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# Intermode : Innovations in Demand Responsive Transport

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## The Intermode Study

Increasingly, conventional bus services do not meet the needs of a large section of the population. This is due to increasing incomes and car ownership levels and the resulting dispersal of activity centres and trip patterns. One possible solution is public transport systems that can operate effectively with lower and more dispersed patterns of demand than the bus, i.e. Demand Responsive Transport (DRT <sup>1</sup>). DRT has featured in a number of UK Government reports suggesting it could be used to tackle a number of policy objectives, and recently the use of Rural and Urban Bus Challenge funding has encouraged the take up of DRT. Existing research on DRT has tended to focus on the means of delivery - i.e. what type of vehicle is most appropriate, how might the technology work, and should a service be fully or semi-flexible?

However, there are a number of additional regulatory, fiscal, institutional and cultural barriers at government, local authority, operator and user levels that have not yet been comprehensively investigated.

These appear to be as important as the technical issues involved.

In 2002, the Department for Transport (DfT) and the Greater Manchester Passenger Transport Executive (GMPTE) commissioned the Open University (in collaboration with the University of West of England and Loughborough University) to determine the market potential for DRT systems in the UK. The project set out to examine examples of 'good practice' DRT systems already in operation and identify any regulatory or institutional barriers hampering the development of DRT schemes.

In essence, the purpose of this study was to look at the potential for DRT as an alternative public transport system in terms of market or demand niches, and from the viewpoint of the public authority and the commercial operator. It aims to determine how DRT might be developed to serve journeys that are not currently well served by public transport and explores why DRT has so far failed to make much impact, and how government and other public authorities might rectify this.

<sup>1</sup> Bakker (1999) defines paratransit [DRT] as describing *transportation options that fall between private car and conventional public bus services. It is usually considered to be an option only for less developed countries and for niches like elderly and disabled people.*

## Composite Cases

To analyse the material, the case studies were aggregated to create a series of composite case studies, each of which was described firstly by the nature of the DRT service it represents and the market it serves and secondly by whether it is driven primarily by public policy or by commercial objectives. There are four function-based composite case types:

**Interchange DRT** providing feeder links to conventional public transport. Typically this would be a DRT service providing an interchange at a rail station or into a bus route.

**Network DRT** enhances public transport either by providing additional services, or by replacing uneconomic services in a particular place or at certain times. Typically, this substitution happens at times of the day or week when demand for conventional public transport is low or dispersed, so making it hard to offer an attractive service. However there are also *places* where DRT may be more appropriate, such as town and city cross-suburban trips. Funding from the Government's Rural Bus Challenge has led to the development of a number of such services, many in areas where conventional bus services had previously been withdrawn.

**Destination-specific DRT** is a specialist form of network DRT that serves particular destinations such as airports or employment locations. A key element of many of these schemes is the presence of a partnership between a local authority and the 'destination' (e.g. a company, airport operator or whatever).

**Substitute DRT** occurs where, instead of complementing conventional bus services, a DRT system totally (or substantially) replaces them. This represents a reinvention of public transport.

## Interchange DRT Composite Case

Except where trunk and DRT services operate at a high frequency, integrated timetabling with connecting services and ideally guaranteed connections are advisable, and it is desirable to encourage flexibility in service design to ensure connections are achieved *in both directions*, i.e. DRT to trunk and trunk to DRT. Driver training is of crucial importance. Vehicle interior should be to a high specification, and ideally as close to a taxi environment as possible. This is particularly important for 'choice' users such as commuters.

There is an issue regarding fares. Most systems operate fares that are the same or comparable to local bus fares, and may even use normal bus tickets. Some, however, have fares that are higher than bus fares, but considerably lower than normal taxis. If modal shift from car is desired fares need to be competitive with perceived motoring costs (including parking costs at stations). Through fares and tickets onto interconnecting service might be more attractive to users.

In the UK context, where a DRT service is introduced to connect with fixed-route public transport, it could be appropriate to have fares moderately above bus fare rates, but with concessions for key groups and discounts for pre-booked pickups/drop-offs at fixed stops.

Financially, Interchange DRT tends to occupy a space that spans subsidised and commercial operations. Overseas examples, like many local bus services, require continued subsidy, although it is notable that for the rural services in particular this is less than for conventional buses. In the UK, the subsidy rate of Â£1.80-4.00 per trip tends to be above the typical maximum of around Â£2 for tendered services. However, initial funding can lead to a level of subsidy no higher than conventional buses. And this is with a higher quality of service, coverage and patronage.

## Network DRT Composite Case

Many of the key design elements of the interchange DRT services apply to network services as well.

For network services, unlike with interchange DRT projects, integrated fares, although desirable, are not an essential requirement. Some schemes do have fares that are integrated with the parallel public transport system and use the same zones, but passengers still pay a premium to use such schemes. If modal shift from car is desired, fares need to be competitive with perceived motoring costs (including parking costs at stations and/or destinations).

