SEStran Cross Tay Sustainable Transport Study

Final Report

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JMP Consultants Limited
City House
City Wharf
Lichfield
Staffordshire
WS14 9DZ

T 01543 440700
F 0800 066 4636
E lichfield@jmp.co.uk

www.jmp.co.uk

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Prepared by Lee White

Verified Tim Steiner

Approved by Iain Sherriff

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Report

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Contents

Tables and Figures

1 Introduction

1.1 The commission to undertake the SEStran Cross-Tay Sustainable Transport Study was awarded to JMP on 22nd January 2008.

1.2 This report sets out the findings and conclusions of work undertaken by JMP during January to February 2009 to assess the Study aims.

1.3 The key aims of the Study are to:

- Identify measures to reduce the use of single occupancy car trips using the Tay Road Bridge in the context of the recent removal of the tolls that had historically been charged in a southbound direction only.
- Develop proposals for Park and Ride (P+R) and/or park and choose site(s) in the northern Fife area to assist in reducing single occupancy car trips across the Tay Road Bridge
- Identify a package of sustainable mode interventions that will also contribute to a reduction in single occupancy car trips across the Tay Road Bridge

1.4 The inception meeting for the study was held at SEStran's Edinburgh office on Tuesday 8th February 2008.

1.5 The key action flowing from the meeting were to instigate the study steering group, the membership of which was confirmed as :

- Trond Haugen SEStran
- Jane Findlay Fife Council
- Lex Harrison SEStran
- Alex Macaulay SEStran
- Alastair Short SEStran
- Niall Gardiner TACTRAN
- Ewan Gourlay Dundee Council

1.6 Stakeholder consultation issues were identified and the following organisations noted as key stakeholders that formed a wider reference group for ongoing consultations :-

- Doug Fleming – Stagecoach Buses
- Moffat and Williamson Bus Co.
- Jim Lee – Travel Dundee
- Peter Williams – First ScotRail
- Nigel Wunsch – Network Rail
- Claire Keggie – Transport Scotland
- Hugh McCafferty – Transport Scotland
- Patricia Mcilquham – Dundee City Council on behalf of Tay Road Bridge Joint Board
- John Crerar – Tay Road Bridgemaster

1.7 Following further discussion with the study steering group other useful persons that it was felt had information that benefit the study were identified :-

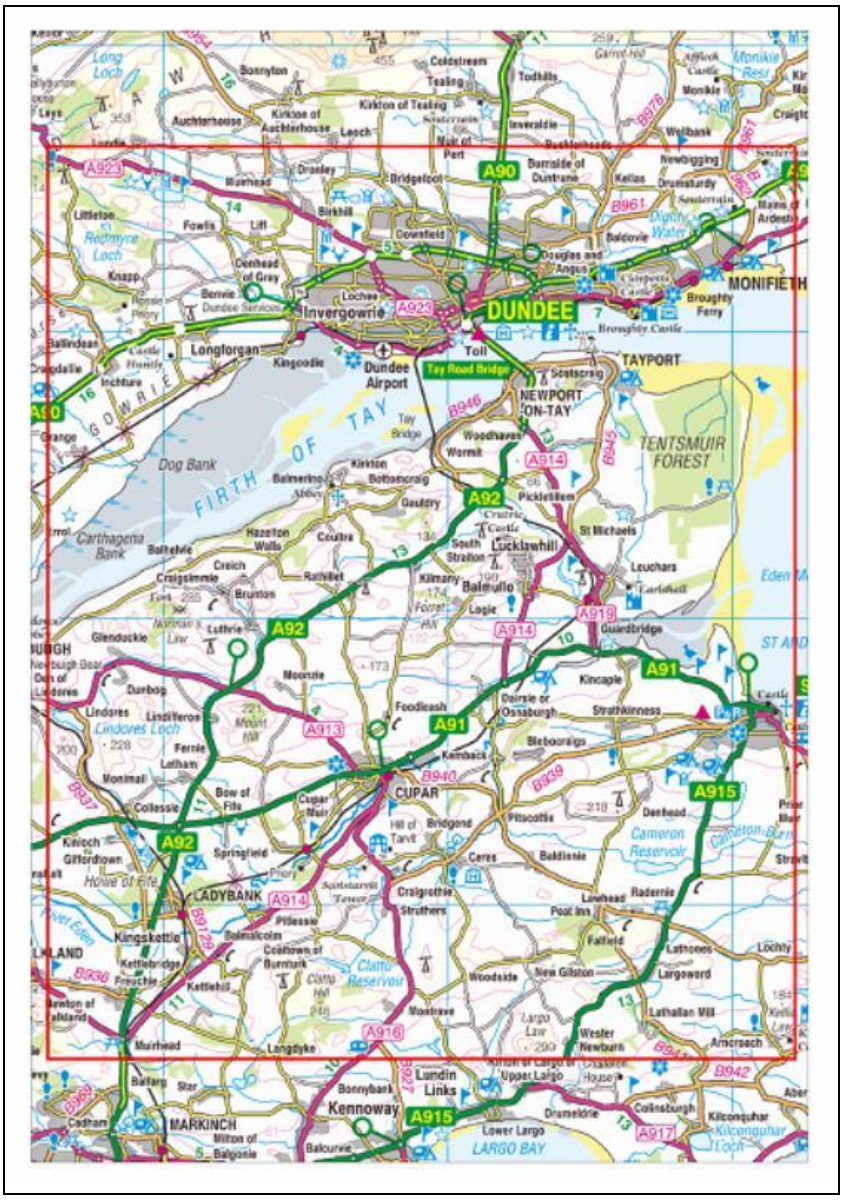
- Les Banks – Dundee Council Waterfront Development
- Cathy Kinnear – Fife Council Local and Community Policy

2 Study Methodology

2.1 The key requirement for the study was to produce STAG1 and STAG2 appraisals a range of interventions to improve sustainable mode travel across the Tay.

2.2 An initial examination of local transport conditions has been undertaken together with discussion with the wider stakeholders. In order to carry out an effective assessment the definition of the study area was the first key matter resolved. In order to use the data available from key sources, such as the Tay Estuary Rail Study it was agreed to limit the study area to that show in Figure 2.1 but to include the P+R sites that the TACTRAN P+R strategy (which is being developed on parallel timescales to this study) may include for the greater Dundee area. In order ensure a full coverage of the likely demand for P+R /park and choose data relevant to the study area from adjoining areas was also used as appropriate.

Figure 2.1 Study Area



2.3 This wider range of data has enabled the generation of a wide range of options which were sifted with the data available from the Fife local area to produce a list of suitable interventions that were

subject to an initial pre-appraisal option sift and the STAG1 appraisal. A do-minimum scenario of 'no Dundee focused P+R proposals' was established at this stage to inform the STAG1 appraisal.

2.4 To ensure that the STAG1 appraisal was fully informed, census data, public transport route and demand data, the Transport Model for Scotland (with land use/housing projections amended as appropriate) and the outputs from a Tay Road Bridge Origin and Destination Survey were used to create a layered GIS mapping of the current situation and market for cross-Tay travel. This mapping exercise identified key target areas and routes that could benefit from P+R /park and choose provision. Planning policies were assessed to confirm growth factors for future years. Where appropriate the patterns of proposed development were overlaid in the GIS mapping to relate land use policies to the transport network in order to identify future markets for P+R /park and choose proposals.

2.5 To benchmark the schemes initially considered appropriate for STAG1 option appraisal each intervention was examined for compatibility against the SEStran and TACTRAN Regional Transport Strategies, the appropriate local transport strategy(s) and the appropriate local land use polices. The STAG1 appraisal concentrated on the key themes of examining the all options generated during pre-appraisal option sifting that meet the policy sift objectives with specific consideration given to the following criteria :-

- Is the option going to alleviate the identified or perceived transport problems and/or maximise potential opportunities?
- Is the option likely to meet the Transport Planning Objectives?
- What are the likely impacts against the STAG Criteria?
- Is the option consistent with Established Objectives?
- Is the option likely to be: acceptable to the public, affordable and feasible to construct and operate?
- Is there a clear rationale for the rejection of options on completion of Part 1 Appraisal?

2.6 The results of the STAG1 appraisal were reported to the steering group. This report formed the basis for a further sifts of potential schemes that were taken forward to STAG2 appraisal and economic assessment. We undertook a demand, cost and environmental assessment of each intervention to inform the STAG2 process. The demand assessment has been generated by the Colin Buchanan Ltd's PRIDE model which is being used in their P+R strategy development work for TACTRAN to ensure consistency between the emerging TACTRAN P+R Strategy and this work.

2.7 A STAG2 appraisal of the options selected has been carried out with the focus on key STAG2 values of assessment against the Transport Planning Objectives developed during the Pre-Appraisal phase and the core STAG2 assessment criteria :-

- Environment;
- Safety;
- Economy;
- Integration; and
- Accessibility and Social Inclusion.

2.8 The outcome of the STAG2 includes an economic assessment. A definitive list of interventions to be taken forward beyond the scope of this study has been established. In order to inform this final selection outline design of civil engineering works has been undertaken as has the production of an indicative delivery strategy.

3 Policy Background

3.1 In order to inform the study appraisals a detailed review of the transport and land use planning policies of the relevant areas of Fife and Tayside was undertaken.

3.2 The current land use and transport planning framework in Fife and Dundee is reflected in a series of policy documents that cover national, regional and local policies which drive the key issues identified by Scottish Government of a wealthier and fairer society, a healthier society, a safer and stronger society and a smarter and greener society.

3.3 The review focused on the deliverables identified by transport policies to reduce car travel in the study area. These concentrated on the issues of bus and rail transport, accessibility planning and sustainable mode interventions. Land use polices were examined for housing development strategies.

Overview of Fife

3.4 The area around the southern bridgehead of the Tay Road Bridge forms part of Fife Council's area. Statistics show that between 2001 and 2004, Fife's population was more or less static showing only slight growth of 4,830 or 1.4% over that period. Since then the population has grown by 8,230, or 2.35%, to 358,930. This is among the fastest growth rates in Scotland. If official 2004 based projections by General Register Office for Scotland (GROS) come about, Fife's population will grow by 9% to 386,851 in 2024. In addition to increased numbers, the profile of Fife's population has also been changing: 33% of households in Fife now contain only one person compared with only 22% in 1981. Similarly, GROS projects a growth in the number of households in Fife by 21% to 186,550 by 2024. People are living longer, households are getting smaller and more people are moving into Fife. These trends will have a marked effect on the transport system as increases population and the number of households will lead to an increase in travel needs and a likely decline in car occupancy rates.

3.5 In terms of the economy Fife's working age population has risen by 7,000 in the last ten years. This compares with just 11,000 for the whole of Scotland. Government projections from 2004 suggest that this figure will grow by 6% over the next 20 years but this may vary. The total number of people in employment has also risen steadily to 167,000 in the year to December 2006. This represents 76.3 % of the working age population, slightly above the Scottish rate of 75.7%. Lower productivity due to a move towards service industries is coupled with lower workplace earnings – £389 gross average weekly earnings in Fife compared to £412 for Scotland in 2006. The increase in the number of workers and their relatively low average earnings will impact on the mobility of individuals within Fife and to areas outside the area where opportunities lie.

3.6 Seventy three percent of Fife residents travelling to work use their own car, mostly driving on their own, not sharing, and consuming 128,000 tonnes of fuel. Between 1998 and 2004, Fife has seen a 10% increase in car journeys to work, a 3% reduction in people car sharing, a 4% reduction in levels of walking, and a 1% reduction in public transport use. These trends will need to be reversed if Fife is to meet its strategic goal of being the most 'green' Council in Scotland.

Overview of Dundee

3.7 The northern bridgehead of the Tay Bridge is dominated by the City of Dundee. Dundee is Scotland's fourth largest city and the most recent estimate of Dundee's population was 142,170 (GROS 2005 Mid-year Population Estimate). The population of Dundee between 1991 and 2005,

declined by 8.6%, a decrease of 13,380 people but recent trends show an increase due to increased numbers of eastern European workers and students. The 2004 based Household Projections by Dundee City Council show a 3.2% decrease in the number of households of 2,150, from 67,730 in 2004 to 65,580 by 2018. Despite this decline, the number of single person households is set to increase.

3.8 Dundee is a regional employment, education, cultural and retail centre. Three hundred thousand people live within a 30 minute drive of Dundee city centre (double that within a one hour drive). The number of jobs in the city has increased from 75,232 in 1997 to 83,790 in 2006 (11.4% increase). Positive employment growth has been experienced by most sectors except utilities and manufacturing. The doubling in the last three years of jobs and firms in new sectors such as science, digital media and customer services is a positive sign. Earnings growth in Dundee surpassed Scotland as median earnings rose by 48.6% in the last ten years compared to 40% for the UK as a whole. However, Dundee still has the third highest levels of low income communities in Scotland. Despite catching up, median earnings are 2.2% below the Scottish average and the claimant rate remains above the Scottish average.

3.9 As for Fife these trends indicate that an increasing population that has more employment opportunities will require a greater quantum of transport therefore the Council will need effective plans to ensure its policy commitments of increasing the level of use for buses for journeys to work within Dundee to 33% by 2011 (based on 2001 levels) and doubling the amount of travel to work journeys by train by 2011 (based on 2001 levels) are met.

Land Use Planning Polices

National Planning Framework for Scotland 2004

Scotland today – The Economy

3.10 In Dundee, many traditional industries have had difficulties in adapting to new technologies and markets. This has led to a fall in population, high unemployment, social deprivation, and significant areas of vacant and derelict land. However, a major improvement in external image has been achieved through revitalisation of the city centre, with long-term investment in retail and cultural facilities and the public realm. A new economy is emerging in the form of clusters at the leading edge of biotechnology, medical science and multi-media software development. Dundee's large student population contributes to an atmosphere of vibrancy and diversity, but the city still loses too many of its young people in their 20s. Stabilising road traffic volumes over the next 20 years is an ambitious target which alone would transform the sustainability of Scotland: reducing growth in fossil fuels requirements; helping to meet existing commitments on emissions of greenhouse gases; and reducing air pollution. It is fully in line with the three priorities for sustainable development – reducing the use of resources, making better use of energy, and tackling congestion while minimising wasteful journeys.

3.11 Across Scotland, roads have been adapted to give a degree of priority to bus services or otherwise encourage travel by bus. Measures include bus priority lanes, new and improved bus stations, improved passenger interchanges and P+R facilities. There is evidence that the long-term decline in bus usage is being reversed. The number of passengers carried by local buses has increased in each of the last 3 years.

Key issues and drivers of change – Transport

3.12 Over the next 25 years Scotland will face significant development pressures, particularly on the east side of the Central Belt where urban expansion could result in journey times getting longer. In

parts of urban Scotland, the trunk road network and public transport systems require investment to address problems of congestion and unreliability. In some rural areas, improvements in transport infrastructure are needed to support economic activity and improve access to social facilities. Much remains to be done to achieve a transport system which matches Scotland's needs and potential.

3.13 The trend towards greater mobility, in particular heavy reliance on the private car, is giving rise to growing congestion and pollution and eroding environmental quality. However, there is a public consensus in favour of action to reduce congestion and the environmental impacts of car use. A key determinant of Scotland's environmental performance over the next 20 years will be the extent to which it is possible to affect a shift to more sustainable modes of transport, and more sustainable patterns of transport and land use.

Vision for Scotland 2025 – Sustainable Transport and Land Use

3.14 Progress towards more sustainable modes and patterns of transport will involve the development of quick and efficient public transport networks to provide alternatives to car use, encouraging the transfer of freight traffic from road to rail and water, and the provision of the necessary intermodal facilities. The Executive wants to encourage a move away from thinking based on single modes of transport towards truly integrated door-to-door solutions. Over the next 25 years, pricing is likely to play an increasing role in the management of travel demand.

3.15 Scotland needs a high quality public transport infrastructure capable of meeting the demand for mobility and policies which encourage sustainable choices. The Executive is taking a range of measures to make public transport an attractive and realistic alternative to driving. It has initiated a programme of major investments in strategic public transport projects, including the development of a tram network in Edinburgh. It has established a Rural Transport Fund to improve public transport in rural areas, and invested in lifeline air and sea connections. For significant passenger flows between larger centres, rail is more energy-efficient and environmentally friendly than road transport. However, buses can provide a flexible and inclusive service and in many areas, particularly in rural Scotland, they are the only viable public transport option. The Executive has set a target of a 5% increase in bus passenger journeys by 2006.

Spatial perspectives – East Coast

3.16 The challenge for Dundee is to reverse population loss. Great strides have been taken in the past decade in improving the quality of the city centre, enhancing cultural facilities and establishing new knowledge-economy clusters. Many young people come to the city for further education. The challenge is to encourage a higher proportion of them to stay.

3.17 The strategy for the Dundee city region will be to promote regeneration, neighbourhood renewal and further improvements to the quality of urban living within the city boundary. Priorities include the redevelopment of the Waterfront and the further development of knowledge economy clusters such as the Digital Media Campus, the Tech Park, the Medipark and the Scottish Crop Research Unit and the improvement of public transport services to these growth areas. Reducing the rail journey time to Edinburgh to under an hour would help to attract high value jobs to the city.

3.18 Stirling and Perth lie at strategic points on Scotland's transport network. Their accessibility and the quality of environment they offer make them attractive locations for development. Perthshire and Stirlingshire have important links with the Glasgow and Edinburgh city regions and provide the interface between Lowland and Highland Scotland. Angus and Eastern Perthshire have strong links to Dundee and there is scope for developing complementary roles for Dundee and Perth as the main centres on the Tay. For Fife, good connections with Edinburgh and Dundee are important.

There is considerable potential for building on the international profile of St Andrews as a leisure destination and centre of academic excellence.

3.19 Overall the aim of the National Planning Framework is to halt the decline in economic capability and to seek development patterns that reduce the need for travel to sustainable levels.

Fife Structure Plan 2006 - 2006

Chapter 1 Vision for Fife – Housing

3.20 Population projections indicate a need for land for approximately 14,500 additional houses to be built in the next 10 years. This need will be met in full, mainly from the existing effective supply, but also by the identification of new development land.

3.21 Rigid segregation of land uses in new development leads, in turn, to commuting, often by inefficient car journeys rather than by public transport, walking or cycling. It also creates single use zones lacking the attributes of balanced communities, especially in larger towns. Whilst a segregated approach remains relevant for incompatible land uses such as housing and heavy or extractive industry, compatible uses can be satisfactorily co-located. This approach is relevant to development within towns and in planned expansions.

3.22 Due cognisance of the objectives of the Fife Structure Plan have been taken into account in this study.

Policy Details

3.23 The Plan's strategy 'Shaping a More Sustainable Fife' seeks to ensure that development is located in the most sustainable locations. Policy SS1 sets out a strategic framework to guide development in accordance with the overall strategy.

3.24 In order to ensure that strategic transportation proposals, including road/rail services, are able to take place, it is necessary to protect the land required from other development. NPPG1: The Planning System encourages the safeguarding of land for transport infrastructure. The proposals reflect those in Fife's Local Transport Strategy likely to be implemented by 2011. The Structure Plan identifies the need to review the requirement for new stations at Leven and to strengthen public transport links to St Andrews through the Local Transport Strategy.

Transport

3.25 Road investment in the strategic network to by-pass Rosyth and upgrade the A95 and upgrade junctions on the A92 in Kirkcaldy and Glenrothes are identified.

Proposal PT2 Transport Proposals

3.26 Land for the following routes and facilities will be safeguarded from prejudicial development and identified in Local Plans, in accordance with the Structure Plan

- New rail station at Newburgh on the Ladybank to Perth line
- New rail station at Wormit on the Ladybank to Dundee line
- Tay Bridgehead P+R site
- Ladybank to Perth rail corridor improvements
- The Leven and St Andrews lines including new stations (subject to review through Local Transport Strategy)

- Land at all rail stations for future platform extensions, improved facilities and parking
- Green Point Car Parks – tourist P+R facilities and associated cycle routes
- A92T Preston to Balfarg Junctions Improvement Scheme (now completed)
- A92T Interchange at Redhouse (unlikely to be justified on Trunk Roads grounds alone but ref Policy SS3, Kirkcaldy Urban Expansion, 4th bullet point, as modified)

Policy T3: Safeguarding of Existing and Potential Transport Routes

3.27 The following routes and land will be safeguarded from development that may prejudice their existing or future transportation use:

- the disused railway network including land previously used for sidings

Conserving and enhancing Fife's environment

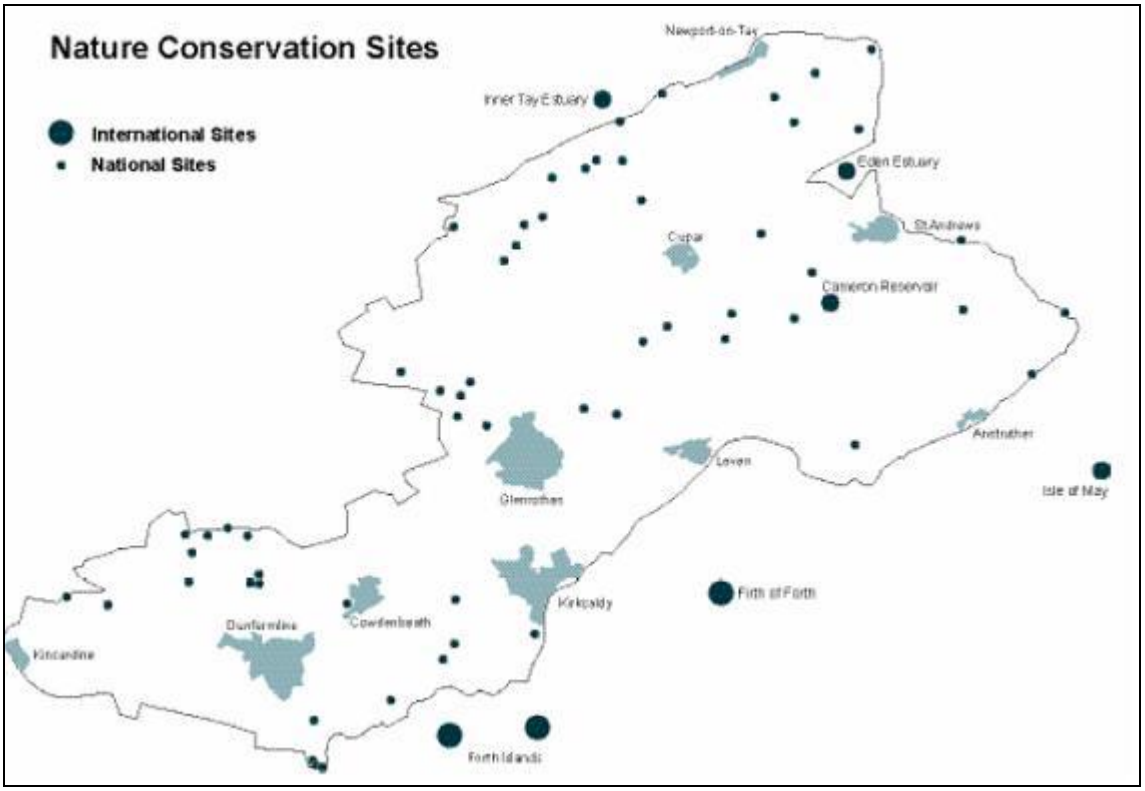
3.28 POLICY N7: Nature Conservation – International Sites Development likely to have a significant effect on a Nature 2000 site will be subject to an assessment of the implications for the site's conservation objectives. The development will only be permitted where the assessment indicates that:

- it will not adversely affect the integrity of the site; or there are imperative reasons of overriding public interest, including those of a social or economic nature and there are no alternative solutions.

3.29 Where such a site hosts a priority habitat and/or priority species as defined by the Habitats Directive (92/43/EC), the only overriding public interest must relate to human health, public safety or beneficial consequences of primary importance to the environment. Other allowable exceptions are subject to the views of the European Commission.

3.30 Sites of national importance to nature conservation are protected by their designation as National Nature Reserves or Sites of Special Scientific Interest (SSSIs). SSSIs, in turn, form the foundation for a range of additional designations. Fife contains, either wholly or partly, over 50 SSSIs. It is therefore important to afford such sites an appropriate level of protection. (para. 3.2.15). Figure 3.1 identifies the key sites in Fife.

Figure 3.1 Fife Environmental Sites



Fife Structure Plan

Policy N8: Nature Conservation – National Sites

3.31 Development which would affect a National Nature Reserve or a Site of Special Scientific Interest will only be permitted where ecological appraisals have demonstrated to the satisfaction of the Council as planning authority that:

- the overall objectives of designation and the overall integrity of the designated area would not be compromised; or
- any adverse effects on the qualities for which the area has been designated are clearly outweighed by social or economic benefits of national importance.

3.32 In summary the Fife Structure Plan provides a direction for the allocation of land uses and seeks to identify within the overall transport context in Fife their impact on movement in the area. A number of definitive proposals are made in respect of the area surrounding the Tay Estuary crossings.

St Andrews and East Fife Local Plan 2006-2016

3.33 It is envisaged that the final plan will be approved in 2009. However it is understood that amendments to the Finalised Draft Local plan may be required to meet emerging policies in areas other than transport.

3.34 Local plan development strategy – Developing the Transport Network core aims for the transport network in the St Andrews and East Fife Local Plan are:

- Maximising the efficient use of the Tay crossing through supporting increased modal shift to public transport and car share.
- Promoting mixed use developments to achieve improved accessibility.

- Focussing major developments on public transport interchanges and town centres served by public transport and increasing development densities in these areas. This includes identifying opportunities for improvements to public transport infrastructure.
- Supporting the provision of strategic transport improvements including a relief road for Cupar and a distributor road for St Andrews.

St Andrews

3.35 The development strategy is to expand St Andrews over the next 20 years to create a University Quarter and to realise the potential of tourism and the University as an economic driver for Fife whilst balancing this with the need to protect its internationally important heritage. Development will provide for employment land, 1,200 houses and community development over a 20 year period.

Cupar

3.36 Cupar's growth over the last 30 years has not been matched by the growth in the town's services and facilities. The Local Plan strategy for Cupar is to consolidate the town's role as the principal centre for services and facilities serving the wider rural hinterland, involving the development of 1,450 houses, community facilities and infrastructure, enhanced education facilities and business and commercial land over a 20 year period.

Leuchars and Guardbridge

3.37 The Finalised Fife Structure Plan 2006-2026 requires accommodating development of additional 400 houses over a 20 year period. The Local Plan identifies development over a 10 year period whilst indicating the direction of development in the longer term.

Taybridgehead

3.38 The Tay bridgehead area, centred on Newport-on-Tay, Wormit and Tayport, is important to Fife's connections to the north because of the cross Tay transport links, and the retail, business, and employment relationships with Dundee and Angus. The Finalised Fife Structure Plan identifies development of 500 houses over a 20 year period.

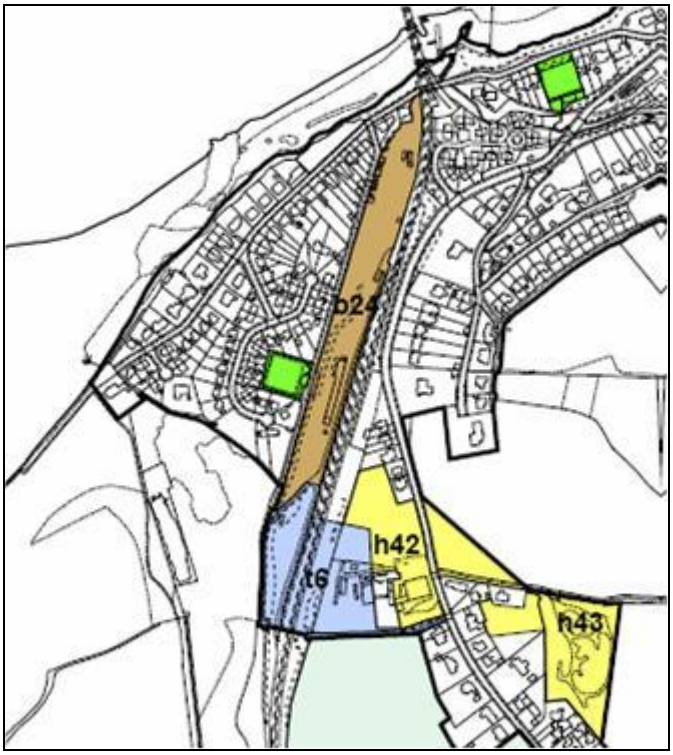
3.39 Integral to the Structure Plan is improved public transport provision including development at Leuchars railway station, taking account of possible light rail and or guided bus proposals. This emphasis on public transport provision is echoed in proposals for Cupar which include bus and rail hubs, improved accessibility, and alternative modes of travel.

3.40 The East Area Transport Plan addresses the viability and development of a direct rail link to St Andrews and a commitment to identify, cost, and appraise measures to address Cupar's traffic problems including the creation of a relief road. At this time, development of a direct rail link to St Andrews is not viable.

3.41 The Local Plan makes a series of land allocations for transport. Key to this study are reservation of the site for Wormit Station, and area of search at the southern bridgehead of the Tay Road Bridge for a P+R /Park and Choose site and allocation of land at Leuchars for an extension to the railway station car park.

3.42 Wormit station site is protected by proposal T6 and is south west of the town of Newport on Tay.

Figure 3.2 Wormit Station Safeguarded Site



Finalised Draft St Andrews and East Fife Local Plan

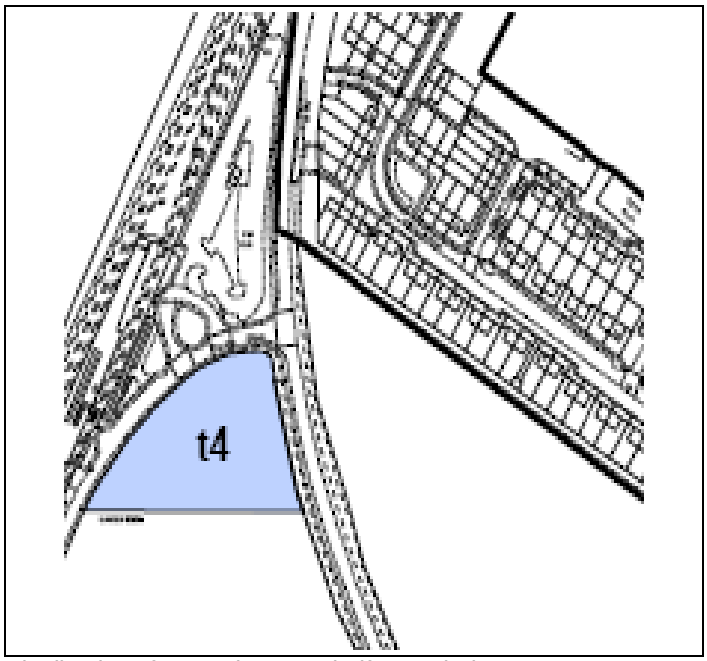
3.43 An area of search was undertaken for a P+R /park and choose site to the east of Newport on Tay at the roundabout on the A92 that leads to the Tay Bridge. A site adjacent to the A92 road in the vicinity of Newport on Tay primary school was not been included in the Finalised draft local plan due in part to opposition from local residents.

3.44 As mentioned in the Settlement Plan, Fife Council has been investigating the possibility of locating a household waste/recycling centre adjacent to the A92 Forgan Roundabout approximately 2 miles from the bridgehead. As major road improvement would be needed for such a site a P+R /park and choose site in the same location would have economies in terms of land used and construction costs.

Figure 3.3 Area of Search for Tay Bridgehead P+R

3.45 The car park at Leuchars Station was expanded in 2007. The Finalised local plan Proposal T4 makes provision for a further expansion into greenfield land opposite the station site.

Figure 3.4 Leuchars Railway Station Car Park Expansion Land



Finalised Draft St Andrews and Fife Local Plan

3.46 Overall the Finalised Draft St Andrews and East Fife Local Plan makes key land allocations including proposals for housing growth in a number of the settlements in the study area. Land for transport use is reserved at sites already identified as having potential for interventions to be made.

Dundee and Angus Structure Plan 2001-2016

Transport policy 3: Sustainable transport

3.47 In order to promote and enhance an efficient, attractive and sustainable transport system through Local Plans and Local Transport Strategies, this Structure Plan supports and requires measures which will:-

- maintain and improve facilities for public transport;
- promote new and attractive pedestrian and cycle priority routes which link to established routes where feasible;
- promote the enhancement of integration and convenience between different modes of transport;
- provide for freight terminal facilities at locations which are convenient and accessible to the rail network, ports and airport;
- improve accessibility to facilities for people with restricted mobility; and
- encourage opportunities for electronic communication.
- seek to minimise the impact on the environment of all development proposals. Where appropriate this will require the preparation of an Environmental Statement.

3.48 The Dundee and Angus Structure plan provides a framework for land allocations in the area immediately north of the Tay Estuary. The aim of the plan is to make development as sustainable as possible with reference to the existing transport network and known or proposed future developments of transport infrastructure.

Dundee Local Plan Review 2005

3.49 The Dundee Local Plan was last reviewed in 2005. The key policies relevant to this study relate to the Waterfront development and transport policy including the recently adopted Central Dundee Parking Strategy. (See para 3.106)

Policy 83: Bus transport

3.50 Dundee City Council will promote: the introduction of bus priority measures in accordance with the need to increase the attractiveness of bus services to the public and contribute to a reduction in traffic congestion. This will concentrate on the City Centre arterial routes and the crossing points on the Kingsway; and the establishment of well sited, high quality passenger waiting and information facilities including bus stops, stances and shelters, particularly at retail and other employment locations. Such provision should relate well to the surrounding road network, and local pedestrian desire lines; along with the completion of a new road exclusively for bus use between Ninewells Hospital, the Medipark and the existing Dundee Technology Park.

Rail services

3.51 Less than 1% of employees commute to work by train, a figure which is disappointingly low given the apparent availability of the rail network. To promote usage there has to be a review of service provision at existing stations and acknowledgement of the growth areas for employment and residential development in the consideration of new facilities. The main Dundee railway station is located close to the City Centre but is not as accessible as its location would imply. Bus access is limited to only a few longer distance services calling to a bus stop located out of sight of the main entrance, with other City bus services also suffering from poor accessibility issues. The station itself is in need of enhancement and does little to reflect the status of Dundee as a major city.

3.52 The provision of a frequent service during peak periods will offer some opportunity for increased use, but in isolation is unlikely to be financially viable. The extension of services is therefore dependent on attaining new market areas through the establishment of further station facilities. This also involves improving existing station facilities and extending station catchment areas by providing intermodal opportunities and improved access arrangements. Dundee City Council therefore supports neighbouring Council's aims to pursue new and improved rail facilities and will investigate the establishment of a new or improved rail halt to the west of Dundee, serving the needs of trip generators in that area, including the Technology Park, Ninewells Hospital and Dundee Airport. The Council has initiated a full review of passenger rail facilities and services for Dundee and its catchment area and will promote improvements in accordance with that review. This review may require Dundee City Council to work with neighbouring authorities to achieve improvements to the existing network.

Policy 84: Passenger rail services and facilities

3.53 Dundee City Council will :-

- promote better access between the City Centre and the rail station;
- promote the renewal of the station facility in line with its status as an entry point to the City;
- support neighbouring authorities in providing modal interchange facilities and new or upgraded rail facilities in their areas;
- promote the enhancement of existing service levels provided by train operators;
- seek to establish a new or improved rail station and transport link in a location west of Dundee Airport and support and promote more effective use of Broughty Ferry Station; and
- not permit the redevelopment of existing or former railway stations or their associated facilities if it will prejudice their availability for future rail use.

3.54 seek to minimise the impact on the environment of all development proposals. Where appropriate this will require the preparation of an Environmental Statement

Central Waterfront

3.55 The shortcomings of Dundee's Central Waterfront Area have for some time been a source of concern. Particular attention has focused on the failure to capitalise more fully on the City's enviable riverfront setting and on the separation of the City Centre from the river. The Dundee Partnership appointed consultants to devise options for reintegrating The Central Waterfront with the City Centre within a 30 year time frame.

3.56 Following extensive consultations on a range of options the Partnership agreed on a final Masterplan for the area. This sets out an integrated package of measures to address the negative impact associated with the existing roads and Tay Road Bridge access ramps in the in the Central Waterfront area while retaining appropriate provision for vehicular access and through traffic. The main elements of the package are :-

- extending the City Centre down to the Waterfront;
- creating a new street pattern;
- improving provision for walking, cycling and buses;
- reducing the effect of cars and parking;
- removing some of the Tay Road Bridge ramps;
- creating a pair of east/west tree lined boulevards;

- providing sites for a variety of mixed use developments;
- forming a new civic space and re-opened dock; and
- providing a new rail station and arrival square.

3.57 Implementing the Masterplan depends on guiding and controlling future development within the Central Waterfront area, providing key elements of infrastructure and ensuring that suitable funding mechanisms are available to deliver the overall project. The Local Plan has an important role in providing a statutory framework for the site to ensure that future proposals for development within the area are consistent with the provisions of the Masterplan. It is understood the build-out of the Waterfront area will take 7 to 9 years from 2008 onwards.

3.58 This will result in a number of road closures and traffic diversions reducing overall highway capacity. To mitigate the effect of these closures it is considered that public transport use will need to be maximised as will P+R use where possible.

Transport Policies

Scotland's National Transport Strategy 2006

Scotland's Transport Needs

3.59 The strategy sets five high level objectives for transport in Scotland's Transport Future. The most relevant to this study seek to:

- Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network; and
- Protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy.

3.60 The strategy recognises that potential tensions exist between the high level objectives such as promoting economic growth while protecting our environment. However, great emphasis is placed on ensuring synergy is achieved. Through consultation this view was often polarised into language illustrating a view that the strategy policy had to choose between the economy and the environment. The authors of the strategy did not think this polarisation was an appropriate direction to take. In line with the Scotland Sustainable Development Strategy, the Framework for Economic Development and Scotland's Climate Change Programme sustainable development is supported, where it brings together the economy, the environment and social inclusion. Sustainable development principles form the basis of the approach to this strategy.

3.61 There are two key strategic outcomes, relevant to this study, which are focused on achieving this vision. They are to:

- Improve journey times and connections, to tackle congestion and the lack of integration and connections in transport which impact on high level objectives for economic growth, social inclusion, integration and safety;
- Reduce emissions, to tackle the issues of climate change, air quality and health improvement which impact on high level objectives for protecting the environment and improving health;

Improved journey times and connections

3.62 The key challenges the strategy faces is how to tackle the critical issue of congestion on key corridors and the strategic pinch points in the road and rail networks: how to make journey times more reliable and how to ensure the infrastructure supports economic activity, providing

connections to key markets and locations, providing access to work and education and access for visitors. The strategy seeks to ensure Scotland is well-connected to maximise the potential of globalisation. The strategy needs to tackle the congestion problems in many cities and towns, including those caused by the school run which also lead to inactive lifestyles for children and road accidents which cause deaths and injuries and contribute to problems of congestion and unreliable journey times.

3.63 For buses, the aim is to ensure that the infrastructure and incentives are in place so that bus operators improve services to hold on to current passengers and achieve modal shift from cars. Buses provide high occupancy sustainable mass transport, promoting economic growth and social inclusion. Buses are the principal, most frequently used and most widely available mode of public transport. They are flexible and new services can be developed and introduced very quickly where demand is identified. They are also particularly important in rural areas. The priority is to encourage the bus market to continue to improve services to attract passengers and, where required, improve bus journey times with the provision of bus priority measures.

3.64 A Bus Action Plan forms part of the National Transport Strategy. It is designed to ensure that there is a step change in planning, partnership and the policy framework for buses and provide fresh impetus to the contribution that buses make to growing the economy and supporting communities.

3.65 Infrastructure measures on local and trunk roads are key to improving bus journey times. These include on-road demand management measures (bus priority measures, bus lanes on key arterial corridors, P+R, traffic management systems and Bus Rapid Transit on segregated sections of roadway). Regional transport partnerships (RTPs) and local authorities will be actively supported through a significant investment in them. RTPs received £70 million between 2006 and 2008 from the Scottish Government, including £10 million for bus-related investment, with local authorities receiving GAE funding of £56 million between 2006 and 2008 for supported services and £730 million for local roads in the same period.

3.66 Bus priority measures can often be introduced without affecting car users. However, where road space is limited, bus priority measures such as bus lanes may reduce the road space available for car users. RTPs and local authorities should introduce bus lanes and other bus priority measures which reduce the space available to car users wherever this is justified. Modal shift from car to bus is achieved by use of carrot and stick – carrot in the form of improved bus services in terms of frequency, quality of vehicle and speed and stick in the form of restrictions on car use. It is stressed that these measures must be introduced at least in tandem.

Reduced emissions

3.67 The aim is to promote better synergies between transport and land use planning to minimise the environmental impacts of transport networks and to contribute to health improvement

3.68 Planning for Transport, Scottish Planning Policy (SPP 17) and Planning Advice Note (PAN 75) were published in 2005 and sets out how development plans should allocate land for new development in the knowledge of the capacity of the transport network and, where necessary, demonstrating where new transport infrastructure is required to service development. In dealing with planning applications, a system is promoted whereby each application contains details of the likely transport impacts and the proposed means of mitigating those impacts through design, investment or sustainable travel plans.

3.69 Assessing planning applications according to the guidance should also prioritise access on foot, by bicycle, by public transport and lastly by car in order to encourage sustainable modes of transport.

New housing developments, supermarkets and businesses should be designed to encourage walking or cycling over local networks to local facilities rather than making car trips the mode of choice. Explicit links should be made to railway stations, bus corridors and other transport interchanges to maximise the opportunity for use of public transport. There is also a regime of maximum parking standards now established to constrain car trips at destinations. These requirements can have a significant impact on the amount of physical activity that individuals undertake, encouraging them to walk and cycle where possible and planning these activities into the early stages of the design work, leading ultimately to improved health.

Review the affordability of public transport

3.70 Current fares policy for rail is set out in the First ScotRail Franchise Agreement, which was let by the Strategic Rail Authority and agreed with Scottish Ministers. As a consequence of the Railways Act 2005, Scottish Ministers now hold direct responsibility for future fares policy. The current fares structure is a mixture of regulated and unregulated fares. Scottish Ministers can restrict the permitted increase on regulated fares while unregulated fares are set by the operator. Scottish Ministers have no control over the levels of unregulated fares.

3.71 The aim is allow the rail fares structure to be easily understood by passengers, to encourage people to travel by rail and to be competitive, where possible, with other modes. Fares policy is currently under review and a new policy is to be developed which maximises opportunities to encourage modal shift to rail.

3.72 Buses are flexible and cost-effective high occupancy vehicles that carried 477 million passengers in 2005-06. The equivalent values for rail are £73 million (2004-05) and air £24 million (2005). Direct support for the bus industry amounts to £62.6 million in 2006-07 (Rail £631 million, Air £41.6 million, Ferry £61.7 million). Subsidy per passenger journey amounts to £0.14 (Rail £9.15, Air £1.81). These figures are on activity in Scotland England and Wales in the years listed.

3.73 The average fare paid across Scotland (excluding concessionary fare passengers) is currently about £1.20 per journey. Due to the increase in car use (54% rise in trips since 1985-86), bus passenger numbers have declined by 31% since 1985-86 and passenger receipts by 14% (real terms). However, increases in congestion (it is estimated that the number of buses and operating costs have increased by at least 10% due to the effects of congestion) have contributed to a real terms increase in fares of 19%.

3.74 Bus services subsidies will be reviewed in the round to ensure that they are adequate, fit for purpose and provide the synergy required to maximise opportunities to improve the provision of bus services; and that they are commensurate with the significance of buses as the principal form of public transport and with their potential to develop.

