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A81 OPTIONS APPRAISAL STUDY

FINAL REPORT

MARCH 2018

WSP | PARSONS BRINCKERHOFF

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FINAL REPORT

East Dunbartonshire Council

Final Issue

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WSP
110 Queen Street
Glasgow
G1 3BX

Tel: +44 (0) 141 429 3555

www.wsp.com

QUALITY MANAGEMENT

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Remarks	Draft	Minor Amendments	Amendments to Bears Way cost estimates & option presentation	Progression of Option 2B to detailed appraisal & updated cycle count data	Updated to reflect change in LDP status and other minor updates	Minor Update to clarify public acceptability criteria for Bears Way extension
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Prepared by	Kirsty Davison / Emma Cowie	Paul White	Caitlin King	Caitlin King	Paul White	Paul White
Signature						
Checked by	Paul White	Caitlin King	Paul White	Paul White	Chris Harris	Chris Harris
Signature						 Harris, Chris Checker 2018.03.05 14:24:40 Z
Authorised by	Paul White	Paul White	Paul white	Paul White	Paul White	Paul White
Signature						
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EXECUTIVE SUMMARY

WSP was appointed by East Dunbartonshire Council (EDC) in August 2016 to identify an appropriate and proportionate package of interventions to alleviate transport issues on the A81 corridor. The intention of the current study is to execute the more detailed and technical components of a STAG Part 2 appraisal, building on previous work undertaken by Aecom in 2008 and 2015. In particular, the study should produce rigorous and robust value for money assessments and establish how potential interventions from the 2015 STAG study compare with each other. It should build on the 2015 STAG study and provide more detail on the appropriateness of interventions, including detailed costs and implications of a new rail station at Allander.

This study follows the methodology of the 2015 update of STAG but will refresh and consolidate the 2008 and 2015 issues and constraints, transport planning objectives and options for detailed appraisal. This is to ensure:

- The problems, issues and constraints associated with the corridor remain current and relevant;
- Commentary from key stakeholders is addressed as far as reasonably practicable within the context of this study;
- Our approach remains commensurate with both the requirements of STAG and the Client's aspirations for a definitive study outcome which will inform future investment decisions; and
- Focus is given where required, to the detailed and technical components of the previous work, whilst avoiding regurgitation of previous work.

Like the 2015 STAG, the appraisal process has taken an objective-led approach, and a new overarching Transport Planning Objective has been derived for this study:

"***To shift to more sustainable modes of transport on the A81 corridor***."

To SMART'en the objective and provide the necessary focus on the outcomes sought for the study area and, eventually, help to facilitate the satisfaction of any competing priorities, two sub-objectives were proposed:

Sub-Objective 1: Increase non-car mode share by 7.5 percentage points over a 5 year period

Sub-Objective 2: Increase public transport use by 5 percentage points over a 5 year period

Following a sifting process, the following options were taken forward for analysis:

Do Minimum

- Provision of increased cycle parking at Milngavie Station (from 28 to 50 spaces), as per the EDC Active Travel Strategy 2015 and Abellio ScotRail Cycle Innovation Plan[1];
- Installation of real time passenger information screens at bus stops along the A81 corridor, as identified in the EDC Local Transport Strategy (LTS) 2013-17; and
- Extension of SCOOT adaptive traffic signal control system to Milngavie Town Centre, also as identified in the EDC LTS 2013-17. Assumed to comprise 4 junctions including bus priority:
  - A81 Strathblane Road / Baldernock Road / A81 Glasgow Road / B8030 Station Road crossroads;
  - B8030 Woodburn Way / Ellangowan Road/Gavin's Mill Road crossroads;
  - B8030 Main Street / B8050 Park Road T-junction; and
  - B8050 Park Road / Clober Road / Douglas Street / B8050 Craigdhu Road crossroads.

Do Something 1

- Extension of the segregated Bears Way cycleway northwards to Milngavie Town Centre and south to Kessington (i.e. Phases 2 and 3).

Do Something 2A

- Expansion of Milngavie Station Car Park from 134 to circa 240 spaces via decking. This work will incorporate landscaping works to enhance visual amenity and screen the car park from Woodburn Way.

Do Something 2B

- Provision of additional car parking for Hillfoot Station at southern Kilmardinny

Do Something 3A

- Construction of a new single track single platform railway station at Allander, including new access from A81, 150 space car park and cycle parking.

Do Something 3B

- Doubling of the railway line between Hillfoot and Milngavie, double platform railway station at Allander, including new access from A81, 150 space car park and cycle parking.

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1 http://www.transport.gov.scot/system/files/uploaded_content/documents/tsc_basic_pages/Rail/ScotRail%20franchise/ASR%20-%20Cycle%20Innovation%20Plan%20-%20June%202015.pdf

The outline qualitative appraisal derived the following scores:

OPTION	STUDY TRANSPORT PLANNING OBJECTIVES	GOVERNMENTS KEY OBJECTIVES	DELIVERABILITY CRITERIA	TOTALS
Do Minimum:	6+	10+	9+	**25+**
Do Something 1:	4+	13+	3+	**20+**
Do Something 2A:	7+	13+	6+	**26+**
Do Something 2B	4+	9+	8+	**21+**
Do Something 3A:	2+	3+	3+	**8+**
Do Something 3B:	2+	2+	1+	**5+**

The detailed appraisal resulted in the derivation of the following Benefit Cost Ratio (BCR) for each option:

OPTION	TOTAL BENEFITS	TOTAL COSTS	BCR	VALUE FOR MONEY
Do Minimum:	£1,174,302	£1,286,376	0.91	**"Poor Value"**
Do Something 1:	£1,205,800	£634,050	1.90	**"Medium Value"**
Do Something 2A:	£11,722,718	£3,859,266	3.04	**"High Value"**
Do Something 2B	£1,021,476	£692,319	1.48	**"Low Value"**
Do Something 3A:	£27,837,874	£36,544,479	0.76	**"Poor Value"**
Do Something 3B:	£27,837,874	£63,389,681	0.44	**"Poor Value"**

The outcomes of the detailed economic analysis and the qualitative assessment of the options indicate that Do Something 2A is the preferred option. This option comprises expansion of Milngavie station car park from 134 spaces to circa 240 spaces via decking.

The rail based options (Do Something 3A and 3B) do not appear to deliver sufficient value for money, and are much less effective when measured against the Study Transport Planning Objectives, the Government's key objectives for STAG appraisal and the identified Deliverability Criteria.

1 INTRODUCTION

INTRODUCTION

1.1.1 WSP was appointed by East Dunbartonshire Council (EDC) in August 2016 to identify an appropriate and proportionate package of interventions to alleviate transport issues on the A81 corridor. The intention of the current study is to execute the more detailed and technical components of a STAG Part 2 appraisal, building on previous work undertaken by Aecom in 2008 and 2015.

BACKGROUND

1.1.2 Over the last decade a number of appraisals have been undertaken for the A81 corridor, including the following:

- In 2005, Atkins recommended that a new railway station was provided at Allander following a STAG-style appraisal of options to generate modal shift;
- In 2008, Aecom undertook a qualitative Transport Appraisal which focussed on means of improving conditions on the A81 corridor, as it passes through East Dunbartonshire. This study concluded that proposals for a rail halt and car park at Kilmardinny should be progressed. However, there remained a number of uncertainties relating to engineering feasibility and cost of this option; and
- In 2015, Aecom undertook further work to refresh the 2008 assessment and further investigate the technical feasibility of options relating to the proposed Allander Station.

1.1.3 The project brief for the current study is to identify an appropriate and proportionate package of interventions to alleviate transport issues on the A81 corridor. The study should produce rigorous and robust value for money assessments and establish how potential interventions from the 2015 STAG study compare with each other. It should build on the 2015 STAG study and provide more detail on the appropriateness of interventions, including detailed costs and implications of a new rail station at Allander.

1.1.4 In particular, the purpose and aims of this study are:

- To provide further information on the appropriateness, financial feasibility and deliverability of options which will allow decision makers to establish whether there is a clear rationale for the potential options and select preferred options for the corridor; and
- To remove any uncertainty regarding the appropriateness and feasibility of potential interventions.

APPRAISAL APPROACH

1.1.5 This study follows the methodology of the 2015 update of STAG but will refresh and consolidate the 2008 and 2015 issues and constraints, transport planning objectives and options for detailed appraisal. This is to ensure:

- The problems, issues and constraints associated with the corridor remain current and relevant;
- Commentary from key stakeholders is addressed as far as reasonably practicable within the context of this study;

- à Our approach remains commensurate with both the requirements of STAG and the Client's aspirations for a definitive study outcome which will inform future investment decisions; and
- à Focus is given where required, to the detailed and technical components of the previous work, whilst avoiding regurgitation of previous work.

1.1.6 Strathclyde Partnership for Transport (SPT) and Transport Scotland (TS) were engaged in the early stages of the study providing guiding principles to the development and progression of the current study. These are summarised below:

SPT COMMENTARY

- à Consideration should be given to local and strategic trips to and from various destinations;
- à Consideration should be given to current use and potential for increased use of bus as a primary mode of transport;
- à There needs to be a balanced and realistic treatment of travel needs in the corridor to ensure that any solutions that emerge are clearly demonstrated to be the appropriate ones; and
- à Option generation and scoring should relate to the transport planning objectives.

TRANSPORT SCOTLAND COMMENTARY

- à A clear evidence based rationale needs to be established for any interventions being considered;
- à The Transport Planning Objectives (TPO's) should be specifically linked to the evidence; and
- à Objectives require to be SMART and incorporate definitive targets and or indicators where possible.

1.1.7 The key tasks in the appraisal process include:

- à Review previous 2008 and 2015 studies;
- à Review current evidence base and refresh problems, issues and constraints;
- à Refine the TPO's in accordance with the above;
- à Refine and re-package options in accordance with the above;
- à Undertake a qualitative appraisal;
- à Undertake a detailed quantitative appraisal;
- à Identify risks and uncertainty; and
- à Confirm preferred option.

STUDY CONTEXT

1.1.8 The A81 trunk road extends from the northern periphery of Glasgow City Centre to Callander in Stirlingshire, passing through East Dunbartonshire and is often considered to be the most important corridor within the authority area given its function in connecting outer lying areas with the wider Glasgow conurbation. In addition, approximately 40% of the authority's population live along the route.

1.1.9 To the north the route serves the rural hinterlands of Stirlingshire including Port of Menteith, Aberfoyle, Balfron, Killearn and Strathblane and the towns of Milngavie and Bearsden, within East Dunbartonshire. Notwithstanding the north south nature of the route, the A81 also facilitates east west movements through the authority area via connections to the A82 Great Western Road and further linkage to Clydebank and Dumbarton in West Dunbartonshire as well as via the Erskine Bridge to Renfrewshire, East Renfrewshire and Inverclyde. To the east, the A81 facilitates access to a number of outlying towns and villages in East Dunbartonshire such as Bishopbriggs, Baldernock, Balmore, Cadder, Torrance and Kirkintilloch.

1.1.10 The A81 intersects the north eastern flanks of Milngavie and Bearsden and supports a number of bus services between these areas and southbound towards Glasgow, via Maryhill Road.

1.1.11 There are three rail stations which have bearing on the extent of the study: Milngavie; Hillfoot; and Bearsden, all three of which offer car parking facilities which have been both anecdotally reported and observed, during the morning peak period in particular to operate to capacity. Milngavie rail station is circa 14km north-west of Glasgow Central Station on the Argyle Line and almost equidistant to Glasgow Queen Street on the North Clyde Line, and represents the terminus within East Dunbartonshire for the Bearsden, Hillfoot and Milngavie line spur, from Westerton. The station serves as a gateway to the West Highland Way long distance footpath which officially starts in Milngavie town centre.

1.1.12 The majority of rail services to and from Milngavie are typically 3-car with 6-cars provided four times per hour during the peak hours. Patronage loadings from Milngavie and Hillfoot are lower with sufficient spare capacity. The peak hour operating 6-car sets are reportedly approaching, or at, capacity as they reach / depart Glasgow. Notwithstanding the addition of passengers at Westerton Station, the capacity constraints are largely incurred out with the EDC boundary as passengers join services on the mainline at Hyndland, Partick and other stations on the Argyle and North Clyde Line.

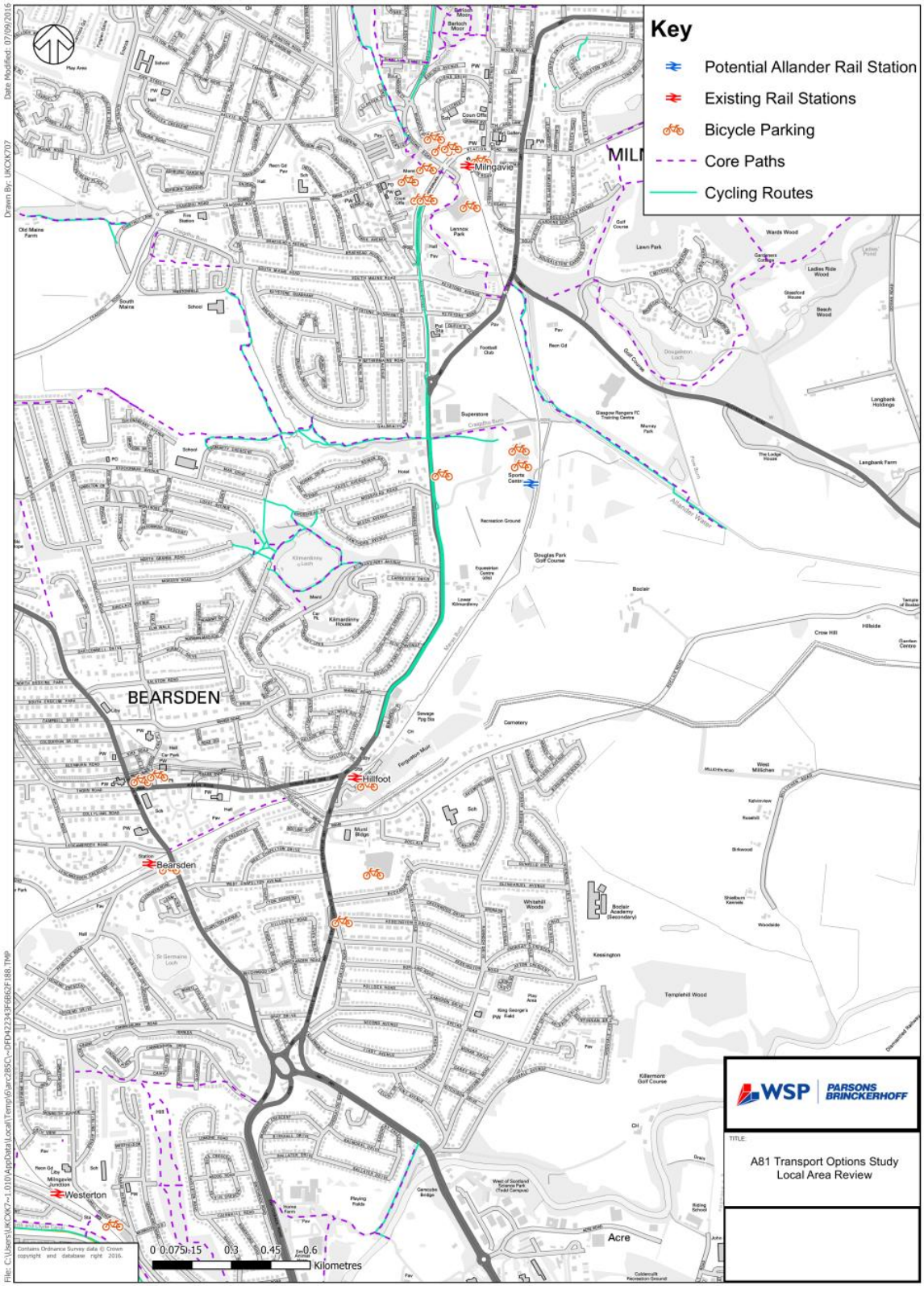
1.1.13 Given both the strategic and local importance of the route, the A81 corridor has been the subject of a number of historical interventions and improvements, with specific consideration given to the corridor within Local Plans and the Local Transport Strategy (LTS).

