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BWCABUS - RURAL PUBLIC TRANSPORT USING GPS BASED DEMAND RESPONSIVE TRANSPORT

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Issue

The benefit of public transport in rural areas is well documented. However, rural Carmarthenshire and Ceredigion is not inherently good bus operating territory. The dispersed population does not generate many passenger flows large enough to produce a good income for operators. Many services have to be subsidised by the County Council, and even these supported services operate at the margins of profitability. Provision is often inefficient and ineffective due to the long and often circuitous routes provided, which are costly to operate and unattractive to potential users.

For many years, rural bus services have been in steady decline. The major impacts have fallen on minority groups such as those on low incomes, including job seekers, those unable to drive, such as the young and elderly, and mothers with young children. There is also a significant group at risk due to the costs of maintaining and operating a motor vehicle. Often these groups of society are constrained in when, and to where, they can travel by factors such as the timing and frequency of the services. However, good public transport is essential in enabling mobility and access to resources that are often not available locally to people without cars and provides an element of choice that can reduce car dependency.

Aims & Objectives

The BWCABUS trial aims to test new technologies and concepts to provide a major step forward in public transport service provision and accessibility in rural Carmarthenshire and Ceredigion. Key objectives of BWCABUS include:

- Provide increased rural accessibility to healthcare, education and life-long learning, employment, shopping and leisure facilities, and visitor attractions;
- Address unmet user needs for public transport through increased rural public transport network coverage, frequency, flexibility and integration;
- Integrate a demand responsive, low capacity, feeder service to fixed timetable conventional bus and train services;
- Promote greater use of more sustainable forms of travel and thereby reverse the long term decline of rural bus use;
- Achieve behavioural change by making public transport more attractive to car users;
- Help sustain rural communities and reduce inequalities;
- Combine the latest technologies (ITS, GPS, scheduling software etc) to achieve a more effective and efficient integrated rural public transport network;
- Engage the community through community development work already underway; and
- Support the objectives of Regional Transport Plan currently under development by SWWITCH.

Bus Services in the Teifi Valley

The A484 corridor running between Carmarthen and Aberteifi via Newcastle Emlyn and the Teifi Valley is one of the core interurban and cross boundary corridors serving Carmarthenshire and Ceredigion.

The bus services on the A484 route offer eleven journeys per day in each direction. For the most part these services are operated on by First Cymru buses, supported financially by the County Councils. The existing timetabled service (460/461) has a through journey time of 80 – 90 minutes diverting to serve settlements with small populations located off, but adjacent to, the main trunk route from/to Carmarthen. The service has a number of diversions and spurs along the route at Llandysul, Henllan and Drefach Felindre. These diversions provide a service to communities adjacent to the route and enable occasional cross valley journeys. However, the diversions create long journey times and hinder the efficiency of the core service. Consequently primary route users travelling between Carmarthen and Aberteifi are put off using the service by longer journey times.

A parallel 'secondary network' of supported bus services operates within the wider Teifi Valley area between Aberteifi, Llandysul, Newcastle Emlyn and Carmarthen. These services usually provide less than daily services and offer a restricted range of choice in terms of timing and places served. In many instances residents without access to a car rely on lifts from neighbours or use the County's Social Car scheme Country Cars. It is also believed that taxis are used significantly for personal travel despite the premium costs involved.

BWCABUS Operation and Management

Significant opportunities were viewed to exist to rationalise the Carmarthen – Aberteifi route to reduce journey times, increase journey time reliability, provide the potential for increased frequencies and enable effective bus and rail connections in Carmarthen.

In place of the fixed timetable approach used at present, the BWCABUS scheme will link conventional bus and train trunk route services to an integrated, demand responsive, low capacity service. The BWCABUS scheme utilises ITS, GPS, a scheduling module, OS mapping and a real time information system, to enable travellers to book a feeder service at any time during operating hours and the controller to route those buses as required. The BWCABUS system guarantees connections at designated hubs on outward and return journeys between the fixed and demand responsive services, with bookings made before setting out.