3.75 The Bus Action Plan will help to ensure a step change in planning, partnership and the policy framework for bus services in order that buses can make the required contribution to growing the economy and supporting communities that is desired. Regional transport partnerships and local authorities have explicit bus policies and targets, which include key economic and social aims. Bus planning should be integrated with planning for demand responsive transport and health service planning to ensure integration.

3.76 A step change in bus compliance enforcement by VOSA and the Traffic Commissioner is required, including targeted enforcement where there are problems. Dundee and Angus Councils have recently signed the first Bus Punctuality Improvement Partnership (along with Stagecoach and National Express Dundee) which will go a long way to address issues of the reliability of and

improvement to bus journey times on corridors to the north, east and west of Dundee. It is considered that bus priority measures from the south of Dundee will be required some time in the future. The extent and scale of bus priority and appropriate timescale for it to be introduced has yet to be determined in consultation with the relevant bodies.

3.77 A substantial investment is made by the Scottish Government in the bus industry. The Bus Action Plan seeks to establish a higher return on that investment, driving up quality for the benefit of the millions of passengers who use the bus. It seeks to be alive to the different requirements of different parts of Scotland. While many of the fundamental challenges for the bus industry are the same across Scotland, in important respects there are also unique circumstances in different parts of the country. There is no one size fits all solution and solutions should be tailored to the specific problems faced.

3.78 A step change is required in bus service provision and infrastructure if bus services are to meet the needs of current bus users and to attract passengers from the car. Action is required to strengthen a range of policy and financial tools to help shift the quality of provision upwards across the industry. That means:

- Closer alignment between central government financing and quality on the ground;
- Strengthening Quality Partnerships so that they can cover more readily issues such as the frequency and punctuality of services;
- Simplifying the process to enable franchising (i.e. a quality contract) where that is seen to be an option by transport authorities; and
- Intensifying the regulation regime so that performance problems are addressed quickly and decisively.

3.79 Information provision is one of the key tools to continuing growth in passenger numbers. A nationwide review of the provision of bus information is required and work with stakeholders will be needed to achieve this.

3.80 The pro-active use of Quality Contracts, Quality Partnerships and Punctuality Improvement Partnerships (intended primarily to tackle bottlenecks) to deliver better bus services is to be encouraged. A review of the legislation on Quality Contracts and Partnerships to simplify the process to encourage transport authorities to use them is desired. Work with Scottish Government colleagues on the development of Quality Partnerships will be carried out. Guidance is being prepared on this matter and it is expected to be published in the very near future.

3.81 Transport interchanges must be of the highest quality, including airports, rail, bus and ferry interchanges. They must cater for all modes of transport including cycling and walking, be accessible for those with limited mobility and suitable for visitors and commuters alike. Integrated planning is central to this and regional transport partnerships will have a key role to play in promoting integration and improving key interchanges in their region. RTPs and local authorities should also consider flexible demand-responsive feeder services for key transport interchanges as a way of improving the quality of transport for the public.

3.82 The national transport strategy for Scotland sets out at a high level the need for mode shift away from private cars to be promoted and sets a regional and local framework for the delivery of infrastructure and service improvements.

SEStran Regional Transport Strategy – 2008

3.83 The SEStran Regional Transport Strategy for 2008 to 2023 is now approved. Key policy commitments are designed to reduce the dependence on the private car.

3.84 Throughout the development of the RTS, SEStran has engaged with the other RTPs on cross-boundary issues. SEStran's relevant schemes highlighted by other RTPs not covered elsewhere in this document are:

- Strategic P+R (SPT) – providing better P+R for travellers from the SEStran area;
- P+R /Park and Choose schemes for Dundee, Perth and Stirling (TACTRAN).

3.85 There are many bus and rail- based P+R sites in operation around the SEStran area. Indeed P+R accounts for 30% of all rail travel in the area. It is extremely popular with users and the demand for P+R continues to grow. At many sites, car park capacity is often reached and this can cause local conflicts in the vicinity of the site. There are obvious benefits from P+R, most notably the removal of car traffic from congested corridors.

3.86 A regional strategy will monitor use of current P+R sites and set out an on-going programme of investment in new and extended P+R sites, both rail and bus based. It will also consider pricing regimes currently in operation.

3.87 SEStran to establish a regional P+R strategy as a high priority. An on-going programme, where demand at P+R sites across the SEStran area is monitored annually will be established. This will lead to a clear, prioritised programme of car park expansions. Proposed new sites will be identified/appraised as part of this strategy to ensure a consistent, regional approach to P+R.

3.88 In addition, the RTS Guidance states that it wishes to see 'action across the region to reduce traffic levels and congestion, particularly on high density commuter routes, through traffic management, provision of P+R , provision of additional public transport services, increased use of bus lanes on major corridors into and within towns and cities, parking controls and charges'. This gives a clear indication of the types of measures the RTS should be pursuing, and the Network-Based Measures theme is closely aligned to the Guidance.

3.89 The SEStran RTS sets out clear goals for the provision of more sustainable access to City Centres through the use of P+R and where appropriate park and choose. The overall aim of the SEStran RTS is to reduce the dependence on the private car.

Fife Local Transport Strategy 2006

3.90 The Fife LTS includes a range of local transport policy interventions to encourage the use of public transport.

- **Policy CMT1/ITT4 –** Increase the number of commuters using P+R /Choose by 20% by 2011.
- **Policy CMP5** -Promote P+R /Walk facilities and locations, particularly for long stay, commuter parking 2009-20011.
- **WCT4** – increase cycle usage across the Tay Road Bridge by 8% by 2011

Longer Term Aims

3.91 **ITP9 –** Continue to investigate the potential for new rail improvements to Levenmouth, Kirkcaldy East, Newburgh, Wormit and an improved public transport link to St Andrews

3.92 **CP8 –** Support the implementation of measures to achieve the traffic growth reduction strategy on the Tay Road Bridge in partnership with relevant organisations

Chapter 6.6 Integrated Transport Networks

3.93 The priority issues for quality integrated transport for Fife, determined from the recent SEStran Integrated Transport Corridors Study (SITCoS) study are to :-

- Enhance the use of “one ticket” for journeys; reduce travel times and cost of journeys
- Implement improvements to bus and rail interchange facilities and services
- Provide greater use of Park and Choose facilities to integrate bus, rail and car share to afford more flexible travel patterns
- Promote greater use of demand management in the longer term

3.94 The Fife LTS picks up the key aims of the national transport strategy and the SEStran RTS and links to local plans that deal with land us in the Fife area. At a local level the development of P+R /park and choose facilities is encouraged as is the use of travel demand management approaches.

TACTRAN Regional Transport Strategy 2008/2023 and Park and Ride Strategy and Action Plan

3.95 TACTRAN’s Regional Transport Strategy seeks a balanced and integrated approach to transport which supports the key themes of:

- delivering economic prosperity
- connecting communities and being socially inclusive; and
- delivering environmental sustainability, health and well-being.

3.96 It is recognised by TACTRAN that public transport has a major role in achieving significant improvements across these three themes. Park & Ride is considered to have a key role and there is a commitment to develop a Regional Park and Ride Strategy which will outline a programme for Park and Ride/Park and Choose networks serving the region’s main towns.

3.97 TACTRAN has subsequently developed a Park and Ride Strategy that expands TACTRAN’s aspiration to maximise the potential for enhanced Park & Ride / Park & Choose networks in the Perth, Stirling and Dundee areas.

3.98 Around Dundee the Park and Ride Strategy identifies the site to the south of the Tay Bridge and to the West of Dundee as high priorities for implementation, with sites to the North and East considered longer term proposals.

3.99 TACTRAN considers that these Park & Ride initiatives can assist in providing necessary links for the movement of people on which the region’s economy and social well-being depends.

Dundee Local Transport Strategy

Public Transport users

3.100 The Dundee City Council Local Transport Strategy identified the potential for a new rail halt/station adjacent to Dundee Airport would provide the opportunity for a cross city rail service, with bus connections to Ninewells Hospital.

3.101 Restraining the use of the private car – The main method of restraining the use of the private car will continue to be to limit the number of long term parking spaces available in the city centre.

3.102 Rail: Rail travel accounts for 1% of commuter trips in Dundee, disappointing given that the city is situated on the East Coast main Line. As Aberdeen and Edinburgh are considered 'end points' by TOC's the city does not benefit from arrival- departure times suitable or frequent enough for many commuters. Additionally the fares structure offered by the TOC's for short commuter trips can act as an economic barrier compared to other modes….

3.103 If a new rail halt could be provided adjacent to Dundee Airport, this would offer a cross-city service. The Airport is also located 1` mile from Ninewells Hospital which is the regional hospital serving the old Tayside area plus North East Fife. The hospital is a major trip end for commuters currently employing approximately 4,500 people. Therefore although the high quality infrastructure exists for bus users, the service and interchange facilities between bus and rail are comparatively poor.

3.104 Access to the main Dundee station is not as convenient as it would suggest. The council will enter into dialogue with Railtrack (*sic*) and the TOC's with a view to improving integration of local services. The council will also support and encourage neighbouring authorities to provide modal interchange facilities at stations in their area. In particular support will be given to Fife council to pursue through their structure plan the provision of new/improved rail facilities.

3.105 Key targets set for the Dundee City Council are:

- To increase the level of use for buses for journeys to work within Dundee to 33% by 2011 (based on 2001 levels)
- Double the amount of travel to work journeys by train by 2011 (based on 2001 levels)
- To integrate accurate walking, cycling, parking, public transport and road information by 2010.

Central Dundee Car Parking Strategy

3.106 Car parking policy is an important element of transport strategy that can affect the economic prosperity of Dundee City. The level of both on-street and off street parking charges and the policy decisions made with the Strategy document gives due consideration to this aspect of parking provision and enforcement.

3.107 There are approximately 5,000 public off-street car parking spaces in Dundee City Centre and 560 on-street spaces. Since 1991 the number of spaces available to commuters around the city centre has been maintained at around 1,900 spaces (fluctuating up to 2,100 during the late 1990s/early 2000s). However, over this period there have been significant changes to lifestyles and also considerable commercial, business and residential development in the city. In light of this, it became apparent that the Council needed to review its central Dundee car parking policies to cater for these.

3.108 The Central Dundee Car Parking Strategy has been developed in three distinct strands:

· Sustainability, Parking Supply and Pricing

· Safety and Convenience

· Residential Amenity

3.109 The first of these strands - Sustainability, Parking Supply and Pricing - deals with the need to develop a car parking strategy that supports the overall aims of the wider Local Transport Strategy. By controlling the demand for spaces and the pricing applied for parking, the car parking strategy contributes towards a sustainable transport system that restrains the inappropriate use of the private car and complements the need to encourage alternative modes of transport.

3.110 The second strand - Safety and Convenience - deals with the quality of the parking facilities in Dundee City Centre ensuring that they are safe to use, accessible by all, convenient for people's needs and there is awareness of the facilities provided through availability of good information.

3.111 The third and final strand of the strategy - Residential Amenity - considers the need for appropriate residential parking. The restricted supply of off-street parking and limited roadside space for on-street parking in the city centre and the immediate surrounding area causes conflict between different users. The strategy sets out to resolve these conflicts to ensure appropriate priority is given to residents parking requirements. However, recognising the complexity involved with this strand of the strategy, a further review of City Centre Resident Parking Scheme and policy report for Edge of Centre Residents Parking Zones is proposed.

3.112 Car parking strategy is an important element of transport policy that can affect the economic prosperity of Dundee City. The level of both on-street and off street parking charges and the policy decisions made with the Strategy document gives due consideration to this aspect of parking provision and enforcement.

3.113 This report focuses on the first of the strands, Sustainability, Parking Supply and Pricing.

3.114 In summary, the Strategy acknowledges that Parking Supply and Pricing are the key controlling factors in traffic management of the network and the resulting impacts.

3.115 The current level of public car park supply is to be maintained to restrict the amount of commuter parking and accommodate variable term shopping, business and other essential parking. Also, the level of parking supply has a direct correlation to the amount of congestion in the city centre as the road network is currently at or nearing capacity at peak times.

3.116 The Strategy also notes that any significant increase in parking supply would result in increased congestion and threaten to undermine public transport, which would also be affected by the increased congestion. In addition, there would be increased costs associated with both building and maintaining any new facility. On the other hand, if the total number of parking spaces was to be reduced to try to further promote public transport, this could threaten the economic vitality of the city centre and cause greater displacement of commuter parking to inappropriate roads on the periphery of the city centre.

3.117 Given the above, it is considered by the City Council that the current level of parking supply achieves the right balance and should be maintained and the pricing strategy which was reviewed in September 2007 (implemented April 2008) will be the subject of further review in the context of the various influencing strategies.

3.118 The Strategy document also recognises **the need to consider Park and Ride facilities to supplement the city centre parking in a sustainable manner** and the use of maximum parking standards to control the level of private non residential parking at new developments.

Key Objectives (There are four key Objectives)

3.119 **SPSP1: To support the economic vitality of the city by encouraging a high turnover of car parking for shoppers and visitors.**

Over the period 2000-2004 the city's wholesale and retail sector has significantly expanded by 800 new businesses1. The regeneration of the city centre, in particular the development of the Overgate Centre, has breathed much needed vitality into the city centre making it the successful regional shopping centre it is today. Parking policy will seek to support the vitality of the city centre by encouraging a high turnover of shoppers and visitors.

3.120 **SPSP2: To ensure that there is no net change in the level of existing car parking facilities.**

To support policies to encourage the use of sustainable modes, parking provision in the city centre will not increase or decrease in net terms. Against a backdrop of nationally increasing traffic levels this will promote a natural shift to sustainable modes. A number of existing car parking facilities are located on valuable land this may be redeveloped during the ongoing regeneration of the city centre. At this time, it is considered that the rate of current and planned improvements to the provision of alternative sustainable modes will not enable a rate of modal shift necessary to cope with a net reduction in parking provision. As such the redevelopment of land currently occupied by parking facilities will need to be matched by the provision of parking facilities elsewhere in the city centre.

3.121 **SPSP 3: Maintain a consistent level of parking provision in the city centre.**

The measures included in the parking strategy will seek to manage parking in Dundee efficiently. The management of parking will support policies to encourage modal shift to sustainable modes as contained in Dundee City Council's Local Transport Strategy. Parking provision will not hinder the use of sustainable modes and its use will not be encouraged in preference to the use of alternative sustainable modes.

3.122 **SPSP4: To assist in meeting the National Air Quality Standards and protecting the city centre environment.**

Dundee City Council has a statutory obligation to improve air quality in the city by seeking to meet the National Air Quality Standards. Traffic has been identified as a potential major contributor of air pollution in the city, with levels of pollutants being particularly high in congested areas. The parking strategy can assist in demand management and therefore reduce congestion, a major contributor to pollution. In addition, consideration will be given to mitigating other forms of pollution such as noise and water and the visual intrusion caused by car parks.

3.123 **RA2: Implement Residents' Parking Zones in appropriate areas of the city.**

The Council will seek to implement, where appropriate, Residents' Parking Zones (RPZs) in areas where residents are experiencing difficulties parking their cars in the vicinity of their homes. These difficulties generally arise because residential areas provide an opportunity for commuters to park free of restrictions or charges. They may also arise because there simply are not enough parking spaces to meet demand from residents or other neighbouring large organisations' parking demand is using scarce kerb space.

The implementation of RPZs on the periphery of the city centre is likely to become increasingly important to ensure that the non-increase in long stay parking provision in the city centre encourages modal shift instead of a transfer of long stay commuter parking to the periphery.

A further policy report will be prepared on the detailed arrangements for bringing forward RPZ proposals on the consultation processes involved and on the optional types of RPZ schemes available.

Fife Parking Strategy 2003

Key elements of this Strategy

Policy SM17 – Increase parking charges to encourage public transport use

3.124 The following measures are proposed to encourage transport use :-

- When considering parking charges, consideration will be given to the cost of travel by alternative modes. In particular, long stay parking charges in Level 1 town centre locations will be set with a view to encouraging travel by other modes;
- The implementation of any further season ticket schemes will be discouraged across all Fife towns, as these can be viewed as encouraging commuter parking. Existing season ticket charges will be increased (above long stay parking rates where appropriate) to reduce the overall discount available for frequent commuting trips.

Policy SM18 – Increase parking charges to fund public transport improvements

3.125 In consultation with public transport operators, Transportation Services and stakeholders, the strategy will seek to identify where the subsidy of public transport services through revenue from the parking account would deliver greatest benefits in increasing accessibility and encouraging mode change from the car. Proposals for implementation will be developed and their effectiveness monitored.

Policy SM32 – Encourage P+R for commuter parking

3.126 In combination with strategy measures SM10-14, the appropriateness of commuter P+R will be investigated, based on availability of suitable P+R sites and forecast levels of usage (para. 6.2.46):-

- Where a viable proposal is identified, consultation will be undertaken with interested parties and public transport operators with a view to implementation
- In combination with strategy measures SM3 and SM7, continue to monitor long stay parking demand and opportunities for P+R sites as development opportunities arise

Policy SM33 – Improve public transport interchange at major Fife rail stations

- Through discussions with public transport operators, bus routes which might serve stations will be identified and together with station access improvements which will ensure an appropriate service can be provided.
- Appropriate passenger waiting facilities will be provided

- Through discussions with public transport operators, the strategy will seek to co-ordinate service frequency and interchange between modes
- A high level of public transport timetable information (bus and rail) will be provided at each station together with an appropriate signing strategy. In partnership with public transport operators a marketing strategy to promote interchange facilities will be developed
- Up-to-date timetable information will be available and every effort will be given to ensure interchange facilities are maintained to a high standard

Policy SM38 – Provide new bus P+R facilities

3.127 Where suitable sites can be identified and a need for the measure identified, the strategy will aim to progress and implement proposals to provide new bus P+R facilities to reduce parking demand and private vehicle demand at the Forth and Tay bridgeheads. (para. 6.3.8)

3.128 The Fife Parking Strategy gives clear support to the provision of P+R facilities at the Tay Road Bridge bridgehead. The use of pricing as a mechanism to encourage urban P+R is noted as is the need to provide additional parking capacity at existing rail stations to take advantage of the longer distance benefits of rail.

Ninewells Hospital Travel Plan (includes parking policy) 2007

3.129 Ninewells Hospital employs 7000 (4500 full time) staff and holds 900 beds. As a major employer in Dundee and a significant service provider to residents of the Tayside and North East Fife thus generating substantial levels of traffic. At present a large proportion of this is car traffic which has important impacts on local traffic congestion and air pollution as well as onsite car park management/provision issues at the Ninewells site.

3.130 The hospital site hosts a large bus interchange integrated into the main hospital entrance. The waiting areas are glazed, completely sheltered and well lit. The stances are well marked and real time departure information is available at each stance as well as audio information for the visually impaired. The bus stances are linked to the main entrance by a glazed walkway. Services to Dundee City Centre, Perthshire, Angus and Fife operate from here. A taxi rank is also situated adjacent to these facilities.

3.131 Bus timetables are currently held at the hospital reception and a real time bus departure board and journey planning kiosk are situated within the main concourse. This information could be extended to include information about walking and cycling routes as well as Liftsharing and rail information for those coming from further afield.

3.132 The staff intranet currently provides links to bus operators that have services running to the Ninewells site but no information on walking or cycling or the site travel plan.

3.133 Public Transport undertakings currently provide some services to the Ninewells site but representations made during the drawing up of the travel plan indicated that this did not adequately meet the needs of staff, patients or visitors, and as a consequence travel by car was adopted as the default option. The travel plan formulation group's remit did not encompass the means of addressing this, but it appears sensible for the public transport operators to consider positive means of interfacing with the known patterns of passenger demand at Ninewells. (para. 4.6.2)

Staff Post code and Travel Survey

3.134 A staff post code analysis was conducted at Ninewells by Dundee City Council in 2005. The full results are attached to the Travel Plan as the evidence base. The analysis found that the majority of staff (72 %) had a Dundee postcode (with 58 % of all staff having a Dundee City postcode), 21 % of staff had a Perth postcode 4% had a Fife postcode and 2 % had other regional postcodes. The majority of staff is therefore commuting from within the city of Dundee and potentially able to make use of the network of public transport routes that serve Ninewells hospital.

3.135 A staff travel survey was completed by Dundee City Council in 2005. Staff at Ninewells responded with 84 % of respondents were based at the main Ninewells Hospital.

3.136 The main results are summarised here:-

- 76% of respondents were women.
- 71% of respondents replied that they lived more than 4 miles from the hospital site.
- 77% of respondents replied that they travelled to work by car (with 66% of staff travelling by car alone and 8% car shared). This is higher than the Dundee and National average (54 and 53% respectively).
- 9% of respondents replied that they travelled by bus and 7% that they walk. This is below the averages for Dundee (18% and 25%) and Scotland (17% and 23%) as a whole.
- 76 % of respondents replied that they undertook some form of business travel. The majority of this business travel was for meetings with approximately 30% of this travel to attend clinics or to visit patients.
- 79% of business travel was conducted with the private car.
- 52% of staff would welcome the adoption of pool cars for business travel.
- When asked whether they would consider public transport as an option to get to work, 89% of those who responded that they had not used public transport for more than 5 years.
- 29% replied that they would consider car sharing as an option and 56% of staff would consider working from home on occasion.

3.137 The strategy highlights the interventions shown in Table 3.1:-

Table 3.1 Ninewells Hospital Parking Policy Recommendations

Investigate the feasibility of offering a flexible shuttle bus service for shift workers	Investigate the feasibility of running demand responsive, flexible shuttle buses to ferry shift workers to and from the hospital. Shuttle busses would run	Report on feasibility and recommendations As appropriate; implement the recommendations. A shuttle bus means that transport options and personal safety are increased for shift workers.

Ninewells Hospital Parking Strategy

3.138 The Ninewells Hospital Travel Plan provides for a reduction in car travel to the hospital. The Travel Plan identifies a series of useful statistics that show low public transport use and a majority of staff travelling over 4 miles to work at the hospital. The appropriate use of P+R maybe a solution worthy of development in such circumstances.

University of Dundee, Green Travel Plan and Car Parking Strategy 2004

3.139 A survey of staff and student travel habits was conducted in March 2004 through online questionnaires being e-mailed to everyone via Hermes1. Over 1,000 responses were received from staff and 950 from students.

3.140 Synopsis of the findings:

- 70% of staff responding travelled by car, which is much higher than the average of 54% for people in Dundee, or 53% for Scotland overall.
- 42% of staff was prepared to consider buses as an alternative mode of transport, with 21% expressing an interest in car sharing, 19% prepared to cycle and 10% willing to walk.
- Students used vehicles less, with 24% travelling by car, 22% using buses and 33% walking.
- A third of students were prepared to consider cycling but at present only 5% do so, citing a lack of storage and poor changing facilities as reasons.
- Students with restricted access to parking permits are forced to park in nearby streets. With 33% doing so, this suggests a considerable pressure on residential parking areas.
- A total of 1,860 staff lives in the Dundee postcode area with 50% resident within the DD1, 2 and 3 zones.
- The majority of students live within 4 miles and 29% reside in either University or private sector accommodation within 1 mile of the campus.
- 64% of staff expressed an interest in 'park and walk', but few would wish to walk for more than 5 minutes.

Public transport

3.141 'Travelling by bus is twice as safe as driving a car, and rail is five times safer than driving' (Energy Efficiency Best Practice Programme)

3.142 Bus travel accounts for just 12% of staff journeys and rail only 3%; for students, this becomes 36% and 4% respectively. Although considerable interest was expressed in these forms of transport, misgivings were expressed about the quality of the service available.

3.143 A promotional programme with guaranteed levels of service together with improved communications would help to address these concerns. The feasibility of P+R for commuters who regularly use the Tay Bridge should also be investigated.

Car sharing

3.144 This should be considered a more responsible way of using the car. Nationally over 80% of car journeys are made by lone drivers and 21% of drivers said that they would be interested in participating in such a scheme if it was efficiently managed and safeguards were in place to get them home in case their lift failed.

3.145 Car sharing databases can bring together individuals in participating organisations. These can increase the opportunities of matching journey times and destinations to optimise the available vehicles. An administrative input is needed to promote and make this a viable option.

Conclusion

3.146 The campus will undergo a profound change in the next five years. The ad hoc car parking arrangements which have existed for decades must be developed in an organised way to prevent an avoidable escalation of frustration to those who seek to drive to work.

3.147 A coherent Green Travel Plan will encourage the use of alternatives to the private car. The plan will be implemented in close collaboration with the City of Dundee. At the same time, the University will construct additional car parking spaces at the five sites identified in the paper. Parking charges will be increased to recover costs. Further work on the funding and organisation of car parking will be carried out over the summer.

Other Studies and Policies

SDG Toll Removal Report and Tay Road Bridge Joint Board Annual Report

3.148 In the financial 2006/7 4,518,826 vehicles used the Tay Bridge (one way southbound, reflecting the toll collection arrangements). The Scottish Parliament confirmed on 21st July 2007 the intention to remove tolls from the Tay Bridge. The removal of tolls on the Tay Bridge was predicted to have a negative effect on the ability of the Bridge to cope with additional traffic hence the need to examine alternative modes of travel on the corridor.

Scotland RUS (2007)

3.149 The Scotland Route Utilisation Strategy assesses the future capacity of the rail network and interventions that are planned to deliver Network Rail and ScotRail's aspirations for the rail network in the current regulatory framework.

3.150 Key polices that will affect cross Tay rail traffic are:-

- The current signalling restrictions prohibit more than one train at a time over the 'high girders' section of the bridge. This option proposes a review of these restrictions, to improve passenger capacity over the bridge. A timetable recast would be required to make best use of the proposed alteration to capacity. The restriction exists to prevent two heavy trains meeting on the high girders. Two lightweight trains are permitted but the interlocking at present does not permit this. As many of the trains on this route are lightweight Sprinter-type vehicles, a less restrictive interlocking would give performance and possibly capacity benefits. Alterations to the signalling interlocking are best delivered within a renewal. The headway improvement was not assessed as it would not deliver any significant benefits if delivered in isolation. It is proposed that when the bridge is resignalled the renewal will seek to modify the operating restrictions.
- Increasing line speed between Hilton Junction and Ladybank, This option proposes to increase the line speed above the current 55 mph, to various speeds in the range 65 mph – 90 mph. The improvement could be delivered in line with a number of phased planned renewals which are currently scheduled to be complete by 2009. This speed increase would reduce journey time by about four minutes for services from Edinburgh to Perth and Inverness. Some minor signalling alterations are required, as well as the completion of the planned track renewals. These would potentially be funded from the NRDF.
- Restrictive signalling headways between Edinburgh and Fife, particularly across the Forth Bridge limit the number of trains that can operate over the corridor and result in increased delays during perturbed running.

3.151 The RUS indicates that Stakeholders were highly supportive of the proposal for a fast and semi-fast service between Edinburgh and Dundee/Aberdeen.

3.152 The RUS commits to increasing car parking provision at railway stations. The expansion of car parks will be undertaken:

- where possible
- when supported by rail capacity developments
- when supported by a positive business case
- when supported by local authorities and Regional Transport Partnerships.

4 Data Collection

Introduction

4.1 The data collection exercise was conducted by contacting the various stakeholders identified and follow up meetings as required. The key aim of the data collection exercise was to collect a picture of the current use of road, bus and rail across the Tay Bridge and the ensure the development of a robust data set that would be used to assess the likely mode towards P+R /park and choose. We also contacted Fife Council's planners and the sustainable transport officers of the relevant authorities to discuss the planning implications of any proposed sites for P+R /park and choose.

4.2 For ease of recording the data collected and the views of Stakeholders a mode specific approach has been used and reference to cross-modal issues recorded as appropriate. The discussions with the sustainable transport officers have been recorded in the next chapter that discusses the initial options for invention that were examined.

Census Data

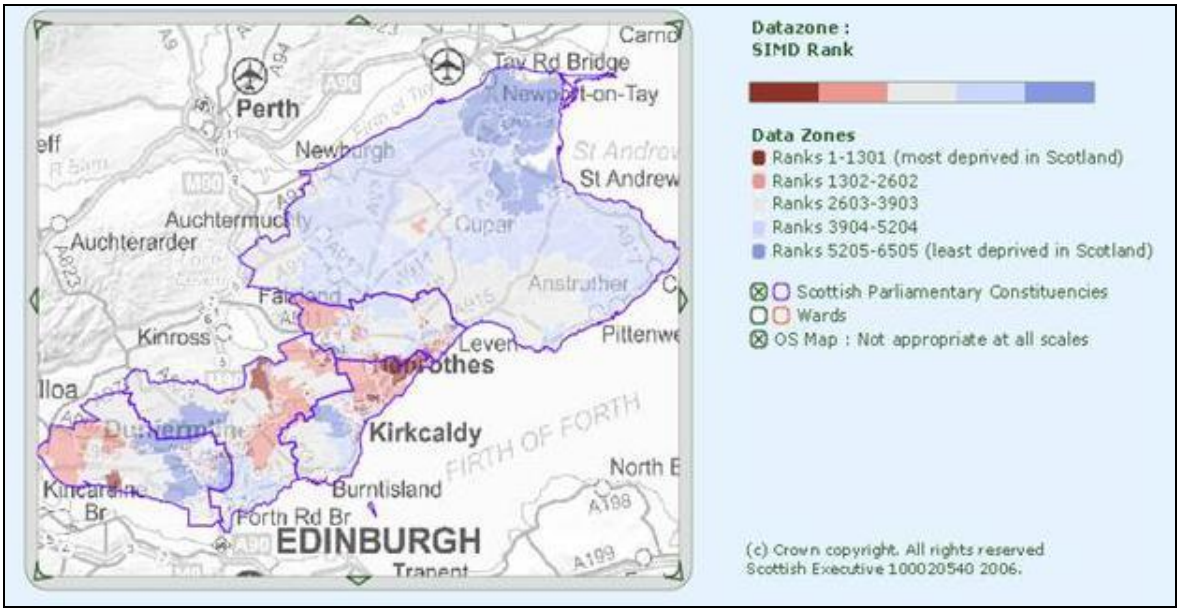
4.3 2001 Census data has been obtained in respect of travel to work data and Index of Multiple Deprivation (IMD) in order to inform the availability of alternatives to car travel. As pricing of P+R and demand is sensitive to parking costs it is proposed to consider IMD as an indicator of the ability to pay for transport/parking. We have collected detailed for all areas in northern Fife (Table 4.1).

Figure 4.1 Summary Travel to Work Data for Northern Fife

	TOTAL	Works or studies mainly at or from home	Underground, tube, metro or light rail, train	Bus, minibus or coach	Taxi or minicab, driving a car or van	Passenger in a car or van	Motorcycle, scooter or moped	Bicycle	On foot	Other
ALL CLASSES OF NS-SeC	27,234	1,138	369	1,619	16,311	2,647	156	818	3,960	216
1. Higher managerial & professional occupations	2,463	136	77	52	1,647	91	14	107	302	37
2. Lower managerial & professional occupations	6,736	256	112	244	4,782	426	47	168	639	62
3. Intermediate occupations	3,693	87	65	301	2,219	417	8	79	498	19
4. Small employers & own account workers	1,701	383	9	14	1,047	99	1	12	115	21
5. Lower supervisory and technical occupations	3,484	54	62	188	2,183	386	27	131	409	44
6. Semi-routine occupations	5,391	133	30	539	2,537	628	33	180	1,295	16
7. Routine occupations	3,766	89	14	281	1,896	600	26	141	702	17

NS-SeC refers to the National Statistics – Socio Economic Classification

Figure 4.2 Index of Multiple Deprivation for Fife



Source: www.scotland.gov.uk

Traffic Data

Dundee Paramics Traffic Model and Dundee City Council Traffic Counts

4.4 The 2007 Paramics traffic model for the greater Dundee area was supplied by Dundee City Council. The model is a peak hour only model that includes the full length of the Tay Road, the current northern bridgehead traffic arrangements and current bus service provision. Not included in the model is the revised Dundee Central Waterfront Masterplan which will be constructed over the next 5 to 7 years and incorporates a radically changed road layout in the area of the northern bridgehead. The roundabout on the A92 at the southern bridgehead is not modelled but traffic count data has enabled a distribution of the traffic entering and leaving the model across the Tay Bridge to be made. .

4.5 Dundee City Council has a series of fixed traffic counters on the ramps leading to and from the Tay Road Bridge at the northern bridgehead. Data is collected on daily basis and is assessed in ***hourly*** time periods. A sample of the data collected has been analysed before and after the removal of the tolls on the road bridge. The after toll data was collected in the first normal, non school holiday, week after the removal of the tolls on 11th February 2008.

4.6 Analysis of the data by day of the week and time indicate that during the initial phase after the removal of the tolls there had been nominal change in the number of vehicles using the Tay Road Bridge and no redistribution of peak usage had occurred.

4.7 Traffic count information was gathered fro Dundee City Council's ATC equipment and is displayed graphically in the following tables. It should be noted that the 28th of February 2007 was a Wednesday and the 28th of February 2008 being a Thursday.

4.8 For clarity and the avoidance of doubt the terminology used in the Figures below refer to the Tay Road Bridge at the Dundee City Council side. **Exit = from the bridge and Entrance = to the bridge**

Figure 4.3

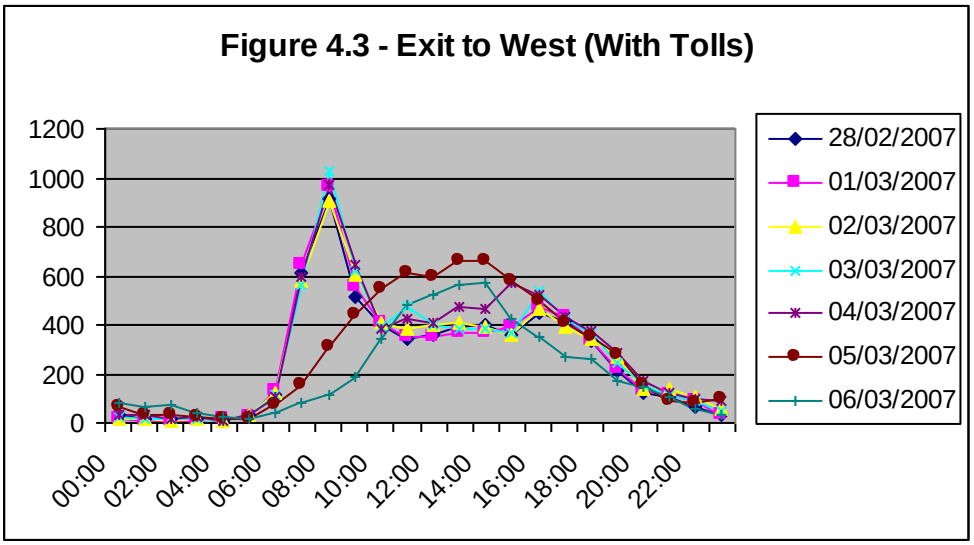


Figure **4.4**

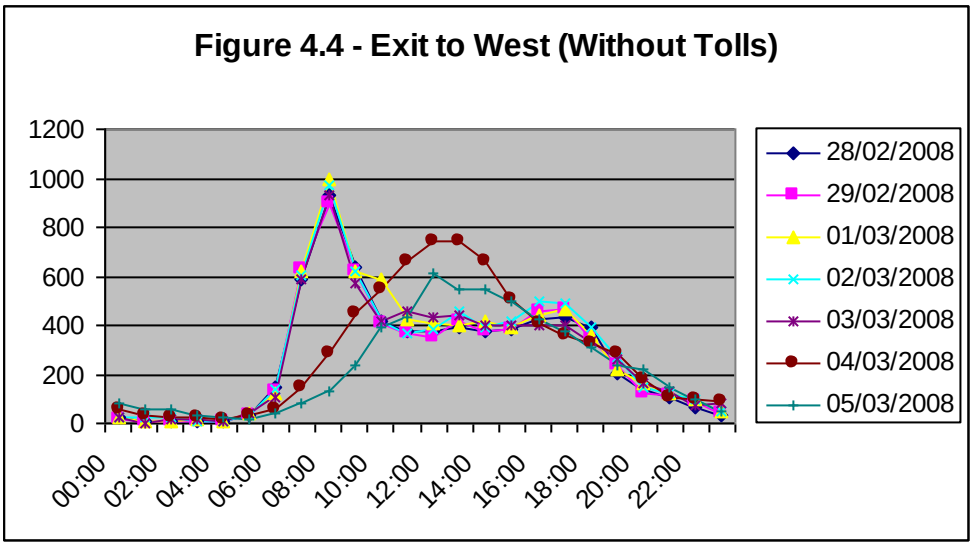


Figure 4.5

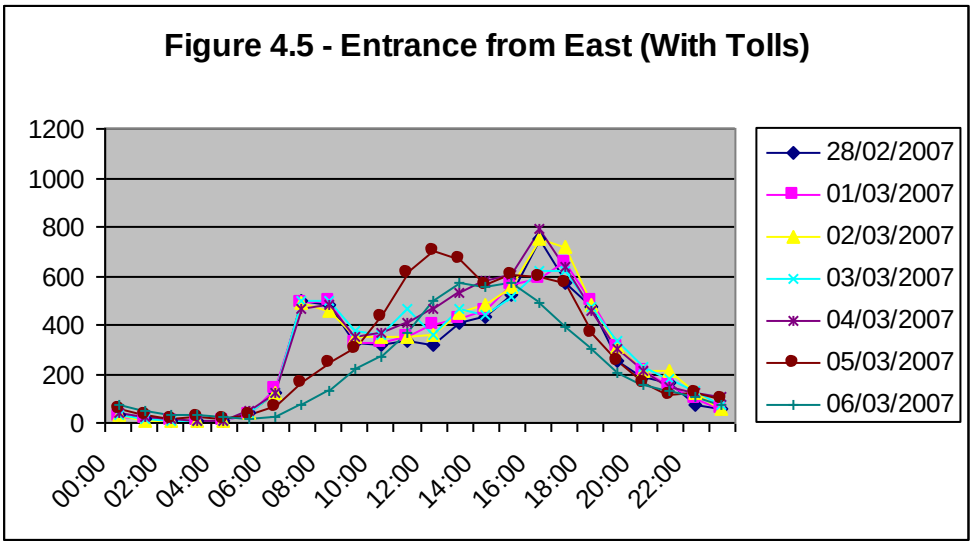


Figure 4.6

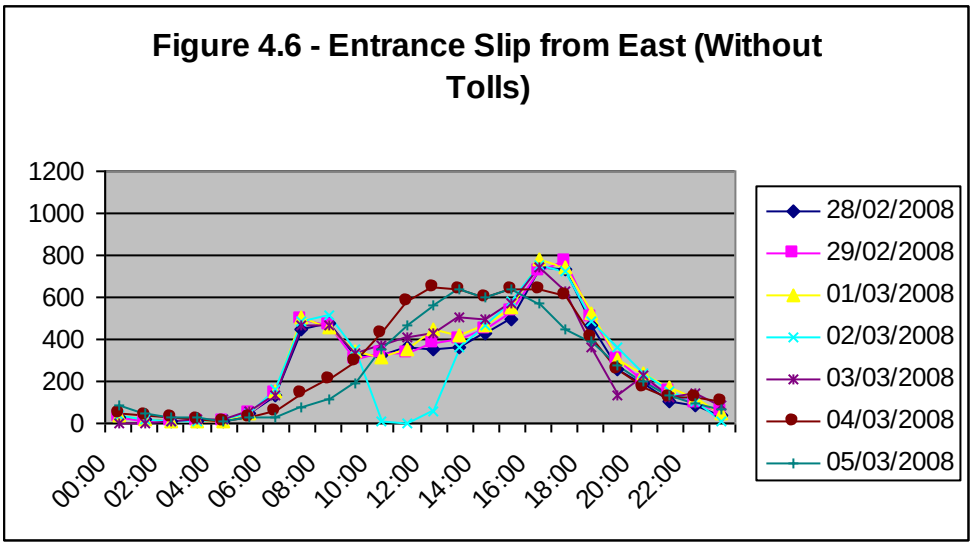


Figure 4.7

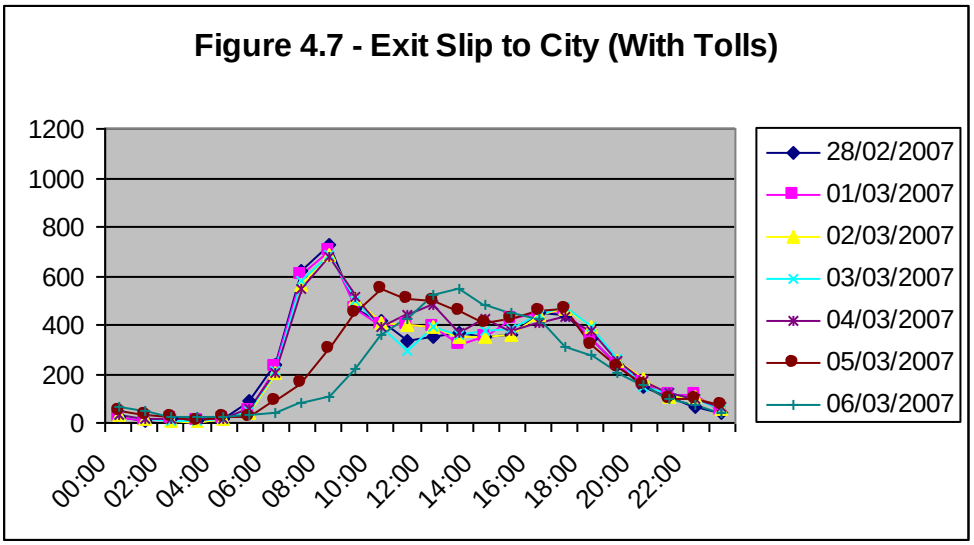


Figure 4.8

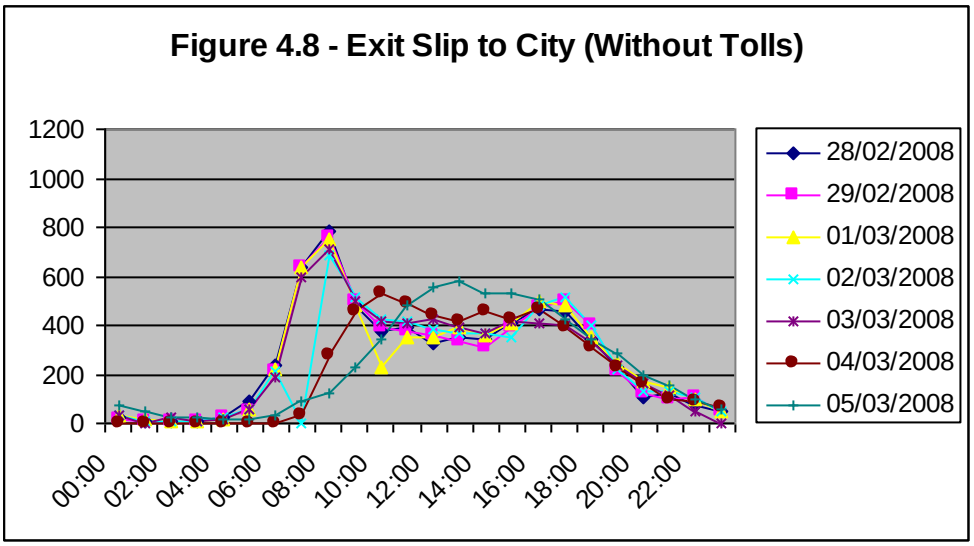


Figure 4.9

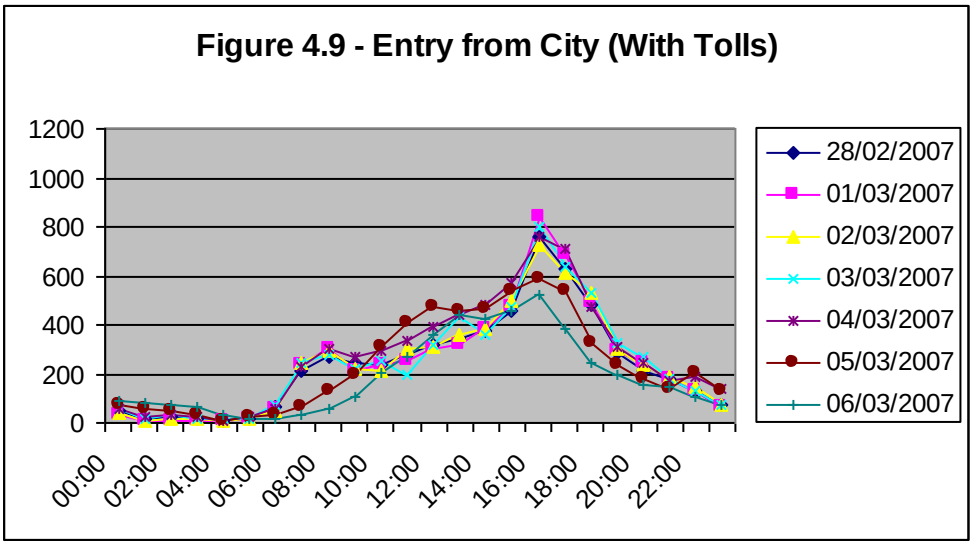
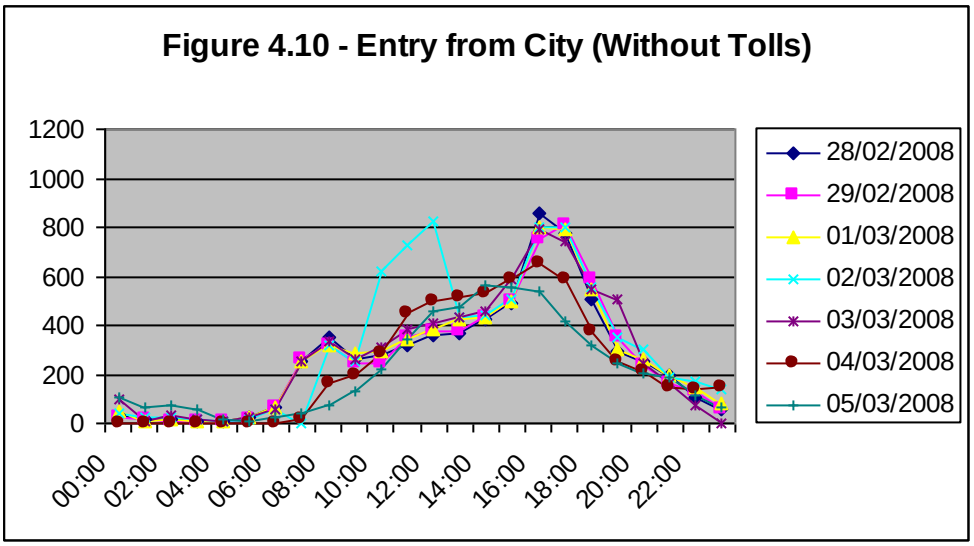


Figure 4.10



TACTRAN/Dundee City Council Tay Road Bridge Origin and Destination Survey

This survey was carried out at the Tay Road Bridge Toll Booth (southbound direction only) on a single 12 hour day in February 2007. Of a one way traffic flow of 10,388 vehicles 17% (1,765 vehicles) were stopped and the driver asked to record postcodes for the beginning and end of their journey. ***NB please note that given the surveys could only be made on the south bound trips,***

all north bound trip information was assumed to be a mirror of the south bound trips and reversing the AM to PM peak.