DRT schemes are typically more expensive to provide per passenger trip than conventional bus (although probably cheaper to operate in the particular circumstances than a conventional bus would be). Therefore public policy driven network schemes that provide additional service levels may be vulnerable in the longer term to funding being cut unless it can be convincingly demonstrated that they are delivering their objectives. Conversely, being more flexible, DRT can very usefully perform as a pilot bus service in an area until demand levels on particular routes or at particular stops can be fully ascertained and resources allocated to a fixed route service.

## **Destination-specific DRT Composite Case**

The destination-specific composite case is a subset of the network DRT case, and hence many of the conditions that applied for the network composite mode will apply here too. Destination-specific services tend to be targeted at particular markets. Often therefore, either the users are perhaps valued in some way (e.g. where companies are happy to subsidise the commuter trips of their employees), or else the users see such a journey as a one-off and are therefore happy to pay a premium (e.g. airport shuttle passengers). Timetables can be geared specifically to meet the particular needs of the site(s) served, rather than designed to co-ordinate with the rest of the public transport network.

Destination-specific schemes do not tend to involve trip chains, and therefore the fares systems, tickets and/or timetables can be self-contained

Destination-specific DRT services have a good potential for commercial partnership funding between an operator, local authority and/or a site owner, tenant or developer. This is because in addition to 'self-interest' reasons for establishing a DRT service (congestion, lack of sufficient parking places, improving access for staff and visitors), there may also be regulatory reasons. For example, where a developer wishes to build a factory or supermarket, planning permission for this will be required from the local council. Often, this process results in a planning agreement whereby the developer agrees to run a scheduled bus to the site for a couple of years. This usually runs virtually empty and is then discontinued. A more positive use of such a planning gain agreement might be to enter into a partnership with the council and bus operator to pump-prime a DRT service.

## **Substitute DRT Composite Case**

Social inclusion concerns have played a major part in many DRT schemes. However, there is a danger of too narrow a market base, and it is notable that a number of these DRT schemes have sought to consolidate a number of specialist DRT services, such as those for people with disabilities, into a general DRT service. Indeed, several of these schemes have merged three or four previous services in order to capture resource efficiency gains, cut costs and improve services to customers.

Most of the above lessons also apply to the more radical substitute DRT services. However, from this analysis one issue to emerge is whether it is better to go for the incremental development of DRT, or if the benefits are only achieved as the result of a radical restructuring. Experience suggests that a total evaluation of an area's bus service is needed, rather than a piecemeal approach.

## **Markets for DRT**

Most DRT schemes have been driven by social policy objectives and hence focused upon captive users, who by definition have restricted transport choices, and in particular have low levels of access to cars. By way of contrast a number of DRT schemes have targeted choice users, many of whom could have made the trip by car. This latter group is of particular interest where the role of DRT in transport and environmental policy is concerned.

One finding to emerge from the analysis of the composite cases is that there are key differences in the user requirements of the 'choice' and 'captive' markets. One factor that is rated highly across all trip types for both captive and choice users is certainty of arrival time. The availability of door-to-door travel, a key attribute of DRT, achieves an interesting mix. For shopping and health trips it is rated strongly for both captive and choice groups, though the rating is higher for choice than captive. Door-to-door travel is also rated higher by choice groups for commuting and leisure trips. It should be noted that door-to-door is a more valuable attribute for women than men, due mainly to the perception of enhanced personal security. These observations are indicative of a more general pattern of difference between choice and captive users. Times of operation appear to be of importance for commuter and leisure trips, with choice commuters scoring higher. This probably relates to leisure trips being in the evenings, possibly after conventional bus services stop. On the important issue of price there is a major contrast between choice and captive users. Price is a very important issue for captive users, but less so for choice users. By way of contrast, comfort and image is far more important for choice than captive users (although comfort understandably scores more highly for health trips and also for leisure trips).

**Recommendation: This analysis can be used and developed to target the design of a DRT service to the markets it is planned to serve. For example, a DRT scheme geared mainly to shopping, health and leisure trips by captive users should combine a different set of attributes than one aimed at car commuters. A key distinction is that what captive users most want is a bus or minicab, whereas the last thing choice users want is a bus. Captive users value bus-like attributes. Choice users value taxi/hirecar type attributes.**

## Financial performance of DRT

An important part of this research has been to explore the interface between commercial and subsidised DRT services - particularly factors that allow a service to make the transition towards commercial viability. However, this research has indicated a more detail financial consideration than a simple commercial/subsidised split. There are four key levels of financial performance:

1. **Commercially viable DRT.** These are services that are either profitable, or operate within a commercial context (e.g. temporary losses are accepted as a service is built up or a loss-making service is compensated by its positive financial effects on a service network as a whole).
2. **Acceptable subsidy DRT.** This is where DRT requires only the same (or less) subsidy than other comparable tendered services (a subsidy of £2 per trip or less appears to be the crucial threshold).
3. **Justifiable higher subsidy DRT.** This is where a subsidy above that comparable to tendered services can be justified. This may be due to the operational area (e.g. deep rural areas cost more anyway), that DRT is replacing inherently even more expensive transport, or because it is yielding significant cross-sector benefits.
4. **Financially unsustainable DRT.** This may be demonstration and trial projects or other services whose losses remain very high.

