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The European Paratransit Experience

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The European Paratransit Experience

A Report in the Series
Paratransit: Options for the Future

Final Report
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Table of Contents

	<u>PAGE</u>
ACKNOWLEDGMENTS	
FOREWORD	
1. INTRODUCTION: THE EUROPEAN PARATRANSIT EXPERIENCE	1
2. PUBLIC DEMAND RESPONSIVE SERVICES	4
3. TAXI-BASED SYSTEMS	13
ROUTE TAXIS	14
CONTRACT SERVICE FOR THE ELDERLY AND HANDICAPPED	19
THE SHARED TAXI/DIAL-A-RIDE INTERFACE	20
"QUASI-CABS"	21
4. RURAL PARATRANSIT	24
5. PUBLICARS AND SHARED VEHICLE SYSTEMS	31
6. RIDESHARING	36
7. SUMMARY: THE EUROPEAN EXPERIENCE	43
GLOSSARY	44

Tables

	<u>PAGE</u>
Table 1 DRT LANDMARKS IN EUROPE: A SUMMARY	6
Table 2 TAXI-BASED PARATRANSIT LANDMARKS	15
Table 3 SOME LANDMARK EUROPEAN RURAL PARATRANSIT PROJECTS	27
Table 4 MAIN PUBLICAR LANDMARK PROJECTS IN EUROPE	32
Table 5 SOME RIDESHARING PROJECTS IN EUROPE	37

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Foreword

Paratransit - the "family" of transportation services between the private drive-alone auto and fixed route transit - is a concept which formally emerged in the early 1970's. Much has occurred since the seminal UMTA-sponsored Urban Institute study - Paratransit: Neglected Options for Urban Mobility (1) - popularized the term and the concept around 1975. However, despite the fact that paratransit is no longer a neglected option, there is still considerable controversy regarding what paratransit is and what it might accomplish. The attitudes towards paratransit are as diverse as the range of services which are included under the paratransit mantle.

Paratransit: Options for the Future is intended to unravel some of the controversy concerning paratransit. Specifically, the overall report is aimed at developing an understanding of the nature of the various paratransit concepts, the results and impacts they have had, and what roles they might play in the future.

The assessment of the experience of paratransit to-date is based on in-depth case studies of a number of services. These studies were designed to identify institutional, site-specific, and operational factors which have most directly influenced the impacts of various types of services. The effort has differed from other recent projects, in that no attempt has been made to develop a comprehensive list of paratransit systems. (Indeed, to provide a broader perspective, we have drawn upon the results of a number of previous studies, notably Barb and Cook (2), Multisystems (3), Systan (4), and Voorhees (5).) Instead, we have attempted to utilize a subset of experiences to provide a better understanding of what paratransit services can and cannot be expected to do. In adopting this approach, we are cognizant of the fact that, by focusing on specific cases, some of the important experiences of paratransit may be missed. However, it was felt that this approach would allow a more in-depth assessment of paratransit than would be possible if an attempt were made to review a greater number of services. The cases selected were intended to cover as wide a range of service permutations as possible. However, where appropriate, information on services not included as case studies has been incorporated as well.

The assessment of the "state-of-the-art" of paratransit traces the evolution of the concept for each market sector considered. Unlike the treatment of the individual paratransit experiences, this discussion is oriented towards an assessment of the forms to which paratransit has evolved, rather than a judgemental analysis of specific services.

Finally, the report addresses possible future directions for paratransit. The aim is to explore the potential future roles and forms of paratransit, partly to aid in guiding its future development in the most effective directions. An emphasis is placed on trying to explore how various future factors will influence paratransit, as well as the way paratransit itself may impact future trends.

The report itself is divided into stand-alone volumes addressing the specific market areas into which paratransit services generally fall: Paratransit for the Work Trip - Commuter Ridesharing; Paratransit for the Transportation Handicapped; General Community Paratransit (in Urban Areas); and Paratransit in Rural Areas. In addition, the report includes a volume on The European Paratransit Experience, covering the development of all types of paratransit in Europe. The Overview volume summarizes the characteristics of the individual types of service, and identifies issues and themes which are common to more than one specific market area. Finally, the Conclusions volume summarizes the findings of the overall study and presents recommendations concerning the future development of paratransit.

1 Introduction: The European Paratransit Experience*

The history of paratransit in Europe over this last decade is substantially different from the U.S. experience. To the European mind, North American developments in this area have been comparatively clear cut. Progress in the U.S. continues to be monitored fairly closely. In recent years, what is perhaps most striking to the European observer concerning the paratransit "movement" as a whole in the U.S. is the massive increase in interest in the concepts of ridesharing, transportation brokerage and their variants. These are substantially more difficult concepts for the European transportation specialist (and institutional structure) to deal with, as will be seen in the pages that follow.

In Europe in general, even in informed transportation circles, the word paratransit does not have the same currency that it has in North America. Not only is it rarely, if ever, recognized when used in discussions, but also, there is not really a functional equivalent in the languages of the continent. This tends to go a fair way toward explaining the fundamental differences in underlying attitudes on the subject between the two continents.

To appreciate these differences, the first thing that the U.S. observer must do is recognize that, unlike the North America experience, public transportation is perceived as highly viable in Europe. Public transit works, and, as a result, has a clear place in virtually all larger European cities - and very strong support in terms of institutions, the regulatory context, funding

* This volume differs considerably in both structure and approach from the other volumes of this study. Rather than attempting to separately explore the history, current state-of-the-art, and possible future directions of paratransit, as is done in each of the other volumes, this volume is simply intended to provide an overview of paratransit's development in Europe. Further, rather than examining paratransit services through the market/setting framework employed in the remainder of the study, this volume uses a service type approach (although it too separates out rural services), with each service type broken out by individual countries. The differences in paratransit in Europe dictate this different breakdown. Also, please note that the material in this volume was produced more than a year earlier than the final drafts of the volumes on the U. S. experience.

mechanisms and habits. Admittedly, it is expensive, but the institutions involved in making these decisions to support existing public systems and approaches are well in place, politically well supported, and operate in a sector where visible progress has been made on many fronts over the last decade and more.

Increasingly, however, despite these successes, European sources are gradually beginning to be aware of a new sub-set of movement problems, with profiles that seem to call for radically different approaches from those which have been relied on in the past. The main thrusts of this growing uneasiness with the existing alternatives include:

- o an increasing questioning of the cost-effectiveness of traditional transit, outside of those high density corridors where it clearly works well,
- o the steady escalation of subsidy requirements for these conventional systems, which now is beginning to reach truly threatening proportions,
- o the increasingly evident access problems of people living in new suburban communities and other outlying lower density areas,
- o growing pressure for improved transportation in small communities, rural areas and among the handicapped.

Strangely enough, there does not seem to be much pressure (as yet) emanating as a result of either: (1) the very high cost of gas at the pump (which is currently getting on, with variations, into the \$3.00+ area); or (2) the clear potential (and need) for reducing oil imports through the massive introduction of ridesharing. Both of these pressures can, however, be expected to make themselves felt in the years ahead, with obvious implications for the paratransit movement.

To appreciate European perspectives and attitudes in this regard, it is useful to bear in mind some of the terms which are being used to discuss these issues at the present time. Because the word paratransit tends to be resisted, the British, for example, have often used the term "unconventional bus services" to describe what they see as their functional equivalent of paratransit -- a term which barely disguises the establishment's basic disapproval of such concepts, and in any event, immediately limits the spectrum of options to be discussed. Less often used is the term "intermediate

transportation" with the (now familiar) idea of the search for some sort of service "between fixed-route buses and fully flexible automotive transport." The French most often use terms which translate to "semi-public transport" or "demand-responsive transportation," nearly always in the context of a dial-a-bus type project. Elsewhere, the general tendency is to refer to the specific kind of service, and not to seek a broader overall label to describe what could be the full range of options to be explored.

The point to be made is, much like in the U.S., there is no central paratransit constituency in Europe. Instead, the tendency has been to move in a much more piecemeal fashion. What makes the European situation even more difficult is that there isn't even a single word to describe the range of paratransit concepts, and, hence, no basis for commonality between different concepts.

Paratransit has thus taken place to date in Europe as a series of largely independent movements, with as yet no central unifying factor, vocabulary or institutional focus. To the extent that these sorts of non-traditional service options have managed to make any headway at all in recent years, this has been achieved:

- o in cases where there has been a felt need for an alternative to the whole public transit/private car dichotomy,
- o by dint of their specific approach and specific (i.e., limited) constituency.

Taken together, these two factors mean that in Europe, to a much greater extent than in North America, paratransit is something that you do, not something you write about. In almost all cases, it represents a -- usually local -- reaction to a specific mobility requirement or opportunity at the community level. Rarely recognized by the official central transportation institutions, and even more rarely supported with specific public funding, these initiatives tend to get relatively little publicity or recognition beyond the places they occur. This, of course, makes charting developments in the sector rather more difficult, but should not be taken as meaning that nothing is happening there, as the following should indicate.

