URBAN CONCEPTS AND TECHNOLOGY STUDY
for European Commission DG XII

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CONTENTS

1.0 INTRODUCTION AND METHOD

Context

1.1 This report forms a component of the Urban Concepts and Technology Study for the European Commission, DG XII, being carried out by the Building Design Partnership, the outline purpose of which is the:

> 'Development of new 'urban concepts' integrating technologies and verifications of their applicability to certain given urban situations'.

1.2 The main theme of the overall study is the creation of a more 'humanised' city. This involves

* defining the characteristics of such a city,
* identifying the specific challenges in achieving the scenario, and
* setting out the means of meeting those challenges.

Within this process, the study identifies specific schemes or initiatives which contribute to the 'humanised city', and this report deals with two such initiatives which address the challenge of motorised urban mobility, namely car-free housing and shared car systems.

1.3 The search for a more 'humanised city' suggests that cities have, to some degree, become inhuman. The working hypothesis here is that the increase in individual motorised mobility experienced in cities throughout Europe is responsible for serious degradation of the quality of urban life. The plausibility of this hypothesis is now universally accepted, and indeed has led to many studies on the subject of transport and the urban environment over the past three or four decades, from the European Commission as well as from member countries.

The innovative element

1.4 This report examines two north-west European cities (Amsterdam and Bremen) that have specifically addressed the issue of reducing individual motorised transport as a way of creating a better quality of urban life, and are pursuing innovative solutions to excessive car dependency and use.

1.5 Many other cities have similar goals and policies, but the solutions studied here differ from those more widely applied, and more commonly understood. The 'conventional' approach to traffic limitation in cities focuses on infrastructure measures (such as improved public transport), or on demand management measures (such as parking control and charges). These target broad sectors of the urban population, and success is judged ultimately by observable shifts in travel patterns, economic trends, air quality and so on.

1.6 The schemes in this report differ from this approach in that they target specific

groups of the urban population and offer them the opportunity of living with minimum use of or dependence on the private car. Success of these schemes will depend inter alia on whether they result in reducing car use by those people who participate. Given the innovative and small scale of the schemes, they will not result in any perceptible change in the travel patterns of the city overall. Their value therefore lies not in the specific quantitative changes which they bring about, but in demonstrating the feasibility (or otherwise) of alternative approaches to urban mobility and urban lifestyles.

The case studies

1.7 Two case study cities have been selected, Amsterdam and Bremen, in order to investigate two related innovations in each, namely car-free housing and car sharing systems. Shared-car systems are conceptually linked to the car-free housing idea, and are therefore an important component of the case studies. The specific schemes studied are:

Amsterdam
* Car-free housing project on water company (GWL) land, Westerpark district;
* Community car rental, Westerpark;
* Autodelen shared car system.
* Call-a-car, Netherlands.

Bremen
* Car-free housing project, Hollerland;
* Stadt Auto shared car system;
* European Car Sharing, pan European initiative.

Definition of car-free housing

1.8 Car-free housing is a general term open to varying interpretations. An important issue arises from two particular definitions:

* New housing development designed to be lived in only by people who choose or elect not to own their own cars.
* New housing where cars, parking and access roads are kept out of the vicinity of dwellings, at the fringe of the site, but are still readily available to residents and visitors.

The first definition is compatible with the objective of lower car use and mobility in the city as a whole, whereas the second definition is not necessarily so. Keeping areas within the housing development free of vehicles may meet the objective of better immediate surroundings for the dwellings, but will not necessarily lead to any less car mobility by residents or visitors.

As in the descriptions of 'alchohol-free' drinks or 'fat-free' foods, car-free is not meant to be taken literally. For example, the spirit of the concept is not broken if one per cent of residents (say, people with a mobility handicap) own cars, or if a

small percentage of trips by residents are made by car, or if on occasions a motor vehicle enters the car-free precinct, for example for furniture deliveries or building repairs.

Definition of shared car systems

1.9 Shared car systems are more complex and difficult to define, partly because new types of system are still being developed. In essence, however, shared car systems can be defined by their key objective, namely a system which provides people with a genuine alternative to individually owned cars. This involves having access to a vehicle locally, spontaneously, and exclusively. In order to achieve the goal of less car use, such systems must produce benefits for the participants when they drive less, for example by shifting the balance from fixed costs (which are high with individual car ownership) to marginal or variable costs.

Study method

1.10 The specific choice of cities is justified by the advanced stage of development of the car-free housing and shared car schemes. While other cities are known to be planning housing with reduced provision for the car, Amsterdam and Bremen apparently will be the first to have major projects completed. A further consideration was the availability of contacts with key actors in both cities.

1.11 The approach taken was a series of semi-structured interviews with key actors in each city, supported by documents, and in each case visits by the researchers to the relevant sites. Interviews and other investigations were carried out during September 1995 using the following outline framework for analysis:

* Goals for humanising the city
* Initiatives for realising the goals
* The role of technology, including social technology
* Implementation issues, especially those affecting replicability of initiatives

The more detailed analytical framework used can be found at Appendix C.

2.0 THE CASE STUDY CITIES IN CONTEXT

2.1 The Dutch city of Amsterdam and the German city of Bremen are situated about 250 kilometres apart, close to the north western coast of the European mainland. Both have had, and developed around, important seaport installations, reflecting their history as important centres for international trade. The larger of the two cities, Amsterdam, has one of the largest historic centres in Europe which for the most part has avoided the ravages of war. The historic areas of Bremen on the other hand were largely destroyed in the second World War, and only small parts have been reconstructed.

2.2 In recent decades, the industrial, port and shipbuilding functions of both cities have declined, in the case of Amsterdam releasing much needed land for new housing.

2.3 The structure of the two cities is rather different. Amsterdam is developed to a high density in a relatively compact structure, with most of the built up areas lying within 8 kilometres of the city centre. Bremen by contrast has a looser structure with generally lower housing densities, and with development stretching for 40 kilometres in a linear fashion along the banks of the River Weser. The related port of Bremerhaven, 60 kilometres from the centre of Bremen itself, accentuates this linear structure.

2.4 Amsterdam can be said to be one of the three main cities of the Dutch Randstad (ring city) agglomeration, along with Rotterdam and The Hague. Bremen is linked through its port function to Bremerhaven, but otherwise is a free-standing city within the Lower Saxony plain.

2.5 The cities differ also in their government structure. Amsterdam is a relatively powerful city within a relatively small country, where power is shared both with national government, and with 16 lower tier city district authorities. Westerpark is one of these districts. Bremen has greater status and autonomy within the German Federal Republic than its size would suggest. In most parts of Germany, power is shared between the Land (state) and municipal and county authorities. Bremen, however, is a city-state where these powers are combined, giving a high degree of governmental autonomy. Germany's two other city-states, Berlin and Hamburg, both both have multi-million populations, compared to Bremen with 650,000 (including Bremerhaven).