Table 4.1 Tay Road Bridge Origin and Destination Survey Data

Time	Vehicle Count	Information Returned
0700-0800	708	78
0800-0900	813	170
0900-1000	590	109
1000-1100	519	77
1100-1200	591	81
1200-1300	715	94
1300-1400	693	106
1400-1500	862	108
1500-1600	1,032	112
1600-1700	1,382	220
1700-1800	1,385	315
1800-1900	1,098	295
TOTALS	**10,388**	**1,765**

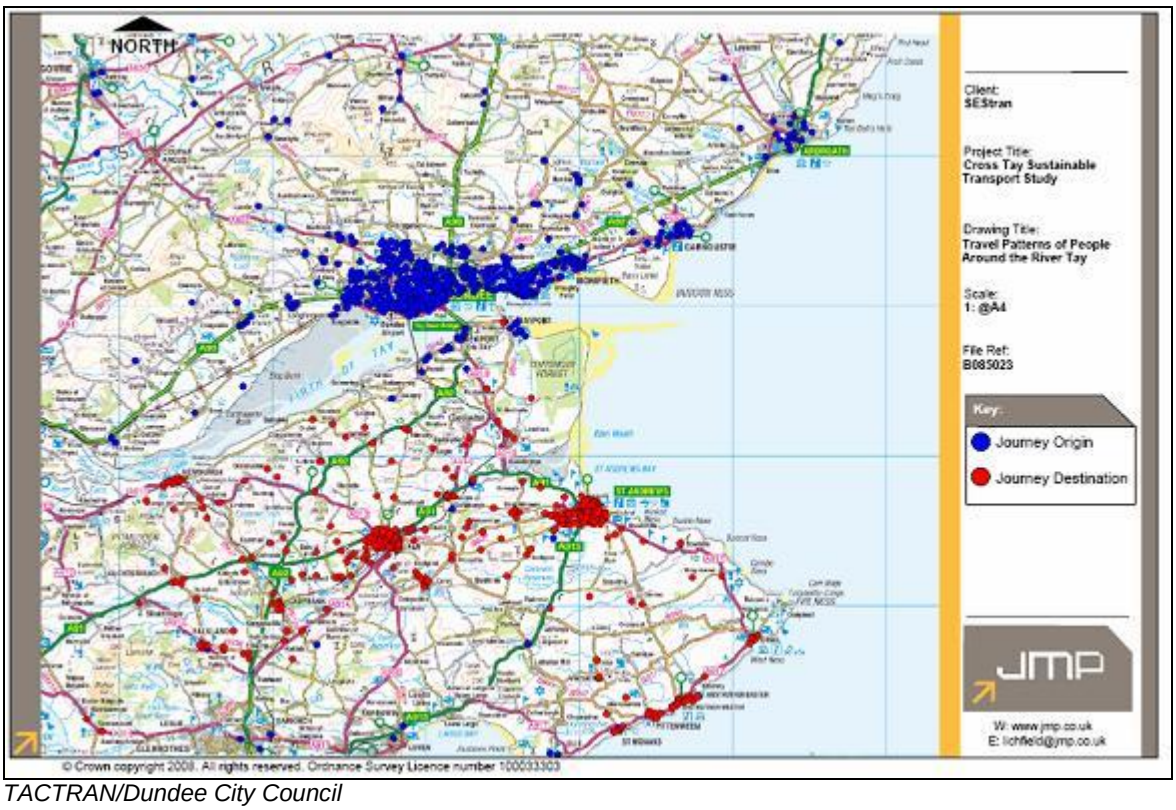
TACTRAN/Dundee City Council

4.9 The postcode data has been converted to GIS format and overlaid on an OS Landranger map of Northern Fife and Tayside to give a visual representation of origins and destinations. The data has also been used to distribute vehicle trips made on the network radiating from the southern bridgehead of the Tay Road Bridge. Given the single direction of the survey it was agreed in principle by the steering group that the northbound origin and destinations were a mirror image (in terms of origin, destination and time of travel) to the southbound data.

4.10 From Table 4.1 it is clear that the majority of southbound cross-Tay travel is from the greater Dundee area to the Fife communities of St Andrews and Cupar. Other notable concentrations of origins were in Carnoustie and Arbroath. Other notable destinations were located on southern bank of the Tay Estuary and the north-eastern coast of Fife.

4.11 The Transport Model for Scotland (TMfS) has been used to assess the usage of the trunk roads leading to the Tay Bridge and to provide estimates of future year traffic flows. Concern was expressed at the inception meeting regarding the population growth assumptions made in the TMfS; a review of this issue against the targets in the Fife Structure plan and relevant local plans has been made and an above indicated growth factor calculated from relevant census data applied to ensure a robust demand assessment could be made. These additional growth factors were included in the TMfS utilisation.

Figure 4.11 Tay Road Bridge Origin and Destination Plot – All Day

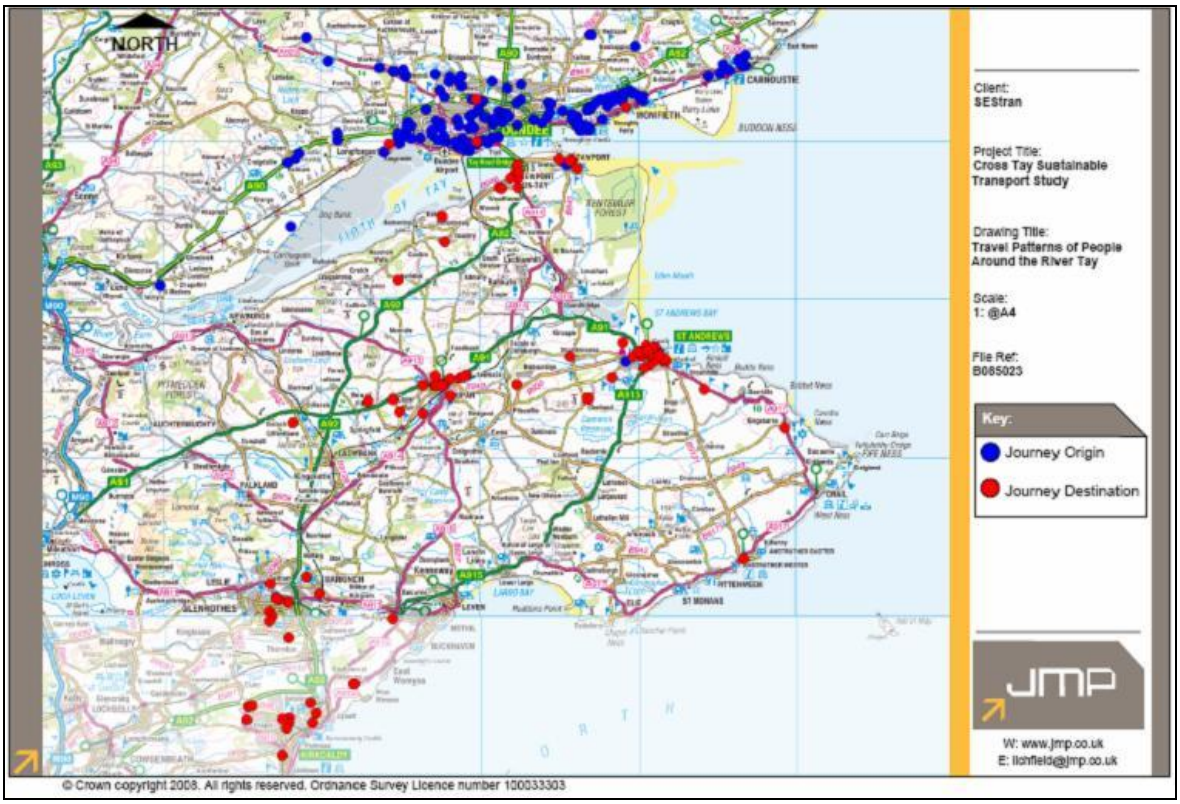


TACTRAN/Dundee City Council

4.12 To focus more clearly on the likely peaks of demand for P+R the am and pm peak periods were also mapped individually.

4.13 The plot of the am peak (0700 to 0900) in Figure 4.12 shows a majority of origins within the Dundee area and the major destination being St Andrews. Included in the data were a number of destinations in the Glenrothes and Kirkcaldy areas which implies a degree of longer distance commuting. Also noticeable were a small number of journeys with Leuchars Railway as a destination. The implication of this is that access to south bound trains at Leuchars is perceived as easier than, for example, in Dundee. Another influencing factor is the fare differential between travel costs to Edinburgh from Dundee and Leuchars, with Leuchars fares being far less expensive.

Figure 4.12 Tay Road Bridge Origin and Destination Plot – am peak

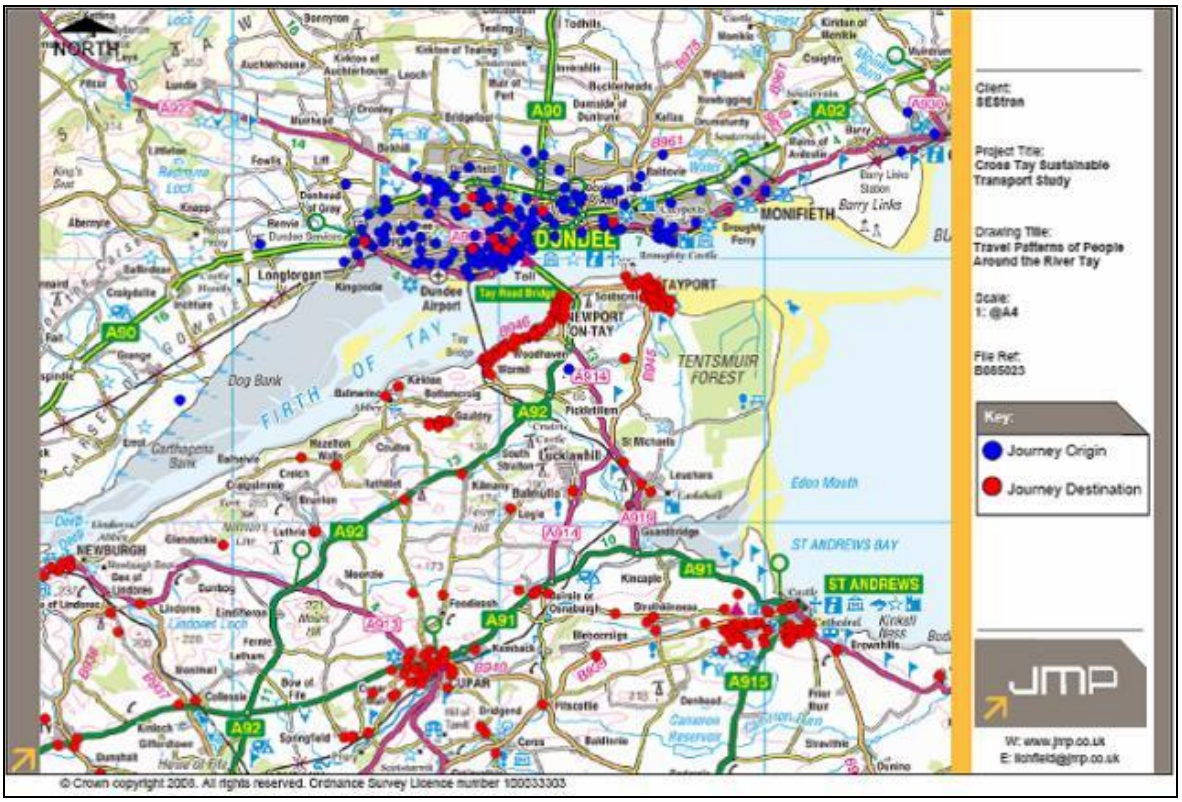


TACTRAN/Dundee City Council

4.14 The pm peak plot in Figure 4.13 13 shows the majority of journeys originating in the Dundee area and key concentrations of destinations in the towns on the southern bank of the Tay Estuary, Cupar and St Andrews.

4.15 Also noticeable in the am plot is the absence of concentrations of journey origins in West and East of Dundee. The off-peak nature of many journeys to both Dundee University and Ninewells Hospital is a possible factor in this trend.

Figure 4.13 Tay Road Bridge Origin and Destination Plot – pm peak



TACTRAN/Dundee City Council

Discussions with the Tay Road Bridge Joint Board

4.16 The Tay Road Bridge Joint Board is the statutory body responsible for the maintenance and operation of the Tay Road Bridge. The Bridge Board see the benefit of sustainable transport solutions for both the wider environmental perspective and the operation of the road bridge and its immediate environs. Their car park at the south side of the bridge, whilst not as key for operational reasons was seen as an asset to the bridge for aesthetic and operational reason. Access through the car park is required to a suitable area for use as a potential contractors' compound should the need arise for heavy maintenance.

4.17 In terms of priority measures on the Bridge the Board would need to be involved in any feasibility or design work that takes place and noted that the ongoing maintenance programme on the bridge meant that the possibility of having two operational lanes in the same direction over the complete length of the bridge at the at the same time over the next 10 years or so is remote. However these ongoing works does afford the opportunity to replicate the provision of bus lanes on traffic flow and it is considered that the relevant transport officers pursue this study/option appraisal.

Bus Data

4.18 JMP interviewed the major operators in the Dundee and Northern Fife areas. At present only Stagecoach Fife and Stagecoach Strathtay operate services across the Tay Road Bridge.

Figure 4.14 Cross Tay Bus Routes

Number	Operator	Origin	Destination	Comments
96	Stagecoach Fife	St Andrews Bus Station	**Ninewells Hospital** via St.Michael's-Tayport & Dundee City Centre and reverse	3 per hour
42	Stagecoach Fife	Cupar	**Ninewells Hospital** Via Dairsie-Tayport-Newport&Dundee city Centre and reverse	1 per hour
X42	Stagecoach Fife	Glenrothes Bus Station	**Dundee Bus Station** Via Cupar&Balmullo and reverse	Peak hours only
X54	Stagecoach Fife	Edinburgh	**Dundee Bus Station** Via Rosyth-Dunfermline-Cowdenbeath-Glenrothes& Newport. and reverse	1 per hour
69/70	Stagecoach Fife	Cupar Crossgate	**Dundee Bus Station** Via Kilmany-Wormit&Newport and reverse	1 per hour
99/00A/B	Stagecoach Fife	St.Andrews	**Dundee Bus Station** Via Guarbridge Leuchars And reverse	4 per hour
77/77A	Stagecoach Strathtay	Gauldry (Fife)	Ethiebeaton Retail Pk (Angus) Via Wormit and Newport, Broughty Ferry&Asludie Hospital Monifeith and reverse	2 per hour

4.19 Stagecoach representatives indicated their general support for the principle of P+R / park and choose with the model developed at Ferrytoll being seen as the most appropriate. Stagecoach have made significant investment in Service 99 from St Andrews to Dundee via Leuchars including two increases in frequency that suggest this service would be an ideal route to develop further.

4.20 Stagecoaches had much less interest in a P+R /park and choose on the outskirts of Leuchars or for a series of smaller sites in the northern Fife area. Stagecoach highlighted the success of the St Andrews to Leuchars Rail Station link which has become of greater importance as St Andrews University has grown.

4.21 Stagecoach fully supported the vision that is being developed by TACTRAN, in conjunction with Dundee City Council, for four P+R sites that encompass all routes into Dundee combined with car parking policies that actively promotes this policy. It must also be recognised that in the councils responsibility to act in a manner which does not inhibit competition (between local bus operators) that cognisance must be taken to include the commercial observations of all potential public transport operators who may wish to provide services. The introduction of a Statutory Quality Partnership would go a long way to addressing many of these issues in a structured manner.

Figure 4.15 Bus Types on Used on Cross Tay Bus Services

Service No.	Route	Bus Type	Emission Standards	Seating Capacity
42/96	Glenrothes-Ladybank-Cupar/St Andrews-Leuchars-Tayport-Dundee-Ninewells Hosp.	Low Floor DART	Euro II	49
X54	Edinburgh-Dunfermline-Glenrothes-Dundee	Volvo B10	Euro III	49
69/70	Cupar-Wormit-Dundee	Mercedes Midi Bus	Euro II	25
72	Tayport-Dundee- Ninewells Hosp.	Mercedes Midi Bus	Euro II	25
77	Monifieth-Dundee-Newport-Wormit-Gauldry	Low Floor DART	Euro II	49
99	Dundee-Leuchars-Guardbridge-St Andrews-Bogward	Low Floor MAN	Euro III	49

Stagecoach East Scotland

4.22 A map showing individual bus stops on each route in Fife has been prepared. This map indicates the limited stop nature of the 99 and X54 routes and the more local nature of the remaining routes crossing the Tay Road Bridge.

4.23 Stagecoach has supplied, in commercial confidence, patronage data from a selection of the bus services crossing the Tay Bridge. From this data it can be concluded that the services have adequate capacity to cope with an increase in use from P+R/park and choose. Even should a significant number of P+R users arrive at a P+R located in the vicinity of the southern bridgehead at identical times, there will be a frequency of 7 (off peak) to 12 (peak) buses per hour with spare capacity to deal with this peak in demand throughout the days and times of operation.

Figure 4.16 Bus Stops in Fife on Cross Tay Routes

Fife Council Data

Rail Data

4.24 In order to collect data relating to the rail industry JMP engaged with both Network Rail and First ScotRail. First ScotRail are the current franchise operator of all internal trains within Scotland and Network Rail are the national infrastructure operator.

4.25 At present there are a number of operating restrictions that constrain the timetable that can be delivered in Northern Fife. Two key limitations are the long signal section between Cupar and Leuchars that limits the interval between trains to a minimum of 9 minutes and the restrictions that two trains cannot pass on the “high girders” of the Tay Bridge. The current timetable in which the majority of trains continue to Aberdeen has been developed on the principle that trains between Edinburgh and Dundee which continue to Aberdeen have no additional “timing allowances” for engineering work, pathing or performance purposes that could be used to introduce additional station calls in the northern Fife area. Trains which terminate at Dundee have an allowance of 3 minutes for passenger trains and 5 minutes for freight trains (for engineering and pathing purposes) that could be used to give time for calls at a new station in northern Fife.

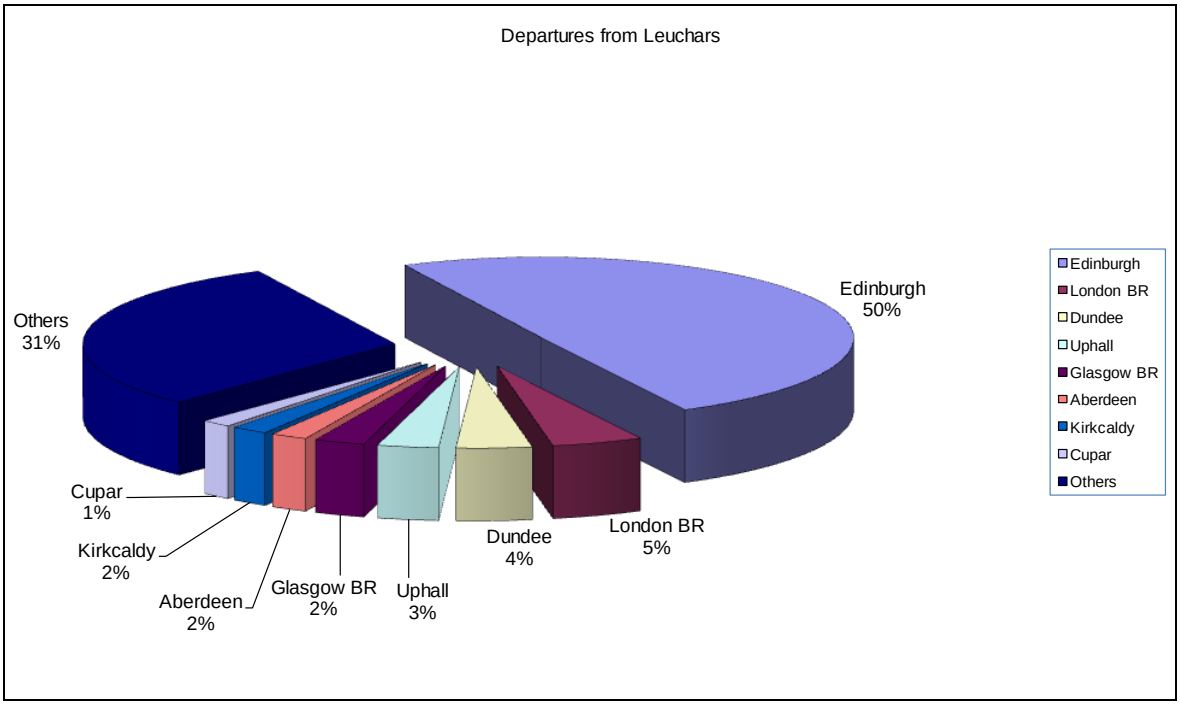
4.26 It is understood that these restrictions are planned to be removed in 2014/2015 when the Dundee area is completely resignalled. Detailed planning for this resignalling has not yet commenced, therefore an opportunity to influence the specification for the resignalling is still available to the regional transport bodies who may wish to protect future possible schemes.

4.27 First ScotRail and Network Rail have indicated that the current timetable will be revised when access charges for freight trains on the Stirling – Alloa – Longannet Power Station route has been resolved. Currently an hourly freight path from Hunterston to Longannet is provided via the Forth Bridge. As the Forth Bridge represents a bottleneck to passenger trains on Edinburgh to Dundee and Fife Circle routes the diversion of this freight train will allow an additional Edinburgh to Dundee train to be provided. A change to the Edinburgh to Dundee service can only be made when the issue of freight traffic being diverted to the new Stirling to Alloa line. Freight trains have recently starting using this line and therefore a timetable changes have been made in the December 2008 national rail timetable.

4.28 There is an hourly Edinburgh to Aberdeen train that only calls at Leuchars in Fife and an hourly Edinburgh to Dundee semi-fast train that calls the previous stopping pattern. These provide two trains per hour to Edinburgh, Dundee and Leuchars and one train per hour to other stations in Fife.

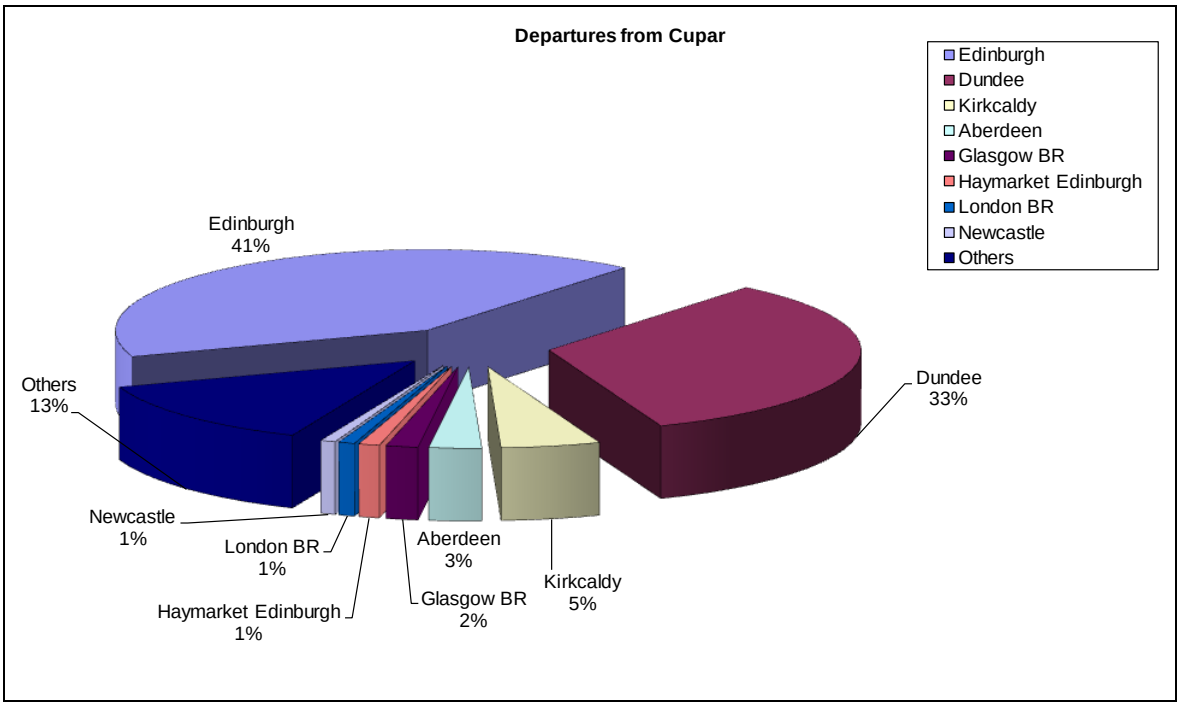
4.29 First ScotRail have supplied LENNON data which records ticketed flows to and from all stations in commercial confidence. The key trend that can be identified from the data which covers passenger traffic to and from Cupar and Leuchars Stations is that journey origin and destinations are heavily weighted towards Edinburgh as the main origin/destination with around a third of journeys starting or finishing there. Leuchars Station has an average daily traffic of circa 1200 single trips (origin or destination) being made whilst Cupar has an average of 700 single journeys daily.

Figure 4.17 Departures from Leuchars Rail Station



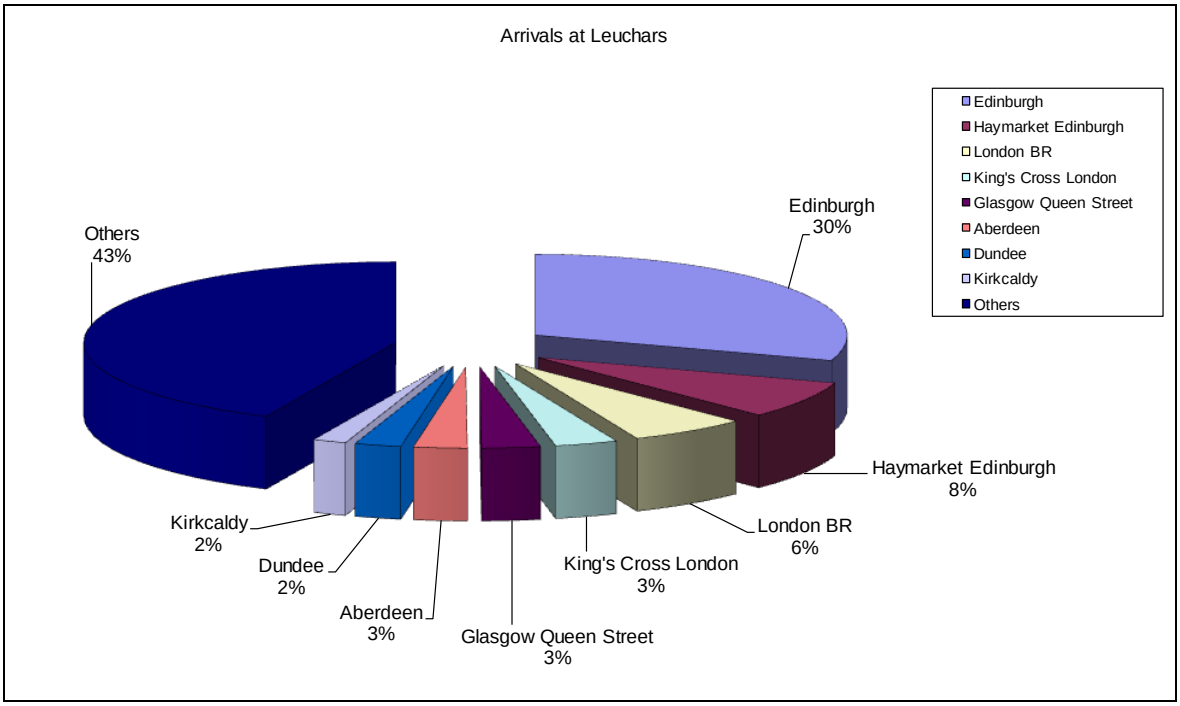
First ScotRail

Figure 4.18 Departures from Cupar Rail Station



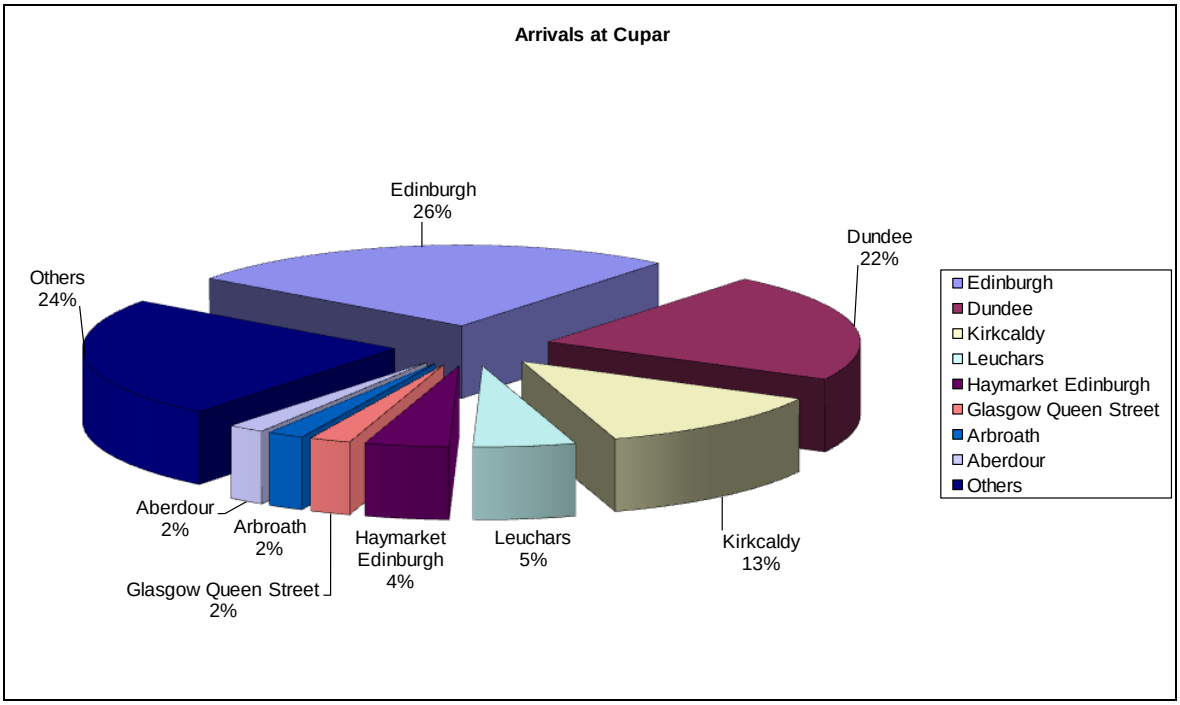
First ScotRail

Figure 4.19 Arrivals at Leuchars



First ScotRail

Figure 4.20 Arrivals at Cupar



First ScotRail

5 Setting the Planning Objectives

Introduction

5.1 Within this chapter, the planning objectives for transport enhancements in the study area are developed. These have been developed in response to:

- The policy background pertinent to the study, as summarised in chapter 3 of this report;
- A knowledge of relevant established objectives for transport and other wider planning policies; and
- The data collected through consultation with key stakeholders.

5.2 Objectives are listed within the categories of outcome and output objectives. Outcome objectives set the overarching framework for any enhancements, and give the long-term aspirations that a successful proposal will help to achieve. The output objectives are more closely aligned with transport issues and enable testing of specific options.

Development of appraisal objectives

5.3 The planning objectives for the appraisal were identified at a meeting of the study steering group with input from all the members of the organisations involved.

5.4 The first planning objective set is 'to meet SEStran policy objectives'. The following policy sub-objectives are of most relevance to meeting this planning objective:

- Economic policy objective – improve labour market accessibility, improve connectivity within Scotland and reduce the negative impacts of congestion while improving journey time reliability.
- Accessibility policy objective – improving access for those with limited transport choice. Also, making transport more affordable
- Environment policy objective – promoting more sustainable travel and increasing transport choices
- Safety and health objectives – improving safety (reducing accidents) and increasing the proportion of trips by walk/cycle
- P1 – make bus travel more attractive for existing car users
- P3 – investment…that builds an integrated rail-based regional transport network
- P9 – commuter parking … city centre will be discouraged
- P11 – reduce road traffic levels, especially single occupant cars
- P13 – reduce demand for car travel and promote modal shift
- P24 – promote the use of more sustainable modes
- P27 – improve access to health services and to reduce congestion caused by travel to these services
- P29 – Transport interventions…to minimise their impact on the environment
- P30 – contribute to the achievement of national & international targets related to air quality
- The second planning objective is 'to meet TACTRAN policy objectives'. The following policy sub-objectives are of most relevance to meeting this planning objective:

Economy

- Improve the efficiency, reliability and integration of the movement of…people

Accessibility

- Improve access to employment, public services, retail and leisure facilities

Environment

- Contribute to…national targets…on greenhouse gas emissions
- Respect the natural and built environment
- Promote a shift to more sustainable modes

Health & well-being

- Meet or better statutory air quality requirements

Safety & security

- Improve transport related safety
- Integration
- Improve integration of all transport modes

5.5 Within this detailed list of policy objectives a level of duplication exists, along with certain objectives that, while relevant to the proposals being developed as part of this study, are unlikely to be the main determinants of a preferred option. Thus, in order to focus clearly on the objectives that the options are attempting to meet, a shorter list of key planning objectives has been developed. Appraising the options against these objectives allows the reviewer to clearly see how the options differ, and thus make the most informed decision regarding a preferred option. The key planning objectives that are used within the appraisal are:

- Reduce the number of single occupancy vehicle trips on the Tay Road Bridge.
- Maximise use of existing public transport capacity across the Tay.
- Contribute to national air quality targets
- Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.
- Minimise impacts scheme upon the natural and built environment

5.6 Within each of these outcome areas and particularly within the transport related outcomes the challenge has been to identify “SMART” targets that can be measured with a specific outcome stated in advance of the appraisal process. Within the list of planning objectives provided above the first three have been developed in to output objectives, with a quantitative outcome stated for use within the appraisal process. For each measurable objective a target minimum change of 5 percent has been set. It is believed that a change of this magnitude should be both achievable and measurable.

5.7 Currently around 76 percent of the peak period vehicle trips on the Tay Road Bridge are single occupancy vehicles. Between the hours of 0700 and 0900 this equates to around 2,100 vehicles. It is proposed that the target reduction in single occupancy vehicles should be 5 percent – around 100 vehicles.

5.8 Bus operators have reported that there is existing spare capacity on bus services across the Tay Road Bridge – vehicles are typically only 50-60 percent full. Increasing the utilisation of this existing

capacity is an objective of the interventions being investigated by this study and thus a target of a 5 percentage point increase in bus capacity utilisation has been proposed.

5.9 Air quality improvement targets may be achieved through highway vehicle mileage reductions and thus an output objective has been set to reduce the mileage of vehicles crossing the Tay and travelling in to Dundee by 5 percent. The distance travelled by existing cross Tay trips in to Dundee has been estimated using:

- the average vehicle trip length of cars in Scotland – 10.56 kilometres (source: www.scotland.gov.uk/Publications/2008/04/16110121/24);
- the number of all day vehicle (car) crossings of the Tay Road Bridge – 17,600 (taken from the Tay Bridge RSI survey); and
- the proportion of Tay crossings with an origin or destination in Dundee city Centre – 21 percent (taken from the PRIDE model as discussed later in this report).

5.10 This calculation indicates that cross Tay Road Bridge Dundee City Centre trips account for around 38,600 kilometres per day. A target of a 5 percent reduction in this figure is proposed as an output objective.

5.11 The output objectives are all summarised in Table 5.1.

Table 5.1 Output objectives

Outcome objective	Output objective			
	Description	**Current**	**Target**	**Change**
Reduce Single Occupancy Vehicles on the Tay Road Bridge	Reduce the total number of northbound single occupancy vehicles on the Tay Road Bridge during the morning peak period	2,100	2,000	- 5%
Maximise use of existing public transport capacity across Tay	Increase the public transport utilisation on Tay Road Bridge crossings	50%	55%	+ 5%
Contribute to national air quality targets	Reduce total vehicle kms of cross Tay car trips travelling in to City Centre	38,600	36,600	- 5%

6 Initial Option Testing

6.1 The initial selection of options for testing was undertaken in conjunction with the steering group and stakeholders. Key issues were to identify schemes and interventions that already formed part of the policy framework in the study area, to carry out a high level environmental assessment to understand limitations that may be placed on development and to carry an initial review to produce a range of interventions that would be subject to STAG part 1 assessment. Included in the options development work was undertaken to develop a capital and revenue cost model that would enable informed opinions to be formed on affordability and deliverability.

6.2 The initial option examination process grouped potential interventions by mode into four areas:

- Rail (including combined Rail and Bus measures)
- Bus
- Sustainable Modes
- Other Modes

6.3 Initial Options identified through a process of discussion and review were:

Table 6.1 High Level Options

	Intervention	Current Policy Context
1	Rail – Wormit Station	In SEStran RTS and Fife LTS. Not in Scotland RUS
2	Rail – Additional parking at existing stations	In SEStran RTS and Fife LTS and TACTRAN RTS. In Network Rail Scotland RUS (2005.
3	Rail – Increased frequency/new local service	Improvements in Line speeds noted in RUS may allow this. Key issue is removal of Hunterston to Longannet Power Station coal traffic from the Forth Bridge which will free up line capacity for additional hourly Dundee to Edinburgh train.
4	Rail – longer trains	No commitment in RUS, current limit of 6x23 metre vehicles without SDO
5	Bus – P+R close to Tay Bridge south side – dedicated service to Dundee	Broad P+R commitment in SEStran/TACTRAN RTS and Fife LTS.
6	Bus – P+R close to Tay Bridge south side – using passing services	Broad P+R commitment in SEStran RTS/TACTRAN RTS and Fife LTS.
7	Bus – P+R located between Tay Bridge and St. Andrews – passing services	Broad P+R commitment in SEStran RTS and Fife LTS.
8	Bus – P+R located between Tay Bridge and St. Andrews – dedicated service	Broad P+R commitment in SEStran RTS and Fife LTS.
9	Bus – increased frequencies and priority measures	general policy support
10	A92/Rail Line intersection P+R - passing bus & rail services	Broad P+R commitment in SEStran RTS and Fife LTS.
11	Bus – series of mini P+R s (less than 150 spaces) on radial routes from Tay Bridge	Broad P+R commitment in SEStran RTS and Fife LTS but this may been seen as new policy direction

	Intervention	Current Policy Context
12	Smarter Choices – HOV lanes on approach to Bridge	General policy commitment to use of smarter choices
13	Smarter Choices – car sharing, individual travel plans	General policy commitment to use of smarter choices
14	Smarter Choices – car sharing from mini P+R s	General policy commitment to use of smarter choices
15	Additional Subsidy to reduce bus/rail fares	General policy commitment to increased use of public transport
16	Reinstatement of tolls on Tay Road Bridge	No current policy commitment at national level
17	Ferry – reinstate cross ferry services	No current policy support

Description of Options

1) Wormit Station

6.4 Wormit Station would be located at the western end of Wormit on the site reserved in the Finalised Draft St Andrews & East Fife Local Plan on the Dundee to Edinburgh line (Engineers Line Reference SCL2 at approximately 56 miles and 12 chains from Edinburgh Waverley). The station would be a traditional two platform design capable of accommodating 6 car trains. Costs have been prepared for a station with ticket office but no cost has been allowed for a station footbridge as an adjacent road bridge could be used to link the two platforms. A car park would be provided for passengers who wished to P+R and the cost of providing 100 spaces included in the assessment.