In the following sections, the recent experiences with paratransit are reviewed. As in the other volumes of this report, both case study and non-case study systems are discussed.

2 Public Demand Responsive Services

The dial-a-ride concept provides a useful microcosm of European attitudes and approaches to paratransit. Beginning in about 1970, the first tangible manifestations of possible European interest in this area began to appear. In all cases, it was clearly a case of the Europeans "looking over their shoulders" to follow and make use, as appropriate, of what was going on in the U.S. at the time.

Interest in demand-responsive transportation (DRT) first appeared in the United Kingdom, Netherlands, Germany and France -- more or less in that order -- and at something of a lag later in Sweden, Norway and Belgium. For a variety of reasons, mainly tracing to the essentially conservative nature of the public sector (and a concern with other problems and priorities), little effective interest in this approach has as yet been manifested elsewhere in Europe. Even where such interest has materialized, in most cases, as will be seen, the tendency has been to "think small."

The experiences with demand-responsive transportation in each of these countries is summarized briefly in Table 1 and the sections below.

United Kingdom

Among the most notable characteristics of past DRT projects in the U.K. have been their small scale, limited service ambitions, and, after about 1975/76, the lack of central government interest and support. Among the main models for pre-1973/74 British interest in DRT were the (mainly smaller) U.S. projects and the Canadian (Ontario) Dial-a-Bus projects. Previously, the Department of Transport (earlier, Environment) had manifested a certain degree of interest in dial-a-ride as a possible new transit approach for the U.K. By the time that the first round of small-scale projects was underway, they had concluded that the general approach was highly expensive, non-evolutionary, and nowhere close to national transportation priorities or needs. At that point, all active central government support effectively ended. Just prior to that, Ford of Britain had similarly abandoned its interest in this area, when the whole concept failed to take off as quickly as had earlier been hoped.

The net result was an effective and almost immediate running down of what was once Europe's largest DRT program, with the entire matter being left

completely in the hands of local government and operators, with unfortunate results. In retrospect, it can be seen that probably the main reasons for this state of affairs were: (1) the original tendency to see DRT as a straight-forward technology-cum-service package that could be fairly easily harnessed by professional transportation operators to deal with the problems of low-density lines which they were increasingly being obliged by public agencies to serve; (2) the limited commitment in terms of time, money, and institutional support to the idea; and (3) the tendency to "freeze" all research, projects, etc. into a very strict and limited DRT mold, with the effect that there was virtually no possibility for creative evolution.

Whatever the reasons, the facts are, that by 1976 the drive to experimentation in this basic area was generally discredited in transportation circles in Great Britain, and by 1980 only one of the original demand-responsive services operated by professional transportation operators (Sale) continued to be active in Britain. The remainder have either gone by the wayside or survive as small and extremely rudimentary community services. Currently, emphasis is primarily on finding ways of improving (at low cost) rural transportation, as will be seen in the section that follows.

Netherlands

Basically, a single project - BUXI (Bus and Taxi) - tells the story of DRT in Holland up until 1977. BUXI was conceived as a semi-demand-responsive (route deviation) system combining a scaled-down regular bus service with the convenience and flexibility of the taxi. The basic goal of the Dutch Center for Transport Planning was to "test" and "prove" the BUXI system, with a view to eventual transfer and adaptation to other sites. The system was implemented as a demonstration project in the town of Emmen in early 1970.

The service basically functioned from the outset as a fixed-route jitney; the demand-responsive option was little used, and was consequently discontinued in 1972. Eventually (in 1975) the system was changed to regular fixed-route, fixed stop service and the minibuses were later replaced by standard transit buses. Since ridership grew steadily over the years, the project cannot be considered a failure; however, the demand-responsive element never developed to the extent planned, and the overall project has thus often been written off as "just one more dial-a-ride failure."

Table 1

DRT Landmarks in Europe: A Summary

Project Name	Type	Year Initiated	Present Status
<u>UNITED KINGDOM</u>			
Bristol (Parkway)	MTO DAR	1972	Withdrawn
Chelmsford	MTF DAR	1972	Shelved
Abingdon	Rt. Dev. Jitney	1972	Withdrawn
Maidstone	MTF DAR	1972	Active
Harrogate	MTF DAR	1972	Active
Andover	DAR Proposal	1972	Refused license
Cranfield Institute	Research Program	1973	Inactive
East Kilbride	Rural DAR	1973	Refused license
Eastbourne	MTF DAR	1973	Withdrawn
Carterton	MTO DAR	1973	Withdrawn
Old Harlow	MTF DAR	1974	Withdrawn
Hampstead Garden Suburb	MTF DAR	1974	Withdrawn
Sale DAR	MTF/MTM DAR	1974	Active
Chiddingly	Rural DAR	1975	Withdrawn
Milton Keynes	MTF DAR/jitney	1975	Ongoing (being withdrawn)
Solihull	MTF DAR	1975	Withdrawn
Stockton	DAR	1976	Inactive
Yaxley DAB	MTF DAR/jitney	1976	Active
Sawtry DAB	MTF DAR/jitney	1976	Active
<u>NETHERLANDS</u>			
Buxi	Simple DAR/jitney service	1969	Replaced
Buxi follow-up	Several prop. DAR's	1971/73	Not followed up
SPECTRA	MTM DAR proposal	1975	Inactive
ALPUT	E&H DAR	1975	Proposed
Taxibus	DRT R&D/demonstration	1975	Active
O-Bus	DRT Checkpoint development program	1978	Active
Streekbuxi	Feeder jitney	1979	Active
Belbus	DRT Jitney demo	1978	Active
<u>FRANCE</u>			
St. Cloud Busphone	MTF DAR service	1975	Active
Andresy-Microbus	MTF DAR service	1975	Failed
Angers Radiobus	Check Point Service	1976	Inactive
Confluent Busphone	Check Point DAR	1977	Active
LA STUS	Check Point Service	1978	Active
Busphone Proposals	Several under discussion at the present time		

Table 1 (cont'd)

Project Name	Type	Year Initiated	Present Status
<u>GERMANY</u>			
Retax	DAR R&D	1970	Active
Rufbus	DAR R&D	1971	Active
Wunstorf R-bus	Check point demo	1978	Active
Friedrichshafen Rufbus	Check Point demo	1977	Active
Telebus (Berlin)	E&H DAR	1979	Active
Columbus	DRT/AVM demo	1979	Active
<u>BELGIUM</u>			
Waterloo Telebus	DAR Proposal	1975	Not Activated
Cheque Taxi	E&H DAR	1972	Active
Sonnez-le-Bus	DAR Proposal	1976	Not Activated
<u>NORWAY</u>			
Mandal DAB	Research Project	1977	Not Activated
Oslo DAR	Research Project	1976	Not Activated
Nordkolt (DAR)	Component of large alternatives study	1976	
<u>AUSTRIA</u>			
Weiner N. Stadt DAB	MTF site study	1977	Not activated
<u>SWEDEN</u>			
DAR Options	Basic Research Program	1972	Research only
Fardtjanst	E&H DRT	1968	Active
Gothenburg DAR	Interim SRT Service	1968	Replaced
Telebuss	Check Point DAR Ltd. demo	1973	Inactive
Taxibuss	DAR Research	1975	Not activated
Stockholm DAR	3 DRT demos	1979	Active
Automated group taxi dispatching	3 DRT demos	1979	Active

DAR = Dial-a-Ride

MTO = Many-to-one

MTF = Many-to-few

MTM = Many-to-many

The original idea of developing the Emmen project as a demonstration that would later be used as a model for similar services in other Dutch suburbs never quite took off. In retrospect, the reasons for this can be discerned as including the following: (1) despite BUXI, the lack of a clear and convincing Dutch model; (2) the general failure of the idea of DRT to win much support anywhere in Europe in the immediate aftermath of that first initiative (i.e., 1972-1976); and (3) the lack of central government support or apparent interest in this general type of approach, and the corresponding failure of the idea to excite any other potential sponsors. As Table 1 indicates, there continued to be some more or less pure research interest in DRT through the mid-seventies, but for various reasons, none of these projects ever got off the ground at that time.

However, in 1976-77, the Ministry of Transport finally decided to set some priorities in this area, in large part as a result of the escalating subsidy requirements of regional operators in semi-rural areas of low and spotty demand. This has led to a total of four demonstration programs, three of which (Streebuxi, Taxibus, and Belbus) have demand-responsive elements and one of which (Buurtbus) involves a community bus project. All of these experiments are now being actively backed by the Ministry of Transport and operated by existing bus systems, and are aimed at serving lower density areas that are, in demographic terms, roughly equivalent to the far urban fringe of most U.S. cities. Of the three, the Taxibus is closest in technology and service intent to the more ambitious U.S. and German projects. In addition, a pilot project has just been launched at Philips (O-Bus) with the intent of developing a multi-level DRT-cum-AVM technology and service package, for which demonstration funding is currently being solicited. Overall, it can be said that the DRT and paratransit movements are only now really getting underway in the Netherlands, and that the chances for substantial near-term progress along these lines are quite good.

