
| Insurance                              |                 | 0.005         |                      |
| <b>SEMI-VARIABLE COSTS</b>             |                 |               |                      |
| Traffic operation staff                | 0.27            |               |                      |
| Vehicle licences,<br>duties etc        |                 |               | 0.7                  |
| Vehicle maintenance                    | 0.15 (0.80)     |               |                      |
| Vehicle depreciation<br>and interest** |                 |               | 10.0 (40.0)          |
| <b>FIXED COSTS</b>                     |                 |               |                      |
| Administration staff                   | 0.24            |               |                      |
| Education, welfare etc                 | 0.16            |               |                      |
| Other fixed costs***                   |                 |               | 38.0                 |

\* Estimated

\*\* Amortised cost based on capital of £2000 per vehicle (after new bus grant), 5 year lifetime, 10 per cent residual value and 12 per cent interest rate. (The vehicles, in fact, had a 35 per cent residual value after 3 years, which gives approximately the same cost per week)

\*\*\* Excluding interest on capital debt

The purpose-built control office was manned from 07.30 until 19.00 by two dispatchers and by one dispatcher during the remaining hours between 06.00 and 23.59. Thirteen direct-line free-phones were provided between the service area and the control office.

Table 2 shows the vehicle operating costs for this service, and the

control costs are detailed in Table 3. It may be seen that the cost of the control centre represented 27 per cent of the total operating cost of £1860 per week, and that the cost of labour accounted for approximately three-quarters of all costs. The average cost of providing the service was approximately £7.50 per bus revenue operating hour.

TABLE 2  
Vehicle operating costs for the Dial-a-Bus Service (January 1977 prices)

|                                   | £/week         |       |               |
|-----------------------------------|----------------|-------|---------------|
|                                   | standard hours | miles | peak vehicles |
| STATISTICS PER WEEK               | 284            | 2908  | 5             |
| VARIABLE COSTS                    |                |       |               |
| One man drivers                   | 744            |       |               |
| Vehicle servicing                 | 57             |       |               |
| Fuel                              |                | 41    |               |
| Tyres                             |                | 26    |               |
| Insurance                         |                | 15    |               |
| Total variable costs              |                | 883   |               |
| SEMI-VARIABLE COSTS               |                |       |               |
| Traffic operations staff          | 77             |       |               |
| Vehicle licences, duties etc      |                |       | 4             |
| Vehicle maintenance               | 43             |       |               |
| Vehicle depreciation and interest |                |       | 50            |
| Total semi-variable costs         |                | 174   |               |
| FIXED COSTS                       |                |       |               |
| Administration                    | 68             |       |               |
| Education etc                     | 45             |       |               |
| Other fixed costs                 |                |       | 190           |
| Total fixed costs                 |                | 303   |               |
| TOTAL COSTS                       |                | 1360  |               |

TABLE 3

Cost of the Dial-a-Bus Control Centre (January 1977 prices)

|   | £/week |
|---|--------|
| Dispatchers   | 435.6  |
| Interest and depreciation on building and equipment*  | 13.8   |
| Interest and depreciation on radio*                   | 6.9    |
| Telephone   | 13.8   |
| Freephones  | 18.6   |
| Electricity   | 1.7    |
| Rates   | 1.7    |
| Miscellaneous costs (fixtures, fitting, printing etc) | 5.5    |
| Total   | 498    |

\*Interest and depreciation were calculated by amortising the capital cost over 10 years at a 12 per cent interest rate

#### 4. THE MINIBUS SERVICE

On 3 September 1976 the dial-a-bus service was replaced by an off-peak fixed route minibus service using the same vehicles. The service operated from Monday to Saturday using 3 vehicles from 09.00 to 17.15 and one vehicle from 19.05 to 23.20, giving a total of 169 bus revenue operating hours per week. This required the provision of 177 standard hours and 2114 vehicle miles per week.

The operating costs, calculated using the unit costs of Table 1, are shown in Table 4. It should be noted that, although this service operated only during off-peak periods, there was no use for such small vehicles during the peak and it was required to bear the peak vehicle costs for the entire fleet of 5 vehicles. The total cost of £950 per week is equivalent to an average of £5.75 per bus revenue operating hour.