Five locations for 'hubs' or interchange points between the fixed and demand responsive services have been identified. These are:

- Cynwyl Elfed
- Dre-fach Felindre
- Henllan
- Newcastle Emlyn
- Cenarth

Trial Design

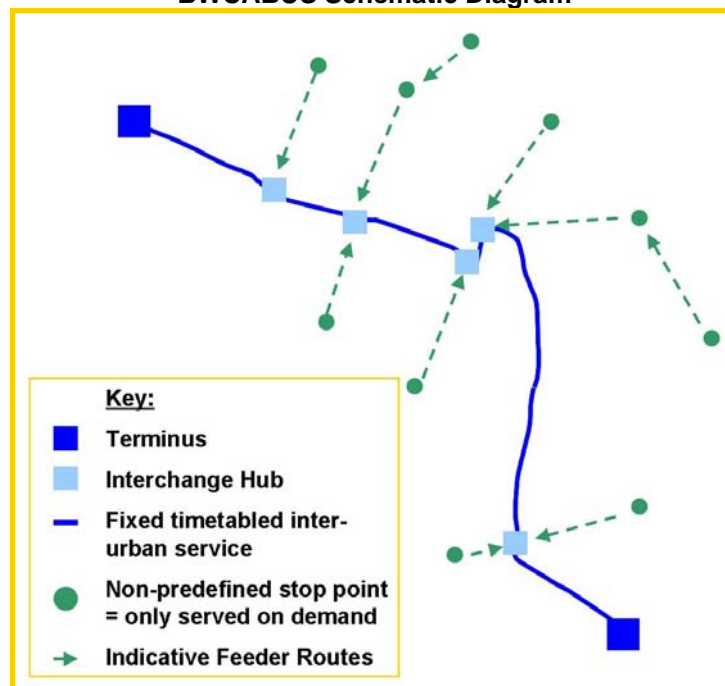
In place of the fixed timetable approach used at present, BWCABUS will link an integrated, demand responsive, low capacity service to conventional bus and train services. The key features of the BWCABUS system are identified below:

- The BWCABUS system guarantees connections at designated hubs between the timetabled 460 service, travelling between Carmarthen and Cardigan, and a demand responsive feeder service.
- The feeder concept ensures integration between the two service types and avoids unnecessary duplication of routes, which is therefore more efficient and environmentally friendly.
- Passengers will change modes (between the BWCABUS and 460 service) at local hubs, where good quality travel information will be available.
- BWCABUS will present 'travel opportunities' in place of bus 'services' on a map. The BWCABUS zone covers several villages that are currently without a bus service and will provide an improved level of service to several others, in some villages this increases provision from no services to 72 opportunities to travel in each direction every week.
- BWCABUS will provide inter area links between villages and assists in improving social inclusion for non car owners, the elderly, young people and those on low incomes.
- Bookings for the BWCABUS service will be made by passengers before setting out via Traveline Cymru, where information on timetabled conventional buses and trains will also be available.

Two minibuses will be purchased to operate the trial. To ensure the highest quality vehicles are used and meet requirements of size and accessibility, these will be purchased and owned by Carmarthenshire / Ceredigion Council. The buses will be uniquely branding in order to create a high profile for the service. This will be designed professionally to create a distinct BWCABUS brand.

BWCABUS will be integrated with conventional bus services, feeding passengers into the 460 service. This approach avoids unnecessary route duplication, and should ensure higher patronage levels on the 460 service. To provide the quality of service that will prove attractive to car users the 460 will be upgraded to provide a direct, hourly service between Aberteifi and Carmarthen, Monday to Saturday (7am – 7pm). By removing diversionary spurs, the journey time will also be reduced from 90 minutes to 70 minutes. A new clock face timetable has been carefully designed to connect with train services and other bus services in Carmarthen and Aberteifi. The new contract to operate this service will specify high quality, fully accessible buses must be used on this route.

BWCABUS Schematic Diagram



The operational contracts for BWCABUS will be let and managed by Carmarthenshire / Ceredigion Council. The contract to operate BWCABUS is likely to be jointly tendered with the upgraded 460 service. This will ensure that one operator is responsible for both elements of service provision, namely the fixed timetabled core service and the feeder services. This arrangement will also make coordination and management far easier than if two bus operators were to hold the contracts separately.

The booking / control system software has been developed specifically for BWCABUS. It utilises ITS, GPS, a scheduling module, OS mapping and a real time information system, to enable travellers to book a feeder service at any time during operating hours and the controller to route those buses as required. The synchronised multi-modal travel and on demand travel information will be achieved using Global Positioning Systems (GPS) satellite navigation technology for real-time vehicle tracking and positioning. The vehicle position information will be handled at a control centre, where it will be used to provide information to drivers, so that interchange from one mode of travel to another may be harmonized.

In the early days of the trial take up is anticipated to be small and BWCABUS will have to build up its passenger base gradually. It is questionable in these circumstances if it is cost effective to set up a new call centre and employ a group of people on a full or part time basis for a small number of initial calls. As the Traveline facilities are already available and because the software is dedicated there is no cost to PTI Cymru other than the cost of the call agent's time. This would allow Traveline to deliver the booking service on behalf of the BWCABUS scheme on a cost effective basis. The PTI Cymru call centre in Porthmadog is open 7 days a week between 0700hrs and 2200hrs, and is fully bilingual.

