

POTENTIAL OF SHARED CAR FLEETS FOR
RESIDENTIAL NEIGHBOURHOODS

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T. M. Pharoah, MSc, MRTPI, MCIT.

Department of Town Planning, Faculty of the Built Environment,
Polytechnic of the South Bank, London. 01-928 8989

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Introduction

This report describes progress in the above named research project made possible by a study visit to the USA which was financed by a Nuffield Small Grant: it thus concentrates on shared car schemes in the USA, and the lessons to be learned for similar experiments planned for the UK.

Throughout a period of 3 weeks, schemes in San Francisco (California), West Lafayette (Indiana) and Toronto (Ontario) were visited and data were collected from a variety of sources. The study programme is summarised at Appendix A and the documents consulted are listed at Appendix B. A statement of expenditure on the study visit is given at Appendix C.

Shared Car Fleets

The concept of Shared Car Fleets (SCF) for residential areas is both new and untried in this country, so some definition is required. It is important to distinguish the concept of SCF from "car sharing" (or "car pooling" in US terminology) which relates to shared rides in individually owned cars. The SCF concept means individual access to cars in shared or group ownership. The innovative element of the SCF concept is the application of shared car fleets in residential areas as an alternative or supplement to individual car ownership.

SCF may be understood as an application of the company "car pool" idea in the residential community, or as a flexible and convenient form of local car rental.

The two US experiments in running SCFs are now briefly described.

STAR, San Francisco

The STAR (Short Term Auto Rental) scheme in San Francisco operated as a commercial experiment from 1983 to 1985. As its name implies, STAR was a form of car rental designed to cater for

short duration as well as longer trips. Based in a large apartment complex (Parkmerced) situated at a 25 minute Metro ride from downtown, the scheme provided residents with a pool of 70 vehicles kept at an underground garage on site from which to rent. Roughly a third of the 350 STAR users either gave up car owning or postponed purchase a car during the experiment. The rest used STAR as a supplement to car ownership, or as a temporary facility whilst visiting San Francisco. STAR reached financial break-even point after only 6 months operation and returned a small profit thereafter.

Through its pay-as-you-drive system of charging, STAR encouraged its members to compare the costs of different means of travel for each trip they contemplated. For many trips it would be cheaper to use San Francisco's excellent public transport. However, as one of the first members, Greg Mendiola, explains "It is much more expensive having your own car than renting from STAR and using transit as well."

MOBILITY ENTERPRISE, West Lafayette, Indiana

The other US experiment operated from 1982 to 1985 at Purdue University, Indiana. Unlike the STAR site, Purdue is located in a car-dependent area with scattered low-density suburbs and virtually no public transport. The aim was not to divert people away from cars as this would not have been feasible, but to make more efficient use of cars. For a monthly fee of \$182, the 15 member households of "Mobility Enterprise" were provided with a "mini-micro" car (specially imported from Japan) to meet their daily and local travel needs, and given access to a shared fleet of 3 full-size cars for longer trips or when more load capacity was required. The mini-micros were kept by members at their homes and the shared cars were kept at the University campus when not on hire.

The Mobility Enterprise (ME) scheme was successful in reducing the number of second cars owned by member households, and in getting people to use the fuel-efficient micro cars for 85% of

their trips and 60% of their mileage. These percentages might have been greater had the micro cars not been prevented from being driven on Interstate highways. The scheme had to end because the micro cars did not meet the strict U.S. safety standards, and the import licence was for a specified period only. But a lasting benefit has been that members have bought smaller cars than they owned prior to the scheme, and most said they would have bought the micros, given the chance. In view of the recent trend in the USA towards the purchase of larger cars, ME was clearly successful in promoting energy-consciousness amongst its members. Although the ME had some hidden administration costs borne by the University, the operation showed a net return on capital of 7.5% in 1984.

Study Findings

The information gathered in North America fell into three broad categories.

- A. Operational aspects of the STAR and MOBILITY ENTERPRISE experimental shared car fleets in San Francisco and West Lafayette respectively.
- B. Attitudes to shared car fleets of participants in the two schemes, as well as those professionally involved.
- C. Contextual material on US transport policy, taxation, law and planning.

An original plan to obtain quantitative data on the effects of the SCF schemes on participants' travel patterns was frustrated because data sets had not yet been prepared; copies of the analysis, however, will be available in Spring 1986. The opportunity was therefore taken to include a visit to consultants in Toronto who have undertaken a major survey and analysis of the SCF issue for the Canadian Government. Also, some extra

interviews with various US transport officials were included.

