

... This 'pay as you drive' system would enable members to compare real journey costs, encouraging the use of other modes ...

● Residential area in Leicester: perfect for car sharing.



Shared cars: key to reducing traffic

TIM PHAROAH looks at the experience of using fleets of shared cars to reduce traffic congestion.

THE provision of Shared Car Fleets (SCF) is an alternative to individual car ownership which could radically alter the role of the car.

Although not an entirely new concept in transport, it has yet to be properly tested, certainly in this country. The apparently intractable problem of accommodating the car in urban areas, however, is a continuing stimulus to the SCF idea, whilst the availability of new information technology offers the potential to ensure its feasibility.

It is important to distinguish the concept from 'car sharing' — or car pooling in US terminology — which relates to shared rides in individually-owned cars: the SCF concept relates to individual access to cars in shared or group ownership. The innovative element is the application of shared car fleets in residential neighbourhoods as an alternative or supplement to individual car ownership.

An important feature is that, unlike ridesharing, SCF schemes do not depend on users knowing one another — let alone liking one another! Nor do they involve the difficult business of matching trip ends and times.

There are many possible forms of SCF. The basic concept, however, is that drivers belong to some form of club which provides a fleet of cars, and have ready access to any of the vehicles in that fleet. The SCF concept may be seen as an extension of the company 'pool car' idea into the residential community, or

alternatively as a more flexible form of local car rental.

The SCF can lead to a radical change in the way cars are paid for and used, which should increase the efficiency of the car, while at the same time reducing the problems it creates.

The objectives of shared car fleets can be summarised under four headings:

- To reduce the total stock of cars owned:
 - inhibiting the trend towards multiple car ownership.
 - improving the productivity of cars in private use.
 - easing parking in residential areas.
 - aiding conservation of urban form.
 - improving visual amenity.
 - providing more space for other purposes, like childrens' play.
 - improving safety in residential areas.

● Extend car ownership to those at present unable to afford it.

● Reduce problems of individual car ownership, like cost, maintenance, cleaning and repairs, and avoiding the need for individual car space for each dwelling.

● Encourage more sparing use of the car.

In short, shared car fleets change the relationship between car ownership and use, so as to reduce both without significantly reducing the benefits of either.

A RESEARCH project at the South

Bank Polytechnic explored the potential of a particular form of shared car designed to overcome most of the limitations of other schemes that have been put forward.

The intention was to mount a demonstration scheme in Richmond, with the co-operation of the borough council. More than 20 people in two streets wanted to become the first members, but finance was not available to start the scheme.

In this scheme people in the selected locality would be able to join a 'club' providing access to any one of a pool of vehicles kept in the locality itself. These vehicles would be available 24 hours a day without the need for booking, and paid for on a mileage rate.

The scheme used a meter technology designed to overcome problems associated with other shared car schemes. The major benefit is the avoidance of booking. Booking requires staff 16-24 hours a day, substantially raising overhead costs and thus setting a large minimum size of scheme for economic viability.

The other alternative to booking and meters, namely ad hoc co-operation between members, requires considerable voluntary effort, and complexity tends to dictate a rather small maximum size of scheme. Meter-based schemes may be as large or small as circumstances require, without any major cost or complexity penalties.

The meter specified for the London experiment is called a Travel Cost Recorder (TCR). The TCR is a microprocessor controlled billing meter for motor vehicles. It computes the cost of individual journeys and allows this information to be continuously displayed, and recorded for the purpose of billing. Essentially it is a means whereby car use can be charged on a 'pay-as-you-drive' basis.

Accumulated costs for each user are stored on a removable 'key counter' which also enables the user to gain access to any number of vehicles or vehicle types. Payments for vehicle use can be made away from the vehicle, at garages or local offices.

Subscription charges would be small and the main payments for the use of the cars would be on the basis of mileage — and possibly fuel consumption and time — measured by the TCR. This is of fundamental importance because it means that the user would pay more nearly the average cost rather than the marginal cost of their journeys.

