



SEStran

DRT for Forth Valley Royal Hospital

June 2010

Feasibility Study

TRANSPORT
TRAFFIC
DEVELOPMENT
PLANNING
URBAN DESIGN
ECONOMICS
MARKET RESEARCH

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DRT for Forth Valley Royal Hospital

Feasibility Study

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1 Introduction

1.1 Report aims and objectives

1.1.1 The principal objectives of this report are to:

- Understand current DRT and Community Transport within the catchment area of Forth Valley Royal Hospital
- Understand patient transport provision throughout the catchment of the new hospital
- Identify gaps in the public transport provision in the catchment area and assess the feasibility of DRT options that would complement existing transport proposals for the new hospital at Larbert
- Build on other work to establish a framework for provision within which specific DRT derivatives and their characteristics can be identified
- Develop an action plan for implementation and provide recommendations for the extension or expansion of DRT pilot schemes

2 Existing Planned Provision

2.1 Introduction

2.1.1 This section contains details of existing or planned public transport links that could be used to connect to the new Forth Valley Royal Hospital. This includes rail, bus and DRT services within the catchment area of the hospital.

2.2 Bus services

2.2.1 The hospital will be served by a number of existing services that currently operate along the A9 Stirling Road outside the hospital site. These will be diverted to serve the stances outside the main hospital entrances. NHS Forth Valley are also funding a number of new bus services that are being procured on it's behalf by Falkirk Council and Clackmannanshire Council.

2.2.2 It is also likely that a number of new commercial services may also provide additional links to the hospital. These will not directly affect this study as DRT services cover areas where population is sparse and conventional services are generally uneconomical. However, they may indirectly affect provision as they may create additional hubs into which DRT services can feed.

2.2.3 In our analysis we recognise that there are already bus services that are “committed” services that will serve the site from opening date. In addition there are “potential” services that may be registered by commercial operators to serve the hospital over the next few months as additional services are transferred to the Forth Valley Royal Hospital creating additional demand.

2.2.4 While we could speculate at how the network could be adjusted we feel that these services will have little impact on the study as they will largely serve urban areas where there is likely to be good potential for patronage generation. The study is focused on provision to more outlying areas where coverage may not be as effective.

2.2.5 During our analysis our recommendations will take account of the “committed” network of public transport services. Our recommendations will also take into account the likely stability of the network, for example there is always likely to be sufficient demand to create a link from Falkirk and Stirling to Forth Valley Royal Hospital. However, other services to areas where demand is more widely distributed may not be economically viable and liable to withdrawal. If commercial services are registered that impact on our recommendations then the recommended DRT network may have to be adjusted accordingly in the future.

2.2.6 Figure 2.1 to Figure 2.3 show all the bus and DRT services that will serve Forth Valley Royal Hospital from the opening date within the respective Clackmannanshire, Falkirk and Stirling Council areas. It also shows services that connect into DRT services at main hubs. The maps are taken from a series of leaflets that are being produced for Forth Valley Royal Hospital.

Figure 2.1: Falkirk area bus routes

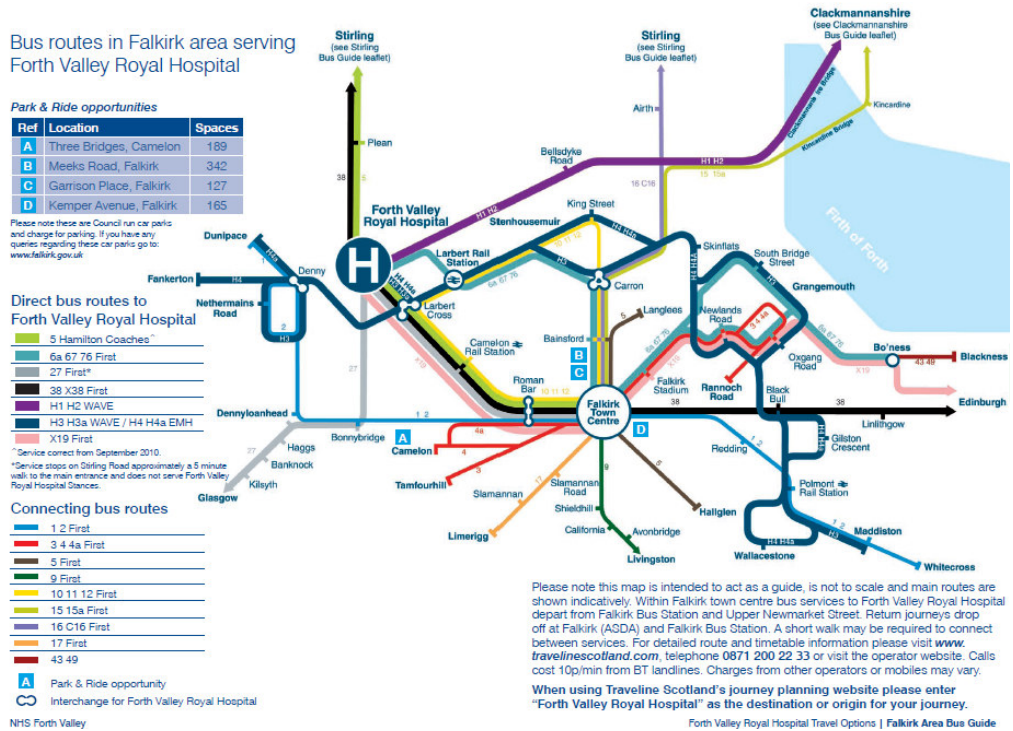


Figure 2.2: Stirling area bus routes

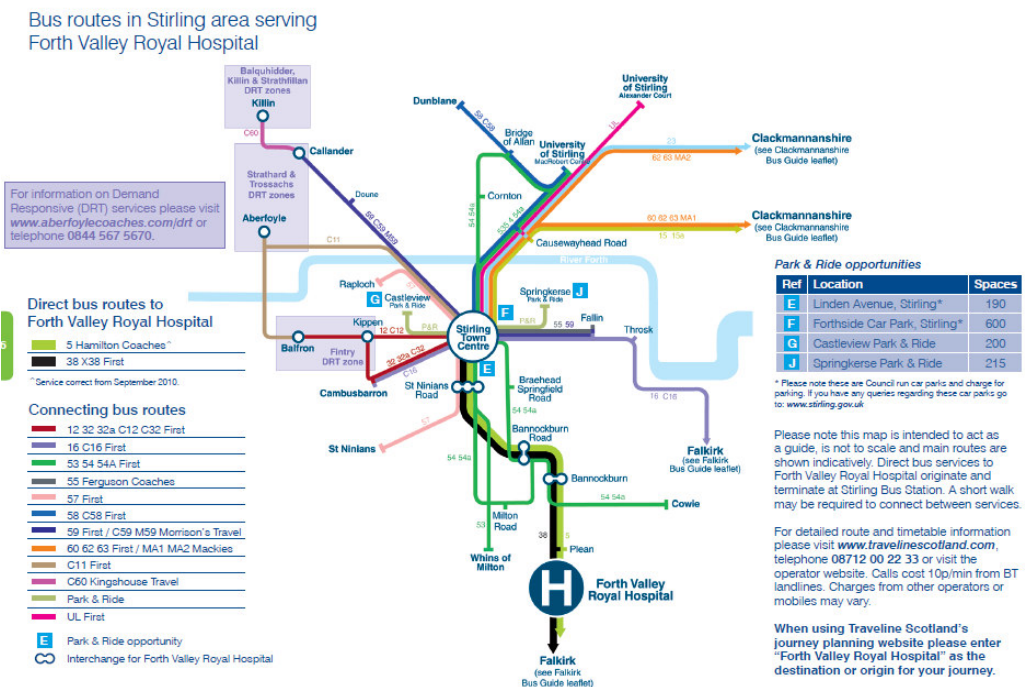
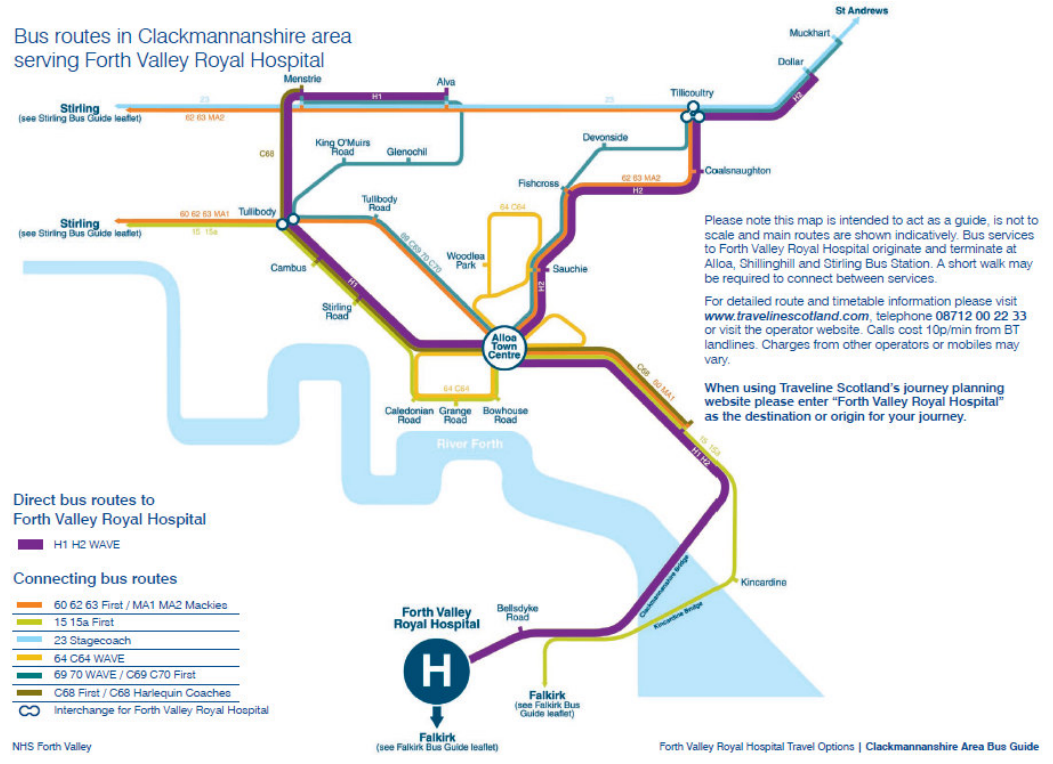


Figure 2.3: Clackmannanshire area bus routes



- 2.2.7 The maps show that for the majority of people living in urban or semi-urban areas it is possible to reach Forth Valley Royal Hospital either by using a direct bus service or with one change usually at Falkirk or Stirling town centres. However, for people living in the northern and western rural areas of Stirling multiple changes may be required.
- 2.2.8 It is worth noting that all the services listed below will serve the Stances outside the Forth Valley Royal Hospital. However, service 27 will serve the stop immediately outside the Forth Valley Royal Hospital on the A9 Stirling Road.

Table 2.1: Committed Bus Services

Service number	Key destinations	Daytime frequency	Operator	Supported/Commercial
5	Falkirk – Forth Valley Royal Hospital - Stirling	60	Hamilton's	Commercial
6a/67/76	Forth Valley Royal Hospital – Larbert Rail Station Carron – Falkirk – Grangemouth – Bo'ness	30	First	Commercial
27	Glasgow – Kilsyth – Bonnybridge – Forth Valley Royal Hospital – Falkirk	60	First	Commercial
38	Edinburgh – Linlithgow – Falkirk – Forth Valley Royal Hospital – Stirling	20	First	Commercial
H1	Forth Valley Royal Hospital – Clackmannan – Alloa – Tullibody – Alva	120	TBC	Supported
H2	Forth Valley Royal Hospital – Clackmannan – Alloa – Tillicoultry – Dollar	120	TBC	Supported
H3	Denny – Forth Valley Royal Hospital – Larbert Station – Stenhousemuir – Grangemouth – Polmont – Maddiston	60	TBC	Supported
H3a	Forth Valley Royal Hospital – Larbert Rail Station	30	TBC	Supported
H4	Fankerton – Denny – Forth Valley Royal Hospital – Larbert Rail Station – Stenhousemuir – Grangemouth – Polmont – Wallacestone	120	TBC	Supported
H4a	Dunipace – Denny – Forth Valley Royal Hospital – Larbert Rail Station – Stenhousemuir – Grangemouth – Polmont – Wallacestone	120	TBC	Supported

2.2.9 The table shows that there are a number of key services to the hospital on all the main approach roads to the hospital. It is worth noting that service 27 will only stop on Stirling Road approximately a five minute walk to the hospital main entrance. The key hubs where secondary services can feed into bus services directly to the hospital are likely to be:

- Stirling (journey time approx 25 minutes);
- Alloa (journey time approx 30 minutes);
- Falkirk (journey time approx 20 minutes);
- Denny (journey time approx 15 minutes).

2.2.10 Bus fares are set by commercial operators and are set on a graduated fare scale with fare stages typically around one mile apart. The supported services are also expected to charge fares that are follow a similar price structure. Singles and returns are available although operators regularly promote day, weekly, monthly and annual tickets as offering

better value for money. The table below summarises the cost of First tickets between Forth Valley Royal Hospital and key destinations at 22nd February 2010:

Table 2.2: First Bus Edinburgh season ticket prices

Travel to/ from	Distance (Miles)	FirstDay	FirstWeek	First4Week	FirstYear
Alloa	11.9	£5 (21.01p)	£20 (16.81p)	£63 (13.24p)	£690 (11.60p)
Aberfoyle	27.1	£9 (16.61p)	£34 (12.55p)	£112 (10.33p)	£1,200 (8.86p)
Bridge Of Allan	13.7	£7 (25.55p)	£24 (17.52p)	£77 (14.05p)	£850 (12.41p)
Callander	23.6	£9 (19.07p)	£34 (14.41p)	£112 (11.86p)	£1,200 (10.17p)
Dunblane	13.6	£9 (33.09p)	£34 (25.00p)	£112 (20.59p)	£1,200 (17.65p)
Falkirk	3.7	£5 (67.57p)	£20 (54.05p)	£63 (42.57p)	£690 (37.30p)
Stirling	8.1	£7 (43.21p)	£24 (29.63p)	£77 (23.77p)	£850 (20.99p)

Note: figures in parentheses are cost per mile based on return journey over 5 days per week and 50 weeks per year

- 2.2.11 The table shows that fares are vary significantly across the catchment area of the Forth Valley Royal Hospital. In particular the price per mile is typically higher for short hop journeys and cheaper for longer distance journeys. This may reflect the different fare elasticities that are related to customer perception. This means that customers willingness to pay is correlated closely with the initial outlay and less closely based around the distance that needs to be travelled.
- 2.2.12 People who live in rural areas may have to use a number of different operators in order to complete their journey. The one ticket system provides an option for regular travellers as season tickets allowing travel for 7 day, 28 days and annually are available. However, they are of little use to occasional travellers and they are also not valid on many operators in rural areas such as Aberfoyle Coaches, Mackies and Morrison's.
- 2.2.13 It may also be a reflection of the fact that passengers undertaking longer distance journeys typically face lower frequencies so price per mile needs to be kept down to encourage patronage. The other determinant is that the cost per mile of operating a bus service in a rural area is likely to be lower in rural areas due to higher average journey speed.
- 2.2.14 When it is considered that it is estimated that car journeys typically cost around 40p per mile some of the fares are very competitive especially over longer distances.

