What is Demand Responsive Transport (DRT)

And how does it differ, if at all, from Community Transport?

DRT is concerned primarily with transport for individuals, as are some elements of the door-to-door Minibus Services, Community Buses and Car Schemes operated by CT organisations. Transport may be provided in a range of vehicles, from single to multiple occupancy.

Effectively, DRT can be a subset of CT - a CT scheme could provide DRT itself or be a partner in a DRT scheme.

The Department for Transport (DfT) has recognised the potential of DRT; pointing out, *"Uncertainty and long waits are typical of the problems faced by users of public transport. Demand-responsive transport can overcome these problems. While commercial companies cannot run profitable services on minority routes, there exists at least one example of a commercial demand-responsive service in the UK, run in the West Midlands. It covers its operating costs, but is partly dependent on grant funding for the purchase of vehicles, and on contract operations to cover some of the overheads.*

The development of technology has increased the possibilities for demand-responsive services (not-necessarily door-to-door services). Such transport approximates more closely to the convenience of a car than scheduled services can and could lower the initiative to own private transport."[1]

DfT recommended an investigation of "...*the possibilities and economics of demand-responsive transport for socially excluded people."*[2]

Defining DRT

The **VIRGIL** project, set up to research different ways of addressing the transport of people and goods in rural areas, defines DRT as

"services that adapt their itinerary and timetable to suit a particular transport demand."

They note further *"this includes different levels of responsiveness. Thus it includes fully demand-responsive services such as taxis, as well as bus services which are mainly regular but which will divert off certain sections of their route if requested."*[3]

SAMPLUS was a collaborative European research project dealing with Demand Responsive Transport (DRT) systems and services for passengers in urban and rural areas. It involved partners from six EU countries and took place from March 1998 to November 1999. In their review of DRT services, researchers at the SAMPLUS project said:

[1] Social Exclusion and the Provision and Availability of Public Transport - A Summary Report
[2] As above
[3] as above

"Demand Responsive Transport (DRT) services cover a wide range of transport services ranging from informal community buses through to well organised service networks that ***match the service offer to the actual travel demand in close to real-time mode****."* (our bold type)

The SAMPLUS researchers also describe a vision for DRT as *"fully flexible multi-hire 'anywhere-anywhere' services which:*

- *Allow people to travel from anywhere to anywhere if desired, for the appropriate fare, rather than limiting such services to specific zones or sectors*
- *Use the new types of vehicles currently emerging, which combine the low running cost and manoeuvrability of the taxi with low floor, easy access, comfortable seating, and a seating layout allowing friendly interaction with the driver.*
- *are open for the general public to use (with special groups receiving appropriate subsidies based on a percentage of the fare)"*

The need for DRT

Problems with mainstream provision

Patterns of transport need have changed over the last few decades and mainstream passenger transport has not been able to change sufficiently to meet these changes. The fixed costs (both economical and environmental) of a timetabled route remain the same; it must run, even if it carries no passengers. It is easy for a particular timetabled service to fall into a downward spiral: changing passenger needs lead to lower usage, which leads to higher cost, which results in service reduction, which in turn leads to lower usage. The eventual result is withdrawal of the service "because nobody is using it"; but the reason nobody is using it is because it doesn't meet passengers' needs.

The commercial bus network, therefore, is increasingly concentrated on main routes, because the level of usage cannot sustain more penetrative services.

The way that bus services are run can create a number of barriers to personal mobility for significant numbers of people.

Social exclusion

Lack of reliable and easily accessible transport services leads to social exclusion, the irony being that those people most likely to be isolated already (older people, disabled people, people on low incomes on isolated housing estates, minority ethnic groups, for example) are most likely to be further isolated by lack of transport. CT schemes have long recognised the role of transport in addressing social exclusion. Transport planners are now looking to DRT services to address some of these issues.

Access to services & facilities

Local shops, banks & post offices continue to reduce in number or disappear altogether. Retail and leisure facilities are increasingly concentrated on fewer sites, usually out of town. This has had a marked effect on people's travel patterns, making accessing services increasingly difficult for those who do not have access to a car

Access to Healthcare
Rationalisation and merging of GP surgeries and health centres, along with a devolvement of many aspects of healthcare from General Hospitals to local GP practices, means that access to some aspects of healthcare without a car can be difficult, even if the General Hospital is on a bus route.