There will be movement between these categories, ideally upwards. Realistically, a DRT service cannot remain in category four beyond a short-term demonstration/set-up project (e.g. two years' funding).

Currently there are very few commercially profitable DRT schemes operating in the UK. Perhaps the closest scheme to profitability is the newly launched Yellow Taxibus that operates between Dunfermline in Fife and central Edinburgh. However, this is not expected to make a profit for at least two years. Once the set up costs have been taken into account this scheme is also aiming to operate as cheaply as possible. Only the minimum level of technology is involved and the drivers employed are new to the public transport industry - they are non-unionised, and only require an ordinary driving licence, not a Passenger Carrying Vehicle licence.

The next level in terms of 'commercial viability' refers to the low-tech shared taxi schemes, e.g. L ovedean Carshare in Hampshire. Average subsidy per passenger trip here is roughly £1. However, a more rural scheme of a similar type, the Fa re Car in Devon costs rather more than that - **£10 per trip**. Once again the routes operate in relatively compact communities and the technology, staff and vehicle costs are minimal.

Commercial DRT operations are not common anywhere in the developed world, but that is not to say they do not exist. In the USA in particular there are several examples. Again they tend to occupy a market niche where a more customised service is valued, but which can be operated in a low-cost manner (simple systems where manual scheduling is adequate and low-cost labour). One of the more widespread is the airport shuttle. The pricing of shuttles at below taxi fares (but not that much lower) is combined with a market that presents a steady (and predictable) demand without particular peaks. Shuttle services seek choice users by addressing their 'hire car' needs and are priced accordingly. Jitneys too serve specialist niche markets, and show that it is possible to have commercial DRT occupying a more downmarket position than the premium product airport shuttle.

In the UK, the DRT industry has historically been driven by the social exclusion agenda, and features schemes that are cumbersome, expensive, bespoke and cost heavy. In general, the systems have tended to have their own call centres, sometimes combining other local authority functions to save replication and thus reduce costs. They are not set up specifically from a commercial perspective. The subsidy levels of the infrastructure (call centres, software, vehicles, etc.) are enormous burdens for councils but so are the operational cost elements. It is debatable that current systems can be made more effective to provide good value for money.

There are major structural problems inherent in the bus industry at present, a key problem being that in the years since deregulation there have been major cuts in the management of local bus services, notably in the product development and service quality areas. This has left the industry with delivery problems even for conventional services, without adding the complexity of DRT. It is questionable whether either a bus company or a local authority would be prepared to put the resources required into ensuring the success of DRT in more than a limited number of areas in the current climate. They face the challenge of retaining premium fare-paying passengers.

**Recommendation: When introducing a DRT scheme it is important to clarify the market it is intended to serve, and to identify the classification of the expected financial performance, i.e. whether it is expected to operate commercially, at acceptable subsidy or at a higher justifiable subsidy.**

**Recommendation: The key lessons of the commercial and near-commercial DRT schemes appear to be as follows. Many of these points apply also to other types of DRT, particularly the acceptable subsidy category.**

- **Services should be simple to understand.**
- **The use of simple, manual, developments of taxi or hire car systems tend to have an associated low cost base.**
- **In planning commercial DRT services it should be recognised that they are often a premium product.**
- **Commercial or near-commercial DRT occupies small niche markets.**
- **Commercial or near-commercial DRT needs sufficient and evenly spread demand.**

The exploration of commercial DRT indicates a number of lessons for the expansion of DRT in the UK. A few UK schemes are within the *acceptable subsidy* category while most are really in the high subsidy demonstration project stage, but may be seeking to maintain a justifiably higher subsidy. This raises an important issue. The distinction between the last two categories is not clear. What constitutes a *justifiable subsidy* may depend on what the alternative public costs may be or whether a financial arrangement can be put into place to recognise a cross-sector benefit. For example, money from a local authority's education budget might part-subsidise a DRT service or purchase student passes instead. This is a rather grey area and further clarity in justifying DRT funding beyond an initial demonstration project is needed.