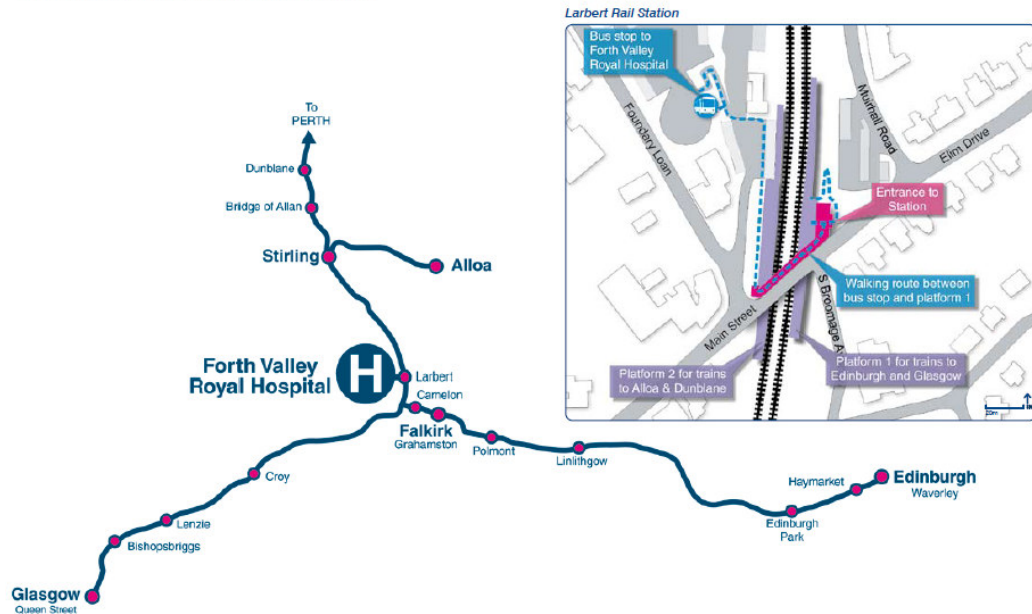
2.3 Rail services

- 2.3.1 Rail services are operated by First ScotRail with frequent services stopping at Larbert Station, which is approximately one mile from the hospital site. Bus services provided by NHS Forth Valley and Firsy will connect with the vast majority of train arrivals and departures at Larbert Hospital and operate directly to/ from the hospital and will take approximately four to six minutes. Bus services provided by NHS Forth Valley will be free for rail passengers on production of a valid rail ticket although it is likely that a charge may be introduced at a later stage in order to enable the service to be sustainable.

2.3.2 Rail services operate on a north-south axis through Dunblane, Bridge of Allan, Stirling, Larbert and Falkirk. There is also a branch line to Alloa, which is served by hourly trains from Larbert. Figure 2.4 shows the direct rail services that will serve the hospital.

Figure 2.4: Rail connections

Rail routes to Forth Valley Royal Hospital



2.3.3 Although not shown on this map the West Highland line does provide an option for customers who live near the A82 corridor. Passengers can travel to Glasgow Queen Street and change for a train to Larbert Rail Station.

2.3.4 Off-peak rail tickets range from £2.70 to £6.10 return for stations within the catchment area of the hospital. Discounts are available to children and railcard holders (including people aged 16-25 or over 60). Travel at peak times (before 0930hrs) costs slightly more although season tickets reduce the price to around the off-peak ticket price assuming five journeys are made per week.

2.3.5 The service levels, journey times and pricing is summarised in Table 2.3. These prices are subject to change during the annual rail fare revision although prices are regulated and are unlikely to alter significantly. The journey times are based on Traveline Scotland website for journeys taking place on 10th August at 1200hrs, although some journey times have had to be altered manually as the data is not fully up to date.

Table 2.3: Rail services to and from Larbert Station

Destination	Rail journey time (mins) to FORTH VALLEY ROYAL HOSPITAL	Bus journey time (mins) to FORTH VALLEY ROYAL HOSPITAL	Trains per hour (daytime)	Off-peak return	Distance from Larbert Station	Cost pence/mile
Dunblane	28	60	3	£6.10	13.023	23.4p
Bridge of Allan	26	48	3	£5.40	10.91	24.7p
Alloa	30	28	1	£6.10	15.89	19.2p
Stirling	20	25	4	£4.20	8.09	26.0p
Camelon	20	6	2	£2.70	1.58	85.7p
Falkirk Grahamstown	23	19	2	£2.70	2.86	47.2p

- 2.3.6 The National Concessionary Travel Scheme that subsidises travel for the over 60's on registered bus services does not extend to rail travel. However, the adult fares are still in the same ballpark as fares that would be charged on local bus services. Table 2.3 also shows that rail services are only really competitive compared to bus in terms of journey time from destinations where direct bus services are not available for example Dunblane and Bridge of Allan.
- 2.3.7 It is also worth noting that the change required at Larbert makes the service more unattractive as DRT passengers may have already had to change at least once. We would therefore recommend that potential rail hubs include:
- Dunblane;
 - Bridge of Allan;
- 2.3.8 Alloa and Stirling have regular direct bus services operating although the bus stations and rail stations are in fairly close proximity so we would envisage that passengers would primarily use bus services, but would be made aware that the option of using rail was available.

2.4 DRT

Stirling Council

- 2.4.1 Stirling Council launched a revised DRT network at the end of March 2010. The service is built around the principle that there are three levels of bus provision:
- **Level 1:** comprises core (generally commercial) bus services that operate between main hubs such as Stirling and Callander. There is an aspiration to operate these services at hourly frequencies or better;
 - **Level 2:** comprises distributor bus services that generally operate from main centres such as Callander and connect with smaller villages such as Killin. These services generally operate at frequencies of every hour or less;
 - **Level 3:** comprises a DRT network that connects into the Level one or Level two bus network at the nearest main hub. This prevents the bus overlapping conventional commercial or contracted routes.
- 2.4.2 The DRT scheme areas are:
- Balquhidder;

- Fintry;
- Killin & Strathfillan;
- Strathard;
- Trossachs.

- 2.4.3 All the services are available on Monday to Saturdays from 0700-2130hrs with no service operated on 25-26 December and 1-2 January. Bookings can be made by telephone, online, text or via email and should be made up to 24 hours in advance if possible.
- 2.4.4 The services are contracted to Aberfoyle Coaches who in turn contract out journeys depending on their locality to the nearest local operator. This means that dead mileage is minimised, which is part of the incentive in the contract as reimbursement is only made for actual passenger mileage at a rate of £1 per mile (minimum £5 per journey).
- 2.4.5 The total cost of the contract comprising the five areas is expected to be approximately £75,000 per annum although this may vary depending on the amount of mileage and journeys undertaken. This does not include any fares taken by the operator or concessionary reimbursement claimed by the operators so the operator takes the revenue risk..

Dial a Ride

- 2.4.6 Dial-a-Ride is a charitable organisation with a fleet of 24 vehicles that operate from a base near the centre of Stirling. Over 23,000 journeys are provided per annum by Dial-a-Ride. The system is only open to those who have certain levels of mobility difficulty. This means that it does not operate as a true DRT system as it is not open to everyone, however it plays an invaluable role in providing transport for people who may be unable to access traditional public transport services, particularly in areas that are on the fringe of the main urban areas.

3 Consultation

3.1 Introduction

3.1.1 This section includes interviews that were held with local authorities, Forth Valley Royal Hospital, transport operators, TACTRAN and SEStran. A questionnaire was sent to consultees (copy included in the appendix) and a telephone interview was carried out a few days later. The findings of the interviews with various consultees is summarised in the following sections.

3.1.2 We also discussed with consultees what they considered was a reasonable journey time and the maximum number of changes passengers could be expected to make to access services. One point of discussion was whether there is a way of combining level 2 and 3 services so that they act as a conventional bus route before turning into a DRT bus route to reduce the number of changes.

3.2 Mark Craske, NHS Forth Valley

3.2.1 Mark is the Travel Manager for NHS Forth Valley and is responsible for implementing the travel plan and ensuring that NHS Forth Valley meets its mode share targets. Discussions with Mark indicated that he was concerned about public transport options for people living to the west of the hospital. He also mentioned that at present Cowie, which is near the hospital will not have a direct service to the hospital with residents instead forced to travel towards Stirling and having to then change to a 38 at Bannockburn.

3.2.2 He suggested the patient groups should be consulted and it was agreed that this would be covered through the forwarding of meeting minutes (shown in the appendix). Representations have been received from DRT operators suggesting that services could be extended from Aberfoyle to Forth Valley Royal Hospital via Stirling with journeys operating in gaps between existing services.

3.2.3 Mark is looking for this study to provide recommendations on where improvements can be made and would be looking to take forward any recommendations with key local authority partners. Any proposals must ensure that they balance the needs of users with generating efficiencies within present arrangements.

3.2.4 The main areas in which he is aware there are gaps in the provision of services are to the north west of Stirling and the rural southern districts of Falkirk. He strongly recommended speaking to Stuart Hislop regarding provision to the areas near the southern bank of the Forth. NHS Forth Valley are always keen to explore any initiatives that would improve the accessibility of the hospital to patients within its catchment area.

3.3 Harry Falconer, Scottish Ambulance Service

3.3.1 Harry manages patient transport provision for NHS Forth Valley with requirements including transport to Edinburgh and Glasgow. A mixture of cars, ambulances and minibuses are operated. Dial-a-Journey provide some services under contract to the SAS and there is a volunteer driver scheme where drivers are paid 40p a mile for up to 10,000 miles (this includes dead mileage). There has been a shortage of volunteer drivers in recent months as drivers used to get 37p a mile for an unlimited number of miles, now that they are limited to being reimbursed for up to 10,000 miles without any tax implications drivers are unwilling to carry out as much work.

- 3.3.2 Dial-a-Journey is a medical based transport system although many patients tend to believe that they are entitled to transport regardless of their condition. The first appointment is booked directly by the patient using a call centre in Perth with subsequent journeys being arranged by the hospital. The patient transport provision (ambulance or conventional) is determined by criteria set by the hospital.
- 3.3.3 Journeys are generally planned 24hrs in advance with vehicle pick ups scheduled to maximise efficiency especially in cases where a minibus is deployed. Harry will be meeting with Graham Courtney (Kingshouse Travel) to discuss if there are efficiencies to be gained from them operating some journeys under contract to the Ambulance Service. These would be for patients who do not require an ambulance or multiple people to help them in and out of vehicles.
- 3.3.4 Harry mentioned that if rural transport provision is to be cost effective then it is vital that the hospital booking system takes into account the patient transport options. This can be easier said than done as many clinics only offer a limited number of times when they can offer specific services and patient travel needs may not be taken into account.
- 3.3.5 Ideally Harry would like to be able to concentrate resources on patients with medical requirements while encouraging other patients to use alternative provision. There are currently issues with availability of transport and complaints have been received about long waiting time for transport. As a general rule patients are dropped off at the hospital and pick up times are scheduled for one hour after the appointment start time.
- 3.3.6 There is potential for conflicts between vehicle movements outside the Forth Valley Royal Hospital as there are only 19 spaces available for dropping off and picking up patients. This will need careful management in order to avoid conflicts between different vehicles. While this will only directly affect ambulances and patient transport vehicles it has the potential to affect buses if queues develop as people try and access these spaces..

3.4 David Brown, Stirling & Clackmannanshire Council

- 3.4.1 David is the public transport officer for Stirling and Clackmannanshire Councils and is responsible for the management of the contracted bus service network. As much of the area is rural a high proportion of contracted public transport journeys are operated under contract to Stirling and Clackmannanshire Council.
- 3.4.2 David described the scheme for DRT in the Stirling Council area in detail (described in section 2.4 in greater detail) and stated that the Scottish Government is taking a close interest as it is a template that could be rolled out elsewhere. The key benefits of the scheme are the hierarchy of bus service provision that prevents duplication along sections of route and means that resources are used efficiently while providing tailored services to meet the needs of rural communities.
- 3.4.3 Two rural areas – Fintry and Killin & Strathfillan - are being converted to have their main provision by DRT rather than fixed timetable services from the end of March.
- 3.4.4 DRT already operates in three areas – Balquhiddy, Strathard and Trossach (see Appendix 2). The cost to passengers varies according to the distance travelled and is broadly similar to the maximum bus fares charged for contracted services. The cost table is shown in Appendix 3.
- 3.4.5 The cost of operation per year: Balquhiddy £16,834, Strathard £15,650, Trossachs (part year extrapolated) £33,840. Stirling Council pays operators £1 per mile when carrying passengers with a minimum fare of £5 payable per journey. This money is only paid while a vehicle is carrying passengers. Where possible the operator aims to carry multiple passenger journeys at the same time.