TABLE 4

Operating costs for the Minibus Service (January 1977 prices)

|                                   | £/week         |       |               |
|-----------------------------------|----------------|-------|---------------|
|                                   | standard hours | miles | peak vehicles |
| STATISTICS PER WEEK               | 177            | 2114  | 5             |
| VARIABLE COSTS                    |                |       |               |
| One man drivers                   | 464            |       |               |
| Vehicle servicing                 | 35             |       |               |
| Fuel                              |                | 30    |               |
| Tyres                             |                | 19    |               |
| Insurance                         |                | 11    |               |
| Total variable costs              |                | 559   |               |
| SEMI-VARIABLE COSTS               |                |       |               |
| Traffic operations staff          | 48             |       |               |
| Vehicle licences, duties etc      |                |       | 4             |
| Vehicle maintenance               | 27             |       |               |
| Vehicle depreciation and interest |                |       | 50            |
| Total semi-variable costs         |                | 129   |               |
| FIXED COSTS                       |                |       |               |
| Administration                    | 42             |       |               |
| Education etc                     | 28             |       |               |
| Other fixed costs                 |                |       | 190           |
| Total fixed costs                 |                | 260   |               |
| TOTAL COSTS                       |                | 948   |               |

## 5. THE CONVENTIONAL SERVICE

On 1 April 1977 the minibus service was replaced by one employing a single conventional bus. This is a 35 seat Bristol LH and, although its operation does not differ significantly from that of the minibus service, the use of a larger vehicle has a fundamental effect on the costing. This is because the vehicle can be used elsewhere during the peaks with the result that this

service does not have to carry the cost of a peak vehicle.

The service operates from Monday to Saturday between 09.25 and 16.18, giving a total of 41.3 bus revenue operating hours per week. This requires the provision of 46 standard hours and 516 vehicle miles per week.

The operating costs are shown in Table 5; these were calculated using those unit costs of Table 1 appropriate to a conventional vehicle.

TABLE 5

Operating costs for the conventional service (January 1977 prices)

|                                   | £/week         |       |               |
|-----------------------------------|----------------|-------|---------------|
|                                   | standard hours | miles | peak vehicles |
| STATISTICS PER WEEK               | 46             | 516   | 0             |
| VARIABLE COSTS                    |                |       |               |
| One man drivers                   | 121            |       |               |
| Vehicle servicing                 | 9              |       |               |
| Fuel                              |                | 16    |               |
| Tyres                             |                | 5     |               |
| Insurance                         |                | 3     |               |
| Total variable costs              |                | 154   |               |
| SEMI-VARIABLE COSTS               |                |       |               |
| Traffic operations staff          | 12             |       |               |
| Vehicle licences, duties etc      |                |       | 0             |
| Vehicle maintenance               | 37             |       |               |
| Vehicle depreciation and interest |                |       | 0             |
| Total semi-variable costs         |                | 49    |               |
| FIXED COSTS                       |                |       |               |
| Administration                    | 11             |       |               |
| Education etc                     | 7              |       |               |
| Other fixed costs                 |                |       |               |
| Total fixed costs                 |                | 18    |               |
| TOTAL COSTS                       |                | 221   |               |

## 6. COMPARABLE COSTS

The previous sections have detailed the cost of provision of each service for the hours and number of vehicles which were actually operated. However, a comparative assessment requires a knowledge of the costs of operation of each type of service for the same operating hours. In the assessment, these costs will be compared with the revenue which it is estimated that each service would earn; they are therefore required to no higher accuracy than that with which the revenue can be estimated (say, 10 per cent).

### 6.1 *Vehicle operating costs*

In order to properly cost a particular service using the NBC method it is necessary to:

- a) specify the required number of buses and operating hours,
- b) draw up a drivers' rota and determine from this the number of standard hours which the service will need,
- c) carry out a route survey to determine the mileage,
- d) determine the peak vehicle requirement.

To avoid the difficult problem of driver scheduling, the present analysis uses an approximation to steps a), b) and c) above, which relates costs directly to operating hours. Table 6 presents an analysis of the operating statistics of the three services which were actually operated.

TABLE 6  
Analysis of operating statistics (per week)

|              | Standard hours | Bus revenue operating hours | Miles       | <u>Standard hours</u><br>Operating hours | <u>Miles</u><br>Operating hours |
|--------------|----------------|-----------------------------|-------------|--|---------------------------------|
| Dial-a-bus   | 284            | 249                         | 2908        | 1.14                                     | 11.7                            |
| Minibus      | 177            | 169                         | 2114        | 1.05                                     | 12.5                            |
| Conventional | 46             | 41                          | 516         | 1.12                                     | 12.6                            |
| <b>Total</b> | <b>507</b>     | <b>459</b>                  | <b>5538</b> | <b>1.10</b>                              | <b>12.1</b>                     |

It may be seen from this table that, on average, standard hours are 10 per cent greater than operating hours. This factor, which primarily takes

account of 'dead' running time, was used below in calculating the time-based costs. In addition, to further simplify the analysis, mileage costs were included in the time based costs by using an average speed of 12 miles/bus revenue operating hour. Using these factors, the unit costs of Table 7, which are derived from Table 1, are simplified to those given in Table 8.