1.1.14 The Bears Way is a segregated cycleway and opened in September 2015 between Burnbrae Roundabout in Milngavie and Hillfoot, offering a two-way traffic-free cycle route adjacent to the A81 corridor. Phase 1 as implemented, was funded by SPT and Sustrans: however following a Council vote in September 2016 not to continue with Phase 2, which was proposed to connect Hillfoot to Kessington, the project has been halted. Completion of all three phases would allow traffic-free cycling for local trips around Milngavie and Bearsden and onto Glasgow.

1.1.15 The A81 represents a unique corridor within East Dunbartonshire in respect of its dual local and strategic function. As a strategic route it caters for a number of longer-distance journeys which often start or end out with the authority area and bring limited economic and other benefits, whilst adding to traffic volumes on the corridor. For example, for some rural villages within Stirlingshire, the shortest routes to Glasgow are via the A81 corridor or via interchange at Milngavie (or other stations in the authority area), which still require passage through the locality. Local journeys and the ability to uptake travel by more sustainable modes are likely heavily influenced by both strategic and local vehicular trips, thereby exacerbating existing prevailing conditions of car-dominated travel.

1.1.16 The study area is shown in Figure 1.1 below:

Figure 1-1 – Study Area



REPORT STRUCTURE

1.1.17 This report is set out as follows:

- à Chapter 2 Problems, opportunities, issues and constraints
- à Chapter 3 Planning and policy framework
- à Chapter 4 Transport planning objectives
- à Chapter 5 Option development, sifting and refinement
- à Chapter 6 Outline appraisal
- à Chapter 7 Detailed appraisal
- à Chapter 8 Preferred option

2 PROBLEMS, OPPORTUNITIES, ISSUES AND CONSTRAINTS

INTRODUCTION

2.1.1 In identifying the existing and potential problems associated with the transport and land-use system on and adjacent to the A81, our focus will relate specifically to problems, constraints and opportunities identified with the previous 2008 and 2015 studies on the corridor, albeit consideration will be given to rationalising these within the current 2016-2017 evidence-context.

2.1.2 We have undertaken a review of key documents pertaining to the corridor and the wider EDC area. These include:

- à A81 Milngavie – Bearsden Corridor Study, STAG Final Report, 2015;
- à Strathclyde Partnership for Transport Regional Transport Strategy 2008 -2021;
- à East Dunbartonshire Council Local Transport Strategy 2013 - 2017; and
- à East Dunbartonshire Council Active Travel Strategy 2015-2020.

2.1.3 The following sections provide an overarching context to problems, constraints and opportunities with respect to regional and local transportation issues. Subsequently, we describe our approach to the rationalisation and refinement of those issues for a current 2016-2017 context and with respect to corridor-specific transportation and travel issues. The derivation and analysis of the "Problems, Opportunities, Issues and Constraints" is presented in Appendix A.

REGIONAL TRANSPORTATION

2.1.4 The Strathclyde Partnership for Transport (SPT) region has a unique geography and population distribution as a function of a focus on the central belt area of Scotland, as well as its wider encompassing of rural hinterlands associated with authority areas such as East Dunbartonshire, the Ayrshires, Inverclyde, West Dunbartonshire and the Lanarkshires. Many of the authority areas support a dense urban population, in particular Glasgow City, while a significant portion of the population is dispersed across smaller towns, settlements and communities of the remaining 11 Council areas. The Regional Transport Strategy (RTS) establishes four key outcomes for the region:

- à Improved connectivity;
- à Access for all;
- à Reduced emissions; and
- à Attractive, seamless and reliable travel.

2.1.5 Whilst not explicit in the RTS, which focuses more so on strategy outcomes as opposed to problems, the following strategic issues are identified from the constraints posed by the wider geography and historical development of the region:

- à a degree of remoteness in terms of access to alternative modes by large areas of the region;
- à growing traffic congestion on the radial corridors into Glasgow and resultant impacts on economy and environment;

- à much of the wider Glasgow conurbation is served primarily by radial corridors from the surrounding authority areas, albeit less effective in movement terms, given the propensity for higher demand and subsequent congestion;
- à there is limited demand for circumferential routes around the wider Glasgow conurbation and between authority areas, and in particular, with respect to generating viable demand for public transport provision on such routes;
- à strategic radial routes in the authority area frequently facilitate through-traffic movements which lend less to the economy whilst contributing to congestion and air quality issues. The rural hinterlands of south Stirlingshire, out with the SPT region, including Strathblane, Blanefield, Killearn and Balfron, amongst others, are within closer proximity to Glasgow via routes such as the A81 in EDC, and as such are drawn to the through-road and rail connections; and
- à insufficient resilience in the wider regional rail network timetable and, outward and national interdependencies, are such that rail operational constraints impact on journey times for many passengers in the wider region.

LOCAL TRANSPORTATION

2.1.6 East Dunbartonshire Council prepared a Local Transport Strategy (LTS) for the period between 2013 and 2017, setting out the Council's position in relation to transport policy. Whilst a policy and more detailed review is contained in Chapter 4 below, the LTS provides a summary of the main transport issues affecting the authority area. These are noted below:

2.1.7 There are five overarching issues the authority faces in relation to transport and travel:

- à The area's demographics, economy and travel patterns;
- à The level of traffic on the local road network;
- à High demand for rail passenger services;
- à Poor quality, frequency and routing of bus services; and
- à Low levels of active travel participation.

2.1.8 The Bearsden and Milngavie area currently experiences a wide range of transport issues including: high demand for car parking at the four railway stations in the area; traffic congestion on key roads; poor air quality; a lack of reliable, frequent and fast bus services to other towns and villages in East Dunbartonshire and, in particular, journey reliability for trips to Glasgow City; and inadequate footways that connect town centres, services and key facilities to outlying residential areas. The LTS also recognises a lack of express bus services between East Dunbartonshire and Glasgow City. Whilst not specific to the study area, the LTS identifies a significantly lower rate of cycling in East Dunbartonshire than the national average (50% lower).

2.1.9 There are a number of issues that relate to the rural area, cross council and boundary travel. Access to areas of tourism interest is poor, bus services to rural towns and villages are infrequent, especially post PM peak, rail and bus services are not integrated, key services are not served by sufficient cycle parking and there is a large demand for travel between East Dunbartonshire and Glasgow.

RAIL NETWORK

2.1.10 During the consultation with SPT, it was highlighted that infrastructure and timetabling constraints limit network resilience locally. The single track infrastructure on the Milngavie line is a key concern as it requires trains to pass on a short double track section between Bearsden and Hillfoot. Under the present timetable, trains are scheduled to pass at Bearsden, and five minutes after one train arrives at Bearsden, another train departs from Milngavie. As a result of the very limited passing opportunities, late running trains approaching Milngavie can delay trains running in the opposite direction at Bearsden, and if this delay exceeds three minutes the next train waiting to depart Milngavie will also be delayed.

CORRIDOR-SPECIFIC TRANSPORTATION

2.1.11 STAG guidance emphasises the importance of identifying actual and perceived problems and opportunities, noting that perceived problems are often as important as those that are evidence-based. The root causes of problems and consequences of problems should be explored. In addition the guidance advocates consideration of issues and constraints and defines these as:

- à "issues" are uncertainties that the study may not be in a position to resolve, but must work within the context of, e.g. uncertainty over whether major infrastructure will be built out, impact of major new land uses aren't clear, etc.; and
- à "constraints" are uncertainties and matters that a study will have to consider when developing an option, but are largely out with the immediate influence of the study, e.g. statutory powers of an authority to promote change, funding levels that can realistically be obtained, legislation etc.

2.1.12 In order to consolidate the undertakings of the previous studies with respect to the problems and issues identified and refine and refresh these for the current study context, the following was collated:

- à "Problems and issues" as identified in the Aecom 2008 report and referenced in the Aecom A81 Milngavie – Bearsden Corridor Study, STAG Final Report, 2015;
- à "Key Issues and Constraints" as identified in the Aecom A81 Milngavie – Bearsden Corridor Study, STAG Final Report 2015;
- à "Problems and Issues Along the A81 Corridor (Stakeholder Workshop Findings) as identified in the Aecom A81 Milngavie – Bearsden Corridor Study, STAG Final Report; and
- à "Wider-Noted Issues and Observations" from a WSP site visit to the study and wider area.

2.1.13 In addition to the above, Strathclyde Partnership for Transport (SPT) and Transport Scotland (TS) were engaged to confirm both their views on the previously completed studies as well as provide insight to the actual and perceived problems and issues associated with the A81 corridor.

2.1.14 The above collated problems and issues were subject to a simplistic retain / reject approach on the basis of their current validity against presented evidence and any changes in the study area over the interim passage of time. Those that were retained were then allocated to the following key themes:

- à Car ownership & usage;
- à Development & planning;
- à Congestion;
- à Bus;
- à Parking; and

- à Walking & cycling.

2.1.15 The reported and "retained" problems and issues, now allocated to a particular "theme", were collated from a wide collection of historical and current perspectives as well as evidenced, observed and perceived from a range of sources. The next step in the refinement process therefore involved the removal of any duplicates or similarly termed issues.

2.1.16 Following on from above, this resulted in the following problem, issue or constraint under each key theme:

Table 2-1 Constraints

THEME	PROBLEM, ISSUE OR CONSTRAINT
Car Ownership & Usage	High car usage in the area with car being the dominant mode of transport.
Development & Planning	Many areas are not within a reasonable walking distance of a rail station.
Congestion	Localised congestion occurs at key junctions on the corridor.
Bus	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor. Journey times do not compare favourably to those of the private car. Many pockets of Bearsden / Milngavie where walking times to nearest bus stops are in excess of ten minutes[2]. Inadequate information around services and lack of real time information. There is no opportunity for bus priority on the corridor.
Parking	Parking facilities at Milngavie, Hillfoot, Bearsden and Westerton Station are operating at capacity. Overspill parking at Hillfoot Station impacts on the operation of the A81 corridor. There is a lack of parking provision in Milngavie.
Walking & Cycling	Infrastructure on the corridor is disjointed in places with quality of routes considered a barrier to walking and cycling. There is a lack of cycle storage at stations and key locations.
Rail	There are capacity constraints on the line between Milngavie and Hillfoot preventing an increase in service frequency and impacting on network resilience and journey time reliability.
Public Transport	There is a lack of integration across modes including by operators and ticket types.

[2] *Scottish Planning Policy* (SPP) (Scottish Government, 2014) recommends that bus stops should be sited within 400m of new residential development which equates approximately to a 5 minute walk. This is based on an average walking speed of 1.3m/s. A walking time to a bus stop in excess of 5 minutes is readily acceptable for some members of the population, but not all. The level of attractiveness of using the bus is proportionate to the distance or time travelled to access a stop.

2.1.17 The next stage in the refinement of the above problems, issues and constraints was developing some clarity around the particulars of the “2017 Issue” (see Table 2-2 below) being a problem, an issue or a constraint. This then informed the treatment of each, and how they will be considered in the subsequent development of the Transport Planning Objectives (TPO’s) and latter option development.

2.1.18 Table 2-2 below, presents the outcome of the consideration of problems, issues and constraints within the current 2017 study context.

Table 2-2 Problems, Opportunities, Issues & Constraints

THEME	2017 ISSUE	PROBLEMS	OPPORTUNITIES	ISSUES	CONSTRAINTS
Car Ownership & Usage	High car usage in the area with car being the dominant mode of transport.	Queuing and delay		Air quality, bus reliability, general car journey time reliability.	High car ownership
Development & Planning	Many areas are not within a reasonable walking distance of a rail station.			Walking distance of rail station.	
Congestion	Localised delays occur at key junctions on the corridor.	Delay		Air quality, bus reliability, general car journey time reliability	High car usage
Bus	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor[3].	Reliability of service and quality of information		Bus use low (despite reasonable frequency)	A81 carriageway widths (both with and without Bears Way); subject to traffic conditions within GCC (outwith study remit); third party reliance on delivery of Real Time Passenger Information infrastructure; and no guarantee bus operators will maintain service frequency.

[3] As obtained from consultations undertaken to support the 2015 STAG study.

THEME	2017 ISSUE	PROBLEMS	OPPORTUNITIES	ISSUES	CONSTRAINTS
	Journey times do not compare favourably to those of the private car.	Congestion			A81 carriageway widths (both with and without Bears Way) are not sufficient for continuous dedicated bus lanes and for distances involved are unlikely to facilitate betterment of bus journey times; subject to traffic conditions within GCC (outwith study remit).
	Many pockets of Bearsden / Milngavie where walking time to nearest bus stops are in excess of ten minutes.			Walking distance to a bus stop.	
	Inadequate information around services and lack of real time information.	Quality of information.		Bus use low (despite reasonable frequency).	Third party reliance of delivery of Real Time Passenger Information infrastructure.
	There is no opportunity for bus priority on the corridor.			Bus use low (despite reasonable frequency).	A81 carriageway widths (both with and without Bears Way) leave limited space for a dedicated bus lane.

Theme	2017 Issue	Problems	Opportunities	Issues	Constraints
Parking	Parking facilities at Milngavie, Hillfoot, Bearsden and Westerton Station are operating at capacity.	Lack of parking provision at stations.	Unmet demand for rail could be fulfilled through increased parking provision and there is existing passenger capacity on services. Reduce or deter short car trips to release parking capacity for those who can't walk or cycle to stations.	Additional traffic and inconsiderate parking on the corridor contributing to air quality, bus reliability and general car journey time reliability issues on the corridor.	Limited land immediately adjacent to stations to provide additional parking.
	Overspill parking at Hillfoot Station impacts on the operation of the A81 corridor.	Lack of parking provision in Hillfoot.	Unmet demand for rail and there is existing passenger capacity on services Land available at Kilmardinny for parking. Reduce or deter short car trips to release parking capacity for those who can't walk or cycle to stations.	Additional traffic and inconsiderate parking on the corridor contributing to air quality, bus reliability and general car journey time reliability issues on the corridor.	Limited land immediately adjacent to Hillfoot to provide additional parking.
	There is a lack of parking provision in Milngavie.	Lack of parking provision in Milngavie.	Unmet demand for rail could be fulfilled through increased parking provision and there is existing passenger on services. Reduce or deter short car trips to release parking capacity for those who can't walk or cycle to the town centre.	Additional traffic and inconsiderate parking on the corridor contributing to air quality, bus reliability and general car journey time reliability issues on the corridor.	Limited land to provide additional parking and noted historical position of refused application for decked car park at neighbouring retail site.