- 3.4.6 Revenue is retained by the operator. Income data is not immediately available, but we are advised that this can be provided. Note that these figures will exclude concessionary reimbursement claimed by the operator. The first year of operation for the schemes that are currently in operation are
- Balquhidder - 2000,
 - Strathard - 2008
 - Trossachs – 2009
 - All other schemes are starting operation in March 2010
- 3.4.7 The booking service is provided by the lead operator who are Aberfoyle Coaches. They have up to 20 vehicles at their disposal including vehicles operated by other operators within their consortium. Bookings by e-mail, internet, phone or text are available and further details are shown in Appendix 2.
- 3.4.8 While Forth Valley Royal Hospital is situated close to the main population centres, these centres are at the eastern extremity of NHS Forth Valley's area. There is a substantial western and northern hinterland of villages and scattered communities. Concerns have been expressed strongly by individuals and representatives in these communities as to the accessibility of Forth Valley Royal Hospital.
- 3.4.9 DRT will improve the ability of rural public transport networks to meet appointment times and every community of at least village size in the Stirling Council area should be able to access Forth Valley Royal Hospital by public transport. However, several changes of journey may be required. For example:
- From Tyndrum or Crianlarich: DRT to Killin - bus to Callander - bus to Stirling - bus to Forth Valley Royal Hospital (1 DRT + 3 buses);
 - From Inversnaid, Stronachlachar or Kinlochard: DRT to Aberfoyle - bus to Stirling - bus to Forth Valley Royal Hospital (1 DRT + 2 buses).
- 3.4.10 Fare paying passengers will incur a separate fare on each route section unless the same operator operates more than one section of the route. However, the one ticket system would provide an option for regular travellers as it is valid in 7 day, 28 day and annual versions. This allows travel on the vast majority of bus and rail operators within designated areas. If one ticket could also be provided in a one day version it may prove even more valuable as it is likely that people in rural areas are more likely to make infrequent trips to the Forth Valley Royal Hospital on public transport due to extended journey times.
- 3.4.11 The weakest links in the chain are the bus services between rural centres and Stirling. At best, these are hourly (Balfron – Stirling, Callander – Stirling), but some are 2-hourly (Aberfoyle – Stirling, Drymen – Balfron, Killin-Callander). However, DRT over long distances is not cost effective.
- 3.4.12 The main benefits of the scheme is the reduction in duplication of scheduled commercial/ supported bus services and maximising the use of existing resources, which avoids the need for Stirling Council to invest in their own vehicles. The standard taxi tariffs are more expensive than DRT with prices starting at £1.20 for up to 0.3 mile (equivalent to £3.60/ mile) and then 18p for each 0.1 of a mile (equivalent to £1.80/ mile) thereafter.
- 3.4.13 Other general points raised were that the distribution of the population compared to the location of Forth Valley Royal Hospital is not favourable to the western hinterland. It is difficult to justify direct services to the hospital due to the remoteness from other major trip attractors. David stated that existing bus operators are more likely to be in favour of extending existing bus services rather than diverting services (for example to serve Cowie). Stirling Council aims to increase the frequency of existing bus routes where the frequency is lower than hourly (for example to Aberfoyle).

- 3.4.14 There may be a certain amount of responding to needs as they emerge. Partnership working between NHS Forth Valley, the three councils and transport operators will be essential to implementing optimal solutions.

3.5 Pam Campbell, Stirling Council

- 3.5.1 Pam works with people in rural areas within the Stirling Council area and there is concern in a number of areas about access to Forth Valley Royal Hospital. In particular issues include the number of connections, the type of vehicles deployed (need to be accessible to people with limited mobility for all journey legs) and also the timings of connections in relation to appointments (in particular the need to avoid overnight stays). Many areas also do not have access to any public transport and this needs to be addressed.

3.6 Chris Cox, Falkirk Council

- 3.6.1 Chris Cox is the Acting Public Transport Officer for Falkirk Council and is responsible for managing local bus service contracts within the Falkirk Council area. The main plan for the Council is the introduction of the revised service 233 contract that will see a half hourly service operate between Denny – Forth Valley Royal Hospital – Larbert Station – Stenhousemuir – Grangemouth – Polmont.
- 3.6.2 At present the only DRT service in the Falkirk Council area is the Dial-a-Journey scheme that is only open to people with mobility problems although membership criteria has been relaxed in recent years. There are no major gaps in provision that Chris is aware of although he suspects that these will take time to emerge as functions are moved to the new hospital.
- 3.6.3 Falkirk Council also own a vehicle that is currently deployed on the E43 that serves Falkirk Hospital. This could potentially be redeployed to meet demand from areas close to the hospital although it partly depends on the outcome of discussions between Falkirk Council and NHS Forth Valley. Chris also mentioned that the concessionary fare reimbursement scheme is changing so that operators are reimbursed 67p instead of 74p per £1 of the equivalent adult fare from April 2010. This may have a negative impact on marginal services that rely on this income.
- 3.6.4 It is important to note that although it is highly likely that any services operating along the A9 will be diverted to serve the hospital we will not know for certain what commercial operators intentions are until a short time (56 day bus service registration period) before the hospital opens. It is therefore important to focus on improving ease of interchange at hubs where passengers are likely to connect for services to the hospital such as Falkirk, Stirling and Alloa.

3.7 Lisa Black, SEStran

- 3.7.1 Lisa stated that the main aim of the study is to ensure that any DRT recommendations complement the existing public transport provision and meet the aims to reduce social exclusion, in particular addressing the need to improve access to healthcare facilities.

3.8 Michael Cairns, TACTRAN

- 3.8.1 Michael advised that a DRT pilot scheme is being examined in West Kinross-shire that could replace an existing Council contracted local bus service and potentially connect with Dollar (for the contracted service H2 to the hospital).

3.8.2 Funding has been available for feasibility studies and the capital elements of DRT schemes with money available this financial year but there is no guarantee of funding other than for feasibility studies will be available in the future.

3.8.3 Michael advised consulting with Dial-a-Journey and stated that accession modelling shows that anywhere outside the urban areas of Stirling are generally considered as inaccessible. It was suggested that David Brown would be aware of many of the local issues.

3.9 Duncan Hearsum, Dial-a-Journey

3.9.1 Duncan is the Chief Executive for Dial-a-Journey which is a registered charity whose main aim is to fill gaps in provision by the conventional transport sector. This includes a Dial-a-Ride service that people with mobility difficulties can apply for membership and then use the service to meet their local transport requirements.

3.9.2 Dial-a-Journey operate a contract for NHS Forth Valley that sees them providing a vehicle to take people to and from a Day Hospital in Stirling. This enables NHS Forth Valley to deploy their vehicles more effectively for example carrying patients with medical requirements.

3.9.3 They also operate a Taxicard booking scheme on behalf of Falkirk, Stirling and Clackmannanshire Councils although other operators actually provide the journeys and claim reimbursement for journeys. This costs approximately £40,000 per annum.

3.9.4 Approximately 25,000 passengers are carried by Dial-a-Journey services that deliver point-to-point transfers for passengers who meet mobility qualifying criteria. Many journeys on Dial-a-Journey only carry 1-2 people due to the service operating in a similar way to a taxi and the difficulty in combining journey requirements. A further 80,000 journeys take place on local bus services that are operated by Dial-a-Journey, but can be used by anyone. This includes a mix of both commercial and contracted work.

3.9.5 Duncan stated that he sees the biggest problem with access to the hospital being from rural areas to the north-west of Stirling. A lot of Dial-a-Journeys demand comes from areas on the periphery of urban areas, generally not rural areas, as the cost of providing journeys from the base in Stirling is prohibitive.

3.9.6 There is a possibility that the Dial-a-Journey contract may be put out to tender as the Councils seek to obtain "best value". As a general point Duncan would be keen to explore whether he could assist the PTS at NHS Forth Valley with providing more transport links. The other opportunity is in taking on marginal services that are not economical for large commercial operators like First.

3.9.7 As a general point Duncan mentioned that he was pleased that NHS Forth Valley have engaged with the operators at an early stage in the hospital development.

3.10 John Buchanan, Aberfoyle Coaches

3.10.1 John Buchanan is the owner of Aberfoyle Coaches who have won the contract to operate the DRT scheme in areas to the west of Stirling. Aberfoyle Coaches are responsible for taking bookings from users and then subcontracting many of the journeys to other private operators depending on the location and requirements of users.

3.10.2 The aim of the DRT system is to minimise dead mileage and the only time work would not be allocated to the operator that is closest to the booking would be if a vehicle was unavailable or it was more cost effective to meet the demand by using a larger vehicle from Aberfoyle.

- 3.10.3 John mentioned that Aberfoyle Coaches will be entering into discussions with Patient Transport Services at NHS Forth Valley to see if some demand in rural areas can be met by Aberfoyle Coaches. For example if a patient is in Killin they could use a conventional bus service to Callander then a DRT service from Callander to the Forth Valley Royal Hospital. A new route is being operated into Glasgow from the end of March and they would like to operate services into Stirling.
- 3.10.4 One possible option mentioned by John would be that a service could be operated from Aberfoyle – Stirling – Forth Valley Royal Hospital – Falkirk. The service would operate in the gaps between the existing 2-3 hourly service operated by First under contract to Stirling Council between Stirling and Aberfoyle. The main advantage of this type of service is that it would reduce the number of changes that passengers would have to make to access the hospital. John would be happy to operate the service via areas such as Fallin and Cowie that may not have direct services to the hospital and this would also reduce potential conflict with existing commercial services.
- 3.10.5 The DRT services have replaced previous provision such as the Postbus and Trossachs Trundler, which operated to fixed schedules that may not meet users needs. DRT can offer fast point-to-point journey times, however one of the issues with the scheme is that there is still a perception that it is only for senior citizens and forthcoming promotion will seek to address this.

3.11 Graham Courtney, Kingshouse Coaches

- 3.11.1 Graham Courtney owns Kingshouse Coaches and will be operating many of the journeys that are required under the new contract although Aberfoyle Coaches will be taking the bookings. He originally started business by operating a small hotel, but diversified into providing local transport services with around 90% of work now being generated through Council contracts.
- 3.11.2 Kingshouse Coaches have a wide variety of vehicles ranging from 53 seat coaches to taxis. He will also be meeting with Patient Transport Services at NHS Forth Valley. Graham stated that NHS Forth Valley has the largest geographical catchment area of any hospital on mainland Britain, which gives an idea of the scale of the challenge.
- 3.11.3 Graham mentioned that the Scottish Government have been very impressed with the DRT scheme and see it as an example of best practice in public and private authorities working together. Examples where the public sector is spending up to 7 times the amount of money for a quarter of the passengers were also discussed.
- 3.11.4 While the DRT scheme does aim to ensure that where practical multiple passengers use the same vehicle, in practice the range of different demand requirements means that this isn't usually possible.
- 3.11.5 In order ensure that patient transport is effective Graham believes that the hospital needs to ensure that patient appointments are matched to when there are journey opportunities available. If this can be done then it could make longer distance trips more viable. For example Graham would be happy to operate a Callander – Forth Valley Royal Hospital bus service and pick up other people at other points along the route.

3.12 Brian Peat, First Bus Edinburgh

- 3.12.1 First Bus Edinburgh are the largest bus operator in the Falkirk, Stirling and Alloa urban areas but at present do not offer DRT services, partly due to the remoteness of their operating bases from rural areas, which would make operations uneconomic. Brian mentioned that service 38 will definitely be diverted to serve the hospital, but could not

offer any further guarantees as provision is currently under review and the information is commercially sensitive.

- 3.12.2 Firsts Bus Edinburgh's core network is based around simple services with minimal route variations and therefore he would be unwilling to consider adjusting the route of existing services as this would mean a drop in frequency along core sections. First are wary of introducing integrated ticketing schemes due to the risk of falling foul of competition law, potential minimal usage and revenue apportionment needing negotiating.

3.13 Conclusions

3.13.1 The main recurring themes that keep arising throughout the consultation are:

- The multiple changes that will be required in order to access the hospital from many rural areas that is likely to lead to pressure from people who need to access the hospital to use patient transport;
- The need for an improvement in Interchange facilities to enable passengers to make a seamless connection between services.
- The need for a quick link to the hospital, but also the requirement to avoid duplicating existing public transport provision already in place;
- The requirement for patients appointments and visiting times to be structured so that people in rural areas are able to make appointments;
- The requirement for transport provision to meet the patient booking times and visiting times (both outward and return journeys);
- The lack of any connection to some rural areas.

3.13.2 The views from the consultation have been taken into account during the development of options to improve connectivity.

4 Accessibility Analysis

4.1 Introduction

4.1.1 This chapter of the report provides information upon the methodology and results of the accessibility analysis carried out for travel to the Forth Valley Royal Hospital. The later stages of the chapter analyse the accession outputs and summarise scenarios that have been run to demonstrate the impact of additional links to improve connectivity.

4.2 About accession

4.2.1 The analysis was carried out using Accession™ software which is used to measure accessibility to and through the multi-modal transport system using GIS based network data, allowing journey time, distance and cost calculations to be made. For the purpose of this study all calculations made were in relation to journey time.

4.2.2 In order to model accessibility to the Forth Valley Royal Hospital the Accession modelling tool requires the following information inputs:

- Origin;
- Destination;
- Road network; and
- Public transport network (timetable and stops).

4.2.3 As a general rule it is considered that an issue with accessibility may exist when an area is more than 60 minutes journey time by public transport from a health facility. This is taken into account during the initial analysis of accession results although the rural nature of the area means that a lot of areas may be outside this travel time.

4.3 Model Boundary

4.3.1 The purpose of this element of the study is to determine accessibility to the new Forth Valley Royal Hospital, operated by NHS Forth Valley and the geographical boundary of the modelled area has been determined by the area which NHS Forth Valley serves.

4.3.2 The NHS Forth Valley boundary was not available in a GIS format for input to the Accession model but is similar to the boundaries of the three local authority areas which it serves (Falkirk, Stirling and Clackmannanshire). Therefore, the boundary used in the model is that of these three areas combined.

4.4 Origins and Destination

4.4.1 The Accession™ model works on assigning the geographical area into defined sub-zones; these are the origins of the journey calculations. The destination for this study is, of course, the new Forth Valley Royal Hospital at Larbert.

4.4.2 The results of the Accession™ model can be presented in many ways and as such two different origin sets have been used as follows:

- Codepoint data (postcodes); and
- 250m origin grid.

4.4.3 The Codepoint data was used to provide outputs from the model in the form of an excel spreadsheet which can be used for further analysis. This data was obtained from Ordnance Survey.

4.4.4 The origin grid was used to provide the graphical outputs presented in this report, this origin set is drawn within Accession over a specified area and creates an origin point at every 250m.

4.4.5 The destination was set as the new Forth Valley Royal Hospital.

4.5 Road Network

4.5.1 While Accession™ can accept two main types of road network data, ITN and Oscar/Meridian we have decided that the most accurate, detailed and up-to-date data set is ITN which has been used within this study.

4.5.2 The ITN network was supplied to Colin Buchanan on licence from SEStran and subsequently trimmed to concentrate upon the study area.

4.6 Public Transport Network

4.6.1 The final and most important piece of information required to be input into the software is the public transport network. For this ATCO (Association of Transport Coordinating Officers) data (supplied in ATCO_Cif data format) has been used which provides a snapshot of public transport data allowing various accessibility calculations to be made.

4.6.2 ATCO_Cif data holds information upon all public transport stop locations and also all scheduled bus routes. The data is updated once every year in October and the data used in this study was produced in October 2009. The data is provided for each local authority area and so for this study we have used data for the Falkirk, Stirling and Clackmannanshire Council areas.

4.6.3 As the data is only updated once per year, intervening changes to the public transport network which take place require to be determined and input manually. Contact was made with various bus operators in the study area to identify if any changes to the public transport network should be made to ensure the model was up-to-date and accurate, these are described in further detail in the Model Scenarios section of this chapter.