Germany

The story of DRT in Germany is essentially that of the RUFBUS and RETAX checkpoint paratransit systems. In late 1977, RUFBUS was implemented in Friedrichshafen, an area of 47,000 persons, of whom only slightly more than half have access to a telephone. This system began with seven vehicles and 29 checkpoints. Passengers can travel from one checkpoint to any other. Twelve

of the checkpoints were equipped initially with "trip selection terminals." Passengers accessing the system at one of these checkpoints (the alternative is to telephone the control center, from home or some other location) pay a partial advance fare and indicate, by pushing buttons on the terminal, the desired destination (and the number in the party). The information is automatically routed to a control center, where a computer makes passenger assignment and vehicle routing decisions. Vehicles are routed only to checkpoints from which there has been a demand for service. The system was expanded in 1979 to twelve vehicles and 48 checkpoints, and currently carries 1,800 passengers per day. The plans call for the system to be expanded throughout the semi-rural area of some 80 square miles surrounding Friedrichshafen and to operate with a total of 48 vehicles and 80 checkpoints (20 to be equipped with trip selectors).

RETAX (or R-BUS), implemented a few months after RUFBUS in the City of Wunstorf, is a very similar concept, also developed by a private corporation. Although RETAX was designed for suburban areas and RUFBUS for rural areas, the former is currently operating in a lower density area, serving some 15,000 persons. Fifteen of the checkpoints have destination selectors; the other four have public phones. The operation is very similar to that of RUFBUS; the system carries approximately 1,000 riders per day.

Based on the success of these two operations, developments in the automated DRT area are now moving quite quickly in Germany, and careful attention and monitoring in the U.S. will be justified.

France

Three projects (LA STUS, BUSPHONE, and CONFLUENT BUSPHONE) essentially summarize the current situation and future DRT prospects in France. LA STUS, a project implemented in Saumur in 1978, represents the successful marriage of grass roots planning and technological approaches to solving transportation problems. The development of the system involved a broad-based multi-level process of community input, emphasizing both citizen participation and a high degree of political support. The option chosen for implementation was a two-level "semi-DRT" scheme combining subscription with variable route service, all centered around a configuration of automated checkpoints. The system has been very successful. It was expanded considerably in 1979 and its

ridership (over 6,000 passengers per day as of 1980) has been more than twice what had been projected during the planning process.

Two earlier French DRT systems - BUSPHONE AND CONFLUENT BUSPHONE - were both developed by a division of Renault. BUSPHONE opened in 1975 in St. Cloud, a wealthy suburb of Paris, and consisted of a peak-hour subscription feeder service and door-to-door dial-a-ride service during the off-peak. The feeder was rather unsuccessful, however, and was abandoned in 1976, while the dial-a-ride has performed quite well and has been enthusiastically received by the community and by local businesses.

The second of Renault's DRT projects - the CONFLUENT BUSPHONE - was implemented in 1976 in an area containing three small communities (total population - 45,000) northwest of Paris. Like the BUSPHONE, service was divided into subscription and dial-a-ride components. However, rather than door-to-door service as in St. Cloud, the CONFLUENT BUSPHONE is a checkpoint service (with nearly 100 checkpoints). This structural difference has been largely responsible for CONFLUENT BUSPHONE recovering twice as much of its costs as has the BUSPHONE system.

The French approach has been somewhat less technological than what is going on in Germany; however the move toward checkpoint services on the one hand, and the development of more participatory planning and operational styles on the other, are advances of major interest.

Sweden

The main actors originally involved in pushing the development of DRT in Sweden have included the Gothenburg Transit Authority (GTA) and Volvo. The GTA took the step in 1968 of introducing the use of a radio taxi/jitney service in a new suburban area as an interim measure while demand was building up to the point of justifying full-scale bus service. This project was considered to be highly successful and cost-effective, but did not emerge as a model that was picked up elsewhere. At the same time, the GTA launched its Fardtjanst service which has not only emerged as a major DRT project in itself, but has more recently provided the jumping off point for a combined venture involving the GTA, Volvo and three taxi-owner federations to develop and demonstrate a new integrated multi-purpose DRT/SRT group dispatching service and technique.

Volvo has also independently launched and tested a DRT technology-based system (Telebuss) centering on a routing algorithm and dispatching system which was tested first for an internal minibus circulator system at its own factory, and, subsequently, in a suburb of Gothenburg and Boras. While these tests demonstrated the basic viability of the concept and hardware, there has been no move to follow up on it immediately.

The main Swedish Dial-a-Ride thrust at present involves a demonstration project in Stockholm consisting of three small checkpoint services. This project has substantial backing from the Ministry of Communications (who, for the first time, are getting directly involved in a DRT project of any sort), the Stockholm Transit Authority, and the Swedish Federation of Public Transport Operators. Its outcome will certainly be very important for the future of DRT in Scandinavia and, to a lesser extent, Europe as a whole.

Belgium, Norway, Austria

After two rather routine site studies for two possible small DRT projects, interest in DRT in Belgium appears to have declined. A proposal for a small Dial-a-Bus project in the small city of Wiener Neve Stadt in Austria has similarly not led to an actual service. In Norway, the Institute for Transport Economy has carried out several site studies with no positive results to date, while a general Scandinavia-wide study (Nordkoit) by the Scandinavia Ministry of Transport has surveyed and made recommendations concerning the possible utility of DRT approaches in the four country area. Essentially, the thrust appears to be that Sweden will take the lead immediately, and that the other countries will monitor progress there and elsewhere as useful.

Summary

The history of DRT in Europe has differed substantially from U.S. experience. There are a number of possible explanations for this, including the following:

- o limited support by central government until very recently, with nothing like an UMTA-style effort launched anywhere,

- o the relatively conservative nature of European national transportation agencies,
- o an extremely constraining regulatory environment which makes "unofficial" attempts at innovation nearly impossible,
- o the effective lack of any strong international push in this area, or other sponsors or pressure points,
- o in most places, a very narrow vision of what DRT was or could become.

Despite these constraints and barriers, future prospects in the sector are presently quite bright. In Holland, France, Germany and Sweden, demand-responsive systems are being pushed ahead. More recently in the U.K., the idea of service innovation has shifted over into rural areas, as will be seen below, and a number of interesting, if mostly small-scale, initiatives are proceeding there.

By and large, the thrust to checkpoint services is now very strong. In some countries (e.g., France and Germany), this is because home telephone ownership is still far from being universal, hence ruling out pure DRT for most communities. In these cases the real argument in this direction is based upon the improved economics that result from more rational clustering of stop points and routing that this permits.

3 Taxi-Based Systems

The preceding section has made it clear that the official public transit enterprises in Europe, by and large, continue to stand aloof from paratransit approaches, albeit with a certain number of exceptions which appear gradually to be picking up momentum. From the vantage of the taxi industry, however, a somewhat different approach is beginning to be observed. The section that follows attempts to summarize this situation.

To begin with, it must be understood that, much as in the U.S., taxis in Europe have long acted as a useful independent element in the passenger transportation sector. The transportation role and effectiveness of these services have been severely restricted, however, by the unwillingness of the industry to innovate, and the restrictions on innovation posed by legislation.

Over the past several decades, at a time that bus and urban rail systems within most of Europe's cities have uniformly converted from basically private and often highly fractionalized operations to be integrated into publicly-owned and increasingly regional transportation entities, the structure of the taxi industry has evolved little, if at all. The bedrock of the industry in most parts of Europe was, and remains, the independent owner-driver, with a gradual move toward a loose semi-cooperative structure. The early pattern of large privately-owned fleets with employee drivers continues in many places, but, by and large, this appears to be breaking down in the face of economic and political pressures which increasingly favor the independent driver. There is also a trend to straight leasing arrangements, as is common in the U.S.

The taxi industry's slowness to innovate is reinforced by its structural fragmentation, its long tradition of independence and, until quite recently, by the fact that it was doing well enough within the constraints of the old model. Without the benefit of public subsidy, fleets have been regularly renewed and qualitatively improved, 2-way radio dispatching has been introduced wherever appropriate, and the number of taxis has continued to increase to the point of pushing steadily on the limit of the available licenses.

As in the United States, however, in recent years, economic pressures have begun to build up as a result of sharp fuel price increases, more expensive vehicles, more costly insurance, and lost time in traffic jams. As a result of these and other factors, the industry is gradually beginning to feel the need to change its long-fixed profile. Until recently, however, the attempts at innovation that have gone beyond the marginal upgrading of equipment or service patterns have been the exception and not the rule. Since most attempted innovations have tended to be very local and the result of independent initiatives, they do not normally come into the public eye. In a few cases, however, more important projects or attempts have emerged, which can provide an indication of the general thrusts of development in this sector on the Continent as a whole.