Many current DRT schemes in the UK operate at passenger subsidies **ranging from less than Â£1 to around Â£10**, while one or two schemes have far higher per trip subsidy costs where subsidy per passenger trip is closer to Â£30. The majority of these schemes feature high quality state-of-the-art minibus vehicles and new and relatively complex call centre and routeing/scheduling equipment and software. Is there any likelihood that such subsidies could fall to an *acceptable subsidy* level (around Â£2 per passenger trip), or even achieve commercial viability? The first thing to consider is, may costs fall? As with many new technologies, it appears that as DRT develops then the costs will fall as technology becomes more affordable and savings are made from the consolidation of call centres. The proliferation of demonstration projects with high start-up costs and under-utilised IT infrastructure could give (and has already given) way to more cost-effective systems, and there is evidence that costs have been cut as schemes mature. In the UK, some of the best practice schemes look like they could deliver a cost per passenger trip close to the *acceptable subsidy* level of Â£2, but this does require very good operating conditions and good market conditions. In other words, some DRT schemes in the UK might well hit the Â£2 target, but this should not be expected of all.

Costs are one part of whether DRT has the potential to achieve either *commercial viability* or an *acceptable subsidy* level. The other key factor is, of course, revenue. Behind this is a major issue of the market position of DRT services. With some notable exceptions (like the Jitney), many of the commercial or low-subsidy DRT services are premium products. They seek to deliver a near-taxi level of service for fares that are closer to taxi fares than bus fares. Commercial DRT addresses upmarket niches - such as air travellers or long-distance, middle-class rail commuters, and while DRT subscription bus pools can be costly due to amenities like comfortable padded seats and air-conditioning, full costs are recovered because customers are prepared to pay for premium quality.

These are not the markets that public policy DRT schemes have so far sought to serve. Instead, they have aimed at a totally different market position that reflects a social inclusion agenda. Thus fares are usually comparable to that of bus services, and in some cases considerably lower. This social inclusion basis of the design of the DRT product is reinforced by the fact that, in the UK, general public DRT has drawn upon the established experience of the dial-a-ride service for people with disabilities. The systems that have been developed to support dial-a-ride have (understandably) been rooted in a social inclusion ethos.

For many DRT schemes, the continuing need for subsidy focuses upon a longstanding rationale for DRT services. This is that, on a per trip basis, DRT is still often far cheaper for public authorities to provide than conventional specialist health, education, or social service transport services. This is the *justifiable higher subsidy* rationale. DRT may be expensive (£5-10 per trip), but for the markets it serves it is cheaper than the alternatives (for example, non-emergency ambulances or taxis at £10-20 per trip). This is how DRT became established as a public transport service for people with disabilities - dial-a-ride and ring-and-ride.

This rationale has now developed to where a public DRT service is more cost effective than running a set of parallel services for people with disabilities, non-emergency ambulances, Social Services and schools transport. If (as in the case of many US and mainland European towns and cities) the ordinary bus service also needs heavy subsidy, then rolling the whole lot into a single DRT service can both improve the quality of the service to users, increase utilisation of resources and cut costs. The larger service will certainly need call and control centres, probably with computer scheduling, but in most cases these exist anyway (and are frequently duplicated and under utilised). The big issue here for the UK is one of cost and revenue allocation among a network of providers and institutional users. Schools transport alone costs £700m a year for just 10-15% of school trips. This could be incorporated into DRT and other bus developments, which would arguably create a greater transport impact than the current plans to expand an institutionally separate schools transport service.

In mainland Europe and the USA, with city authorities being the end funders, the issue of cost and revenue allocation seems to be of less concern. In the UK, with each branch of the public sector having its own budget and increasingly being required to act in a market way, such simplifications are not possible. Thus cost and revenue allocation software is needed along side the vehicle management and trip allocation systems.

Perhaps there needs to be recognition that social inclusion-led DRT services will inevitably require higher long term subsidy than normal supported bus services. Such DRT services will not only need start-up funding, but a high permanent revenue subsidy as well. In some countries, particularly the USA, the need for continuing subsidy has led to new financial arrangements, such as local hypothecated taxes and charges, rather than a dependence on traditional central government grants. An expansion of social inclusion-led DRT services in the UK could well require different funding structures to those that are currently in place, but would only be of significance if they were additional to the funding already provided by government to local authorities and Passenger Transport Executives (PTEs).