TABLE 7  
Unit costs (January 1977 prices)

|                             | Minibuses | Conventional buses |
|-----------------------------|-----------|--------------------|
| £ per standard hour         | 3.64      | 4.29               |
| £ per mile                  | 0.028     | 0.045              |
| £ per peak vehicle per week | 49        | 79                 |

TABLE 8  
Simplified unit costs (January 1977 prices)

|                              | Minibuses | Conventional buses |
|------------------------------|-----------|--------------------|
| £ per revenue operating hour | 4.34      | 5.26               |
| £ per peak vehicle per week  | 49        | 79                 |

To check the accuracy of these approximations the three services were re-costed using the simplified unit costs. As shown in Table 9, the results were well within the required limits.

TABLE 9  
Application of the simplified unit costs

|              | (£/week) |           | Percentage Error |
|--------------|----------|-----------|------------------|
|              | Actual   | Estimated |                  |
| Dial-a-bus   | 1360     | 1326      | -2.5             |
| Minibus      | 948      | 978       | 3.2              |
| Conventional | 221      | 217       | -1.8             |

These costs may therefore be used to determine the vehicle operating costs for any service given its hours of operation, the number of vehicles required and the type of vehicle employed. In the following costings the operating day has been divided into 3 periods:

1. peak 07.00 - 09.30 and 16.30 - 18.30,
2. inter-peak 09.30 - 16.30,
- and 3. evening 18.30 - 23.30

For Monday to Saturday service which requires  $n_1$  vehicles during the peak,  $n_2$  vehicles between the peaks and  $n_3$  in the evening, the cost of vehicle operation obtained from the unit costs of Table 8 are given by:

$$C = 117n_1 + 182n_2 + 130n_3 + 49F \quad \text{for minibuses,}$$

$$= 221n_1 + 221n_2 + 158n_3 \quad \text{for conventional buses,}$$

where C is the cost in £ per week.

In the first of these expressions F is the size of the minibus fleet. When constructing the sample costs of Table 10 it was assumed that the operation of one or two vehicles would require a single spare but that two spares would be required to keep three or four vehicles on the road.

## 6.2 Dial-a-bus control costs

These costs are determined by:

- (a) the operating hours of the service - which defines the period for which the control centre must be manned, and
- (b) the level of demand - which determines the extent to which double-manning will be required.

It is assumed that the control centre must be manned for one hour before the service starts (or re-starts) but that it need not be manned after the service has finished for the day. It is further assumed that the supply will be adjusted to match the demand and that the extent of double manning will therefore depend on the number of vehicles in service. It is concluded from the experimental service that it is necessary to employ two dispatchers throughout any period for which there are more than two vehicles in service.

From Table 3, the unit costs of operating the control centre are a standing cost of £62 per week plus £2.46 per hour for each dispatcher. These unit costs, together with the above assumptions are sufficient to determine the cost of control for any dial-a-bus service. For instance a service which employs 2 vehicles during the peaks, 3 between the peaks and one in the evening would require the control centre to be double manned from 09.30 until 16.30 and single manned for the remaining hours between 06.00 and 23.30. It would therefore require 147 dispatcher hours per six-day week and would cost a total of £424 per week to operate.

### 6.3 Total operating costs

Using the above unit costs, it is possible to construct the total operating cost for each type of service for any reasonable combination of operating hours and vehicles in service. The services costed in Table 10 are based on provision of a daytime off-peak service. The four sets of services employ a maximum of between one and four vehicles in service at any one time. Within each set, services have been considered which operate between the peaks, throughout the working day, during the off-peak and all day. Boxes have been placed around the costs of those services which most closely approximate to the three services which were operated in Harlow; these are all within 5 per cent of the actual costs. The costs of the dial-a-bus services were obtained by addition of control costs to the equivalent minibus service.

## 7. RESOURCE COSTS

All of the foregoing analysis is concerned with the costs to the operator of providing the different services. It is suggested that these are appropriate for use by the operator or the local authority when assessing the performance of a service or when deciding which type of service to operate. However, an assessment made by central government should employ the resource costs, which measure the costs to the community of providing a service. The resource costs differ from those of the operator in a number of ways<sup>5</sup>. Firstly, the resource costs should not contain taxes; these are simply transfer payments. Conversely the new bus grant should not be deducted from the vehicle purchase price when calculating resource costs and capital costs should be amortised at a standard interest rate. Finally, the track (road maintenance) costs should be added to the variable costs of vehicle operation.