3.0 AMSTERDAM

Profile of Westerpark car-free housing

Brief description:

Development of new housing on ecological principles for people who want to live without a car, and without the problems of other cars.

Site:

6 hectares site (excluding buildings to be retained) two kilometres west of central station.

Development:

600 dwellings in blocks of varying design. Density 100 dwellings per hectare.

Tenure:

50% for social renting, 50% owner occupied.

Developer:

Four housing associations leasing the land from Westerpark District Council.

Status:

Construction started (site cleared by September 1995).

Car-free component:

No cars allowed into the housing area.

Vehicle access controlled for emergency and special purposes only, thus vehicle-free surroundings.

Aim to allocate housing to people willing to sign a letter of intention to live without owning a car.

Residents' alternatives to the car:

Local facilities (shops, schools etc) accessible on foot;

Bus service and cycle paths to city centre, tram route to other destinations.

Community shared car scheme will have pick-up point for at edge of the scheme.

Parking:

180 spaces at edge of scheme. 45 of these for cars of visitors, of those with mobility disability, and of the community car service. Permits for use of other 135 spaces to be allocated to residents by lottery.

Profile of community car service (BAS) shared car system

Brief description:

Cars available for members within the local community, on an hourly rental basis, paid by a mixture of subscription and hourly and distance charges.

Site:

Existing site to be supplemented by site within or adjacent to the car-free housing.

Status:

Fully operational and expanding. Started 1994 by conventional car rental company as commercial franchise for Westerpark District Council.

Operation:

Users book by telephone (office hours) and collect car from car rental office.

Origins and goals of car-free housing

3.1 The Westerpark district of Amsterdam, the focus for our case study, contained the epicentre of the famous squatter riots of the early 1970s, leading for a time to social housing being allocated by residents themselves rather than the city council. This period was one of more widespread discontent in the city, including opposition to development and transport policies.

3.2 This period of citizen unrest led to a general re-alignment of city planning and transport policies towards the late 1970s, for example the shift away from satellite settlements to the 'compact city' model of development, and the decision to emphasise public transport and bicycles rather than private transport. It says something for the tolerance of the city council that the period of civil unrest was portrayed in the council's permanent exhibition of the history of Amsterdam's development.

3.3 Westerpark itself, one of 16 Districts of Amsterdam, is politically very left-wing, and the district is currently controlled by a 'Red-Green' coalition. The area has high unemployment (30%) and a mixed population, with people on relatively low incomes, together with people who are relatively well off. Many are also well educated, and familiar with community involvement in housing and planning decisions.

3.4 The Westerpark car-free housing scheme originated with the political idea locally that people who live without their own cars (whether through choice or necessity) should not have to live with the cars of others.

3.5 The scheme's design was an initiative of the newly established Westerpark district council, though the decision to create a car-free development may be seen in the context of the wider political and planning climate of the time:

* In 1990, the Dutch government adopted a new transport structure plan, which included, amongst many policies, a call for a greater role for car-free housing, and said 'It is time to start considering appropriate kinds of layout for residential areas in a sustainable society; municipalities will therefore be invited to develop sustainable projects, and Central Government funding will be available for the most promising experiments' (Second Chamber of the States-General, 1990, page 33). (It should be noted that the same document, while promoting the concept of ride-sharing to improve car occupancy, did not mention car sharing as an alternative to car ownership - this concept was little known at the time.)

* In March 1992, six months before planning for the GWL development began, the City of Amsterdam held a referendum on the issue of traffic

reduction in the inner city. This produced a small majority in favour, leading to specific plans for its achievement agreed by the City in 1995 (Lemmers, 1994).

* Other proposals for car-free housing have been put forward elsewhere in Amsterdam, notably on the former dock areas east of the city centre. These are not currently being developed because of uncertainties in the housing market.

3.6 Another key factor in the origin of the scheme is that of housing density. The neighbourhood adjacent to the site contains the highest density housing in the Netherlands, with 220 dwellings per hectare. Development policies for the site determined by the city council were for a density of at least 100 dwellings per hectare, and this density could be incompatible with high quality environmental standards if full car provision were provided. In addition, the housing finance available from the city was conditional on the required density being achieved, and insufficient to provide for underground parking and access.

3.7 The objectives of the scheme itself are to provide housing which meets ecological aims, and has high design and landscape quality. The planning scheme for the site (the 'bestemmingsplan') specifies that it will be a 'car-free' development, though this needs further explanation.

3.8 Key events in the Westerpark car-free housing scheme:

September 1989	City of Amsterdam decides on GWL waterworks site for housing.
January 1990	Amsterdam divided into 16 districts or 'city parts' with semi-autonomous elected councils and administration.
Autumn 1992	Westerpark District begins planning of the project.
March 1993	Consultant report on legal aspect of car-free housing.
Summer/Autumn 1995	Site preparation, construction begins.

The role of technology

3.9 Having described the schemes, and the goals they are intended to serve, we now briefly review the role of technology.

3.10 The Westerpark car-free housing development is presented as using state-of-the-art environmental building technology, in particular for the conservation of heat, energy and water. It has not been possible within the scope of this study to assess the effectiveness or economic viability of the particular building technologies used.

3.11 Also important to the scheme is what we have termed 'social technology' aspects, which are concerned with the management and operation of the scheme. These

can be summarised as follows:

* Use of two caretakers on site to control access into the site of exempted vehicles, by means of electronic card operation of the entry gate (this technology is becoming common, for example for deliveries to shops in pedestrianised streets).
* Enforcement of the parking area for residents only.
* Allocation of social housing to applicants who will not thereby create additional housing pressure in the District.
* Requiring new residents in the scheme voluntarily to sign a pledge to live without owning their own car, or to make minimum use of car mobility.
* The allocation of parking spaces first to priority users (eg. those with a disability), and through a lottery system.
* The provision on-site of a community car service at preferential rates for resident subscribers.

3.12 The most significant use of information technology amongst the schemes studied was in the innovative 'Autodelen' shared car system. Although not operational at the time of the visit (operation began the following day), the use of computers in the booking, billing, allocation, and monitoring of car use is a potential break-through for much more widespread application of shared car systems.

3.13 This technology could help to overcome, or at least simplify, some of the difficulties encountered with shared car systems:

* Ability to identify particular users of each car at any time,
* Selective access to cars depending on reservation priorities,
* Avoidance of beurocracy and paperwork, especially for users,
* Monitoring of car and member activity.