A. OPERATIONAL ASPECTS

1. Manager skills were found to be a major issue for both the STAR and ME schemes. John Crain (the founder of STAR) explained that in addition to having enthusiasm for the scheme, their manager required three skills:

- Systems (design and operation of the office)
- Auto maintenance (arranging, checking car maintenance)
- Public relations (dealing with customers)

He felt in retrospect that all these skills were unlikely to be encountered in a single person, and certainly not at a realistic salary. This problem was independently confirmed by an external observation of the scheme in operation, and it was also recognised by the staff at Purdue who said that the ME had considerable and uncosted professional inputs.

This problem will be reduced in the UK experiment by a simplification of procedures through the use of automatic billing meters, and by using contract hire vehicles, which would require little involvement in vehicle maintenance.

2. Bad debts were initially a problem for STAR which was later solved by removing bad payers from the membership, and by carrying out careful checks on the creditworthiness and driving records of new applicants. It was not a problem for ME, probably because all members of ME worked for Purdue University, who could easily have retrieved debts by deductions from salary.

For the UK experiment, measures to avoid bad debts will probably consist of direct debit mandates, perhaps combined with advance payment of a substantial deposit. It is unlikely that people in Britain would accept the highly personal credit checks which STAR felt compelled to use.

3. Identification of users was a problem for STAR which was only partially solved. When vehicles are abused or parking offences

are committed, the problem arises of identifying the member responsible. Indeed, such behaviour may in itself only arise through lack of an adequate ID system. Since this was not found to be a problem for ME, it may be related to the size of scheme: STAR was a large operation with as many as 250 members at any one time. The London scheme is unlikely to exceed 40 members, but the ID problem will have to be considered further.

4. Financial viability was achieved by both the STAR and ME schemes within a year. This conclusion is encouraging for future schemes, but needs qualification. Both the US schemes incurred considerable costs which were attributable to their experimental nature. Since these were mostly "hidden" costs of professional time not borne by the schemes themselves, it is not possible to predict with certainty the likely economics of future SCF schemes. Furthermore, the economics of SCF operation will vary from one country to another. For example US petrol is roughly half the price of that in the UK, whilst vehicle tax is also much lower. On balance, it is believed that the higher cost of motoring in Britain will favour the economics of SCF operation.

5. Charge rates are crucial to achieving a balance between demand for and supply of vehicles in the fleet. The choice is mainly between charges for time and mileage travelled or - as in the case of conventional rental and the STAR scheme - a mix of the two. The advantage of charging for time is that demand can be smoothed by having higher charges at peak time, thus achieving a better utilisation of the fleet. For the managers of STAR, and also J. Parviainen of Toronto, this was seen as vital for the economic viability of SCF schemes. The disadvantage of a time charge is that it introduces a disincentive for existing car owners to join SCF schemes, since car owners do not incur any extra cost for time away from home, only for distance travelled. This point was accepted by those interviewed in North America. The London experiment is intended to use a mileage-only charge for this reason, though a time charge may have to be added if

demand peaks threaten the viability of the scheme.

6. Marketing of SCF schemes was thought by the instigators of both STAR and ME to be an important issue requiring a good deal of care. Indeed, at Purdue specialists were employed to carry out a detailed marketing exercise for the ME scheme, and some interesting findings are given in the paper by Feinberg and Snuggs. In particular it was found that recruitment needed "focus group" interviews to put across effectively a novel and complex concept like the Mobility Enterprise, and that these groups should be small.

STAR also used the personal approach to marketing the scheme, but also offered incentives to attract interest in the scheme. Firstly a leaflet was distributed to residents at Parkmerced explaining the scheme. A returnable portion of the leaflet asked residents to answer questions about their current car. STAR then calculated the current car costs, showing average cost per mile, and sent these results back to the residents. This proved popular and also helped to improve perception of the relative costs of STAR and individual car ownership. STAR were able to demonstrate that car owners would save money by using STAR if their annual mileage was less than 8-10,000 miles.

The second main marketing ploy of STAR was to buy residents' existing cars at full market value, with a buy-back option. STAR bought the cars with cheques post-dated by 60 days, and stored the cars. At any time within that period, if dissatisfied with STAR, the owner could tear up the cheque and have his or her own car back again.

It is intended to emulate STAR's successful marketing techniques in the London scheme.