Access to Employment
Many more people are employed in service industries in relatively low-paid jobs, which involve anti-social hours and seven-day working. Workplaces in the service sector are often concentrated in the out-of-town sites mentioned above, away from bus routes. Walking to work is a thing of the past for most of these people, and access to work for those without a car has become increasingly difficult.

Accessibility

Mainstream passenger transport (in the main, bus services) is arranged so that the passenger comes to the transport, rather than vice versa. Despite improvements, mainstream bus services can be difficult or impossible to use for anybody with a mobility impairment.

Getting to the service
The walk to a bus stop can be difficult or impossible for people with mobility impairments.

In isolated areas, poorly served by mainstream provision, the nearest bus stop is not within practicable walking distance.

Waiting
Older or disabled people may not have the physical strength to endure a long wait at a bus stop.

In inclement weather with no shelter, waiting at a bus stop can be difficult and unpleasant for anyone, especially when combined with unreliable services.

Travelling
Once the bus arrives, it may prove difficult or impossible for older or disabled people to board.

Fear of falling during the journey may act as a deterrent to people with mobility impairments using mainstream (usually one-person-operated) bus services.

Personal safety

In certain areas, the walk to, and the wait at, a bus stop might involve a significant degree of personal risk, especially during the hours of darkness.

Uncertainty

The unreliability of some mainstream services means that passengers can never be certain that the bus will arrive. This may result in people deciding not to travel at all.

Solutions

Demand Responsive Transport is a response to the needs outlined above. Of course, it is not the answer to everything, and is not a replacement for the mass transport facilities offered by conventional bus services. In fact, as part of an

integrated system of transport provision, it can boost usage of mainstream transport systems, by acting as a feeder service.

By operating smaller vehicles, DRT can achieve better penetration at lower cost, into areas inaccessible to conventional buses. DRT has a number of advantages over mainstream bus services:

- The fixed costs are lower than for a timetabled service; if there is no demand, the service doesn't need to run.
- It can operate door-to-door, avoiding the problems associated with the passenger getting to the transport and risks to personal safety.
- The fact that it operates door-to-door can make it an attractive alternative to the car.
- Vehicles are physically accessible to disabled people

DRT & CT

The underlying ethos & principles of DRT closely match those of Community Transport Schemes. Indeed DRT services have been a component of some schemes' existing services for many years.

However, there are some differences, both in form and function. The **SAMPLUS** researchers point out that *"many people in the transportation sector (operators, authorities and policy makers) didn't really understand the advances in DRT. The idea of 'Dial-a-Bus' where you telephone days before you travel, or the Post Bus that carries the pensioner around the countryside still seem to come to mind."*

The two most common components of CT schemes that deal with transport for the individual are **Dial A Ride** and **Community Car Schemes**; at first sight, they might be thought to be Demand Responsive Transport. Both offer a service tailored to individual need, with travel provided form door to door. However, there may be some differences between such schemes' current modes of operation and emerging models of DRT.

Immediacy

DRT is designed to respond to bookings made at short notice - the type of "at once" booking we make when we call a taxi.

Dial A Ride and Community Car Schemes operate primarily on an advance-booking basis.

Availability to the general public

One of the primary attributes of DRT is its availability to the general public.

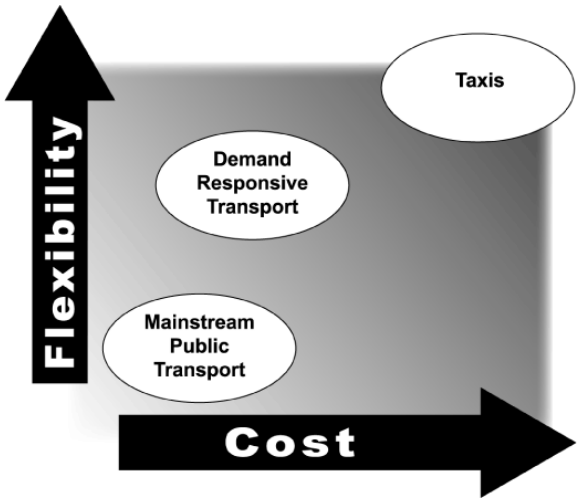
CT schemes, while aiming to provide safe, accessible and affordable transport, will often be legally restricted in the ways they can do so. For the majority, this will mean that they are prohibited from providing services to the general public using paid drivers, unless they hold a PSV Operator's licence. See the "Practicalities" section for further information.