There would be no difference between perceived and actual costs since the latter would always be displayed on the key counter. This 'pay as you drive' system would enable members to compare real journey costs, thereby encouraging the use of other modes including public transport for a greater proportion of their journeys.

THE evolution of shared car fleets has been from central business district circulation systems, to an emphasis on

schemes based on residential neighbourhoods managed by transportation brokers or user co-operatives.

All have been concerned with making more efficient use of the car, and reducing its damaging effects on society and the environment. There is now ample evidence from SCF schemes in other parts of the world that the concept is capable of flexible interpretation to suit varying objectives and

circumstances that there is considerable latent demand for such schemes, and that they are popular with those who participate.

The ability of SCF schemes to generate a commercially attractive rate of return is so far less clear, as is their ability to reduce vehicle miles. Only properly conducted experiments can provide the answers.

● *Tom Pharoah is a senior lecturer in the Department of Town Planning at South Bank Polytechnic. The author acknowledges financial assistance from the Nuffield Foundation, and contributions from Trevor Yerworth, research assistant to the project.*

Shared cars in practice

France-Societe Procotip

The Procotip scheme was introduced in Montpellier, France, in 1971. It has been described as a 'kind of self-drive hire service', providing a pool of cars in the town for any driver who subscribed to the club.

By 1972 members of the co-operative had the use of 37 bright blue Simca 1000s. On an assumption that one car in co-operative use would replace 15 to 20 privately owned ones, Philippe Leblond (designer of the scheme) calculated that a fleet of 600 cars would be able to sweep 12,000 cars off the streets of Montpellier and thus eliminate the acute congestion found there.

Users received a key which opened all the cars in the scheme. The key had a user identification number which was recorded by a dashboard meter when the car was started. The meters accepted plastic tokens, pre-purchased by the user, which were then 'consumed' in proportion to the length of time the engine was running. The cars were kept in specially designated groups of three or four parking bays spread throughout the town.

The Procotip scheme foundered for a number of reasons including lack of financial support to bring the scheme to a sufficiently large size, and difficulties of preventing illegal use of the designated parking bays.

Japan: Town Spider

The Town Spider is a public-use rent-a-car system developed by Toyota for use in dense city areas.

It uses two-passenger cars operating from a network of parking lots. Time charges and other data are transmitted automatically to a central control computer through a radio transmitter/receiver installed in each car. Carrying only digital data, efficient use is made of scarce radio frequencies.

The driver activates the car by inserting a magnetically encoded membership card into an electronic card reader linked to the radio. Spiders are oriented toward eventual use of battery powered engines.

Netherlands: Witkars

The Witkar, a small two-seater electric car, was introduced to the streets of central Amsterdam in 1974.

The basic goal of its designer, Luud Schimmelpennink, was to reduce the volume of cars — both moving and parked — by providing transport for those trips not served by conventional public transport, but with less damage to the environment than the traditional car.



● STAR garage in San Francisco.

Any of the 35 cars could be hired from one of six 'stations' within the central three sq kms of Amsterdam, and users were charged until the car was deposited at the same or another station. Each station was linked to a central computer which calculated the cost for each user and debited this amount from the user's account at the Amsterdam Savings Bank.

The computer also collected data on car use and provided instant information on parking availability at the user's destination. Witkar batteries were automatically recharged by overhead gantries at the stations.

Like Procotip, the Witkar organisation was a co-operative society and working parties of volunteers looked after administration, maintenance, publicity and — initially — manning the stations. Membership of the co-op cost Dfl.25 (about £5). At its height, Witkar had 3,400 members.

To hire a car members had to pay a further Dfl.25 for a personal magnetically encoded key, like a credit card, to be inserted in the car during operation.

The system operated until 1984 and managed to overcome early operating problems. Its main fault was the restricted area of service. It catered for short trips for which the main competitor was walking, so it was never likely to reduce congestion.