4.6.4 The current version of the Accession™ software is not capable of adequately modelling DRT services and as a method to overcome this shortcoming we have created fixed timetabled routes for services as proxies for the DRT services. The timetables for these services have been created so that they coincide with the timetables on the main bus routes to which they will provide access. This means that a connection time of between 5-10 minutes is allowed, which would be similar to the connection time allowed if a through journey was booked on a DRT service.

4.6.5 The routes have also been designed so that they cover the main roads within the area that they serve and areas connect with the nearest bus stop where they can transfer on to a bus service for Forth Valley Royal Hospital. They are intended to replicate the journey times that passengers in different locations would experience if they needed to travel to/ from the hospital, however the routes in the form they are set up should not be used to try and predict travel patterns for journeys within the various DRT zones.

4.7 Methodology

4.7.1 The parameters of the calculation using the aforementioned inputs to the model are as follows:

- **Travel Modes** – Bus, coach and heavy rail.
- **Connection Modes** – Walk.

- **Maximum Connection Distance** – 800m.
- **Walk Speed** – 4.8km/h.
- **Maximum Interchange Distance** – 500m.
- **Road Node Spacing** (i.e network entry point) – 200m.
- **Model Period** – Monday, 0700-1600.

4.7.2 The accessibility analysis has been carried out in relation to total travel time between the origin points and the Forth Valley Royal Hospital, the results show the quickest journey available departing the origin point after 0700 and arriving at the hospital before 1600. The overall journey time and results within the model were limited to a maximum time of 180 minutes.

4.7.3 To allow the results of the model to have a greater accuracy a new bus stop and link road was created to replicate the set-up at the new hospital. It is worth noting that this means that the model does not pick up improved service levels generated by enhanced frequencies as only the quickest journey time is used in the output.

4.8 Model Scenarios

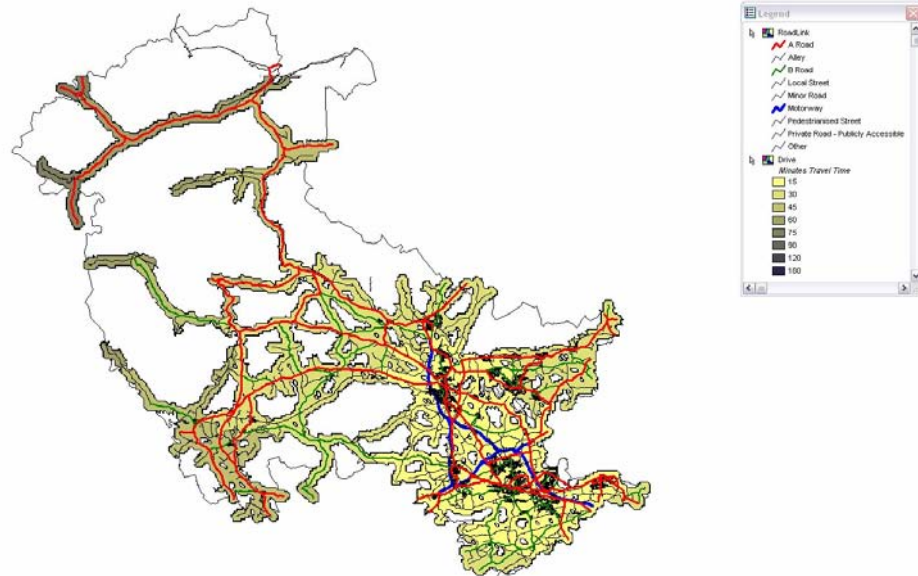
4.8.1 In order to update the model and ensure that bus and DRT service changes that have had a significant effect on provision in rural areas were included in the analysis a number of changes have had to be made to bus service provision in certain areas. As stated earlier in this chapter original ATCO_Cif files that include data that was correct at October 2009 has been used.

4.8.2 This section contains a summary of the model runs that have taken place and a commentary on what the maps are showing. The first map shown is the drive times from various areas within the NHS Forth Valley catchment area.

Drive time

4.8.3 This map shows the drive times between locations within the NHS Forth Valley catchment area and Forth Valley Royal Hospital and takes account of all roads that have been implemented up to October 2009. It is worth noting that these drive times are for off-peak journeys and therefore will not take into account additional travel time that may be incurred during peak hours.

Figure 4.1: Drive times

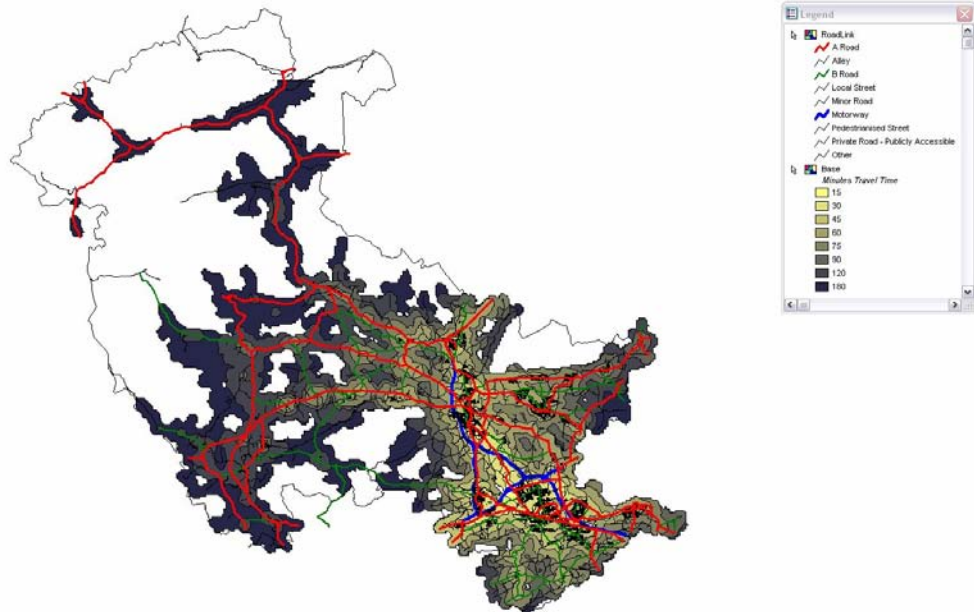


4.8.4 The map demonstrates that only areas within the far north west rural areas are more than an hour drive time of the Forth Valley Royal Hospital. As expected the areas in the urban areas and near main A roads or motorways have the fastest drive times to the hospital. Overall if you have access to a car then you will have excellent connectivity to the Forth Valley Royal Hospital. The white areas are places where the road network does not extend to and are therefore not considered as part of this analysis.

Base

4.8.5 This is the output from the ATCO_Cif files as provided by SEStran and TACTRAN so includes information that is correct at October 2009. This model run does not include any new bus routes that will be introduced as part of an investment in new routes by NHS Forth Valley or any service diversions implemented by First or other bus operators. It also does not take into account DRT zones that may have already been in place in October 2009.

Figure 4.2: Base accession output

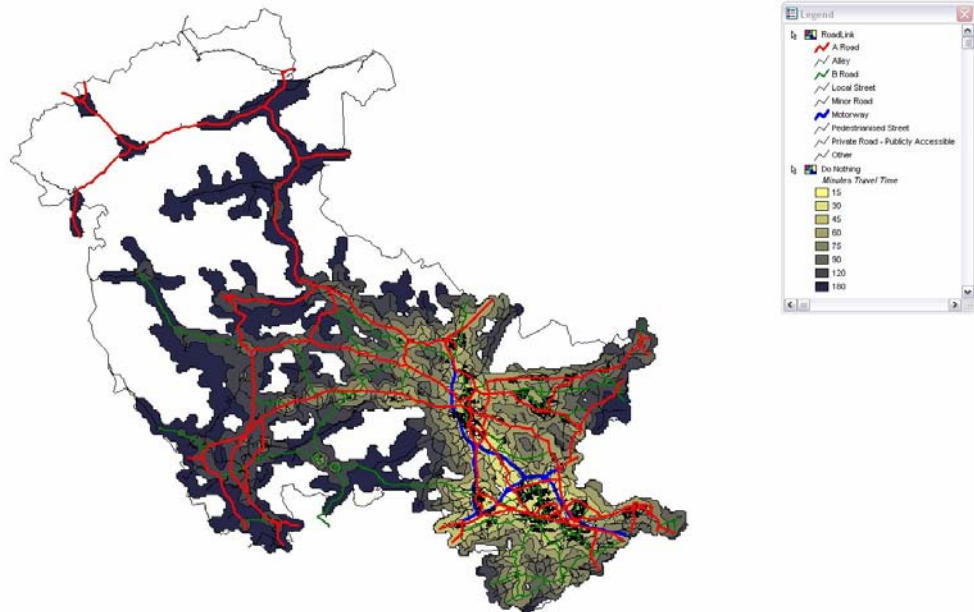


- 4.8.6 The output is illustrated in a map with journey times illustrated by different colour bandings. The output demonstrates that the majority of areas within the Falkirk and Stirling urban areas have journey times that are well within an hour although they are generally much slower than those obtained by driving.
- 4.8.7 However rural areas are relatively inaccessible. People who live in the north east area of Clackmannanshire will have to travel times in excess of an hour. Areas to the west of Stirling, especially away from the main A road corridors also have extended journey times of over an hour, with areas to the far north west and west having journey times in excess of two hours.
- 4.8.8 This map demonstrates that if no additional services were to be provided then large areas of the NHS Forth Valley catchment area would be inaccessible. In addition people who had access to a car would almost certainly choose to drive due to the much quicker journey time offered by road.

Do Nothing

- 4.8.9 This scenario is the same as the Base option except for the following changes:
 - Bus services 5 & 38 that operate along Stirling Road are diverted into Forth Valley Royal Hospital;
 - The R7, 25, C60 (original timetabled routes) and Trossachs Trundler services are deleted;
 - Stirling DRT schemes (Balquhiddar, Fintry, Killin & Strathfillan, Strathard and Trossachs) and C60 (new timetabled routes) are added.
- 4.8.10 This option attempts to replicate the rural bus network following changes that have been implemented since October 2009. DRT routes have also been added to replicate the effect of the new DRT zones that have replaced some local bus routes and the services that operate past the new hospital and should serve the new Stances as part of the section 75 commitment have been adjusted.

Figure 4.3: Do nothing accession output



4.8.11 The do nothing output generates an improvement in accessibility in the far north west region where new routes have been added and coverage extended. However, journey times are still very long as people living on the DRT routes have to make multiple changes in order to reach the hospital. There is little change to the network in other areas of the NHS Forth Valley catchment area.

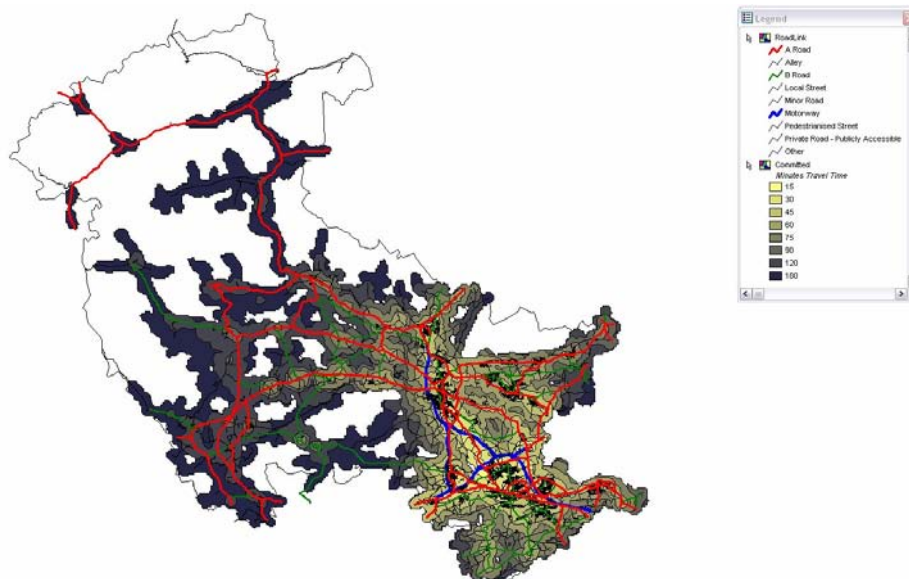
Committed

4.8.12 This scenario is the same as the Do nothing option except for the following changes:

- Service 233 in Falkirk is removed;
- New services H1, H2, H3, H3a, H4 & H4a, which are funded by NHS Forth Valley are added.

4.8.13 This option seeks to replicate the provision that will actually exist when the Forth Valley Royal Hospital opens on August 3rd. It does not include any potential options that have been added to test the impact on improved accessibility.

Figure 4.4: Committed accession output



4.8.14 The main impact of the new routes is felt in the north west area of Clackmannanshire where passengers will benefit from no longer having to change buses to reach the hospital. As the new routes in the Falkirk area mainly provide an increased frequency rather than any significant new connections there is only a minor impact on accessibility as accession does not pick up the enhanced frequency impact.

4.9 Gap analysis

4.9.1 The accessibility analysis undertaken using the Accession™ software is very useful for identifying where people face extended journey times via public transport to Forth Valley Royal Hospital. However, it does not take into account the number of changes faced by users or the frequency of the services that provide connections to rural areas.

4.9.2 Usually the maximum journey time for access to local health centres should be less than one hour. However, given the rural nature of the area and extended journey times likely to be incurred we have defined the definition of a gap in provision existing where:

- Journey time to/ from Forth Valley Royal Hospital more than 60 minutes;
- More than one change required to access Forth Valley Royal Hospital;
- Frequency of bus service less than once every two hours.

4.9.3 These definitions will allow solutions to be focused on areas where major gaps in provision exist and will prevent areas being reviewed that may already have sufficient public transport links in place.

4.9.4 The accessibility analysis identified a number of key areas where extended journey times will be currently incurred by people wishing to access the hospital using public transport.

4.9.5 Areas where extended journey times are incurred include:

- Areas to the north and west of Callander;
- Areas to the north of Aberfoyle;
- Areas to the west of Denny;
- Areas to the east of Dollar.

4.9.6 All other areas have a reasonable standard of service and are able to access the new Hospital within a reasonable travel time.

4.10 Hubs

4.10.1 Table 4.1 and Table 4.2 show the key hubs through which people will need to interchange to travel onward in order to access the hospital from areas identified as having extended journey times to the Forth Valley Royal Hospital along with the frequency of the services and typical onward connection time.