7. Car maintenance was an important issue that emerged from both the American schemes, but for different reasons. For STAR, which used second-hand vehicles, it was initially difficult to keep the fleet adequately maintained. This was a major problem for

the manager, and also on occasions for members.

The ME scheme on the other hand began with brand new vehicles which were therefore much easier to keep in top condition. An added advantage was that they were maintained at Purdue's own workshops, which made quality control easier than for STAR. What was not anticipated, however, was that the availability of new vehicles without having any responsibility for maintenance or repairs, proved extremely popular with the ME participants, and indeed seemed to be appreciated even more than the cost savings of the scheme. This important benefit of the SCF idea could therefore be used as a major selling point.

B. ATTITUDES TO SHARED CAR FLEETS

1. Popularity of the STAR and ME schemes was clear from the personal interviews with participants. That there was no shortage of takers for either scheme is an important finding. A paradox that emerged was that while STAR and ME members had become aware that the costs of private car ownership were higher than using the SCF scheme, they nevertheless felt that the charges were too high. It may be that people would rather not know the precise cost of their car trips, in which case there will be a problem of marketing pay-as-you-drive schemes, which Shared Car Fleets inevitably are.

Participants of ME said they enjoyed the lack of problems and worries over the maintenance and administration that go with individual car ownership. They also felt that the key to their acceptance of ME was the fact that the scheme was embedded in another organisation (namely Purdue University) which took the liability for its success. They expressed no enthusiasm for continuing a scheme of their own, now that ME had closed down.

Another feature enjoyed by ME members was that they got to know one another through the scheme. No similar benefit arose from the STAR scheme, whose membership was both much larger, more heterogeneous and without the ties of a common employer as at

Purdue university.

2. Market Potential of SCF schemes was investigated by Purdue university. National surveys into attitudes to the Mobility Enterprise concept found that 8% of the population would be willing to join such schemes, and as many as 25% in some urban areas. For West Lafayette itself, the figure was 16%. Amongst those who said they were not interested, the most prominent reasons given were "Don't like sharing vehicles" and "Like current vehicle". The national survey, as well as the Purdue "focus groups" referred to above, all showed less interest in ME amongst younger adults and the elderly. In practice, however, the age of ME members was more evenly spread. It was the case, however, that members of ME (and probably STAR also) tended to be better educated than average, and more likely to be in professional employment. The conclusion for the London scheme is that potential "joiners" may need careful education about the benefits of SCF.

3. Reduced car ownership is an objective of most SCF schemes. About a third of STAR users gave up car ownership, or postponed car purchase as a result of the scheme. The ME also led to some reduction in car ownership by the members, though this lay mostly in reduced multiple car ownership. Some members transferred their existing cars to their children rather than sell them (people under 21 years old were excluded from ME).

A major change in attitudes towards the car occurred as a result of the ME scheme. The mini-micro cars were entirely new to the USA, and altogether smaller and more spartan than normal US cars. But they became popular with the members, to the point where they used them for an increasing proportion of trips, and would have bought them when the scheme closed, had US vehicle regulations allowed. A lasting result of this new liking for small cars has been that members bought smaller cars than they had owned prior to the ME experiment.

C. CONTEXT MATERIAL

A great deal of information was gathered on public transport and city planning in San Francisco and Chicago. Only that with relevance to the Shared Car Fleet experiments is reported here.

1. Energy saving continues to be a concern of US transport policies. Indeed, it was the oil crisis of 1979 which led to the setting up of many energy saving experiments, including the STAR and ME schemes.

2. "Downsizing" of US automobiles was another consequence of this concern, with even Cadillac now producing a "compact" model. However, as gasoline prices have stabilised, real prices have gradually returned to pre-1979 levels, and this is reflected in an increase in the average size of car purchased over the past few years. Impetus for SCF schemes in the US may thus be related to the level of concern over oil conservation.

3. "Transit First" policies have also emerged from the energy issue, but have continued to be important as an element of policies designed to regenerate the inner city areas. Most urban public transit operations in the US are heavily subsidised from the public purse, especially in densely developed cities with development pressures. Thus San Francisco's municipal transit system is not only one of the most heavily used systems in the USA, it receives 75% of its revenue from State and local subsidy. This is reflected in the high quality service provided and low flat fares, which proved to be important for STAR members who could reduce their travel bills by driving less and using transit more.