Implementation issues

3.14 Innovative schemes which depart in some way from the mainstream of development or transport practice do not come about easily. The Westerpark scheme is no exception, but it is necessary to examine the process of implementation, and to question whether any lessons can be learnt.

3.15 The most fundamental issue concerns the intention to promote the scheme for those willing to live without their own cars. This raised the issue of whether it was possible, with recourse if necessary to enforcement using legal processes, to make non-ownership of a car mandatory for all people living in the scheme. The consultants commissioned to investigate this issue concluded that this was not possible under existing Dutch law. This means that only voluntary agreements with prospective residents can be made, which would seem to have a number of disadvantages:

* Residents who initially agree not to own cars, can subsequently change

their minds.

* Those intending willingly to live by the agreement could find their decision undermined by those who decide to break it.
* The inability to reserve the housing solely for those without cars means that car parking has to be provided in the scheme. The existence of this parking is a highly visible contradiction of the car-free principle.
* Adherence to the agreement relies on peer pressure or sense of duty or principle, which may be difficult to sustain over time.

3.16 The timetable of implementation is given above. The process included considerable involvement of the community, and the design process was in outline as follows:

* In November 1992, 1,600 leaflets were distributed in the locality, to invite people to an evening meeting.
* The meeting was an open debate on the housing scheme, the only fixed decisions were:
  - Density (600 dwellings on 6 hectares)
  - Development on environmental principles.
* Of the people attending, 60 decided to participate in further discussions. The District officers met with these twice a month to discuss the scheme.
* In the meantime, politicians came forward with the idea of a car-free development. The participation group agreed this on condition that other people's cars would also be kept out.
* 18 architects were invited to submit competition entries for the design of the scheme, of which 4 were chosen. These 4 worked with the District urban designer (who was also an architect) to produce the final designs, each architect designing one or more of the blocks.
* Only one of the original 60 remains involved and will live in the scheme. However, new participation groups have been formed to discuss the design of the actual apartments. About 120 people came to a meeting to discuss the plans with the architects themselves, and designs were modified as a result.
* The District owns the land, and is leased to 5 housing associations, who together commissioned one contractor to build the whole scheme.

3.17 The public participation process was time consuming, but because of it, there were no objections to the zoning plan (bestemmingsplan) when it was produced in 1994, and this saved about 6 months by not having to hold a public inquiry.

3.18 Management of the scheme when completed will be through a community association, which will include representatives of the residents, the housing associations, and the two caretakers, who are responsible for social as well as technical aspects of management.

3.19 The strong commitment to the community by both residents and politicians is noticeable in the process. It is perhaps significant that in Amsterdam, local

politicians are obliged to live in the area they serve.

3.20 Implementation of shared car systems raises rather different issues. Car-free housing involves new ideas and issues within an area of traditional local authority activity, but shared car systems involve an entirely new aspect of municipal concern. Westerpark District was the first in Amsterdam to offer a community car service franchise to its residents, and the successful operation of that scheme for perhaps two years before the car-free housing is complete has provided the confidence necessary to establish it as part of the car-free housing initiative.

3.21 Implementation of the Autodelen scheme, although not linked in any way to Westerpark, follows an entirely different model. The initiator was personally motivated by the principle of a genuine alternative to individual car ownership, and persued it as an independent commercial venture. This was made possible by the involvement of his wife, who had both business and computer systems experience, and also by Amsterdam City Council who invested in some infrastructure for the on-street car pick-up points. The greatest difficulty in setting up the whole scheme was overcoming the various beaurocratic hurdles: permissions were needed from 7 separate local authority departments.

4.0 BREMEN

Profile of Hollerland car-free housing

Brief description:

Development of new housing for people who undertake to live without owning a car.

Site:

2.6 hectares at edge of city, 6 kilometres north east of city centre.

Development:

210 dwellings including 150 apartments and 60 terraced houses. Density 80 dwellings per hectare.

Tenure:

Mix of social housing, private rented and owner occupied.

Developer:

Gewoba, the housing agency of the city of Bremen.

Status:

Original idea 1992-3 from seminars at Bremen University; detailed planning 1993-5; construction due to start late 1995. Completion expected 1996-7.

Car-free component:

No cars allowed into the housing area.

Vehicle access controlled for emergency and special purposes only.

Consequently, vehicle-free surroundings in which to live.

Residents sign a contract which obliges them not to own a car whilst living in the scheme.

Residents alternatives to the car:

Local facilities (shops, schools etc) accessible on foot;

Bus services and cycle paths to University (10 minutes) and city centre (20 minutes).

Planned extension of tram route will serve the site.

Stadt Auto shared car scheme will have pick-up point for 1 or 2 cars at edge of the scheme.

Parking:

28 spaces at edge of scheme for cars of visitors, of those who become disabled, and of the Stadt Auto shared car scheme.

Profile of Stadt Auto shared car system

Brief description:

Cars available for members within a local community, on an hourly rental basis, paid by a mixture of subscription and hourly and distance charges, designed as a genuine alternative to individual car ownership.

Site:

Several sites in different parts of the city.

Status:

Fully operational and expanding. Started 1990 as private initiative.

Operation:

Users book by telephone (24 hours) and collect car from local pick up point, where a safe contains the car keys.

Users complete form for each trip and deposit this in safe for billing, which is done monthly by direct debit.

Hollerland site:

Only 1 or 2 cars planned for car-free housing due to expected low demand.

Origins and goals of Hollerland car-free housing

4.1 The residential development is designed specifically for people to live without owning their own cars. Unlike the Westerpark scheme, it is expected that residents' non-ownership of cars will be legally enforced. The means by which this will be achieved without infringing laws which uphold personal liberty has been a major challenge for the promoters of the scheme.

4.2 As with Westerpark, the aim is to provide a very high quality living environment for people who decide to live without owning a car, by ensuring that such people do not have to suffer the problems caused by other people's cars. This benefit applies, of course, only within the development itself. Additionally, residents will themselves impose less burden on other parts of the city, by not driving to or through them.

4.3 The Hollerland scheme was not political in origin; it developed from a research project at the University of Bremen under the title 'living without cars'. This project was concerned with why some people consider themselves to be dependent on the car, and conversely to investigate why some people should voluntarily live without a car. Several seminars on this theme were held at the University, with representatives from the City. The professor conducting this research, together with a civil servant from the city of Bremen, developed the idea of a car-free housing development, and set about persuading the city, its housing agency, and indeed the wider community, that there was a market for such housing.