Table 2 summarizes several dozen leading examples of taxi-based paratransit or paratransit-related service innovations in Europe. While the list is certainly incomplete, it should serve to provide a fairly good first view of the status of developments and thinking on this subject in Europe. Note that there is some overlap between this listing and Table 1, especially in the U.K. and Sweden cases. These duplications are minor, and reference is made here to ensure that the reader gets a fair view of what is going on under each heading.

Overall, we can perceive four major currents of activity that are likely to dominate over the next half decade or so. First, there is the route taxi concept which has gained considerable popularity over the past six years and which is discussed further below. Beyond this, there are contract specialized services for the elderly and handicapped. Third, there is the eventual fusion of dial-a-ride and shared-ride taxi service. The final concept, that which we refer to as the "quasi-cab," is discussed briefly in the closing section of this chapter.

Route Taxis

A route taxi aims at providing a smaller, lower cost vehicle as a substitute for regular transit service where demand is, for some reason, not sufficient to justify the use of conventional full-size scheduled buses. In

Table 2

Taxi-Based Paratransit Landmarks

Country/City	Type	Year Initiated	Present Status
<u>UNITED KINGDOM</u>			
Maidstone	Dial-a-cab	1972	Active
London	Route-taxi proposal	1973	Not activated
East Kilbride	Dial-a-cab proposal	1973	Not activated
Westminster	Maxi-taxi Terminal-based jitney study	1974	Shelved
Chelmsford	Polycab Shared-taxi demo	1976	Not active
<u>FRANCE</u>			
Paris	Jitneys (35-1 remaining)	1933	Active
Paris	Shared taxi proposal	1971	Shelved
Bescancon	Route Taxi	1972	Replaced 1975
Paris	Airport limo/scatter taxi proposal	1974	Shelved
Andressy	Microbus Dial-a-cab	1975	Replaced
Lyons	Feeder taxi/airport shuttle	1976	Active
<u>FEDERAL REPUBLIC OF GERMANY</u>			
Dusseldorf	Route taxi	1971	Active
Karlsruhe	Route taxi	1971	Active
Profzheim	Route taxi	1972	Active
West Berlin	Route taxi	1972	Active
Stuttgart	Route taxi	1972	Active
Bremerhaven	Route taxi	1974	Active
Dortmund	Route taxi	1974	Active
Bremen	Route taxi	1974	Active
Munich	Route taxi	1975	Active
Kiel	Route taxi	1976	Active
Sarrelouis	Integrated route taxi trial	1976	Discontinued
Pirmasens	Route taxi	1977	Active
Frankfurt	Route taxi	1977	Active
Friedrichshafen	Route taxi (Rufbus)	1977	Active
Hamburg	Route taxi (Retax)	1978	Active

Table 2 (continued)

Country/City	Type	Year Initiated	Present Status
<u>SWEDEN</u>			
Gothenburg	Route taxi/DAR	1967	Replaced
Gothenburg	E&H Service/DRT	1969	Active
278 cities/towns	Fardtjanst/E&H taxis	1971/6	Active
Malmo	Automated group taxi dispatching pilot	1979	Being deployed
Gothenburg	Automated group taxi dispatching pilot	1979	Being deployed
Stockholm	Automated group taxi dispatching pilot	1979	Being deployed
<u>NORWAY</u>			
Hasvick	Route taxi/DAR Proposal	1975	Not activated
Steigen	Route/feeder taxi proposal	1975	Not activated
Eidskoz	Dial-a-cab demo	1975	Replaced
<u>BELGIUM</u>			
Wolvwe St. Pierre	E&H taxi service	1971	Active

Europe, this approach has made substantial headway over the past decade, with several variants becoming fairly widespread.

The best known of Europe's route taxis are the German Lineintaxi or Sammeltaxi. These projects have in all cases: (1) been initiated by the local public transit agency; (2) involve direct contracts with local taxi enterprises; and (3) aim at providing specific service frequency along defined transit lines. Reasons for instituting such services in each case have been purely economic, and have resulted from the fact that local regulations require the operator to maintain minimum levels of service without regard to cost. To use these services, passengers proceed to bus stops as usual, pay the standard bus fare, and travel the usual line -- with the exception that they travel in a taxi rather than a bus. The taxi driver is paid a fixed fee to ensure the requisite minimum service frequency along the route (typically at 20 or 30 minute intervals); this fee usually represents considerably less than the transit operator would have to spend in order to keep full-sized buses on the road around the clock.

The first of these route or replacement taxis was established in Germany as a substitute for two bus lines in Dusseldorf in 1971. The formula was found to be a good one, and has since been picked up in more than a dozen other large German cities, as Table 2 shows. Within each place, a certain number of variants are practiced with respect to the details of service intervals, types of vehicle and back-up services, although the main lines of the approach are broadly the same across the country. What is significant is that this has been done by the local transporters themselves, without being pushed or cajoled by the central authorities.

In point of fact, the practice has become so widely accepted over the last eight years, that the sponsors of both the Retax demonstration in Wunstorf and Rufbus in Friedrichshafen more or less automatically decided to make use of this formula for operation of their projects in the low-peak periods.

An earlier route taxi project, making use of a slightly different approach, proved successful in Gothenburg, Sweden in 1967. There the problem was to offer a decent level of service in a new suburb over an interim period while the new resident population was just beginning to move in. To

accomplish this, the transit agency contracted with the local taxi operator to provide a semi-demand-responsive service along a fixed route. The service operated as a limited many-to-one "Dial-a-Cab" to get riders to the local train station, and as a route taxi for return trips. Passengers each paid the regular transit fare, with very fast service available for groups of 3 or more riders (thus -- interestingly enough -- placing the onus for grouping rides on the passengers and not on the operator). The service was considered highly successful by all participants; however, demand built up so swiftly that, after 3 months, the basic economics dictated a switch over to a full-sized scheduled bus. A similar project in Besacon, France operated successfully beginning in 1972, with service also later converted to scheduled transit buses. Despite these successes, this particular approach does not appear to have been tried again outside of Germany, although, in 1975, two such proposals were screened (but not activated) in two Norwegian cities.

Overall, the route taxi concept is one which can be expected to be reproduced in various ways across the European continent in the decade ahead. It would also appear to be promising in the U.S., although institutional issues here (i.e., 13(c)) may make it somewhat more difficult to implement.

Jitneys

The jitney as an independent, quasi-organized form of short-headway group transportation is, by and large, no more familiar on the European transportation scene than in the United States. The jitney differs from the route taxi in several respects. The basic operating principle is that the jitney operates over more or less fixed routes (in the sense of being generally recognized rather than tightly prescribed), but that they have, apart from termini, neither fixed stops nor fixed schedules.

The longest standing jitney operating in Europe has its origins in Paris, beginning in 1933. Gradually, over about two decades, a total of 35 jitney lines were developed to link the city's suburbs with the main gates of the central area. Of these, only one remains today. Its official status tells the whole story: the service is "tolerated, but not authorized" by the authorities.

Studies investigating the usefulness of introducing new jitneys were carried out in Paris in 1971/72 and London in 1973, but, in both cases, the reactions of nearly all the official actors, including the public transit operator, were universally hostile. Neither study led to a project or demonstration, or appeared to stimulate interest elsewhere in this concept.

More recently, in 1976, the Westminster City Council (a London borough authority) studied and pushed for the introduction of a jitney (the Westminster Maxi-Taxi), but there again sharp opposition from many quarters, including London Transport, precluded even a demonstration project.

Unlike the closely related route taxi, the jitney, as such, would not appear to have much of a future in Europe. This is mainly the case, we it appears, because the concept is a particularly uncomfortable one in areas where the existing official transportation authority is a strong one, as is the case in most European cities.

Contract Services for the Elderly and Handicapped

As is the case in the U.S., in recent years contracts have been awarded to the local taxi operator to serve the transportation-disadvantaged. In Europe, this has meant primarily the handicapped, and in recent years to a much greater extent, the elderly.

In most parts of Europe, special transportation for the elderly and handicapped is normally provided by welfare and charitable associations, complemented by reduced fare schemes on conventional public transport services. In a number of cases, however, attention has been given to the idea of making use of the existing taxi fleet for some portion of these services. In Brussels, for example, this has been done since 1971 with their "Cheque Taxi" service which carries both the elderly and the handicapped. Similarly, in Sweden, the "Fardtjanst" system has not only developed in its city of origin, Gothenburg, but has emerged as the E&H formula for transportation in the country.

What is important about the Fardtjanst-type system from the vantage of the taxi industry is that it serves as a means for identifying and bringing on line a whole new market segment. As developments in Sweden have shown, the

number of additional passengers and income that even a fairly modest service can mean for the taxi industry can be considerable. In many instances, ridership actually doubled within a fairly short period of time. The second aspect of this approach which is worthy of mention is the comparative ease with which it can be replicated, once the basic technique and institutional arrangements are down pat. Within a half-dozen years in Sweden, for example, the Fardtjanst formula has expanded from a single local enterprise to the point where it now covers literally every one of the 276 towns and cities in Sweden.