THEME	2017 ISSUE	PROBLEMS	OPPORTUNITIES	ISSUES	CONSTRAINTS
Walking & Cycling	Infrastructure on the corridor is disjointed in places with quality of routes considered a barrier to walking and cycling.	Low walking and cycling uptake (likely) as a result of network conditions.	Existing section of new segregated cycle infrastructure and EDC connections onwards to Glasgow.	Infrastructure is inconsistent and unkempt, and high traffic volumes reduce uptake of walking and cycling.	Funding, maintenance costs and public perception.
	There is a lack of cycle storage at stations and key locations.	Lack of cycle parking.	Abellio Station Travel Plans and relative ease of introduction.	Is there a genuine lack of cycle parking at stations and key locations?	Limited land to provide more cycle parking at Hillfoot and reliance on third party (ScotRail Abellio) to deliver more cycle parking.
Rail	There are capacity constraints on the line between Milngavie and Hillfoot preventing an increase in service frequency and impacting on network resilience and journey time reliability.	Unmet demand for rail and there is existing passenger capacity on services. Network resilience and journey time reliability.		Single track section between Hillfoot and Milngavie and limited timetable flexibility.	
Public Transport	There is a lack of integration across modes including by operators and ticket types.				Is there demand for interchange functions within EDC (as opposed to GCC)?

2.1.19 Notwithstanding the commentary on Public Transport under “Constraint”, it is considered that with the SPT Zonecard being operational in the area, as well as the Concessionary Travel Card, the validity of this point could be questioned.

2.1.20 In order to inform development of the TPO's, a further exercise involved examining each Problem, Opportunity, Issue and Constraint and applying the following criteria:

1. Do you want to do anything about this?; and
2. What can you do?

2.1.21 The thinking behind this rhetoric evaluation was that, when considering "*high car usage in the area with car being the dominant mode of transport*", for example, it would be prudent to note that high car ownership is a constraint – but at an authority (and, in some instances, national) level. Further, this is something there is less ability to exert influence over, but the fundamental problem of congestion and the subsequent issues of air quality, bus reliability, and general journey time reliability, can potentially be addressed through complementary measures.

2.1.22 In effect, we may not be able to solve or reduce car ownership in the area, but we can possibly help lower the private car's status as the dominant mode of travel and / or alleviate some of the impacts of that. So the next stage in the process was about the application of logic and pragmatism to ensure the relevant "2017 Issue" (see Table 2-2) are taken forward with an element of realism.

2.1.23 This further analysis for each of the "Problems, Opportunities, Issues and Constraints" is presented in Appendix A, the outcomes of which are integral to the development of the TPO's and latter option development.

3 PLANNING & POLICY FRAMEWORK

INTRODUCTION

3.1.1 This section considers the premise of the study within the regional and local land-use and transport planning and policy context.

SPT Regional Transport Strategy (2008 – 2021)

3.1.2 The RTS was approved in June 2008 and influences all of the future plans and activities of the organisation and informs future national and local transport strategies. The overall vision for the RTS is:

'*A world class sustainable transport system that acts as a catalyst for an improved quality of life for all*'

3.1.3 The objectives for the RTS are as follows:

- **Safety and Security:** To improve safety and personal security on the transport system.
- **Modal Shift:** To increase the proposition of trips undertaken by walking, cycling and public transport.
- **Excellent Transport System:** To enhance the attractiveness, reliability and integration of the transport network.
- **Effectiveness and Efficiency:** To ensure the provision of effective and efficient transport infrastructure and services to improve connectivity for people and freight.
- **Access for All:** To promote and facilitate access that recognises the transport requirements of all.
- **Environmental and Health:** To improve health and protect the environment by minimising emissions and consumption of resources and energy by the transport system.
- **Economy, Transport and Land-use Planning:** To support land-use planning strategies, regeneration and development by integrating transport provision.

3.1.4 In order to provide focus for the RTS, four Strategy Outcomes have been identified:

- **Improved connectivity:** The west of Scotland has a transport system that underpins a strong, sustainable economy.
- **Access for All:** The west of Scotland has a transport system that is safe, secure and accessible to all.
- **Reduced Emissions:** The west of Scotland has a transport system that promotes sustainable travel for a cleaner environment and healthier lives.
- **Attractive, Seamless Reliable Travel:** The west of Scotland has a transport system that provides attractive, seamless, reliable travel.

3.1.5 The following table provides a summary of the relevant indicators outlined in the RTS to monitor the Strategy:

Table 3-1 Summary of RTS Indicators

INDICATORS	BASELINE	TARGET (DIRECTION OF TRAVEL)
Proportion of passengers satisfied with public transport information provision.	89% rail (2006); 81% bus (2006); 60% Subway (2007)	Increase
Proportion of passengers satisfied with the public transport system.	85% rail (2006); 75% bus (2006); 86% Subway (2007)	Increase
Proportion of passengers satisfied with public transport reliability.	89% rail (2006); 74% bus (2006); 51% Subway (2007)	Increase
Proportion of working age population within a given public transport journey time of a strategic employment centre.	73% (30 minutes) (2008)	Increase
Proportion of 15% most deprived population within 400m of a bus stop with at least 6 buses an hour between 7am and 7pm on an average weekday.	79% (2008)	Increase
Proportion of total population within a given public transport journey time of a hospital.	64% (30 minutes) (2008)	Increase
Proportion of total population within a given public transport journey time of a GP.	81% (30 minutes) (2008)	Increase
Proportion of 16 – 19 year olds within a given public transport journey time of a further education establishment.	82% (30 minutes) (2008)	Increase
Modal share of adults undertaking active travel to work or education.	35% travel to work (incl. public transport) (2006)	Increase
Modal share of children undertaking active travel to school.	75% (incl. public transport) (2006)	Increase
Index of residents rating their neighbourhood as a good place to live in terms of public transport.	4.2 (ratio of 'good' to 'poor' public transport references) (2006)	Increase
Proportion of trips undertaken by walking, cycling, public transport.	12.5% walking; 0.6% cycling; 18.1% public transport (all 2006)	Increase

Glasgow and the Clyde Valley Proposed Strategic Development Plan (2017)

3.1.6 The A81 Corridor is identified within the SDP as Radial Corridor R14 'Maryhill / Bearsden / Milngavie'. A potential option for public transport change is stated as 'Heavy or light rail - improve / develop service frequency; improve core bus frequencies and routings'

3.1.7 The current Plan has been developed as part of the updating process of the currently approved Strategic Development Plan (2012). The Proposed Plan was submitted to Scottish Ministers in May 2016 following public consultation that was conducted on between January and February 2016.

3.1.8 The vision for the Proposed Plan is:

'By 2036 Glasgow and the Clyde Valley will be a resilient, sustainable compact city region attracting and retaining investment and improving the quality of life for people and reducing inequalities through *the creation of a place which maximises its economic, social and environmental assets ensuring it fulfils its potential as Scotland's foremost city region.'*

3.1.9 Policy 17: Promoting Sustainable Travel states:

'Transport Scotland, SPT and the Clydeplan local authorities will work together to deliver the planned and programmed investment in the city region's transport network as set out in the Strategic Transport Projects Review, Regional Transport Strategy, Glasgow and Clyde Valley City Deal Infrastructure Fund, Local Transport Strategies and related programmes. In addition consideration should be given the potential broad level strategic options and interventions set out in Schedule 13.

3.1.10 Building on current and previous studies, plans and strategies, Clydeplan seeks to prioritise work to identify future land-use and transport integration solutions, in partnership with Transport Scotland and SPT, across the city region, and seek to identify future actions and interventions in support of the Vision and Spatial Development Strategy.'

3.1.11 As outlined in the previous SDP (2012), the A81 corridor is outlined as Radial Corridor R14 'Maryhill / Bearsden / Milngavie' with the potential option for improving / developing frequency of heavy and light rail as well as improving core bus frequencies and routings noted under Schedule 13 of the Plan

East Dunbartonshire Local Development Plan (2017)

3.1.12 The East Dunbartonshire Local Development Plan (LDP) was adopted in February 2017 and supersedes the Local Plan 2 (2011). The LDP sets a framework for the growth and development of East Dunbartonshire up to 2025 and beyond.

3.1.13 The vision for the Local Development Plan is that East Dunbartonshire will be: *'Working together to achieve the best with the people of East Dunbartonshire.'*

3.1.14 The principal policies set out to underpin the overarching vision are as follows:

- à Sustainable Economic Growth;
- à Design and Placemaking;
- à Supporting Regeneration and Protection of the Green Belt;
- à Sustainable Transport; and
- à Green Infrastructure and Green Network.

3.1.15 In addition there are further relevant policies lying under the categories of place; network of centres and retail; economy and employment; and infrastructure and utilities.

3.1.16 The A81 corridor is highlighted in the East Dunbartonshire Spatial Strategy Map as part of a Route Corridor Initiative.

3.1.17 The Communities Section of the LDP outlines relevant strategies based on broad geographical areas within East Dunbartonshire.

3.1.18 Under Policy 3: Supporting Regeneration and Protection of the Green Belt, the site of 'Kilmardinny, including equestrian centre and former bus depot' is noted to be 'critical to the wider regeneration of Milngavie/Bearsden and should continue to be treated as a priority. The large area of vacant land continues to be a major blight on the area. See Creating Sustainable and Inclusive Communities schedule for requirements.'

3.1.19 Policy 4: Sustainable Transport outlines that a Transport Appraisal of the A81 Corridor will be undertaken. Comments relating to this are as follows:

'East Dunbartonshire Council and SPT have commissioned a refresh of a 2008 STAG study of the A81 corridor which connects Bearsden and Milngavie with Glasgow. The appraisal is ongoing and is examining a range *of transport options that can reduce congestion on the corridor and improve transport conditions more generally. The results of the appraisal will identify possible solutions to identified transport issues or opportunities along the corridor which may include significant interventions such as a new rail station at Allander or and/or other projects identified in the Council's Local Transport Strategy 2013-2017. Any preferred options emerging from the appraisal will require further and more detailed technical study to confirm viability. Any options identified will be considered as part of the existing network and not as stand-alone facilities for new developments. Until the outcomes of the refreshed STAG appraisal and subsequent technical assessments of deliverability and viability are available, East Dunbartonshire Council will, as a precaution against sterilisation, continue to safeguard:*

- *Land sufficient to locate a rail station at Allander/Kilmardinny which could be easily connected to the existing rail line. Any potential rail station must provide good facilities for access by walking and cycling with a wide walk-in/cycle catchment clearly established. Land adjacent should be reserved for provision of high-quality footways and cycleway, in addition to a road link to connect potential new station to the A81.*

  Land should be set aside for a potential car park to act as park-and-ride facility adjacent to the potential rail station site.

- *Land at Kilmardinny to* provide *a location for a potential bus park and ride scheme, and associated car park with a minimum of 150 spaces.'*

3.1.20 Policy 6: Creating Inclusive and Sustainable Communities identifies Kilmardinny (6.12) as having an indicative capacity of 320 units. This area of land outlined on the proposals map is consistent with that designated in the previous LP2 as site UC 1C. The key requirements for the land parcel are outlined as below:

1. Develop in line with an approved Masterplan;
2. Planning Obligations for A81 Route Corridor proposals including footpath, cycleway and road access improvements;
3. Provide a landscaped green network corridor between Milngavie and Bearsden along the Craigdhu Burn;
4. Planning Obligations to include development of a new Allander Sports Centre;
5. Provision of business units; and
6. Flood prevention and drainage schemes, including off site measures where appropriate.

East Dunbartonshire Local Transport Strategy (2013 – 2017)

3.1.21 The LTS was approved in August 2013 and sets out an Action Plan which proposes actions in three related areas: Active Travel, Public Transport, and Roads and Parking. Actions are set out across the short, medium and long term.

3.1.22 The LTS provides an overview of the changing demography and economy of East Dunbartonshire and a forecast of future trends, demonstrating a requirement to take these changed into account when developing transport schemes. The LTS states:

'The LTS aims to set out objectives and transport interventions that will help address the changing needs of local communities across East Dunbartonshire in terms of providing a transport network that provides an effective and efficient way to travel across all travel modes. The transport network must meet the needs of all age groups of East Dunbartonshire and provide access to employment, healthcare, retail and leisure facilities.'

3.1.23 The total population is set to decline in the area, with a reduction in the working population and an increase in pensionable population. The LTS states:

'Not only is the total population reduction forecast to continue, but the proportion of people of working age that *live in the area is expected to fall from approximately 63 per cent (2010) of the total population to 52 per cent (2035).'*

3.1.24 Key demographic forecasts have been extracted from the LTS and are provided below:

Table 3-2 Forecast Population Change in East Dunbartonshire Between 2010 and 2035

AREA	NATURAL CHANGE	NEW MIGRATION	PERCENTAGE FORECAST POPULATION CHANGE
Scotland	+1.3%	+8.9%	+10.22%
East Dunbartonshire	-4.0%	-5.8%	-9.8%

Table 3-3 Forecast Percentage Change in Population by Age Group between 2010 and 2035

AREA	ALL AGES	CHILDREN	WORKING AGES	PENSIONABLE AGES
Scotland	+10.2%	+3.2%	+7.1%	+26.2%
East Dunbartonshire	-9.8%	-22.8%	-17.9%	+22.1%

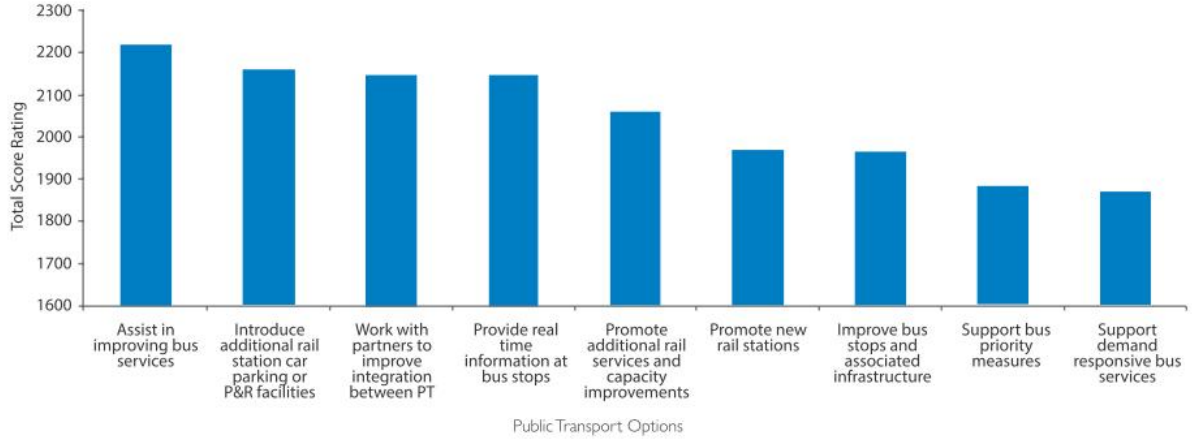
3.1.25 The LTS summarises the transport implications of the changing character of the area:

- East Dunbartonshire's population has declined over recent years and this trend is forecast to continue during the period between 2010 and 2035 with a reduction of 9.8 per cent expected. This is likely to involve a reduction in total journeys.
- The population of East Dunbartonshire is ageing and the number of people aged over 65 years old is forecast to increase by 11,000 people between 2010 and 2035. This is likely to result in a reducing demand for commuting but a growth in need for local journeys for access to services.
- The percentage of economically active people living in East Dunbartonshire has decreased over recent years, however, this percentage is still higher than both the Scottish and British national averages. There is a considerable difference in the average weekly wage between people that live in East Dunbartonshire and people who work in the area. Commuting is however likely to remain a significant travel issue.
- The LTS conducts a review of the existing transport network within East Dunbartonshire. With regards to public transport, the LTS finds that rail patronage grew considerably between 2004/05 and 2011/12 and states that 'East Dunbartonshire Council aims to continue to work with our partners such as Transport Scotland, Network Rail, First Scotrail and SPT and

ensure that both existing and future demand for rail travel is met through improvement projects.'