A DRT scheme could, however, be flexible enough to accommodate a range of different ways of working *(see The Call Centre below).*

DRT - principles & components

DRT therefore, describes a range of passenger road transport solutions united by a number of common factors:

- **The service comes to the passenger (or at least meets them halfway), rather than vice versa.**
- **The service is available to the general public**
- **The service is provided to the passenger on demand.**



SAMPLUS researchers (see diagram to the left) have positioned DRT halfway, in flexibility and cost terms, between mainstream public transport and taxis.

Mainstream Public Transport costs the least, but in passengers' terms, is probably also the least flexible.

Taxis cost the most but, in passengers' terms, are the most flexible.

DRT services, which may use a combination of transport solutions, fall somewhere in the middle, giving a (hopefully) satisfactory balance between cost and flexibility. DRT is in its infancy in many parts of the country, but the signs are that it will grow in popularity.

Vehicles

DRT services can be provided by a range of vehicles - from the large low-floor accessible bus, which deviates as necessary from a fixed route to collect passengers to a shared taxi, which provides a true door-to-door service.

DRT services can also be provided by the same range of vehicles one might find operating in CT schemes; cars, Multi Passenger Vehicles (MPVs), minibuses.

These vehicles will be liable to one of two regulatory frameworks, depending on how the operation is constituted. See "Practicalities" for further detail.

The call centre

The key to DRT services is, as we have seen, that the response to the need for transport is rapid, in close to real-time mode. For this to happen, there needs to be an effective method of:

- Taking the passenger's booking
- Allocating that request for transport quickly and efficiently.

In order to measure and monitor the effectiveness of the service, there will also need to be a method of recording and analysing pre-and post-trip data.

One way to combine the allocation, booking and data recording functions is in a central Call Centre.

This is a centralised facility, using trained operators and dispatchers, which deals with all aspects of bookings, scheduling and statistical analysis of usage.

Passengers only need to call one centralised number, but a call centre ***could*** have access to a range of transport solutions, including

- Taxis or licensed private hire vehicles
- DRT scheme minibuses
- CT vehicles
- Dial A Ride services
- Local Authority Social Services transport
- Hospital transport - (non-emergency patient transport services)
- Mainstream bus services (with the capability to deviate from routes by a pre-determined distance)

The passenger's trip, therefore, could be with any one of a number of types of operator, allocated by call centre staff according to availability, suitability and cost.

Call centres can vary in complexity, from a one-person operation using paper-based scheduling of a small number of vehicles and control by mobile phone, to a large centre co-ordinating the transport fleets of a number of partners by radio control, using GPS vehicle tracking linked to computerised scheduling.

Whatever the size, the principles remains the same. The centralisation of booking benefits both the user - who gets the quickest and most appropriate trip with just one telephone call - and the transport providers involved - where spare capacity can be used effectively and duplication of effort can be avoided. Car Schemes and Dial A Rides that wish to can maintain their advance bookings, and "dip in" to the call centre to use spare capacity.

Monitoring & evaluation

The statistics recorded by the call centre can be manually logged and analysed, or recorded and analysed automatically, as part of a computerised booking/dispatching service.

The raw usage statistics can be used, in conjunction with customer satisfaction surveys, to produce measures of value for money.

<u>Using the statistics - Value for Money</u>

There are three issues to consider when deciding whether a passenger transport service provides value for money:

1. How many people does it carry?
2. What does the service cost?
3. How well does it meet passengers' needs?

Cost per trip, the result of dividing item 2 by item 1, is a crude measure of **value for money**. This can be quite a useful measure - for example, a major transport authority replaced failing bus routes with DRT services using shared taxis. Despite what some may expect, the cost per trip for the DRT service was lower (in some cases by a factor of 50%) than for the timetabled bus service, due in part to a large increase in patronage on some services.

Of course, cost per trip also needs to be qualified by a **quality measure** - this means asking passengers how suitable the service is for their needs.

In the example quoted above, the DRT services were rated very highly indeed, particularly on grounds of convenience, personal safety and value for money. The services clearly met the needs of passengers who were using them.

Types of DRT services

DRT encompasses a variety of modes of journey. All can be accessed from a centralised booking number, and could also be combined.

Door-to-door - *wholly flexible*

The vehicle picks up a passenger is collected from their agreed pick-up point and taken directly to their agreed destination. The route will be determined solely by the requests for trips received; passengers can be picked up from a variety of places and dropped of at a variety of destinations

Example 1: Elderly Mrs A wants to travel to visit a friend in a neighbouring village. She uses a walking frame and a wheelchair, so couldn't get to a bus stop even if there was one. The call centre dispatcher, having examined the available options, sends an accessible taxi, which takes her to her friend's house. On the way, it may divert to pick up other passengers, but all will be dropped off at their requested destinations.