6.5 Wormit station would be served by one train per hour in each direction and the local bus service.

Figure 6.1 Site of Wormit Station – including road bridge

2) Additional parking at existing stations

6.6 The Network Rail Route Utilisation Strategy (RUS) for Scotland commits to increasing car parking provision at railway stations. The expansion of car parks will be undertaken:

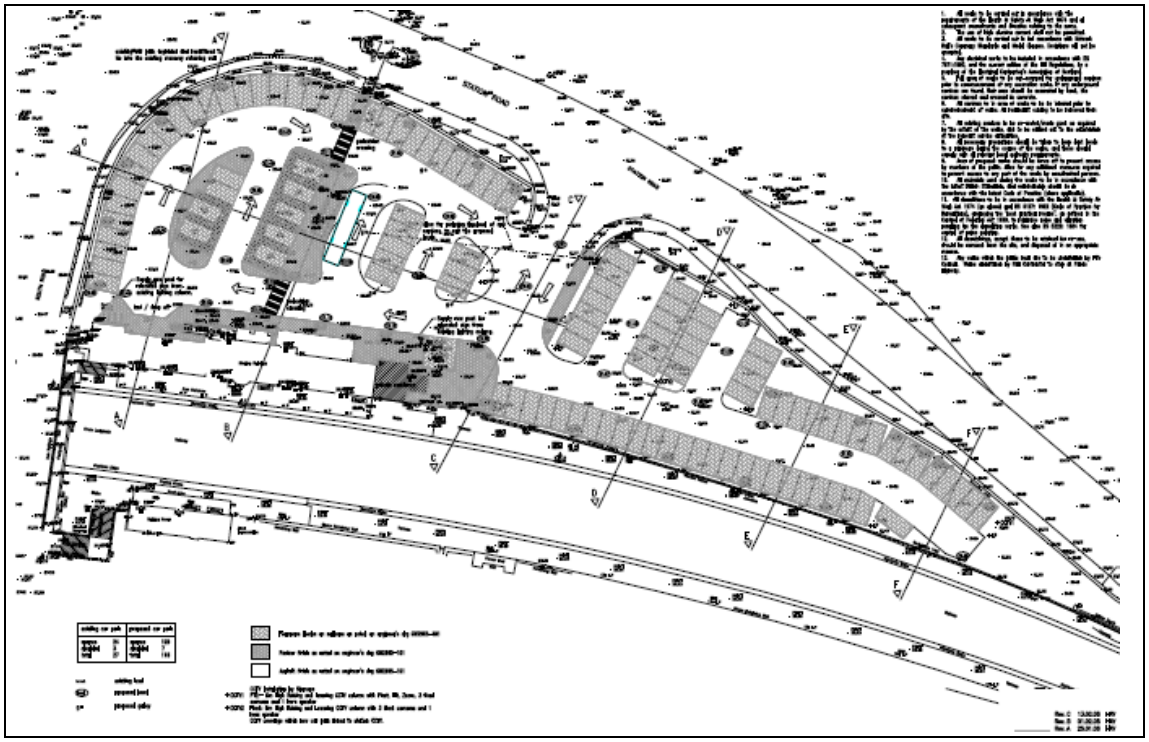
- where possible
- when supported by rail capacity developments
- when supported by a positive business case
- when supported by local authorities and Regional Transport Partnerships.

6.7 "Scotland's Railways" recommends "a rolling programme of car park expansions and including station design to include feeder bus services and opportunities to walk/cycle to stations". This RUS details capacity constraints on key corridors and recommends a number of options which will support passenger growth, of which car parking forms a key part. Regional transport partnerships and train operating companies play an important role in the development of stations and car parks. The various stakeholders have formed an Implementation Group, which will meet at a working level to ensure a joined-up approach is adopted to the management of current car parks and that extensions are proposed at the most appropriate locations to support passenger and rail growth proposals.

6.8 First ScotRail have provided, as part of their franchise commitments, increased formal car parking from 24 spaces and 3 priority disabled spaces to 106 spaces and 7 priority disabled spaces at Cupar Station. The scheme was completed in the 2008/2009 financial year. The existing payment regime in the station car park of £1 per day and £4 per week was widened to include the new spaces.

6.9 Given the First ScotRail intervention at Cupar which uses the majority of the available land adjacent to Cupar Station consideration of expansion of rail station car parks has focused on Leuchars station, although expansion at both Leuchars and Cupar has been subject to an appraisal.

Figure 6.2 Cupar Rail Station Car Park



First ScotRail

6.10 Leuchars Station car park has recently been doubled in size to around 150 spaces. Even with this expansion some evidence exists to indicate that demand is approaching the new capacity at the car park with some vehicles parked on the road outside the station.

Figure 6.3 Leuchars Station – Building

Figure 6.4 Leuchars Station – Car Park

3) Increased frequency/new local rail service

6.11 The Tay Estuary Rail Studies of 2003 and 2005 examined a number of options for increasing frequencies of rail services across the Tay Bridge and the potential for new rail services.

6.12 The 2003 study examined the wider Tayside area for improvements to rail services and recommended:

- A new hourly service from Arbroath to Perth calling at all key stations;
- A comprehensive package of station enhancements at Arbroath, Montrose, Carnoustie, Dundee, Perth on the line of the new service with lesser improvements at Broughty Ferry & Monifieth sufficient to raise quality to a minimum benchmark and brand the service.
- A new station at Dundee West

6.13 The 2005 study concentrated on the proposal to provide a service from Perth to Arbroath via Dundee with a new station at Dundee West. The recommended option is a new hourly service between Arbroath and Perth, stopping hourly at Perth, Dundee West, Dundee, Broughty Ferry, Monifieth, Carnoustie and Arbroath.

6.14 The previous hourly service from Edinburgh to Dundee (and Aberdeen) that calls at Cupar and Leuchars has been increased in frequency to two trains per hour from December 2008 now that issues with freight train access charges on the Stirling – Alloa – Kincardine Power Station route have been resolved. The additional train will call at Leuchars only between Edinburgh and Dundee. In view of the commitment of Transport for Scotland and First ScotRail to the two trains per hour service no further assessment of this option is proposed.

4) Longer trains

6.15 The current length of trains on the Edinburgh to Dundee services is dictated by the length of the platforms en route. In effect this means for regular services 6 car trains are the maximum that can be accommodated. Currently longer trains (e.g. National Express trains to London and the

overnight Aberdeen sleeper service) do call at stations in Fife but this is under a derogation from HM Rail Inspectorate that would not be extended should additional trains were to be lengthened. On the changes to service frequency discussed previously First ScotRail have indicated that 3 or 6 car diesel units will be the traction employed on this route and therefore no further appraisal is proposed at this juncture.

5) P+R on south side of Tay Road Bridge – dedicated service to Dundee

6.16 This option would entail the construction of a P+R/ park and choose site close to the southern bridgehead of the Tay Road Bridge. A possible site for this would be at the roundabout immediately south of the bridge, with access provided directly from the A92. A dedicated service to Dundee City Centre and other key destinations on the route would be provided. An operating cost model for a service from this location, operating on 15 minute frequency between 0700 and 1900, has been developed that indicates an annual bus operating cost of between £214,000 and £284,000 in addition to site operating costs (we estimate that these would be in the order of £30,000 per annum).

Figure 6.5 Tay Road Bridge South P+R Site

6) P+R on south side of Tay Road Bridge – using passing services to Dundee

6.17 This option would be as above, but with existing local bus services providing the link to Dundee. Passing local bus services would serve the site and provide up to 7 buses per hour to Dundee City Centre and other local destinations e.g. Ninewells Hospital and the Dundee University.

6.18 A variation on this option builds upon the evidence collected from Fife Council who is seeking to develop a major public amenity site adjacent to the A92 Forgan Roundabout on the outskirts of Newport on Tay. The scheme concept would be similar to the Tay Road Bridge site and be served by passing services although the frequency would be a maximum of 5 buses per hour on routes X54 and 99.

6.19 Originally, Fife Council had examined a site adjacent to the A92 road in the vicinity of Newport on Tay Primary School. At the first draft of the local plan significant objections were made to this site that has led Fife to consider the site at Forgan roundabout on the A92. In the light of the current fluid nature of the draft local plan the three locations - Bridgehead, "Primary School" and Forgan have all been subject to appraisal.

7) P+R located between Tay Bridge and St. Andrews – passing services

6.20 This option was to include the provision of a P+R site on the 99 bus route from St Andrews to Dundee. No site considered has any formal planning status and the only probable site identified for consideration was on the northern outskirts of Leuchars. A bus service of 4 buses per hour could be provided by service 99.

8) P+R located between Tay Bridge and St. Andrews – dedicated services

6.21 This option was to include the provision of a P+R site on the 99 bus route from St Andrews to Dundee. No site considered has any formal planning status and the only probable site identified for consideration was on the northern outskirts of Leuchars. Appraisal of the bus cost operating cost model and discussions with Stagecoach suggest that the high cost of operation and possible abstraction from existing bus services would result in an unsustainable proposal.

9) Bus increased frequencies & priority measures

6.22 Increasing frequencies on existing corridors is dependent on the availability of spare vehicle capacity and/or the impact on existing services. When combined with P+R enhanced frequencies may be possible, depending on the success of P+R in terms of filling otherwise empty seats. Similarly, bus priority measures can enhance cross Tay public transport movements in isolation or can be combined with other P+R options to maximise the impact.

10) A92/Rail Line intersection P+R - passing bus & rail services

6.23 This option would be to develop a new rail station and bus interchange with parking where the A92 road and the Edinburgh to Dundee rail line cross approximately 3 miles south of Newport on Tay. The new station would be on Engineers Line Reference SCL2 at approximately 54 miles and 0 chains from Edinburgh Waverley in vicinity of St Fort Ground Frame. One train per hour and the hourly X54 bus route would serve the site with a target customer base of longer distance commuters. The possibility of two trains per hour calling after the increase in rail frequencies on this route in December 2008 should also be considered.

11) Bus – series of mini P+R s (less than 150 spaces) on radial routes from Tay Bridge

6.24 This option was developed to test the theory that locally based mini P+R sites (up to 150 spaces) would be more effective at attracting motorists away from their cars. The P+R sites would need to be located on the fringes of the current urban area to ensure a suitable market. The issue of site operating costs would be multiplied by the provision of a number of sites and the sites due to their limited size would be unlikely to support dedicated bus services.

12 – 14) Sustainable Modes

6.25 The initial thinking for sustainable mode interventions was to develop individual items that would be subjected to STAG Part 1 assessment. Subsequent to discussion with the Sustainable Transport Officers (STOs) of SEStran, Fife Council and TACTRAN a stand-alone paper on sustainable interventions was produced for discussion with the steering group.

6.26 As part of this element of the option production process the Sustainable Transport Officers from SEStran, TACTRAN and Dundee met with JMP to identify a package of sustainable transport

options that would be included in the STAG1 Appraisal of Cross Tay interventions that will seek to reduce the level of single occupancy car journeys using the Tay Road Bridge.

6.27 In the original sift of options the following options were considered :-

- 12) Smarter Choices – HOV lanes on approach to Tay Road Bridge.
- 13) Smarter Choices – car sharing, individual travel plans
- 14) Smarter Choices – car sharing from mini P+R s

6.28 On the basis of early discussions around these initial options it was also agreed that a package of measures should be drawn up that included greater emphasis on local cycling and walking. This package is described below.

15) Sustainable modes package

6.29 Following the discussions with the sustainable transport officers of relevant authorities JMP produced a package of sustainable transport interventions that should be considered for STAG1 appraisal. It is proposed that the package focuses on the key issue of providing park and choose facilities at appropriate locations near to the Southern bridgehead of the Tay Road Bridge.

6.30 The proposed option is :-

- Cycling and walking – a P+R site as near to the southern bridgehead as possible (if recommended) becomes also a park and choose site for a change of mode from car to cycling/walking for the bridge element of the journey to Dundee. Dedicated park and choose spaces in P+R car park. This would include the provision of improved step free access at the northern bridgehead and dedicated cycle/walking lane(s) at the southern bridgehead. High quality cycle locker facilities to be included in design of park and choose site for people to park and cycle into Dundee. Agree cycle facilities on buses e.g. exterior cycle rack. Improve signage for cyclists and pedestrians (key during Waterfront redevelopment works). Seek increased cycle provision or increase in train service frequency.
- Park and Share – Dedicated park and share spaces in P+R car park. Increased information provision on approaches to site(s). Any bus priority measures (apart from traffic signal related interventions which would require bus detection) to also be available to HOVs.
- Information and Marketing – Advertising of national cycle network at park and choose site. Increase scope of Dundee public transport RTI to include sustainable mode information. General increase in signage provision to cater for cycling/walking and park and choose. Promotion of “Liftshare” services to key target audiences – Dundee University, Ninewells Hospital.

16) Additional Subsidy to reduce bus/rail fares

6.31 This option would entail using additional revenue support to reduce bus and rail fares in the northern Fife area. As public transport, especially for shorter journeys, is price sensitive this intervention could boost travel on key public transport routes across the Tay. A mechanism would need to be agreed that would enable Transport for Scotland to ring fence funding for lower rail fares through the ScotRail franchise. Difficulties may arise with the “English” franchisees on this route as their funding is from the DfT in London and not Transport for Scotland.

17) Reinstatement of tolls on Tay Road Bridge

6.32 This option would involve the reinstatement of the tolls on the road bridge. Previously the tolls were collected in a south bound direction only and were used for the maintenance of the Bridge

and a study conducted by Hyder for the Bridge Board examined moving the toll booth to the north bound direction with collection at the southern end of the Bridge. The tolls were removed in February 2008 following a manifesto commitment of the Scottish Government to provide free river crossings in Scotland on major bridges. At the same time Transport for Scotland also redistributed funding for maintenance of the bridge.

18) Ferry – reinstate cross ferry services

6.33 Until the Tay Road Bridge opened in 1966 a ferry service operated between Newport on Tay and Dundee. A reinstatement of this service would require the provision of new landing stages, waiting areas and ferryboats. It is understood that tidal patterns in the Estuary would make this option difficult to operate, as would bad weather.

Results of Initial Option Assessment

6.34 To undertake an initial assessment a scoring chart was adopted that marked each intervention against the core policy objectives of SEStran and TACTRAN, the core study objective of reducing single occupancy car trips using the Tay Road Bridge and general economic and land use polices. An outline indication of deliverability was also made.

Table 6.2 Initial Option Assessment

	Option	Meet SEStran policy objectives	Meet TACTRAN policy objectives	Reduce Single Occupancy Car trips	Meet wider policy goals of housing & economic growth	Deliver-ability	Comments	Conclusion
1	Rail – Wormit Station	√√		√	√	√	Site allocated in local plan, general policy support for improved access to rail network in SEStran RTS, Network Rail not fully supportive of new station due to timetable and business case issues, high capital cost of the intervention, short journey with low fares, poor road links from A92 for strategic P+R, hourly train frequency likely to be unattractive for P+R, strong local support.	Undertake STAG1
2	Rail – Additional parking at existing stations	√√√	√√√	√√√	√√	√√√	Land reserved in local plan for Leuchars, site more constrained at Cupar and DDA works will reduce land available there, local support likely to be forthcoming, policy support (SEStran RTS), business case likely to be capable of establishment (esp. at Leuchars), 2 tph at Leuchars from 2009 .	Undertake STAG1
3	Rail – Increased frequency/new local service						Increased frequency to occur when track access contracts for Alloa line resolved which frees up capacity for additional Dundee to Edinburgh service each hour, cost of rolling stock for 2tph to be met through current franchise arrangement, TACTRAN are examining rail options in the Tay Estuary area though these do not include cross Tay services. As increased frequencies to be delivered in short term and new services to be assessed in other forum no further assessment is recommended as the key deliverables are either being progressed or form part of wider option testing work.	No further assessment proposed
4	Rail – longer trains						Agreed that trains longer than the current 6 car limit will not operate, therefore no further examination of this option required	No further assessment proposed

	Option	Meet SEStran policy objectives	Meet TACTRAN policy objectives	Reduce Single Occupancy Car trips	Meet wider policy goals of housing & economic growth	Deliver-ability	Comments	Conclusion
5	Bus – P+R on south side of Tay Road Bridge – dedicated service to Dundee	√	√√	√√√	√√	√	Land is reserved in St Andrews and North Fife local plan for site adjacent to A92, high cost of dedicated service operation, quality differential between dedicated P+R service and using existing local bus services now minimal, will need to establish route in Dundee. The annual cost of operation between the P+R & City Centre has been assessed as being between £213,000 and £252,500 dependant on vehicle type. Given this high subsidy level further appraisal is not recommended.	No further assessment proposed
6	Bus – P+R on south side of Tay Road Bridge – using passing services	√√√	√√	√√√	√√	√√	Land reserved in local plan for site adjacent to A92, strong policy support (SEStran, TACTAN), low cost of operation if services pass the site dedicated service operation, quality differential between dedicated P+R service and using existing local bus services now minimal, will need to establish route in Dundee. Two additional site locations also exist: at Forgan Roundabout, potentially in conjunction with public amenity site at this location, and in the vicinity of Newport-on-Tay Primary School. Note this second sub option has previously received objections when included in the first draft of the local plan. A STAG1 appraisal will be carried out of these sites.	Undertake STAG1
7	Bus – P+R located between Tay Bridge and St. Andrews – passing services	√√	√	√	√√	√	No planning policy support for this intervention with no site allocated but support from other local polices e.g. Fife parking strategy and draft St Andrews local plan to seek a solution to parking issues in St Andrews, question of what is the target market for a site in this area, would such a site affect viability of existing bus routes? STAG1 appraisal may be carried but unlikely to go beyond this stage due to lack of clear target market and abstraction from existing bus routes	No further assessment proposed

	Option	Meet SEStran policy objectives	Meet TACTRAN policy objectives	Reduce Single Occupancy Car trips	Meet wider policy goals of housing & economic growth	Deliver-ability	Comments	Conclusion
8	Bus – P+R located between Tay Bridge and St. Andrews – dedicated service	√√	√	√	√√	√	No planning policy support with no site allocated but support from other local polices e.g. Fife parking strategy and draft St Andrews local plan, question of what is the target market for a site in this area, would such a site affect viability of existing bus routes? Conclusion – STAG1 possibility but unlikely to go beyond this stage due to lack of clear target market and abstraction from existing routes	No further assessment proposed
9	Bus – increased frequencies and priority measures						Increased frequencies dependent on spare vehicle capacity on existing services and the effect that P+R will have in terms of filling otherwise empty seats. Identification of priority measures will be incorporated into assessment of individual options taken forward. This option to be tested in conjunction with other interventions therefore no specific appraisal is proposed	Include in P+R site assessments
10	A92/Rail Line intersection P+R (3 miles south of Newport on Tay) - passing bus & rail services	√√	√√	√√√	√	√√	No specific site recognised in planning policy but principle of strategic intervention recognised in SEStran and TACTRAN RTSs, likely to trap strategic trips on the A92, is target market Dundee or southbound journeys, possible low bus frequencies, is it an alternative to a cheaper car park expansion at Leuchars ? Network Rail would convincing of concept, timetable and business case, high capital cost of the intervention and long term ownership issues. Due to the strategic location of the site further appraisal is recommended	Undertake STAG1

	Option	Meet SEStran policy objectives	Meet TACTRAN policy objectives	Reduce Single Occupancy Car trips	Meet wider policy goals of housing & economic growth	Deliver-ability	Comments	Conclusion
11	Bus – series of mini P+R s (less than 150 spaces) on radial routes from Tay Bridge	√√	√	√	√	0	No specific sites in land use policies, would these attract critical mass of custom, may be an operator led initiative, issues of high capital cost and multiple sets of revenue costs. Demand is likely to be constrained by local nature of these interventions, would need to be served by passing services so issue of abstraction, may less sustainable than other measures due to possibility of increasing short distance car journeys. Further appraisal not recommended due to high operational costs and lack of clear target market and abstraction from existing bus routes	No further work
12	Smarter Choices – HOV lanes on approach to Bridge						Included in package of Smarter Choice measures for assessment	Include in P+R demand assessments
13	Smarter Choices – car sharing, individual travel plans						Included in package of Smarter Choice measures for assessment	Include in P+R demand assessments
14	Smarter Choices – car sharing from mini P+R s						Further appraisal not recommended due to high operational costs and lack of clear target market	No further work
15	Sustainable modes package						Include within bus based P+R options close to the southern bridgehead of the Tay Road Bridge.	Include in P+R demand assessments
16	Additional Subsidy to reduce bus/rail fares	√√	√	√√	√√	x	Further appraisal not recommended due to high ongoing cost and difficulties in funding rail fare reductions	No further work

	Option	Meet SEStran policy objectives	Meet TACTRAN policy objectives	Reduce Single Occupancy Car trips	Meet wider policy goals of housing & economic growth	Deliver-ability	Comments	Conclusion
17	Reinstatement of tolls on Tay Road Bridge	√	√	√	x	xx	Likely to be politically difficult and may be seen as tax on Cross Tay journeys that will change socio-economic outlook of the area. Initial evidence of toll removal is that little change in Cross Tay journeys occurred.	No further work
18	Ferry – reinstate cross ferry services	√√	√√	√	√	xxx	The tidal nature of the Tay Estuary would cause operational difficulties with impact on environment of landing stages, high capital cost and potential journey time penalty. These factors suggest discounting this option.	No further work – option for longer term assessment

Key to Initial Option Assessment table

√√√	Significant benefit	xxx	Significant disbenefit
√√	Moderate benefit	xx	Moderate disbenefit
√	Slight benefit	x	Slight disbenefit
0	No, or negligible, impact		

7 STAG Part 1 Appraisal

Overview

7.1 From the initial options sifting process seven scheme options have been identified as offering a potential solution and are thus taken forward to the STAG Part 1 appraisal. They are:

- Tay Bridge Roundabout P+R;
- Forgan Roundabout (A92/A914 intersection) P+R;
- Site adjacent to Primary School on B995;
- New Rail Station: A92/Rail Line intersection;
- Leuchars Rail Station increased parking space provision;
- Cupar Rail Station increased parking space provision; and
- New rail station at Wormit.

7.2 Each of the options are analysed in greater detail in the section below. However, detailed demand forecasting of each site has not been feasible at this stage due to restrictions in modelling outputs. Outline forecasts have been produced that are sufficient to identify the magnitude of demand and with these described below. More detailed forecasting is considered in Part 2.

Demand Forecasting

7.3 This work uses the PRIDE demand model that has been established to develop the TACTRAN P+R strategy for Dundee and the wider TACTRAN area.

7.4 PRIDE is a demand forecasting model developed by Colin Buchanan Ltd (CB) specifically for the assessment of P+R schemes. It was developed initially for the 1993 Greater Manchester P+R Methodology Study; it has been modified and enhanced since, and has been used extensively by CB in a variety of P+R studies. The main inputs to PRIDE are:

- car trip demand by origin, destination, time period and/or trip purpose;
- car journey costs – in-vehicle time, parking search times, parking charges, and walk times from the car park;
- journey costs by P+R – access times to the P+R site by car, walk time at the site, wait time, fare, in-vehicle time, and walk time from the bus stop at the destination;
- mode choice parameters.

7.5 Origin – destination data has been taken from the PARAMICS model of Dundee City Centre. This provides excellent disaggregation destination data; however the model only extends to the southern bridgehead in Fife and so origin data has needed to be simulated using the Tay Bridge Traffic Survey data. It is this element of the forecasting process that is relatively basic in the Part 1 appraisal; however additional work has taken place for the full STAG part 2 assessment.

7.6 Cost data is derived from time and distance skims from the model. The availability of free parking is a major constraint on the P+R market. Dundee City Council have recently undertaken a major survey of private non-residential parking (PNR) in the city centre and this has provided a valuable input to the accurate assessment of potential P+R demand.

7.7 In the absence of direct survey information parking, search times have been related to the ease of parking, which itself is a function of the balance between demand and supply. Walk times from the car parks to destination zones is estimated from maps and average walking speeds.

7.8 Model parameters (model penalty and spread factor) represent attitudes to mode shift. These vary by area and are derived from research on P+R elsewhere in the UK.

Tay Bridge Roundabout P+R

Introduction

7.9 This option is based on the construction of a car park in the land on the west side of the A92, immediately west of the Tay Bridge Roundabout. Access to the site would be from a new arm on the Tay Bridge Roundabout with a bus turning facility also provided. Restrictions to the land available in this location mean that the site size would be limited to around 120 to 140 spaces. It is envisaged that provision for the existing informal park and choose arrangements would be retained with extra provision made for secure cycle storage.

Demand

7.10 A P+R demand forecasting model (PRIDE) has been used to predict potential demand from this site. The PRIDE model has already been used by Colin Buchanan's to undertake the TACTRAN P+R strategy development study. The modelling indicates that demand, based on 2008 data, during the morning peak period would be around 140 vehicles. This forecast is based upon trips to destinations in Dundee **city centre** only.

7.11 The Tay Road Bridge site to the west of the roundabout is restricted in size by an existing residential development and the A92. Capacity is in the region of 120 to 140 vehicles and therefore actual demand at this site is likely to be limited by the capacity of the car park. For the purposed of this appraisal demand has been capped at 130 vehicles.

Costs

7.12 Scheme costs have been developed using unit rates and an assumed site size of 130 spaces (see Table 7.1 and Table 7.2). Given the small overall site size, in P+R terms, a basic facilities building has been included within the costings and therefore only limited allowance for staff supervision hours has been made.

7.13 The demand forecasting was undertaken on the basis of P+R users paying for the bus transit, with no additional parking charge. No revenue stream would, therefore, exist to cover the revenue implications of operating the site unless an agreement with the local bus operator(s) could be made to secure a contribution from the income generated by the P+R site. An example of this type of funding exists at the Edinburgh Ferrytoll P+R site, where Stagecoach are responsible for staffing and cleaning the terminal building while Fife Council are responsible for maintenance of the car park and terminal building.

Table 7.1 Capital costs

Item	Rate	Unit	Cost
Land Site clearance	£150	per space	£19.500
Regrading, landscaping	£224	per space	£29,120

Item	Rate	Unit	Cost
Perimeter fence	£900	per space	£117,000
Electricity supply	£10,000	fixed	£20,000
Site access road	£30,000	fixed	£30,000
Waiting room, information office, public toilet			£20,000
Signs, fixed information displays	£10,000	fixed	£10,000
Car park drainage	£100	per space	£13,000
Car park surfacing	£1,260	per space	£163,800
Car park kerbing	£300	per space	£39,000
Footways and footpaths	£60	per space	£7,800
Car park lighting	£105	per space	£13,650
Car park markings	£20	per space	£2,600
CCTV cameras	£30,000	per camera	£90,000
Miscellaneous works	£100	per space	£13,000
Sub-total			**£578,470**
Fees, design, preliminaries	15%		£86,770
Contingencies/risk	10%		£57,847
Total			**£723,087**

Table 7.2 Operating costs

Item	Rate	Units	Cost (£ p.a.)
Site supervision and security	£10	per man hour	£6,240
Cleaning and maintenance	£10	per man hour	£4,160
Marketing	£2,000	fixed	£2,000
Publicity materials	£4,000	fixed	£4,000
Utilities	£8,000	fixed	£8,000
CCTV maintenance contract	£2,000	per camera	£6,000
Contingencies	£9,700	Per site	£9,700
Total			**£40,100**

Table 7.3 Tay Bridge Roundabout P+R Appraisal Summary table

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		Promoter: South East Scotland Transport Partnership (SEStran) Support: Tayside & Central Scotland Transport Partnership (TACTRAN)	
Proposal Name:	Tay Bridge Roundabout P+R		
Proposal Description:	Creation of a P+R site of ~130 spaces on the west side of the A92, south of the Tay Bridge Roundabout. Transit to be provided by existing bus services (routes 42, 72, 96 and 99)	Estimated Total Public Sector Funding Requirement:	Capital cost of construction: £723,000 Annual operating cost: £40,100
Background Information			
Geographic Context:	The proposal makes use of land between the A92 and residential areas at the northern end of Newport-on-Tay. The land is currently grassed and screened from the residential properties by a line of mature trees. The site is immediately south of the Tay Road Bridge and is thus potentially able to serve all road trips across the Bridge as well as be served by all existing bus routes across the Bridge.		
Social Context:	The European Structural Fund Area does not cover the Tay Bridgehead area and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and the Tay Bridgehead Area does not come into any of these areas. Leader In Fife Funding would be available for small projects in rural areas where it could be used for publicity and advertising of park & choose sites.		
Economic Context:	By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.		

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme is designed to attract existing car users travelling to Dundee via the Tay Road Bridge. Charging structure (bus fares) likely to be most attractive to single occupancy vehicles
Maximise use of existing public transport capacity across Tay	P+R encourages modal shift & transfer from car to bus
Contribute to air quality targets	A net reduction in vehicle mileage from car to bus transfer should result in reduced emissions of CO_2.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing bus users a well located site should result in a net reduction in private vehicle trips.
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation
Rationale for Selection or Rejection of Proposal:	Due to the key location of the site STAG2 appraisal is recommended. STAG2 will need to consider the limited size of the site and the range of destinations available from this site. The use of the Bridge Board's informal car park as a park and choose site at the Bridgehead will also be examined as part of the STAG 2 assessment.
Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose. Constraints on the size of the site mean that providing a suitable bus turning facility along with the parking spaces may create technical problems. Site capacity is believed to be restricted to around 130 spaces.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £723,000 to construct. No parking charges are planned and as bus fares will be collected by the operator there will be no direct user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements.
Public:	An 'area of search' for a P+R site, covering the Tay Bridge Roundabout area, was identified in the most recent draft of the St Andrews and East Fife Local Plan.

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	+ +	A reduction in vehicle mileage (& hence CO2) from the diversion of 130 trips out of the City Centre to the P+R facility is forecast. There may be some increase in mileage from new trips generated or from existing bus users transferring to P+R. Air & water quality: No significant impacts Distributional impacts: there is a transfer of parking from Dundee City to green belt.
Safety:	+	Accident rates per passenger kilometre are lower for bus travel than car travel* and thus a transfer of trips from car to P+R (bus) would be expected to lead to a reduction in personal injury accidents. Personal security within the car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Bus Killed: 0.2; Bus KSI 7; Bus all personal injury accidents: 149 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	+ +	Highway impacts: The removal of 130 trips from the highway – including Tay Bridge & Dundee City Centre – will have small positive impacts for journey times over the bridge; however this small reduction in trips will have a significant journey time saving for non bridge traffic in the CWD area. . Bus impacts: An additional bus stop at the P+R site will result in a minor journey time disbenefit for existing passengers. However, the additional demand may stimulate higher frequency services which would benefit the new P+R passengers as well as existing bus users. Development impacts: The transfer of parking spaces to the P+R site would allow redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities. Economic impacts: provision of a new transport facility enhances the accessibility of Dundee thereby assisting businesses and employment.
Integration:	+ + +	Modal integration: the proposal is designed to enable car to bus interchange. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike and continue the journey by bus. Users would also be permitted to park at the site and complete their journey by bike and thus secure cycle parking facilities could be provided for those wishing to leave their bike at the P+R site overnight. Encouraging journeys to be made by non-car modes integrates with local and national policies.

Accessibility & Social Inclusion:	+	Transport accessibility: The new transport facility broadens choice and option values. Social exclusion: The primary benefits are to car owners though site is also accessible by cycle. Bus passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the bus corridors.

New Rail Station: A92/Rail Line intersection

7.14 This option proposes a new rail station on the Ladybank to Dundee line at the intersection with the A92, south east of Wormit. Direct access from the A92 would mean that the traffic would not pass through residential areas in the vicinity of the new station while journey times would be more favourable. A new site access junction with the A92 would be required along with an access road, the station car park and the new station itself.

7.15 The current rail service frequency to Dundee from Leuchars – the next station south of this proposed new site location – is two trains per hour though it is unlikely that the 'new' station would benefit from the higher service frequency. During the morning peak period the addition of cross country services to the pattern of departures at Leuchars means that the southbound service frequency – towards Edinburgh – is around three trains per hour. Again, it is not known whether a new station would also be served by the cross country services. First ScotRail's position at present is that a new station at any location north of Leuchars would be served only by the one semi-fast train per hour.

Demand

7.16 At this STAG1 level assessment no demand forecasts have been developed for this station. Should the proposal be progressed to a STAG2 level demand forecasts will be developed at that stage. By way of comparison, analysis of Lennon data for Cupar station shows around 730 passenger movements per weekday, with 1,200 at Leuchars. Cupar station is provided with 100 parking spaces, while Leuchars has around 150 spaces.

Costs

7.17 An initial cost estimate of providing the new station with an associated car park has been developed using unit cost rates. The car park cost has been based on a site with capacity for around 100 vehicles with other key assumptions as listed below:

- Trains are formed of a maximum of six cars giving an overall length of 145 metres (i.e. 23.8 metres x 6, plus an overrun area of 2.0 metres – rounded up.);
- Platform end ramps are 7.5 metres in length;
- No signals require relocation to make way for platforms;
- A fully accessible footbridge with span plus DDA-compliant ramps will be needed; and
- A combined booking office and waiting room will be provided on one platform and a shelter on the other.

Table 7.4 Station capital costs

	Rate	Unit	Quantity	Cost
Land acquisition at agricultural rates	£40,000	Sum	1	£40,000
Site clearance	£10,000	Sum	1	£10,000
Regrading, landscaping	£7	Sq. metre	4000	£28,000
Relocation of S&T cables and ducting	£50,000	Sum	1	£50,000
Perimeter fence – whole site inc car park	£180	Linear metre	600	£108,000

	Rate	Unit	Quantity	Cost
Enabling/civils works	£100,000	Sum	1	£100,000
Platforms, end ramps, shelter/building bases	£155	Sq. metre	1280	£198,400
Footbridge span	£250,000	Sum	1	£250,000
Footbridge ramps	£275,000	Unit	2	£550,000
Footbridge steps	£30,000	Unit	2	£60,000
Platform and footbridge lighting	£2,000	Light	30	£60,000
Shelter	£18,000	Sum	1	£18,000
Booking office/waiting room	£140,000	Sum	1	£140,000
Fence to rear of platform	£55	Linear metre	320	£17,600
Station signs, seats/litter bins/fixed display boards	£15,000	Sum	1	£15,000
PA, CIS and telephone installations	£100,000	Sum	1	£100,000
Electricity supply	£20,000	Sum	1	£20,000
Miscellaneous works	£30,000	Sum	1	£30,000
Sub-total				**£1,795,000**
Fees, design, preliminaries (25%)	25%			£448,750
Contingencies/risk (15%)	15%			£269,250
Delivery and site costs	£100,000	Sum	1	£100,000
Possessions	£500,000	Sum	1	£500,000
Total				**£3,113,000**

Table 7.5 Station Car Park capital costs

	Rate	Unit	Quantity	Cost
Land Site clearance	£150	per space	100	£15,000
Regrading, landscaping	£224	per space	100	£22,400
Perimeter fence	£180	linear metre	0	£0
Electricity supply	£20,000	fixed	0	£0
Car park drainage	£100	per space	100	£10,000
Car park surfacing	£1,260	per space	100	£126,000
Car park kerbing	£300	per space	100	£30,000
Footways and footpaths	£60	per space	100	£6,000
Car park lighting	£105	per space	100	£10,500
Car park markings	£20	per space	100	£2,000
CCTV cameras	£30,000	per camera	2	£60,000
Miscellaneous works	£100	per space	100	£10,000
Sub-total				**£291,900**
Fees, design, preliminaries (15%)	15%			£43,785
Contingencies/risk (10%)	10%			£29,190
Total				**£364,875**

7.18 The combined cost estimate of the new station and car park is, therefore, around £3.5 million excluding the cost of a new junction off the A92 trunk road.

7.19 Annual operating costs for the station and car park have also been prepared. These assume that the station is staffed for one shift per day and that there is one train per hour each way on 363 days.

Table 7.6 Station and car park annual operating costs

	Rate	Unit	Quantity	Cost (£ p.a.)
Station maintenance	£15,000	Sum	1	£15,000
Staffing	£43,500	Sum	1	£43,500
Access charges per annum (363 days)	£2.00	per train stop	13,068	£26,136
Other variable costs (BTP, National Train Enquiries, ATOC, etc)	£20,000	Sum	1	£20,000
Other fixed costs	£10,000	Sum	1	£10,000
Total				**£114,636**

Table 7.7 A92/Rail intersection P+R Appraisal Summary table

<table>
<tr><td colspan="4">Proposal Details</td></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Promoter: South East Scotland Transport Partnership (SEStran)
Support: Tayside & Central Scotland Transport Partnership (TACTRAN)</td></tr>
<tr><td>Proposal Name:</td><td>A92/Rail intersection P+R</td><td></td><td></td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Provision of a new station and 100 space car park to acts as a P+R facility. Station to be built on the east side of the intersection of the A92 and Aberdeen to Edinburgh rail line. Rail services to be provided by the existing operator: First ScotRail.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital: £3.5 million + cost of new junction on A92 trunk road</td></tr>
<tr><td>Annual operating cost of: £115,000. (assumed to be covered by station operator & recouped through ticket sales)</td></tr>
<tr><td></td></tr>
<tr><td colspan="4">Background Information</td></tr>
<tr><td>Geographic Context:</td><td colspan="3">The site is located on the east side of the A92, at the intersection with the Aberdeen to Edinburgh rail line, and approximately 200 metres northeast of the A92/B946 intersection. The land required for the station, car park and access road is currently farmland. The new station would be between the existing stations of Leuchars and Dundee.</td></tr>
<tr><td>Social Context:</td><td colspan="3">The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.</td></tr>
<tr><td>Economic Context:</td><td colspan="3">The new station would act primarily as a P+R site, attracting users from origins in Fife, and serving destinations within Dundee, Edinburgh and elsewhere. The station site would have minimal implications for the economy in its immediate vicinity.</td></tr>
</table>

(A92/Rail intersection P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme is designed to attract existing car users travelling to Dundee via the A92 and the Tay Road Bridge. Charging structure (rail fares) likely to be most attractive to single occupancy vehicles
Maximise use of existing public transport capacity across Tay	P+R encourages modal shift & transfer from car to rail
Contribute to air quality targets	Reduction in vehicle mileage should result in reduces emissions of CO_2
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to rail for part of the journey. Although P+R can cause some switch from existing rail users a well located site should result in a net reduction in private vehicle trips.
Minimise the impact on the natural and built environment	New station and car park can have an adverse impact on the environment that needs to be carefully managed through design and implementation
Rationale for Selection or Rejection of Proposal:	This proposal at present is unlikely to give good value for money on the basis of the services likely to be offered at present and therefore at this point in time no further appraisal is recommended. However, the growth of St Andrews in terms of the University and an additional 1500 houses proposed for inclusion in the revised draft local plan make this site of possible use for a strategic park and site in the future. In view of this the site should be protected in the revised draft local plan for future transport use.
Implementability Appraisal	
Technical:	Provision of a new station with associated car park is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	Continued operation of the site will depend upon the ongoing provision of rail services from the new station. New services are not part of the proposal and thus this option depends on the continued commercial viability of existing services. Should services not meet requirements then the success of the site could be compromised or additional costs incurred in providing additional transit services to the key destination(s).
Financial:	New station and car park is estimated to cost £3,478,000 to construct. Annual operating costs of £115,000 are forecast. No parking charges are assumed (as with the existing edge of town Leuchars station). It would be expected that the station would be operated by First ScotRail and while the car park could remain in the ownership of SEStrans / Fife County Council, for the purposes of this appraisal it has been assumed that the car park would also be operated by First ScotRail.
Public:	This proposal has not been made public and the land not identified within the Local Plan for this purpose.

(A92/Rail intersection P+R Appraisal Summary table – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	+	There would be a reduction in vehicle mileage (& hence CO2) from highway trips diverted from Dundee and other destinations such as Edinburgh. The possibility exists that new highway trips may be generated or lengthened as rail travellers with access to a car switch from more local stations. Air & water quality: No significant impacts. Distributional impacts: transfer of parking from Dundee City to green belt.
Safety:	+	Accident rates per passenger kilometre are lower for rail travel than car travel* and thus a net transfer of highway mileage from car to P+R (rail) would be expected to lead to a reduction in personal injury accidents. Personal security within the station and car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Rail Killed: 0.1; Rail injured: 12 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	+	Traffic impacts: a small net reduction in trips on the Tay Bridge and in Dundee City Centre would be expected. Rail impacts: a small growth in rail passenger numbers would be expected. The additional demand could assist in supporting the planned higher frequency services though it is understood that the plans are that the only stop in Fife would be at Leuchars. The additional stop for rail services will add a small delay for existing rail passengers. Development impacts: The transfer of parking spaces to the P+R site would allow redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities.
Integration:	+	Modal integration: enables car to rail interchange. Although it would be possible to access the new station by other modes – such as walk and cycle – the station site is remote from existing settlement areas.
Accessibility & Social Inclusion:	+	Transport accessibility: new transport facility broadens choice and option values. Social exclusion: primary benefits are to car owners though site also accessible by cycle. Rail passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the rail corridor. Additional stop will increase journey times of existing passengers on the line.

Forgan Roundabout (A92/A914 intersection) P+R

7.20 This option is based on the construction of a car park in the land on the southwest side of the Forgan Roundabout (intersection of the A92, A914 and B995), approximately 2 kilometres south of the Tay Bridge Roundabout. Access to the site would be from the B995 with a bus turning facility provided within the site. This option could be developed jointly with a proposal for a waste transfer site at the same location.

7.21 The site would be served by the existing local bus service 99, and thus connections would be made with the centre of Dundee at a frequency of around 5 buses per hour throughout the day. While the site is well located to attract trips from the A92, Leuchars and St. Andrews, potential users from Tayport and Newport-on-Tay would need to divert from the obvious routes to Dundee in order to access the site.

7.22 At present Fife Council is seeking to develop a household waste/recycling site and business park in the general area of the Forgan Roundabout. A definitive site may be recommended in the next draft of the local plan but the potential for a P+R scheme to be developed in conjunction with this work should be noted.

7.23 A P+R demand forecasting model has been used to predict potential demand from this site. The modelling indicates that in the forecast opening year of 2012 demand during the morning peak period would be around 100 vehicles.

Costs

7.24 Scheme costs have been developed using unit rates and an initial size of 130 spaces (see Table 7.8 and Table 7.9) but the ability to include up to 275 spaces within the initial land area. Given the small overall site size, in P+R terms, a basic facilities building has been included within the costings and therefore only limited allowance for staff supervision hours has been made. The demand forecasting was undertaken on the basis of P+R users paying for the bus transit, with no additional parking charge. No revenue stream would, therefore, exist to cover the revenue implications of operating the site. However, as noted for the appraisal of the Tay Bridge Roundabout site, it may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements.