**Recommendation: Although some bus fare-type DRT services have achieved a subsidy level of around £2 per passenger, these tend to be the simple, small low-cost shared taxi arrangements. For the more costly DRT bus, with supporting call centres etc., it may be unrealistic to expect much better than a £3.50-4.00 subsidy cost per passenger trip if passengers are to pay fares on a par with conventional bus fares. This is roughly double the acceptable subsidy level, and so an**

**additional rationale is needed for this further public funding. This observation raises the issue of fares. There does appear to be a lack of clarity in the fares policies of DRT services and a serious long-term problem of getting subsidies down to a politically fundable level (even if financial reforms do provide new sources of subsidy). DRT seems to be targeted at the wrong sector - a legacy of a culture from dial-a-ride background, with pricing far too low for what is a premium product. DRT needs to identify stronger markets for DRT rather than the captive user one that is central at the moment.**

Such arguments raise a number of possibilities. One key issue to explore is whether the service as a whole needs to be designed for low fares or whether social inclusion measures are built in to reduce fares for *particular users* of the service. For example, it would be possible to have a DRT service that has premium fares for the premium service it is, but with clear concessionary fares targeted upon social inclusion groups. This would make funding for social inclusion more transparent, while increasing fare yield from groups able to pay. Overall it would enhance the financial viability of DRT and could crucially lower the average subsidy of well-designed UK schemes to approximately the level for conventional bus services. However, asking some groups to carry the cost is not an easy issue to address.

**Recommendation: In the UK context, the mechanism for delivering justifiable subsidy may need to be different than the general subsidy used for DRT in other countries. A funding partnership based upon paying for client groups may be appropriate. For example, NHS Trusts might be persuaded to contribute to DRT services that reduce the number of missed appointments, or a school might pay for improved attendance.**

**Recommendation: There appear to be three general market niches where DRT can be seen to fit. First, low-tech, low-quality, small-scale simple DRT systems can be applied in areas where captive users are happy to use any form of public transport but are only willing (or able) to pay low fares. Second, there are niches (e.g. employer shuttles, airport shuttles) where commercial operators can target choice users who appreciate luxury and are prepared to pay a premium for a service that is as far away from a bus or a minicab as possible with small-scale, simple to operate systems. Finally, large-scale, complex network DRT systems require high-tech equipment if they are to operate efficiently. As a result they will be relatively expensive to operate. However, providing that savings can be made (usually by substituting them for even more expensive specialist transport trips) there is scope for these services to be cost effective - assuming the benefiting bodies actually pay for those benefits. It is also advisable that services should be of high quality and that fares be raised above those of a comparable bus service as it will be important to attract a proportion of choice users.**

## **Marketing DRT**

DRT market research has proved deceptive. It is therefore very important that schemes should be designed to be flexible - i.e. they should be able to be adjusted easily to better serve the actual rather than the predicted market.

In addition, key factors that satisfy existing users are different from those that attract the car use. Typically, regular passengers say they want cheaper fares, while those who DRT operators want to attract onto their services generally put reliability and effective frequency to the top of the list. Five key barriers preventing motorists using public transport were inadequate networks, a lack of information, longer journey time, access difficulties, and general concerns that public transport is unusable. A DRT operator

that majors on the things that existing users value would miss out on these additional factors that would be needed to effect modal shift.

In defining DRT, operators have a major problem in that the term can be taken to mean a large number of different things e.g. a whole range of combinations of different schedule and route flexibility types. More broadly, as with the bus, to satisfy both existing customers and to increase modal share requires: a pleasant waiting environment; good reliability; an easy to understand network; an easy to understand ticketing structure; easily accessible vehicles to those with heavy shopping, prams and pushchairs, and wheelchairs; a direct service with easy interchange; a frequent service; good value for money; friendly and helpful staff; and comfortable, clean, well heated and ventilated vehicles.

## **Key operational decisions**

There are a number of DRT-specific operational characteristics. These include: type and size of DRT vehicle; degree of route flexibility; degree of timetable flexibility; whether to interchange or not; level of technology; mode of booking; and call centre technology. There are also a number of regulatory and financial issues with licensing the operators, vehicles, drivers and routes that need to be balanced, and there are mandatory requirements if the vehicles are to be used for special needs type work, e.g. space for wheelchairs or low floor access. Image is also crucial. For instance, women are often uncomfortable sharing vehicles with only four or five seats, while larger vehicles are often perceived to give off an institutionalised aura. Finally, there is an issue to do with the DRT journey times becoming more elongated as the number of passengers increases. Perhaps the ideal solution to the vehicle size issue is to offer a range of different-sized vehicles, which the DRT operator calls on as and when a particular type of vehicle is required.

The degree of route flexibility is also affected by the level of demand, and crucially by its distribution (i.e. the land use and road network patterns). In general, fully flexible routes can be very inefficient because of the first-come-first-served nature. More efficient is where a loop/zone system can be introduced with deviations (ideally with two buses travelling in opposite directions) so that more people can be picked up, because the first-come-first-served nature of the service is diluted slightly. Reducing the flexibility also has the effect of making the service easier for passengers to understand, as it is difficult to explain that it is a bus service that behaves like a taxi. A second way of achieving flexibility is to vary the scheduling. Here services only run on demand - i.e. when requested by a passenger. Such services range from extremely high frequency operations, to very low demand scenarios. Current regulations suggest that no timetable is required for services registered to run at a minimum five minute frequency, and so theoretically very high frequency jitney-style services could be run under a these rules.