4.4 The concept of car-free housing arose from broader concerns about the negative impacts of the car on environmental quality, and also the spatial requirements of the car, which conflict with the normal tenets of 'urbanity' and 'community'.

4.5 Hollerland was chosen partly because it was a site becoming available in the short term, and partly because its location made it unsuited to the provision of through roads. Its position at the edge of the city, however, is recognised as being less than ideal in terms of access without cars. While the main destinations are served by public transport, travel further afield or to other suburbs would involve travelling first to the city centre.

The role of technology

4.6 The main contribution of Hollerland is in the realm of 'social technology', examples being the use of shared cars to provide 'mobility insurance' for residents living

without their own car, and the innovative use of legal instruments to make the scheme feasible, and to ensure that the goals of car-free living are achieved.

4.7 A particular problem that had to be overcome was the Reich Garage Code of 1939, which since that time has compelled the provision throughout Germany of at least one parking space for each new dwelling constructed. A change in the law was thus necessary before the Hollerland scheme could legally be constructed.

4.8 The second problem was the feasibility of requiring residents not to own cars as a condition of residence. The scheme promoters believe that, after more than two years examination of the possibilities, a solution to this has been found. Even so, the success of the scheme will depend on sufficient people living without their own cars, since any departure from this will cause parking (and traffic) problems elsewhere.

4.9 As with the Westerpark scheme, there is a sense in which the principles involved depend on minimum use of technology in the conventional sense of marketable hardware. Residents' life-styles are envisaged which make minimum use of motorised transport or building equipment such as lifts and waste disposal, as part of the objective of reducing noise, pollution, and non-renewable energy consumption.

4.10 The housing scheme relies mainly on environmental building techniques to achieve efficient use of energy. The design and layout of the housing blocks includes consideration of passive solar power, and heat and energy conservation. There is otherwise no particular innovation in the environmental technology applied in the development.

4.11 Keeping the housing area free of vehicles also involves management techniques and barrier control of the access ways, but such techniques are widely used, and a great deal of proprietary equipment is available, including various forms of barriers, ramps, bollards, and control equipment.

4.12 The Stadt Auto shared car system that will be offered to residents of the car-free housing itself represents an example of 'social technology', in that a user-orientated system is established to simultaneously serve community-orientated goals. Although such systems are not widely used in Europe as yet, with more than 100 operational schemes it may no longer be appropriate to describe shared car systems as innovative.

4.13 Two issues arise from the study of the Hollerland case. First, replicability of the system may require more sophisticated technology and systems design, if it is to be applied without reliance (as at present) on committed enthusiasts for the concept.

4.14 Second, is the issue of whether shared car availability is crucial to the success of the Hollerland car-free housing scheme. It was initially assumed, by the present

authors but also initially by the scheme originators, that residents would need cars available on a shared basis to provide an alternative when theyu no longer owned their own cars. It was felt that there would be some journeys for which there would be no reasonable alternative to the car (eg. escorting elderly relatives, collecting heavy items of shopping). Discussions with the prospective residents of Hollerland have, however, led to a revision of this assumption. The people concerned appear to be fully committed to a genuine car-free existence, and have indicated that they do not wish to use any cars, not even shared cars. As a consequence the Stadt Auto company is intending to locate no more than 2 cars at Hollerland for the entire scheme, at least initially. This is unlikely to be an economic operation, but it is considered important to maintain the principle of multi-mode choice and availability. Also, there can be no certainty that residents will maintain over time their radical commitment to car-free lifestyles. In essence, this is an issue of social technology involving market research and monitoring.

Implementation issues

4.15 Bremen's status as a city-state has assisted in the implementation of the car-free housing concept in at least two respects. First, the change in the law allowing housing to be built without 100% car parking provision for residents was relatively easy straightforward. Other cities first have had to pursuade their respective state government to act, for example Nuremburg has pursuaded the Bavarian government to anul the provisions of the Garage Code.

4.16 Second, the developer of the scheme is the city's main housing agency, Gewoba, which owns about two thirds of the city's housing stock. This organisation is subject to the policy influence of the City administration, thus making possible the implemenation of innovative housing policy, and is also sufficiently large and experienced to handle the development issues. A smaller independent developer might not be able or willing to take the necessary risks. (Gewoba was formerly owned by city unions, but is now an independent non-profit organisation in which the City has a 49% stake.)

4.17 However, there were difficulties associated with dealing with such a large bureaucratic organisation. Gewoba were initially sceptical about the idea, and were only pursuaded when the administrative barriers to the scheme were removed, and interest from the public became apparent. Even after official acceptance of the scheme, the housing association were not enthusiastic about the research and development aspects of such an innovative scheme.

Public involvement

4.18 There is a history in Bremen of enabling residents to express their wishes to the authorities, and this has helped in the planning of the Hollerland scheme. A group was appointed in 1980 to act as moderator between the housing developer (Gewoba), the city, and residents ('Bewohnerberatung'). For the Hollerland

scheme, this work has been financed 50% by the city, and 50% by the European Commission. Their report was presented in September 1995.

4.19 The Hollerland scheme has from the start emphasised the participation of interested parties and prospective residents. In terms of the design of the scheme the main events were as follows:

* Press notice in June 1992 produced 300 inquiries from prospective residents.
* Prospective residents invited to meetings and workshops to discuss the concept, and the site.
* They chose a number of architect-planners from a list provided by the city council. The criteria included experience of building and urban development, but also of participation in the design process.
* September 1993, architects presented their ideas at a meeting with the prospective residents.
* Further meetings at which design issues were raised and resolved. Concerns shifted, however, to dwelling prices rather than dwelling design.

4.20 Two examples of how the design was altered in the design workshops are:

* Residents wanted a circular housing block enclosing a courtyard, until a demonstration with a scale model showed that some dwellings would recive little daylight.
* The small parking lot was relocated away from the pedestrian access between the housing and the bus stop.

4.21 Strong media interest has been maintained, and it is recognised that positive coverage and support from the media is crucial. The scheme's success depends on being able to 'sell' the idea of a car-free lifestyle. Negative portrayal of the idea could reduce willingness to participate in what is inevitably a learning process.

Stadt Auto implementation

4.22 A feature of shared car systems is that they can begin on a small scale, and grow or contract according to demand. They could be implemented by a large organisation on a wide scale, but so far this has not occurred. Schemes have mostly, like Stadt Auto in Bremen, come about as a result of a few individuals with commitment to the concept as part of a strategy for reducing dependence on cars, and with the opportunity and skills to develop appropriate schemes. The Bremen scheme received some initial financial support from the city (Ministry of Business), and sponsorship for promotion work, and also a contribution of computer software for the operation of the scheme. (This software is now used by a third of ECS members.) Now, however, the scheme is self financing and supports 3.5 members of staff.