Table 4.1: Callander area connections

Origin	Service number (s)	Frequency (mins)	Destination	Onward connection time
Balquidder, Killin & Strathfillan	DRT zones	120	Connection with C60	5
Killin	C60	120	Callander	8
Callander	59/ C59/ M59	60	Stirling	10
Stirling	5/ 38	20	FORTH VALLEY ROYAL HOSPITAL	N/A

4.10.2 Table 4.1 demonstrates that passengers who live in the DRT zones north of Callander and need to travel via Stirling would need to interchange up to three times to travel on four different buses in order to access Forth Valley Royal Hospital. Good connections are provided at all points along the route that minimises the connection times, but accession analysis shows that journey time still exceeds 90 minutes once passengers travel north of Callander. The analysis shows that there is an opportunity for improving journey times and minimising changes by providing a fixed DRT service from Callander to Forth Valley Royal Hospital.

Table 4.2: Aberfoyle area connections

Origin	Service Number (S)	Frequency (Mins)	Destination	Onward Connection Time
Strathard & Trossachs	DRT zones	150-210	Connection with C60	5
Aberfoyle	C11	150-210	Stirling	10
Stirling	5/ 38	20	FORTH VALLEY ROYAL HOSPITAL	N/A

4.10.3 Table 4.2 shows that passengers who live in the Strathard & Trossachs DRT zones rely on a connection through Aberfoyle to access the hospital. The bus service from Aberfoyle to Stirling is very infrequent so the main gap in this area is the low frequency of the bus service from Aberfoyle rather than excessive journey times given the distances travelled.

4.10.4 There are no public transport connections available from areas to the west of Denny at present. Service H4 will travel as far as Fankerton and offers potential for connecting DRT services to be provided to isolated communities to the west of this destination along the B818.

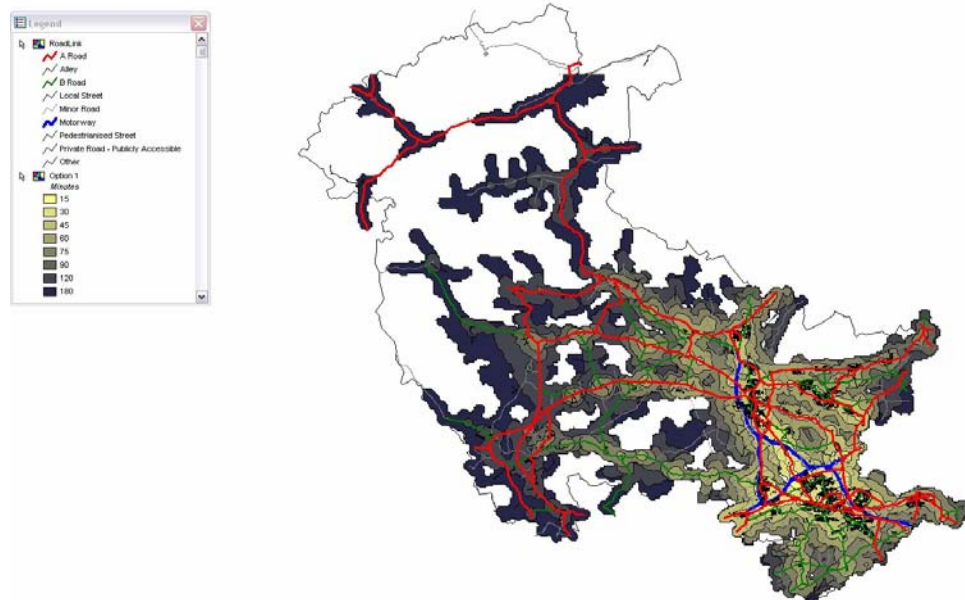
4.10.5 Public transport connections are provided to some areas to the east of Dollar by Stagecoach service 23 with connections possible at Stirling Bus Station for service 38

direct to Forth Valley Royal Hospital. There may be potential in including Dollar within a DRT scheme for West Kinross as it will enhance connections to areas that are not on the main bus routes.

4.11 Enhanced connections

- 4.11.1 In order to assess the effect of measures designed to improve connectivity to destinations that have been identified as warranting potential improved links additional enhanced connection options can be modelled in Accession™.
- 4.11.2 The main issue with journeys to areas north of Callander is the extended journey time and the multiple changes required to access the Forth Valley Royal Hospital. The bus frequencies are all of an adequate standard. A demand responsive direct link could be introduced from Callander to Forth Valley Royal Hospital. This would remove the need for a change and also give a quicker journey time.
- 4.11.3 Passengers who need to use bus services that operate from Aberfoyle have to use an infrequent service that only provides a limited number of journeys per day. Possible solutions include operating additional journeys so that a 2-hourly headway is provided or alternatively providing a direct service from Aberfoyle to Forth Valley Royal Hospital. It is not possible to model the impact of a 2-hourly service in accession as it only takes into account the quickest journey time during a specified time frame. However, it is possible to model an additional direct route from Aberfoyle to Forth Valley Royal Hospital.
- 4.11.4 A DRT route could be modelled that operates from Balfron – Boquhan – Fintry – Fankerton for connections on the H4 to Forth Valley Royal Hospital. This would also potentially open up additional journey times to areas to the west of Denny and potentially benefit passengers on all bus services that travel through Balfron.
- 4.11.5 A DRT route can be modelled that covers the Muckhart and Rumbling Bridge area in order to assess the effect of a DRT service in this area.
- 4.11.6 In order to assess the impact of measures to improve accessibility in the various areas discussed above the following options were modelled in an enhanced connections model run:
- Two hourly direct route from Callander to Forth Valley Royal Hospital via A84, M9 & A9 connecting with the C60 service in Callander for connections further north;
 - Two hourly direct route from Aberfoyle to Forth Valley Royal Hospital via A81, A873, A84, M9 & A9;
 - Two hourly route from Balfron – Boquhan – Kippen – Fankerton connecting with the H4 service in Fankerton for connections to Forth Valley Royal Hospital;
 - Two hourly route from Rumbling Bridge – Muckhart – Dollar connecting with the H2 service in Dollar for connections to Forth Valley Royal Hospital.
- 4.11.7 Figure 4.5 below shows the accession output with the new services that have been introduced in place.

Figure 4.5: Enhanced connection output



- 4.11.8 As expected the enhanced connections deliver considerable benefits to people who live in the rural areas of Stirling. Where new routes are created the journey times are reduced significantly and benefits are also spread to connecting routes. For example journey times drop considerably on the Killin to Callander bus route. The only exception to this is that for areas to the north of Dollar the introduction of a DRT scheme appears to have little overall impact on journey times above those already provided by scheduled bus services.
- 4.11.9 This analysis demonstrates that investment in new routes can help improve accessibility to the new Forth Valley Royal Hospital. However, this assumes that existing levels of provision are retained on all bus routes in the Stirling area.

5 Framework for Provision of DRT

5.1 Introduction

5.1.1 This section will identify general characteristics that should determine when DRT services should be implemented. This will enable a general framework for provision of the services to be drawn up and allow SEStran and TACTRAN to identify areas where DRT provision could replace conventional bus services.

5.2 Types of DRT for Forth Valley Royal Hospital

5.2.1 There are four principal markets for DRT:

- High care needs e.g.:
 - for those with disabilities
 - social services transport
 - community transport
- Premium value services e.g.:
 - Airport transfer
- High value to Agency services e.g.:
 - Patient transport
 - school transport
 - joblink services
- Best Value e.g.:
 - Low demand areas
 - Geographical difficulties
 - Rural services

It is well understood that there can be a degree of overlap in the above and the definitions and operational characteristics can cater for more than a single generic market. For example High care needs DRT can be configured (as we might expect in terms of Forth Valley Royal Hospital services) to also provide public transport for the wider public.

5.2.2 Our appraisal of the needs of DRT to meet the needs of the Forth Valley Royal Hospital is such that the type of service that should be considered falls into the first and last category i.e. DRT to achieve Best Value but that it should cater for those with high care needs.

5.2.3 In respect to public transport we have focussed on the three main types of DRT that can be operated to serve the characteristics of the area while complimenting the existing transport provision..

5.2.4 DRT solutions are usually designed for two principal purposes

1. So that they enable access to local services
2. So that they offer connection opportunities to scheduled fixed route bus and rail services.

Clearly these purposes can be served simultaneously if hubs or interchanges are located in local villages or towns with scheduled bus services and local services.

5.3 Fixed route

5.3.1 Service journeys operate on a fixed route with timed terminal and intermediate points. However they only operate on demand if customers pre-book a service. The main advantage of this type of service is that mileage related costs are not incurred (although driver and capital costs are still incurred) by operating empty buses, however the system

is likely to very ineffective if demand is dispersed as either the route will have to be adapted so that it is very lengthy or users may face long walk to connect with the service. This type of service is usually operated by a minibus or midibus style vehicle.

5.4 Semi-Flexible

5.4.1 Involves services operating on a route with fixed terminal points, which may be the same if the service operates in a loop. Some intermediate terminal points may also be fixed for example major destinations such as town centres or hospitals. Routes between these fixed terminals are flexible and depend on demand from users. This type of service is usually operated by a minibus or midibus style vehicle.

5.5 Fully Flexible

5.5.1 These schemes operate throughout designated areas and passengers can book journeys between any two points within these designated areas. A flexible service is provided with a limit on the area in which journeys take place to ensure that customers who have a bus service available do not use the DRT service. The only limits are the operational hours and an area wide limit for journeys.

5.5.2 Schemes are generally designed so passengers are able to connect into fixed bus routes at interchange points within the specified area. These type of services can either be operated using minibus or midibus style vehicles or alternatively they can be operated using taxis if demand is likely to be very low and journey requirements are dispersed. This is the type of scheme that has been deployed in the north west rural areas of Stirling.

5.6 A Framework for Development

5.6.1 A number of factors should be present if DRT services are to be successfully deployed. This framework does not seek to investigate individual schemes in detail, however some general principles are set out that should enable areas where a DRT service could be implemented to be identified.

Policy Objective

5.6.2 It is normally the case that where DRT services are considered there is an underlying issue or problem relating to accessibility and public transport provision. In this context Public bodies will tend to have a defined policy objective that seeks to address the areas of deficiency. It is helpful if promoting bodies articulate the problems and issues and develop a policy that seeks to address them.

Lack of Commercial Bus Operators

5.6.3 The UK bus market is considered to be mature and as such the presumption is that where the potential to operate services on a commercial basis i.e. that do not require state support, exists, these opportunities have already been taken up by the private sector.

5.6.4 DRT (as in the context of this study) is seen as filling a gap in public transport that cannot be provided on a fully commercial basis. As such consideration needs to be given to establishing potential operators willing to participate in a subsidised scheme. It may be that after due consideration of the response by the private sector DRT services could be operated directly by the promoting body. This will involve considerable levels of skill to

design, manage and market the scheme and consideration should be given to the availability an source of such skills.

Sparcity of population

- 5.6.5 DRT can operate in urban areas as well as rural areas. Where population densities are relatively low by comparison to our cities and towns the design considerations differ but a common theme that exists is that DRT services should be designed to provide access to services e.g. Doctor's surgeries and/ or provide the opportunity to connect with other transport provision.
- 5.6.6 Population density will determine the scale of DRT services and careful consideration needs to be given to design at the outset. DRT services are often developed on a trial basis and this is often seen as a way of minimising risk i.e. Of over-design. The strategy of growing the DRT service in response to customer demand seems to be an efficient way of developing these services.

Suitable road network

- 5.6.7 The characteristics of the local road network has a bearing on DRT design; narrow country lanes may dictate smaller more manoeuvrable vehicles; a lack of network may offer the opportunity to deploy larger vehicles; the presence of dual carriageways or fast links can greatly influence the size of area over which the DRT service operates.
- 5.6.8 A lack of road network may push DRT design towards a design that is more suited to fixed or semi-fixed routes. Where the population is both disperse but broadly homogeneous and there is a network of minor roads DRT may take a more flexible design to better cater for the characteristics of population location and access.

Appropriate locations of hubs or interchanges

- 5.6.9 Design of DRT schemes should make best use of the potential offered by settlements and towns. Often these are where key services are located and they naturally form key location destinations for DRT services. The design of DRT services should take account of the relative distance between such hubs and interchanges and this attribute may dictate the efficiency of services i.e. The degree of overlap.

Spine network of scheduled bus or rail services

- 5.6.10 In many rural parts of Scotland commercial bus operators run services on definable 'spine' routes where they tend not to divert from that route. Such services link key settlements along the route. The opportunity presents itself in the design of DRT to link into the commercial bus service where bus stops, even in rural locations, can provide convenient interchange opportunities for DRT services. Increased use of DRT services can be gained if the service is coordinated with the commercial service timetable. Allowance needs to be given for frequency but also, and almost more importantly, on the reliability of the commercial bus service; arriving 5 minutes late when the commercial service has a 2 hour frequency will not encourage patronage.

Dedicated marketing and customer support resources

- 5.6.11 Experience shows the value of establishing a dedicated resource to market DRT services. Marketing should begin a month or more before the introduction of the service. Contact should be made with local groups and if possible the service vehicle can be taken to the community to give confidence and visibility.

- 5.6.12 Marketing material need not be high cost – in fact experience shows that low cost but targeted marketing can achieve impressive results. The opportunity should be taken to use all available staff to generate knowledge of services. For example there can be a misconception that the new DRT service is a replacement for Dial-a-Ride and not open to the general public.
- 5.6.13 It is essential that the DRT scheme caters for the needs of the customer base. This can only be understood if feedback is gained and analysed. Managers need to be responsive to the needs of customers and where necessary change the service. It may be that, for example, the initial scheme design had the service stopping at a particular location in a village that is inconvenient for customers or indeed presents them with a mobility barrier – modifying the pick-up/ drop-off location could boost patronage through a simple redesign. Such intelligence needs to be actively gathered and assimilated.
- 5.6.14 The ‘marketing mix’ should be actively used as a tool to focus on the key elements of what is required to implement and promote the DRT services.

Call centres

- 5.6.15 To operate a DRT service it is intrinsic to DRT that customers have the ability to book the service in advance. Scale of operation will dictate the size of the operation to handle calls. Small scale DRT schemes can be managed effectively by a paper-based booking system – a dispatcher books the calls and provides drivers with the required route and stop requests. As schemes develop in size promoters need to consider the need for electronic booking and scheduling systems, communications equipment and call handling resources. As schemes develop into large scale operations operational call centres tend to be required and managed and this requires funding albeit that economies of scale will be achieved. It is extremely beneficial if call operators have a working knowledge of the geography over which the services are provided.