- The LTS conducted a four week consultation for members of the community to engage with the Council on issues relating to transport. A question was posed providing nine options relating to possible public transport interventions that East Dunbartonshire Council could help deliver in order to improve the services in the area. Respondents were asked to rate each of these public transport improvements in terms of priority. Below is an extract from the LTS illustrating the results.

Figure 3-1 Public Transport Questionnaire Result



3.1.26 The LTS outlines the main issues for transport and travel in East Dunbartonshire. In relation to rail transport, the main issues found for the area are summarised below:

- **Meeting the Demand for Rail Services:** During the six year period between 2004/05 and 2010/11, the number of rail passengers that travelled through East Dunbartonshire's stations increased by approximately 1,023,000 trips, which equates to a growth of 35 per cent. Whilst such an increase is positive due to rail being a sustainable mode of transport, the capacities of railway station car parks are inadequate across East Dunbartonshire. The LTS identifies that this limited capacity leads to passengers parking on surrounding streets, impacting on local residents and business owner. Options are identified for encouraging passengers to either walk or cycle. The potential for better integration between scheduled bus and train services is noted to be difficult to address due to legislation constraints. The LTS states :

  'The Council, as part of the requirements outlined in Local Plan 2, will conduct an investigation during the plan period into the merits, costs and feasibility of developing new rail stations at Woodilee, Westerhill and Allander. The study will investigate the issue and uncertainty with regards to whether such proposals can be delivered in terms of reasonable finance and impact on existing operational performance. The study will recommend the appropriate intervention for the geographical areas concerned within the context of the whole range of solutions available to address transport problems.'

3.1.27 The LTS identifies clear objectives in order to mitigate the above issues. It states that any possible transport intervention should be assessed against these objectives to ensure that the correct solutions are developed. The objectives for the LTS are:

- Delivering a safe transport network across all modes;
- Improving the health and wellbeing of the community through promoting sustainable travel, attractive well designed streets and active travel routes throughout East Dunbartonshire;
- Enhancing the accessibility of services, facilities and businesses in East Dunbartonshire, which promotes social inclusion;

- à Delivering reliable and efficient public transport services through close working with key transport partners and providers in order to achieve modal shift;
- à Ensuring that existing roads and footways are maintained incorporating high environmental and design standards;
- à Developing a transport network that supports both the local and wider region through delivering sustainable economic growth and travel, while conserving and enhancing the natural and historic environment where possible; and
- à Ensuring that the impacts from transportation on the environment and air quality are mitigated in order to work towards the targets set out in the Climate Change Act 2008.

3.1.28 The LTS has identified several intervention measures to improve travel within East Dunbartonshire. The following table summarises those in relation to public transport and the A81 corridor.

Table 3-4 Public Transport Interventions and Action Plan Extract

INTERVENTION	Period of Time	BEARSDEN MILNGAVIE	RURAL AREA COUNCIL WIDE CROSS BOUNDARY
Undertake a technical study to determine the merits, costs and feasibility of developing new rail stations at Woodilee, Westerhill and Allander.		1 – 3 years	
Work with transport partners to enhance integration between bus and rail services in East Dunbartonshire through improved timetabling.		4+ years	
Work with the train operator and Transport Scotland to increase capacity on peak travel services as required.			
Work with Transport Scotland, Network Rail and the train operator to improve the level of frequency during peak travel periods.			
Work with SPT to develop an integrated transport network that could improve connectivity between residential areas and railway stations.		1 – 3 years	
Develop and implement travel hubs on the A81 Route Corridor (Hillfoot, Kessington and Burnbrae), Bishopbriggs and Lenzie to promote the integration of different transport modes at key interchange locations.			4+ years
Continue to support and work to identify new routes, improved timetabling for bus services subsidised by SPT.			4+ years
Develop and manage a Quality Bus Partnership with operators and SPT in order to improve services, standards and reliability.			1 – 3 years
Work with bus operators and SPT to develop real time information on primary bus routes and at key stops.		1 – 3 years	

INTERVENTION	BEARSDEN MILNGAVIE	RURAL AREA COUNCIL WIDE CROSS BOUNDARY
Explore opportunities to provide additional bus services or alter routing to address gaps in areas.		4+ years
Continue to improve bus infrastructure including the upgrade of shelters and lay-bys and measures such as priority signals and lanes, which will be undertaken in line with high environmental and design standards: à Road network adjacent to Hillfoot Railway Station à A803 through Bishopbriggs à Kirkintilloch town centre à A81 Corridor through Bearsden and Milngavie	4+ years	
Assess and implement bus priority measures such as signals and lanes to reduce bus journey time and improve punctuality.	4+ years	

East Dunbartonshire Council Active Travel Strategy (2015 – 2020)

3.1.29 This Active Travel Strategy (ATS) is the first of its kind for East Dunbartonshire and is intended to supplement the Local Transport Strategy (LTS) 2013 – 2017. It sets out an evidence base and framework for active travel projects with the aim of increasing participation in active travel in East Dunbartonshire.

3.1.30 The ambition for this strategy for East Dunbartonshire is defined as:

"East Dunbartonshire is a place where walking and cycling for everyday journeys is a convenient, safe and attractive choice for residents, commuters and visitors."

3.1.31 The aims set out within the strategy to facilitate achieving the ambition are as follows:

1. Facilitate an increase in the proportion of everyday journeys and leisure journeys made by walking and cycling in East Dunbartonshire.

2. Deliver a more connected network of active travel routes and infrastructure incorporating high environmental and design standards.

3. Facilitate delivery of behavioural change, through activities such as training and promotion of active travel.

3.1.32 The ATS sets out key actions to be implemented aimed at delivery of infrastructure and measures to induce behavioural change towards active travel. Extracts of key actions relating to the A81 corridor are outlined below:

- **Action 1.1:** Enhancement of Path and Cycle Network – Bearsden
  - Investigate the feasibility of provision of new infrastructure or enhancement and its likely environmental implications, at:
    - Continuation of the Bears Way cycle scheme to Glasgow City Council boundary;
    - Mosshead/Craigdhu Wedge – upgrade path network including signage whilst considering potential concerns of habitat loss;

- A810 Duntocher Road corridor;
- B8050 Baljaffray Road/Grampian Way corridor;
- A808 Roman Road –connecting the A809 to the A81; and
- A810/A809 Duntocher Rd/Drymen Rd corridor.

- **Action 1.2:** Enhancement of Path and Cycle Network – Milngavie
  - Investigate the feasibility of provision of new infrastructure or enhancement, and its likely environmental implications at:
    - Path between Kilmardinny and Milngavie Town Centre - high quality shared use path, enhancing the existing path adjacent to Allander Leisure Centre to connect proposed Kilmardinny development to Allander Walkway;
  - Cycle link between Mains Estate and Allander;
  - Investigate the feasibility of providing enhanced cycle link between Mains Estate and Allander Leisure Centre/A81. Potential routes include:
    - Craigdhu Road;
    - Hunter Road;
    - Craigton Rd/Gardens;
  - A81 cycle route on Woodburn Way/Main St north of Park Road extension;
    - Extend A81 cycleway to Milngavie Train Station and Milngavie Town Centre;
- **Action 1.11:** Milngavie and Kirkintilloch – Active Travel Towns
  - Pilot designation of Milngavie and Kirkintilloch as 'Active Travel Towns';
  - The development of Milngavie and Kirkintilloch as Active Travel Towns will be taken forward through the town centre strategies (see action 1.18). The following will be considered further through this work:
    - Investigate Milngavie precinct opening to cyclists on a 'Share with care' basis. Build on Milngavie's location as start of West Highland Way as an active travel destination, accessible by foot, cycle, bus and train;
    - Provision of secure cycle parking, enhanced information provision and high standards of public realm; and
    - Assessment of the likely environmental effects of proposals will be completed before implementation.
- **Action 1.16:** Secure cycle storage at rail stations and town centres
  - Provision of sheltered cycle parking racks at all rail stations and town centres in EDC (Milngavie Station is a financed and committed project, planned before the development of the ATS).
- **Action 1.18:** Town Centre Strategies
  - Prepare development strategies for the long-term improvement of each town centre to include:
    - creation of pedestrian and cycle friendly centres; and
    - key priorities for improving accessibility.
  - Carry out a review of Bishopbriggs, Milngavie and Bearsden town centres to help establish opportunities for improving the physical environment for pedestrians and cyclists;
  - The individual strategies will seek to maintain and improve accessibility to and within each town centre. Potential measures include:

- de-cluttering streets;
- improved cycling facilities including provision of secure cycle parking;
- better signage;
- effective use of shared space;

< This will be dependent on existing provision within each centre, as identified through the health checks on a case by case basis.

3.1.33 A Monitoring Plan has been outlined in the ATS to ensure that the actions are being effectively delivered, are meeting the strategy objectives and are achieving the intended outcomes. The Monitoring Plan is set out against baseline data to allow for measurement of objectives against targets. However, the ATS states that:

"the quality of data for establishing the base rates of active travel participation is mixed. Cycle counters in particular are limited and the council relies in part on nationally-collected data sources like the National Census (2011) and the Scottish Household Survey. Where possible, the council will aim to install cycle counters on major routes over the course of the strategy. Following completion of the A81 Bears Way Cycleway, the Council is committed to installing counters used to monitor success of the project. It is intended that other counters will be delivered on existing major corridors and new routes once delivered. These counters will contribute to the establishment of an accurate base of active travel rates which is not reliant on external data sources. The council will also investigate a full range of options for collecting active travel data, including bi-annual pedestrian and cycle counts on major routes and outside public transport infrastructure."

4 TRANSPORT PLANNING OBJECTIVES

4.1.1 The Transport Planning Objectives (TPO's) have been derived following the review, rationalisation and refinement of the Problems, Opportunities, Issues and Constraints and in conjunction with the Planning and Policy Framework review, as above.

4.1.2 TPO's are fundamental to present and latter stages of the appraisal process and, in particular, in reflecting both the issues and opportunities for the corridor, as well as being cognisant of established policy directives. In effect, the TPO's require to express the desired outcomes for the study and, in remaining by nature objective, should avoid the tendency to be lead towards preferred and / or political solutions, which pre-empt and undermine the appraisal process.

4.1.3 Additionally, the TPO's provide the basis for the appraisal of alternative options and, during Post Appraisal, should be central to Monitoring and Evaluation.

4.1.4 The challenge this study faces is that there is a Client need to gain clarity of uncertainties raised from earlier studies. The requirements of STAG (and recognising the guiding principles suggested by SPT and TS), however, are such that the linkage between problems, opportunities, issues and constraints needs to clearly inform the TPO's and subsequent option development. As such, the development of our TPO's is mindful of this and, whilst we are adhering to a STAG-compliant study, our approach remains cognisant of the requirements of our study brief.

4.1.5 The previous STAG study had 9 objectives, which in practice was too many to be useful or manageable. Also, the STAG objectives were not SMART (Specific, Measurable, Achievable, Relevant and Time-bound), as highlighted by Transport Scotland. An example of one of the STAG objectives is stated below:

> *"Promote modal shift to sustainable transport for trips (particularly commuting) from or to the study area"*

4.1.6 Clearly, this objective does not meet the SMART stipulations, as it not specific, measureable or time-bound. The objective does, however, encapsulate the primary aim of many transport improvement schemes, namely the shift to more sustainable modes of travel. STAG advises that a SMART objective will be:

- à **Specific**, it will say in precise terms what is sought;
- à **Measurable**, there will exist means to stakeholders' satisfaction whether or not the objective has been achieved;
- à **Achievable**, there is a general agreement that the objective set can be reached;
- à **Relevant**, the objective is a sensible indicator or proxy for the change which is sought; and
- à **Timed**, the objective will be associated with an agreed future point by which it will have been met.

4.1.7 However, it is recognised that Transport Planning Objectives may be articulated in general terms indicating a desired direction of change. Consequently, in taking forward the objectives, this new study focused on an overarching objective, namely:

> *"To shift to more sustainable modes of transport on the A81 corridor"*

4.1.8 In considering SMART objectives, the current trends in travel must form part of this consideration. To this end, Transport Scotland's Scottish Transport Statistics 2015 (the latest version available) database was reviewed. This showed that in East Dunbartonshire, rail patronage has been increasing by around 40% in the last 10 years, however, since 2013 has remained fairly consistent with no significant change per annum. Bus patronage is decreasing by around 1 percentage point per annum, resulting in an overall reduction in public transport usage. It would therefore make sense to aim to increase rail patronage by circa 0.5 percentage points per annum and to aim to curb the decrease in bus usage by 0.5 percentage points per annum. This could result in a 1 percentage point per annum public transport increase, or 5% in five years.

4.1.9 In addition, the percentage of people walking as a mode of travel has not changed significantly in last 10 years, and private car usage has also remained fairly consistent. It would therefore seem reasonable to aim to achieve a modal shift from car to walking by 0.5 percentage points per annum, which could result a 2.5 percentage point modal shift in 5 years. When added to the above 5 percentage points per annum increase in public transport use, this would result in a 7.5 percentage point increase in non-car modes over the same 5 year period. Based on this, two sub-objectives were proposed:

Sub-Objective 1: Increase non-car mode share by 7.5 percentage points over a 5 year period

Sub-Objective 2: Increase public transport use by 5 percentage points over a 5 year period

4.1.10 The derivation of SMART objectives which purport equal validity against the requirements of being specific, measurable, achievable, relevant and timed, can be difficult to achieve. The determination of whether a particular objective can or will be achieved, is heavily dependent on the availability of existing and valid data as well as its availability in the future, in order to observe the noted change within the identified timescale.