Sweden: Sambil

Vasteras Shared Car Users (SAMBIL) is an independent non-profit organisation which enables car-owning households to hire out their cars to non-car owning households.

Introduced in 1980, the scheme had achieved a membership of 100 households by 1984. The basis for the co-operation is written into an agreement for joint car use which

states the right to use, fares and damage responsibility. These agreements are usually of a bi-lateral nature though some members have signed more than one agreement to achieve higher mileage or better availability.

Sweden: HYRBIL

The HYRBIL car co-op is now being implemented in the neighbourhood of Vivalla in Orebro. The concept was established in 1983 with the support of a co-operative petrol station in the centre of the area.

The society keeps 10 cars of various sizes and began with 30 member households. Cars are available at the petrol station at non-profit rates for members.

The HYRBIL scheme follows a one year experiment in 1980-81 called HYR125, in which holders of public transport farecards could rent cars from organised car rental agencies at a 40 per cent reduction. One per cent of all driving licence holders, and one per cent of all fare card holders tested the offer. 25 per cent of this group were considered to be a 'new market' for both fare cards and car rental. HYR125 accounted for nearly 15 per cent of the total car rental market. 70 per cent of the renters did not own a car, and 80 per cent of these said they would not buy a car if the system was made permanent.

A further proposal arising from this experiment is for a nationwide network of 25 paratransit stations located at main railway stations.

UK: Green Cars

Green Cars are described as 'co-operatively owned by more than one family or shared between people without...intimate personal relationships'.

Both fixed and running costs are allocated in proportion to the use made of the car by each member, the amounts being calculated periodically with the help of log books. A meter has been developed at the Open University for the purpose of allocating costs automatically on a mileage basis.

Although there are at least 17 Green Cars operating in the UK more or less successfully, the main problem is the inflexibility inherent in schemes with only one or two vehicles. Advance booking is required to ensure car availability, and success depends largely on the participants' compatibility and ability to co-operate.

USA: Mobility Enterprise

The Mobility Enterprise — operated by Purdue University, Indiana, from 1983 to 1985 — aimed to increase the productivity of the car through the use of 'mini/micro' cars in conjunction with a shared fleet of intermediate and full-size vehicles. Unlike other shared car schemes, it operated in a car orientated area — West Lafayette — with high car ownership, low density housing with individual off-street parking and virtually no public transport.

The aim was not therefore to direct people away from cars, this would not be feasible, but to reduce multiple car ownership, and to increase the proportion of travel made in small, energy-efficient cars.

The 14 member households of Mobility Enterprise were provided with a mini/micro car, specially imported from Japan, to meet their daily and local travel needs. In addition they were given access to a shared fleet of three full size vehicles for longer trips or when more load carrying capacity was required.

USA: STAR

STAR stands for short term auto rental and is the name of a car rental club for the 9,000 residents of the Parkmerced apartment complex about 25 minutes metro ride from downtown San Francisco.

STAR members paid \$25 a year subscription to share 70 cars located at an underground garage. As its name implies STAR was a form of car rental designed to cater for short duration as well as longer trips. A ten minute shopping trip for example could cost well under a dollar. Insurance, servicing, washing and repairs were all included. Individual trips were paid for on a mileage and time basis (billed monthly) and were manually booked in and out from the STAR office on site.

STAR was the brainchild of John Crain, of Crain Associates, who put up \$200,000 in confidence of his scheme becoming a commercial success. The scheme operated from 1983 to March 1985 during which time it is estimated that a third of the 350 STAR users either gave up car owning or postponed a decision to own a car.

There were problems in the design of STAR which led to its closure, notably the use of secondhand cars, which proved unreliable, and the administrative burden of manual booking and accounting. But the scheme was popular with members, and provided extra mobility, apparently without any overall increase in vehicle miles travelled.