Advances in software, computers, digital maps, expert systems, remote communications, in-vehicle computers and GPS technologies have suddenly made DRT viable. But, while the costs of high tech schemes may or may not continue to fall, they are still relatively expensive to introduce, and there remain occasional problems installing and using the equipment. When selecting the level of technology required, the scale and complexity of the operation envisaged should determine whether a high-tech set up is necessary or not. Similarly, is a new call centre needed or could the work be contracted out? Technology also allows operators to monitor and analyse service patterns, potentially allowing the system to evolve more effectively, and this may be reason to adopt a high-tech approach. Finally, technology offers almost close to 'real-time' demand responsiveness even on complex networks, to a level far in advance of manual systems. Interestingly, so far the few commercial operators have looked to low-tech solutions based on

technology for conventional taxi operation, which are deliberately limited in what they can achieve.

There are several modes of booking DRT, including boarding at the terminus, 'hail-and-ride' along the route (by hand or sometimes by pressing a button at a stop so the next bus will deviate to pick up at that stop, as in some schemes in Italy, such as in Bologna), via the Internet and by telephone. Of these methods, the telephone offers the most high-tech and flexible approaches to be adopted, but there is the cost of the call involved and the need for a call centre, possibly routing software, and therefore additional staff. Pre-booking using a telephone has become far more viable with the widespread take up of mobile phone technology.

For the future, Internet technology is now being mooted as being the way forward with the advantage of possibly offering automated (and thus far cheaper) booking.

## **Implementation issues**

DRT systems tend to require a more complex network than conventional bus or taxi services. At the very least this involves operators, call centres and local authorities. It is also clear that good relations need to be established with the local community, rival transport operators (particularly minicab and taxi firms who may see a subsidised service as a threat), and local trip generators such as employers, retail outlets, etc., that could encourage their staff and visitors to use the service, or even potentially sponsor or contribute towards the costs of providing the service. There can be problems involving taxi and private hire operators, as moving into DRT and being expected to work in partnership with the local authority and others is not their normal mode of operation. Finally, clear communication channels with the various licensing, regulatory and financing authorities can smooth the path of implementation enormously.

Politically, there is widespread political enthusiasm for DRT, but it is the support of the operators, not the politicians, that is the biggest problem. One approach to dealing with this operator reticence has been for local authorities to bear all the revenue risk by issuing gross cost contracts. In practice, this has meant that the local authority buys/leases and brands the vehicles, plans the routes and then invites operators to bid to run the services for a fixed fee which they will receive no matter how many people use the service. Currently DRT is still limited to niche markets and limited areas of the country, and considered experimental. It is almost as though DRT has to reach a 'critical mass' and be more widely accepted before the conservative bus industry accepts it as a viable proposition. Thus far, DRT is seen as providing a less certain revenue stream than conventional public transport.

Directly related to this and a serious operational problem that has afflicted DRT projects in the UK and elsewhere, is active opposition from rival transport operators. However, the research conducted for this study suggests that the fear of competition from DRT expressed by taxi operators is ungrounded, and DRT is in reality an opportunity. There is considerable, guaranteed profit to be gained. In essence, more needs to be made of the positive incentives for communities to encourage small, local taxi operators to participate in DRT.

## Issues facing Government

### Institutional, legal and regulatory

While it could be argued that the plethora of existing and potential regulatory regimes allows operators flexibility in the type of schemes they devise, in practice the complexity facing operators has hindered rather than facilitated the development of not only DRT, but other innovative transport options such as car club, lift share or vanpooling schemes.

Currently DRT is neither 'fish nor fowl' - it is neither taxi, nor minicab nor bus, meaning that it is extremely complicated to set up a DRT scheme and that DRT is not seen as a mainstream public transport solution by all players. Further, registration, licensing and financing principles and procedures continue to be conducted on an ad hoc basis - an undesirable situation for all concerned because DRT scheme promoters are thus forced to negotiate from scratch every time they register a service or try and claim financial support. To be successful DRT needs a strong identity.

**Recommendation: The current institutional arrangements facing DRT scheme promoters are too complicated. Ideally, over the longer term the operating, licensing and financing regimes of all the road-based passenger public transport sectors need to be re-visited and completely replaced with a new integrated system governed by common principles, based on safety and the needs of the passenger, and controlled by a single governing authority. Ad hoc and piecemeal alterations to the various regimes would seem to be counterproductive. On the other hand, it is recognised that such a wholesale change in the current political climate is very unlikely to happen for a variety of reasons and that some specific changes would benefit DRT operations (see Chapter 6). As a minimum, in the short term, the DfT needs to further clarify the institutional framework for ALL potential types of DRT scheme. Also, as DRT has no natural constituency to draw from for political support, unlike the established bus and taxi lobbies, one possible remedy could be to set up a new DRT forum.**

For the cases studied, there was also some comment that more information about how to set up, plan, run and market DRT would be helpful to local authorities and bus operators.