4.1.11 With respect to this study, obtaining the relevant supporting data, particularly with respect to public transport (bus) use, and it subsequently informing the overall proportion of non-car mode share, is particularly difficult due to reasons of commercial sensitivity. It is suggested that the use of the overarching objective is beneficial in this respect, allowing an element of more qualitative interpretation as necessary, but supported by the more detailed sub-objectives and data where it is available. Further, for the purposes of identifying a preferred option, as is the case with this study, the overarching and sub-objectives allow a like for like comparison in evaluating the identified options from a qualitative perspective.

5 OPTION DEVELOPMENT, SIFTING & REFINEMENT

5.1 INTRODUCTION

5.1.1 A detailed analysis of the problems, opportunities, issues and constraints has informed this, the optioneering stage of this study. In the first instance, and within the requirements of our brief, there was a need to revise and refresh previous components of the earlier conducted studies around possible corridor improvements. Mindful of that approach and the subsequent development of new TPO's specific to the study within a 2016 context, it is appropriate that the option development is mindful of previously assessed options (or parts thereof) as well as being updated to reflect the approach to this study.

5.1.2 The initial options / packages have been refined and developed following the methodology set out below:

- à Review previous 2008 and 2015 studies;
- à Review current evidence base and refresh problems, opportunities, issues and constraints;
- à Confirm committed land-use options which may impact on option development;
- à Confirm infrastructure and operational constraints;
- à Determine the implementability of previous and potential new options; and
- à Refine and re-package options in accordance with the above.

5.2 OPTION DEVELOPMENT

5.2.1 The previous study included an initial long list of 31 scheme options, within the following scheme types:

- à Increase car parking at rail stations;
- à Parking guidance;
- à Rail PnR at Allander;
- à Quality bus corridor;
- à Ticket improvements;
- à Enhanced walking and cycling;
- à Bus service improvements;
- à Junction improvements;
- à Variable Message Signage (VMS); and
- à Road options.

5.2.2 These were then sifted on the basis of their appraisal against the (then) Transport Planning Objectives which, following an initial sift, resulted in 11 options being taken forward to the STAG Part 1 appraisal. The output of the STAG Part 1 appraisal was as follows:

- Package 1 – (Do Minimum);
- Package 2 – (Active Travel Modes);
- Package 3 – (Public Transport & Access);
- Package 4 – (Road); and
- Package 5 – (Integrated Active Travel, Public Transport and Road Modes).

5.2.3 Much of the packages (or components therefore) contained within the 2015 Aecom report have been considered within the current operating context of the corridor and an evaluation made of them remaining fit for purpose. Key considerations included:

- Implementability;
- Indication of need;
- Public acceptability; and
- Practicality (to address issues).

5.2.4 This resulted in our initial packaging of a number of options within the simple themes of: active travel; parking; bus; and rail and based on their ability to contribute to achieving the over-arching and sub-objectives for the study. Under "parking" it was recognised that limited space at Milngavie and Hillfoot Stations reduces the opportunity for increased parking provision and therefore park and ride, albeit decking of the existing Milngavie Station car park remains a technically feasible and deliverable option. The acceptability or otherwise of further development on the site, in particular, one with a listed building (the station building) is a planning matter and out with the ability of this study to determine.

5.2.5 This resulted in the following initial option packaging as presented in Table 5-1 below.

Table 5-1 Initial Option Packaging

OPTION	SCHEME COMPONENTS	
Do Min	Active Travel Strategy Actions	Enhancement of path and cycle network – Bears Way Secure cycle storage at rail stations and town centres Signage improvements
Active Travel	Do min +	ATS uncommitted schemes includes: 1) Enhancement of path and cycle network – Bearsden 2) Enhancement of path and cycle network – Milngavie 3) Milngavie and Kirkintilloch Active Travel Towns
Parking	Do min +	Milngavie additional car park decked Park & ride charging mechanism at Milngavie and Hillfoot Parking VMS installed at Milngavie and Hillfoot Designated parking bays on A81 (Hillfoot)
Bus	Do min +	Improved bus waiting facilities and information Alleviating bus service delay
Rail	A) Do min +	Single track single platform, parking provision for 150 spaces
	B) Do min +	Dual track between Milngavie and Hillfoot, two platforms, parking provision for 150 spaces

5.2.6 This initial approach allowed us to retain some semblance of method to that adopted in the previous study. However, following consultation with TS and further consideration, it was recognised that these packages were exclusive of a multi-modal improvement scenario which allowed a combination of options to be drawn together around scalability of cost and the ability to support a variety of mode improvements which would be complementary to wider corridor and policy aspirations. In effect, this approach was exclusionary of the principles of well-rounded transport planning.

5.2.7 Further, discussions undertaken with East Dunbartonshire Council Road and Planning Officers, as well as confirmation around committed and non-committed schemes identified in the Active Travel Action Strategy, warranted that the initial options and packages be refined. It should be noted that a Council Members decision was taken in late September 2016 to halt further progression of the Bears Way scheme beyond the existing Phase 1.

5.2.8 A presentation was given to the East Dunbartonshire Council Transport Working Group on 4th November 2016 which also provided further valuable feedback to the ongoing development and refinement of options. It was indicated that consideration should be given to the inclusion of a car park at Kilmardinny South and within proximity to Hillfoot Station, and this was subsequently evaluated.

5.2.9 As such the following refined options were derived:

Table 5-2 Refined Options

OPTION	DESCRIPTION
Do Minimum:	Increased cycle parking, installation of RTPI and extension of SCOOT adaptive traffic signals
Do Something 1:	Extension of the Bears Way (Phases 2 & 3)
Do Something 2A:	Expansion of Milngavie Station car park
Do Something 2B:	Provision of additional car parking for Hillfoot Station at southern Kilmardinny
Do Something 3A:	Single track single platform railway station at Allander
Do Something 3B:	Double track platform railway station and double tracking between Hillfoot and Milngavie

5.2.10 Further detail is provided on these below as well as including the key components that inform the appraisal.

DO MINIMUM

5.2.11 The Do-Minimum scenario comprises interventions which have already been identified by EDC and SPT, and have committed funding, but which are yet to be implemented. These interventions will be undertaken regardless of the findings of the present study. Town centre parking charges are to be brought in for car parks in Milngavie at Douglas Street, Mugdock Road, Stewart Street (North) and Woodburn Way. Whilst charges are expected to apply to parking beyond two hours and at certain times, the charging structure and mechanism is designed to encourage turnover in town centre car parks and reduce commuter parking. The parking charges are not included in the Do Minimum (or other) options, as the implications of the charging would require a detailed parking supply and demand analysis exercise which is out with the remit of this study. It is recognised, however, that town centre parking charges may result in a modal shift in favour of walking and cycling to rail stations (for those within reasonable walking and cycling distance), as well as some increase in vehicular trips, including by bus, on the corridor for those who seek alternative travel (or parking) arrangements, as a function of "all-day" parking being too expensive.

5.2.12 The do minimum scenario includes:

- Provision of increased cycle parking at Milngavie Station (from 28 to 50 spaces), as per the EDC Active Travel Strategy 2015 and Abellio ScotRail Cycle Innovation Plan[4];
- Installation of real time passenger information screens at bus stops along the A81 corridor, as identified in the EDC Local Transport Strategy (LTS) 2013-17; and
- Extension of SCOOT adaptive traffic signal control system to Milngavie Town Centre, also as identified in the EDC LTS 2013-17. Assumed to comprise 4 junctions including bus priority:
  - A81 Strathblane Road / Baldernock Road / A81 Glasgow Road / B8030 Station Road crossroads;
  - B8030 Woodburn Way / Ellangowan Road/Gavin's Mill Road crossroads;
  - B8030 Main Street / B8050 Park Road T-junction; and
  - B8050 Park Road / Clober Road / Douglas Street / B8050 Craigdhu Road crossroads.

DO SOMETHING 1

5.2.13 The first Do-Something scenario incorporates measures to enhance provision for cyclists along the largely car-dominated A81.

5.2.14 The do-something 1 scenario comprises:

- Extension of the segregated Bears Way cycleway northwards to Milngavie Town Centre and south to Kessington (i.e. Phases 2 and 3).

5.2.15 Phase 1 of the Bears Way is already operational, however in late September 2016 the decision was taken by Council Members to halt further progression of the Bears Way scheme beyond Phase 1. As such, the completion of Bears Way has been included as a 'Do Something' scenario.

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4 http://www.transport.gov.scot/system/files/uploaded_content/documents/tsc_basic_pages/Rail/ScotRail%20franchise/ASR%20-%20Cycle%20Innovation%20Plan%20-%20June%202015.pdf

DO SOMETHING 2

5.2.16 The Do Something 2A scenario comprises:

- à Expansion of Milngavie Station Car Park from 134 to circa 240 spaces via decking. This work will incorporate landscaping works to enhance visual amenity and screen the car park from Woodburn Way.

5.2.17 Following a presentation to the EDC Transport Working Group it was suggested that consideration should be given to inclusion of car parking to the southern end of Kilmardinny to facilitate additional parking opportunities to support access to Hillfoot Station.

5.2.18 This was considered as Do Something 2B:

- à Provision of additional car parking for Hillfoot Station at southern Kilmardinny.

5.2.19 The anticipated walk distance from the indicative parking location to the rail station was measured as being circa 500m. Whilst this is in keeping with the typical acceptable walking distance to a rail station (800m from a residential property), it is considered unlikely that for many commuters the time associated with driving, finding a space, parking and walking circa 500m, introduces too much additional travel time on both an outbound and inward trip, to remain attractive. Anecdotal evidence and experience suggests that park and ride sites are most effective where the rail station can be viewed when parking the car (which is not the case in this location) and mode shift declines beyond 200m for any leg of the journey.

5.2.20 The location is considered to be too remote from the station facility as part of a two-mode journey, to be attractive to commuters. During initial considerations around a possible park and ride arrangement on the A81 corridor, it was considered highly unlikely that time-precious commuters would change mode twice (car – walk – train) in one journey.

5.2.21 Notwithstanding the above, following discussion with EDC it was agreed to progress this option to the detailed appraisal stage to allow for thorough consideration of all options.

DO SOMETHING 3

5.2.22 The third Do-Something scenario involves the construction of a new railway station behind the existing Allander Leisure Centre, within the Kilmardinny development. Previous studies by Oxford Rail Strategies[5] (ORS) and Aecom[6], have investigated the potential for a new station at Allander in engineering terms, and both have looked at the constraints relating to the fact that the railway line is presently single track between Hillfoot and Milngavie. Aecom and ORS disagree as to whether a new railway station could be accommodated within the existing timetable in a situation where the railway line remains single track. As such, this study considers two options:

- à Do Something 3A – construction of a new single platform railway station at Allander, including new access from A81, 150 space car park and cycle parking; and
- à Do Something 3B – doubling of the railway line between Hillfoot and Milngavie, double platform railway station at Allander, including new access from A81, 150 space car park and cycle parking.

[5] Allander Rail Halt, Rail Consultancy Report for Bearsden North Community Council, Oxford Rail Strategies (2014)
[6] Allander Rail Station, Feasibility Report, Aecom (2015)

5.2.23 As noted by both the Allander Rail Station Feasibility Report (Aecom, 2015) and the Allander Rail Halt Rail Consultancy Report (ORS, 2014), the addition of a new stop at Allander will reduce turnaround time at Milngavie, but turnaround time remains long enough such that it would not adversely affect network performance. However, the single track infrastructure on the branch remains a concern due to trains only being able to pass on the short double track section between Bearsden and Hillfoot.

5.2.24 Under the present timetable, trains are scheduled to pass at Bearsden and five minutes after one train arrives at Bearsden, another train departs from Milngavie. As a result of the very limited passing opportunities, late running trains approaching Milngavie can delay trains running in the opposite direction at Bearsden, and if this delay exceeds three minutes the next train waiting to depart Milngavie will also be delayed.

5.2.25 This three minute turnaround window at Milngavie would be reduced to one minute with the addition of another stop at Allander, which is concluded by Aecom as leading to an unacceptable deterioration in service robustness. Aecom suggests a timetable amendment, which could address this issue and permit an additional stop at Allander, however, this change would impact service times at Westerton and would therefore require alteration of timetables across the wider region. At this stage, it is not possible to determine definitively whether such a timetable alteration would be possible given the interdependencies of services across the wider central belt / Scotland: timetabling work would require to be undertaken by Scotrail Abellio.

5.2.26 An alternative means to address this issue would be to double the track between Milngavie and Hillfoot, as per the Do Something 3B option; however this will be a costly exercise, as it would involve the removal of the existing track which runs down the centre of the corridor and the subsequent installation of two tracks.

5.2.27 The provision of a double-track railway line between Hillfoot and Milngavie would improve network resilience, through reducing the impact of late running trains on other services. However, this option is likely to be more costly and disruptive, largely as a result of the fact that the existing railway line runs down the centre of the rail corridor and so the existing line would have to be moved to accommodate double tracking. Whilst there may be wider benefits of network resilience beyond the study area as a result of this option, these may be offset by the additional stopping time and potential timetabling impacts as a result of a new station.

6 OUTLINE APPRAISAL

6.1 INTRODUCTION

6.1.1 Following the option generation and refinement process for identifying solutions for the A81 corridor as outlined in Section 5, above, each of the generated options has undergone an outline appraisal against the agreed Transport Planning Objectives and the Government's five criteria of Environment, Economy, Safety, Integration and Accessibility and Social Inclusion. Consideration is also given to Feasibility, Affordability and Public Acceptability.

6.1.2 A qualitative assessment has been undertaken for each option against the following criteria:

- The Study Transport Planning Objectives;
- The Government's STAG Criteria; and
- Feasibility, Affordability and Public Acceptability.

6.1.3 This was based on a seven point scale of assessment ranging from -3 to +3 and which considers the relative size and scale of impacts of each option. In accordance with STAG, this assessment is primarily based on qualitative information as well as quantitative factors (where supporting data is available).

6.1.4 The assessment scale is based on the below:

- Major benefit (3+) – these are benefits or positive impacts which, depending on the scale of benefit or severity of impact, should be a principal consideration when assessing an option's eligibility for funding;
- Moderate benefit (2+) – the option is anticipated to have only a moderate benefit or positive impact. Moderate benefits and impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together do so;
- Minor benefit (1+) – the option is anticipated to have only a small benefit or positive impact. Small benefits or impacts are those which are worth noting, but the practitioner believes are not likely to contribute materially to determining whether an option is funded or otherwise;
- No benefit or impact (0) – the option is anticipated to have no or negligible benefit or negative impact;
- Minor cost or impact (-1) – the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together could do so
- Moderate cost or impact (-2) – the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together could do so; and
- Major cost or impact (-3) – these are costs or negative impacts which, depending on the scale of cost or severity of impact, the practitioner should take into consideration when assessing an option's eligibility for funding.