4.23 Amongst these committed individuals, however, is a recognition of the benefits of

integration and common standards, hence the creation of, and participation in the organisation known as European Car Sharing, currently coordinated from Stadt Auto in Bremen.

4.24 A particular problem in Bremen, and elsewhere in Germany, is the lack of power of local authorities to designate street space for particular companies or organisations. The guaranteed availability of parking for the shared pool of cars is essential for the success of the operation (otherwise users cannot find the cars they have booked), and consequently in Bremen pick up points have had to be provided on off-street sites. This limits application in precisely those areas where shared cars are most useful, namely in areas of extreme parking scarcity.

4.25 Stadt Auto is concerned to maintain the ecological principles of its own operation and (through ECS) those of other car sharing schemes throughout Europe.

4.26 Unlike the Autodelen scheme in Amsterdam, or the Call-a-car system, Stadt Auto buys its own cars. This clearly requires start-up finance since the cars must be available in advance of the members. Financing was arranged through a bank. It is considered important to offer new cars for the scheme, to counter the fears and doubts of potential members:

* Is a car available?
* Is it clean?
* Is it reliable?

Outcomes of Stadt Auto

4.27 Unlike the other schemes investigated in this study, which have not yet been implemented, Stadt Auto has been in operation for 5 years, and so its impact and success can be judged.

4.28 It is estimated that overall, for all members, the scheme results in a reduction of 10% of cars owned. This results from the 'three thirds' rule of thumb of people joining Stadt Auto:

* one third do not own cars and would not have owned cars,
* one third do not own a car but without Stadt Auto would have bought one,
* one third own a car when joining.

4.29 1 in 6 of people in the latter two categories either sell a car or are dissuaded from buying one.

4.30 Efforts have been made to capitalise on the benefits of a reduction in cars, by promoting and partly financing the conversion of on-street parking places to bicycle parking racks. 60 spaces have been converted in Bremen so far.

4.31 Of course, it is not just important to reduce the total car stock, but also the extent of

car use (kilometres driven). An issue is whether the reduced car use of former car owners is offset by increased car use by those who previously did not own cars. However, users of Stadt Auto drive a great deal less than car owners on average, about 2-3,000 kilometres compared to the German average of around 12,000 kilometres. Although precise data are unavailable, an estimate is that 20-25,000 kilometres are saved for every 10 members of Stadt Auto. With 400 members, this means a saving in excess of 8 million kilometres each year.

4.32 While this is insignificant in relation to current totals, in the long term, widespread availability and membership of Stadt Auto would drastically reduce car kilometres, and hence noise, pollution and danger.

5.0 CONCLUSIONS

Goals for a more humanised city

5.1 Both the Westerpark and Hollerland car-free housing schemes were motivated by the goal of creating better living conditions that are free of the problems created by accommodating motor vehicles in housing schemes. In Amsterdam this arose from local politicians, who argued that those living without cars should not have to suffer the problems caused by the cars of others. In Bremen the idea was promoted by a city official and a university professor.

Both Amsterdam and Bremen have demonstrated a commitment to creating a more humanised city environment in their wider plans and policies. While the two car-free housing schemes can be seen as part of these broad goals, there was in neither case apparently any direct link from overall policy to specific scheme proposals. It fell to committed individuals to make the conceptual links, and to secure the necessary official commitment and support for action.

All of the schemes studied (both housing and shared-car schemes) had environmental and quality of life objectives behind them. These provided the motivation of certain key individuals who promoted the schemes, often in the face of considerable obstacles and resistance. In no case did a scheme arise from the day-to-day workings of bureaucracy.

The aims of scheme promoters were in all cases pragmatic and rational, to secure environmental and lifestyle benefits of less cars, while retaining mobility benefits through high quality alternatives and selective car use.

The car-free concept

5.2 The concept of car-free housing is open to mis-interpretation, and two types of scheme should be distinguished:

* *Housing which provides vehicle-free living space*. This does not preclude residents from owning cars, but does prevent anyone from driving or parking within the living areas.
* *Housing for car-free living*. The housing is available only to people who renounce car ownership. This provides for residents the benefits of the first category. In addition it provides benefits for the whole city through less car parking and less car driving.

The Westerpark scheme satisfies the first category only; the Hollerland scheme in Bremen satisfies both categories.

There is a clear demand for car-free housing in both categories. The extent of this demand is not known, but in any case is likely to vary according to the experience from pioneering schemes studied.

The legal possibility of ensuring that residents do own their own cars is crucial for the more radical second category. The promoters of the Westerpark scheme concluded that it was not possible under present Dutch law. In Bremen, it is believed that existing housing laws can be adapted. This is clearly an area where much further work and experience is needed.

Shared car systems are seen as an important component of car-free housing, offering 'mobility insurance' to those who have renounced car ownership.

Their role is not yet clear in car-free housing, since prospective residents have expressed a desire to live without any cars, not even shared cars.

There appears to be a divergence between the pragmatic views of scheme promoters, who work towards a scenario of rational multi-mode living, and prospective residents of car-free housing who appear to be more evangelistic in their distaste for the car.

The role of technology

5.3 The schemes studied have a range of technological ideas and techniques combined to meet social objectives. This is quite distinct from technology promoted for commercial objectives, which may or may not provide social benefits.

The schemes differ from the conventional approach to transport planning. Instead of intervention in the system as a whole (large infrastructure projects, public transport subsidies etc), the schemes studied target individuals and their specific needs and desires. In terms of planning techniques, this represents a switch from the approach of designing systems to meet forecast levels of demand, towards one of public involvement, market research, and market experimentation.

Technology in the conventional sense is used to support the operation of the car-free housing and shared car systems. There is no doubt that technology could further enhance the viability of such projects. But it is equally clear that the projects have not arisen from, nor been dependent on the development or application of new technology.

Because of the environmentally-oriented goals of the car-free housing schemes, building technology has been applied to conserve heat and energy, and to minimise the impact of the housing on the environment.

Social technology

The schemes studied require a broader definition of technology for their contribution to be fully appreciated. The integration of techniques within a single project in the service of wider community objectives may be referred to as 'social technology'. This concept can then embrace not only information or engineering

technology (such as the Autodelen computer-controlled car-sharing system), but also legal innovation, participation models of planning and decision making, and techniques of building which minimise waste, or use of non-renewable energy.

This concept of social technology is important, because it allows the importance of technology to be acknowledged where it is of benefit to all, whilst at the same time recognising that in meeting community objectives, the best solutions may depend on minimum use of technology.