Key Operational Benefits

BWCABUS will significantly improve public transport services on the main A484 corridor and also helps to provide a long term sustainable solution for accessibility. BWCABUS provides a strategic integrated public transport service which links communities with each other and provides access to services within and outside the Counties of Carmarthenshire and Ceredigion.

The innovative nature of this concept lies in integrating DRT and conventional public transport networks with the optimisation of vehicle use through GPS. This can improve service quality, increase demand, increase rural accessibility and in the longer term, better - value provision of rural public transport.

Meeting Unmet Transport Needs

Several studies have indicated the link between accessibility to public transport and social exclusion. Often this is the consequence of infrequent bus services, with little choice of departure time and long journey times; thus for many it is the "mode of last resort". This proposal will make the long distance main route service attractive to some existing car users, eliminating as it does the parking problem. It will increase the choice of departure times from more settlements and reduce journey times to market towns.

The departure time choices are a crucial factor in reducing social exclusion. The BWCABUS scheme provides 'travel opportunities' in place of bus 'services' on a map. In some villages this increases provision from 4 services per week to 72 opportunities to travel in each direction. This could increase if evening services were introduced. The scheme would also provide inter area links between villages and assists in improving social inclusion for non car owners, the elderly, young people and those on low incomes.

Key Benefits for Wales Transport Strategy Outcomes
 The key benefits of introducing the BWCABUS trial have been identified as:

Social	Economic	Environmental
1. Improved access to local services: Health, Education, Shopping & Leisure	1. Improved access to employment opportunities	1. Promotes sustainable transport
2. Maximises travel opportunities	2. Increased demand & therefore revenue generation	2. Decreased car use amongst rural population
3. Reduces geographical isolation	3. Optimising provision within budget limits	3. Achieves greater transport integration
4. Allow socially excluded to fully participate within communities	4. Commercial opportunities to exploit concepts & software	4. Encourage tourism without cars
5. All vehicles low floor & fully accessible	5. Strengthen viability of interurban service	
6. Service is responsive & on demand	6. Could undertake some school contracts	
7. Retain rural population		

Marketing & Promotion

As this new system marks a significant change in public transport provision within the area it is vitally important that a comprehensive and varied campaign is undertaken. The main marketing and promotion activities would include leaflets to be distributed door-to-door within the operating area and through civic buildings such as library's etc, local advertising to include posters and radio adverts, and a launch event to which the Assembly Minister for Transport would be invited to formally launch the new service.

Indicators of Success

The success of BWCABUS will be measured against indicators related to the trials aims and objectives, and the three key outcomes of the Wales Transport Strategy: Social, Economic and Environmental impacts. The achievement of BWCABUS's objectives will be determined by indicators including:

- Reduced levels of public transport subsidy
- Increased patronage levels
- Improved access to healthcare, education, employment, shopping and leisure, and visitor attractions
- Improved passenger satisfaction levels
- BWCABUS model proves attractive to bus industry and can be transferred to other areas of Wales
- Local / National / European awareness of the scheme
- Changes in levels of car use amongst BWCABUS members
- Increased concessionary pass use amongst rural population

Timing

With the design phase completed, systems developed and consultation undertaken, BWCABUS has entered the trial stage. The Wales Transport Research Centre, Carmarthenshire and Ceredigion County Councils are working together to source the funding needed to get the trial operational.

Both Carmarthenshire and Ceredigion Council's are committed to funding the main 460 service upgrades and have committed significant funding towards the BWCABUS trial operating costs and bus purchase. However, external sources of capital funding are necessary to cover the estimated shortfall required to set up and operate the trial scheme. In addition to the Welsh Assembly Government other sources of funding are being actively investigated, including the Big Lottery People & Places Programme, and European Convergence Funding.

Once the necessary funding has been secured a lead in time of 6 months is anticipated to allow for the buses to be purchased, contracts let, and equipment/systems to be installed. This would suggest a start date, at the very earliest, early in 2008.

Exploitation & Future Developments

Further research into the future expansion of BWCABUS will investigate the phased expansion of the operating area into adjacent areas and consider its deployment into new areas of operation across Wales. BWCABUS has also been well accepted when presented at conferences in the UK and across Europe. The research will therefore also consider applications outside Wales and opportunities to export the concept to other European member states. Opportunities to commercially exploit BWCABUS will also be explored with leading market companies such as Logica and QinetiQ.

Project Partners

The BWCABUS trial has been developed in partnership by the Wales Transport Research Centre, and Carmarthenshire and Ceredigion County Council's. This work has been funded by the Welsh Assembly Government. This is a unique partnership representing National and Local Government, Academia, and two of the four regional consortia – SWWITCH & Taith.



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