6.2 ASSESSMENT AGAINST STUDY TRANSPORT PLANNING OBJECTIVES

6.2.1 Performance of the options against the Study Transport Planning Objectives is shown in Table 6-1, below.

Table 6-1 Performance of Options Against Study Transport Planning Objectives

OPTION	OVERARCHING OBJECTIVE	SUB-OBJECTIVE 1	SUB-OBJECTIVE 2	TOTALS
	To shift to more sustainable modes of transport on the A81 Corridor	Increase non-car mode share by 7.5% over a 5 year period	Increase public transport use by 5% over a 5 year period	
Do Minimum: Increased cycle parking, installation of RTPI and extension of SCOOT adaptive traffic signals	2+	2+	2+	**6+**
Do Something 1: Extension of the Bears Way (Phases 2 & 3)	2+	2+	0	**4+**
Do Something 2A: Expansion of Milngavie Station car park	2+	3+	2+	**7+**
Do Something 2B: Provision of additional car parking for Hillfoot Station at southern Kilmardinny	1+	2+	1+	**4+**
Do Something 3A: Single track single platform railway station at Allander	1+	1+	0	**2+**
Do Something 3B: Double track double platform railway station at Allander	1+	1+	0	**2+**

6.2.2 The Do Minimum and Do Something options perform the highest against the study objectives on the basis of the components of these options which enhance and encourage the uptake of sustainable modes as well as public transport (bus & rail), through infrastructure provision and enhancements. These will improve the quality of experience for public transport mode users.

6.2.3 Do Something 1 scores moderately overall. Phases 2 and 3 of Bears way will route alongside the A81 providing traffic-free cycling for local trips around Milngavie and Bearsden and onto Glasgow. As such, it has the potential to encourage the abstraction vehicular trips along the corridor to cycling for both local and commuter trips into Glasgow. It therefore scores moderately well against the overarching objective and sub-objective1.

6.2.4 Do Something 2A scores just better than the Do Minimum option on the premise that the provision of additional car parking may encourage some new vehicular trips to the road network for shorter trips, albeit is likely to abstract longer road trips from the corridor to rail. This then lifts the score against sub-objective 1 for Do Something 2A over the Do Minimum option. This is similar for Do Something 2B, however the remote location of this option from Hillfoot Station brings the score down slightly as uptake is likely to be less for longer journeys.

6.2.5 Do Something 3A does not score particularly highly overall. Given the location of the station within two existing station catchment areas, it can be expected that a number of passengers will likely abstract from either Milngavie or Hillfoot. Moreover, whilst the option will provide more accessible parking provision, compared to the neighbouring stations, given the remote location of the station from the A81 corridor itself and a low residential catchment (within 800m from a station), this option will generate an increased level of local vehicular trips in the first instance. Please see Rail Accessibility Assessment in Appendix B. This option has less ability than the Do Minimum or Do Something 1 option, to increase non-car mode share and increase public transport use, because of the abstraction from existing stations in close proximity (as opposed to being able to generate “new” demand). Therefore, it scores less well against the transport planning objectives overall.

6.2.6 Do Something 3B scores similarly to Do Something 3A as a function of the principles surrounding the access and catchment parameters for the station remaining unchanged. The issue with both Do Something options is that the station, whilst possibly abstracting some car trips from the A81 corridor (not Milngavie or Hillfoot-bound), will give rise to an increase in vehicular trips around this area of the corridor, the impacts of which are unquantifiable at this time.

6.3 ASSESSMENT AGAINST GOVERNMENT STAG CRITERIA

6.3.1 Performance of the options against the Government STAG Criteria is shown below in Table 6-2, based on the seven point scale as used above.

Table 6-2 Performance of Options Against Government STAG Criteria

OPTION	ENVIRONMENT	ECONOMY	SAFETY	ACCESSIBILITY & SOCIAL INCLUSION	INTEGRATION	TOTALS
Do Minimum: Increased cycle parking, installation of RTPI and extension of SCOOT adaptive traffic signals	1+	Costs 2+ Benefits 1+	0	1+	Policy 3+ Transport 2+	**10+**
Do Something 1: Extension of the Bears Way (Phases 2 & 3)	3+	Costs 1+ Benefits 3+	0	1+	Policy 3+ Transport 2+	**13+**
Do Something 2A: Expansion of Milngavie Station car park	3+	Costs 1+ Benefits 3+	0	1+	Policy 3+ Transport 2+	**13+**
Do Something 2B: Provision of additional car parking for Hillfoot Station at southern Kilmardinny	2+	Costs 2+ Benefits 1+	0	1+	Policy 2+ Transport 1+	**9+**
Do Something 3A: Single track single platform railway station at Allander	-2	Costs -1 Benefits 1+	-1	1+	Policy 3+ Transport 2+	**3+**
Do Something 3B: Double track double platform railway station at Allander	-2	Costs -3 Benefits 2+	-1	1+	Policy 3+ Transport 2+	**2+**

ENVIRONMENT

6.3.2 The Do Something 1 and 2A options score the highest in terms of environment as a function of their ability to take vehicles off the corridor and onto more sustainable rail and cycle modes. The Do Minimum option only scores a slight positive since there is likely to be little variance from the status quo of bus patronage: whilst the user experience will be enhanced, it is unlikely to generate a significant shift of single occupancy vehicle trips on to public transport. The Do Something 2B option scores a slight positive since users are likely to be reluctant to utilise the new car park, instead electing to abstract to stations further along the line or parking on surrounding streets closer to Hillfoot Station.

6.3.3 The rail options score less well in environmental terms. This is on the basis that whilst there is the potential for a new station to take some vehicular trips off the length of the A81 corridor, Do Something 3A and 3B are anticipated to primarily abstract some *existing* passengers from the Milngavie or Hillfoot Stations because they are presently over-subscribed in terms of parking and, as such, these trips inherently remain on the road network, and just "shift to rail" at a different location on the existing line. The parking provision associated with the new Allander Station will inevitably draw an element of new patronage to the rail network, however, the disbenefit in environmental terms will be the increase in vehicular trips onto the surrounding local road network (during peak periods) when the network already experiences congestion (and delay). This will be focused on the access to the Allander Station area and is compounded by the location of the station being "removed" from the mainline of the A81 corridor and being subject to a very minimal walk-in catchment. The Kilmardinny residential and commercial development is noted, but is not of sufficient scale to generate a reasonable level of walk-in catchment to the Station with the distances involved. Please see Rail Accessibility Assessment in Appendix B.

ECONOMY

6.3.4 Economy has been considered with respect to both costs and benefits, to account for an indicative comparison of capital / expenditure costs as well as those economic benefits which are likely to be accrued for the local economy as a function of the option.

6.3.5 The Do Minimum option scores most favourably, comparatively, against the Cost's component as a function of 1) the schemes it incorporates are committed and funded and 2) the capital costs for implementation (and maintenance) are comparatively lower than those associated with the other options. The Benefits component scores lower, however, since the nature of the option is more likely to enhance the existing public transport user-experience as opposed to generating many new in-bound trips.

6.3.6 The Do Something 1 option scores lower on Costs compared to the Do Minimum option as a function of the infrastructure costs associated with Bears Way implementation (design, installation and maintenance) costs. The Benefits score as significantly positive on the basis of the option's ability to encourage both in and outbound trips to the locality for both commuters and visitors to the area, encouraging spend within and out with local area.

6.3.7 Similarly, the Do Something 2A option scores lower on Costs due to implementation costs associated with the car park decking, however the Benefits score as significantly positive as the option is likely to encourage greater rail patronage and spend in and outwith the local area.

6.3.8 The Do Something 2B option scores a positive on Costs due to the comparatively low cost of at-grade car park implementation, however the Benefits score is only a minor positive due to the low expected uptake of users willing to change mode twice.

6.3.9 The Do Something 3A option scores a minor negative in terms of Costs and a minor positive in terms of Benefits. This is an upshot of the costs associated with the implementation of the option, whilst also mindful that in many respects a new station with parking provision at Allander, is unlikely to significantly vary the status quo for incoming economic (or visitor) trips to the area. Indeed, as described above under Environment, a significant proportion of patronage to the Allander Station is likely to abstract from existing Milngavie and Hillfoot Stations - oversubscribed in terms of parking, and only minimal new inbound trips to the Kilmardinny retail element could be anticipated by rail. As such, overall, Do Something 3A scores as neutral (no benefit or impact) in terms of economy.

6.3.10 The Do Something 3B option scores lower again in terms of Costs (-3) but slightly higher in terms of Benefits (2+), since it isn't unreasonable to assume that the twin-tracked option will introduce some further economic benefits with respect to the operational resilience of the rail network and, ultimately, journey time savings / improvements. These are recognised as marginal, however.

SAFETY

6.3.11 With respect to Safety it is considered that, for this qualitative appraisal, there is little variation across the potential options, with the Do Minimum and Do Something 1, 2A and 2B options scoring neutral for both safety and security criterion, because they don't materially vary the status quo. The Do Something 3 options both score as slightly negative, on the basis that the provision of a new station at Allander will re-focus some of the suppressed demand for parking at Milngavie and Hillfoot Stations, to a more focused central point on the local road network at the most busy times including school peak periods. As such, it is considered that vehicular trips abstracted from other stations and / or new trips to the road network accessing Allander rail station – and, in any event, potentially amounting to circa 150 inbound as well as a degree of drop-offs, is sufficiently notable to potentially impact on road safety in the vicinity of the Station and the A81 corridor.

ACCESSIBILITY

6.3.12 All options score comparatively against accessibility on a qualitative evaluation against the sub-components of Accessibility and Social Inclusion including community and comparative accessibility, since each improve the status quo for all users in terms of network coverage and access to local services / amenities. Whilst scoring is derived for different reasons for each, there is an inherent improvement to the status quo with all options, which warrants a slight positive score across the piece.

INTEGRATION

6.3.13 With respect to Integration a qualitative evaluation has been made of each option against its respective "fit" with Policy (including transport and land use) and (other) Transport infrastructure. All options score comparatively highly positive (2+ or 3+) across the Policy criteria and moderately positive (1+ or 2+) across the Transport criteria. Further, through the inclusion of access to the rail (local and strategic) network and Bears Way which will support cycling trips to and from the authority area, the local and strategic components of the "fit" of these options is more pronounced compared to other options.

6.4 FEASIBILITY, AFFORDABILITY AND PUBLIC ACCEPTABILITY

6.4.1 Performance of the options against Feasibility, Affordability and Public Acceptability is shown below in Table 6-3, on the seven point scale as used above.

Table 6-3 Performance of Options Against Feasibility, Affordability and Public Acceptability

OPTION	FEASIBILITY	AFFORDABILITY	PUBLIC ACCEPTABILITY	TOTALS
Do Minimum:	3+	3+	3+	**9+**
Do Something 1:	3+	2+	2-	**3+**
Do Something 2A:	3+	1+	2+	**6+**
Do Something 2B:	3+	3+	2+	**8+**
Do Something 3A:	2+	1-	2+	**3+**
Do Something 3B:	1+	3-	3+	**1+**

6.4.2 As can be seen from the above, and as expected, the Do Minimum and Do Something 2B options score as a major benefit across all three criteria, with the exception of Do Something 2B scoring a moderate benefit under public acceptability. As such, they generate the highest total scores compared to the other options. That said, as a function of these options being relatively inert with respect to technical implementation and, in particular, visibility to the public, it is considered unlikely that these options would attract either positive or negative public or stakeholder views. Indeed, these are not of sufficient scale to generate any context of a “red-ribbon” (larger-scale or significant public-interest) scheme.

FEASIBILITY

6.4.3 With respect to technical feasibility, each option becomes more onerous as they descend in order in the table, with the exception of Do Something 2B. However, it’s a truism that very few infrastructure schemes are not implementable on technical merits, with the advance of engineering and other technologies. In short, anything is feasible (and deliverable) with a commensurate level of design and engineering. Whilst this equates to increased costs, they remain feasible nevertheless. As such the scores for feasibility reduce for each option as they appear in order, however, negative impact scores have not been attributed based on the premise that all schemes are ultimately feasible.

6.4.4 Do Something 1 and 2A score comparative to the Do Minimum and Do Something 2B options with respect to feasibility, as they remain comparatively “easy” options to design and implement. Technical engineering and design would be onerous, but far less so, than for the Do Something 3A and B options.

AFFORDABILITY

6.4.5 With respect to Affordability, the scoring approach is not dissimilar to that for Feasibility, and reduces in keeping with the order of the options in the table and, inherently, the increasing costs associated with the design, implementation and maintenance of each option. In this instance, the scoring of the Do Something 3A and 3B options is negative (slight and significant, respectively), given the extensive costs associated with both options. Unlike Feasibility, affordability can't readily be overcome, however, it is anticipated that should these options generate an appropriate Benefit Cost Ratio under the detailed appraisal, then further work will likely consider funding options and sources as appropriate.

PUBLIC ACCEPTABILITY

6.4.6 Do Something 1 scores negatively under public acceptability, as a function of the current levels of public acceptability around the Bears Way (phase 1) being unknown and the recent political decision (September 2016) to not progress the scheme further at this time. Do Something 3A and Do Something 3B score a moderate benefit and major benefit respectively, as a function of the tangible and visible nature of the proposed options, coupled with a general thrust and political aspiration that a significant piece of infrastructure, particularly around a rail-based option, is perceived to alleviate issues on the A81 corridor.

6.5 SUMMARY OF OUTLINE APPRAISAL

6.5.1 The outline appraisal provides a qualitative evaluation of how each of the potential options for the A81 corridor performs against the study Transport Planning Objectives and the Scottish Governments overarching objectives of: Environment; Economy; Safety; Accessibility & Social Inclusion; and Integration. Consideration has also been given to "deliverability" criteria of: Feasibility; Affordability; and Public Acceptability. Performance of the options against each of the key qualitative criteria is summed and presented below in Table 6-4.

Table 6-4 Performance of Options Against Key Qualitative Criteria

OPTION	STUDY TRANSPORT PLANNING OBJECTIVES	GOVERNMENTS KEY OBJECTIVES	DELIVERABILITY CRITERIA	TOTALS
Do Minimum:	6+	10+	9+	**25+**
Do Something 1:	4+	13+	3+	**20+**
Do Something 2A:	7+	13+	6+	**26+**
Do Something 2B:	4+	9+	8+	**21+**
Do Something 3A:	2+	3+	3+	**8+**
Do Something 3B:	2+	2+	1+	**5+**

6.5.2 With traditional STAG appraisal approaches, it would typically be prudent to prune back or refine those options which perform less well against the key qualitative criteria, to reduce the level of detail required during the detailed appraisal stage. In this instance, however, there is a noted divide between the potential options with respect to the disparity of costs and, ultimately, the scalability of the different options. Notwithstanding, the requirement of this commission is to execute the more detailed and technical components of a STAG Part 2 appraisal for the rail-based options. As such, they will not be rationalised or refined further at this stage, albeit the rail-based options are noted to score less well than the Do-Minimum, Do Something 1 and Do Something 2A and 2B options, against the study Transport Planning Objectives, the Government's key objectives for STAG appraisal and the identified Deliverability Criteria.

7 DETAILED APPRAISAL

7.1 INTRODUCTION

7.1.1 This section of the report addresses the approach, assumptions and results, with respect to each of the options being progressed to more detailed appraisal.

7.1.2 There is not one overarching detailed appraisal approach that can be applied consistently across all the options, as a function of their multi-modal nature and the associated variance in the relevant parameters of each. As such, the approach to the detailed technical appraisal varies across the Do Minimum, the Do Something 1, Do Something 2A and the Do Something 3 (A & B) options and the particular approach of each are addressed below.