Funding support

- 5.6.16 It is likely that because operators have not established a market for public transport services on a commercial (non-subsidised) basis in those areas where DRT services are being considered, DRT will need to receive financial support. It will be a matter of time before a service will settle to a steady state of patronage – typically it can take 2 months from the initial inception of the service; thereafter it will be a number of months before the steady state is achieved. It is vital that appropriate marketing activity is undertaken during the launch and build up period if long term success is to be gained and revenue income is gained. The level of funding support will depend on the DRT scheme design and the level of marketing.
- 5.6.17 In developing DRT schemes the opportunity to look at replacement of other DRT-type and supported bus services should be taken. Dial-a-Ride, Ring’n’Ride and subsidised bus services can offer the potential for redeployment of funding provided the DRT scheme is designed in such a manner that it meets those customers’ needs and the DRT service offers improved efficiency.
- 5.6.18 Start up costs are usually a key issue for promoters of schemes and while on-going revenue sources may be identified at the conception stage capital funding sources should be identified. If the scheme moves towards implementation decisions will be needed to secure capital funding. The opportunity to redeploy or use in a different way existing resources should not be missed. For example Council’s often have fleets of vehicles used on School journeys that could be configured to be used as DRT services thereby increasing operational efficiency.

6 Outline Business Case

6.1 Introduction

6.1.1 DRT services can be cost effective when introduced in areas where existing commercial bus services exist in core 'spine' routes and none operating in the rural areas away from the spine. They can also be effective in offering a "spine" connection between rural areas where there is very low demand and a regular bus service would not be justified, but where the alternative route would be considerably longer than using a private vehicle by existing public transport connections.

6.2 DRT services

6.2.1 DRT services are funded in a very different way to bus services. Bus service costs are largely fixed once a tender is awarded. However, the cost of DRT provision is mainly variable and closely related to the number of journeys undertaken by passengers. We have therefore built a model to compare the costs of DRT and bus provision with differing passenger numbers.

6.2.2 In order to qualify for concessionary fares reimbursement DRT services must be registered with the traffic commissioner and the operator must have a PSV licence or a special restricted PSV licence. This system is used by the operator of the Stirling DRT scheme and if the condition is not met concessionary reimbursement cannot be claimed.

6.2.3 Appendix 4 has a table showing the notional costs of a DRT service as a comparison against the costs of a notional commercial bus service. The table is intended to represent a bus route that is operated by one vehicle compared to the costs of replacing the bus route with a DRT scheme and providing a comparison of costs with different levels of patronage.

6.2.4 It is assumed that each passenger journey is treated individually on a bus, however it is assumed that each DRT journey carries an average of 1.25 passengers per trip. So if 1,000 passengers are carried per annum then 800 DRT journeys will take place. The number of passengers per journey will also vary depending on how dispersed demand is likely to be and also the number of trips made.

6.2.5 We have an in depth knowledge of bus costs within the industry due to work to develop a bus costing model that has measured costs in urban and rural areas. The model shows that it costs approximately £100k per annum to procure a typical bus service in a rural area. This assumes that the service will operate from around 0700-1900hrs with no limit on maximum age for the vehicle. The cost for DRT provision is directly related to the number of journeys made with an estimated cost per journey of £8.50.

6.2.6 The total cost per bus journey is directly related to the number of passenger journeys that have taken place, which is divided by the cost per annum of providing the bus service. The cost per DRT journey is taken from the subsidy provided, which is £1 per mile, equal to £6 for a 6 mile journey. The average revenue per journey is then added, which is required in order to get an accurate figure for the cost per journey.

6.2.7 It is assumed that the average single fare per 6 mile journey is £2, this is based on the Stirling Council maximum fare scale. The maximum fare for a six mile journey is £2.50, but concessionary re-imburement and carriage of children means that we have estimated the average at £2. Once registered a bus service is fixed and any additional revenue generated (passengers carried) will help reduce the amount of subsidy per

passenger. We have assumed that each DRT journey carries on average 1.25 passengers meaning that each journey generates revenue of £2.50.

6.2.8 The total subsidy for each number of per passenger is simply the Revenue per passenger minus the cost per passenger. The total subsidy per journey for DRT is the revenue per journey minus the cost per journey. The DRT subsidy per journey stays the same, whereas the subsidy per passenger decreases as more passengers are carried as the costs are fixed.

6.2.9 The total subsidy per annum is related to the number of passengers for both bus and DRT. The DRT figure is calculated by multiplying the number of DRT journeys by the subsidy per journey. The calculations show that when under 15,000 passengers per annum are carried per vehicle it is generally more efficient to deploy a DRT service than a traditional bus route.

6.3 Proposed DRT schemes

6.3.1 We have not been supplied with detailed costings for many transport services, for example patient transport services so it is very difficult to determine the exact nature of savings that could be achieved. This section will therefore identify the main scope for identifying savings and the likely costs and benefits that the individual schemes could generate.

6.3.2 Discussions have shown that Stirling Council have adopted a very progressive approach to identifying potential DRT schemes and then developing and implementing these schemes. Our approach would be to seek to build on this work to improve links to Forth Valley Royal Hospital.

6.3.3 In seeking to address the demand created by the New Royal Hospital we think that there are two potential policy directions that could be taken:

1. meet current demand for all existing (and projected) patients under current policy guidelines that deal with transport eligibility
2. seek to identify efficiencies through the introduction of a Transport Triage system that would differentiate between those that are sufficiently mobile not to need door-to-door ambulatory transport i.e. can travel by public transport, and those that can not

6.3.4 The introduction of the second approach would have three key benefits:

- The potential to use NHS patient transport targeted at those who are really in need
- Boost the viability of DRT services in remote rural locations
- Reduction in cost to the NHS budget

6.3.5 The implication of this change in policy and provision would be for those patients who could use public transport the replacement of PTS services by DRT services in rural areas where more than one change is required to access the Forth Valley Royal Hospital. It is important that NHS Forth Valley should contribute towards the cost of transporting passengers that are carried to ensure that savings are shared.

Comparison of Costs

6.3.6 Assuming appointments could be arranged efficiently it is assumed that each DRT journey would carry 2 passengers and that 5 return journeys would take place each week each being 25 miles in length.

6.3.7 It is assumed that on average one person would be entitled to concessionary travel so one of the passengers would travel free and the operator would claim re-imburement at

a rate of 64% of the full adult fare. The full adult fare is based on the maximum fare scale that is set by Stirling Council for two single fares for 25 mile trips, which is £5.80.

6.3.8 The payment from Stirling Council is based on a fee of £1 per mile (£50) plus a £10 per hour allowance as it is assumed that the driver would have to wait for two hours before the return trip.

6.3.9 The PTS vehicle costs are based on annual costs per vehicle at £50,000. This works out at approximately £1,000 per week and assuming the vehicle is used for five days per week the cost would be approximately £200 per day. It is assumed that the vehicle would be able to be deployed on two trips per day so the cost per trip would be approximately £100.

Table 6.1: Indicative PTS/ DRT Cost Comparison

	Demand Responsive Transport	Patient Transport Services
Fare revenue	£11.60	£0
Concessionary re- imbursement	£7.42	£0
Total revenue	£19.02	£0
Payment from Stirling Council and waiting time	£70	£0
Vehicle cost	£0	£100
Total costs	£70	£100
Total subsidy required	£50.98	£100

6.3.10 Table 6.1 shows that it should be possible to generate significant savings of around 50% by switching provision from PTS to DRT. This is partly because mileage costs would be significantly reduced as the vehicle would not have to run out of service from the depot to pick up people to take them to the hospital and then return them at the end of the day.

6.3.11 One note of caution is that the above appraisal is based on a single journey/ passenger the cost of providing the service measured in terms of 'per passenger journey' is around £25 so care needs to be taken to ensure that as many patients as possible are carried on each vehicle. It is also important that only people who are eligible for this service should be able to use it to avoid increasing costs when a public transport network is already available. Thus, while there is the potential for saving in the Patient Transport area, cost per passenger could be significantly reduced if DRT could carry 5 passengers per journey (on average).

6.3.12 Other improvements in accessibility can be delivered by increasing the scope of existing schemes such as the one in Fintry. This is likely to increase costs, however, as long as many of the additional journeys are taking place instead of using patient transport services then savings will be made. However, the charging of normal fares should prevent misuse of the system and ensure that only people who genuinely need to use the service make trips.

6.4 Conclusion

6.4.1 This section demonstrates that there is potential for achieving some efficiencies by transferring any passengers who are able from Patient Transport Services to Demand Responsive Transport. The main saving comes from the location of the vehicle matching the origin of the journey more closely, which minimises dead mileage.

6.4.2 However, if we assume that further efficiencies are not possible then enhancing the connectivity is likely to largely depend on the number of trips generated. Table 6.2 shown below gives an indication of the likely costs of introducing the enhanced connections when compared with estimated demand. It is very difficult to estimate likely demand as detailed figures showing the number of patients who could use the service are not available:

Table 6.2: Enhanced connection costs

Option	Cost per passenger	Low case no of passengers per annum	High case no of passengers per annum	Low case cost	High case cost
Callander DRT	£25	250	1,000	£6,250	£25,000
Aberfoyle DRT	£25	250	1,000	£6,250	£25,000
Kippen DRT	£18	250	1,000	£4,500	£18,000
Muckhart DRT	£6	250	1,000	£1,500	£6,000
TOTAL	N/A	1,000	4,000	£18,500	£74,000

6.4.3 Table 6.2 demonstrates that the likely cost of the enhanced connections would be between approximately £18½k and £74k per annum. More detailed demand modelling would enable the costs to be estimated more accurately.

7 Action Plan

7.1 Introduction

7.1.1 This section will set out an action plan to enable the introduction of DRT services that could improve connections to Forth Valley Royal Hospital.

7.2 Recommendations

7.2.1 In order to address the point above it is recommended that the following initiatives should be developed.

- Introduction of a DRT service from Callander or a suitable hub that runs directly to the hospital, potentially up to one return journey per day. Journeys would only operate if they were booked at least 24hrs in advance. Would replace patient transport services provision to northern rural areas where customers did not require a specialised vehicle;
- Potential for an extension of the Fintry DRT zone to allow connections with the H4 at Fankerton. In the longer term the H4 could be withdrawn from Fankerton and the DRT zone extended so that journeys could be made to Denny, Duke Street for connections to First commercial services and H3/H4/H4a services to Forth Valley Royal Hospital;
- Investigate the potential for linking the proposed West Kinross DRT scheme into the H2 service at Dollar;
- Allocate travel sectors for different areas for travel to the hospital, for example if you don't live far from Stirling then you should use a bus into Stirling and change for the 38 to Forth Valley Royal Hospital. However, if you live further away then you would be entitled to use the Callander to Forth Valley Royal Hospital DRT service;
- Forth Valley Royal Hospital to develop a patient appointment booking system that can identify patients who will be using public transport and if they live in a rural area with limited transport options then appointments should be booked so they coincide with transport arrival and departure times;
- Utilise spare E43 vehicle to cover destinations that won't be served directly by existing planned commercial or supported provision that are closest to the hospital once it is clear what will be covered by commercial provision;
- Ensure that fast frequent services are provided from main hubs direct to the Forth Valley Royal Hospital and these are easily identifiable through signage both at the stop and for identifying the walking routes to the stop. Where practical different services to the Forth Valley Royal Hospital should depart from common stops. Common stops should be easily identified in main hubs especially when there are multiple stops in a single location.

7.2.2 It is important that any improved links are designed in such a way that they do not have an adverse impact on existing services. This may require any new links that are created (for example to Aberfoyle or Callendar) to have conditions in place that state that journeys must start or finish at Forth Valley Royal Hospital to minimise abstraction from existing services. The local authorities should be consulted closely during the development of any new services as they are responsible for procuring many services in rural areas.

7.2.3 We would recommend that any revised DRT provision would need extensive publicity in order to make people aware that this is an option. This could be carried out through:

- Rural area community and healthcare groups;

- NHS Forth Valley telephone operators should be fully briefed so they can explain to patients;
- Information on NHS Forth Valley and local council websites;
- Production of leaflets explaining how the system works;
- Publicity on information boards and bus stops in rural areas;
- Direct mail marketing campaign in rural areas;
- Arranging public meetings to provide an opportunity to discuss the system.

Suggested Patient Transport Triage System

- 7.2.4 It would appear sensible from the perspective of tailoring the service to meet the needs of all customers if a Patient Categorisation Scheme were adopted – a Patient Triage System. We suggest that a ‘triage’ type system be developed and offer the following as a suggested set of criteria:
- A – Require Ambulance transport and not able to use public transport service – service provided by NHS/ SAS patient transport services;
 - B – Require door-2-door transport but not ambulance transport – use DRT to feed into hubs with direct services into Forth Valley Royal Hospital (maximum target of two changes)
 - C1 – No mobility or medical issues preventing use of public transport but more than one change required to access the hospital – allowed to use DRT service if it is available to improve journey time.
 - C2 – No mobility or medical issues preventing use of public transport living in area with no more than one change required to get to the hospital - no special provision;
- 7.2.5 Hospitals would have to keep a record of patient home address and chart must show the time slots when they are available to visit the hospital for appointments. If there is a limit as to when clinics can be held DRT services may need to balance hospital operating requirements with the requirements to provide efficient patient transport.
- 7.2.6 The operation of the Triage System would be the role of the Clinical Appointments manager. Through a combination of clinical assessment and dialogue with the patient we are sure that an operational procedure could be developed that would underpin the system. The benefit to the NHS would be a reduction in the need for specialist transport provision that is both costly and draining on scarce resources while at the same time enabling transport through other means. The rights of the patient are thus preserved and savings on the NHS transport budget could accrue.