TABLE 10

Sample Operating Costs (January 1977 prices)

| NUMBER OF VEHICLES IN SERVICE                |                               |                               | £/WEEK              |         |                |
|--|-------------------------------|-------------------------------|---------------------|---------|----------------|
| n <sub>1</sub><br>07.00-09.30<br>16.30-18.30 | n <sub>2</sub><br>09.30-16.30 | n <sub>3</sub><br>18.30-23.30 | CONVENTIONAL<br>BUS | MINIBUS | DIAL-A-<br>BUS |
| 0  | 1                             | 0                             | 220                 | 280     | 460            |
| 1  | 1                             | 0                             | 440                 | 400     | 650            |
| 0  | 1                             | 1                             | 380                 | 410     | 680            |
| 1  | 1                             | 1                             | 600                 | 530     | 870            |
| 0  | 2                             | 0                             | 440                 | 510     | 690            |
| 2  | 2                             | 0                             | 880                 | 750     | 1000           |
| 0  | 2                             | 1                             | 600                 | 640     | 910            |
| 2  | 2                             | 1                             | 1040                | 880     | 1220           |
| 0  | 3                             | 0                             | 660                 | 790     | 1070           |
| 3  | 3                             | 0                             | 1330                | 1140    | 1560           |
| 0  | 3                             | 1                             | 820                 | 920     | 1290           |
| 3  | 3                             | 1                             | 1480                | 1270    | 1770           |
| 0  | 4                             | 0                             | 880                 | 1020    | 1300           |
| 4  | 4                             | 0                             | 1770                | 1490    | 1910           |
| 0  | 4                             | 1                             | 1040                | 1150    | 1520           |
| 4  | 4                             | 1                             | 1930                | 1620    | 2120           |

The removal of taxes and the use of a lower interest rate tend to slightly reduce the resource costs below those of the operator. However, the effects of adding the new bus grant and the track costs are much more significant\* with the net result that the resource costs exceed the operator's costs. It may be seen by comparing Tables 7 and 11 that the hourly costs remain unchanged but that, because of the relatively high track costs,

\*Removal of new bus grant results in an almost doubling of the vehicle depreciation and interest charges shown in Table 1. The track costs were calculated according to reference 5 to be 1.9p/mile for a minibus and 3.1p/mile for a 45 seat conventional vehicle.

the distance based resource costs are some 60 per cent higher than the operator's costs. The disallowance of new bus grant doubles the effective vehicle capital cost and therefore has a more significant effect on the cost of operating the more highly priced conventional vehicles.

TABLE 11  
Unit resource costs (January 1977 prices)

|                             | Minibuses | Conventional buses |
|-----------------------------|-----------|--------------------|
| £ per standard hour         | 3.64      | 4.29               |
| £ per mile                  | 0.044     | 0.071              |
| £ per peak vehicle per week | 57        | 116                |

These unit costs may be simplified, just as before, to those shown in Table 12; these may be directly compared with the simplified unit costs of Table 8.

TABLE 12  
Simplified unit resource costs (January 1977 prices)

|                              | Minibuses | Conventional buses |
|------------------------------|-----------|--------------------|
| £ per revenue operating hour | 4.53      | 5.57               |
| £ per peak vehicle per week  | 57        | 116                |

Using these, the resource costs of vehicle operation are given by:

$$\begin{aligned}
 C &= 122n_1 + 190n_2 + 136n_3 + 57 F && \text{for minibuses} \\
 &= 266n_1 + 234n_2 + 167n_3 && \text{for conventional buses,}
 \end{aligned}$$

where the terms are all defined for the equivalent equations given in Section 6.1.

Since the costs of the dial-a-bus control centre are dominated by the despatchers wages, the resource costs differ only slightly from those of the operator. Thus the labour costs are the same, £2.46 per hour for each



dispatcher, but the standing costs are 8 per cent less at £57 per week.

These costs were used to calculate the total resource costs of operating each type of service, as described in Section 6.3. Overall, the resource costs were found to be between 4 and 12 per cent higher than the operators costs with the greatest increase on the services which employ conventional buses, particularly in the peak hours. The resources and operator's costs differed least for the dial-a-bus services.