7.2 THE DO MINIMUM OPTION

APPRAISAL APPROACH & ASSUMPTIONS

7.2.1 Please see Appendix C. To reiterate the detail of the Do Minimum option, this includes:

- Provision of increased cycle parking at Milngavie Station (from 28 to 50 spaces), as per the EDC Active Travel Strategy 2015 and Abellio ScotRail Cycle Innovation Plan[7];
- Installation of real time passenger information screens at bus stops along the A81 corridor, as identified in the EDC Local Transport Strategy (LTS) 2013-17; and
- Extension of SCOOT adaptive traffic signal control system to Milngavie Town Centre, also as identified in the EDC LTS 2013-17. Assumed to comprise 4 junctions:
  - A81 Strathblane Road / Baldernock Road / A81 Glasgow Road / B8030 Station Road crossroads;
  - B8030 Woodburn Way / Ellangowan Road / Gavin's Mill Road crossroads;
  - B8030 Main Street / B8050 Park Road T-junction; and
  - B8050 Park Road / Clober Road / Douglas Street / B8050 Craigdhu Road crossroads.

7.2.2 The detailed appraisal of the Do Minimum option has been undertaken in accordance with the methodology set out in TRL593, the Green Book and DfT WebTAG. A Base Case and an Option Case will be developed: the Base Case is the current scenario without the schemes and the Option Case is same as the Base Case but *with* the planned schemes. The Option Case will be compared against the Base Case with costs and benefits assessed.

7.2.3 The appraisal will test both 10 years and 20 years, with proper discounting rates applied as suggested in the Green Book. All the values and prices will be compared at 2010 DfT's base year.

[7] http://www.transport.gov.scot/system/files/uploaded_content/documents/tsc_basic_pages/Rail/ScotRail%20franchise/ASR%20-%20Cycle%20Innovation%20Plan%20-%20June%202015.pdf

7.2.4 The Option Case will include the intervention of the following:

- à SCOOT Bus priority at junctions 2 and 3 above (junction 1 & 4 have insufficient space for effective bus priority); and
- à RTPI at 25 bus stops along the A81 corridor between Milngavie Railway Station and A81 / Switchback Road / Drymen Road roundabout

7.2.5 The main benefits for the bus priority scheme are considered to be journey time saving benefits for current bus users, revenue benefits from attracted new bus users, and associated non-user benefits including: Noise; Local Air Quality; Greenhouse Gas Emissions; Accident Savings; and Indirect Taxation. These will be assessed based on TRL593 GJT elasticities, estimated journey time savings and average fares per journey. Non-user benefits will be assessed using the methodology set out in WebTAG Marginal External Costs, based on the road mileage reduction as a result of mode shift.

7.2.6 The main benefits for the RTPI at bus stops will be revenue benefits from attracted new bus users and associated non-user benefits. The value in WebTAG databook Table M3.2.1 will be adopted, which is 1.47 minutes equivalent saving in generalised journey time. TRL593 elasticities will be used to estimate the number of new bus users.

7.2.7 The option benefits will be compared against the costs to implement as well as additional operating/maintenance costs, and a benefit-cost ratio will be calculated.

7.2.8 The inputs and assumptions for the Do Minimum option appraisal are presented in Table 7-1, below (and in greater detail in Appendix C).

Table 7-1: Inputs and Assumptions

APPRAISAL ELEMENT	INPUTS AND ASSUMPTIONS
Appraisal Period	Costs and benefits have been appraised over both 10 and 20 year periods
Cost Profile	Instillation cost of SCOOT has been provided by EDC based on installation costs for existing SCOOT junctions between Kessington junction and Hillfoot junction. This cost has been factored to apply to the 4 new junctions noted previously. Additional costs for civils have been applied based on professional judgement, and a 5% design, 7% supervision and 20% risk costs has been applied to the cost. Maintenance / operational costs have been assumed to equate to 1% of SCOOT installation costs. A breakdown of the estimated SCOOT capital cost per junction is provided below: · SCOOT installation: £27.666.67 · Civils: £33,000 · Design, supervision and risk: £19,413.33 · **Total: £80,080** Real Time Passenger Information costs have been estimated based on professional judgement and experience, as follows: · RTPI installation: £10,000 per bus stop · Maintenance: £200 per bus stop plus £20,000 total operating costs assuming shared services with Glasgow City Council It should be noted that these provisional cost estimates have been produced for guidance purposes only. WSP accepts no liability for any damage, loss, expenses or cost incurred as a result of relying on the information provided in the cost estimate. The cost estimate was derived from local sources and the application of WSP's reasonable skill and care, but may be subject to site specific, seasonal, regional and other such cost variations of which WSP is unaware. As such the estimate should not be relied upon for tender or

APPRAISAL ELEMENT	INPUTS AND ASSUMPTIONS
	procurement purposes. For accurate costing advice the assistance should be sought of a suitably qualified Quantity Surveyor.
Average ticket price per journey	Derived from the First Bus and McGills Operator fare lists, a target route was selected returning an average ticket price of £1.90 per journey.
Frequency of affected buses	Based on timetables for each affected service on the route
Average Journey Length	Average journey length has been assumed to be 1/3 of the average total journey time for each bus routed through the corridor, calculated using bus timetables. Average journey time has been estimated to be 28.7 minutes per trip.
Average Journey Distance	Estimated based on 1/3 of the total bus routes as above. Average distance was estimated as 4.9 miles per trip.
Value of time	Assumed to be £6.04 per hour for non-work other
Car kilometre savings	Assumed to 1% of the new bus passenger kilometres as a result of mode shift.
Journey Time Saving	Percentage journey time saving estimate has been derived from the results of commercial systems published on the SCOOT website[8]. A 12% initial saving in delay was cited, with the potential to achieve an extra 3% reduction in delay for every year that a fixed-time plan 'ages'. The measured benefits of SCOOT depend on the efficiency of the previous model. A conservative estimate of a 10% initial saving was therefore applied. This estimate was applied to the derived average journey time on the stretch of route through the existing and future SCOOT systems, between the northernmost future SCOOT junction, and the southernmost existing SCOOT junction. Using this methodology a journey time saving of approximately 1 minute was estimated.
Number of bus users to benefit from the scheme	An estimate of passengers benefiting from SCOOT has been based on Census 2011 Method of Travel to Work and Origin Destination data for the corridor. A bus passenger catchment was established based on those living on the corridor that would logically use the relevant bus routes to travel to Glasgow City Centre (and therefore travel by bus along the entire corridor). The total number of Travel to Work bus users from the Census analysis was assumed to occur predominantly during the peak period, and was therefore growthed using COBA expansion factors to return daily passenger numbers of 2027 passengers. Passengers benefiting from Real Time Information have been estimated using the same methodology, however bus route 47A has been incorporated which uses a partial section of the study network, travelling in a predominantly east-west direction. These passengers will not benefit as directly from journey time savings associated with SCOOT, but will benefit where the starting point of their journey is based on the A81 corridor. As such, the above methodology was utilised with the addition of further peripheral destinations along the relevant bus route. Bus passengers benefiting from Real Time Information was established to be 2071 daily passengers.

[8] http://www.scoot-utc.com/documents/survey_results.pdf

APPRAISAL RESULTS

7.2.9 The appraisal results are presented in Table 7-2, below.

Table 7-2: Appraisal Results – SCOOT and RTPI

BCR CALCULATIONS	10 YEARS PRESENT VALUE (£)	20 YEARS PRESENT VALUE (£)
Net benefits to passengers and private sector (plus tax impacts)		
Bus user journey time saving benefits	379,869	706,085
Revenue benefits - farebox	260,951	465,299
Non user benefits - road decongestion	1,180	2,471
Non user benefits - noise, air quality, greenhouse gases, accident benefits and others	241	447
Sub-Total (A)	**642,241**	**1,174,302**
Costs to government (broad transport budget)		
Grant (capital) costs	813,640	813,640
Operating and maintenance costs	276,407	472,357
Indirect taxation	235	379
Sub-Total (B)	**1,090,282**	**1,286,376**
Net Present Value (NPV) (A-B)	**-448,041**	**-112,074**
Benefit Cost Ratio (A/B)	**0.59**	**0.91**

7.2.10 The value of benefits (A) and value of costs (B) allow comparison of the costs and benefits of a scheme or option. The benefit-cost ratio (BCR) is given by benefits (A) / costs (B) and so indicates how much benefit is obtained for each unit of cost, with a BCR greater than 1 indicating that the benefits outweigh the costs.

7.2.11 A value for money assessment which focuses on the economic case for an option is based upon the benefit-cost ratio of a scheme using monetised impacts in line with WebTAG guidance. The following categories are:

- à BCR <1 = poor value for money;
- à BCR 1 – 1.5 = low value for money;
- à BCR 1.5 – 2.0 = medium value for money;
- à BCR 2.0 – 4.0 = high value for money; and
- à BCR > 4.0 = very high value for money.

7.2.12 The results show that the costs of implementation of SCOOT and Real time Passenger Information would outweigh the benefits in the first 10 and 20 years of operation.

7.3 THE DO SOMETHING 1 OPTION

APPRAISAL APPROACH & ASSUMPTIONS

7.3.1 To reiterate the detail of the Do Something 1 option, this comprises:

- à Extension of the segregated Bears Way cycleway northwards to Milngavie Town Centre and south to Kessington (i.e. Phases 2 and 3).

7.3.2 The Department for Transport's (DfT) Active Mode Appraisal Toolkit has been used to derive the benefit-cost ratio of the extension of the Bears Way.

BEARS WAY EXTENSION (SEE APPENDIX D)

7.3.3 As previously stated, a Council Members decision was taken in September 2016 to halt further progression of the Bears Way scheme beyond the existing Phase 1, which is reflected in the (2-) Public Acceptability scoring in Table 6-3. Consequently, the completion of Bears Way has been included as a 'Do Something' scenario.

7.3.4 The DfT released the Active Mode Appraisal Toolkit (AMAT) and reported on the evidence base to quantify the impact of investment in cycling and walking and to make the case for investing in both. The tool incorporates Health, Journey Quality and Decongestion benefits.

7.3.5 The toolkit has been utilised to test the implementation of Phase 2 and 3 of the Bears Way, both as separate and joint schemes. The journey quality impacts have been assessed utilising WebTAG Databook (Spring 2016 release v1.6)[9].

7.3.6 Background annual growth has been calculated based on previous DfT and EDC manual counts at locations where Phase 2 and Phase 3 would be routed, and manual cycle count data for 2017 provided by EDC conducted at the same locations. Background annual growth was derived as 8.1% for Phase 2 and 7.1% for Phase 3.

7.3.7 Benefits that have been calculated include: Noise; Local Air Quality; Greenhouse Gases; Journey Quality; Physical Activity; Accidents; Decongestion; and Indirect Taxation. The inputs and assumptions of the appraisal are presented in Table 7-3, below.

Table 7-3: Inputs and Assumptions

APPRAISAL ELEMENT	INPUTS AND ASSUMPTIONS
Appraisal Period	Costs and benefits have been appraised over a twenty year period.
Cost Profile	Costs have been derived from the cost of Bears Way Phase 1 provided by EDC, and factored on a cost per km basis. . EDC advised that an estimated cost of £70,000 per junction should be applied for upgrading works for the following 2 signalised junctions falling within Phase 2: à B8049 Roman Road / A81 Milngavie Road / B8049 Boclair Road crossroads; and à A81 Milngavie Road / West Chapelton Avenue / Asda Access Road. No junctions within the Phase 3 section of route require upgrade. As the AMAT is based on assumptions from the WebTAG databook which is based on 2010 prices and values, the calculated costs for implementation and maintenance have been discounted from 2016 to 2010 values to provide a Benefit to Cost Ratio that isn't skewed.
Optimism Bias	An optimism bias of 3% has been applied to the estimated costs of the scheme, based on WebTAG unit A1.2 guidance for a roads scheme in an advanced stage of development, due to the costs estimate being based directly from the completed Bears Way Phase 1.

[9] https://www.gov.uk/government/publications/webtag-tag-data-book-july-2016

APPRAISAL ELEMENT	INPUTS AND ASSUMPTIONS
Journeys	Existing cycle levels have been calculated from EDC manual cycle counts located where Phase 2 and Phase 3 would be routed. Cycling levels have been predicted to increase by 33% based on a comparison of automatic cycle count data from November 2015 and 2016 located on Bears Way Phase 1.
Journey Quality Impacts	Journey quality impacts have been assessed utilising WebTAG Databook (Spring 2016 release v1.6) for an on-road segregated cycle lane scheme.
Decay Rate	A conservative decay rate of 10% has been applied to the assessment.
Decongestion Benefit	Decongestion benefit has been based on the predicted increase in cycle levels (see above), factored by local car mode share for the estimated catchment area of the scheme.
Number of days in the year figures expected	220 (number of working days)

7.3.8 As discussed previously, background growth estimates have been based on 2017 EDC cycle counts compared to previous DfT and EDC manual counts at the same locations for Phase 2 and Phase 3 respectively. For appraisal of Phases 2 and 3 in conjunction, an average of the 2 levels of background growth has been applied. These are shown in Table 7-4, below.

Table 7-4: Scenarios of Background Growth

BACKGROUND GROWTH SCENARIO	BACKGROUND ANNUAL GROWTH
Phase 2	8.1%
Phase 3	7.1%
Phases 2 and 3	7.6%

7.3.9 As noted above, the base cycle flows have been gathered from manual counts provided by EDC, summarised in Table 7-5, below.

Table 7-5: Baseline Cycle Flows

SOURCE	BEARS WAY	LOCATION	YEAR	CYCLE COUNT
EDC Manual Count	Phase 2	A81 (North of Roman Road / Boclair Road)	2017	188
EDC Manual Count	Phase 3	B8030 Main Street (South of Keystone Avenue)	2017	98

APPRAISAL RESULTS

7.3.10 The PVB (Present Value of Benefits) and PVC (Present Value of Costs) allow comparison of the costs and benefits of a scheme or option. The benefit-cost ratio (BCR) is given by PVB / PVC and so indicates how much benefit is obtained for each unit of cost, with a BCR greater than 1 indicating that the benefits outweigh the costs.

7.3.11 A value for money assessment which focuses on the economic case for an option is based upon the benefit-cost ratio of a scheme using monetised impacts in line with WebTAG guidance. The following categories are:

- à BCR <1 = poor value for money;

- à BCR 1 – 1.5 = low value for money;
- à BCR 1.5 – 2.0 = medium value for money;
- à BCR 2.0 – 4.0 = high value for money; and
- à BCR > 4.0 = very high value for money.

BEARS WAY EXTENSION

7.3.12 Tables 7-6 and 7-7 show the Present Value of Costs and Benefits for Phase 2 and 3 respectively, with Table 7-8 presenting results for Phases 2 and 3 combined under a 'medium' growth scenario (see Appendix D for data sources and assumptions).