4. Parking is an aspect of urban transport which can affect the potential of SCF. For example, in certain luxury apartments in downtown Toronto, residents' parking spaces are rented at \$10,000 per year. A consultant to the Canadian Government, J. Parviainen, felt that this might well stimulate interest in SCF as a way of promoting new downtown apartments, which would lower

residents' parking charges.

Another feature beneficial to STAR was the fact that San Francisco has parking restrictions and charges throughout the city. This is an unavoidable additional cost for car owners which increased the relative attraction of joining STAR.

5. Cars are the predominant mode of travel in most parts of the USA. An example is West Lafayette, home of the ME scheme, which is almost totally dependent on the car. There are virtually no public transit services. San Francisco, however, is more European in this respect, and residents of the city are more "multi-modal" in their approach to travel. Thus members of STAR were able to choose not only between different types of vehicle for their trips, but also between public and private transport, and walking, and even cycling. It is this range of choice that is lacking in car-based communities in the USA, but which still exists in San Francisco, as well as in many European cities.

APPENDIX A

STUDY PROGRAMME - USA & CANADA - SEPTEMBER 1985

San Francisco

John Crain & Associates (STAR)
US Department of Transport, Regional Office
San Francisco MUNI Director of Planning
San Mateo County Transit (SAMTRANS) headquarters
San Francisco City, Director of Planning
San Francisco City, highways department
STAR participants - interviews
San Francisco city library
Site visit to Parkmerced apartment complex and STAR site

Purdue University, West Lafayette, Indiana

Automotive Engineering Centre (Mobility Enterprise HQ)
Centre for Public Policy and Public Administration
Transport Services Department (auto workshops)
Consumer Sciences and Retailing Department
Mobility Enterprise participants - interviews
Site visits

Toronto

J. A. Parviainen & Associates - consultants on SCF for
Transport Development Centre, Transport Canada

Chicago

North East Illinois Planning Commission
University of Illinois, Department of Urban & Regional Planning.

APPENDIX B

DOCUMENTS ACQUIRED OR CONSULTED - SEPTEMBER 1985

STAR

| | | | |
|--|---|---|---------|
| "STAR Feasibility Programme", Crain & Associates, 1982 | | | |
| "STAR Progress Report" | " | " | 1984 |
| "STAR Services & Prices" | " | " | 1984 |
| "STAR: Report of First Year" | " | " | 1985 |
| Plus internal documents | " | " | 1982-85 |

MOBILITY ENTERPRISE

"The Mobility Enterprise: A New Concept in Personal Transportation" M. J. Doherty & F. T. Sparrow, Purdue 1983

"Optimal Management of a Shared Fleet with Peak Demands", J.K.Cochran & F.T.Sparrow, Purdue 1983

"Fuel-Efficient Autos: Progress and Prognosis", R.K.Whitford, Purdue 1984

"The Mobility Enterprise Experiments: An Overview", M.J.Doherty & F.T.Sparrow, Purdue 1984

"Improving the Productivity of the American Automobile: A Stochastic Process View", J.K.Cochran (unpublished PhD thesis, Purdue 1984)

"Viability of the Mobility Enterprise Concept" - Reports to the Urban Mass Transportation Administration, Washington D.C. by R.K.Whitford and C.K.Orskie.

VOL 1 "Neighbourhood Transport Delivery Service"

VOL 2 "Potential Users of a Shared Vehicle - ME System"

"Consumer Dynamics of Shared Transportation Systems", T.L. Snuggs R.H.Feinberg, J.Meoli; Purdue, 1984

GENERAL

"US Bureau of Census", Census Data for Parkmerced, San Francisco

"Shared Vehicle Fleet Concepts: State of the Art Review",
J.A.Parviainen & Associates

"Shared Vehicle Fleets: Implementation Sites & Institutional
Issues", J.A.Parviainen & Associates

Plus various papers on US transport, planning, and law.

APPENDIX C

FINANCIAL STATEMENT

| ITEM | £ |
|---|------|
| Travel to and within USA (Air + Car Rental) | |
| BA Flydrive discount package | 967 |
| 21 nights @ £20 | 420 |
| Subsistence, 21 days @ £15 | 315 |
| Other costs (airport fees, taxi, tips, film, reprographic costs) | 52 |
| <hr/> | |
| TOTAL COST | 1754 |
| <hr/> | |
| NUFFIELD SMALL GRANT RECEIVED | 1735 |
| <hr/> | |
| Overspend | 19 |
| <hr/> | |

T. M. Pharoah



Polytechnic of the South Bank - December 1985