5.4 Handling innovation

Innovative schemes require the involvement of committed and highly competent individuals. None of the schemes studied was a product of normal bureaurocratic structures or processes.

Equally, such committed individuals require the support and backing of official bodies for the implementation of their ideas and projects.

Converting innovative ideas to mainstream practice, however, will require political and official commitment on a much wider scale. An example, perhaps, is the attempt of the Dutch Ministry of Transport to promote the call-a-car scheme throughout the Netherlands.

In achieving the necessary know-how for the replication of car-free housing, the schemes studied offer valuable experience in terms of

* participation models of planning and city management;
* encouraging 'movers' and overcoming 'blockers' in the implementation process;
* financial and legal issues;
* potential contribution to the goal of the humanised city.

Car-free housing in the narrow sense of dwelling precincts free of vehicles is not particualrly innovative, and can easily be replicated.

Car-free housing in the more radical sense of being available only to those who renounce car ownership depends crucially on the necessary legal instruments being available.

The success of car-free housing will ultimately depend, however, not on legal enforcement, but on the willing participation of residents. Legal instruments are necessary to protect the interests of the majority who willingly renounce car ownership, from the minority who might break the principle and hence undermine the viability of the entire concept.

Shared car systems are too numerous to describe or evaluate in this report. The conclusions from the systems studied may be summarised as follows:

* Shared car systems can be commercially viable;
* They can offer an alternative to individual car ownership;
* They can operate with minimum use of technology;
* Replicability could be aided with greater encouragement from all levels of government, including the Eurpoean Union;
* This applies especially to meeting the objectives of common standards and practices, as currently promoted by European Car Sharing;
* Computer and comminications technology is relatively underdeveloped in this field, but is potentially capable of making shared-car systems replicable in a wider variety of locations.

Finally, there is a need for much more rigorous monitoring of the effects of shared car systems and car-free housing on travel patterns. Only in this way can such initiatives be fully integrated with city-wide transport and planning objectives and programmes.

APPENDIX ATHE SCHEMES IN AMSTERDAM

The Westerpark housing scheme in detail

The scheme is for the construction of 600 dwellings on 6 hectares of land formerly used as a water pumping station. Some buildings on the site will be retained for community use.

The site lies about 2 kilometres west of Amsterdam central station, adjacent to an area of very high density housing built between the two world wars. It is served by a tangential tram route which skirts the historic inner city area, and by a bus route from central station to the employment area of Sloterdijk to the west. Shops, schools and community facilities are located within a short walk or cycle ride.

Car-free?

All residents will be asked to sign a letter of intention to live without owning a car. After an investigation by consultants (Werkgroep '2Duizend, 1993), it was found to be impossible under Dutch law to enforce this, but residents will be sought who are wholeheartedly in support of the spirit of the scheme, which is to provide for a lifestyle in which the car plays only a small part. There is apparently very strong demand for such housing, the District having received 4,000 inquiries in response to a small newspapaer advertisement.

The term 'car-free' can justifiably be used in relation to the layout and design aspects of the scheme, which will ensure that all spaces internal to the site are kept virtually free of parked and moving vehicles. This means that within the scheme, residents without cars do not have to suffer the cars of others. This is not particularly innovative, however, since many housing schemes have been built (in Amsterdam and elsewhere) where roads and parking have been kept to the edge of the development, or underground, allowing ground level vehicle-free areas within.

The scheme cannot be described as 'car-free' in the sense of providing only for people who do not own cars. Some reports have portrayed the scheme as such, but the final design incorporates 180 parking places, including spaces for visitors, those with a disability, and for loading. 135 will be available to residents of the scheme, and these will be allocated by a lottery system. Users will then pay 51 NLG (about £20) per three months for a permit to use the car park, but does not provide a designated space. The Westerpark scheme could therefore more accurately be described as 'car-reduced' rather than 'car-free' housing. Nevertheless, it is the firm intention of Westerpark District to allocate housing to those who have a firm commitment to living without their own cars. A crucial issue will be whether the scheme is attractive to people who own, or aspire to own, a car.

A principal of the council is that 'no public money should be spent on parking provision'. Underground parking for the scheme would have cost 40,000 NLG per

space, but was ruled out in any case on engineering grounds. The surface parking to be provided will cost 10,000 NLG (£4,000) per space.

It appears that the ratio of parking spaces to dwellings will be greater than in the adjacent high density area built before the war, from which it is expected many of the future tenants will be drawn. The older area offers (mostly on-street) about 0.2 parking spaces per dwelling. The GWL car-free scheme offers 0.3 spaces per dwelling. (This compares with the planning standard in the inner city of 0.5 spaces per dwelling.) Consequently, residents in the scheme could have a greater possibility for car ownership than they do at present, except of course they cannot guarantee a parking permit through the lottery system.

Mixed use development

The scheme has incurred a deficit of 35,000 NLG per dwelling, to be made up by housing subsidy. The dwelling units will be 50% social housing, and 50% owner-occupied. Social housing subsidies are paid to households with an income of less than 75,000 NLG (£30,000) on dwellings whose cost is up to 200,000 NLG. Allocation of the social housing is based on a priority system as follows:

1. People displaced by redevelopment (none at present).
2. People who will leave behind a small apartment, and have lived in Westerpark for 5-10 years.
3. The same, but coming from another district.
4. All others.

It is considered important to attract better-off people into the scheme, to maintain spending power in local shops. The sale price of owner occupied dwellings will be 275-375,000 NLG for sizes ranging from 70-135 square metres. The first 28 units for sale were offered on 1st May 1995, and attracted hundreds of applicants for what are expensive apartments.

The site incorporates some listed buildings, including the old pump machinery building, and these together with the water storage tower will be retained in the scheme. There will be a community building including a creche and day centre for the elderly run by the District.

Design and layout

The scheme is notable for its ecological design features, including energy, heat and water conservation, and waste recycling. In terms of architecture and landscape, the design had to meet the requirements of high density combined with a high quality external environment to exploit the benefits of a car-free site. Some features are listed here:

* The landscaping has been specially commissioned, and follows in some ways the principles of the English 'garden city'. Every dwelling has access to

individual open space:
  - ground floor apartments have their own garden,
  - top floor apartments have roofgardens,
  - tenants of other apartments can rent an allotment for 35 NLG (about £15) per annum.
* In line with supervision and 'defensible space' principles, gardens will be enclosed by hedges 1.2-1.4 metres in height.
* One block is designed specially for people with a severe disability.
* Five playgrounds are provided, including one for teenagers located to reduce noise nuisance.
* A natural gas driven generator will provide heat and electric power (CHP) for the scheme.
* Rainwater toilet flush is provided.
* Showers and taps are of a water saving design.
* Refuse collection points are located at two corners of the site; these have underground containers with 7 compartments for different types of waste, and these will be emptied once a month (such waste collection techniques are already operating elsewhere in Amsterdam).
* Cycle paths will be provided, but it is conceded that as normal in the city, cyclists will ride where they wish.