Two additional implications of this approach which make it of special interest are the facts that:

- o by helping to shore up the business side of the local taxi industry at a time of increasing economic pressures, it can make higher levels of taxi service available to people throughout the community; and
- o it serves to get the taxi industry -- and its regulators -- accustomed to the idea of service innovation and broader social service, in a positive context.

It is the latter issue which will probably make this particular approach a factor of particular importance as far as taxi sector developments are concerned in the decade to come.

The Shared Taxi/Dial-a-Ride Interface

The original dial-a-ride movement in Europe in the early 1970's ultimately turned out to have little of interest to offer to the taxi industry, and vice versa. Other than several small isolated British projects and the aborted Andresy Micro-Bus there was no major intersection of interest between the two approaches.

As in the U.S., however, the future appears to look altogether different in this regard. The signs are that the approach of clustering riders, and stops, so as to achieve higher occupancy rates on the one hand, and lower fares on the other, is now being thought through, this time from the specific vantage of the cab operator seeking to make his/her enterprise more cost-effective. Since it is he/she who ultimately is going to make the decision about introducing and/or continuing the service, there would seem to be a powerful

logic to such an approach. The fact is that the pressures for this sort of improvement are there, and, in a few places, the basic "model" for achieving this appears to be moving ahead.

At the leading edge, the Swedes are currently involved in a three-city demonstration project sponsored by the Swedish Taxi Owners Association with major inputs from Volvo and the Ericcson telecommunications group. The objective is to develop and put into operation a new taxi-dispatching system which will be gradually upgraded to permit a whole range of group-ride and shared-used services. The intention is to develop the basic systems elements (hardware and software) into modules covering 50 vehicles each, which can then be added and combined as appropriate to permit larger systems coverage.

Scatter Taxis

The "scatter" taxi concept is a form of shared-ride taxi in which service is provided out of major transportation terminals. While numerous shared-taxi operations of the scatter type can be observed to operate on a more or less informal basis throughout Europe, most of these operate at railroad stations in smaller (e.g., rural) communities.

More structured scatter taxi projects, resembling in most details the U.S. airport limousines that will typically serve half a dozen city nodes, have recently begun to get some attention in Europe. In Paris, a fairly ambitious proposed service along these lines was turned down by the authorities in 1974 when the major new airport was coming on line. More recently, a successful service of this type has been established in Lyons.

"Quasi-Cabs"

In most parts of Europe, taxis, although regulated primarily by local authorities, are quite rigidly defined by law. They are closely prescribed not only with reference to the areas that they can operate in, conditions of pick-up, fare levels, safety, etc., but also in term of the sorts of services which they can or cannot offer. These rigidities have served to keep most taxis away from innovation.

However, there also exists, in many countries, a certain number of "quasi-cab" operations which, on the surface, look much like cabs and which do

many of the same things that most people use taxis for, but also offer some services beyond those which the formally designated taxis are allowed to offer. In most cases, these services tend to operate in much less restrictive regulatory contexts, and enjoy greater flexibility in terms of their possible operation and use.

Throughout Europe, it is of course possible to hire chauffeur-driven cars. Although the range of uses to which these potential "transit" suppliers are being applied continues to be highly limited, there is considerable room for possible "public transportation" developments there. However, the vehicle rental firms, with one exception (see Section 5 below on PUBLICARS), have been slow to pick up the lead.

In France, there is a category of readily available, relatively low-cost chauffeured car - "voiture de petite remise" - which in many cases exists alongside the regular taxi industry. The main differences between the two (thus far) are that the former: (1) tend to operate mainly in more rural areas; and (2) cannot generally pick up passengers on the street. This is equivalent to livery services available in some American cities. Because of the looser regulatory structure, a certain amount of experimentation with new service arrangements, including subscription services, is reported to be going on - something which would not be possible for conventional taxis under current laws.

Similarly, in most British cities, two kinds of taxis operate: vehicles formally registered as taxis (i.e., usually the familiar Black Leyland taxis), of which there are some 28,000 in the country; and a second variant, which is usually referred to as a minicab, of which there are at least 325,000. Taxis in Britain, as elsewhere, tend to be highly regulated and highly conservative in nature, by and large proving quite resistant to new service ideas. Their number has been quite stable in recent years.

Minicabs, which are radio-ordered only and may not ply the streets for trade, on the other hand, are much more loosely regulated and have shown a fair amount of adaptability in recent years in an attempt to provide more appropriate services. While there is, as yet, no concerted move to organize these vehicles into some sort of more formal paratransit service mode, they often tend to function de facto as such, offering group ride and subscription

services in an ad hoc manner. Again, the basically local and private nature of these initiatives tends to keep them out of the public eye, but the fact remaining that the basic adaptability is there, and the sector is developing rapidly as a result.

Given the much less binding contexts within which they operate, it would be surprising not to see further developments of some of these quasi-cab operations as the basis for new and more service-oriented transportation operations in European cities in the future.

4 Rural Paratransit

This section takes a different approach to mapping paratransit developments in Europe. Instead of scanning for the progress of a given delivery concept, such as dial-a-ride, or developments as seen from the vantage of an existing service provider, such as the taxi operator, the following takes as its point of departure a specific transportation gap -- in this case that associated with insufficient access possibilities for rural populations, as a target area to which paratransit solutions are being applied.

One of the fastest developing areas of paratransit activity in Europe is that involving rural and small communities or, more aptly, "village transportation." The basic problems in rural Europe tend to be somewhat different from those in the United States. Among the more obvious differences are the European trends toward: (1) lower car ownership, especially among retired people, of whom 3 out of 4 are without access to a private car; (2) substantially lower telephone ownership (making dial-a-ride services less likely); and (3) the usually higher population densities and shorter distances involved. In point of fact, outside of Scandinavia, most of Europe's rural areas have population densities and proximities to urban centers that would qualify them as "exurban" in the United States. This, of course, has substantial implications for transit.

The main problem of such areas, as seen from the vantage of private transportation providers, is that demand is, each year, increasingly feeble and unsteady, and that the travel budgets of those affected are tightly limited. The steep increase in car usage in sparsely populated areas in recent years has further reduced the demand for public transport.

Despite the comparatively small number of people involved, the problem is one that not only stubbornly refuses to go away, but which actually continues to get more severe with each passing year. Furthermore, as in the U.S. in the last few years, it has tended to become visible to both the politicians and the public.

Among the other factors contributing to the increasing severity of the problem are:

- o continuing abandonments of rural rail services (and to a lesser extent scheduled bus services);
- o the aging of the rural population, rendering a higher proportion of people transit-dependent;
- o the general economic decline of many rural areas, in good part a result of structural changes in the European economy; and
- o the closing down of social service and commercial functions (especially shops and schools) in many rural communities.

In the final analysis, the converging forces are fast creating an intolerable access situation in many rural regions throughout Europe, with pensioners, housewives, low-income people and children (for non-school activities) especially hard-hit. And, while this problem has been literally decades in the making, it has only been in the last few years that it has received any attention at all from the public sector, and that, as yet, on still quite a small scale.

One of the major obstacles to more massive extension of the paratransit services that have appeared in Europe over the past decade -- other than the possible weaknesses in the concepts thus far put forward -- has resulted from the fact that they are, by and large, being attempted in areas where well-entrenched transportation interests are already in place. The trouble is, of course, that the urban and suburban areas in which these service ideas have primarily been pushed are just those places where institutional resistance and the regulatory maze are apt to be most debilitating for any innovative project or service idea. Once again, this parallels developments in the U.S.

In contrast, the rural regions in most parts of Europe present an excellent location for new transportation ideas. The railways are pulling out their rural passenger service as rapidly as central government and media pressure permit, while scheduled rural and regional bus services (i.e., for those other than school and work uses and the like) are being maintained in many cases with increasing operator reluctance, as the client base melts away (moving to the city, losing their jobs, getting old, dying). In many places, this reluctance is manifesting itself in further service withdrawals, more or

less visible and explicit -- which, of course, only serve to exacerbate the situation and to set off a new round in the whole process of access/activity decline.

Faced with these problems, in varying degrees and a range of variants, European public sector and transportation institutions across Europe are being obliged to improvise in a variety of ways. Fiscal pressures -- which are increasingly over-riding all others -- are providing the main catalyst for policy change, meaning of course, service shutdowns or cutbacks. In the better-off rural areas, where agriculture is still strong and the family structure still in place, these curtailments tend to be tolerable, since increasing auto ownership and active family ties usually serve to take up the slack. The real problems tend to occur, however, in those rural areas where the economy is on the decline, the young people have fled, and only the elderly and less able have stayed in place.

To make matters worse, it often proves, in fact, to be difficult even to discern that there is a problem. Just as people "learn" to travel when a new service is opened up, so people in declining areas come to "forget" about travelling. And while some of this "saving" may not be such a bad thing, the reality is that, in most cases, what occurs is a combination of resignation and forced isolation. However, the usual statistical measures will often not pick this up.