Table 7.8 Capital costs

Item	Rate	Unit	Cost
Land Site clearance	£150	per space	£19,500
Regrading, landscaping	£224	per space	£29,120
Perimeter fence	£900	per space	£117,000
Electricity supply	£10,000	fixed	£10,000
Site access road	£30,000	fixed	£30,000
Waiting room, information office, public toilet		fixed	£80,000
Signs, fixed information displays	£10,000	fixed	£10,000
Car park drainage	£100	per space	£13,000
Car park surfacing	£1,260	per space	£163,800
Car park kerbing	£300	per space	£39,000
Footways and footpaths	£60	per space	£7,800
Car park lighting	£105	per space	£13,650

Item	Rate	Unit	Cost
Car park markings	£20	per space	£2,600
CCTV cameras	£30,000	per camera	£90,000
Miscellaneous works	£100	per space	£13,000
Sub-total			**£578,470**
Fees, design, preliminaries	15%		£86,770
Contingencies/risk	10%		£57,847
Total			**£723,087**

Table 7.9 Operating costs

Item	Rate	Units	Cost (£ p.a.)
Site supervision and security	£10	per man hour	£6,240
Cleaning and maintenance	£10	per man hour	£4,160
Marketing	£2,000	fixed	£2,000
Publicity materials	£4,000	fixed	£4,000
Utilities	£8,000	fixed	£8,000
CCTV maintenance contract	£2,000	per camera	£6,000
Contingency	£9,700	per site	£9,700
Total			**£40,100**

Table 7.10 Forgan Roundabout Site P+R Appraisal Summary table

<table>
<tr><td colspan="4">Proposal Details</td></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Promoter: South East Scotland Transport Partnership (SEStran)
Support: Tayside & Central Scotland Transport Partnership (TACTRAN)</td></tr>
<tr><td>Proposal Name:</td><td>Forgan Roundabout Site P+R</td><td></td><td></td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Creation of a P+R site of ~130 spaces on the southwest side of Forgan Roundabout, approximately 2km south of the Tay Road Bridge. Transit to be provided by existing bus service route 99.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital cost of construction: £723,000</td></tr>
<tr><td>Annual operating cost: £40,100</td></tr>
<tr><td></td></tr>
<tr><td colspan="4">Background Information</td></tr>
<tr><td>Geographic Context:</td><td colspan="3">The proposal makes use of land south of the B995 at the Forgan Roundabout (intersection of the A92, A913 and B995). The site is currently farmland and there are two existing properties immediately north of the proposal, fronting on to the B995.
In addition to serving trips along the A92 the site can also be accessed from the B995 (Wormit, Newport-on-Tay) and the A914 (Leuchars, Cupar and St. Andrews).</td></tr>
<tr><td>Social Context:</td><td colspan="3">The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.</td></tr>
<tr><td>Economic Context:</td><td colspan="3">By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.</td></tr>
</table>

(Forgan Roundabout Site P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme is designed to attract existing car users travelling to Dundee via the A92 and the Tay Road Bridge. Charging structure (bus fares) likely to be most attractive to single occupancy vehicles
Maximise use of existing public transport capacity across Tay	P+R encourages modal shift & transfer from car to bus
Contribute to air quality targets	A net reduction in vehicle mileage from car to bus transfer should result in reduced emissions of CO_2.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.	P+R encourages modal shift & transfer from car to bus
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation
Rationale for Selection or Rejection of Proposal:	This proposal is recommended for STAG2 assessment on the basis of land availability and the economies of scale that may result if Fife Council pursues their household waste/recycling centre at or nears this location. Demand with 5 buses per hour to Dundee is likely to be strong.
Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £723,000 to construct. No parking charges are planned and as bus fares will be collected by the operator there will be no user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements.
Public:	This proposal has not been made public and the land not identified within the most recent of the Local Plan for this purpose. However, it is understood that Fife are currently investigated a number of possible uses for land in this area, for inclusion in the next draft of the Local Plan.

(Forgan Roundabout Site P+R Appraisal Summary table – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	+ +	A reduction in vehicle mileage (& hence CO2) from the diversion of 100 trips out of the City Centre to the P+R facility is forecast. There may be some increase in mileage from new trips generated or from existing bus users transferring to P+R. Air & water quality: No significant impacts Distributional impacts: there is a transfer of parking from Dundee City to green belt.
Safety:	+	Accident rates per passenger kilometre are lower for bus travel than car travel* and thus a transfer of trips from car to P+R (bus) would be expected to lead to a reduction in personal injury accidents. Personal security within the car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Bus Killed: 0.2; Bus KSI 7; Bus all personal injury accidents: 149 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	+ +	Highway impacts: The removal of 100 trips from the A92, Tay Bridge & Dundee City Centre — however this small reduction in trips will have a significant journey time saving for non bridge traffic in the CWD area. . Peak period queues on the approach to the Bridge will be reduced by this transfer of trips to P+R. Bus impacts: An additional bus stop at the P+R site will result in a minor journey time disbenefit for existing passengers on the route 99. However, the additional demand may stimulate higher frequency services which would benefit the new P+R passengers as well as existing bus users. Development impacts: : The transfer of parking spaces to the P+R site would allow redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities. Economic impacts: provision of a new transport facility enhances the accessibility of Dundee thereby assisting businesses and employment.
Integration:	+ +	Modal integration: the proposal is designed to enable car to bus interchange. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike – e.g. from Wormit or Newport-on-Tay – and continue the journey by bus. Encouraging journeys to be made by non-car modes integrates with local and national policies.

Accessibility & Social Inclusion:	+	Transport accessibility: The new transport facility broadens choice and option values. Social exclusion: The primary benefits are to car owners though site is also accessible by cycle. Bus passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the bus corridor.

B995 site adjacent to Primary School

7.25 This option is a variation on the Forgan Roundabout, but the site is located between the A92 and the B995, immediately north of the Primary School. It is approximately 1.5 kilometres south of the Tay Bridge Roundabout. Access to the site would be from a new link on to the A92.

7.26 The site would be served by the existing local bus service 99, and thus connections would be made with the centre of Dundee at a frequency of around 5 buses per hour. While the site is well located to attract trips from the A92, Leuchars and St. Andrews, potential users from Tayport and Newport-on-Tay would need to divert from the obvious routes to Dundee in order to access the site.

7.27 A P+R demand forecasting model has been used to predict potential demand from this site. The modelling indicates that, based on 2008 data, demand during the morning peak period would be around 95 vehicles.

Costs

7.28 Scheme costs have been developed using unit rates and an assumed site size of 130 spaces (see Table 7.11 and Table 7.12) but the ability to include up to 250 spaces within the initial land area. Given the small overall site size, in P+R terms, a basic facilities building has been included within the costings and therefore only limited allowance for staff supervision hours has been made. The demand forecasting was undertaken on the basis of P+R users paying for the bus transit, with no additional parking charge. No revenue stream would, therefore, exist to cover the revenue implications of operating the site. However, as noted for the appraisal of the Tay Bridge Roundabout site, it may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements.

Table 7.11 Capital costs

Item	Rate	Unit	Cost
Land Site clearance	£150	per space	£19,500
Regrading, landscaping	£224	per space	£29,120
Perimeter fence	£900	per space	£117,000
Electricity supply	£10,000	fixed	£20,000
Site access road	£130,000	fixed	£140,000
Waiting room, information office, public toilet			£20,000
Signs, fixed information displays	£10,000	fixed	£10,000
Car park drainage	£100	per space	£13,000
Car park surfacing	£1,260	per space	£163,800
Car park kerbing	£300	per space	£39,000
Footways and footpaths	£60	per space	£7,800
Car park lighting	£105	per space	£13,650
Car park markings	£20	per space	£2,600
CCTV cameras	£30,000	per camera	£90,000
Miscellaneous works	£100	per space	£13,000
Sub-total			**£678,470**

Item	Rate	Unit	Cost
Fees, design, preliminaries	15%		£101,770
Contingencies/risk	10%		£67,847
Total			**£848,087**

Table 7.12 Operating costs

Item	Rate	Units	Cost (£p.a.)
Site supervision and security	£10	per man hour	£6,240
Cleaning and maintenance	£10	per man hour	£4,160
Marketing	£2,000	fixed	£2,000
Publicity materials	£4,000	fixed	£4,000
Business rates*	£10,000	fixed	£0
Utilities	£8,000	fixed	£8,000
CCTV maintenance contract	£2,000	per camera	£6,000
Contingency	£9,700	Per site	£9,700
Total			**£40,100**

** Only apply if a facilities building is provided*

Table 7.13 B995 'Primary School' Site P+R Appraisal Summary table

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		Promoter: South East Scotland Transport Partnership (SEStran) Support: Tayside & Central Scotland Transport Partnership (TACTRAN)	
Proposal Name:	B995 'Primary School' Site P+R		
Proposal Description:	Creation of a P+R site of ~130 spaces between the A92 and the B995. Transit to be provided by existing bus service route 99.	Estimated Total Public Sector Funding Requirement:	Capital cost of construction: £848,000
			Annual operating cost: £40,100
Background Information			
Geographic Context:	The proposal makes use of land to the north of the Newport-on-Tay Primary School, between the A92 and the B995. Access would be from an enhanced junction on the A92, between the Tay Bridge Roundabout and Forgan Roundabout. The land is currently used for agriculture.		
Social Context:	The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.		
Economic Context:	By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.		

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme is designed to attract existing car users travelling to Dundee via the A92 and the Tay Road Bridge. Charging structure (bus fares) likely to be most attractive to single occupancy vehicles
Maximise use of existing public transport capacity across Tay	P+R encourages modal shift & transfer from car to bus
Contribute to air quality targets	A net reduction in vehicle mileage from car to bus transfer should result in reduced emissions of CO_2.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing bus users a well located site should result in a net reduction in private vehicle trips.
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation
Rationale for Selection or Rejection of Proposal:	This proposal is recommended for STAG2 assessment on the basis of land availability and demand with 5 buses per hour to Dundee is likely to be strong.

Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £848,000 to construct including site access road. No parking charges are planned and as bus fares will be collected by the operator there will be no user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements.
Public:	This site was identified for a possible P+R site in an earlier draft of the Local Plan. Following a number of objections the site was withdrawn from the current plan. Including this site in the appraisal process enables comparisons to be made with the alternative options.

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	+ +	A reduction in vehicle mileage (& hence CO2) from the diversion of 95 trips out of the City Centre to the P+R facility is forecast. There may be some increase in mileage from new trips generated or from existing bus users transferring to P+R. Air & water quality: No significant impacts Distributional impacts: there is a transfer of parking from Dundee City to green belt.
Safety:	+	Accident rates per passenger kilometre are lower for bus travel than car travel* and thus a transfer of trips from car to P+R (bus) would be expected to lead to a reduction in personal injury accidents. Personal security within the car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Bus Killed: 0.2; Bus KSI 7; Bus all personal injury accidents: 149 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	+ +	Highway impacts: The removal of 95 trips from the A92, Tay Bridge & Dundee City Centre – however this small reduction in trips will have a significant journey time saving for non bridge traffic in the CWD area. . Bus impacts: An additional bus stop at the P+R site will result in a minor journey time disbenefit for existing passengers on the route 99. However, the additional demand may stimulate higher frequency services which would benefit the new P+R passengers as well as existing bus users. Development impacts: The transfer of parking spaces to the P+R site would allow redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities. Economic impacts: provision of a new transport facility enhances the accessibility of Dundee thereby assisting businesses and employment
Integration:	+ +	Modal integration: the proposal is designed to enable car to bus interchange. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike – e.g. from Wormit or Newport-on-Tay – and continue the journey by bus. Encouraging journeys to be made by non-car modes integrates with local and national policies
Accessibility & Social Inclusion:	+	Transport accessibility: The new transport facility broadens choice and option values. Social exclusion: The primary benefits are to car owners though site is also accessible by cycle. Bus passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the bus corridor.

Increased parking space provision at Leuchars Rail Station

7.29 The existing Leuchars rail station, on the line between Edinburgh and Dundee, includes a free car park owned by Fife Council. The current car parking capacity is around 150 spaces. At peak times demand can approach this capacity with additional vehicles observed to be parked outside of marked bays.

7.30 The core train service on the Dundee to Edinburgh line was one train per hour supplemented by additional longer distance London and Cross Country services that also call at Leuchars. From December 2008 the core Edinburgh – Dundee service increased to 2 trains per hour in each direction. This service enhancement over time is likely to lead to increasing pressure on parking facilities at Leuchars, particularly as the higher frequency service is not available from the neighbouring Cupar station.

Demand forecasts

7.31 In order to estimate the increased parking pressure from the rail service enhancement a basic forecasting model has been built. This uses industry recognised demand elasticities to forecast the additional demand likely to be generated at Leuchars as a result of the frequency enhancement. The model is based on timetabled journey times, frequencies and required interchanges for journeys from Leuchars and uses existing demand data taken from the rail industry's 'Lennon' ticket sale database.

7.32 The forecasting exercise indicated the number of trips to and from Dundee could increase by around 15 percent, growth to and from Edinburgh would be around 5 percent with other origins/destinations less than this. However, with journeys to many destinations unaffected by the frequency increase, the overall growth forecast is only around 3 percent.

7.33 The forecasting exercise indicates that the additional capacity required at the car park as a result of the frequency increase is minimal. However, there are a number of reasons to believe that there is a requirement for parking capacity in excess of that predicted through the modelling:

- Site visits and anecdotal evidence has revealed that demand at the car park is already approaching supply at peak times
- The higher service frequency may attract customers who previously used other stations, such as Cupar, as neighbouring stations do not receive the higher service frequency that will benefit Leuchars; and
- Leuchars station also serves the larger urban area of St Andrews – the use of generic demand elasticities within the modelling may not accurately reflect the unique nature of this station's catchment.

7.34 Accordingly, the assessment of increasing the parking capacity at Leuchars has been based on the provision of an additional 100 spaces.

Costs

7.35 Cost estimates have been developed for a nominal 100 space increase in car park capacity. These will be broadly similar to those used for other assessments in this report, except that some fixed elements will be avoided as in this case the costs relate to a car park extension rather than a new stand alone feature.

7.36 With the existing station car park operated by Fife Council, and the rail services provided primarily by First ScotRail, there would be no direct funding stream to cover site operating costs. As with the

bus based P+R sites appraised in this section it may be possible, however, to secure a contribution towards all or some of the costs from First ScotRail.

Table 7.14 Capital costs

	Rate	Unit	Quantity	Cost
Land Site clearance	£150	per space	100	£15,000
Regrading, landscaping	£224	per space	100	£22,400
Perimeter fence	£900	per space	100	£90,000
Electricity supply	£20,000	fixed	1	£20,000
Car park drainage	£100	per space	100	£10,000
Car park surfacing	£1,260	per space	100	£126,000
Car park kerbing	£300	per space	100	£30,000
Footways and footpaths	£60	per space	100	£6,000
Car park lighting	£105	per space	100	£10,500
Car park markings	£20	per space	100	£2,000
CCTV cameras	£30,000	per camera	2	£60,000
Miscellaneous works	£100	per space	100	£10,000
Sub-total				**£401,900**
Fees, design, preliminaries (15%)	15%			£60,285
Contingencies/risk (10%)	10%			£40,190
Total				**£502,375**

Table 7.15 Operating costs per annum

	Rate	Units	Cost (£p.a.)
Site supervision and security	£10	per man hour	£3,120
Cleaning and maintenance	£10	per man hour	£4,160
CCTV maintenance contract	£2,000	per camera	£2,000
Total			**£9,280**

Table 7.16 Expansion of parking facilities at Leuchars Rail Station

<table>
<tr><td colspan="4">Proposal Details</td></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Promoter: South East Scotland Transport Partnership (SEStran)
Support: Tayside & Central Scotland Transport Partnership (TACTRAN)</td></tr>
<tr><td>Proposal Name:</td><td>Expansion of parking facilities at Leuchars Rail Station</td><td></td><td></td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Expansion of parking facilities at Leuchars Rail Station. Number of formalised spaces increases by 100. Services to Dundee (& Edinburgh) provided by First ScotRail.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant: £502,000</td></tr>
<tr><td>Annual revenue support: £9,300</td></tr>
<tr><td></td></tr>
<tr><td colspan="4">Background Information</td></tr>
<tr><td>Geographic Context:</td><td colspan="3">Additional car parking to be provided southeast of Station Road. Access to be provided directly from Station Road. The site is currently used as farmland.</td></tr>
<tr><td>Social Context:</td><td colspan="3">The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.</td></tr>
<tr><td>Economic Context:</td><td colspan="3">Increased parking provision allows the station to fulfil a P+R role, attracting users from origins in Fife (particularly St. Andrews), and serving destinations within Dundee, Edinburgh and elsewhere. The increased parking provision would have minimal implications for the economy in its immediate vicinity.</td></tr>
</table>

(Expansion of parking facilities at Leuchars Rail Station – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme is designed to attract existing car users to switch to rail for part of their journey. The charging structure (rail fares) is likely to be most attractive to single occupancy vehicles. However, existing travel patterns suggest that most rail journeys from Leuchars are towards Edinburgh and thus the impact on the Tay Road Bridge will be minimal.
Maximise use of existing public transport capacity across Tay	P+R encourages modal shift & transfer from car to bus
Contribute to air quality targets	Reduction in vehicle mileage from car to rail mode shift should result in reduces emissions of CO2
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.	P+R aims to encourage mode shift from car to rail for part of the journey. Although P+R can cause some switch from existing rail (or bus) users a well located site should result in a net reduction in private vehicle trips.
Minimise the impact on the natural and built environment	Expanding the station car park can have an adverse impact on the environment that needs to be carefully managed through design and implementation
Rationale for Selection or Rejection of Proposal:	This proposal is recommended for STAG2 appraisal. The anecdotal evidence of a shortfall in parking capacity, combined with the likely increased demand that will occur as a result of the service frequency increase due to occur during 2008, means that the provision of additional capacity needs to be considered comprehensively.

Implementability Appraisal	
Technical:	Provision of an enhanced car park is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	The benefits of the car park come from the transfer of trips from road to rail and thus the continued provision of rail services from the station is essential. These services are not part of the proposal and thus are subject to their continued commercial viability. Should services not meet requirements then the success of the site could be compromised or additional costs incurred in providing additional transit services to the key destination(s).
Financial:	New car park is estimated to cost £502,000 to construct. Annual operating costs of £9,300 are forecast. Parking at this station is currently free and thus no funding stream will exist to contribute towards capital and operating costs.
Public:	The draft of the most recent St Andrews and East Fife Local Plan has made an allocation of land to the south of the station for the purposes of expanding the parking facilities at the station.

(Expansion of parking facilities at Leuchars Rail Station – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	+	There will be a small reduction in vehicle mileage (& hence CO2) from trips diverted from car to rail There could be an increase in mileage from trips that are diverted away from more local stations Air & water quality: No significant impacts Distributional impacts: transfer of parking from Dundee and Edinburgh City Centres to Leuchars station.
Safety:	+	Accident rates per passenger kilometre are lower for rail travel than car travel* and thus a net transfer of highway mileage from car to P+R (rail) would be expected to lead to a reduction in personal injury accidents. Personal security within the station and car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Rail Killed: 0.1; Rail injured: 12 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	++	Traffic impacts: a small net reduction in trips on the Tay Bridge and in Dundee City Centre would be expected. Some additional trips will occur around Leuchars town. Rail impacts: a small growth in rail passenger numbers would be expected. The additional demand may assist in supporting the planned higher frequency services. Development impacts: transfer of parking spaces to Leuchars Station would allow redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities. Economic impacts: provision of a new transport facility enhances the accessibility of Dundee thereby assisting businesses may allow redevelopment of some parking spaces in Dundee. Some passengers may transfer from existing bus routes, making these less economic.
Integration:	++	Modal integration: Increased parking capacity enables additional car to rail interchange.

Accessibility & Social Inclusion:	+	Transport accessibility: enhanced parking facilities broaden transport choice and option values. Social exclusion: benefits are for car owners. Rail passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the rail corridors.

Increased parking space provision at Cupar Rail Station

7.37 Cupar station is in the centre of the town of Cupar and had a limited number of formal parking spaces that were charged at the rate of £1 day and £4 per week. An adjacent piece of open ground formed an informal extension to the car park that was not subject to the charging regime.

7.38 First ScotRail agreed with the franchise funder, Transport for Scotland that the car park should be quadrupled in size (from around 25 formalised spaces to 100 spaces - now completed) and the charging regime extended to cover the new larger area. This used up the available land for an at grade car park at Cupar station. A package of wider improvements was also part of the car park enhancement scheme.

7.39 In the light of the First ScotRail initiative we have appraised the Cupar scheme for comparative purposes with an extension at Leuchars. It should be noted that Cupar station is not due to benefit from the increase in service frequency planned for Leuchars station.

Table 7.17 Expansion of parking facilities at Cupar Rail Station

<table>
<tr><td colspan="4">Proposal Details</td></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Promoter: First ScotRail
Support: South East Scotland Transport Partnership (SEStran)</td></tr>
<tr><td>Proposal Name:</td><td>Expansion of parking facilities at Cupar Rail Station</td><td></td><td></td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Expansion and formalisation of parking facilities at Cupar Rail Station. Number of formalised spaces increases from ~25 to ~100. Services to Dundee (& Edinburgh) provided by First ScotRail.</td><td rowspan="3">Estimated Total Public Sector Funding Requirement:</td><td>Capital costs/grant: Unknown</td></tr>
<tr><td>Annual revenue support: Unknown</td></tr>
<tr><td>NA</td></tr>
<tr><td colspan="4">Background Information</td></tr>
<tr><td>Geographic Context:</td><td colspan="3">Additional car parking to be provided within the existing boundaries of Cupar Rail Station. An area of wasteland, currently used for informal parking by rail passengers, will be incorporated in to the car park with the formalisation process increasing the number of spaces available.</td></tr>
<tr><td>Social Context:</td><td colspan="3">The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not fall within any of these areas.</td></tr>
<tr><td>Economic Context:</td><td colspan="3">Increased parking provision allows the station to fulfil a P+R role, attracting users from origins in Fife and serving destinations within Dundee, Edinburgh and elsewhere. It is believed that the increased parking provision would have minimal implications for the economy in its immediate vicinity.</td></tr>
</table>

(Expansion of parking facilities at Cupar Rail Station – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme could encourage some existing users of the Tay Road Bridge to switch to rail for trips to Dundee. However, existing travel patterns suggest that most rail journeys are towards Edinburgh and thus the impact on the Tay Road Bridge will be minimal. As station users will have to pay parking charges in addition to their rail fares the charging structure is less likely than other options to be particularly attractive to single occupancy vehicles.
Maximise use of existing public transport capacity across Tay	Enhanced parking capacity will enable greater use of rail services from Cupar Station, though impact on Tay crossing is expected to be slight.
Contribute to air quality targets	Reduction in vehicle mileage from car to rail mode shift should result in reduced emissions of CO_2
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.	Enhanced parking facilities can enable a transfer of trips from road to rail
Minimise the impact on the natural and built environment	The expansion to the station car park makes use of waste ground within the station boundary. Redevelopment is likely to enhance the built environment.
Rationale for Selection or Rejection of Proposal:	This proposal is developed out with the current STAG assessment exercise. Therefore as outturn costs and a commercial package has been agreed in principle, appraisal at STAG2 level is not recommended
Implementability Appraisal	
Technical:	Provision of increased car parking spaces is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	The car park would continue to be operated by first ScotRail and thus they would retain any operational risks that may exist.
Financial:	This option is subject to a separate submission and thus details of the financial arrangements have not been sought. It is noted that as parking at Cupar station is charged at rates of £1 per day and £4 per week, a small revenue stream will be created to finance operating costs and, potentially, financing the capital cost.
Public:	The proposal, combined with plans for step free access to both platforms, has been made public.

(Expansion of parking facilities at Cupar Rail Station – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	+	There will be a small reduction in vehicle mileage (& hence CO2) from trips diverted from car to rail Air & water quality: No significant impacts Distributional impacts: transfer of parking from Dundee and Edinburgh City Centres to Cupar station.
Safety:	+	Accident rates per passenger kilometre are lower for rail travel than car travel* and thus a net transfer of highway mileage from car to P+R (rail) would be expected to lead to a reduction in personal injury accidents. Personal security within the station and car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Rail Killed: 0.1; Rail injured: 12 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	+	Traffic impacts: a small net reduction in trips on the Tay Bridge and in Dundee City Centre would be expected The transfer of parking spaces to the P+R site would allow redevelopment of some City Centre parking spaces. There would be a small increase in traffic volumes in Cupar town centre. Economic impacts: provision of a new transport facility enhances the accessibility of Dundee thereby assisting businesses and employment. Rail impacts: a small growth in rail passenger numbers would be expected. The additional demand may assist in supporting higher frequency services in the future. Development impacts: transfer of parking spaces to Cupar Station would allow redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities. Economic impacts: provision of a new transport facility enhances the accessibility of Dundee thereby assisting businesses Some passengers may transfer from existing bus routes, making these less economic.
Integration:	+	Modal integration: Increased parking capacity enables additional car to rail interchange.
Accessibility & Social Inclusion:	+	Transport accessibility: enhanced parking facilities broaden transport choice and option values. Social exclusion: benefits are for car owners. Rail passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the rail corridors.

New Wormit Rail Station

7.40 The new Wormit Rail Station has been discussed by Fife Council and SEStrans over a number of years. The station would be located at the west end of Wormit village on the Dundee to Edinburgh Rail line (engineers line reference SCL2) at approximately 56 miles and 12 chains from Edinburgh Waverley on the site reserved in the draft local plan

7.41 The Tay Estuary Rail Study 2003 examined the business case for a station at Wormit in conjunction with improvements to local train services in the Dundee and Tay Estuary areas. With one train per hour, a station at Wormit was forecast to generate revenue of circa £100,000 per annum but operating costs were included within the wider service improvements proposed. This assessment did not include appraisal of the new housing discussed above. However it was clear that this option was not economically viable.

Table 7.18 Station Capital Costs

	Rate	Unit	Quantity	Cost
Land acquisition at 'development' rates	£300,000	Sum	1	£300,000
Site clearance	£10,000	Sum	1	£10,000
Regrading, landscaping	£7	Sq. Metre	4000	£28,000
Relocation of S&T cables and ducting	£50,000	Sum	1	£50,000
Perimeter fence - whole site inc car park	£180	Linear metre	600	£108,000
Enabling/civils works	£100,000	Sum	1	£100,000
Platforms, end ramps, shelter/building bases	£155	Sq. Metre	1280	£198,400
Platform and footbridge lighting	£2,000	Light	30	£60,000
Shelter	£18,000	Sum	1	£18,000
Booking office / waiting room	£140,000	Sum	1	£140,000
Fence to rear of platform	£55	Linear metre	320	£17,600
Station signs, seats / litter bins / fixed display boards	£15,000	Sum	1	£15,000
PA, CIS and telephone installations	£100,000	Sum	1	£100,000
Electricity supply	£20,000	Sum	1	£20,000
Miscellaneous works	£30,000	Sum	1	£30,000
Sub-total				**£1,195,000**
Fees, design, preliminaries (25%)	25%			£298,750
Contingencies/risk (15%)	15%			£179,250
Delivery and site costs	£100,000	Sum	1	£100,000
Possessions	£500,000	Sum	1	£500,000
Total				**£2,273,000**

Table 7.19 Station Car Park Capital Costs

	Rate	Unit	Quantity	Cost
Land	£100	per space	100	£10,000
Site clearance	£50	per space	100	£5,000

	Rate	Unit	Quantity	Cost
Regrading, landscaping	£224	per space	100	£22,400
Perimeter fence	£180	Linear metre	0	£0
Electricity supply	£20,000	fixed	0	£0
Car park drainage	£100	per space	100	£10,000
Car park surfacing	£1,260	per space	100	£126,000
Car park kerbing	£300	per space	100	£30,000
Footways and footpaths	£60	per space	100	£6,000
Car park lighting	£105	per space	100	£10,500
Car park markings	£20	per space	100	£2,000
CCTV cameras	£30,000	per camera	2	£60,000
Miscellaneous works	£100	per space	100	£10,000
Sub-total				**£291,900**
Fees, design, preliminaries (15%)	15%			£43,785
Contingencies/risk (10%)	10%			£29,190
Total				**£364,875**

7.42 The combined cost estimate of the new station and car park is, therefore, around £2.6 million.

7.43 Annual operating costs for the station and car park have also been prepared. These assume that the station is staffed for one shift per day and that there is one train per hour each way on 363 days.

Table 7.20 Station and car park annual operating costs

	Rate	Unit	Quantity	Cost (£p.a.)
Station maintenance	£15,000	Sum	1	£15,000
Staffing	£43,500	Sum	1	£43,500
Access charges per annum (363 days)	£2.00	per train stop	13,068	£26,136
Other variable costs (BTP, National Train Enquiries, ATOC, etc)	£20,000	Sum	1	£20,000
Other fixed costs	£10,000	Sum	1	£10,000
Total				**£114,636**

Table 7.21 Wormit Railway Station Appraisal Summary table

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		Promoter: South East Scotland Transport Partnership (SEStran) Support:: Tayside & Central Scotland Transport Partnership (TACTRAN) and First ScotRail	
Proposal Name:	Wormit Railway Station	Name of Planner:	Trond Haugen, SEStran
Proposal Description:	Creation of a new rail station at Wormit on the Dundee to Edinburgh rail line. Transit to destinations (e.g. Dundee & Edinburgh) would be provided by existing First ScotRail services.	Estimated Total Public Sector Funding Requirement:	Capital – £2,638,000 Revenue – £115,000 p.a.
Funding Sought From: (if applicable)	Transport for Scotland/Fife Council capital funds; revenue funds through ScotRail franchise and ticket sales.	Amount of Application:	£2,638,000 (revenue through rail franchise process)
Background Information			
Geographic Context:	The preferred location of the new station is at the west end of Wormit, adjacent to the B4411 road and the Dundee to Edinburgh rail line. The station site is approximately 150 metres from the Tay Estuary and 250 metres from the former Tay Bridge South Station. The site is level on what is currently agricultural land. An existing underpass would be used in lieu of a station footbridge.		
Social Context:	The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not fall within any of these areas.		
Economic Context:	In view of the alternative transport modes available – bus and car via the Tay Road Bridge – it would not be anticipated that there would be significant economic impacts for Wormit.		

(Wormit Rail Station Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Scheme is aimed at attracting existing car users travelling to Dundee via the Tay Road Bridge. Charging structure (rail fares) likely to be most attractive to single occupancy vehicles
Maximise use of existing public transport capacity across Tay	P+R encourages modal shift & transfer from car to bus
Contribute to air quality targets	Reduction in vehicle mileage should result in reduces emissions of CO_2
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.	The new station would encourage some existing car drivers to shift from car to rail for all or part of their journey. However, there are existing bus services from the Wormit area and hence it is likely that the station would also result in a shift from bus to rail and thus the sustainability benefits could be diluted.
Minimise the impact on the natural and built environment	New station could have an adverse impact on the environment that needs to be carefully managed through design and implementation
Rationale for Selection or Rejection of Proposal:	The station will only be served by one train per hour in each direction and the local hourly Newport to Dundee bus service. This will not generate significant P+R demand. Local demand will be constrained by location of the station at the west end of the Newport on Tay and Wormit built up area.

(Wormit Rail Station Appraisal Summary table – continued)

Implementability Appraisal	
Technical:	Provision of a new station with associated car park is an established technique without untried technologies. Good design to Railway Group Standards GI/RT7016 and RIS-7700-INS will ensure compliance with ensure a station compliant with current standards is built. Network Rail in its role as network operator would approve the final design and construction. If the station were to be added to Network Rail's regulated asset base the station would be maintained to contemporary standards. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose. The site is adjacent to the Firth of Tay & Eden Estuary Special Area of Conservation, The Tay Estuary RAMSAR environmental control site which will require good design and a watching brief being undertaken for any adverse environmental issues during construction. The site would be expected to have an environmentally friendly drainage system and appropriate mitigation for any adverse environmental impacts.
Operational:	Continued operation of the site will depend upon the ongoing provision of rail services from the new station. These services are not part of the proposal and thus are subject to their continued commercial viability and passenger franchise renewal. It is possible that the station would initially operate under the 'experimental service' provisions which essentially allow a three/five year market testing period for a new service. Should services not meet requirements then the success of the site could be compromised or additional costs incurred in providing additional train services to the key destination(s). It should be noted that the train service on the Dundee to Edinburgh line will be increased to 2 trains per hour in each direction from December 2008 but the additional trains would not call at Wormit due to timetabling issues.
Financial:	New station and car park is estimated to cost £2,638,000 to construct. This would provide a two platform station, booking office and waiting shelters. This cost assumes that a nearby underpass is used for passenger transfer between the two platforms and no dedicated station footbridge would be provided. Station car parking at a cost of £364,875 per 100 spaces would be provided for the station. The Tay Estuary Rail study (2003/2005) assessed the demand at Wormit station to generate revenue of circa £100,000 pa thus leaving an operational revenue shortfall against the forecast annual operating costs. No parking charges are planned (as with the existing edge of town station at Leuchars and in accordance with SEStran/Fife Council policies) and as the rail fares will be collected by the operator there will be no user funding stream to cover capital or operating costs unless the rail operator becomes the station facility owner under a station lease from Network Rail. Capital funding would need to be found from the SEStran, Fife or Transport for Scotland transport capital allocations. Revenue funding would come from fares if the ScotRail franchisee became SFO and if required Transport for Scotland Revenue support through the ScotRail franchise could be used to support the operation of the station if a sound economic case but not a financial case could be made.
Public:	This proposal has been made public through inclusion of the station site in Draft St. Andrews and North East Fife local plan. The landowner is aware of this designation of the site in the local plan and it is thought by council officers that a Compulsory Purchase Order under section 189 of the Town and Country Planning (Scotland) Act 1997 would not be needed.

(Wormit Rail Station Appraisal Summary table – continued)

Government's Objectives for Transport		
Objective	Assessment Summary	Supporting Information
Environment:	0	A reduction in vehicle mileage (& hence CO2) from car to rail transferred trips would benefit the environment. However, vehicles from the A92 would need to access the site along the local B946 road. An increase in mileage from generated/modal shift trips may occur but is unlikely to be great due to the location of the site remote from the A92. Air & water quality: No significant impacts expected but site is close to Tay Estuary RAMSAR site Distributional impacts: transfer of parking from Dundee City to surrounding town.
Safety:	+	Accident rates per passenger kilometre are lower for rail travel than car travel* and thus a net transfer of highway mileage from car to P+R (rail) would be expected to lead to a reduction in personal injury accidents. Personal security within the station and car park site would be enhanced through suitable lighting levels along with a CCTV system. * Accident rates per billion passenger kilometres (2005): Rail Killed: 0.1; Rail injured: 12 Car Killed: 2.6; Car KSI 23; Car all personal injury accidents: 275
Economy:	0	Traffic impacts: a small net reduction in trips on the Tay Bridge and in Dundee City Centre would be expected. Some additional trips will occur on the B496. Rail impacts: a small growth in rail passenger numbers would be expected. The additional demand may assist higher service frequencies in the future, though the additional stop for rail services will add a small delay for existing rail passengers. Development impacts: transfer of parking spaces to the P+R site may allow redevelopment of some City Centre parking spaces. Some passengers may transfer from existing bus routes, making these less economic.
Integration:	0	It would be possible to access the new station by walking and cycling modes. As the station site is remote from the A92 little car to rail integration would be expected.
Accessibility & Social Inclusion:	+	Transport accessibility: new transport facility broadens choice and option values particularly for Wormit residents. Rail passenger growth may stimulate higher frequency services which will benefit existing and potential new passengers along the rail corridor. Additional stop will increase journey times of existing passengers on the line and transfer of passengers from bus services may result in lower bus frequencies.

8 Conclusions from STAG 1 Appraisal

Discussion

8.1 The STAG1 appraisal is designed to identify a limited number of options for further assessment in the STAG 2 appraisal. STAG2 is designed to provide detailed a deliverability assessment of each intervention.

8.2 The STAG1 outputs show that a P+R / park and choose site at the Tay Bridge Roundabout site has a good likelihood of success due to the high frequency of bus services available and the ease with which a site at this location could attract car drivers. However, the site is limited in size and therefore will be subjected to detailed assessment of parking demand in the STAG2 process to ascertain if demand could be catered for at this location.

8.3 As the appraisal of scheme options needs to reflect a deliverable scheme, subsequent work on the costs and benefits of the schemes restricts demand at the Tay Bridge Roundabout site to that which can be accommodated by a 130 space site. Thus, all subsequent output reflects demands at the Tay Bridge Roundabout site capped to 130 vehicles.

8.4 As a result of the STAG 1 process which identified the Bridgehead area as having the highest user demand potential, two other site locations in the vicinity of the Tay Bridge Roundabout were also considered: the existing Bridge Board car park site and land to the south east of the roundabout. Discussions established that the existing car park functions as a tourist related activity is still required and an innovative design would thus be required to incorporate any P+R site in this vicinity. Site investigations also revealed that there is land to the south east of the roundabout which could be suitable for P+R development. The land is elevated above the A92 and roundabout – and geology – the solid rock base would result in the requirement to link the existing car park site and the south east site by way of a pedestrian bridge. Detailed examination of these options are the subject of a paper apart entitled 'Landfall Site Tay Road Bridge Joint Board Discussion Paper Option Review' dated 20th March 2009 and its findings have informed the STAG 2 process in this report.

8.5 These sites would be served by the greatest number of existing local buses and thus connections would be made with destinations such as Dundee centre, Ninewells Hospital, Leuchars and St. Andrews. The combined bus frequency to the key destination of Dundee City Centre would be 7 buses per hour during the peak.

8.6 The proposed P+R site at Forgan Roundabout (A92) should be subject to more detailed assessment on the basis that the site at the Tay Bridge Roundabout site is constrained in size and if successful it is likely that a further P+R site for strategic traffic on the A92 would be needed. This proposal is recommended for STAG2 assessment on the basis of land availability and the economies of scale that may result if Fife Council pursues plans for a possible household waste/recycling centre at or nears this location. Demand with 5 buses per hour to Dundee is likely to be strong.

8.7 Likewise the B995 'Primary School' site should also be given further consideration, due to its closer location in towards the bridgehead.

8.8 An extension of the car park at Leuchars station is supported on the basis of the current observed under provision of car parking at the station and the growth plans that Fife Council and others are pursuing in the St Andrews area.

8.9 The scheme to expand the car park at Cupar station has been completed and therefore further assessment is not required.

8.10 The proposal for a new rail station at Wormit is not recommended for further appraisal at this point in time. Low train (and bus) frequency suggest the market for this station would be local in nature and whilst resulting in a reduction in car trips from the Wormit and Newport on Tay areas to Dundee the proposal offers limited attractiveness to other drivers using the Tay Bridge due to the location of the site and the low quality links to the A92 road. On the basis of data in the Tay Estuary 2003 Rail Study an operating revenue loss is predicted which would require additional subsidy from Transport for Scotland. However, it is recommended that the current site designation in the draft local plan is retained due to the possibility of further housing growth in the Wormit and Newport on Tay areas that may feature in a revised draft local plan.

8.11 The option of a strategic P+R at the intersection of the A92 and the Edinburgh to Dundee rail line was shown to be a less positive option that the extensions to car parks at existing stations and therefore not recommended for further appraisal. The observations of Network Rail and First ScotRail that an hourly train service could be provided suggest that demand from the markets envisaged for this option would be low.

Conclusion from STAG1 Appraisal

8.12 The following interventions have been assessed against the STAG 1 appraisal criteria and deemed to be appropriate for STAG Part 2 Appraisal.

- Tay Bridge Roundabout/Landfall Site P+R Site
- Forgan Roundabout (A92) P+R Site
- Site adjacent to the Primary School off the B995
- Leuchars Railway Station Car Park Extension

9 Demand Forecasting

Overview

P+R forecasting

9.1 Following the initial demand forecasting work undertaken for STAG Part 1, forecasts has been revisited to better reflect the strategy proposed for P+R and the planned future changes in land uses within the Dundee area. The forecasts now include additional demand to the Ninewells Hospital and Western Gateway areas. These were omitted from the earlier work due to the limited coverage of the base traffic model used within the PRIDE P+R modelling process.

9.2 The revised forecasting approach used here has also made use of earlier forecasting work, which was undertaken by Buchannan's and based on the Transport Model for Scotland. Originally future year matrices reflected National Road Traffic forecasts, adjusted using the National Trip End Model (TEMPRO) for the Dundee region. These growth factors show only small levels of growth within future year matrices. Future year growth in trips – and hence P+R forecasts – now include the land use changes contained within the Transport Model for Scotland. These forecasts reflect localised changes in land use and are thus include the most location specific information currently available. Whilst accepting that these forecasts are at best a proxy measurement they are considered robust due to the application of local knowledge and professional scrutiny.

9.3 The final element of modification to the forecasts is the disaggregation of journeys from Fife. These changes do not alter the overall forecast demand but instead provide additional detail on the origins of trips in order that the impacts of their switch to P+R may be better understood and appraised.

9.4 The disaggregation of trips within the Fife area made use of data collected from vehicles using the Tay Road Bridge. This data revealed the trip origins of users of the crossing, and thus additional zones were created for journeys from Fife, enabling the disaggregation of trips in the PARAMICS model shown to be using the Tay Road Bridge. Cost data for these movements – journey time and distance – were obtained from the AA on-line route planning software[1].

9.5 The disaggregation process enables estimates to be made of the impact of changes in journey patterns in response to interventions such as a new P+R site. Estimates of changes such as vehicle journey distance are required within the STAG2 appraisal in order to investigate the impacts of proposals on planning objectives and against STAG criteria.

Rail forecasting

9.6 The provision of additional parking facilities at a station would not, in itself, usually stimulate additional demand unless, as at Leuchars from December 2008, a frequency increase has been made to improve the relative attractiveness of rail travel. It has been indicated, however, that existing parking capacity at Leuchars is approaching capacity a car park extension could lead to increased demand. Analysis of data on capacity utilisation at Leuchars, and comparison with a similar unconstrained station car park could enable an estimate to be made of the level of suppressed demand. The only available data on Leuchars Station car park utilisation – from a survey 22 February 2007 – failed to indicate demand in excess of capacity. This is likely to be due the initial expansion to the car park that occurred immediately prior to this date. More recent visits during the course of the study found 15-20 vehicles parked on the roadside outside the station and the car park nearing the current parking capacity.

[1] http://www.theaa.com/

9.7 An increase in rail service frequency at Leuchars Station occurred during December 2008 and it expected to result in increased demand for rail travel and therefore parking requirements. The demand forecasts used within the appraisal of this station capacity option therefore relate to the expected increase in rail patronage at the station as a result of the enhanced frequencies. The forecasts have been produced by using standard rail industry demand elasticities.

9.8 The forecasting methodology used is covered in Chapter 7 in relation to the STAG1 appraisal. In view of the low level of demand indicated by these forecasts further, more detailed, work has not been undertaken for the STAG2 appraisal. It should be noted that while the forecasts for additional rail demand at Leuchars show only 30 extra person trips per day, the appraisal is undertaken of the provision of an additional 100 spaces. This is so capacity may better reflect the existing average and peak requirements that are believed to occur at this location.

Results

9.9 The results of the forecasting exercises are reported in Table 9.1 and Table 9.2. For the bus based options peak period (up to 0930) demand forecasts are made, with these results factored for all day results that are in turn annualised. The rail forecasting methodology results in an all day demand that is disaggregated to provide a peak period flow.

9.10 Results are provided for two forecast years – 2012 and 2022. The year 2012 is assumed to be the opening year of the facility with 2022 chosen as the Transport Model for Scotland future year, from which the growth forecasts are taken for this Paramics based modelling exercise. The 2012 opening year results indicate full demand while experience more generally with P+R indicates that there is a delay in the take up of a new facility. Accordingly, the appraisal process includes a ramping up period where forecast demand is factored by 50% in the first year, followed by 75%, 90% and then 100% in the fourth and subsequent years.

Table 9.1 Summary of site option one way demand forecasts (2012)

	Tay Bridge Roundabout/ Landfall site*	Forgan Roundabout	Primary School	Leuchars Station
Person trips				
Morning peak period	230	178	188	22
All day	**310**	**240**	**254**	**30**
Annual	96,749	74,890	79,218	9,424
Vehicle trips				
Morning peak period	185	143	151	18
All day	**249**	**193**	**204**	**24**
Annual	77,820	60,159	63,628	7,509

* Note capacity at Tay Bridge Roundabout site is less than forecast demand

Table 9.2 Summary of site option one way demand forecasts (2022)

	Tay Bridge Roundabout/ Landfall site*	Forgan Roundabout	Primary School	Leuchars Station
Person trips				
Morning peak period	293	228	241	70
All day	**396**	**308**	**325**	**96**
Annual	123,566	95,991	101,455	30,157
Vehicle trips				
Morning peak period	233	182	192	58
All day	**315**	**245**	**259**	**77**
Annual	98,327	76,478	80,854	24,029

* Note capacity at Tay Bridge Roundabout site is less than forecast demand

9.11 The forecasts shown in Table 9.1 and Table 9.2 reflect the true demand for a P+R service from each location, irrespective of the availability of sufficient capacity at the location. For the Tay Bridge Roundabout site the maximum capacity that can be provided is estimated to be in the region of 130 vehicles – well short of the future year demands at this location. At a constrained capacity of 130 vehicles annual demands equate to 40,560 vehicles or 50,418 person trips.