**Recommendation: Government should improve the dissemination of public transport planning, operating and marketing techniques, possibly through the publication of a good practice guide.**

With DRT there are many different variations in the degree of route and timetable flexibility. This is combined with uncertainty in the legislation, which has led to a non-uniformity of how the legislation is applied among the six Traffic Commissioners found in eight regions.

The second major concern to emerge from the research was to do with the related issue of timing points. Timing points are seen as being problematic because buses are required to run to them even if there are no bookings, and because they limit the flexibility of how the service is operated.

Monitoring whether services run (or are available to run) or not currently determines the limit of how flexible a service can be. There is therefore a need to look at alternative approaches to the current 'catch all' timing-point method, which, while appropriate to fixed timetable services, is clearly useless for on-demand style service patterns. Instead, the 'mystery shopper' approach might be an alternative way for Traffic Commissioners to monitor actual service compliance, for example with a sample of services being

booked by telephone to see if they are then operated as per the published standard.

**Recommendation: New monitoring methods need to be devised by the Traffic Commissioners (or subsequent registration body). This would allow a more comprehensive range of flexible public transport service options to be registered.**

In theory, the deregulation of bus services due to the 1985 Transport Act should have encouraged bus and taxi operators to bid for operations, and stimulate competition. In practice, this has rarely happened. In summary, taxis are being under utilised.

**Recommendation: As a minimum, stronger guidance and/or regulation needs to be issued to taxi and Private Hire Vehicle (PHV) licensing authorities extolling the virtues of shared taxi-type operations. More beneficial would be to standardise private hire and taxi licensing rules while shifting these licensing responsibilities from the district authority tier to that of the highway authority (where the authority is not a unitary one) or to a PTE (where one is present).**

A very specific regulatory barrier relating to the potential for DRT services to substitute for specialist services such as education, social service and disabled transport, was due to Section 60(5) of the 1985 Transport Act, preventing PTEs from 'owning and loaning' vehicles, thus making it far more complex for them to act as a vehicle broker. This brokerage system would theoretically enable a council or a PTE to provide a vehicle pool, from which private and community transport operators, council departments and Primary Health Care Trusts could lease vehicles as required for a few hours a day - perhaps significantly reducing costs.

**Recommendation: The regulations in the 1985 Transport Act preventing PTEs from 'owning and loaning' vehicles should be rescinded <sup>2</sup> .**

## **Financial issues**

An important consequence of the institutional arrangement is whether a service is eligible for particular types of funding or not. Public subsidy accounts for 30% of bus operator revenue for services outside London, which comes from Bus Service Operators Grant (BSOG), payments for tendered services, and concessionary fares compensation. For DRT, as with licensing, the situation is rather less clear.

Essentially, the current position is that private hire vehicles are never eligible for BSOG, while taxis are only eligible when operating as a registered Taxibuses under Section 12 of the 1985 Transport Act. Regulations were introduced from May 2002 to extend the BSOG scheme to a wider range of Community Transport services, i.e. those which are provided by a non-profit making body under a Section 19 permit. Local bus services are only eligible for BSOG providing that services are available to the general public and that members of the public can make single journeys between any two stopping places.

**Recommendation: BSOG should be extended to cover all mileage on services registered with the Traffic Commissioners as 'shared use' public transport services, whether they be operated by bus or taxi. Ideally, it should also be possible for DRT schemes registered with and monitored by local authorities to be eligible for BSOG too <sup>3</sup> .**

The UK Government recently decided to extend the Rural Bus Subsidy Grant (RBSG) for a further two years (to 2005/6) and to allow it to be used for funding a wider range of services, possibly including DRT, although final decisions are still to be taken on exactly what services will be covered. As of November 2003, the DfT is consulting interested organisations on the details of the changes to the rules of the grant.

**Recommendation: Rural Bus Subsidy Grant should be extended to cover all mileage on services registered with the Traffic Commissioners as 'shared use' public transport services, whether they be operated by bus or taxi, should they comply with the 'rurality' criteria. Similarly, rural local authority registered DRT schemes would also ideally be eligible.**

One major area of DRT funding in the UK has been Rural, and more recently, Urban Bus Challenge funding. RBC and UBC has had a very positive effect on the DRT industry. However, there are problems in that it is overly complex, encourages innovative schemes rather than potentially cost effective schemes, and requires time to be spent on bidding for resources with no guarantee that any money will be forthcoming.