Appendix 1 – DRT questionnaire

Memorandum



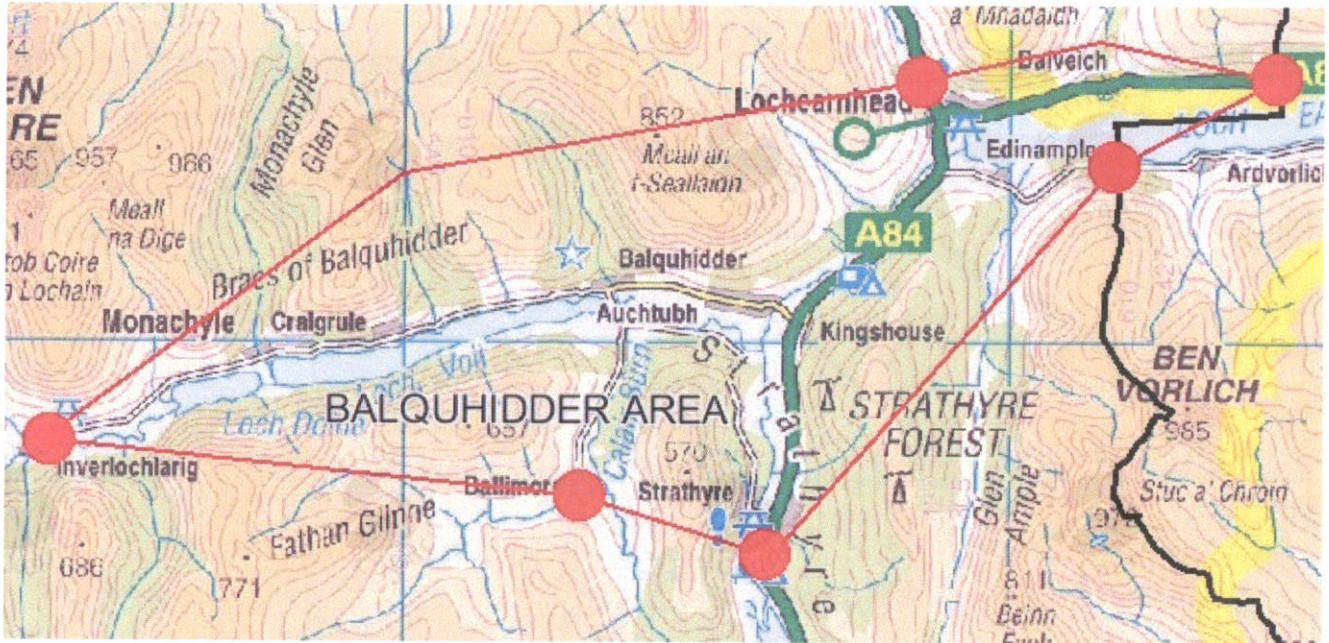
4 St. Colme Street
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T 0131 226 4693
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www.cbuchanan.co.uk

To FVRH Consultees
From Duncan Ellis
Date 18/02/2010
CC John Halliday, Neil Heggie, Lisa Black
Job number 18077-01-1
Subject FVRH DRT Questionnaire

1. Please can you identify any changes that are planned to the public transport network (any mode) within the next 12 months?
2. Please can you provide details of any existing DRT schemes that you are responsible for including scope, cost to passengers, cost of operation, revenue generated and when it began operation?
3. Please can you provide details of the funding arrangements for the DRT schemes detailed in question 1?
4. Please can you provide details of the booking arrangements for any DRT schemes detailed in question 1 including whether this system could handle additional capacity?
5. Please can you provide details of any planned or committed DRT provision?
6. Please can you identify any local issues or gaps in provision we need to be aware of when planning the provision to the hospital?
7. Is there anyone else who we should be consulting regarding provision of DRT services?
8. Do you have any other comments about how DRT or public transport provision to the hospital could be improved?
9. Any other comments or questions?

Appendix 2 – Stirling Council DRT Scheme Areas

Balquhiddier Scheme Area



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Scheme	Area
Balquhiddier	On adopted publicly-maintained roads wholly within the area bounded by: (a) A84 at south end of Strathyre village; (b) end of public road at Ballimore, south of Balquhiddier; (c) end of public road at Inverlochlarig, west of Balquhiddier; (d) A85 at north end of Lochearnhead village; (e) Council boundary on A85 east of Lochearnhead; (f) Council boundary on South Loch Earn Road east of Edinample. 'North end', 'south end' etc. means furthest extent of 30 mph speed limit.

The service will be available on Mondays to Saturdays between 07:00 – 21:30

No service on 25-26 December or 01-02 January in any year

National Entitlement Cards accepted as on bus services

Bookings can be made by:

Telephone: 0844 567 567 0

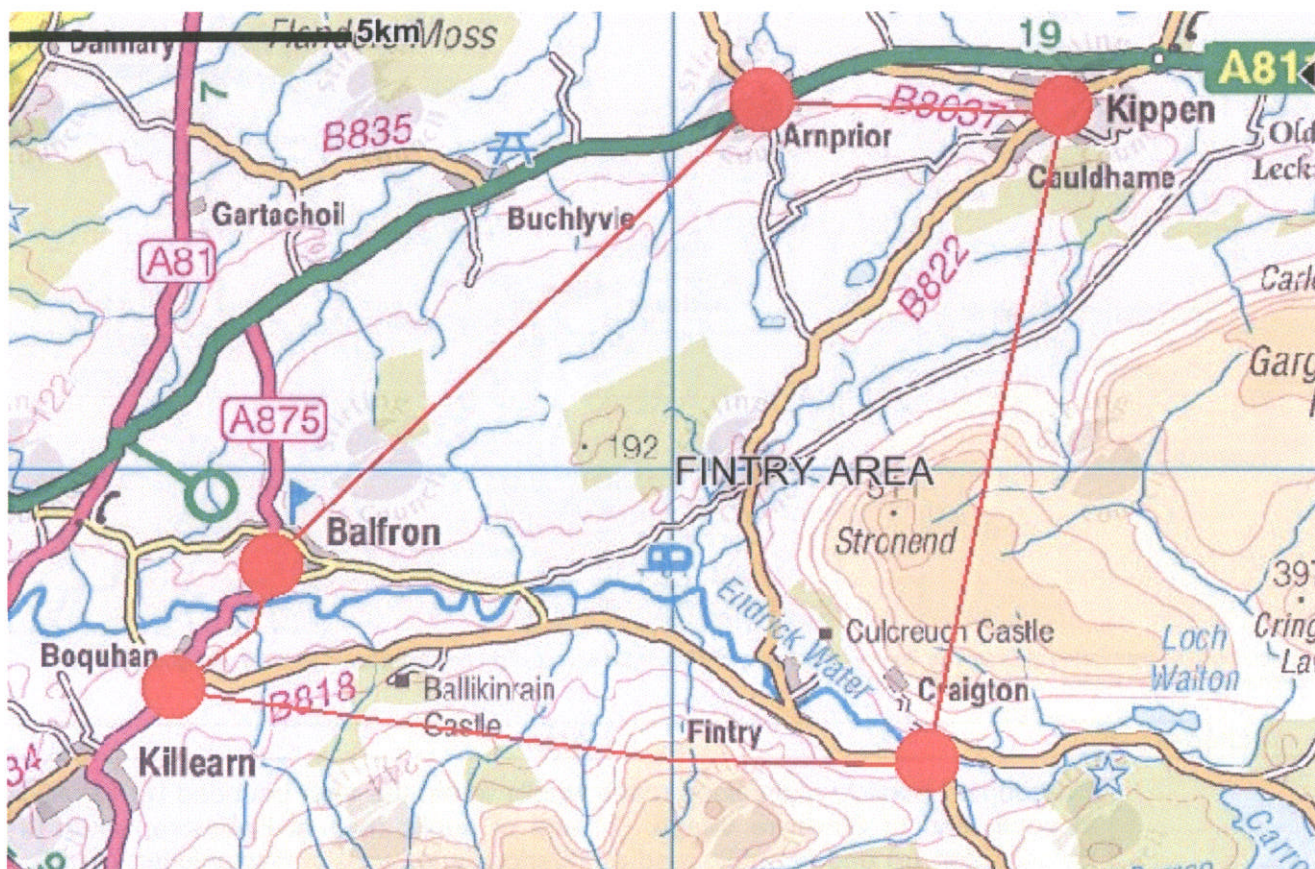
E-mail: sales@aberfoylecoaches.com

Online via website: www.aberfoylecoaches.com

Text: 0844 567 567 0

While bookings should be made 24 hours in advance, every effort will be made to accommodate passengers making bookings on shorter notice.

Fintry Scheme Area



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Scheme	Area
Fintry	On adopted publicly-maintained roads wholly within the area bounded by: (a) Kippen Cross bus stops, Kippen; (b) junction of B818 and B822 at Gonachan; (c) junction of A875 and B818 at Blackhills Crossroads; (d) Buchanan Street bus stops, Balfron; (e) Arnprior bus stop on A811.

The service will be available on Mondays to Saturdays between 07:00 – 21:30

No service on 25-26 December or 01-02 January in any year

National Entitlement Cards accepted as on bus services

Bookings can be made by:

Telephone: 0844 567 567 0

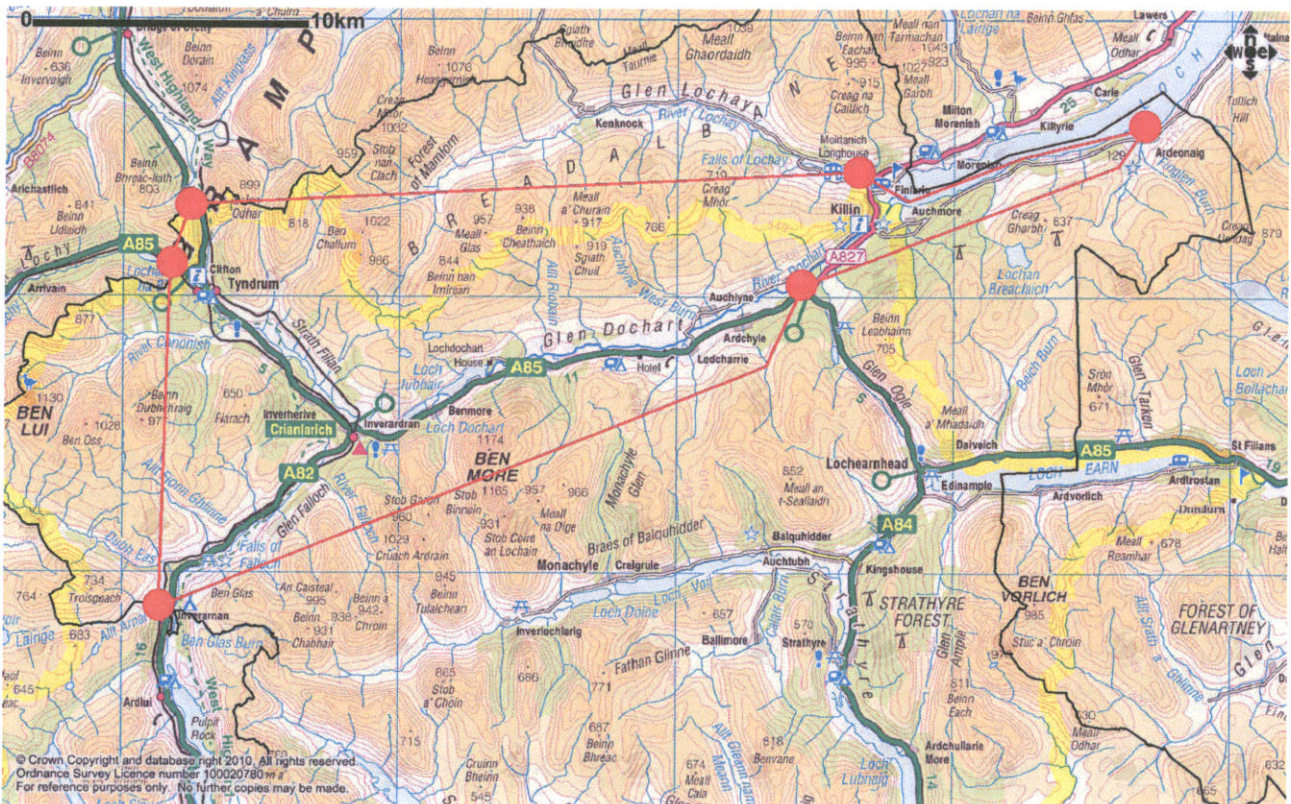
E-mail: sales@aberfoylecoaches.com

Online via website: www.aberfoylecoaches.com

Text: 0844 567 567 0

While bookings should be made 24 hours in advance, every effort will be made to accommodate passengers making bookings on shorter notice.

Killin & Strathfillan Scheme Area



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Scheme	Area
Killin & Strathfillan	On adopted publicly-maintained roads wholly within the area bounded by: (a) Ardeonaig Hotel; (b) junction of A85 and A827 at Lix Toll. (c) Council boundary on A82 at Inverarnan; (d) Council boundary on A85 west of Tyndrum; (e) Council boundary on A82 north of Tyndrum; (f) A827 at Bridge of Lochay, north of Killin.

The service will be available on Mondays to Saturdays between 07:00 – 21:30

On Tuesdays, Thursdays and Saturdays, the service will be available to connect with the bus from Callander arriving in Killin at 21:52

No service on 25-26 December or 01-02 January in any year

National Entitlement Cards accepted as on bus services

Bookings can be made by:

Telephone: 0844 567 567 0

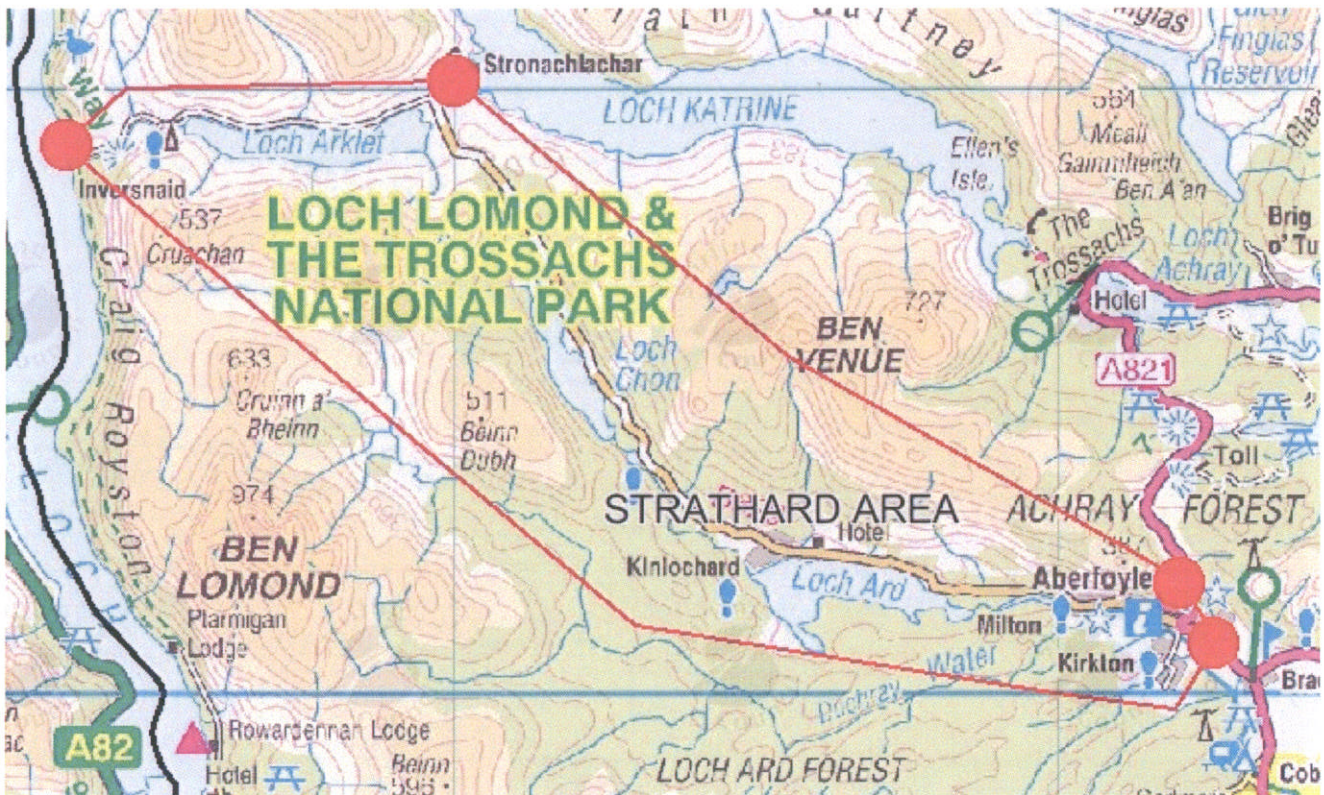
E-mail: sales@aberfoylecoaches.com

Online via website: www.aberfoylecoaches.com

Text: 0844 567 567 0

While bookings should be made 24 hours in advance, every effort will be made to accommodate passengers making bookings on shorter notice.