Our preliminary assessment has identified a range of project and program initiatives in rural transportation in the eight European countries under discussion. These are noted in Table 3. This is obviously not a complete listing, but it should serve to provide an indication of the broad thrusts of the development of rural transportation in Europe.

Table 3 requires at least a few words of comment and clarification. To begin with, as will be seen, the British listings involve not individual projects, but broad programs or types of approaches. In nearly all cases, they refer to single vehicle schemes. Of all countries covered in the survey, Great Britain would appear to be the place with the widest range of alternative approaches under study. The reasons for this innovative surge can be traced to several sources, including the (relatively) stable nature of village life there, a long tradition of active local government and participation, and the existence of strong county involvement in transportation matters.

Table 3

Some Landmark European Rural Paratransit ProjectsUNITED KINGDOM

<u>Programs/Approaches</u>	<u>Year</u>	<u>Present Status</u>
Postal buses	1968	ca. 160 rural bus services
"Open" schoolbus	1968	ca. 80 bus services which accept non-school passengers
Commercial rural midibuses	late 60's	ca. 50 subsidized rural midibus services
Hired village buses	late 60's	ca. 20 services contracted especially by rural units
Community buses	1969	ca. 15 volunteer-driver minibus services
"Social car" schemes	1971	ca. 100 organized lift-giving schemes
RUTEX	1976	4 grant-sponsored projects

FRANCE

<u>Projects</u>	<u>Year</u>	<u>Type</u>	<u>Status</u>
St.-Clement-laronye	1973	Improved bus service	Active
Maine Angevin	1976	Improved bus service	Withdrawn
Pays d'Othe	1976	Improved bus service	Withdrawn
Vexin	1976	Rural collective taxi	Active
Le Cheylland	1976	Rural collective taxi	Planned
Bocage Virois	1977	Improved bus service	Active
Gondrecourt Taxibus	1977	Rural collective taxi	Active
Vassiviere	1977	Improved bus service	Active
Monts de Lacausse	1977	Rural collective taxi	Active
Florac	1977	Postal bus	Planned
Mellionas	1978	Improved bus service	Active
Dampierre	1978	Improved bus service	Active

NETHERLANDS

Buurtbus program -- 5 active services, 37 to implement during 1979

NORWAY

Eidskog -- 1975/76 Demonstration project

DENMARK

Open school buses -- program operated since 1974

SWITZERLAND

Postal buses

AUSTRIA

Postal buses

GERMANY

Postal buses

As shown in the table, the most common rural approach in Great Britain has been the postal bus, in which postal delivery vehicles carry passengers as well as mail. This basic concept can also be found in several other countries (most notably Sweden, Switzerland, Germany, Austria, and Finland), although the continental services generally differ fundamentally from the British approach in several ways. Basically, the former services have, over the past decades, been reconfigured into rural passenger buses, operating on trunk routes (at quite high speeds), that also carry mail. Because they have been around for quite some time and have been thoroughly integrated into the management structure of the respective national post offices, these can be thought of as "mature" systems, which have by now, gone most of the way toward exhausting their market possibilities. The British approach, on the other hand, must be considered to be still quite far from its ultimate potential.*

Community buses, which were first pioneered in Britain and only later taken over by the Dutch as a basic model for their program, are run on a non-profit basis depending on volunteer drivers, volunteer village committees for management, and technical assistance from local professional operators. Although the first of these services came on line in the U.K. informally as early as 1969, the first "official" or fully licensed community bus project started up only in 1975 (in Norfolk). Two new services were then introduced the next year, and the remainder since.

What is perhaps most interesting about these services is not so much their success -- which is very real despite the modest circumstances of their operation -- but their relative slowness to impact, in a more thorough-going way, at the national level in Britain. The Dutch Community Bus (or Buurtbus) program provides a vivid contrast in terms of visibility and speed of impact. Doubtless, the main explanation of this can be traced, at least in part, to the decision of the Dutch Ministry of Transport to contribute actively to the development of this approach. In Britain, by contrast, the matter has been left largely in county and local hands without any national focus, which may account for the slower program development there.

* See the RURAL PARATRANSIT Volume for additional discussion of the postal bus concept.

An additional explanation for this difference may result from the differing attitudes of existing rural/regional bus operators in the two countries. In the U.K., their attitude appears to be, at best, lukewarm. In Holland, on the other hand, the regional bus operators are taking an active hand in this, in part at least because they see these systems working as feeders for their own services, and in part because they see them as taking off some of the pressure to open up new and unprofitable commercial services.

The idea of the "open" school bus that can accommodate rural passengers other than students is one which has received some attention in the U.S. as well. The concept appears to be getting most attention in Denmark, the U.K., and France, more or less in that order. There are, it is recognized, a number of problems associated with this approach, including most notably the limited hours of vehicle availability and drawbacks in terms of accessibility and comfort, especially for elderly or handicapped travellers. Nevertheless, this general approach is receiving attention and can be expected to see further development in the future.

Of the remaining British programs, RUTEX--the Rural Transport Experiment--is perhaps the most interesting. RUTEX, which is the only one of these programs initiated and supported by central government in Britain, was set up in 1976 "to test on the ground what could be done to help rural communities." The original program was designed to test a range of alternative approaches, and, in each case, is actively led by a local government sponsor with central government finance and monitoring assistance.

The first RUTEX demo projects were initiated in 1977, and are being run with subsidies of only several thousand dollars per year. Small in scale, the approach is very much one of trying to make the best use of existing transportation resources, with small additions and variations as useful. All four projects have been positively evaluated thus far, but it is not yet clear what this means for the future. Their most interesting contribution would seem to be the incentive that they could provide to understanding: (1) that there is actually a problem; (2) that an area-wide approach may be the best; and (3) that the answers must be found largely by upgrading, sharpening and better integrating existing institutions and resources.

In France, a somewhat, but not altogether different approach is being taken. The leading organizations in the French rural transportation

improvement programs are the Ministries of Transport, Public Works, and Agriculture. The approach is basically a conservative one that emphasizes the study, in phases, of: (1) the transportation insufficiencies of targeted areas where pressure appears to be building up; (2) the conservation of existing resources, with inputs from local government and in-place private transporters; and (3) the formulation of multi-level solutions which usually result in some combination of structuring of existing commercial services, "open" school and work buses, and broadening of the passenger base by establishing multi-community interest groups and coordinated services. This program, which, thus far, has generated about a dozen small-scale projects, appears to be making inroads into some of the institutional and inertial barriers that have served to inhibit service improvements. The approach is, however, one that is often closer to conventional bus service improvements than to what is usually thought of as a paratransit approach.

Elsewhere across the continent, it is, by and large, these more conventional bus transit improvement approaches which are being focused upon for rural transportation purposes. Nonetheless, as the best of the above paratransit approaches begin to make progress and gain greater visibility, there is every reason to suspect that they will be picked up and replicated, especially where they show promise of keeping central subsidies to a minimum acceptable level. That will, in the short run at any rate, certainly be the key factor in explaining the speed, or slowness, with which these new approaches penetrate.

5 Publicars and Shared Vehicle Systems

"Publicar" developments in Europe are of particular interest because they represent a category of paratransit in which developments have substantially outpaced those in the U.S., and also because they provide an excellent microcosm of concerns, attitudes and approaches that are more or less unique to Europe.

Publicars, as the term is used here, refer to "self-drive" vehicles which are available for shared use in a serial mode to a given (non-family) group or community. This idea of a serial or successive use by different users as they choose to use the system, as opposed to the kinds of sharing that carpooling and other ridesharing approaches imply, is the distinguishing characteristic of the publicar. This general category spans four main types of service arrangements including:

- o "U-drive" or self-drive taxis,
- o collectively-owned vehicles or "cooperative cars,"
- o several kinds of innovative/collective or very short-term car rental services,
- o public bicycle schemes.

In Europe, it is important to avoid narrowing this concept of collective vehicle ownership and use unnecessarily to include only schemes which make use of automobiles, particularly since there has been an interesting background with reference to bicycles as well. Thus, we use the term "publicar" to describe both shared car and shared cycle schemes.

Table 4 identifies a total of eleven European publicar projects, four of which involve bicycles and the remainder various approaches to serial car sharing. The bicycle projects have all been launched as purely local initiatives and usually have had the benefit of only rather rudimentary planning. All of the older projects ran into trouble as a result of problems of holding onto and maintaining their vehicles.