The environmental measures will cost 2 million NLG (about £800,000 or £1,300 per dwelling) of which 40% will be met by direct subsidy.

Shared car systems in detail

As noted above, there are different forms of shared car system, and three have been studied in the Netherlands:

* Community car service, Amsterdam
* Autodelen, Amsterdam
* Call-a-car, Netherlands government initiative.

Community car service

Westerpark District council offered a franchise for the operation of a community car rental service, offering to local subscribers short term car rental at preferential rates. This service has been operated by Diks car rental company in Westerpark since February 1994. The service is not specifically related to the car-free housing scheme, but is seen as a way of providing occasional car access to those who do not own a car (currently three quarters of the households in the locality do not have a car). The car-free housing concept, however, relies on enabling people to live without their own car, and the community car service has established itself as helping to meet this objective. (Other important components include good local public transport, and a good range of facilities available within a short walk or bicycle journey.) The franchise held by Diks car rental therefore includes a specific requirement to establish a local office and car pick-up point within or adjacent to the

Westerpark car-free housing development.

The service is similar to conventional car rental except for the following positive features:

* Cars are available locally within a short walk or cycle ride. (Diks offer a 5 NLG delivery and collection service, but most users do not bother with this.)
* The minimum rental period is 1 hour, compared to half day for conventional rental.
* For subscribers who live in Westerpark, rates are 50% lower than normal car rental.
  They pay 100 NLG to join, and can then rent for 5 NLG per hour (25 NLG per day) plus 50 cents per km. Also for members a car is guaranteed.
* There is no form filling or document checking at the time of rental.
* Non-residents of Westerpark can also join but they pay 300 NLG.
* The rental is available up to 7 pm (not so far a 24 hour service)

A decision on the continuation of the Diks franchise will be made in February 1996, so research on the effects just started in September 1995. So far it appears that 20% members have sold their own cars in six months.

Diks car rental report that they attracted 200 members in the first 18 months of operation in Westerpark, compared to a target of 50. The community car service (De Buurt Auto Service, or BAS) is already offered by Diks on a similar franchise arrangement in two other districts of Amsterdam, and will soon start a third. Hence the concept has already proved to be replicable.

Autodelen, Amsterdam

Autodelen is a private commercial initiative, but with financial and other support from Amsterdam city council. A pool of cars is made available at (initially) two pick-up points for subscribers to the scheme. Each member has a key which opens a safe at the pick-up point which in turn contains the keys to the cars kept at that point. Cars can be reserved by telephone, 24 hours a day, and keys to those cars at those times are automatically locked except to the person with the reservation. Record keeping and billing are carried out by computers in the street safe, in the cars, and at the head office. The scheme started operation on September 7th 1995, with an official opening on October 6th.

Call-a-car

Call-a-car is essentially an alternative format of community car service. As with that system, cars are available locally to members for short term rental. Being more easily available, and for shorter time periods than conventional car rental, the aim is to provide a genuine alternative to individual car ownership, and so can be categorised as an 'environmentally friendly' system. Unlike the community car service, the cars are not necessarily owned by a conventional rental company. In

the scheme studied, in Culemborg, the cars are owned by car dealers, and the cars are kept on their forecourts.

The term Call-a-Car ('Bel een auto' in Dutch) was invented by the Dutch Ministry of Transport and Public Works who in 1992 decided to promote the system throughout the Netherlands as part of its strategy for reducing the growth in car use. The Ministry employs a specialist to promote the idea, and to assist local municipalities to establish schemes in their areas. By 1995 at least 40 municipalities in the Netherlands had either started schemes or had expressed positive interest in doing so. As with Autodelen, it potentially provides another option for the provision of car support for car-free housing schemes like Westerpark.

APPENDIX BTHE SCHEMES IN BREMEN

The Hollerland car-free housing scheme in detail

The site lies at the edge of the built up area of Bremen, about 8 kilometres North East of the city centre, to which it is linked by a local and an express bus service. There are plans to extend an existing tram route past the site. The site is part of a 'new town' proposed in the 1960s but never developed due to a downturn in the forecast population. Most of the rest of that land is now a nature reserve, so there will be no future extension beyond the present scheme.

The scheme will include 210 dwellings (original plan for 250 dwellings) on a site of 2.6 hectares (just over 80 dwellings per hectare), a density somewhat lower than Westerpark, but higher than existing housing in the locality. Cars will not be allowed into the site, though provision is made for occasional and emergency vehicle access to all dwellings. Parking provision amounts to 28 spaces, for visitors, residents who become disabled, and shared cars. A change in the law was required to allow parking provision below the norm throughout Germany of one space per dwelling.

The scheme includes 150 flats and 60 row houses. The tenure pattern will be:

* Row houses all owner occupied
* 25 flats social (subsidised) rent
* 125 flats rented or owner occupied (the mix will depend on market conditions)

If there is no interest for owner occupation, the developer is content to rent all units, so this does not affect the viability of the scheme. (Note than in Bremen a small subsidy is available for home ownership as well as renting, depending on the family and dwelling characteristics. Subsidies are also available for those with special needs.)

The main idea is that people will want to live without a car. The city has no power or will to force people not to own cars, but people wishing to live at Hollerland will sign a contract not to own a car.

For people renting the situation is simple, because the rental contract will preclude the ownership of a car for all family members.

For owner occupiers, the intention is to adapt an existing type of legal contract, used in Germany for apartment buildings, which binds the owner to a share of the responsibility for common roofs or open spaces. This can be adapted to apply to row houses as well as to flats, and to include non ownership of a car while living in the property. This is considered to have the additional benefit of giving substance to the idea of shared responsibility for amenities and environment, and shared benefits of no cars.

When a resident sells the dwelling, the commitment to no car is sold with it. It is conceded that this has yet to be tested in the courts.

The City does, however, have established powers to keep cars out of the housing scheme. Barriers will prevent vehicles entering the access ways, but key access will be possible for refuse collection vehicles, and scheme representatives will allow access by key for other special purposes such as emergencies and removals.

The 28 parking spaces are grouped at one end of the scheme, and are for shared cars (estimated initially at only 1 or 2 for the whole scheme), visitors, and for cars of residents who become disabled.