#### 8. SUMMARY AND CONCLUSIONS

The costs of operating dial-a-bus, minibus and conventional bus services have been calculated from the unit costs of operating the experimental dial-a-bus service in Harlow. These unit costs (calculated from standard NBC costing) were combined into a simplified form which permitted the calculation of the operating costs of a range of services. The variations of costs with fleet size, operating hours and type of service were examined using both the resource costs and the costs to the operator.

The analysis supports the following conclusions:

1. The higher fuel consumption, maintenance costs and capital costs of conventional buses result in higher unit costs of operation than for minibuses. All other things being equal, a minibus fleet could be operated at about 80 per cent of the cost of a fleet of conventional buses.
2. It was found in Harlow and elsewhere that minibuses were too small to be usefully employed during the peak hours. Thus the off peak minibus service had to bear the full standing costs of the vehicle fleet. This effect more than offsets the lower unit costs of the small vehicles for the operation of off-peak services.
3. The average cost for minibus operation was found to lie in the range £5 - £6.50 per bus revenue operating hour. To cover this cost from revenue at normal fares would require a productivity of 30-40 passengers per vehicle hour. Bearing in mind the small vehicle size and the non-uniform nature of demand, it is unlikely that this productivity could be achieved.
4. The necessary provision of one or two spare vehicles was found to represent a high standing cost for the operation of small minibus services.

5. A small dial-a-bus service was found to cost between 25 and 65 per cent more than an equivalent minibus service. Even assuming that two dispatchers could cope with the demand generated by 10 vehicles, the control costs associated with a dial-a-bus service would still represent in excess of 10 per cent of the total cost of that service.

6. In all cases the resource costs of providing a bus service were found to be greater than the operator's costs. For the services studied they were found to be between 4 and 12 per cent higher with the greatest difference in the costs of services which employed conventional buses, particularly in the peak hours. Thus the resource cost of operating a conventional bus throughout the day was found to be some 10 per cent greater than the operator's costs. This difference was primarily due to the inclusion of road maintenance costs in the resources and the reduction in cost to the operator resulting from the new bus grant. These factors contributed approximately equally to the difference between resource and operator's costs.

#### 9. ACKNOWLEDGEMENTS

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#### 10. REFERENCES

1. MARTIN, P H. Comparative assessment of unconventional bus systems. *Department of the Environment Department of Transport, TRRL Report SR 387*. Crowthorne, 1977 (Transport and Road Research Laboratory).
2. TUNBRIDGE, R J and D M J HALE. Comparative assessment of demand responsive and fixed route bus service. *Department of the Environment Department of Transport TRRL Report LR 847*. Crowthorne, 1977 (Transport and Road Research Laboratory).
3. TAYLOR, H W. A method of bus operations costing developed by NBC. *Proceedings of a Symposium on the Costing of Bus Operations, Paper 2. Department of the Environment, TRRL Report SR 180*. Crowthorne, 1975 (Transport and Road Research Laboratory).

4. MITCHELL, C G B and P H MARTIN. Some preliminary results of the Harlow dial-a-bus experiment. *Department of the Environment, TRRL Report SR 214*. Crowthorne, 1977 (Transport and Road Research Laboratory).
  
5. MARTIN, P H and R J TUNBRIDGE. The optimisation of public transport in small towns. *Department of the Environment Department of Transport, TRRL Report LR 791*. Crowthorne, 1977 (Transport and Road Research Laboratory).

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Department of Transport, TRRL Supplementary Report 409:  
Crowthorne 1978 (Transport and Road Research Laboratory).

A comparison is made of the costs of operating dial-a-bus, minibus and conventional bus services. The costs are based on the standard NBC costing of the experimental dial-a-bus service in Harlow and the fixed route services which succeeded it, but are analysed in such a way as to pertain to the general question of whether to operate minibuses or conventional buses. It is concluded that, although a minibus fleet can be operated at about 80 per cent of the cost of a fleet of conventional buses, small vehicles generally cannot be employed during the peak hours. Thus even an off-peak minibus service must bear the full standing costs of the vehicles. This effect more than offsets the lower unit cost of the small vehicles for the operation of off-peak services. Because of their small capacity, it is unlikely that minibuses could achieve sufficient productivity to cover their operating costs from revenue. The necessary provision of spare vehicles was found to represent a high standing cost for the operation of small minibus fleets. In addition, the control costs for a small dial-a-bus service resulted in costs of between 25 and 65 per cent more than an equivalent minibus service. In all cases, the resource costs of operating a bus service were found to be greater than the operator's costs.

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