More recently, the new French Velo-Self projects are trying to avoid problems of vandalism by establishing a formal "check-out" mechanism wherein

Table 4

Main Publicar Landmark Projects in Europe

Project Name	Type	Country	Year Initiated	Status
White Bicycle	Shared bicycles	Netherlands	1965	Withdrawn (1967)
Procotip	Car Club	France	1971	Withdrawn (1973)
Self-drive taxi	Systems study	U.K.	1972	Completed
Witkar	Car Club	Netherlands	1973	Active
Bilpoolen	Car cooperative	Sweden	1975	Active
Green Car	Car cooperative	U.K.	1975	Active
LaRochelle	Public bicycles	France	1976	Withdrawn (1979)
T.I.B.	Systems study	France	1976	Completed
Velo-Self	Three new public bike systems	France	1979	Active
Paydrive	Group-shared car rental	U.K.	1979	Active
"Voiture Banalisees"	Considered for demo project	France	1976	Under considera- tion

user identity is controlled and sometimes deposits are made. While most of the earlier projects were undertaken as local political "statements," the new generation of bicycle systems is taking a new and more pragmatic approach in which all costs are paid through the sale of advertising space on the vehicles themselves. Typically, 50-100 bicycles are involved in each project.

More interesting have been the half dozen projects involving shared automobiles. Of these, the French Procotip project in Montpellier represented the pioneering experiment, although it was ultimately abandoned. The Procotip project was established in 1971 as an auto-sharing cooperative, and included at its height, nearly 300 members. A major element of the project was an invention by an independent entrepreneur of a metering/monitoring device which would: (1) accept only certified keys; (2) identify the user; and (3) chew up a plastic coin at a uniform rate as the car was driven. At its height, the Procotip scheme had a fleet of 35 equipped vehicles, access to 17 special reserved parking sites, and served a membership of approximately 100 key holders. After about 18 months of operation, however, the company was forced into bankruptcy. Among the reasons most commonly cited for its failure were:

- o the fact that the service area was too small,
- o the inability of the organizers to keep unauthorized vehicles from blocking their reserved parking areas,
- o some mechanical problems with the meters.

Other reasons for the failure of the Procotip project include: (1) inadequate information dissemination of the basic system concept and details; (2) failure of the system to charge identified users for time in use as well as mileage; (3) nearly non-existent site planning; (4) lack of local government support; and (5) inadequate financing, bookkeeping and faulty project economics.

The Procotip concept, however, has not entirely slipped from view and presently, several agencies of the French government are reportedly giving serious attention to a near-term demonstration project, possibly making use of a refined version of the Procotip meter.

As Procotip was winding down, the Witkar - or "white car" - project was getting underway in Amsterdam. Begun by the same group of individuals who

half a dozen years earlier had launched the White Bicycle project, the Witkar concept had a strong ecological and conservationist orientation and made use of a small electric vehicle of original design.

The basic building blocks of the Witkar concept are: (1) a fleet of purpose-built two passenger electric cars; (2) a reservation system; and (3) a network of special parking facilities. The system is accessed by certified key holders who can check out a vehicle from any station and are then billed for both time and mileage until such time that the car is checked into an authorized Witkar station. Since its inception in 1974, the project has gone through several stages of development (and decline); at its peak in 1976, it was reportedly using 35 vehicles and six stations in the central area. A number of technology and component improvements have been made, or at least designed, since the system was first put into service, and the organizers claim to have the entire technology in hand for a very sophisticated, cashless automated system. Total development cost for the project to date has been estimated at about \$400,000, and the organizers continue to be hopeful of possible large scale government support that will allow them to achieve what they regard to be the minimum critical mass necessary to obtain project viability.

More recently, there has been progress reported by an independent initiative in the U.K. The concept, Green Cars, essentially involves a shared car ownership scheme. Originated by a group out of the Open University in Milton Keynes, the keys to the Green Car program are a set of explicit car sharing guidelines and a costing technique which shifts costs into mainly variable costs. While the idea is a simple one, it has some interesting implications for travel and modal choices. Part of the basic idea is that the current cost structures (practices) tend to disguise the real cost of automotive travel, since car owners tend to make their modal choices on the basis of the car's (relatively low) perceived marginal costs. The Green Car group points out that, if the basic cost structure were shifted so that would-be drivers weigh instead the real average costs of car travel (as opposed to perceived marginal costs) against the alternatives, this would make other forms of travel relatively more attractive. The group has also investigated the problems of non-availability of shared vehicles when needed, and have concluded that this sort of scheme works best where other arrangements can be made for work trips, and where advance reservations are practiced.

Currently, some 20 Green Car schemes are reported in operation in the U.K., and these are being monitored by the Open University team. Since there have been difficulties in getting participants to use log books properly for cost-sharing, the Green Car team has developed a device which they dub the "paydrive meter." This meter accomodates up to four keys, each of which starts the car and sets in motion the appropriate (separate) charge meter. The meter is calibrated to show cumulative billings for each user to date.

Since the meter has been available, a commercial rental service has been launched (by Lowerental in Norfolk), based on standardized 6-week group rental contracts. The original intention has been to promote the concept in rural areas but, as this has proven unsuccessful, the Open University group is now concentrating on trying to get it implemented in suburban and urban areas. No government funding or industrial support have as yet been made available to the project.

A similar cooperative ownership project was tested in Sweden (Bilpoolen), where a handful of neighborhood rental collectives have been sharing cars since 1975. In 1978, this project received approximately \$150,000 in government funding for demonstration and monitoring purposes.

The overall status of publicars in Europe is thus, despite the many obstacles, fairly healthy. Certainly this has not been because they have been the object of enormous or continuing government attention and support. While some funding has trickled in over the years to the several French, Dutch and Swedish initiatives for specific stages of development work, there has been no significant large-scale commitment to the development of this type of service.

6 *Ridesharing*

The previous sections chart the main lines of development activity and accomplishment in the paratransit sector in Europe over the last decade, with one notable exception. Thus far, among the many projects and schemes enumerated here, there has not been a single example of carpooling, vanpooling, buspooling--or of ridesharing in any of the forms that have been so important in recent North American experience. This has not been an unconscious omission. Rather, it reflects the actual status of thinking and structured initiatives concerning ridesharing in this part of the world. Until quite recently, there has been, relative to U.S. experience, very little ridesharing, and that mostly confined to small, informal and often unsuccessful efforts. For Europe, ridesharing continues to be very much an untapped transportation resource.

Since most projects that could appropriately be listed under this heading are both very local and informal -- and more often than not, short-lived -- it proves quite difficult to track progress in the sector, given the large number of countries involved. Table 5 represents our best attempt at summarizing information on specific examples of structured ridesharing initiatives. Some of the issues associated with ridesharing in Europe are discussed in the context of individual countries below.

Germany

We were unable to turn up a single example of a large-scale, formalized carpooling project in Germany. On the other hand, various sources have shown that close to 5% of all commuting trips are made by people riding on a regular basis as passengers in someone else's car -- roughly a third of the total moving each day on conventional transit. Thus, somehow, despite the fact that there is little being done officially at either the government or company level to encourage carpools, there are several million passenger trips each day taking place along these lines. Obviously, something is happening that is worthy of mention.

German tax law explicitly recognizes the fact of ridesharing, and makes accommodations for it. There is little doubt that this had had something to do with the growing use of carpools since the early 1970's. The law allows

Table 5
Some Ridesharing Projects in Europe

Country	Project	Dates	Status
<u>GERMANY</u>			
Tax rebate for carpooling	Carpooler allowed to deduct \$0.15 per km.	1974	Active
<u>SWEDEN</u>			
SCA vanpools	Ca. 150 vans carrying poolers working at SCA in N. Sweden	1963	Active
SKF carpool	Ca. 250 vehicles, 850 workers in company organized pools	late 60's	
Volvo carpool (Olofstrom)	Ca. 270 vehicles, 920 workers in company organized carpools	late 60's	
Volvo buspool	Ca. 20 vans; linked to company ridesharing program	late 60's	Active
Ridesharing study	Chalmers Univ. receives TRD grant to study ridesharing prospects	1976	Active
Volvo "contractual carpool"	Program stimulating carpooling & facilitating vehicle purchase	1978	Active
<u>FRANCE</u>			
Morez Vanpool	Area-wide vanpool, 43 vehicles	1963	Active
Provoya	Organized hitchhiking for longer trips; presently in 12 cities	1970	Active
Parly II- Org. Hitchhiking	Organized hitchhiking scheme in shopping center	1974	Active
Orleans Vanpool	Employer vanpool	1974	Active
Paris Carpool	Attempted Project: "I Voiture pour 4"	1974	Discontinued
Mulhouse Carpool	Attended Project: "Compagnons a 4 Roues"	1974	Discontinued
Saumur-Org. Hitchhiking	Studied organized hitchhiking as transit option	1977	Not Implemented

TABLE 5 (cont'd)

Country	Project	Dates	Status
Busclub	Study program aimed at uncovering barriers to vanpooling	1978	Continuing
Caen vanpool	Small area-wide vanpool demo	1979	Active
Rouen vanpool	Area-wide vanpool demo	1979	being deployed
<u>BELGIUM</u>			
Taxistop	Organized hitchhiking and ridesharing	1978	Active
<u>UNITED KINGDOM</u>			
"Hospital Cars"	Arranges hospital trips for needy; volunteer drivers; carries 6 million passengers per year	1948	Active
Stevenage buspool	"Blue Arrow" bus pool	1971	Active
Hale Barns Buspool	Buspool organized by local transportation authority	1969	Discontinued
WVRS	"Social car" scheme putting drivers in contact with needy persons; 81 active projects	1971	Active
Formby buspool	Demonstration project	1971	Inactive
Enabling provision for carpool demos	Pushed by U.K. DOT as interim measure	1974	Provisional
South Horncastle Buspool	Organized by local bus company	1975	Active
Oxfordshire Carpool	4 low cost "open" carpool project	1975	Discontinued
<u>SWITZERLAND</u>			
Zurich Carpool	Area-wide carpool	1974	Not activated
Geneva Carpool	Area-wide carpool	1974	Shelved
Bienne Carpool	Proposed commuter carpool	1975	Rejected by voters
<u>NETHERLANDS</u>			
ANWB Carpool	Area-wide carpool for Amsterdam	1974	Shelved

commuters to deduct from their taxable income about \$0.20 per km for their daily work trip as solo drivers, or \$0.25 if they carpool. This, of course, works as a direct financial incentive to ridesharing.