9.12 As the appraisal of scheme options needs to reflect a deliverable scheme, subsequent work on the costs and benefits of the schemes restricts demand at the site to the west of the Tay Bridge Roundabout to that which can be accommodated by a 130 space site. Thus, all subsequent output reflects demands at the Tay Bridge Roundabout site capped to 130 vehicles and in reality is taken forward for academic comparison purposes only.

10 STAG 2 Appraisal

Overview

10.1 Five scheme options have been derived from the STAG Part 1 appraisal to examine in greater detail in Part 2, these are:

- Tay Road Bridge Roundabout P+R Site
- Forgan Roundabout (A92) P+R Site
- Site adjacent to the Primary School off the B995
- Landfall site P+R (immediately east of Tay Bridge Roundabout)
- Leuchars Railway Station Car Park Extension (see comments in para 10.6)

10.2 Note that the Landfall site is based on the same demand forecasts as the Tay Bridge Roundabout location, but as the Landfall site is not capacity constrained the appraisal results differ between these two options. Whilst the existing car park does have a capacity constraint due to size and topography, the site to the south can accommodate in the region of > 500 spaces at ground level and as such currently would have no capacity constraints. A separate technical report will be issued for the Landfall sites/proposals.

10.3 Each scheme is examined against both the Local Transport Planning Objectives, established in Section 5, and the National STAG criteria. Results are reported for demands in an opening year of 2012 and a future year of 2022.

Appraisal against Transport Planning Objectives

Reduce the number of single occupancy vehicle trips on the Tay Road Bridge

10.4 It was noted within the STAG1 appraisal that the method of charging assumed for the P+R sites – bus/rail fares and thus on a per person basis – was likely to appeal primarily to car users with none or few passengers. However, the demand forecasting model used calculates generalised costs for vehicles using an average occupancy and thus does not distinguish between single occupancy vehicles and those with passengers.

10.5 For this appraisal a range of results have therefore been reported – the most prudent end of the scale assumes that the P+R sites are only successful in attracting vehicles with average levels of single occupancy, while the most optimistic assumes that all forecast users are single occupancy vehicles.

10.6 The results (Table 10.1 and Table 10.2) indicate that the Forgan Roundabout, Primary School and Landfall sites are likely to achieve the targeted reduction in single occupancy vehicles of 5 percent with the Tay Bridge Roundabout site only likely to be close to achieving the targeted reduction if it succeeds in attracting above average proportions of single occupancy vehicles. With the majority of the demand at Leuchars travelling towards Edinburgh, the impact on the Tay Road Bridge crossings is negligible and thus not reported in the tables in this section. However for completeness the Leuchars Station option is included in the ongoing deliberations within this report, accepting that in its self it does not meet the planning objectives of the study.

Table 10.1 Cross Tay single occupancy vehicle reduction (peak period) 2012

	Tay Bridge Roundabout	Forgan Roundabout	Primary School site	Landfall site
'Existing' vehicle trips	3,426			
P+R demand	130	143	151	185
Cross Tay SOV proportion	76.0%			
'Existing' SOV trips	2,604			
Likely minimum SOV P+R demand	99	109	115	140
New Cross Tay trips	2,505	2,495	2,489	2,464
Likely minimum SOV reduction	3.8%	4.2%	4.4%	5.4%
Maximum SOV reduction	5.0%	5.5%	5.8%	7.1%
New cross Tay SOV range	72.2% - 76.0%	71.8% - 76.0%	71.6% - 76.0%	70.6% - 76.0%

Table 10.2 Cross Tay single occupancy vehicle reduction (peak period) 2022

	Tay Bridge Roundabout	Forgan Roundabout	Primary School site	Landfall site
'Existing' vehicle trips	3,638			
P+R demand	130	182	192	233
Cross Tay SOV proportion	76.0%			
'Existing' SOV trips	2,765			
Likely minimum SOV P+R demand	99	138	146	177
New Cross Tay trips	2,666	2,627	2,619	2,587
Likely minimum SOV reduction	3.6%	5.0%	5.3%	6.4%
Maximum SOV reduction	4.7%	6.6%	6.9%	8.4%
New cross Tay SOV range	72.4% - 76.0%	71.0% - 76.0%	70.7% - 76.0%	69.6% - 76.0%

Maximise use of existing public transport capacity across the Tay

10.7 The provision of P+R facilities should assist in increasing the usage of existing cross Tay public transport capacity. For all the bus based options the existing and forecast capacity utilisation is shown in Table 10.3 and Table 10.4, along with the increase from existing and thus the extent to which the option meets the planning objective target. For the rail option – Leuchars car park extension – the impact on cross Tay Road Bridge capacity utilisation will be minimal as around 90 percent of the demand travels towards Edinburgh.

10.8 With all three of the bus options the additional demand on the bus services as a result of the P+R facility results in a substantial increase in capacity utilisation – greater than the target set for this planning objective. The percentage point increases at the Forgan Roundabout, Primary School and Landfall sites in 2022 – over 33% - suggest that additional bus capacity is likely to be required.

Table 10.3 Public transport utilisation (morning peak period) 2012

	Tay Bridge Roundabout	Forgan Roundabout	Primary School site	Landfall site
P+R one way person trips	162	178	188	230
'Existing' cross Tay one way bus trips	350			
Existing capacity utilisation	50%			
New capacity utilisation	73%	75%	77%	83%
Percentage point utilisation increase	23%	25%	27%	33%

Table 10.4 Public transport utilisation (morning peak period) 2022

	Tay Bridge Roundabout	Forgan Roundabout	Primary School site	Landfall site
P+R one way person trips	163	228	241	293
'Existing' cross Tay one way bus trips	350			
Existing capacity utilisation	50%			
New capacity utilisation	73%	83%	84%	92%
Percentage point utilisation increase	23%	33%	34%	42%

Contribute to national air quality targets

10.9 In order to contribute to national air quality targets a planning objective to reduce vehicle emissions was set. The target associated with this objective was to reduce private vehicle mileage on cross Tay journeys in to Dundee by 5 percent. Existing mileages of vehicles within this category were estimated using traffic flows and average trip lengths as described in Chapter 5 of this report. Using the modelled data of revised trip patterns the change in vehicle mileage is estimated as shown in Table 10.5 and Table 10.6.

10.10 With P+R demand at the Forgan Roundabout, Primary School and Landfall sites not restricted by the site size the vehicle kilometre reduction is greater than the requirement set at up to 9.1% (Forgan Roundabout site, 2022). With the Leuchars site mainly attracting trips towards Edinburgh, the impact on cross Tay trips is minimal. However, by way of comparison, the total vehicle kilometres saved, predominantly on journeys towards Edinburgh, is calculated to be of the order of 3,400.

Table 10.5 Change in cross Tay to Dundee vehicle trip kilometres (all day trips) 2012

8.2%	Tay Bridge Roundabout	Forgan Roundabout	Primary School site	Landfall site
Vehicle kilometres saved	1,414	2,981	2,635	2,714
Average one way trip length	10.56			
Vehicle crossings of bridge (0700-1900)	18,088			
Dundee CC proportion of all bridge crossings	21%			
Existing vehicle kilometres	39,467			
Vehicle kilometre reduction	3.6%	7.6%	6.7%	6.9%

Table 10.6 Change in cross Tay to Dundee vehicle trip kilometres (all day trips) 2022

	Tay Bridge Roundabout	Forgan Roundabout	Primary School site	Landfall site
Vehicle kilometres saved	1,414	3,790	3,349	3,429
Average one way trip length	10.56			
Vehicle crossings of bridge (0700-1900)	19,205			
Dundee CC proportion of all bridge crossings	21%			
Existing vehicle kilometres	41,722			
Vehicle kilometre reduction	3.4%	9.1%	8.0%	8.2%

Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift.

10.11 This planning objective was set as noted in chapter 5, though no measurable target was set. All the P+R options are based on attracting new public transport demand from car to public transport and thus meet this objective. The Forgan Roundabout option attracts the greatest number of vehicle trip kilometres with the Landfall site attracting the greatest number of trips. The Leuchars car park expansion results in the greatest reduction in highway trip mileage due to the introduction of not only the half hourly train service but also the "fast service" to Edinburgh, thus attracting car trips/kilometres form a previous greater trip/journey length distance per day. .

Minimise impacts scheme upon the natural and built environment

10.12 New P+R sites can have an adverse impact on the environment that needs to be carefully managed through design and implementation. All the sites being appraised make use of existing open space and thus some negative impact on the natural environment would be expected.

10.13 The proximity of sensitive receptors (residential properties) to the Tay Bridge Roundabout site means that adverse noise, air quality and visual amenity factors may need to be mitigated against. The Forgan Roundabout site is not believed to pose any significant environmental concerns and is largely remote from residential dwellings, though the landscape classification of 'upland foothills' is not as conducive to development as the 'urban' category of the Tay Bridge Roundabout site. The car park extension at Leuchars will have some adverse impact on the environment as it will make use of agricultural land. It will, however, be remote from existing residential properties – the closest are on Meteor Row, separated from the car park extension by the existing car park and the A919.

Appraisal against STAG Criteria

Introduction

10.14 A detailed assessment of each of the four options against the STAG criteria is presented below.

Environment

10.15 JMP Consultants has previously undertaken a desktop study to inform the environmental section of a Scottish Transport Appraisal Guidance (STAG) Part Two Assessment for the Cross Tay Sustainable Transport Study. The full Environmental Report, entitled *"Cross Tay Sustainable Transport Study – Environmental Report*", (document reference B085023-M R.001, Rev. /dated 29th April 2008) was produced as a stand-alone technical report. (It should be noted that the

Environmental STAG 2 appraisal work for the Landfall Site is included in a paper apart entitled 'The Landfall Site, Tay Road Bridge Discussion Paper, Option Review dated 20th March 2009.)

For each site, in accordance with STAG methodology, the following parameters have been assessed:

- Noise and vibration
- Air quality
- Water quality, drainage and flood defence
- Geological features
- Biodiversity
- Visual amenity
- Agriculture and soils
- Cultural heritage
- Landscape

10.16 A summary of each site's environmental "*footprint*" is presented below.

Noise

10.17 Due to the absence of detailed traffic information for each site, a comprehensive noise assessment was not conducted in JMP Report *"Cross Tay Sustainable Transport Study – Environmental Report*", (document reference B085023-M R.001, Rev. /dated 29th April 2008). Similarly, no on-site noise monitoring was conducted. In accordance with STAG methodology, the necessity of a WebTAG 3.3.2 noise assessment must be established at the earliest opportunity.

10.18 In general terms, it is considered that the Tay Bridge Roundabout site may present the greatest concern in terms of noise nuisance to nearby sensitive receptors. Out of the three sites considered, this location places a noise source in closest proximity to a number of residential properties. Therefore, this site may give the greatest potential for noise complaints.

10.19 However, as no comprehensive noise assessment was conducted, the potential noise impact of each site cannot be defined in detail at this stage.

Air quality

10.20 Due to the absence of detailed traffic information for each site, a comprehensive air quality assessment was not conducted in JMP Report *"Cross Tay Sustainable Transport Study – Environmental Report*", (document reference B085023-M R.001, Rev. /dated 29th April 2008). In accordance with STAG methodology, the necessity of a WebTAG 3.3.3 air assessment must be established at the earliest opportunity.

10.21 The desktop study established that (at the time of writing the cited JMP Report) none of the proposed sites were within an Air Quality Management Area (AQMA).

10.22 Similar to noise, the Tay Bridge Roundabout site may present the greatest concern in terms of air pollution to nearby sensitive receptors. Out of the all sites considered, this location places a source of air pollution in closest proximity to a number of residential properties. Therefore, this site may give the greatest potential for impacts upon air quality.

10.23 However, as no comprehensive air quality assessment was conducted, the potential air impact of each site cannot be defined in detail at this stage.

Water quality, drainage and flood defence

10.24 Fife contains "*one of the most highly productive bedrock aquifers in Scotland… The Devonian Sandstone Aquifer*" (British Geological Survey Commissioned Report CR/01/250). After studying freely available mapping, JMP conclude that water run off from the Forgan Roundabout site and the Leuchars Station expanded car park proposal may pose a greater risk to groundwater quality than the Tay Bridge Roundabout site or the Landfall sites.

10.25 It is evident, from the Scottish Environment Protection Agency (SEPA) Indicative River and Coastal Flood Map, that all sites have a flood risk of lower than 0.5% in any given year. However, through verbal correspondence, JMP are aware that the Leuchars Station car park site may be prone to flooding.

10.26 It must be noted that the scale of the mapping available was not conducive to detailed site assessment. In order to conduct a WebTAG 3.3.11 study, in accordance with STAG requirements, it may be necessary to obtain detailed site specific information. This information, due to its detail, may be different to that presented in this Report, and the cited JMP Report.

Geological features

10.27 The STAG guidance states that at the Strategic Level, the geology section should identify "those sites of particular geological importance (designated sites) or significant mineral reserves" that the proposed development site may affect. In particular, at this level of assessment, Sites of Special Scientific Interest (SSSI), and Regionally Important Geological Sites (RIGS) should be identified.

10.28 From an analysis of the data freely available (at the time of writing the cited JMP Report), JMP concluded that none of the sites were within the immediate vicinity of a SSSI or RIGS.

Biodiversity

10.29 In accordance with STAG guidance, at the Strategic Level designated sites (Special Areas of Conservation, Special Protection Areas, National Nature Reserves and Sites of Special Scientific Interest) should be identified.

10.30 From an analysis of the data freely available (at the time of writing the cited JMP Report), the Tay Bridge Roundabout site is within the vicinity of the Firth of Tay and Eden Estuary, a "*Special Area of Conservation*" (SAC). The SAC boundary is limited to the estuary, therefore at this stage the site is not expected to have an impact upon this. However, further scoping may identify the need for further assessment. Further biodiversity assessment should be conducted in accordance with WebTAG 3.3.10 guidance.

10.31 The Forgan Roundabout and Leuchars Station sites were not identified, at the time of writing the cited JMP Report, as being within the vicinity of any designated sites.

Visual amenity

10.32 In accordance with STAG Strategic Level guidance, a subjective assessment to identify key views and impacts upon sensitive receptors was made. It was evident from this assessment that the Tay Bridge Roundabout site may have the greatest visual impact. This is due to the proximity to the site of several sensitive receptors.

Agriculture and soils

10.33 Through development plans and development control under the Town and Country Planning (Scotland) Act 1972, a number of controls have been put in place to limit development on prime agricultural land (land classified as 1, 2, or 3.1). In accordance with STAG the "*Macaulay Land*

Use Research Institute Agricultural Land Classification Maps" should be consulted for this element of the Appraisal.

10.34 The "*Land Capability Agricultural Classification"* for specific sites were verbally obtained from Fife Council. The classifications are listed below:

- Tay Bridge Roundabout site – Unclassified
- Landfall site (car park unclassified) site opposite 3.2
- Forgan Roundabout site – Land Classification – 3.2
- Leuchars Station site – Land Classification – 2

10.35 It can be concluded that development at the Leuchars Station and Landfall sites will have the greatest impact upon agriculture and soils. At 3.2, land at Forgan roundabout is not classified as 'prime agricultural land' whilst the Tay Bridge Roundabout site does not make use of agricultural land.

Cultural heritage

10.36 From an analysis of freely available information (at the time of writing the cited JMP Report) no cultural heritage sites were identified at any of the sites.

Landscape

10.37 To assess the landscape characteristics of each site, reference was made to the "*Fife Landscape Character Assessment*" (1999). From analysis of mapping contained within this document it was concluded that each site had the following classification:

- Tay Bridge Roundabout site – Urban
- Landfall-Urban
- Forgan Roundabout site – Upland Foothills
- Leuchars Station site – Coastal Flats

Conclusion

10.38 It is evident from Table 10.7, presented below, that, from a desktop based study, JMP conclude that the Tay Bridge Roundabout site, followed by the Leuchars Station site may have the greatest impact upon the environment. The Forgan Roundabout site, at this stage, is considered by JMP to have the least impact upon the environment.

Table 10.7 Summary of Environmental Effects

Parameter	Potential For Greatest Impact
Noise and vibration	Tay Bridge Roundabout
Air quality	Tay Bridge Roundabout/Landfall
Water quality, drainage and flood defence	Leuchars Station
Geological features	/
Biodiversity	Tay Bridge Roundabout
Visual amenity	Tay Bridge Roundabout
Agriculture and soils	Leuchars Station
Cultural heritage	/
Landscape	/Landfall

10.39 However, the above statement must be treated with caution, as in accordance with STAG, it may be considered necessary to conduct further, more detailed assessments particularly if planning consent is being applied for. These further assessments may lead to qualification of the results recorded in this report.

Safety

Accidents

10.40 The STAG2 guidance requires consideration to be given to changes in the number of transport related accidents as a result of the scheme options. If measurable changes to accident numbers and/or severity are identified as important impacts of an option then use should be made of established methodologies to aid the quantification of road traffic accidents. This is particularly relevant to the site to the west of the Tay Road Bridge where mitigation measures may prove difficult if not impossible due to the requirement to have buses stopping adjacent to a roundabout.

10.41 The following 'Economy' section identifies quantified reductions in highway vehicle trip distances as a result of all the options being appraised and thus there is some potential that numbers and severity of accidents may reduce slightly as a result. However, small changes to vehicle speeds are also possible as a result of the reduced vehicle demands and these can lead to increased accident rates. The models used for this study are unable to show these changes to the small reductions in highway demand and thus a complete quantitative appraisal of the safety implications would not be possible. It is for this reason that the most prudent approach, of not claiming safety benefits as a result of any of the options, is being adopted here.

Security

10.42 All the P+R site options being considered within this appraisal would be designed to high standards of safety and security for people and property. The provision of CCTV cameras for coverage of the parking area is included in all the costings of the options – helping to ensure that all the sites are secure.

10.43 Where it is claimed that a scheme is able to deliver significantly different levels of security to those prevalent in the Do Minimum option the STAG2 guidance requires a quantitative appraisal of the changes. In this instance the security measures envisaged are required to ensure that individuals' personal security does not deteriorate as a result of interchanging at the P+R site, or property security be affected by leaving a car parked at a remote location. As such no specific security enhancements over the Do Minimum scenario are envisaged.

Economy

Introduction

10.44 A detailed assessment of the economic impacts of the scheme has been undertaken. The Transport Economic Efficiency analysis is presented below.

10.45 An overview of the likely Wider Economic Benefits or Economic Activity and Location Impacts indicated that these are likely to be minimal for all the sites and, therefore, a detailed assessment has not been undertaken at this stage.

Transport Economic Efficiency

10.46 The direct transport benefits from each of the four scheme options has been assessed through an evaluation of:

- P+R User benefits
- Non-user (dis)benefits
- Revenue impacts
- Capital Costs; and
- Operating Costs

P+R User Benefits

10.47 There are direct economic benefits associated with those users who choose to use the P+R facilities as an alternative to private car travel. These benefits can be measured through comparing the generalised cost of their previous journey by private car with the generalised cost of their new journey utilising the P+R site.

10.48 Generalised cost is made up of the following elements:

- Journey time from origin to destination
- Interchange penalties for changing mode during the journey (e.g. from private car to bus)
- Wait times
- Walk times (e.g. from private car parking to final destination)
- Vehicle operating costs associated private car use
- Charges (e.g. bus fares or private car parking charges)

10.49 Each of the above elements is either already expressed in monetary values or can be translated into a value using values of time. This then allows a single generalised cost value to be generated for each origin – destination pair by both private car and by P+R. The difference between these values not only determines the proportion of people who will choose to switch to using the P+R sites (e.g. demand) but also the economic value that they will gain through doing so.

10.50 The P+R user benefits have therefore been forecast for each of the four sites by assessing the changes in generalised costs. The results (summarised in Table 10.8 and Table 10.9) show that the largest generalised time savings per user are achieved at the Tay Bridge Roundabout and Landfall sites. However, the greater usage of the unconstrained Landfall site results in far higher annual monetary values than the Tay Bridge Roundabout sites. The low level of additional demand at the Leuchars site means that overall benefits remain lower than the bus based options.

Table 10.8 Value of user benefits 2012

Site	P+R users. AM peak period person trips	Generalised time saving (mins. Per person)	Annual monetary value (£'000s)
Tay Bridge Roundabout	162	8.63	48.83
Forgan Roundabout	178	2.99	25.12
Primary School	188	1.86	16.58
Leuchars Station	22	4.08	5.16
Landfall site	230	8.63	93.68

Table 10.9 Value of user benefits 2022

Site	P+R users. AM peak period person trips	Generalised time saving (mins. per person)	Annual monetary value (£'000s)
Tay Bridge Roundabout	163	18.36	122.29
Forgan Roundabout	228	12.72	159.56
Primary School	241	11.54	153.00
Leuchars Station	22	4.08	6.01
Landfall site	293	18.36	254.71

Non-User impacts

10.51 There are two sets of non-users who will be affected by the P+R scheme:

- Private car users on the Tay Road Bridge and car and bus users in Dundee City Centre in relation to non TRB trips and accrued journey time savings; and
- Existing bus users on services that will be diverted into the P+R site.

10.52 In the case of the Leuchars station car park extension it is assumed that the additional rail passengers do not result in any disbenefits for existing rail travellers.

10.53 Private car users on the Tay Road Bridge and in Dundee City Centre are likely to benefit from the P+R scheme as it will result in fewer private car vehicles – reducing congestion and improving average journey times. This effect was tested within DCC's traffic model and the results included within the appraisal process.

10.54 The DCC highway trip modelling was based on a reduction of 257 vehicles in the two hour peak period. This resulted in a journey time reduction of seven seconds for inbound highway trips within the inner ring road and on the Tay Road Bridge. The appraisal process uses a pro-rata approach to including this non-user benefit, based on the most recent forecasts for P+R demand at each site. The approach also reduces the benefits accrued in future years, in line with forecast general traffic growth.

10.55 It is assumed that the benefits of the congestion reduction only occur on weekdays and during the morning and evening highway peak periods. As the Leuchars Station car park extension option is forecast to have only a very small impact on Tay Road Bridge and Dundee City Centre trips, no non-user benefit has been estimated for this option.

10.56 In 2012 the number of Tay Road Bridge (non P+R user) trips benefiting from the reduced congestion in the two hour morning peak period – taken from DCC's modelling – is in the region of 3,300 (Table 10.10). For the Landfall site the factored journey time saving is 4.9 seconds, resulting in annual savings of £23,000. Increasing usage of the site and rising values of time result in an annual benefit of £32,600 by 2022 (Table 10.11).

Table 10.10 Value of non-user benefits 2012 – Tay Road Bridge

Site	'Non-user' trips (AM peak period)	Average one way journey time saving (sec)	Annual journey time savings (mins.)	Annual monetary value (£'000s)
Tay Bridge Roundabout	3,296	3.4	140,237	16.5
Forgan Roundabout	3,283	3.8	153,476	18.0
Primary School	3,275	4.0	161,919	19.0
Landfall site	3,242	4.9	195,997	23.0

Table 10.11 Value of non-user benefits 2022 – Tay Road Bridge

Site	'Non-user' trips (AM peak period)	Average one way journey time saving (sec)	Annual journey time savings (mins.)	Annual monetary value (£'000s)
Tay Bridge Roundabout	3,508	3.2	136,794	18.7
Forgan Roundabout	3,456	4.5	188,253	25.7
Primary School	3,446	4.7	198,426	27.1
Landfall site	3,404	5.8	238,401	32.6

10.57 In 2012 the number of Dundee City Centre (non P+R user) trips benefiting from the reduced congestion in the two hour morning peak period – taken from DCC's modelling – is in the region of 12,100 (Table 10.12). For the Tay Bridge Roundabout site the factored journey time saving is 3.4 seconds, resulting in annual savings of £60,600. Although the assumed journey time saving is less by 2022, rising values of time mean that the annual monetary value rises to £68,600 (Table 10.13). Greater usage of the other bus based sites results in greater journey time savings and thus annual monetary values.

Table 10.12 Value of non-user benefits 2012 – other highway trips

Site	'Non-user' trips (AM peak period)	Average one way journey time saving (sec)	Annual journey time savings (mins.)	Annual monetary value (£'000s)
Tay Bridge Roundabout	12,130	3.4	516,053	60.6
Forgan Roundabout	12,130	3.8	566,976	66.6
Primary School	12,130	4.0	599,673	70.4
Landfall site	12,130	4.9	733,424	86.1

Table 10.13 Value of non-user benefits 2022 – other highway trips

Site	'Non-user' trips (AM peak period)	Average one way journey time saving (sec)	Annual journey time savings (mins.)	Annual monetary value (£'000s)
Tay Bridge Roundabout	12,878	3.2	502,233	68.6
Forgan Roundabout	12,878	4.5	701,472	95.8
Primary School	12,878	4.7	741,609	101.3
Landfall site	12,878	5.8	901,873	123.2

10.58 The second group of non-users affected are those who already use the existing bus services that will be utilised by the P+R. The journey time for some of these users will be affected by the fact that the buses will be diverted off the main road into the P+R site. Whilst this may not add a large amount of time to each individual trip the cumulative affect across users and over time can be significant. It is assumed that the additional demand at Leuchars station does not result in any additional delay for existing rail users.

10.59 Overall demand data has not been provided by the operators, however an indicative forecast was provided that suggested that, on average, buses crossing the Tay Bridge carry around 25-35 passengers. Using this value it has been feasible to provide an outline assessment of the number of existing bus passengers who will travel on services that will be diverted into the P+R sites. This obviously differs depending upon the location of the site. An assumption has also been made that bus services continue to serve the site throughout the course of the day, although in reality a lower frequency could be employed.

10.60 In addition an assessment of the likely increase in journey times has been undertaken based on the requirement to access the P+R site, load/unload and egress the site. This has been based on the remoteness of the individual sites from the existing bus routes. The Leuchars Station option is not affected as it is a rail-based option.

10.61 The greater diversion and hence delay made by the existing buses to The Forgan Roundabout and Primary School sites results in greater non user disbenefits than the Tay Bridge Roundabout site despite the greater number of bus passengers affected by the Tay Bridge Roundabout site (Table 10.14 and Table 10.15). Disbenefits are greatest at the Landfall site due to the assumed one minute delay combined with a large number of existing bus services affected.

Table 10.14 Value of non-user disbenefits 2012

Site	'Non-user' Bus Trips Affected (All Day)	Average one way Journey Time Increase (sec)	Annual Journey Time Increase (min)	Annual monetary value (£'000s)
Tay Bridge Roundabout	937	20*	97,468	10.9
Forgan Roundabout	669	60	208,859	23.4
Primary School	669	60	208,859	23.4
Landfall site	937	60	292,403	32.8

Table 10.15 Value of non-user disbenefits 2022

Site	'Non-user' Bus Trips Affected (All Day)	Average one way Journey Time Increase (sec)	Annual Journey Time Increase (mins)	Annual monetary value (£'000s)
Tay Bridge Roundabout	1,057	20*	109,882	14.4
Forgan Roundabout	755	60	235,461	30.8
Primary School	755	60	235,461	30.8
Landfall site	1,057	60	329,645	43.1

* This figure of 20 seconds is based on the assumption that a bus stop could be provided on the roundabout. In reality permission for this from Transport Scotland would not be forthcoming on road safety grounds.

Revenue Impacts

10.62 The P+R scheme is likely to have two impacts upon revenue streams:

- Bus and rail revenues; and
- Dundee City (plus Edinburgh City in the case of the Leuchars option) car parking revenues which in the case of Dundee is offset by the potential for the redevelopment of some City Centre parking spaces. The current estimate of land value in the CWD area is estimated at £1M per acre, notwithstanding the income from land rates and the benefits of which accrue from employment/commercial opportunities. In the case of Edinburgh there is existing suppressed demand that would fill 'spaces' which in reality would result in no loss of revenue to Edinburgh Council from its parking revenue.
- Economic impacts: provision of a new transport facility enhances the accessibility of Dundee, better enabling the build out of the CWD and thereby assisting businesses and employment.

10.63 At present it is assumed that there will be no charge for using the P+R site itself, rather the revenue will be generated through bus or rail fares. Given the impact upon city centre parking revenue there is likely to be a distribution effect between local government and private sector operators, as much as an overall change in revenue generation.

10.64 Additional bus revenue has been calculated based on an assumed £2.50 return fare and the forecast number of P+R users. Extra rail revenue is based on the weighted average of return rail fares to Dundee and Edinburgh (£16.83).

10.65 With P+R fares standardised across the bus based option the revenue generated is directly linked to demand – thus the Landfall site generates the highest revenues in both 2012 and 2022 (

10.66 Table 10.16 and Table 10.17). It is notable that while the Leuchars option results in only a limited increase in demand, 2012 revenues are comparable with the other options due to the significantly higher rail fares on this longer distance journey.

Table 10.16 Revenue generated 2012

Site	P+R Users (AM Peak period, person trips)	Return Fare	Total Annual Revenue (£'000s)
Tay Bridge Roundabout	162	2.50	170.2
Forgan Roundabout	178	2.50	187.2
Primary School	188	2.50	198.0
Landfall site	230	2.50	241.9
Leuchars Station	22	16.83	158.6

Table 10.17 Revenue generated 2022

Site	P+R Users (AM Peak period, person trips)	Return Fare	Total Annual Revenue (£'000s)
Tay Bridge Roundabout	163	2.50	172.0
Forgan Roundabout	228	2.50	240.0
Primary School	241	2.50	253.6
Landfall site	293	2.50	308.9
Leuchars Station	22	16.83	158.6

10.67 For the bus based options the reduction in City Centre parking revenue has been based upon the reduced number of vehicle trips into Dundee and an average car parking charge taken from the PRIDE P+R model. For the rail option the average parking charge for Edinburgh (£7.99) is also used with the weighted average charge for the two centres calculated as £7.54.

10.68 The highest P+R demand levels are associated with the greatest loses in Dundee parking revenue, and thus the Landfall site results in the greatest revenue loss (Table 10.18 and Table 10.19). However it is considered that the development potential in reducing the car parking capacity in Dundee on a pro rata basis would far outweigh this theoretical loss of revenue.

Table 10.18 Revenue lost 2012

Site	P+R Users (AM Peak period, vehicle trips)	Average parking charge	Total Annual Revenue (£'000s)
Tay Bridge Roundabout	130	4.81	263.1
Forgan Roundabout	143	4.90	294.9
Primary School	151	4.89	310.9
Landfall site	185	4.81	374.0
Leuchars Station	18	7.54	56.6

Table 10.19 Revenue lost 2022

Site	P+R Users (AM Peak period, vehicle trips)	Average parking charge	Total Annual Revenue (£'000s)
Tay Bridge Roundabout	130	5.77	315.8
Forgan Roundabout	182	5.86	448.4
Primary School	192	5.84	472.5
Landfall site	233	5.77	567.1
Leuchars Station	18	7.54	56.6

10.69 Comparing the tables for the revenue generated and revenue lost highlights that there is a net loss of revenue as a result of the lower user charges associated with the bus based P+R options. This loss is directly related to the difference in user charges between City Centre parking and the P+R user charge, and thus higher demand levels result in greater financial loses. As the user charge for the Leuchars option is higher than the average parking charge foregone, there is a net gain in financial revenues.

10.70 In terms of revenue allocation, Dundee City Council, who are responsible for much of the off-street parking in Dundee from which P+R users transfer, would receive reduced parking charge revenues. However, they would have the opportunity to reallocate land currently used for car parking spaces to other purposes or to avoid the costs of providing additional parking capacity required in future years. The bus operating companies will gain revenue. For the rail based option, there is a transfer of revenues from the parking authorities (predominantly in Edinburgh) to the rail operator.

Capital Costs

10.71 The capital costs used in the STAG part 1 assessment of options have been reworked to reflect the demands used in this stage 2 assessments. Including contingencies and optimism bias the costs for the Forgan Roundabout and Primary School sites are in the order of £2 million, with the smaller Tay Bridge Roundabout site around half this figure.

10.72 Table 10.20) and the larger and more complex Landfall site costed at £2.8 million. The simpler Leuchars car park extension is estimated to cost around £0.6 million.

Table 10.20 Capital costs (current prices)

Site	Site capacity created	Contingency	Optimism Bias	Total Capital Costs (£'000)
Tay Bridge Roundabout	130	10%	25%	903.9
*Forgan Roundabout	275	10%	25%	1,790.0
Primary School	275	10%	25%	1,946.3
+Landfall site	411	10%	25%	2,803.4
Leuchars Station	100	10%	25%	635.5

*These costs are in relation to a 275 space car park at Forgan Roundabout as opposed to the STAG 1 which costed for a 130 space car park (which would not have met demand forecast.)

+ The Landfall Site (the preferred option as reported in the paper apart entitled 'Landfall Site Tay Road Bridge Discussion Paper Option Review' dated 20th March 2009.)

10.73 Forgan Roundabout Capital costs

Item	Rate	Unit	Cost
Land Site clearance	£150	per space	£41,250
Regrading, landscaping	£224	per space	£61,600
Perimeter fence	£900	per space	£247,500
Electricity supply	£20,000	fixed	£20,000
Site access road – 340m	£118,000	fixed	£118,000
Waiting room, information office, public toilet			£160,250
Signs, fixed information displays	£10,000	fixed	£10,000
Car park drainage	£100	per space	£27,500
Car park surfacing	£1,260	per space	£346,500
Car park kerbing	£300	per space	£82,500
Footways and footpaths	£60	per space	£16,500
Car park lighting	£105	per space	£28,875
Car park markings	£20	per space	£5,500
CCTV cameras	£30,000	per camera	£180,000
Bus Turning Head	£40,000	fixed	£40,000
Miscellaneous works	£100	per space	£27,500
Sub-total			£1,413,475

Item	Rate	Unit	Cost
Fees, design, preliminaries	15%		£212,021
Contingencies/risk	10%		£163,549
Total			£1,789,045

10.74 An appraisal over a 60 year period would usually include renewal costs for infrastructure. However, the primary construction involved with all of the options being appraised here is a car park. As car parks would require renewal works – resurfacing – a number of times during a 60 year period the renewal costs have been included within the annual maintenance costs that are itemised below.

10.75 Residual values are considered to be limited for all options, and will relate only to prepared land values which constitute a small proportion of overall costs (a maximum of around £25,000 when discounted to 2004 prices).

Operating and Maintenance Costs

10.76 The operating and maintenance cost of each of the schemes has also been assessed through the STAG part 1 assessment. Table 10.21 below presents a summary of these costs. Included within the costs is a 10% contingency value along with an optimism bias allowance. A rate of 20% has been used for the optimism bias within the economic appraisal, in-line with the level of detail of the cost forecasts at this stage.

10.77 Operating cost savings are also assumed through the reduction in need for parking provision within Dundee (and in the case of the Leuchars option, also Edinburgh). Operating cost savings have been estimated at the same rates as used for the additional costs, but without the contingency and optimism bias factors. These are notional amounts used for direct comparison of the scheme options.

Table 10.21 Operating costs

Site	Contingency	Optimism Bias	Total Operating Costs (£'000)	Net Operating Costs (£'000)
Tay Bridge Roundabout	10%	20%	40.1	9.7
Forgan Roundabout	10%	20%	40.1	9.7
Primary School	10%	20%	40.1	9.7
Landfall site	10%	20%	40.1	9.7
Leuchars Station	10%	20%	12.2	3.0

TEE Summary

10.78 The analysis of all the direct transport costs and benefits of the schemes have been aggregated to provide an overall assessment of each scheme option. All values are discounted to 2004 prices.

10.79 The results of the TEE analysis indicate that all the P+R options deliver a positive NPV result (Table 10.22). The net present values of the Tay Bridge Roundabout, Forgan Roundabout and Primary Scholl sites are similar at around £2.7 million. Slightly perversely, the lower demand for P+R at the Tay Bridge Roundabout site compared with Forgan Roundabout, Primary School and Landfall site options, means that this site delivers a higher BCR of around 1.89:1. However, it is notable that user and non-user benefits achieved by the Tay Bridge Roundabout site are lower than those at the other bus based sites as a result of the capacity restrictions at this site. The Landfall site also offers almost double the Net Present Value of any of the other schemes.

Table 10.22 Transport Economic Efficiency (£'000s)

Element	Tay Bridge Roundabout	Forgan Roundabout	Primary School	Landfall site	Leuchars Station
PV Revenue P+R	£2,486	£4,522	£4,780	£5,780	£3532
PV Revenue CC Car Park	-£2,341	-£4,273	-£4,503	-£5,341	-£1261
Indirect Tax	-£222	-£587	-£521	-£520	-£685
PV of User Benefits	£2,496	£3,103	£2,948	£5,938	£150
PV of Non-user benefits	£1,525	£1,874	£2,020	£2,206	0
PV of Operating Costs	-£470	-£470	-£470	-£470	-£60
PV of Capital Costs	-£715	-£1,415	-£1,540	-£2,171	-£494
PV Value of Costs to Public Accounts	**-£3,112**	**-£5,584**	**-£5,811**	**-£7,051**	**-£2,157**
Net Present Value (NPV)	**£2,758**	**£2,753**	**£2,713**	**£5,421**	**£1,183**
Benefit Cost Ratio (BCR)*	**1.89 : 1**	**1.49 : 1**	**1.47 : 1**	**1.77 : 1**	**1.55 : 1**

* The Benefit Cost Ratio is a measure of present value per £ invested. Benefit-Cost ratio = Net present value divided by the cost to Government. A benefit-cost ratio (BCR) is an indicator, used in the formal discipline of cost-benefit analysis, which attempts to summarise the overall value for money of a project or proposal.

A major shortcoming of BCRs is that, by definition, they ignore non-monetised impacts. Attempts have been made to overcome this limitation by combining BCRs with information about those impacts that cannot be expressed in monetary terms, such as for example, the environment and or carbon footprinting.

A further complication with BCRs concerns the precise definitions of benefits and costs. These can vary depending on the funding agency. This is witnessed by including the cost to government a sum of money lost through fuel tax and loss of parking revenue to local authorities.

10.80 The higher unconstrained demand for P+R at the Landfall site, and the high level of accessibility offered for trips to Dundee, means that this site delivers the highest net present value: £5.5 million.

10.81 The benefit of the Leuchars station car park extension primarily stems from the difference in rail fare revenue gained over the parking revenue lost on the longer distance movement between Leuchars and Edinburgh. Although the BCR of the Leuchars station car park extension is comparable with the bus based options, the net present value is less than half those of the bus based options as a result of the lower forecast additional demand for this option.

Integration

Transport interchanges

Services and ticketing

10.82 As the options appraised in this report all make use of existing public transport services there are no issues concerning services integration. Furthermore, it is not proposed that any parking charge is levied at any of the potential P+R sites and hence there are no ticketing integration issues.

Infrastructure and information

10.83 The infrastructure and information implications are included within the economic assessment.

Land-use transport integration

10.84 All of the options being appraised at this level show a high level of integration with land use policies. This integration occurs at all levels from Scottish national policies through to the local plans covering Fife and Dundee areas.

10.85 The Scottish National transport Strategy sets high level objectives for transport in Scotland's Transport Future. The P+R options will assist in the requirement to increase the accessibility of the transport network and protect the environment and improve public health through building and investment in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy.

10.86 The P+R options will contribute to the key strategic outcomes, notably tackling congestion and the lack of integration and connections in transport which impact on high level objectives for economic growth, social inclusion, integration and safety. Furthermore high level objectives for protecting the environment and improving health will be met through the reduction of emissions forecast for the options, tackling the issues of climate change, air quality and health improvement.

10.87 The National Transport Strategy aims to ensure that the infrastructure and incentives are in place so that bus operators improve services to hold on to current passengers and achieve modal shift from cars. The Tay Bridge Roundabout, Forgan Roundabout, Primary School and Landfall sites all assist in this aim by providing high quality interchange infrastructure that caters for all modes of transport including cycling and walking, suitable for visitors and commuters. The infrastructure is forecast to increase public transport ridership which could in turn potentially benefit existing passengers through future enhancements in service frequency.

10.88 The Fife Structure Plan safeguards through the Tay Bridge Roundabout site option appraised here. safeguards land at 'all rail stations for future platform extensions, improved facilities and parking' – this clearly accords with the Leuchars Station car park extension option.

10.89 The Dundee and Angus Structure Plan (2001-2016) aims to promote and enhance an efficient, attractive and sustainable transport system through Local, Regional and Local Transport Strategies/Plans. Their support for measures that improve facilities for public transport and promote

the enhancement of integration and convenience between different modes of transport accords with all the options appraised.

10.90 Requirements of the Local Plans for East Fife and Dundee are more specific and support the objectives of the 5 options specifically in relation to 'Maximising the efficient use of the Tay crossing through supporting increased modal shift to public transport and car share'. In addition, improved public transport provision including development at Leuchars railway station is also identified in the East Fife Local Plan. Dundee's support for transport developments in neighbouring authorities' areas fits with the options being appraised – it is noted that these are supported where they provide modal interchange facilities and new or upgraded rail facilities along with the enhancement of existing service levels provided by train operators.

Policy integration

Disability

10.91 All of the P+R options considered within this STAG 2 appraisal would be constructed with specific provision made for disabled parking, in addition to the general parking provision. The Leuchars Station option may require a review of the existing level demand for designated spaces for Blue Badge Holders, with any additional spaces required provided close as is practically possible to the station entrance.

10.92 Bus service 99, representing around 50 percent of the service frequency at the Tay Bridge Roundabout and Landfall sites and all services from the Forgan Roundabout and Primary School sites, is operated by low floor accessible vehicles. The other services at the Tay Bridge Roundabout and Landfall sites (42, 72 and 96) are not operated by accessible vehicles.

10.93 Leuchars station is accessible to the disabled through a ramped overbridge to the single island platform. Step free access is also available at Dundee and Edinburgh Waverley stations, with lifts to all platforms at Dundee and level access to all platforms at Edinburgh.

10.94 By its nature P+R can be considered a disbenefit for the disabled, in that it requires the user to interchange between one transport mode and another. For the disabled this may present a considerable inconvenience. However, as the facilities being appraised offer alternative travel options, rather than a replacement that existing travellers would be required to use, their impact for disabled would at worst be neutral.

Health

10.95 At present an unofficial 'P+R' system operates from the small tourist car-park on the south – east bridgehead of the Tay Bridge; some Dundee commuters leave their vehicles at this site and continue their journey by cycle. Broadening the scope of the P+R options to become 'Park and choose' sites that include secure cycle parking facilities would enable growth and formalisation of this market. While this would be possible at any of the site options, the Tay Bridge Roundabout and Landfall options offer the shortest cycle trip distance and are therefore most likely to be attractive to potential users of this facility.

10.96 Similarly, by providing secure cycle parking facilities at the P+R sites some users may be encouraged to cycle to the sites and continue their journey to Dundee by bus. The catchment areas for this method are primarily Newport-on-Tay and Tayport, again suggesting that the Tay Bridge Roundabout and Landfall sites would be the most suitable location for this market segment. However, as Newport-on-Tay and Tayport are both already served by bus routes direct to Dundee, only limited demand for this facility would be expected.