Environmental design features include:

* Passive solar energy (orientation of dwellings)
* Temporary use of existing district heating system, and subsequent use of waste incinerator district heating system.
* Heat insulation of buildings

Landscape design was not integral to the design of the scheme, and was still not finalised at the time of study. Only certain principles are established such as no provision of kerbs, and as little paving as possible.

Stadt Auto shared car system

The Stadt Auto shared car scheme started in Bremen in 1990, with the aim of providing access to cars without ownership of cars. This aim determines the structure of the system:

* Spontaneous use possible, 24 hours a day
* Flexible use
* Hourly hire
* No bureaucracy
* Neighbourhood based

Members of Stadt Auto make a telephone booking (taken by a 24 hour taxi company), and collect the car from their local pick-up point, where the key is kept in a specially designed safe.

The director of Stadt Auto in Bremen, in 1995 became also the convenor of European Car Sharing, an organisation acting as an umbrella for well over 100 shared car schemes in Austria, Germany, Netherlands and Switzerland. ECS is concerned with members having access to all schemes and hence with standardised systems of operation and charging.

Stadt Auto is concerned to maintain the ecological principles of its own operation and (through ECS) those of other car sharing schemes throughout Europe. These include. for example,

* A car-share tariff always at least twice the price of public transport,
* Cars in the fleet kept for at least two years (conventional car hire companies sell cars on after 4-6 months),
* Promote car-sharing as an alternative to car ownership, byt linking with other transport providers, such as the German Federal Railways and local public transport undertakings.

APPENDIX CGuide for key-actor interviews and document search in Amsterdam and Bremen

KEY POINTS (all schemes)

1. Goals and objectives of the scheme?
   * What was the motivation for the scheme?
     (Eg: concerns about lack of choice in housing or travel; adverse effect of cars in housing; cost of space devoted to cars; design constraints imposed by cars)
   * Who initiated the idea/scheme?
     Top-down or bottom-up? (Academic, citizens' group, pressure group, municipality, state government, business)
   * To what broad goals and objectives does the scheme contribute?
     - Environmental
     - Social
     - Economic
     - Other
   * Are these explicit in plans for the district/city/region/state?
     What are the relevant documents? Are they available?
2. In what way will the schemes create more 'humanised' environments?
   * Opportunity (choice) for people to live in better local environment?
     - More green space
     - Less danger from traffic,
     - More freedom for children,
     - Security issues (do people feel safe in traffic-free spaces?
   * Influence (reduce) use of cars, contributing to general environmental conditions?
   * Participation of citizens in planning, design, management?
   * Fostering community spirit and involvement?
3. What role does technology play?
   * Use of technology in the scheme?
   * Potential for technology in the scheme? (eg. communications, teleworking, teleshopping)
   * Relevance of technology external to the scheme (transport facilities, payment systems, information systems, technology relating to other sectors such as health and education, and accessibility to these)
   * Management or social technology? Low/intermediate technology

4. Implementation issues?
   * Who decided on the scheme?
   * Who is involved in implementation? What roles?
   * What constraints were there? (legal, planning, political etc)
     How were these overcome?
   * Financial issues.
     - Who pays, who contributes?
     - Who profits?

KEY POINTS: CAR-FREE HOUSING SCHEMES

1. Function

* What is mix of activity on the site?
  - Number of dwellings
  - Types of dwellings (size, tenure, rents, prices)
  - Non residential activities
* How does the scheme relate to overall housing programme in the city?
* What people will live in the scheme? (Social mix, likely market segment, employment, age, stage of lifecycle)

2. Form

* What is the layout, form and density of buildings?
* Design characteristics (low rise, single aspect, materials, defensible space etc)
* What are proportions of land use (building, open space, access ways, parking, non-residential)

3. Linkage

* Internal linkages - between people and activities within the site.
* External linkages - between the site and the locality, and the city.
* Existing links, and those to be improved, developed, eg. publ;ic transport, walking, cycling routes.

4. Technology

* Any particular technology identified in the buildings/layout
  (eg. solar power, CHP, heat conservation, microclimate, low energy design, intelligent buildings)
* Potential for communications or other technology
* Transport technology
  - Walking and cycling;
  - Public transport;
  - Shared access cars, car rental

5. Social technology

* Legal agreements for car-free living
* Incentives for car-free living?
* Resident selection, involvement
* Management, maintenance
* Future protection of car-free status?

6. Market characteristics

* Profit, non-profit?
* Developers' enthusiasm (perceived market)
* Demand (actual or tested market)
* Replicability? (extent of the market)
* Filling a gap in the market, or shaping the market?

7. Benefits

Lower provision for cars will provide potential for different benefits; what particular mix was selected?

* Lower cost per dwelling (higher profit or lower price/rent?)
* More dwellings on the site
* More green/open space per dwelling

* Ranking of these by potential residents?
* What other benefits attract residents? (Lifestyle benefits, travelstyle benefits)
* Quantification of benefits?
* Disbenefits?

8. Promotion

* How was the idea promoted?
* How was the scheme marketed?

9. Implementation

* Who designed the scheme?
* Who will build?
* Infrastructure provision?
* Timescale, timetable?

10. Problems

* Difficulties encountered
* Lessons learnt for next time

KEY POINTS: SHARED CAR SYSTEMS

1. Type of scheme
    * Shared access to pool (neighbourhood based)
    * Subscription car rental (local base)
    * Flexible car rental (by hour, no minimum)
    * Support system (eg. guarantees, taxi back-up)
    * More than one scheme?
2. Operational design
    * Dedicated to car-free housing scheme?
    * Available to others in locality?
    * Links to other branches, other schemes?
    * Charges, fees, membership
    * Insurance
    * VAT or other taxes
3. Technology
    * Booking (computer, telephone, drop-in)
    * Key security
    * Billing technology (fuel, kilometres, time, meters, smart cards, credit cards)
    * Charge system (direct debit, monthly account)
    * Car security
    * Key security
    * Vehicle type/mix
    * Vehicle tracking?
    * Records
4. Market characteristics
    * Characteristics of membership (age, income, education, car ownership, stage of life cycle, household characteristics)
    * Characteristics of non-joiners?
    * Market share/potential?
5. Promotion
    * How is scheme promoted?
    * Guarantees for those who sell their car?
    * Financial/other incentives to join?
6. Implementation
    * Private/cooperative arrangement
    * Municipal initiative
    * Commercial initiative
        - bespoke
        - existing company (name?)
    * Subsidies, financial contributions?
    * Management/Staffing/Customer involvement
    * Accountability
7. Monitoring of benefits
    * Reduced car use
    * Reduced car ownership
    * Reduced parking requirement

* Membership
* Mode of travel patterns

8. Problems

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