**Recommendation: The Challenge funding mechanisms have served their purpose, and there is now a need for a more predictable source of money to support DRT schemes as they strive to become a financially viable form of public transport. This could be offered through BSOG or RBSG, or perhaps through a 'pump priming' fund (such as the Kickstart initiative), whereby the subsidy gap between DRT and conventional bus routes might be covered for the first two or three years. In any event, a decision as to the long-term future of the Challenge funding scheme (and about any replacement money) would be appreciated as soon as possible.**

While vehicles of ten seats (including the driver) or more qualify to be zero rated for VAT on costs on fares, private hire vehicles and taxis do not. This inconsistency with the VAT treatment of costs and fares does have an impact on the take up of shared taxi schemes. Once again though, the issues of monitoring and enforcement are crucial.

**Recommendation: Ideally, subject to an appropriate monitoring and enforcement regime being established, taxis and PHVs should be eligible for zero-rated VAT on costs and fares whenever they are operated as a public transport system, as opposed to exclusive-use.**

## Political

In some ways, DRT already has a strong political backing as it is perceived to help address the 'social inclusion' policy area and it could be developed to meet 'resource efficiency', 'integration', 'environment' and 'congestion' objectives too. However, there are a number of areas where DRT could be embedded further into such policy processes. One way is through accessibility planning. Previously, there has been a tendency to consider access to public transport services in terms of distance from a bus stop and frequency of service. A subtle alteration to these accessibility planning indicators, e.g. by suggesting that people be offered at least an hourly *opportunity* to travel would mean that DRT would become the most efficient way of meeting the standard in many places.

**Recommendation: Government needs to set a framework from which to set legislation concerning how often the public should have access to transport. An hourly opportunity to travel would be a good standard. A national accessibility standard for rural areas would promote DRT, as it would be the only efficient way of meeting the standard in many places.**

Land use is a significant shaping factor in the effectiveness and efficiency of public transport systems, and in recent years low-density out-of-town developments have been allowed to proliferate. Such developments are car-friendly and bus-unfriendly, and so DRT may be more appropriate than a bus in these areas. However, this should not mean that developers should be allowed to carry on in a similar vein, using DRT as a solution for poor planning, and planning rules need to be altered accordingly.

**Recommendation: Planning guidance should recognise that low-density out-of-town developments are not conducive to public transport operation and should be discouraged. However, where such developments already exist, DRT may be a possible solution to poor public transport accessibility.**

A further issue of importance is in the calculation of costs and benefits relating to DRT (and to public transport as a whole). For instance, enabling older people to access social networks through public transport delivers significant benefits, but these are not 'reclaimed' by the transport sector.

**Recommendation: Government ought to sponsor more research into the wider environmental, social and economic benefits of transport in order to help justify higher public transport subsidies.**

Very much related to this is the question of subsidies to other forms of transport. It is important to note that the costs of using public transport relative to the marginal cost to the user of using a car have risen significantly over recent years, and any future widening of the cost gap between public transport and the car will undermine the viability of DRT.

**Recommendation: Government needs to consider policies aimed at reversing the trends whereby car use is becoming cheaper and public transport use more expensive.**

On a more prosaic level, while DRT is typically more expensive than conventional fixed-route bus services per passenger trip, it is also usually far less expensive than specialist education, social service and health transport services. Allowing DRT to take on these trips may well provide a more cost effective option for a local authority currently subsidising these services separately (providing the fixed costs of providing DRT services are also reduced). However, significant institutional and cultural barriers need to be overcome before any meaningful integration can take place. In particular, it is vital that financing streams are properly established.

**Recommendation: Government ought to examine ways and means of encouraging the establishing of vehicle brokerage operations.**

## **Other barriers**

The proliferation of call centres is also seen as a problem. While scheme-by-scheme centres may be desirable from an operational viewpoint, (local knowledge of an area is valued by customers), the set-up and operational costs involved are typically high, and many current UK DRT schemes are simply far too small to justify the level of investment required. Regional level call centres therefore probably offer the best balance between cost and operational requirements.

**Recommendation: Government needs to look at ways of developing a more rational network of DRT call centres.**

Other technological barriers are that there is still no mobile telephone coverage in some very remote areas of the country, such as parts of Cornwall and the north west of Scotland (arguably where DRT might be most effective), making high tech DRT schemes very difficult to introduce.

<sup>2</sup> As of November 2003, it is understood that the DfT has already pledged to allow PTEs to lease vehicles and is in the process of drawing up a Regulatory Reform Order to effect this.

<sup>3</sup> Since this recommendation was made, the regulations of February 2004 do enable a whole new raft of DRT services to be registered with the Traffic Commissioners which are thus also eligible for BSOG. Nevertheless, local authority-registered schemes remain ineligible (see <http://www.dft.gov.uk/pgr/strategy/ria/registrationofflexiblelocalb5558> for further details).