Semi-flexible service

The passenger is collected from her/his requested pick up point, and taken to her/his choice of fixed destination(s).

Example 2: Mr & Mrs D live on a remote housing estate with infrequent and unreliable public transport. The bus company don't operate during the hours of darkness because of assaults on drivers and there have been attacks on passengers waiting at bus stops. Mrs D works shifts at a factory on the outskirts of a large town, eight miles away. Their one car has just broken down, which would have meant that one of them might have to give up work because they cannot get there. However, there is now a DRT service, funded by the County Council. Departure times are broadly fixed (say every half hour, for example) Mrs D, who is working nights, calls to book a pick up on the 22.30 journey. The bus collects her from home and takes her, and ten other people from the estate, to work at the factory. The bus comes back to collect them the next morning at 06.30, and takes them back to the estate, in time to collect Mr D for his early shift, along with ten other people who work in the town.

Such a service, if operated 24 hours a day, can provide safe transport at all hours, enabling shift workers, for example, safe and economical transport.

Feeder service - *semi flexible*

The passenger is collected from their agreed pick-up point and taken to a "feeder point" or interchange on the route of a mainstream service. This could feeder service could be operated by a single-or multi occupancy vehicle. In the case of the latter, pick-ups on the feeder service will need to be scheduled to allow effective interchange with the mainstream service.

Example3: Mr B wants to go shopping at the superstore in a nearby town. He lives in a small village with no regular bus service to the nearest town. However, there is a regular, and accessible, bus service, which runs along the main road, four miles

away. Mr B books a place on the regular minibus feeder service, which collects him from his home just outside the village, and takes him, along with five other people, to rendezvous with the scheduled bus service at a pre-determined point.

For feeder services to work effectively passengers must be

- allowed to remain on the feeder vehicle until the main service arrives, otherwise there is a risk of re-introducing the barriers listed in “Accessibility” above.
- able to buy a “through ticket”, valid for the whole journey.

Semi-scheduled route

A bus, or minibus, runs on a pre-determined route. However, it may deviate from that route by a pre-determined amount to collect passengers who have booked through the call centre. Services such as these are sometimes referred to as a PlusBus.

Example 4: Ms C, a mature student and a single mother, needs to get to the College of Technology in the county town, six miles away from the village where he lives. She needs to take her toddler with her so he can be looked after in the college crèche. Ms C telephones the Call Centre, where the dispatcher arranges for the local PlusBus, a 25-seater low-floor bus, to deviate from its regular route to call and pick her up from her home. Mrs C wants to make the journey every weekday, but on two days out of five, classes don’t start until midday. The dispatcher uses tailor-made scheduling software to divert the PlusBus each weekday.

Flexibility is the key

It is important to realise that the trips Mr & Mrs D, Ms C, Mr B and Mrs A wanted to make could have been carried out by any one of the range of transport solutions available to the DRT Call Centre. **Mrs A**, for example, might have been accommodated at short notice by spare capacity on a **Dial A Ride** vehicle. Ms C could have been sent a **minicab**. The important point is that the passenger’s transport needs are fulfilled, their choice of when and where to travel is not limited by the service options available (so the service fits the passenger, rather than vice versa) and the booking process is simple.

If a passenger has a particular preference or need, the Call Centre can do its best to accommodate that preference. But the centralisation of control avoids the *passenger* having to make those calls to a variety of different agencies.

Examples

Two examples of services currently being funded by a Transport Authority and operated from a centralised control centre involve taxis and accessible minibuses:

Shared taxi service

This is a service funded by **Rural Challenge Grant**, which replaced a bus service funded by **Rural Bus Grant**. It provides transport for people in rural areas, picks them up at home and drops off at the local centre and interchange point where they can connect to trains or buses to nearby towns and a major city. This is a new scheme and serves a large rural area, which means it takes some time to pick up all passengers. Funds have been provided by DTLR for an accessible vehicle.

Minibus service

These are demand responsive evening bus services operated in the evening by a Community Transport scheme, with subsidy from a Transport Authority. Two operate as semi-fixed routes and one operates as entirely demand responsive. They are operated under an operator's licence rather than a S19 permit or a private hire licence. Two of these are funded from **Rural Challenge Grant**.