Similarly, it is known that a certain number of German industrial employers have privately moved to encourage vanpools in order to facilitate worker access to jobs at outlying plant sites. In these cases, the firm buys the van and arranges for a volunteer driver/organizer who organizes the pool, whose members then share the costs. These systems were quite active during the early to mid-seventies, at a time when labor was scarce and many industrial firms had moved away from their original urban sites.

In the areas bordering France, these vanpools even worked across the frontiers to facilitate (relatively cheap) French labor's access to high-paying German industrial jobs. Reportedly, at least two large French industrial employers have tried the same thing in the east of France, but apparently without success.

Sweden

In Sweden, ridesharing has been practiced for some time - always at a local or company level - but not singled out for study and possible policy manipulation until quite recently (1976). All told, there are somewhere between 200 and 250 active vanpools in the country, mostly in northern Sweden, where they were organized by a large timber company in the early 1960's. Several other rural employers have also developed small scale vanpools, but possibly the most interesting effort has been at the Volvo plant at Olofstrom.

Volvo has established a two tiered program of contractual ridesharing that has operated over the last ten years.* The company has, for some time, encouraged internal carpooling, and has recently given more structure and incentives for these efforts. Some 20 buspools have been established, but when occupancy drops below 15 passengers per vehicle, Volvo sets up a "contractual carpool," selling cars on favorable terms to former buspoolers

* Not surprisingly, auto manufacturers have tended to participate in the vanpooling and carpooling businesses, both in order to facilitate worker transit and to encourage vehicle sales. In Europe, there are such initiatives at plants of Volvo, Citroen, Volkswagen, and Peugeot; other projects likely exist as well.

who agree to give rides to 3 or 4 colleagues each day, and to let a reserve driver use their car in their absence. This contractual carpool component has been practiced since January 1978, and presently involves some 50 vehicles.

Thus far, however, ridesharing has not otherwise had much impact in Sweden, which is why the national Transport Research Delegation awarded a grant in 1979 to the Chalmers Institute of Technology to look into the national potential for ridesharing. The interim results of the study show the concept to be vastly underused, and indicate that further policy changes will be needed to stimulate ridesharing, if the concept is to make any headway on a national level.

France

In France, ridesharing is not, as yet, a popular concept. There are, apparently, major and multiple sources of personal and institutional resistance to ridesharing and its principal variants, not the least of which is a legal/regulatory statute that makes any transport of non-related passengers on a regular basis by anyone other than a regulated transportation enterprise at least difficult, and, as often as not, illegal. Moreover, positive incentives for ridesharing are largely absent.

One employer-organized vanpool was set up as an independent initiative in Orleans in 1974, and this is reportedly working satisfactorily. An older and much larger project in the region of Morez goes back to the 1960's and involves a total of 43 vans operating within an area-wide multi-enterprise configuration. Neither the Morez nor the Orleans formula has caught on; indeed, the only major study of Morez commissioned to date has as its objective an assessment of ways of replacing the vans by more formal bus service.

The several area-wide carpooling programs that have been attempted--mainly in the wake of the 1973 energy shortage-- have failed to get off the ground, largely as a result of insufficient preparation and support.

On the other hand, there have been several organized hitchhiking initiatives which have achieved some success. Most of these involve travel over longer distances (usually by students), but one which has been set up in a regional shopping center has functioned for several years now without any particular government incentives or support.

In recognition of the possible utility of ridesharing, the French Ministry of Transport initiated in 1978 a project aimed at clarifying the barriers and potential of vanpools in particular and ridesharing more generally. The results of this study are expected to become available later this year, and it is anticipated that they will clear the way for policy changes and possible demonstration projects in the area.

Belgium

In Belgium, an organized hitchhiking service, Taxistop, was set up in early 1978 and currently has more than 2000 subscribers, including both vehicle owners and riders. The principle is that members, who pay a \$7.00 fee to join, receive a sign (on which they print the name of their destination), which they extend to catch the eye of participating drivers. When the hitchhiker disembarks, he/she pays a fee of 3 cents per kilometer. Recently, the organization has begun to develop carpools for regular commuting trips for subscribers as well. The project has no official recognition or financial support.

United Kingdom

Carpooling and vanpooling are still in very early stages of development in Britain. Table 5 represents a fairly good summary of the broad lines of activity to date. Central government apparently views the concept as one of uncertain value outside of rural areas, where its role is yet to be defined (see Section 3 above), and has thus far limited its role to the monitoring of several ongoing local projects.

Switzerland

Despite the energy crisis and the advent of \$3.00 per gallon gasoline, there have been only a few isolated attempts to promote organized carpool schemes in Switzerland similar to the programs in the U.S. and elsewhere in Europe. Two leading newspapers, one radio network, and two automobile associations tried to establish carpooling schemes in Zurich and Geneva in late 1974. Just over a thousand Zurich motorists participated, but only 100 could be matched. In Geneva, the response was much lower - one hundred completed

questionnaires - and the sponsor gave up the idea. As a result of these failures, proposals for a carpooling scheme in the town of Bienne were rejected by the local authority.

Netherlands

In the Netherlands, the Royal Dutch Automobile Association (ANWB) encountered a very poor response in 1974 when it tried to launch a commuter pooling scheme in Amsterdam. No further attempts are known to have been made since then.

7 Summary: The European Experience

To summarize, the European paratransit experience has had certain parallels to that in the U.S., but, by and large, has been rather different. As in the U.S., early public demand-responsive services were victims of unrealistic expectations. Unlike the case in the U.S., however, the concept of general community demand-responsive services did not eventually proliferate. Of considerable interest to the U.S., however, are developments in this area in Germany, where several relatively large-scale checkpoint systems, utilizing sophisticated control technologies, have been implemented. If these services prove successful, they may serve as models for other services, both in Europe and the U.S.

The role of taxi operators in Europe has also been quite different than that in the U.S. Few European shared-ride taxi services for the general public, either unsubsidized or contract, are reported. However, taxis have become the most common form of service for the elderly and handicapped (again, perhaps, providing a lesson for the U.S.). Taxis have also been used in fixed route service, a practice which has seen very limited use in the U.S.

As in the U.S., attention in Europe has recently begun to focus on mobility problems in rural areas. Because of less in the way of institutional constraints, rural areas may become the center for paratransit activity in Europe.

In an area of significantly different developments, Europe has also been the scene for demonstration of a number of shared-auto, or "publicar" concepts. This approach has thus far only been studied in the U.S.

Finally, unlike the case in the U.S., the various ridesharing modes have not caught on in any formal sense in Europe, where a history of high gas prices have masked the impact of recent oil price hikes, and where transit is more widely used.

Glossary

checkpoint DRT service:

This is a form of demand-responsive transportation in which passengers can travel from one checkpoint to another; certain checkpoints are equipped with trip selection terminals, at which passengers can request service and indicate their destinations by pushing the appropriate buttons. This information is automatically routed to a control center, where a computer makes passenger assignment and vehicle routing decisions.

organized hitchhiking:

Various arrangements can be termed "organized hitchhiking," although all generally involve some pre-registration and/or pre-arrangement in the matching of riders and drivers.

postal bus:

This form of rural transportation involves the joint transportation of passengers and mail in rural postal delivery vehicles.

publicars:

The term "publicars" refers to various forms of "self-drive" vehicle systems, in which vehicles are available for shared use in a serial mode to a given (non-family) group or community. The basic types of publicars are self-drive taxis; collectively-owned vehicles, short-term car rental, and public bicycle schemes.

quasi-cab:

Quasi-cab operations provide taxi-like service but also offer some services beyond those which formally-designated taxis are allowed to offer.

route taxis:

A route taxi aims at providing a smaller, lower cost vehicle as a substitute for regular transit service where demand is not sufficient to justify the use of conventional full-size scheduled buses.

scatter taxis:

This is a form of shared-ride taxi in which service is provided out of major transportation terminals (mostly railroad stations in smaller communities).