Strathard Scheme Area



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Scheme	Area
Strathard	On adopted publicly-maintained roads wholly within the area bounded by: (a) A821 at east end of Aberfoyle village; (b) end of public road at Inversnaid; (c) end of public road at Stronachlachar; (d) A821 at north end of Aberfoyle village. 'East end', 'north end' etc. means furthest extent of 30 mph speed limit.

The service will be available on Mondays to Saturdays between 07:00 – 21:30

No service on 25-26 December or 01-02 January in any year

National Entitlement Cards accepted as on bus services

Bookings can be made by:

Telephone: 0844 567 567 0

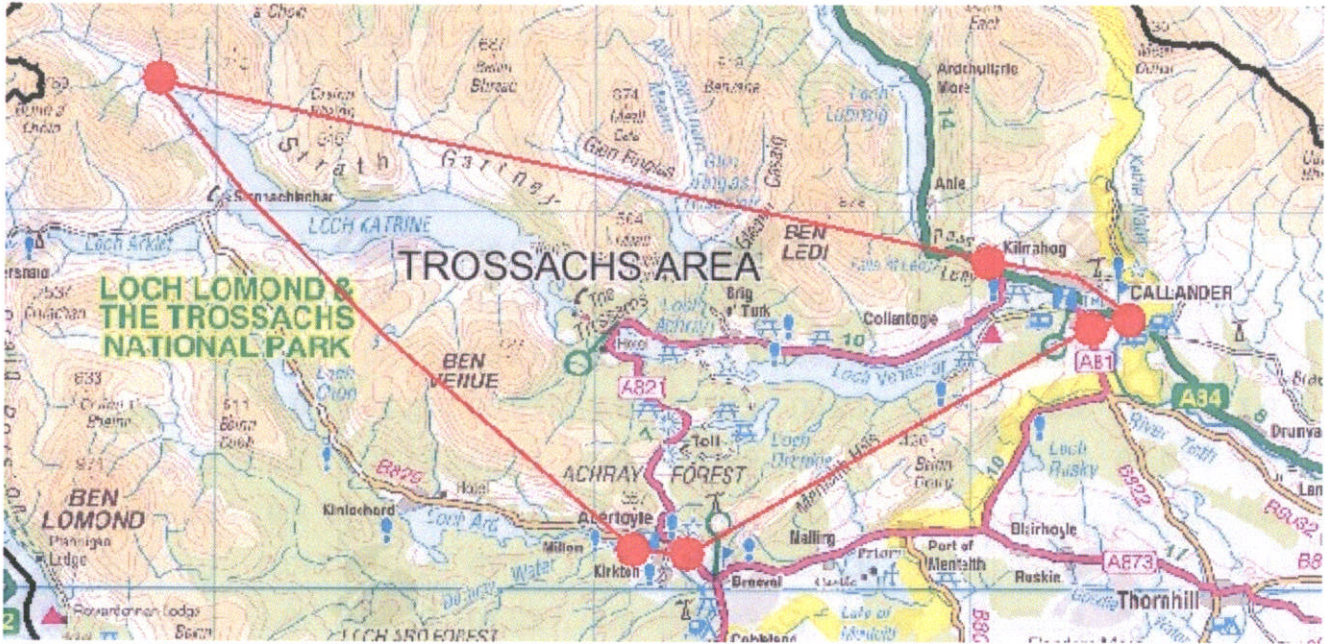
E-mail: sales@aberfoylecoaches.com

Online via website: www.aberfoylecoaches.com

Text: 0844 567 567 0

While bookings should be made 24 hours in advance, every effort will be made to accommodate passengers making bookings on shorter notice.

Trossachs Scheme Area



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Scheme	Area
Trossachs	On adopted publicly-maintained roads wholly within the area bounded by: (a) A821 at east end of Aberfoyle village; (b) B829 at west end of Aberfoyle village; (c) unclassified road on north shore of Loch Katrine at Glengyle House; (d) A84 at west end of Kilmahog; (e) A84 at east end of Callander (f) A81 at south end of Callander. 'East end', 'north end', etc. means furthest extent of 30 mph speed limit.

The service will be available on Mondays to Saturdays between 07:00 – 21:30

No service on 25-26 December or 01-02 January in any year

National Entitlement Cards accepted as on bus services

Bookings can be made by:

Telephone: 0844 567 567 0

E-mail: sales@aberfoylecoaches.com

Online via website: www.aberfoylecoaches.com

Text: 0844 567 567 0

While bookings should be made 24 hours in advance, every effort will be made to accommodate passengers making bookings on shorter notice.

Appendix 3 – Cost of using Stirling DRT

Maximum Farescale (all schemes)

Miles	Adult	Child	Miles	Adult	Child	Miles	Adult	Child	Miles	Adult	Child
0.1	£1.00	£0.50	3.1	£1.80	£0.90	6.1	£2.50	£1.25	9.1	£3.10	£1.55
0.2	£1.00	£0.50	3.2	£1.90	£0.95	6.2	£2.50	£1.25	9.2	£3.10	£1.55
0.3	£1.00	£0.50	3.3	£1.90	£0.95	6.3	£2.50	£1.25	9.3	£3.10	£1.55
0.4	£1.00	£0.50	3.4	£1.90	£0.95	6.4	£2.60	£1.30	9.4	£3.20	£1.60
0.5	£1.10	£0.55	3.5	£1.90	£0.95	6.5	£2.60	£1.30	9.5	£3.20	£1.60
0.6	£1.10	£0.55	3.6	£1.90	£0.95	6.6	£2.60	£1.30	9.6	£3.20	£1.60
0.7	£1.10	£0.55	3.7	£2.00	£1.00	6.7	£2.60	£1.30	9.7	£3.20	£1.60
0.8	£1.20	£0.60	3.8	£2.00	£1.00	6.8	£2.60	£1.30	9.8	£3.20	£1.60
0.9	£1.20	£0.60	3.9	£2.00	£1.00	6.9	£2.70	£1.35	9.9	£3.20	£1.60
1.0	£1.20	£0.60	4.0	£2.00	£1.00	7.0	£2.70	£1.35	10.0	£3.30	£1.65
1.1	£1.20	£0.60	4.1	£2.10	£1.05	7.1	£2.70	£1.35	10.1	£3.30	£1.65
1.2	£1.30	£0.65	4.2	£2.10	£1.05	7.2	£2.70	£1.35	10.2	£3.30	£1.65
1.3	£1.30	£0.65	4.3	£2.10	£1.05	7.3	£2.70	£1.35	10.3	£3.30	£1.65
1.4	£1.30	£0.65	4.4	£2.10	£1.05	7.4	£2.80	£1.40	10.4	£3.30	£1.65
1.5	£1.40	£0.70	4.5	£2.10	£1.05	7.5	£2.80	£1.40	10.5	£3.40	£1.70
1.6	£1.40	£0.70	4.6	£2.20	£1.10	7.6	£2.80	£1.40	10.6	£3.40	£1.70
1.7	£1.40	£0.70	4.7	£2.20	£1.10	7.7	£2.80	£1.40	10.7	£3.40	£1.70
1.8	£1.50	£0.75	4.8	£2.20	£1.10	7.8	£2.80	£1.40	10.8	£3.40	£1.70
1.9	£1.50	£0.75	4.9	£2.20	£1.10	7.9	£2.90	£1.45	10.9	£3.40	£1.70
2.0	£1.50	£0.75	5.0	£2.30	£1.15	8.0	£2.90	£1.45	11.0	£3.40	£1.70
2.1	£1.50	£0.75	5.1	£2.30	£1.15	8.1	£2.90	£1.45	11.1	£3.50	£1.75
2.2	£1.60	£0.80	5.2	£2.30	£1.15	8.2	£2.90	£1.45	11.2	£3.50	£1.75
2.3	£1.60	£0.80	5.3	£2.30	£1.15	8.3	£2.90	£1.45	11.3	£3.50	£1.75
2.4	£1.60	£0.80	5.4	£2.40	£1.20	8.4	£3.00	£1.50	11.4	£3.50	£1.75
2.5	£1.70	£0.85	5.5	£2.40	£1.20	8.5	£3.00	£1.50	11.5	£3.50	£1.75
2.6	£1.70	£0.85	5.6	£2.40	£1.20	8.6	£3.00	£1.50	11.6	£3.60	£1.80
2.7	£1.70	£0.85	5.7	£2.40	£1.20	8.7	£3.00	£1.50	11.7	£3.60	£1.80
2.8	£1.80	£0.90	5.8	£2.40	£1.20	8.8	£3.00	£1.50	11.8	£3.60	£1.80
2.9	£1.80	£0.90	5.9	£2.50	£1.25	8.9	£3.10	£1.55	11.9	£3.60	£1.80
3.0	£1.80	£0.90	6.0	£2.50	£1.25	9.0	£3.10	£1.55	12.0	£3.60	£1.80

Note: National Entitlement Cards accepted as on bus services

Miles	Adult	Child	Miles	Adult	Child	Miles	Adult	Child	Miles	Adult	Child
12.1	£3.60	£1.80	15.1	£4.20	£2.10	18.1	£4.70	£2.35	21.1	£5.30	£2.65
12.2	£3.70	£1.85	15.2	£4.20	£2.10	18.2	£4.70	£2.35	21.2	£5.30	£2.65
12.3	£3.70	£1.85	15.3	£4.20	£2.10	18.3	£4.80	£2.40	21.3	£5.30	£2.65
12.4	£3.70	£1.85	15.4	£4.20	£2.10	18.4	£4.80	£2.40	21.4	£5.30	£2.65
12.5	£3.70	£1.85	15.5	£4.30	£2.15	18.5	£4.80	£2.40	21.5	£5.30	£2.65
12.6	£3.70	£1.85	15.6	£4.30	£2.15	18.6	£4.80	£2.40	21.6	£5.40	£2.70
12.7	£3.80	£1.90	15.7	£4.30	£2.15	18.7	£4.80	£2.40	21.7	£5.40	£2.70
12.8	£3.80	£1.90	15.8	£4.30	£2.15	18.8	£4.80	£2.40	21.8	£5.40	£2.70
12.9	£3.80	£1.90	15.9	£4.30	£2.15	18.9	£4.90	£2.45	21.9	£5.40	£2.70
13.0	£3.80	£1.90	16.0	£4.30	£2.15	19.0	£4.90	£2.45	22.0	£5.40	£2.70
13.1	£3.80	£1.90	16.1	£4.40	£2.20	19.1	£4.90	£2.45	22.1	£5.40	£2.70
13.2	£3.80	£1.90	16.2	£4.40	£2.20	19.2	£4.90	£2.45	22.2	£5.50	£2.75
13.3	£3.90	£1.95	16.3	£4.40	£2.20	19.3	£4.90	£2.45	22.3	£5.50	£2.75
13.4	£3.90	£1.95	16.4	£4.40	£2.20	19.4	£5.00	£2.50	22.4	£5.50	£2.75
13.5	£3.90	£1.95	16.5	£4.40	£2.20	19.5	£5.00	£2.50	22.5	£5.50	£2.75
13.6	£3.90	£1.95	16.6	£4.50	£2.25	19.6	£5.00	£2.50	22.6	£5.50	£2.75
13.7	£3.90	£1.95	16.7	£4.50	£2.25	19.7	£5.00	£2.50	22.7	£5.60	£2.80
13.8	£3.90	£1.95	16.8	£4.50	£2.25	19.8	£5.00	£2.50	22.8	£5.60	£2.80
13.9	£4.00	£2.00	16.9	£4.50	£2.25	19.9	£5.00	£2.50	22.9	£5.60	£2.80
14.0	£4.00	£2.00	17.0	£4.50	£2.25	20.0	£5.10	£2.55	23.0	£5.60	£2.80
14.1	£4.00	£2.00	17.1	£4.50	£2.25	20.1	£5.10	£2.55	23.1	£5.60	£2.80
14.2	£4.00	£2.00	17.2	£4.60	£2.30	20.2	£5.10	£2.55	23.2	£5.60	£2.80
14.3	£4.00	£2.00	17.3	£4.60	£2.30	20.3	£5.10	£2.55	23.3	£5.70	£2.85
14.4	£4.10	£2.05	17.4	£4.60	£2.30	20.4	£5.10	£2.55	23.4	£5.70	£2.85
14.5	£4.10	£2.05	17.5	£4.60	£2.30	20.5	£5.20	£2.60	23.5	£5.70	£2.85
14.6	£4.10	£2.05	17.6	£4.60	£2.30	20.6	£5.20	£2.60	23.6	£5.70	£2.85
14.7	£4.10	£2.05	17.7	£4.70	£2.35	20.7	£5.20	£2.60	23.7	£5.70	£2.85
14.8	£4.10	£2.05	17.8	£4.70	£2.35	20.8	£5.20	£2.60	23.8	£5.70	£2.85
14.9	£4.10	£2.05	17.9	£4.70	£2.35	20.9	£5.20	£2.60	23.9	£5.80	£2.90
15.0	£4.20	£2.10	18.0	£4.70	£2.35	21.0	£5.20	£2.60	24.0	£5.80	£2.90

Note: 'National Entitlement Cards accepted as on bus services

Appendix - 4 DRT –vs- Bus