10.97 A rural footpath (which follows a redundant rail line) begins in Cupar Road adjacent to the potential Primary School site and leads south toward Victoria Street and eventually to a track in to the site of the potential Tay Bridge Roundabout P+R site. Potentially this could be developed into a National Cycle Network quality footpath/cycle route, thereby enhancing the sustainable mode access options for the Primary School site option. Developing this facility has been considered previously, but information from Fife Council suggests that it has been rejected due to costs.

Rural affairs

10.98 Both the Forgan Roundabout site and the Primary School site may be considered to be rural or semi-rural in their location. Although both would be located adjacent to the A92 it may be considered that they offer improved transport options to Dundee to the communities living close by. Both offer improved opportunities to encourage people away from private car use for at least part of their journey. All schemes offer the potential to encourage a limited amount of walking and cycling to their locations, as well as reducing the demand for private travel across the Tay Road Bridge.

Further social inclusion impacts

10.99 The Forgan Roundabout and Primary School site P+R schemes offer the least potential for greater access and inclusion opportunities, being located away from community bases. Furthermore, it is unlikely that the extension to Leuchars car park can offer improved inclusion benefits, serving only a greater volume of the existing commuter users. The Tay Bridge Roundabout/Landfall location is adjacent to the eastern parts of Newport-on-Tay so may offer alternative travel options to people who live near to the site. Increased access opportunities from Newport-on-Tay may allow more local journeys to be made, thereby allowing those who do not have access to a car, greater opportunities to access public transport services.

10.100 P+R are inherently of most benefit to drivers commuting to work. As these people are likely to be within the higher social and economic groups P+R may widen social inequalities by subsidising travel for less needy social groups. P+R often offer little benefit to those groups who are presently socially excluded.

10.101 While the increase in patronage on public transport services as a result of the provision of a P+R site can help the financial viability of services and potentially lead to enhanced service frequencies that benefit all passenger, it is also possible that some users will be encouraged to travel further by car to access a P+R site, rather than making their whole journey by bus or rail. This phenomenon can reduce the viability of the more remote parts of the public transport networks, leading to reductions in services that have detrimental impacts for those social groups without access to a car.

Accessibility and Social Inclusion

Community accessibility

10.102 The options appraised within this chapter all aim to broaden the accessibility of existing public transport services within Fife. The provision of parking facilities at a new P+R site or at Leuchars station enables residents to drive to a public transport interchange where they may join a bus or rail service to continue their journey. This effectively broadens the catchment area of the public transport services from those residences within a walk or cycle distance of a bus route/station to encompass all travellers through the Fife area with access to a car. Without finite barriers to this catchment it is not possible to quantify the resulting catchment of the P+R /rail services.

10.103 The P+R sites proposed would also serve a 'park and choose' function enabling site access on foot and by bike, as well as allowing drivers to park and complete their journey by bike. As the bus services providing the transit to Dundee are expected to continue operating along their existing routes – other than minor diversions in to the P+R sites – the walk/cycle catchment areas are likely to be little changed by these options. However, by providing secure cycle parking facilities at the P+R sites additional bus passengers may be attracted to the services where previously they were concerned over the security of their cycle left at other locations close to the bus routes. To this end it is believed that the Primary School and Tay Bridge Roundabout sites offer the most potential opportunities for access by cyclists, due to their proximity to the local settlements, Woodhaven and Newport-on-Tay respectively.

10.104 Of specific relevance to access to the Primary School site is the rural footpath (which follows a redundant rail line) beginning in Cupar Road adjacent to the Primary School site and, and leads south toward Victoria Street and eventually to a track which leads to the site of the proposed Tay Bridge Roundabout site. Potentially this could be developed into a National Cycle Network quality footpath/cycle route that would enhance the walking and cycling options from the Primary School site. Developing this facility has been considered previously by Fife Council, though information suggests it was rejected due to costs.

10.105 The expansion of parking facilities at Leuchars station would have no affect on public transport accessibility or catchment areas for non-car owners.

Comparative accessibility

10.106 P+R is inherently of most benefit to car drivers and specifically commuters. As many of these people are likely to be within the higher socio-economic groups, relative accessibility levels of other socio-economic groups will deteriorate. Those sites offering the greatest benefits for non-car owners – as described above – are likely to perform best in terms of disadvantaged social groups. The Leuchars car park extension will have no discernable impact on disadvantaged social groups.

All the options appraised will have positive impacts in terms of enhancing travel options for those in rural areas. Traditionally difficult to serve by public transport, travel opportunities for rural dwellers are enhanced through the option to drive to a P+R site or Leuchars station, where the journey can be completed by public transport mode. Clearly these benefits are only available to those with access to a car.

11 Cost to Government

Introduction

11.1 The Cost to Government section outlines the financial impact of the scheme on Government funds.

Investment costs

11.2 All of the scheme options require upfront investment in the P+R site infrastructure and facilities.

Operating and maintenance

11.3 All of the scheme options require on-going maintenance of the P+R site infrastructure and facilities as well as day to day operation. However, it is assumed that there would be a saving from reduced parking requirements in the City Centres, and thus the cost to government stems from the assumption that contingencies and optimism bias is only applied to the new costs incurred, and not to the existing costs that would be saved.

Grants and subsidy payments

11.4 No proposals for grants of subsidy payments are included at this time.

Revenues

11.5 There are no direct revenues generated from the P+R site that would accrue to the Government.

11.6 Dundee City Council (and Edinburgh City Council in the case of the Leuchars option) would be affected by the change in the level of car park revenue. It is estimated that around 73% of the lost revenue would be attributable to Council car parks for only those trips ending in the central area of Dundee which have now transferred to P+R.

Indirect Taxes

11.7 The forecast reduction in vehicle trips would result in a decrease in indirect taxes to Central Government.

Summary

11.8 Table 11.1 presents the overall impact of each scheme in terms of the Cost to Government. Investment costs generally reflect the size of the facility required to accommodate forecast demand, including an access road for the Primary School site and a footbridge at the Landfall site. Net operating and maintenance costs are assumed to be equal across the bus based options with revenue loses greatest for the Landfall site and least for the Leuchars Station car park extension. Overall present values of costs to government are broadly £6 million for the Forgan Roundabout and Primary School sites and half the figure for the Tay Bridge Roundabout option. The present value of cost to government is greatest for the Landfall site – reflecting the larger scale of this option as evidenced by its benefits.

Table 11.1 Transport Economic Efficiency (£'000s- Discounted to 2004)

Element	Tay Bridge Roundabout	Forgan Roundabout	Primary School	Landfall site	Leuchars Station
Investment Costs	715	1,415	1,540	2,171	494
Operating and Maintenance Costs	470	470	470	470	60
Grants and Subsidy Payments	-	-	-	-	-
Revenues Loses	1,705	3,112	3,279	3,890	918
Indirect Tax Reductions	222	587	521	520	685
Present Value of Costs to the Public Accounts	**3,112**	**5,584**	**5,811**	**7,051**	**2,157**

12 Risk and Uncertainly

Introduction

12.1 The risks associated with P+R /park and choose provision relate to three areas:-

- Operational costs and operational capability;
- Revenue Income and the overall P+R offer; and
- Capital Cost and provision of the site/facilities.

12.2 Robust assessments of the capital cost of P+R site construction have been benchmarked to the year of opening.

12.3 Site availability is a material risk that has been assessed in the appraisal process in terms of the current land-use policies. Changes in policy or the need for the use of Compulsory Purchase Powers must be seen as an on-going risk as must an increase in land values which affects the capital cost of the scheme.

12.4 Equally should the preferred option be the Landfall site, the land use/availability as determined by the owners(Tay Road Bridge Joint Board for the existing car park and the ground to the south which is in private ownership), prove to be unavailable, the fall back location of the Forgan roundabout should be pursued.

12.5 The capital cost element includes a defined specification of passenger facilities with an increased or amended specification increasing risk of cost escalation. Fixing the specification at this stage will assist in reducing this risk.

12.6 The need for new accesses to/from the A92 trunk road, for the Tay Bridge Roundabout site and for a site adjacent to Newport on Tay Primary School, may import risk into the project due to the need to agree detailed designs with Transport for Scotland. Detailed design at the pre-planning application stage in conjunction with Transport for Scotland could mitigate this risk however it is considered unlikely that Transport for Scotland could find a bus stopping facility which would meet their standards.

12.7 For the Forgan Roundabout site the provision of access roads by Fife Council in conjunction with their proposed household waste and recycling site has been assumed. Should this proposal not materialise the capital cost element will need to increase.

12.8 Detailed design will also remove elements of risk from the capital cost estimate as risks are mitigated or resolved by design work.

12.9 An increase in the number of parking incidences above the predicted level is a risk that could have operational and capital cost issues due to the need to provide additional capacity. A defined strategy for managing the site and bus services in terms of capacity and parking/travel prices will reduce this risk.

12.10 An assumption has been made that in future years some type of bus priority measures will be included on the cross Tay route in order to offset the increases in journey time due to the projected increase in general traffic flows on the corridor. Bus priority measures/lanes will require to be addressed in order to maintain the attractiveness of P + R/Choose operations.

Operational costs and operational capability

12.11 Robust assessments of the operational costs of a P+R site have been benchmarked to the year of opening. As the bus service be will provided by routes passing the site no incremental increase in operational costs has been made. However, should the preferred site be located away from the bus routes operating at the time of opening then additional costs could be incurred.

12.12 The ability of bus operators to change routes at relatively short notice is a risk that will need to be managed in the lead up to a P+R opening to ensure adequate service provision.

12.13 The current uncertainty regarding fuel and other direct operating costs, leading to changes in the charges used in the modelling to produce the demand estimates, will need to be considered and may need amending to reflect revised circumstances.

12.14 Competition between bus operators for custom at the P+R site may emerge although none is present now. Production of an effective operating protocol for the site will enable such changes to be managed and risk of over-competition or rapid fluctuations in service levels reduced.

12.15 An increase in the number of parking incidences above the predicted level is a risk that could have operational and capital cost issues. A defined strategy for managing the site and bus services in terms of capacity and parking/travel prices will reduce this risk.

Revenue income and the overall P+R offer

12.16 A shortfall in the predicted revenue will result in two key implications:

- The operating costs of the site are not met;
- The quantity and quality of service will reduce to meet the trade available.

12.17 To mitigate this risk an effective marketing and promotion strategy together with a clear monitoring regime and pricing policy will reduce this risk.

12.18 An increase in revenue above the predicted level may have two effects:

- The generation of super-profits for the bus operator(s);
- An increase in competition for the enhanced level of trade available.

12.19 In this case the first risk can be mitigated by a profit sharing arrangement with the appropriate bus operators and the second scenario by production of an effective operating protocol for the site that will enable such changes to be managed and risk of over-competition or rapid fluctuations in service levels reduced.

12.20 There is a risk, particularly, at the Tay Bridge Roundabout/Landfall sites that abstraction of passengers from existing bus services that do not serve the P + R sites occurs. This may involve passengers accessing the site on foot to avail themselves of the greater frequency of service there or by driving locally to the site instead of using existing local bus routes for the cross-Tay journey. The first risk can be mitigated by measures to control pedestrian access to the site and the second by partnership working with bus operators to manage the overall public transport offer in the vicinity of the Tay Road Bridge.

External factors

12.21 The success of P+R sites can be greatly influenced by other factors within the mode choice decision such as the cost and availability of parking at the destination. Policies can be implemented that control the availability and/or cost of parking at the destination – Dundee – thus increasing the demand for P+R. In order to attempt to quantify the impact of these uncertainties the P+R demand forecasting model was used to test nominal changes in walking times and City Centre parking charges.

A parking charge sensitivity test was conducted by increasing the parking charges used within Dundee to a level of Retail Price Index (RPI) growth plus four percent. Whilst it should be noted that the current Central Dundee Car Parking Strategy looks towards a balance of factors in determining car parking charges ranging from bus fare levels to inflation for example for the sensitivity test, it was assumed that the RPI plus four percent is not an unreasonable assumption. This would mean that a charge of £6.24 (Dundee 2012) would increase to £7.02 and that a charge of £6.90 (Dundee 2022) would increase to £10.39. PRIDE tests were run for the Landfall site that show that peak period demand could be increased by up to 17.5 percent by this policy (Table 12.1).

Table 12.1 Sensitivity tests of Landfall site P+R forecasts

	2012			2022		
	Morning peak	Inter peak	All day	Morning peak	Inter peak	All day
RPI + 4%	5.2%	3.0%	4.7%	17.5%	10.1%	15.5%
+6 minutes walk time	44.0%	0.0%	32.6%	35.8%	0.0%	26.2%
RPI & walk time adjustments	51.3%	3.0%	38.8%	55.2%	10.1%	43.1%

12.22 The PRIDE modelling of trips to Dundee reflects the availability of free on-street parking in some locations. It would be possible to expand the Dundee CPZ and thereby restrict the availability of this parking. This was modelled by increasing the average walk time for travellers who were assumed to not have to pay to park at their final destination. The expansion of the CPZ that this walk time change was effectively modelling covered the following areas:

- Dundee West End;
- Dudhope, Hilltown;
- Princes St; and
- Invergowrie Drive.

12.23 The expanded CPZ area is between 0.1 and 1.0km from the current CPZ and hence an average distance of 0.4km was assumed. Using an average walk speed of 4km/h this suggests an additional 6 minutes of walk time. Walk times have only been increased in the morning peak as it was assumed that only commuters would have previously parked in the expanded CPZ area. For this reason, interpeak results are identical to the original results.

12.24 The increased walk time has a significant impact on the demand forecasts – up to an additional 44 percent peak period P+R demand. Furthermore, the modelling indicates that combining the RPI adjustments and the expanded CPZ could increase all day P+R demand by around 40 percent in 2022.

12.25 It should thus be concluded that there is a significant variation in demand in response to key external factors. Any policies and indeed policy levers in respect of car parking charging/provision that Dundee are likely to pursue with respect to parking within the City will need to be reflected in the provision of P+R within Fife.

13 Project Summary Tables

Overview

13.1 Summary tables covering the STAG2 appraisal process have been prepared and are presented within this chapter. The tables draw together the key results from the appraisal process and present the findings in a standardised format.

Table 13.1 Tay Bridge Roundabout P+R Appraisal Summary table

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		Promoter: South East Scotland Transport Partnership (SEStran) Support: Tayside & Central Scotland Transport Partnership (TACTRAN)	
Proposal Name:	Tay Bridge Roundabout P+R		
Proposal Description:	Creation of a P+R site of ~130 spaces on the west side of the A92, south of the Tay Bridge Roundabout. Transit to be provided by existing bus services (routes 42, 72, 96 and 99)	Total Public Sector Funding Requirement:	Capital cost of construction: £903,900 Annual operating cost: £40,100 Present value of cost to govt.: £3.112 million
Funding sought from:		**Amount of application**	
Background Information			
Geographic Context:	The proposal makes use of land between the A92 and residential areas at the northern end of Newport-on-Tay. The land is currently grassed and screened from the residential properties by a line of mature trees. The site is immediately south of the Tay Road Bridge and is thus potentially able to serve all road trips across the Bridge as well as be served by all existing bus routes across the Bridge.		
Social Context:	The European Structural Fund Area does not cover the Tay Bridgehead area and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and the Tay Bridgehead Area does not come into any of these areas. Leader In Fife Funding would be available for small projects in rural areas where it could be used for publicity and advertising of park & choose sites.		
Economic Context:	By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.		

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Between 99 and 130 SOVs removed in peak period in 2022 – representing a 3.6 to 4.7 percent reduction in Cross Tay SOV movements. The change may, therefore, not fully meet the 5 percent planning objective
Maximise use of existing public transport capacity across Tay	Forecast increased public demand results in increased capacity utilisation – increases from 50 percent to 73 percent in peak periods by 2022. This increase exceeds the target of 5 percent set for this objective.
Contribute to air quality targets	A net reduction in vehicle mileage of 3.4 percent is forecast in 2022. While this should result in reduced emissions of CO_2, it does not meet the 5 percent reduction target set.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing bus users a well located site such as the Tay Bridge Roundabout option should result in a net reduction in private vehicle trips (as predicted in the air quality target described above).
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation. The proximity of sensitive receptors (residential properties) to this site mean that adverse noise, air quality and visual amenity factors may need to be mitigated against.
Rationale for Selection or Rejection of Proposal:	This site achieves the highest BCR of all the bus based options and contributes to the planning objectives (though not all are met). However, limited capacity at this location suggests that additional P+R facilities would also need to be provided and thus this site is only an option in conjunction with another location.
Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. The site is constrained in size to approximately 130 spaces and thus is unlikely to be sufficient for the demand at this location. Constraints on the size of the site also mean that only simple bus stopping facilities may be provided. It is unlikely that any new access from the trunk road would be permitted at this locus and therefore provision of adequate bus stop facilities is problematic.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £903,900 to construct. No parking charges are planned and as bus fares will be collected by the operator there will be no direct user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements – otherwise a separate source of revenue funding will need to be identified. Some operating cost savings may be achievable within Dundee as a result of transferring parking supply to this site. Land may also be released that may be redeveloped for other purposes.
Public:	An ‘area of search’ for a P+R site, covering the Tay Bridge Roundabout area, was identified in the St Andrews and East Fife Local Plan.

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Environment			
Sub-objective	Qualitative information	Quantitative information	Significance of impact
Noise and vibration:	This site may present the greatest noise concern due to nearby sensitive receptors – it is in close proximity to a number of residential properties.	8 properties are adjacent to the site. Note that these properties are separated from the site by a line of mature trees.	-
Air quality – overall	The site is not within an Air Quality Management Area (AQMA).		0
CO_2 (global), PM_{10} (local) NO_2 (local)	A reduction in vehicle mileage (& hence reduction in vehicle emissions) is forecast, though there may be some increase in mileage from new trips generated or from existing bus users transferring to P+R	By 2022 a 3.4% reduction in existing cross Tay City Centre bound vehicle mileage (& hence reduction in vehicle emissions) is forecast	+
Water quality, drainage & flood defence	Low risk from car park water runoff. Low flood risk.	Flood risk of less than 0.5% in year	0
Geology	Site is not within any specific geologically sensitive area (e.g. SSSI or RIGS)		0
Biodiversity	Site is not within any biodiversity area – though a SAC covers the Tay Estuary area, close to this site		0
Visual amenity	The site will be visible from certain areas such as the A92, but is partially screened from the residential properties on the ends of Tay Street, Tay View Terrace, Prospect Terrace, Northfield Road & Elizabeth Crescent by an existing line of mature trees.		-
Agriculture & soils	Site is classified as 3.2 (not prime agricultural land) by the MacCaulay Institute 'Land capability for agriculture'		0
Cultural heritage	No cultural heritage sites affected		0
Landscape	The site is within an area classified as AGLV. Change of use to P+R is likely to affect this classification		0

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Safety			
Sub-objective	Qualitative information		Quantitative information
Accidents (change in personal injury accidents, balance of severity & total discounted savings)	Accident rates per passenger kilometre are lower for bus travel than car travel and thus a transfer of trips from car to P+R (bus) would be expected to lead to a small reduction in personal injury accidents. However, forecast changes in trip volumes and kilometres are small & hence no significant measurable change is appraised		
Security	In order to maintain personal and property security within the car park site, compared with the Do Minimum scenario of driving & parking in Dundee, suitable lighting levels along with a CCTV system would be implemented. No net change in security, from the Do Minimum, is thus forecast.		
Economy (Transport Economic Efficiency)			
Sub-objective	Item	Qualitative information	Quantitative information
User & non-user benefits	Generalised cost user benefits	A generalised cost saving of 18.36 minutes (in 2022) has been estimated for P+R users.	PV of benefits: £2,486,000
	Non-user benefits	In vehicle time for existing (non-P+R) bus users are increased by 20 seconds as a result of the P+R stop. Journey times of remaining cross Tay and Dundee City Centre vehicles are reduced by 3 seconds in the peak direction and period in 2022.	PV of benefits: £1,525,000
Private sector operator impacts	Investment costs	None	£0
	Operating & maintenance costs	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for privately owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 27% of this would have been accrued by privately owned car parks.	PV: -£636,000
	Revenues	Bus fares modelled at typical P+R rate of £2.50 return	PV: £2,486,000
	Grant/subsidy payments	None	£0
Economic activity & location impacts	Local economic impacts	No economic activity impacts included within appraisal	
	National economic impacts		
	Distributional impacts		

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Integration			
Sub-objective	Item	Qualitative information	Quantitative information
Transport interchanges:	Services & ticketing	P+R site provides a new interchange, primarily for transfer from car to existing bus services. Ticketing systems will be as provided by existing bus operations.	Demand forecasts indicate around 50,000 P+R users per year. In 2022 approximately 330,000 'existing' bus users experience minor disbenefit as a result of increased journey time.
	Infrastructure & information	Primary infrastructure benefits and costs covered in economic evaluation. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike and continue the journey by bus. Users would also be permitted to park at the site and complete their journey by bike and thus secure cycle parking facilities could be provided for those wishing to leave their bike at the P+R site overnight.	
Land-use transport integration		A high level of consistency with land-use planning policies, specifically minimising emissions and consumption of resources and energy through modal shift from cars. This option also makes use of land at the Tay Bridgehead safeguarded for P+R use, and aims to maximise the efficient use of the Tay crossing.	
Policy integration		Proposal fits with disability policies through the provision of specific disabled parking areas, though some of the bus services are currently not operated by low floor vehicles. Health policies are also assisted through opportunities to cycle to/from the site, though social inclusion impacts could be mixed as site primarily cater for car owners.	

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Accessibility & Social Inclusion			
Sub-objective	Item	Qualitative information	Quantitative information
Community accessibility	Public transport network coverage	Network coverage not directly affected as bus routes remain unchanged, but catchments are effectively increased as car drivers are able to access public transport services from the P+R site. Access to bus services by cycle also enhanced by the provision of secure cycle parking facilities at the site.	
	Access to other local services	This option is favourable with respect to access by walking and cycling – being close to the existing residential areas of Newport-on-Tay and Woodhaven.	
Comparative accessibility	Distribution/spatial impacts by social group	P+R of primary benefit to car drivers and thus likely to benefit higher socio-economic groups. Accessibility of this site by walk/cycle goes some way to spreading the benefits to other socio-economic groups. Capacity constraint means this site is only likely to be available to early morning commuters.	
	Distribution/spatial impacts by area	P+R enables access to public transport services by car owners in rural areas who are not directly served by buses.	

Cost to public sector		
Item	Qualitative information	Quantitative information
Public sector investment costs	Provision of car park and bus stop facility	PV: -£715,000
Public sector operating & maintenance costs	On-going maintenance of car park facility	PV: -£470,000
Grant/subsidy payments	None	£0
Revenues	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for publicly owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 73% of this would have been accrued by publicly owned car parks.	PV: -£2,341
Taxation impacts	There is a net reduction in vehicle mileage and hence fuel used, resulting in reduced fuel tax monies.	PV: -£222,000

(Tay Bridge Roundabout P+R Appraisal Summary table – continued)

Monetised summary	
Present value of transport benefits	£2,496,000
Present value of cost to government	-£3,112,000
Net present value	£2,758,000
Benefit-cost to government ratio	1.89 : 1

Table 13.2 Forgan Roundabout P+R Appraisal Summary table

<table>
<tr><td colspan="4">Proposal Details</td></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Promoter: South East Scotland Transport Partnership (SEStran)
Support: Tayside & Central Scotland Transport Partnership (TACTRAN)</td></tr>
<tr><td>Proposal Name:</td><td>Forgan Roundabout P+R</td><td></td><td></td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Creation of a P+R site of ~275 spaces on the southwest side of Forgan Roundabout, approximately 2km south of the Tay Road Bridge. Transit to be provided by existing bus service route 99.</td><td rowspan="3">Total Public Sector Funding Requirement:</td><td>Capital cost of construction: £1,790,000</td></tr>
<tr><td>Annual operating cost: £40,100</td></tr>
<tr><td>Present value of cost to govt.: £5.584 million</td></tr>
<tr><td>Funding sought from:</td><td></td><td>Amount of application</td><td></td></tr>
<tr><td colspan="4">Background Information</td></tr>
<tr><td>Geographic Context:</td><td colspan="3">The proposal makes use of land south of the B995 at the Forgan Roundabout (intersection of the A92, A913 and B995). The site is currently farmland and there are two existing properties immediately north of the proposal, fronting on to the B995.
In addition to serving trips along the A92 the site can also be accessed from the B995 (Wormit, Newport-on-Tay) and the A914 (Leuchars, Cupar and St. Andrews).</td></tr>
<tr><td>Social Context:</td><td colspan="3">The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.</td></tr>
<tr><td>Economic Context:</td><td colspan="3">By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.</td></tr>
</table>

(Forgan Roundabout P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Between 138 and 182 SOVs removed in peak period in 2022 – representing 5.0 to 6.6 percent reduction. The change, therefore, exceeds the 5 percent planning objective set
Maximise use of existing public transport capacity across Tay	Forecast increased public demand results in increased capacity utilisation – increases from 50 percent to 83 percent in peak periods by 2022. This increase exceeds the target of 5 percent set for this objective.
Contribute to air quality targets	A net reduction in vehicle mileage of 9.1 percent is forecast by 2022. This should result in reduced emissions of CO_2, and exceeds the 5 percent reduction target set.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing bus users a well located site such as the Forgan Roundabout option should result in a net reduction in private vehicle trips (as predicted in the air quality target described above).
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation. The Forgan Roundabout site is not believed to pose any significant environmental concerns and is largely remote from residential dwellings, though the landscape classification of 'upland foothills' is not as conducive to development as the 'urban' category of the Tay Bridge Roundabout site.
Rationale for Selection or Rejection of Proposal:	This site achieves a high level of demand compared with the Tay Bridge Roundabout site and is comparable with the Primary School site. It meets and exceeds the planning objectives set. The loss of parking revenue from Dundee means that there is a negative NPV. As it may be possible to develop this site in conjunction with other opportunities being pursued by Fife in this area, there is no history of planning objections to a P+R site in this location, and additional priority may be provided on the A92 at a later date, this is the preferred P+R site option.

(Forgan Roundabout P+R Appraisal Summary table – continued)

Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £1,790,000 to construct. No parking charges are planned and as bus fares will be collected by the operator there will be no direct user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements – otherwise a separate source of revenue funding will need to be identified. Some operating cost savings may be achievable within Dundee as a result of transferring parking supply to this site. Land may also be released that may be redeveloped for other purposes.
Public:	This proposal has not been made public and the land not identified within the Local Plan for this purpose.

(Forgan Roundabout P+R Appraisal Summary table – continued)

Environment			
Sub-objective	Qualitative information	Quantitative information	Significance of impact
Noise and vibration:	Minimal noise or vibration impacts are predicted – the site is remote from residential developments with only one property in the vicinity	1 property adjacent to the site.	0
Air quality – overall	The site is not within an Air Quality Management Area (AQMA).		0
CO_2 (global), PM_{10} (local) NO_2 (local)	A reduction in vehicle mileage (& hence reduction in vehicle emissions) is forecast, though there may be some increase in mileage from new trips generated or from existing bus users transferring to P+R	By 2022 a 9.1% reduction in existing cross Tay City Centre bound vehicle mileage (& hence reduction in vehicle emissions) is forecast	+
Water quality, drainage & flood defence	Low risk from car park water runoff. Low flood risk.	Flood risk of less than 0.5% in year	0
Geology	Site is not within any specific geologically sensitive area (e.g. SSSI or RIGS)		0
Biodiversity	Site is not within any biodiversity area		0
Visual amenity	The site will be visible from certain areas such as the A92.		-
Agriculture & soils	Site is classified as 3.2 (not prime agricultural land) by the MacCauley Institute 'Land capability for agriculture'		0
Cultural heritage	No cultural heritage sites affected		0
Landscape	The site is within an area classified as AGVL. Change of use to P+R will, therefore, be detrimental		-

(Forgan Roundabout P+R Appraisal Summary table – continued)

Safety		
Sub-objective	Qualitative information	Quantitative information
Accidents (change in personal injury accidents, balance of severity & total discounted savings)	Accident rates per passenger kilometre are lower for bus travel than car travel and thus a transfer of trips from car to P+R (bus) would be expected to lead to a small reduction in personal injury accidents. However, forecast changes in trip volumes and kilometres are small & hence no significant measurable change is appraised	
Security	In order to maintain personal and property security within the car park site compared with the Do Minimum scenario of driving & parking in Dundee, suitable lighting levels along with a CCTV system would be implemented. No net change in security, from the Do Minimum, is thus forecast.	

(Forgan Roundabout P+R Appraisal Summary table – continued)

Economy (Transport Economic Efficiency)			
Sub-objective	Item	Qualitative information	Quantitative information
User & non-user benefits	Generalised cost user benefits	A generalised cost saving of 12.72 minutes (in 2022) has been estimated for P+R users.	PV: £3,103,000
	Non-user benefits	In vehicle time for existing (non-P+R) bus users are increased by 1 minute as a result of the detour in to the P+R site and the additional dwell time at the stop. Journey times of remaining cross Tay and Dundee City Centre vehicles are reduced by 4 seconds in the peak direction and period in 2022.	PV: £1,874,000
Private sector operator impacts	Investment costs	None assumed. Bus service operators could be approached for a contribution towards investment costs.	£0
	Operating & maintenance costs	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for privately owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 27% of this would have been accrued by privately owned car parks. No private sector P+R site operating costs assumed. Bus service operators could be approached for a contribution towards operating costs.	PV: -£1,161,000
	Revenues	Bus fares modelled at typical P+R rate of £2.50 return	PV: £4,522,000
	Grant/subsidy payments	None	£0
Economic activity & location impacts	Local economic impacts	No economic activity impacts included within appraisal	
	National economic impacts		
	Distributional impacts		

(Forgan Roundabout P+R Appraisal Summary table – continued)

Integration			
Sub-objective	Item	Qualitative information	Quantitative information
Transport interchanges:	Services & ticketing	P+R site provides a new interchange, primarily for transfer from car to existing bus services. Ticketing systems will be as provided by existing bus operations.	Demand forecasts indicate around 96,000 P+R users per year by 2022. Approximately 235,000 existing bus users experience minor disbenefit as a result of increased journey time.
	Infrastructure & information	Primary infrastructure benefits and costs covered in economic evaluation. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike and continue the journey by bus. Users would also be permitted to park at the site and complete their journey by bike and thus secure cycle parking facilities could be provided for those wishing to leave their bike at the P+R site overnight.	
Land-use transport integration		A high level of consistency with land-use planning policies, specifically minimising emissions and consumption of resources and energy through modal shift from cars and maximising the efficient use of the Tay crossing.	
Policy integration		Proposal fits with disability policies through the provision of specific disabled parking areas, with the bus services operated by low floor vehicles. Health policies are also assisted through opportunities to cycle to/from the site, though social inclusion impacts could be mixed as sites primarily cater for car owners.	

(Forgan Roundabout P+R Appraisal Summary table – continued)

Accessibility & Social Inclusion			
Sub-objective	Item	Qualitative information	Quantitative information
Community accessibility	Public transport network coverage	Network coverage not directly affected as bus routes remain unchanged, but catchments are effectively increased as car drivers are able to access public transport services from the P+R site.	
	Access to other local services	This option is less favourable with respect to access by walking and cycling than other STAG2 appraised options – being relatively remote from the existing residential areas.	
Comparative accessibility	Distribution/spatial impacts by social group	P+R of primary benefit to car drivers and thus likely to benefit higher socio-economic groups. Lower levels of accessibility of this site by walk/cycle, compared with other options, means benefits not widely shared with other socio-economic groups.	
	Distribution/spatial impacts by area	P+R enables access to public transport services by car owners in rural areas who are not directly served by buses.	

Cost to public sector		
Item	Qualitative information	Quantitative information
Public sector investment costs	Provision of car park and bus stop facility	PV: -£1,415,000
Public sector operating & maintenance costs	On-going maintenance of car park facility	PV: -£470,000
Grant/subsidy payments	None	£0
Revenues	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for publicly owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 73% of this would have been accrued by publicly owned car parks.	PV: -£4,723,000
Taxation impacts	There is a net reduction in vehicle mileage and hence fuel used, resulting in reduced fuel tax monies.	-£587,000

(Forgan Roundabout P+R Appraisal Summary table – continued)

Monetised summary	
Present value of transport benefits	£3,103,000
Present value of cost to government	-£5,584,000
Net present value	£2,753,000
Benefit-cost to government ratio	1.49 : 1

Table 13.3 B995 'Primary School' Site P+R Appraisal Summary table

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		Promoter: South East Scotland Transport Partnership (SEStran) Support: Tayside & Central Scotland Transport Partnership (TACTRAN)	
Proposal Name:	B995 'Primary School' Site P+R		
Proposal Description:	Creation of a P+R site of ~275 spaces between the A92 and the B995. Transit to be provided by existing bus service route 99.	Total Public Sector Funding Requirement:	Capital cost of construction: £1,946,300 Annual operating cost: £40,100 Present value of cost to govt.: £5.81 million
Funding sought from:		**Amount of application**	
Background Information			
Geographic Context:	The proposal makes use of land to the north of the Newport-on-Tay Primary School, between the A92 and the B995. Access would be from an enhanced junction on the A92, between the Tay Bridge Roundabout and Forgan Roundabout. The land is currently used for agriculture.		
Social Context:	The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.		
Economic Context:	By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.		

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	By 2022 between 146 and 192 SOVs removed in peak period – representing 5.3 to 6.9 percent reduction. The change, therefore, exceeds the 5 percent planning objective set.
Maximise use of existing public transport capacity across Tay	Forecast increased public demand results in increased capacity utilisation – increases from 50 percent to 84 percent in peak periods by 2022. This increase exceeds the target of 5 percent set for this objective.
Contribute to air quality targets	A net reduction in vehicle mileage of 8.0 percent is forecast. This should result in reduced emissions of CO_2, and exceeds the 5 percent reduction target set.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing bus users a well located site such as the B995 Primary School site option should result in a net reduction in private vehicle trips (as predicted in the air quality target described above).
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation. The Primary School site is not believed to pose any significant environmental concerns and is largely remote from residential dwellings, though the site may need to be screened from the existing primary school to the south.
Rationale for Selection or Rejection of Proposal:	This site achieves the highest levels of demand of the options tested and meets or exceeds the planning objectives set. The loss of Dundee parking revenue means that there is a negative NPV recorded. As the results of this option are broadly similar to those of the Forgan Roundabout site, other factors are likely to influence the decision between these two locations. An element of planning risk exists with this site as a similar proposal has been rejected previously. Furthermore, although an access road allowance has been included in the financial calculations this site would also require junction works on the A92 and thus a risk exists concerning their acceptability and their cost. It would appear likely; therefore, that Forgan Roundabout is the preferred site option.

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. There is a requirement for a modified junction with the A92 that would need to be approved As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £1,946,000 to construct. No parking charges are planned and as bus fares will be collected by the operator there will be no direct user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements – otherwise a separate source of revenue funding will need to be identified. Some operating cost savings may be achievable within Dundee as a result of transferring parking supply to this site.
Public:	This site was identified for Class 4 Business/Industry in the Tay Coast Local Plan Adopted 1998. It was zoned for possible a possible P+R site in the Consultative Draft St Andrews and East Fife Local Plan. Following a number of objections, particularly concerning its proximity to the Primary School and access to the site, the site's use for Transportation was withdrawn from the plan. The site has been included here with alternative access arrangements assumed.

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Environment			
Sub-objective	Qualitative information	Quantitative information	Significance of impact
Noise and vibration:	Minimal noise or vibration impacts are predicted – the site is remote from residential developments, close only to a primary school – mitigation measures should be possible if any adverse impacts are noted.	Primary School adjacent to the site.	0
Air quality – overall	The site is not within an Air Quality Management Area (AQMA).		0
CO_2 (global), PM_{10} (local) NO_2 (local)	A reduction in vehicle mileage (& hence reduction in vehicle emissions) is forecast, though there may be some increase in mileage from new trips generated or from existing bus users transferring to P+R	By 2022 a 8.0% reduction in existing cross Tay City Centre bound vehicle mileage (& hence reduction in vehicle emissions) is forecast	+
Water quality, drainage & flood defence			0
Geology			0
Biodiversity			0
Visual amenity	The site will be visible from certain areas such as the A92.		-
Agriculture & soils	MacCaulay 3.2		0
Cultural heritage			0
Landscape	AGVL		-

Safety		
Sub-objective	Qualitative information	Quantitative information
Accidents (change in personal injury accidents, balance of severity & total discounted savings)	Accident rates per passenger kilometre are lower for bus travel than car travel and thus a transfer of trips from car to P+R (bus) would be expected to lead to a small reduction in personal injury accidents. However, forecast changes in trip volumes and kilometres are small & hence no significant measurable change is appraised	
Security	In order to maintain personal and property security within the car park site compared with the Do Minimum scenario of driving & parking in Dundee, suitable lighting levels along with a CCTV system would be implemented. No net change in security, from the Do Minimum, is thus forecast.	

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Economy (Transport Economic Efficiency)			
Sub-objective	Item	Qualitative information	Quantitative information
User & non-user benefits	Generalised cost user benefits	A generalised cost saving of 11.54 minutes (in 2022) has been estimated for P+R users.	PV: £2,948,000
	Non-user benefits	In vehicle time for existing (non-P+R) bus users are increased by one minute as a result of the detour in to the P+R site and the additional dwell time at the stop. Journey times of remaining cross Tay and Dundee City Centre vehicles are reduced by 5 seconds in the peak direction and period in 2022.	PV: £2,020,000
Private sector operator impacts	Investment costs	None assumed. Bus service operators could be approached for a contribution towards investment costs.	£0
	Operating & maintenance costs	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for privately owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 27% of this would have accrued by privately owned car parks. No private sector P+R site operating costs assumed. Bus service operators could be approached for a contribution towards operating costs.	PV: -£1,224,000
	Revenues	Bus fares modelled at typical P+R rate of £2.50 return	PV: £4,780,000
	Grant/subsidy payments	None	£0
Economic activity & location impacts	Local economic impacts	No economic activity impacts included within appraisal	
	National economic impacts		
	Distributional impacts		

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Integration			
Sub-objective	Item	Qualitative information	Quantitative information
Transport interchanges:	Services & ticketing	P+R site provides a new interchange, primarily for transfer from car to existing bus services. Ticketing systems will be as provided by existing bus operations.	Demand forecasts indicate around 101,000 P+R users per year by 2022. Approximately 235,000 existing bus users experience minor disbenefit as a result of increased journey time.
	Infrastructure & information	Primary infrastructure benefits and costs covered in economic evaluation. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike and continue the journey by bus. Users would also be permitted to park at the site and complete their journey by bike and thus secure cycle parking facilities could be provided for those wishing to leave their bike at the P+R site overnight.	
Land-use transport integration		A high level of consistency with land-use planning policies, specifically minimising emissions and consumption of resources and energy through modal shift from cars and maximising the efficient use of the Tay crossing.	
Policy integration		Proposal fits with disability policies through the provision of specific disabled parking areas, with the bus services operated by low floor vehicles. Health policies are also assisted through opportunities to cycle to/from the site, though social inclusion impacts could be mixed as sites primarily cater for car owners.	

Accessibility & Social Inclusion			
Sub-objective	Item	Qualitative information	Quantitative information
Community accessibility	Public transport network coverage	Network coverage not directly affected as bus routes remain unchanged, but catchments are effectively increased as car drivers are able to access public transport services from the P+R site.	
	Access to other local services	This option is less favourable with respect to access by walking and cycling than Tay Bridge Roundabout site – being relatively remote from the existing residential areas.	
Comparative accessibility	Distribution/spatial impacts by social group	P+R of primary benefit to car drivers and thus likely to benefit higher socio-economic groups. Lower levels of accessibility of this site by walk/cycle, compared with Tay Bridge roundabout site, means benefits not widely shared with other socio-economic groups.	
	Distribution/spatial impacts by area	P+R enables access to public transport services by car owners in rural areas who are not directly served by buses.	

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Cost to public sector		
Item	Qualitative information	Quantitative information
Public sector investment costs	Provision of car park, access road and bus stop facility	PV: -£1,540,000
Public sector operating & maintenance costs	On-going maintenance of car park facility	PV: -£470,000
Grant/subsidy payments	None	£0
Revenues	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for publicly owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 73% of this would have been accrued by publicly owned car parks.	PV: -£3,279,000
Taxation impacts	There is a net reduction in vehicle mileage and hence fuel used, resulting in reduced fuel tax monies.	PV: -£521,000

(B995 'Primary School' Site P+R Appraisal Summary table – continued)

Monetised summary	
Present value of transport benefits	£2,948,000
Present value of cost to government	-£5,811,000
Net present value	£2,713,000
Benefit-cost to government ratio	1.47 : 1

Table 13.4 Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table

Proposal Details			
Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)		Promoter: South East Scotland Transport Partnership (SEStran) Support: Tayside & Central Scotland Transport Partnership (TACTRAN)	
Proposal Name:	Expansion of parking facilities at Leuchars Rail Station		
Proposal Description:	Expansion of parking facilities at Leuchars Rail Station. Number of formalised spaces increases by 100. Services to Dundee (& Edinburgh) provided by First ScotRail.	Total Public Sector Funding Requirement:	Capital costs/grant: £635,500 Annual revenue support: £12,200 Present value of cost to govt.: £2.157 million
Funding sought from:		**Amount of application**	
Background Information			
Geographic Context:	Additional car parking to be provided southeast of Station Road. Access to be provided directly from Station Road. The site is currently used as farmland.		
Social Context:	The European Structural Fund Area does not cover this site and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and this site does not come into any of these areas.		
Economic Context:	Increased parking provision allows the station to fulfil a P+R role, attracting users from origins in Fife (particularly St. Andrews), and serving destinations within Dundee, Edinburgh and elsewhere. The increased parking provision would have minimal implications for the economy in its immediate vicinity.		

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Existing travel patterns from Leuchars station indicate that the majority of the new demand is likely to be drawn towards Edinburgh and thus this option will have very little impact on this planning objective.
Maximise use of existing public transport capacity across Tay	See comments above
Contribute to air quality targets	The target set for this objective will not be met as this option primarily serves journeys towards Edinburgh. It should be noted, however, that the option is forecast to result in a net vehicle mileage reduction of over 3,000 kilometres per day, which is around three times greater than forecast for the bus based options. This should result in reduced emissions of CO_2 and other vehicle emissions.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing rail users the Leuchars station site is most likely to attract users from its immediate hinterland – areas such as St. Andrews. This should result in a net reduction in private vehicle trips.
Minimise the impact on the natural and built environment	The car park extension will have some adverse impact on the environment as it will make use of agricultural land. It will, however, be remote from existing residential properties – the closest are on Meteor Row, separated from the car park extension by the existing car park and the A919.
Rationale for Selection or Rejection of Proposal:	This site offers benefits similar to those set out as a requirement of the planning objectives, but as the trips served are focused on movements towards Edinburgh it fails to meet the targets. Thus, while there are benefits to be had from pursuing this option it should be in conjunction with one of the other options appraised, all of which are more closely targeted on meeting the planning objectives.

Implementability Appraisal	
Technical:	Provision of an enhanced car park is an established technique without untried technologies. As with all demand forecasting exercises there are risks that the levels of demand predicted will not be met, or may be exceeded, resulting in the infrastructure provided being inappropriate for purpose.
Operational:	The benefits of the car park come from the transfer of trips from road to rail and thus the continued provision of rail services from the station is essential. These services are not part of the proposal and thus are subject to their continued commercial viability. Should services not meet requirements then the success of the site could be compromised or additional costs incurred in providing additional transit services to the key destination(s).
Financial:	New car park is estimated to cost £635,500 to construct. Annual operating costs of £12,200 are forecast. Parking at this station is currently free and thus no funding stream will exist to contribute towards capital and operating costs.
Public:	The draft of the most recent St Andrews and East Fife Local Plan has made an allocation of land to the south of the station for the purposes of expanding the parking facilities at the station.

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Environment			
Sub-objective	Qualitative information	Quantitative information	Significance of impact
Noise and vibration:	Minimal noise or vibration impacts are predicted – the site is remote from residential developments.		0
Air quality – overall	The site is not within an Air Quality Management Area (AQMA).		0
CO_2 (global), PM_{10} (local) NO_2 (local)	A reduction in vehicle mileage (& hence reduction in vehicle emissions) is forecast, though there may be some increase in mileage from new trips generated or from existing rail users (e.g. from Dundee or Cupar) transferring to Leuchars.	~3,000 kms per day saved.	+
Water quality, drainage & flood defence	Flood maps indicate a low risk to flooding at the site, though anecdotal evidence suggests the site is prone to flooding.	Flood risk of less than 0.5% in year	0
Geology	Site is not within any specific geologically sensitive area (e.g. SSSI or RIGS)		0
Biodiversity	Site is not within any biodiversity area		0
Visual amenity	The site will be visible from certain areas such as the A919 and the properties along Meteor Row.		-
Agriculture & soils	Site is classified as 2 (prime agricultural land) within the 'Land capability agricultural classification'. This indicates that, of all the sites appraised, this site has the greatest impact on agricultural provision.		-
Cultural heritage	No cultural heritage sites affected		0
Landscape	The site is within an area classified as 'Countryside' and 'Coastal flats'. Change of use to P+R will, therefore, be detrimental		-

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Safety			
Sub-objective	Qualitative information		Quantitative information
Accidents (change in personal injury accidents, balance of severity & total discounted savings)	Accident rates per passenger kilometre are lower for rail travel than car travel and thus a transfer of trips from car to rail would be expected to lead to a small reduction in personal injury accidents. However, forecast changes in trip volumes and kilometres are relatively small & hence no significant measurable change is appraised		
Security	In order to maintain personal and property security within the car park site compared with the Do Minimum scenario of driving & parking in Dundee/Edinburgh, suitable lighting levels along with a CCTV system would be implemented. No net change in security, from the Do Minimum, is thus forecast.		
Economy (Transport Economic Efficiency)			
Sub-objective	Item	Qualitative information	Quantitative information
User & non-user benefits	Generalised cost user benefits	A generalised cost saving of 4 minutes has been estimated for P+R users. The benefit largely stems from the vehicle operating cost savings of the modal transfer	PV: £150,000
	Non-user benefits	No non-user benefits or disbenefits are assumed. Unlike the bus based options the rail services already call at the site of this option	£0
Private sector operator impacts	Investment costs	None assumed. First ScotRail could be approached for a contribution towards investment costs.	£0
	Operating & maintenance costs	The transfer of parked vehicles from Edinburgh and Dundee to the P+R site will result in a loss of revenue for privately owned car parks in City Centres. It is estimated that the average price paid to park is £7.99 in Edinburgh and £5.77 in Dundee and that 27% of the car park spaces are privately owned. No private sector P+R site operating costs assumed. First ScotRail could be approached for a contribution towards operating costs.	PV: -£343,000
	Revenues	Return rail fares assumed are £18.00 to Edinburgh and £6.30 to Dundee	PV: £3,532,000
	Grant/subsidy payments	None	£0
Economic activity & location impacts	Local economic impacts	No economic activity impacts included within appraisal	
	National economic impacts		
	Distributional impacts		

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Integration			
Sub-objective	Item	Qualitative information	Quantitative information
Transport interchanges:	Services & ticketing	Additional parking facilities enable further modal transfer from car to enhanced rail services. Ticketing systems will be as provided by rail operators (primarily First ScotRail).	Demand forecasts indicate around 9,000 extra rail users per year.
	Infrastructure & information	Primary infrastructure benefits and costs covered in economic evaluation.	
Land-use transport integration		A high level of consistency with land-use planning policies, specifically minimising emissions and consumption of resources and energy through modal shift from cars. This option also fits National strategies through improved facilities and parking at rail stations, and Dundee's Local Plan desire to multi-modal interchanges developed in neighbouring regions.	
Policy integration		Proposal fits with disability policies through the provision of specific disabled parking areas at a station with ramped platform access. Social inclusion impacts could be mixed as the proposal primarily caters for car owners.	

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Accessibility & Social Inclusion			
Sub-objective	Item	Qualitative information	Quantitative information
Community accessibility	Public transport network coverage	Network coverage not directly affected as rail services remain unchanged, but catchments are effectively increased as additional car drivers are able to access the station.	
	Access to other local services	Expanding car parking facilities has no direct impacts on access by other modes.	
Comparative accessibility	Distribution/spatial impacts by social group	Additional car parking spaces of benefit only to car drivers and thus likely to benefit higher socio-economic groups.	
	Distribution/spatial impacts by area	Additional parking enables access to rail services by car owners in rural areas.	

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Cost to public sector		
Item	Qualitative information	Quantitative information
Public sector investment costs	Provision of car park extension	-£494,000
Public sector operating & maintenance costs	On-going maintenance of extended car park facility	-£60,000
Grant/subsidy payments	None	£0
Revenues	The transfer of parked vehicles from Edinburgh and Dundee to the P+R site will result in a loss of revenue for publicly owned car parks in City Centres. It is estimated that the average price paid to park is £7.99 in Edinburgh and £5.77 in Dundee and that 73% of the car park spaces are publicly owned.	-£918,000
Taxation impacts	There is a net reduction in vehicle mileage and hence fuel used, resulting in reduced fuel tax monies.	-£685,000

(Expansion of parking facilities at Leuchars Rail Station Appraisal Summary table – continued)

Monetised summary	
Present value of transport benefits	£150,000
Present value of cost to government	-£2,157,000
Net present value	£1,183,000
Benefit-cost to government ratio	1.55 : 1

Table 13.5 Landfall site P+R Appraisal Summary table

<table>
<tr><td colspan="4">Proposal Details</td></tr>
<tr><td colspan="2">Name and address of authority or organisation promoting the proposal: (Also provide name of any subsidiary organisations also involved in promoting the proposal)</td><td colspan="2">Promoter: South East Scotland Transport Partnership (SEStran)
Support: Tayside & Central Scotland Transport Partnership (TACTRAN)</td></tr>
<tr><td>Proposal Name:</td><td>Landfall site P+R</td><td></td><td></td></tr>
<tr><td rowspan="3">Proposal Description:</td><td rowspan="3">Creation of a P+R site of 494 spaces (including existing 83 spaces) on the east side of the A92, south of the Tay Bridge Roundabout. Connection between the new and existing car parks by a footbridge. Transit to be provided by existing bus services (routes 42, 72, 96 and 99)</td><td rowspan="3">Total Public Sector Funding Requirement:</td><td>Capital cost of construction: £2,803,400</td></tr>
<tr><td>Annual operating cost: £40,100</td></tr>
<tr><td>Present value of cost to govt.: £7.051 million</td></tr>
<tr><td>Funding sought from:</td><td></td><td>Amount of application</td><td></td></tr>
<tr><td colspan="4">Background Information</td></tr>
<tr><td>Geographic Context:</td><td colspan="3">The proposal uses land southeast of the Tay Bridge Roundabout to provide additional P+R capacity in conjunction with the existing car park north east of the Tay Bridge Roundabout. The two locations would be connected by a footbridge.
The site is immediately south of the Tay Road Bridge and is thus potentially able to serve all road trips across the Bridge as well as be served by all existing bus routes across the Bridge. The buses would access the existing car park area only – to minimise impacts on journey times for through passengers.</td></tr>
<tr><td>Social Context:</td><td colspan="3">The European Structural Fund Area does not cover the Tay Bridgehead area and there are no Priority Partnership areas in Fife. Social Inclusion Partnership Areas (known as Regeneration Areas), are based on the Scottish Index of Multiple Deprivation and the Tay Bridgehead Area does not come into any of these areas. Leader In Fife Funding would be available for small projects in rural areas where it could be used for publicity and advertising of park & choose sites.</td></tr>
<tr><td>Economic Context:</td><td colspan="3">By attracting users from all origins south of the Tay, and serving multiple destinations within Dundee, the P+R site would have minimal implications for the economy in its immediate vicinity.</td></tr>
</table>

(Landfall site P+R Appraisal Summary table – continued)

Planning Objectives	
Objective:	Performance against planning objective:
Reduce single occupancy vehicles using the Tay Road Bridge	Between 177 and 233 SOVs removed in peak period in 2022 – representing a 6.4 to 8.4 percent reduction in Cross Tay SOV movements. The change may, therefore, meets the 5 percent planning objective
Maximise use of existing public transport capacity across Tay	Forecast increased public demand results in increased capacity utilisation – increases from 50 percent to 92 percent in peak periods by 2022. This increase exceeds the target of 5 percent set for this objective.
Contribute to air quality targets	A net reduction in vehicle mileage of 8.2 percent is forecast in 2022. This meets the 5 percent reduction target set and will this contribute to reduced emissions of CO_2.
Promote the use of sustainable travel, whilst reducing the demand for car travel through mode shift	P+R aims to encourage mode shift from car to bus for part of the journey. Although P+R can cause some switch from existing bus users a well located site such as the Landfall site option should result in a net reduction in private vehicle trips (as predicted in the air quality target described above).
Minimise the impact on the natural and built environment	New P+R site can have an adverse impact on the environment that needs to be carefully managed through design and implementation.
Rationale for Selection or Rejection of Proposal:	This site achieves a high BCR and the highest NPV of all the options and contributes to the planning objectives. These facts, along with its ability to meet forecast demand at this location, indicate that this is a preferred site.
Implementability Appraisal	
Technical:	Provision of a P+R car park with associated stopping facilities for existing bus services is an established technique without untried technologies. The site does require a substantial access road and footbridge.
Operational:	Continued operation of the site will depend upon the provision of regular, reliable, affordable bus services with sufficient spare capacity to accommodate the P+R demand. These services are not part of the proposal and thus are subject to their continued commercial viability.
Financial:	Site is estimated to cost £2,800,000 to construct. No parking charges are planned and as bus fares will be collected by the operator there will be no direct user funding stream to cover capital or operating costs (£40,100). It may be possible to agree a funding arrangement with the bus operator to cover all or part of the revenue requirements – otherwise a separate source of revenue funding will need to be identified. Some operating cost savings may be achievable within Dundee as a result of transferring parking supply to this site. Land may also be released that may be redeveloped for other purposes.
Public:	An ‘area of search’ for a P+R site, covering the Tay Bridge Roundabout area, was identified in the most recent draft of the St Andrews and East Fife Local Plan.

(Landfall site P+R Appraisal Summary table – continued)

Environment			
Sub-objective	Qualitative information	Quantitative information	Significance of impact
Noise and vibration:	Minimal noise or vibration impacts are predicted – the site is remote from residential developments with only one property in the vicinity.	1 property adjacent to site	0
Air quality – overall	See below		+
CO_2 (global), PM_{10} (local) NO_2 (local)	A reduction in vehicle mileage (& hence reduction in vehicle emissions) is forecast, though there may be some increase in mileage from new trips generated or from existing bus users transferring to P+R	By 2022 a 8.2% reduction in existing cross Tay City Centre bound vehicle mileage (& hence reduction in vehicle emissions) is forecast	+
Water quality, drainage & flood defence	Low risk from car park water run off. Low flood risk.	Flood risk less than 0.5% in a year	0
Geology	Site not within any specific geologically sensitive area (e.g. SSSI or RIGS)		0
Biodiversity	Site is not within any biodiversity area – though a SAC covers the Tay Estuary area, close to this site		0
Visual amenity	The site will not be visible from the A92 however it may be visible from the north aspect of the Tay Road Bridge.		-
Agriculture & soils	Site is classified as 3.2 (not prime agricultural land) by the MacCaulay Institute 'Land capability for agriculture'.		0
Cultural heritage	No cultural heritage sites affected		0
Landscape	The site is within an area classified as AGVL. Change of use to P + R is likely to affect this classification. Mitigation measures such as tree planting has been taken into account in the costings.		0

(Landfall site P+R Appraisal Summary table – continued)

Safety			
Sub-objective	Qualitative information		Quantitative information
Accidents (change in personal injury accidents, balance of severity & total discounted savings)	Accident rates per passenger kilometre are lower for bus travel than car travel and thus a transfer of trips from car to P+R (bus) would be expected to lead to a small reduction in personal injury accidents. However, forecast changes in trip volumes and kilometres are small & hence no significant measurable change is appraised		
Security	In order to maintain personal and property security within the car park site, compared with the Do Minimum scenario of driving & parking in Dundee, suitable lighting levels along with a CCTV system would be implemented. No net change in security, from the Do Minimum, is thus forecast.		
Economy (Transport Economic Efficiency)			
Sub-objective	Item	Qualitative information	Quantitative information
User & non-user benefits	Generalised cost user benefits	A generalised cost saving of 18.36 minutes (in 2022) has been estimated for P+R users.	PV of benefits: £5,938,000
	Non-user benefits	In vehicle time for existing (non-P+R) bus users are increased by 60 seconds as a result of the P+R stop. Journey times of remaining cross Tay and Dundee City Centre vehicles are reduced by 6 seconds in the peak direction and period in 2022.	PV of benefits: £2,206,000
Private sector operator impacts	Investment costs	None	£0
	Operating & maintenance costs	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for privately owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 27% of this would have been accrued by privately owned car parks.	PV: -£1,452,000
	Revenues	Bus fares modelled at typical P+R rate of £2.50 return	PV: £5,823,000
	Grant/subsidy payments	None	£0
Economic activity & location impacts	Local economic impacts	No economic activity impacts included within appraisal	
	National economic impacts		
	Distributional impacts		

(Landfall site P+R Appraisal Summary table – continued)

Integration			
Sub-objective	Item	Qualitative information	Quantitative information
Transport interchanges:	Services & ticketing	P+R site provides a new interchange, primarily for transfer from car to existing bus services. Ticketing systems will be as provided by existing bus operations.	Demand forecasts indicate around 124,000 P+R users per year. In 2022 approximately 330,000 'existing' bus users experience minor disbenefit as a result of increased journey time.
	Infrastructure & information	Primary infrastructure benefits and costs covered in economic evaluation. It is also envisaged that cycle parking facilities would be provided for users wishing to access the site by bike and continue the journey by bus. Users would also be permitted to park at the site and complete their journey by bike and thus secure cycle parking facilities could be provided for those wishing to leave their bike at the P+R site overnight.	
Land-use transport integration		A high level of consistency with land-use planning policies, specifically minimising emissions and consumption of resources and energy through modal shift from cars. This option also aims to maximise the efficient use of the Tay crossing.	
Policy integration		Proposal fits with disability policies through the provision of specific disabled parking areas, though some of the bus services are currently not operated by low floor vehicles. Health policies are also assisted through opportunities to cycle to/from the site, though social inclusion impacts could be mixed as site primarily cater for car owners.	

(Landfall site P+R Appraisal Summary table – continued)

Accessibility & Social Inclusion			
Sub-objective	Item	Qualitative information	Quantitative information
Community accessibility	Public transport network coverage	Network coverage not directly affected as bus routes remain unchanged, but catchments are effectively increased as car drivers are able to access public transport services from the P+R site. Access to bus services by cycle also enhanced by the provision of secure cycle parking facilities at the site.	
	Access to other local services	This option is favourable with respect to access by walking and cycling – being close to the existing residential areas of Newport-on-Tay and Woodhaven.	
Comparative accessibility	Distribution/spatial impacts by social group	P+R of primary benefit to car drivers and thus likely to benefit higher socio-economic groups. Accessibility of this site by walk/cycle goes some way to spreading the benefits to other socio-economic groups.	
	Distribution/spatial impacts by area	P+R enables access to public transport services by car owners in rural areas who are not directly served by buses.	

Cost to public sector		
Item	Qualitative information	Quantitative information
Public sector investment costs	Provision of car park and bus stop facility	PV: -£2,215,000
Public sector operating & maintenance costs	On-going maintenance of car park facility	PV: -£470,000
Grant/subsidy payments	None	£0
Revenues	The transfer of parked vehicles from the City Centre to the P+R site will result in a loss of revenue for publicly owned car parks in Dundee. It is estimated that in 2022 the average price that P+R users would have paid to park in Dundee is £5.77 and that 73% of this would have been accrued by publicly owned car parks.	PV: -£5,341,000
Taxation impacts	There is a net reduction in vehicle mileage and hence fuel used, resulting in reduced fuel tax monies.	PV: -£520,000

(Landfall site P+R Appraisal Summary table – continued)

Monetised summary	
Present value of transport benefits	£5,938,000
Present value of cost to government	-£7,051,000
Net present value	£5,421,000
Benefit-cost to government ratio	1.77 : 1

14 Conclusion

Summary

14.1 The appraisal of the options for the Cross Tay Sustainable Transport Study has concluded that the development of a P+R site on the approaches to the Tay Road Bridge should be pursued. Due to the need to attract traffic to a number of destinations, Central Dundee, Ninewells Hospital and University it recommended that a site be brought forward as soon as possible. The site should be served by the existing bus services passing this location

14.2 The Landfall Site offers the best frequency and catchment area. Accepting that there is land ownership and planning policy issues at the Landfall site, discussions with all stakeholders, including bus operators, the Tay Bridge board and other landowners will need to be undertaken.

14.3 Of the alternative bus based P+R options, the Tay Bridge Roundabout site is too constrained in size to support a viable stand-alone P+R facility and will not cope with the anticipated future demand. The site at the Primary School which was the subject of many objections in the Draft Local Plan and, notwithstanding the foregoing, it would require a completely new junction on the A92 trunk road. At this time there is a general presumption by Transport Scotland that there will be no new access taken from the Trunk Road. The site at Forgan roundabout could be an acceptable alternative should the land ownership and planning policy issues at the Landfall site be too problematical.

14.4 Both the preferred Landfall and alternative Forgan roundabout sites achieve a positive Benefit Cost Ratio:

- Landfall site 1.77:1 with a capital cost of £2.8m
- Forgan Roundabout 1.49:1 with a capital cost of £1.79m

14.5 It should be noted that a significant part of the overall economic benefits of this scheme befalls (collectively) to non bridge car users in Dundee City Centre with the users of the Park and ride/choose scheme itself as well as Bridge traffic also benefiting significantly.

14.6 It is recognised that there is relatively little congestion on the Tay Road Bridge at present but this will most likely increase, particularly with the regeneration of the Dundee City Centre and the Waterfront Development. It is therefore envisaged that bus priority measures will be required in due course to ensure that Bus Park and Ride remains an attractive option for people travelling to Dundee form Fife.

14.7 An agreement should be sought that ensures the operating costs of the site are covered through application of the fares collected at the P+R site. The site should be equipped with CCTV coverage to ensure security. A staff presence is also desirable to give users confidence that security will be maintained in all circumstances. The site should be designed to encourage park and choose with a small number of priority spaces for car sharers and those who wish to park and cycle into Dundee. Adequate parking should be provided for cycles and powered two wheelers and the possibility of buses providing “bad weather” transport for cyclists and pedestrians be explored with the bus operators.

14.8 Due to the increase in rail services at Leuchars from one train per hour to two trains per hour from December 2008, and the current parking provision approaching current capacity, it is recommended that the station car parking provision at Leuchars be extended by use of the open

land adjacent to the station which is reserved in the draft local plan. The recommendation is to provide a further 100 at grade spaces which would be subject to the same operational regime as the current car park. Due to flooding issues with the land it is recommend that a sustainable urban drainage system is adopted to ensure that the runoff from the car park area is attenuated to manageable levels. In this light the outline design makes provision for a balancing pond.

14.9 In the longer term further consideration of P+R provision will be needed as demand for parking increases over time with the current level of supply remaining static in Dundee City Centre. Dundee's Local Transport and Central Dundee Parking Strategies articulate this. The TACTRAN P+R/Choose strategy considers that a co-ordinated approach is required to meet these requirements.

Outline Delivery Strategy

14.10 It is recommended that the following actions should be prioritised:

- The delivery of the P+R / park and choose site at the Landfall site;
- The delivery of a car park extension at Leuchars Rail Station; and
- The retention of the land designation for Wormit Station through the St Andrews and East Fife local plan process should be pursued. This will ensure land for P+R is available should housing growth and / or P+R demand rise significantly.

14.11 In the delivery of the P+R / park and choose sites it is recommended that all relevant authorities seek to pass maximum commercial accountability to the private sector as they are best placed to deal with revenue related issues. In addition, it is recommended that the public sector partners seek a mechanism that will either allow for the recovery of site operating costs from the bus fares collected at the site(s) or for direct collection of fares that will enable site costs to be met. An on-site payment mechanism is not recommended due the liability for VAT that may result. Pay on the bus has implications for concessionary fare re-imbursement as the services calling at the site will be normal local bus services that accept the usual range of concessionary travel passes.

14.12 Capital funding of the P+R may be sought from local sources through planning gain, through the grant in aid system by which the public sector receives funding, or from appropriate borrowing facilities. Under the Transport (Scotland) Act 2005, Regional Transport Partnerships are permitted to borrow money for the purposes of its capital expenditure. They must however have regard to the Prudential Code for Capital Finance in Local Authorities when determining its programme for capital investment. The key objectives of the Prudential Code are to ensure that the capital investment plans of local authorities are affordable, prudent and sustainable. In the case of P+R if a revenue stream can be secured to cover site operating costs there is potential for this revenue source to be exploited to cover the cost of prudential or other borrowing. It should be noted that in current SEStran and TACTRAN business plan no borrowing is envisaged, therefore should this option be pursued a change of policy would be required.

14.13 The detailed design of the P+R / park and choose sites should seek to address the following issues:

- The point or points of access from the local highway network.
- the location of the Waiting Facilities / Customer Services Building in relation to the bus movements; the distance to be walked by the customers to the building; the need to see all the site from the building; and any planning constraints

- the general levels for the site in relation to drainage for surface water and waste water and any landscape or planning constraints
- the volume of visitors, cars and buses
- the safety and security of users and their vehicles
- facilities for cyclists and pedestrians
- bus and car routes separated as far as possible
- clear safe routes for pedestrians within the site
- the capability for extension in the future

14.14 It is recommended that once a funding package has been confirmed that work should progress on land acquisitions and the detailed design. This recommendation is made on the basis of the benefits offered by a P+R / park in general and especially during the re-development of the Dundee Central Waterfront area which will restrict access to and from the Tay Road Bridge.

14.15 It is worthy of note that the Landfall site (sub option 2) can progress in at two discrete yet complimentary phases;

- Creation of bus turning facility and promotion/marketing of the facility
- Construction of car park and pedestrian bridge

This would allow the costs to be phased over at least two financial years.

14.16 The detailed design of the Leuchars rail station car park extension will need to consider the factors noted above and will need to ensure compliance with the requirements of First ScotRail and any rail specific requirements that are in excess of the usual highway design standards.

Appendix A

STAG2 Options – Outline Designs

STAG2 Options – Outline Designs

Outline designs have been prepared for the options appraised at the STAG2 level (see below). These show the broad extent of the developments as appraised, including the locations of parking areas and bus stopping facilities (as appropriate).

The design for the Tay Bridge Roundabout site is restricted by the A92 and the existing residential development at this location. Accordingly the indicative design shown only includes parking spaces for around 130 vehicles (Figure 14.1).

The Forgan Roundabout site is shown with an indicative layout for up to 275 vehicles (Figure 14.2). Note that this site size is greater than included in the appraisal and reflects the potential for this site to accommodate greater volumes of P+R users.

As noted within this report, potential exists to develop the Forgan Roundabout site should Fife Council seek to develop other land uses in the area. Although this land use has not been included within the current Local Plan, we understand this option is under consideration and thus an indicative P+R design layout is shown for a new roundabout to access the combined sites (Figure 14.3).

Similar to the Forgan Roundabout design, a layout for the Primary School site has been produced showing a nominal 250 spaces with an area that could be expanded for an additional 250 spaces (Figure 14.4). This includes the access route on to the A92 but not the design of a particular junction layout for which further discussions would be needed with Transport for Scotland.

The design for the Leuchars Station car park expansion is also included. This is shown with the 100 parking space figure used in the appraisal (Figure 14.5). Due to the flooding issues noted by the environmental report an indicative location for a “balancing” or storm relief pond has been included.

The final design is for the recently included Landfall site. This shows the location of the existing car park along with the design for the new construction, including access road and footbridge.

Figure 14.1 Outline Design – Tay Bridge Roundabout P+R

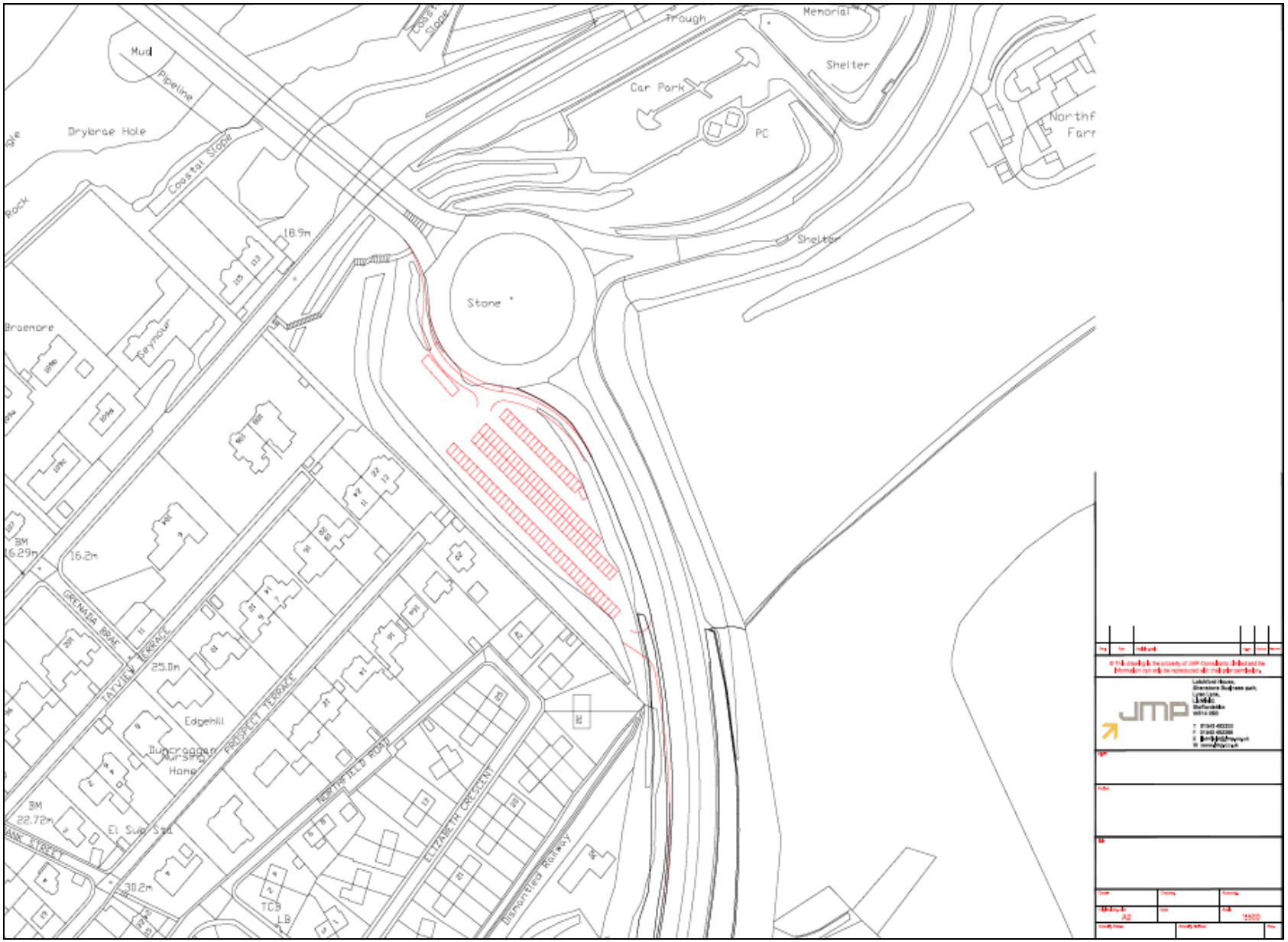


Figure 14.2 Outline Design – Forgan Roundabout/A92 P+R

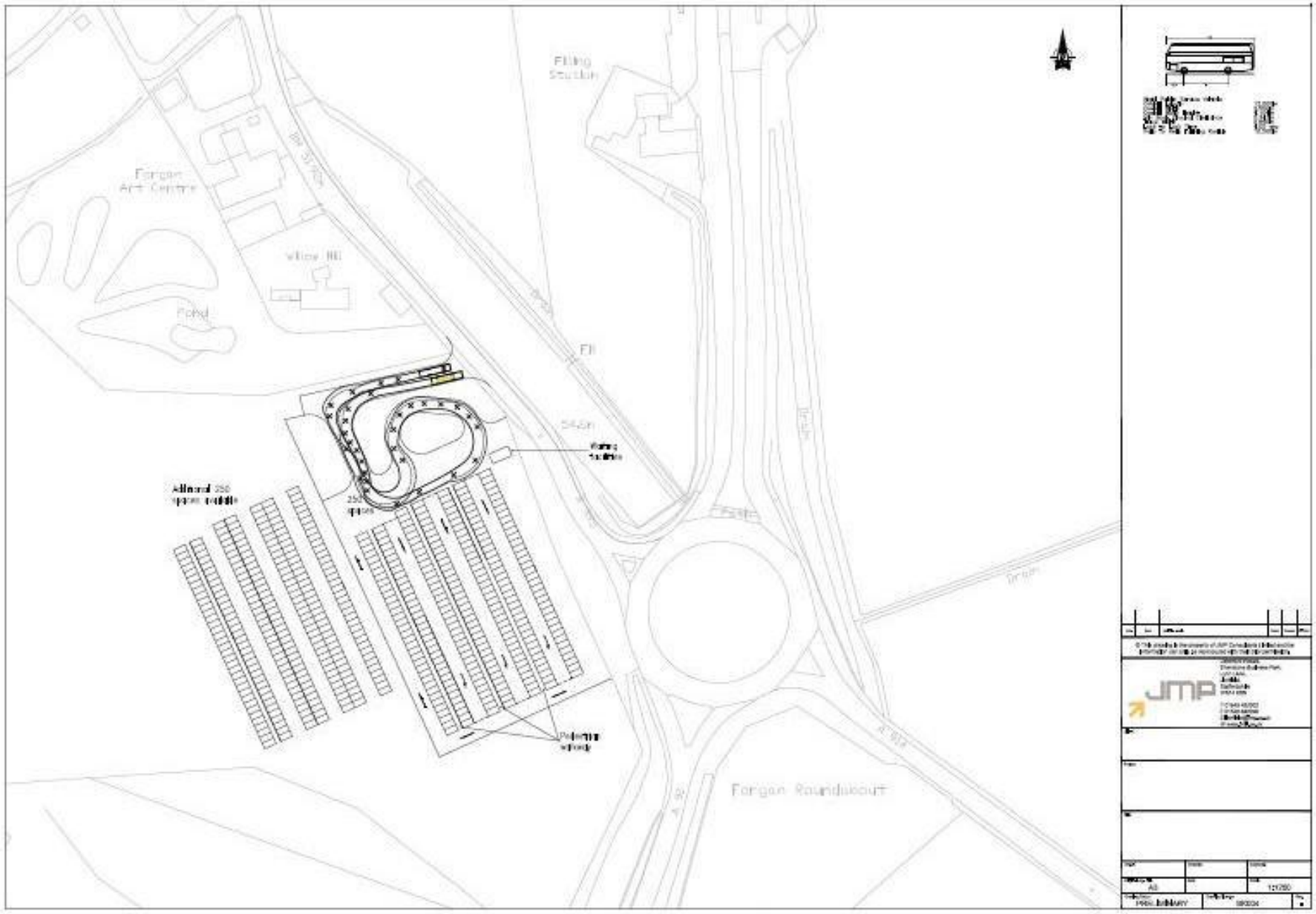


Figure 14.3 Outline Design – Forgan Roundabout/A92 P+R site with new roundabout access

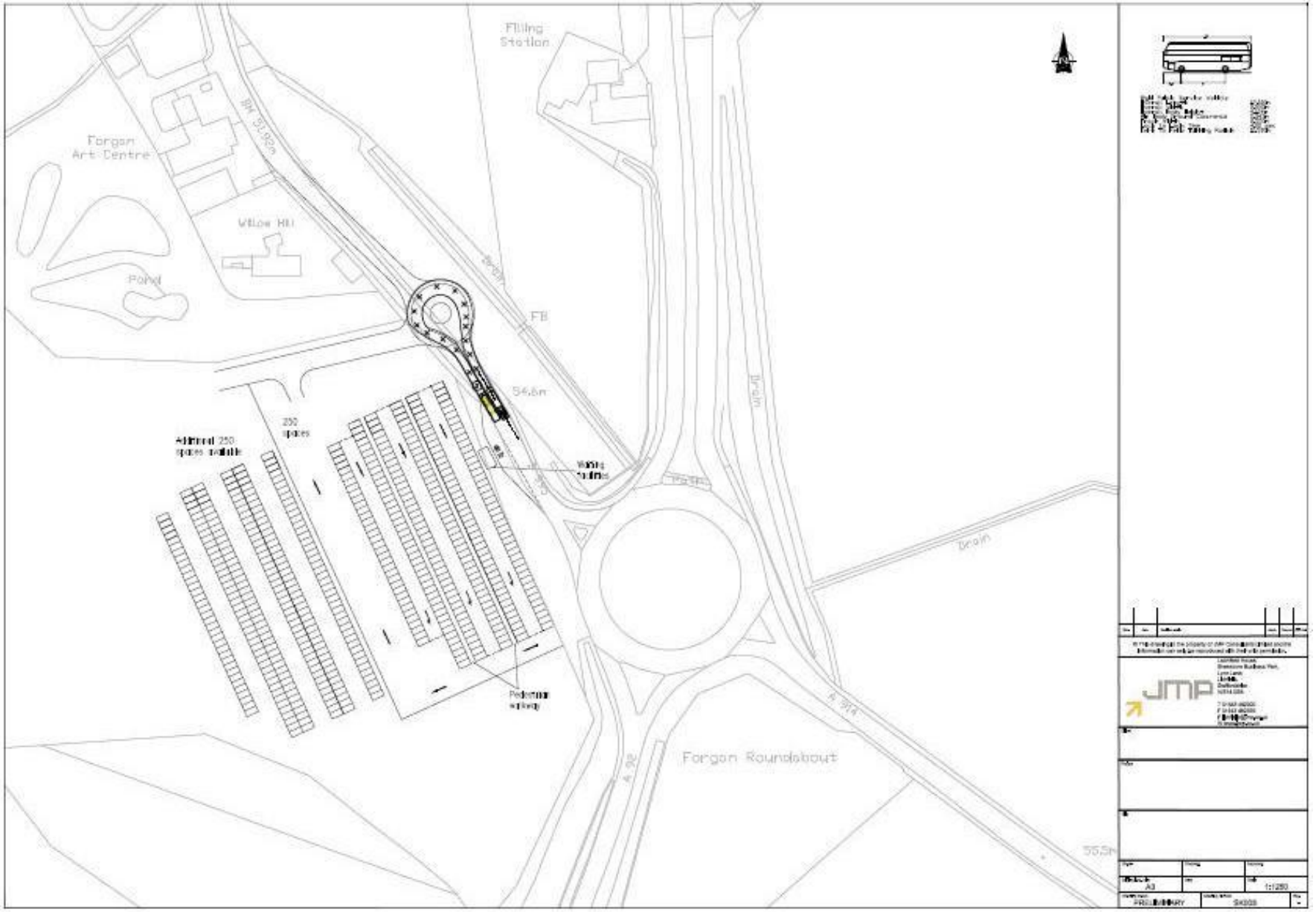


Figure 14.4 Outline Design – Primary School P+R site

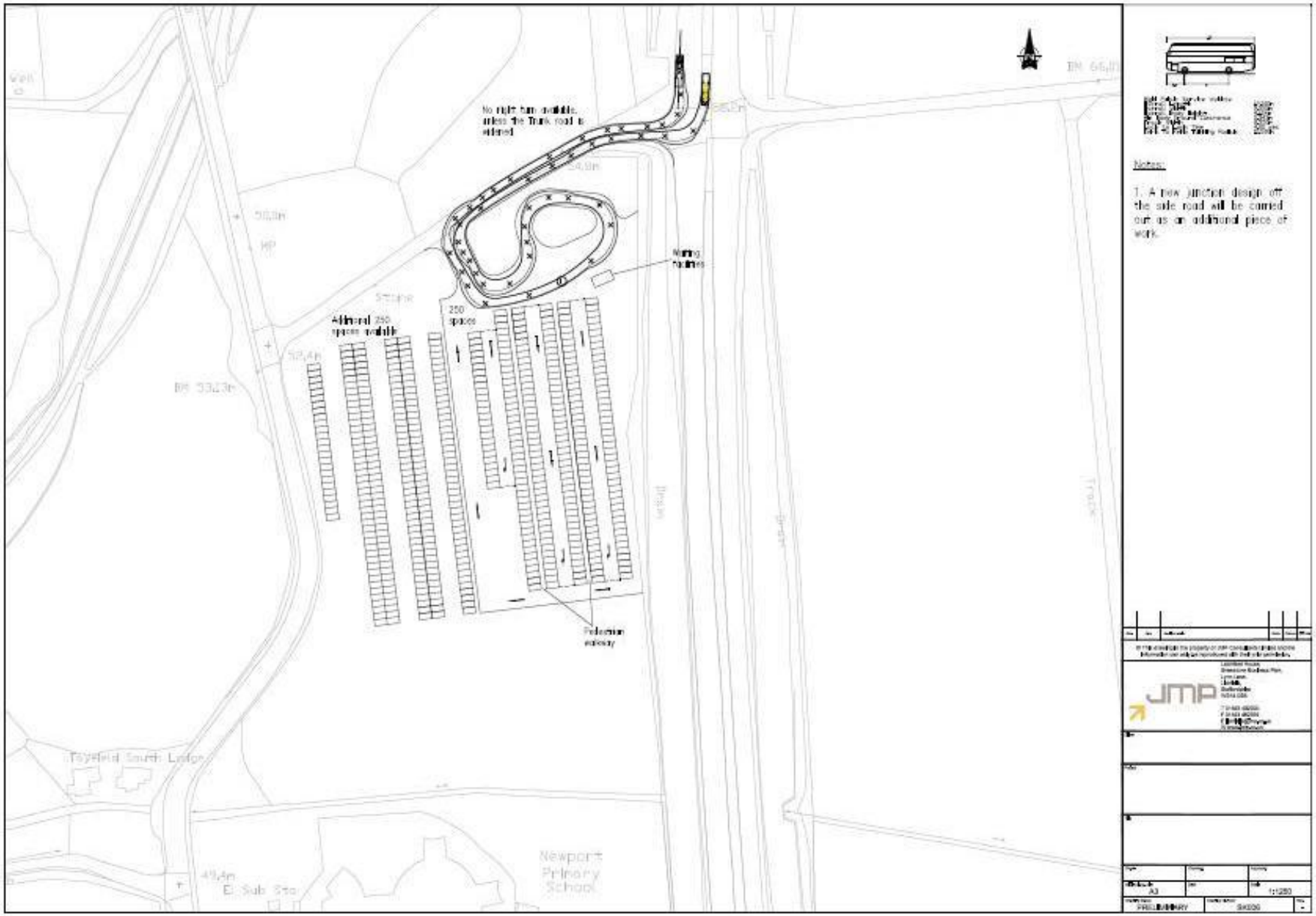


Figure 14.5 Outline Design – Leuchars Rail Station Car Park Expansion

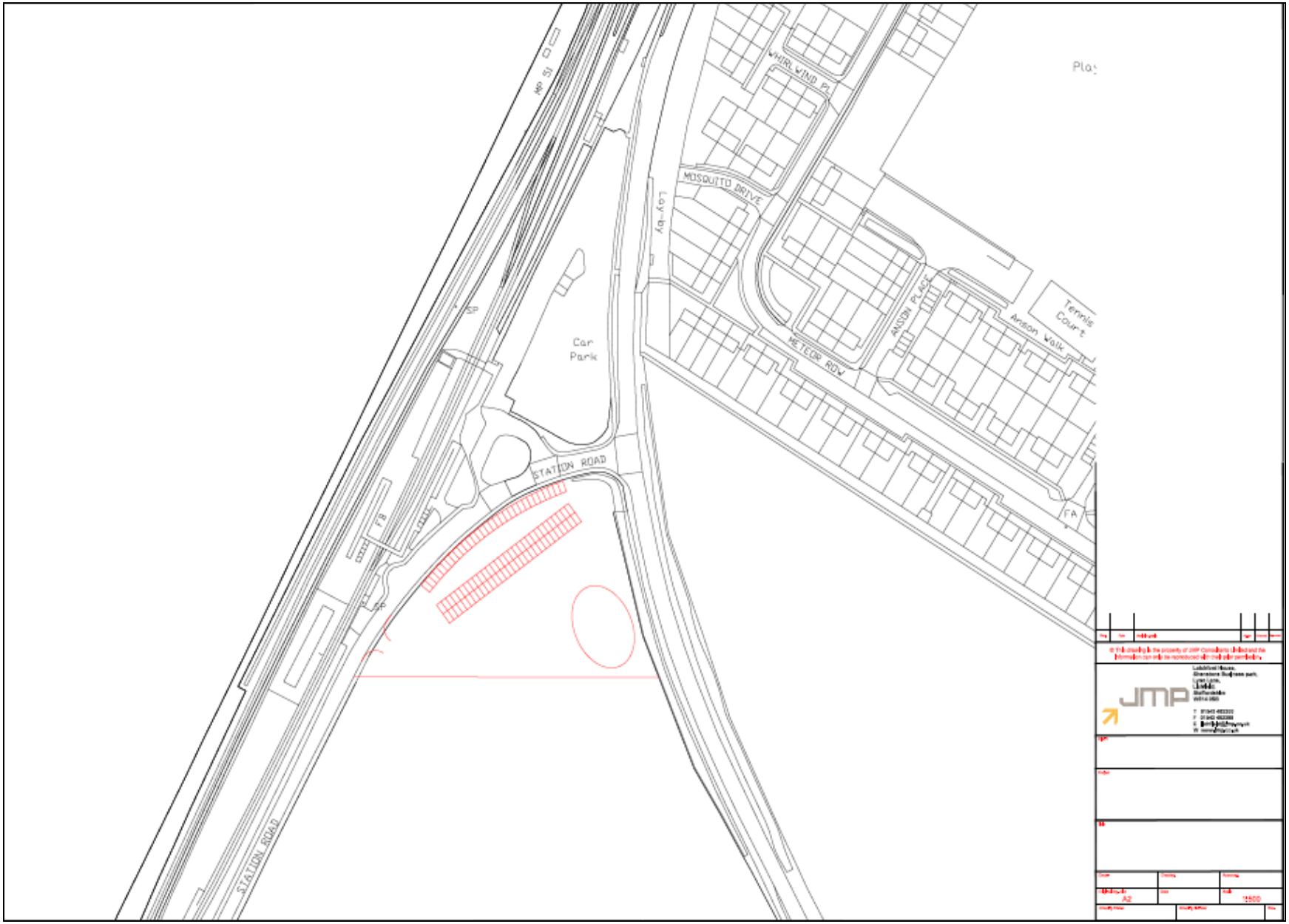


Figure 14.6 Outline Design – Landfall P+R site