Table 7-6: Present Value of costs and benefits (Phase 2: 8.1% background growth)

COSTS AND BENEFITS	IN £,000S
Noise	0.33
Local Air Quality	0.00
Greenhouse Gases	1.06
Journey Quality	552.06
Physical Activity (incl. absenteeism)	275.27
Accidents	4.81
Decongestion	54.30
Indirect Taxation	-5.56
Private Contribution	0.00 (-345.30 with potential third party funding)
Present Value of benefits (PVB)	**882.27 (536.97 with potential third party funding)**
Present Value of costs (PVC)	**366.24 (20.94 with potential third party funding)**
Benefit Cost Ratio	**2.41 (25.64 with potential third party funding)**

Table 7-7: Present Value of costs and benefits (Phase 3: 7.1% background growth)

COSTS AND BENEFITS	IN £,000S
Noise	0.14
Local Air Quality	0.00
Greenhouse Gases	0.4
Journey Quality	252.52
Physical Activity (incl. absenteeism)	155.56
Accidents	2.01
Decongestion	23.02
Indirect Taxation	-2.28
Private Contribution	0.00 (-249.21 with potential third party funding)
Present Value of benefits (PVB)	**391.41 (142.20 with third party funding)**
Present Value of costs (PVC)	**267.79 (18.58 with potential third party funding)**
Benefit Cost Ratio	**1.46 (7.65 with third party funding)**

Table 7-8: Present Value of costs and benefits (Phases 2 & 3: 7.6% background growth)

COSTS AND BENEFITS	IN £,000S
Noise	0.42
Local Air Quality	0.00
Greenhouse Gases	1.35
Journey Quality	778.96
Physical Activity (incl. absenteeism)	354.74
Accidents	6.19
Decongestion	71.11
Indirect Taxation	-6.97
Private Contribution	0.00 (-594.52 if potential third party funding considered)
Present Value of benefits (PVB)	**1,205.80 (611.28 with third party funding)**
Present Value of costs (PVC)	**634.06 (39.54 with potential third party funding)**
Benefit Cost Ratio	**1.90 (15.46 with third party funding)**

7.3.13 The above tables demonstrate that if built as a standalone, Phase 2 is predicted to result in a BCR of 2.41, which WebTAG suggests represents a 'high value for money' option.

7.3.14 The standalone option of Phase 3 represents a 'low value for money' option with a BCR of 1.46, due to estimated implementation costs being lower without a requirement for junction upgrading.

7.3.15 The results of Phases 2 and 3 built in conjunction under an existing background growth scenario show a BCR of 1.90 constituting a 'medium value for money' option'. If third party contributions or grant funding is considered as a 'private contribution', then all BCR values are considerably higher, representing 'very good value for money'.

7.4 THE DO SOMETHING 2A OPTION

APPRAISAL APPROACH & ASSUMPTIONS

7.4.1 To reiterate the detail of the Do Something 2A option, this comprises:

- à Expansion of Milngavie Station Car Park from 134 to circa 240 spaces via decking. This work will incorporate landscaping works to enhance visual amenity and screen the car park from Woodburn Way.

7.4.2 A bespoke Park and Ride Demand Model has been used to derive the benefit-cost ratio of the Milngavie Station Car Park.

EXPANSION OF MILNGAVIE STATION CAR PARK

7.4.3 Detailed appraisal of the expansion of the Milngavie Station Car Park has been derived using the bespoke Park and Ride Demand Model developed to appraise the Do Something 3A and 3B options. Given the complexity of the model, the data inputs and assumptions are discussed in greater detail in the approach to the Do Something 3A appraisal (below). With respect to the Milngavie Station car park enhancement, the increase in parking provision by circa 106 spaces and the associated (design, implementation and maintenance) costs are included in an iteration of the Park and Ride Demand Model.

7.4.4 Costs associated with the design, implementation and maintenance of the car park have been provided by in-house infrastructure designers / engineers.

APPRAISAL RESULTS

7.4.5 The PVB (Present Value of Benefits) and PVC (Present Value of Costs) allow comparison of the costs and benefits of a scheme or option. The benefit-cost ratio (BCR) is given by PVB / PVC and so indicates how much benefit is obtained for each unit of cost, with a BCR greater than 1 indicating that the benefits outweigh the costs.

7.4.6 A value for money assessment which focuses on the economic case for an option is based upon the benefit-cost ratio of a scheme using monetised impacts in line with WebTAG guidance. The following categories are:

- à BCR <1 = poor value for money;
- à BCR 1 – 1.5 = low value for money;
- à BCR 1.5 – 2.0 = medium value for money;
- à BCR 2.0 – 4.0 = high value for money; and
- à BCR > 4.0 = very high value for money.

EXPANSION OF MILNGAVIE STATION CAR PARK

7.4.7 The table below shows the potential benefit-cost ratio (BCR) of increasing the car parking at the Milngavie station from 134 to 240.

Table 7-9: Economic Appraisal Results – Milngavie Car Park Expansion

BCR CALCULATION	2010 PRICES AND VALUES	
Carbon	£	108,639
Time - Non users	£	5,419,149
VOC Costs - New users	£	1,614,051
Accident Benefits	£	1,537,870
Revenue	£	3,043,008
Total Benefits	**£**	**11,722,718**
Time – Existing users (wider disbenefit)	£	-
Local Funding	£	-
Capital Costs	£	3,037,626
Developer Contribution	£	-
Operating Costs	£	217,573
Indirect Tax Cost	£	604,067
Total Costs	**£**	**3,859,266**
	BCR = 3.04	

7.4.8 The above table demonstrates that increasing the car parking spaces at Milngavie station from 134 to 240 is predicted to result in a BCR of 3.04, which WebTAG suggests represents a 'high value for money' option.

7.5 THE DO SOMETHING 2B OPTION

7.5.1 To reiterate the detail of the Do Something 2B option, this comprises:

- à Provision of additional parking for Hillfoot Station at southern Kilmardinny.

7.5.2 A bespoke Park and Ride Demand Model has been used to derive the benefit-cost ratio of the additional Hillfoot Station car parking, as was used for the appraisal of the Do Something 2A option.

ADDITIONAL HILLFOOT STATION CAR PARK AT SOUTH KILMARDINNY

7.5.3 Detailed appraisal of the additional parking for Hillfoot Station at South Kilmardinny has been derived using the bespoke Park and Ride Demand Model developed to appraise the Do Something 3A and 3B options. Given the complexity of the model, the data inputs and assumptions are discussed in greater detail in the approach to the Do Something 3A appraisal (below). With respect to the additional parking for Hillfoot Station, the increase in parking provision by circa 150 spaces and the associated (design, implementation and maintenance) costs are included in an iteration of the Park and Ride Demand Model.

7.5.4 Costs associated with the design, implementation and maintenance of the car park have been provided by in-house infrastructure designers / engineers.

APPRAISAL RESULTS

7.5.5 The PVB (Present Value of Benefits) and PVC (Present Value of Costs) allow comparison of the costs and benefits of a scheme or option. The benefit-cost ratio (BCR) is given by PVB / PVC and so indicates how much benefit is obtained for each unit of cost, with a BCR greater than 1 indicating that the benefits outweigh the costs.

7.5.6 A value for money assessment which focuses on the economic case for an option is based upon the benefit-cost ratio of a scheme using monetised impacts in line with WebTAG guidance. The following categories are:

- à BCR <1 = poor value for money;
- à BCR 1 – 1.5 = low value for money;
- à BCR 1.5 – 2.0 = medium value for money;
- à BCR 2.0 – 4.0 = high value for money; and
- à BCR > 4.0 = very high value for money.

ADDITIONAL HILLFOOT STATION CAR PARK AT SOUTH KILMARDINNY

7.5.7 The table below shows the potential benefit-cost ratio (BCR) of providing additional car parking for 150 cars located to southern Kilmardinny, approximately 500m north of Hillfoot.

Table 7-10: Economic Appraisal Results – Additional Hillfoot Station Car Parking

BCR CALCULATION	2010 PRICES AND VALUES	
Carbon	£	7,929
Time - Non users	£	392,700
VOC Costs - New users	£	144,693
Accident Benefits	£	178,934
Revenue	£	297,219
Total Benefits	**£**	**1,021,476**
Time – Existing users (wider disbenefit)	£	-
Local Funding	£	-
Capital Costs	£	405,666
Developer Contribution	£	-
Operating Costs	£	217,573
Indirect Tax Cost	£	69,079
Total Costs	**£**	**692,319**
	BCR = 1.48	

7.5.8 The above table demonstrates that providing an additional 150 car parking spaces at southern Kilmardinny for Hillfoot Station is predicted to result in a BCR of 1.48, which WebTAG suggests represents a 'low value for money' option.

7.6 THE DO SOMETHING 3 (A & B) OPTIONS

APPRAISAL APPROACH & ASSUMPTIONS (SEE APPENDIX E)

7.6.1 To reiterate the detail of the Do Something 3 options, this includes:

- à Do Something 3A – construction of a new single platform railway station at Allander, including a new access from A81, and provision of a 150 space car park and cycle parking;

- Do Something 3B – doubling of the railway line between Hillfoot and Milngavie, double platform railway station at Allander, including a new access from A81, and provision of a 150 space car park and cycle parking.

7.6.2 A demand forecasting and appraisal tool, essentially a Park and Ride Demand Model (see Appendix F), has been developed to identify the level of attraction likely to be generated by the Do Something 3 options.

7.6.3 The general methodology and modelling assumptions used in the Park and Ride Demand Model have been agreed by Transport Scotland, within the context of the model being used for the Robroyston Station Business Case. The specific modelling and data assumptions used in the bespoke Park and Ride Demand Model (Appendix F) for this study have been agreed by EDC and SPT.

7.6.4 The model has utilised a number of datasets and assumptions which have been used to identify the level of attraction generated by the two rail-based options. The scheme options are anticipated to attract vehicular trips which are currently travelling past the site on the A81 corridor as well as some trips which may abstract from the existing Milngavie and Hillfoot Stations, as well as the potential generation of some new trips from the surrounding residential area.

7.6.5 The following data has been used to identify the level of traffic which has the potential to switch to the rail services using a new rail station and park & ride facility:

- Traffic flow data (see Appendix E-1);
- Traffic flow past the site(see Appendix E-1);
- Proportion of traffic accessing the city centre; (see Appendix E-1);
- Car occupancy levels (see Appendix E-1);
- Mode choice sensitivity (see Appendix E-1);
- Journey time data (see Appendix E-2);
- Journey times to Glasgow City Centre (see Appendix E-2);
- Vehicle operating costs (fuel) (see Appendix E-2);
- Total distance between the site and Glasgow City Centre;
- Parking costs; (see Appendix E-2); and
- Local trip attraction.

7.6.6 The above supporting data Inputs and assumptions are described in greater detail in Appendix E.

APPRAISAL RESULTS (SEE APPENDIX E-4)

DO SOMETHING 3A: SINGLE TRACK SINGLE PLATFORM STATION AT ALLANDER

7.6.7 The results of the appraisal for the Do Something 3A options are shown in Table 7-11, below.

7.6.8 The capital costs for the single track single platform station have been derived from an equivalent study, where the costs, for this level of appraisal, were derived from Network Rail. (See Appendix E-3).

Table 7-11: Do Something 3A Economic Appraisal Results – 150 space car park

BCR CALCULATION	2010 PRICES AND VALUES	
Carbon	£	164,057
Time - Non users	£	15,032,744
VOC Costs - New users	£	2,432,155
Accident Benefits	£	2,308,549
Revenue	£	7,900,370
Total Benefits	**£**	**27,837,874**
Time – Existing users (wider disbenefit)	£	28,007,783
Local Funding	£	-
Capital Costs	£	6,036,970
Developer Contribution	£	-
Operating Costs	£	1,588,578
Indirect Tax Cost	£	911,149
Total Costs	**£**	**36,544,479**
	BCR = 0.76	

7.6.9 The table above demonstrates that the single track single platform station option with 150 car parking spaces is not predicted to result in a positive net present value, and hence has a benefit-cost ratio (BCR) of less than 1.0.

7.6.10 A “sensitivity” test was undertaken to determine a typical level of parking provision that would generate sufficient patronage to a new single track single platform station at Allander. The analysis was based on an increase in parking provision only, with all other factors remaining the same. This indicated that the single track new station option, with a 550 space car park, is predicted to have a BCR of 1.17 which represents ‘low value for money’.

7.6.11 In the absence of a high-walk-in catchment to the station, critical to rail patronage demand is the size of the car park and therefore the facility’s ability to attract vehicular trips. The provision of 550 parking spaces to support the facility is effectively an arbitrary figure, tested only to illustrate the levels of parking necessary to facilitate enough demand for the facility to achieve a BCR greater than 1. However, it is considered an impractical level of provision and too high to be feasible, for the following reasons:

- à Additional land take would be required to provide a car park of this scale and the costs of such are not included in this assessment;
- à The provision of a 550 space park and ride would require supporting access and road network mitigation / improvements to accommodate the additional trips and the costs of such are not accounted for in this assessment;
- à Notwithstanding that the impacts of a draw of 550 inbound (plus drop-off) trips to the facility have not been tested on the surrounding road and junction network, it is considered that this more intense volume of traffic on the local road network during the peak hour, would begin to have a disbenefit on environment; safety and security (potentially more so for school children); and accessibility, as the dominance of the private car is likely to discourage local walking and cycling; and
- à Should the analysis account for the above costs not currently included in the assessment, then the costs of providing a 550 space car park would begin to outweigh the benefits and the benefit-cost ratio is anticipated to reduce below 1.0.

DO SOMETHING 3B: DOUBLE TRACK DOUBLE PLATFORM STATION AT ALLANDER

7.6.12 The results of the appraisal for the Do Something 3B option is shown in Table 7-12, below.

7.6.13 The capital costs for the double track double platform station have been derived from an equivalent study, where the costs, for this level of appraisal, were derived from Network Rail. (See Appendix E-3)

Table 7-12: Do Something 3B Economic Appraisal Results – 150 space car park

BCR CALCULATION	2010 PRICES AND VALUES	
Carbon	£	164,057
Time - Non users	£	15,032,744
VOC Costs - New users	£	2,432,155
Accident Benefits	£	2,308,549
Revenue	£	7,900,370
Total Benefits	**£**	**27,837,874**
Time – Existing users (wider disbenefit)	£	28,007,783
Local Funding	£	-
Capital Costs	£	32,882,172
Developer Contribution	£	-
Operating Costs	£	1,588,578
Indirect Tax Cost	£	911,149
Total Costs	**£**	**63,389,681**
	BCR = 0.44	

7.6.14 The table above demonstrates that the twin track double platform station option with 150 car parking spaces is not predicted to result in a positive net present value, and hence has a benefit-cost ratio (BCR) of less than 1.0. Given the much larger cost of the construction of a twin track station, plus the necessary track upgrades, it is not surprising that the BCR is relatively poor with this option.

7.6.15 As with option 3A, a “sensitivity” test was undertaken to determine a typical level of parking provision that would generate sufficient patronage to a new twin track double platform station at Allander. The analysis was based on an increase in parking provision only, with all other factors remaining the same. This indicated that the twin track new station option, with a 550 space car park, is predicted to have a BCR of 0.73 which represents ‘poor value for money’.

7.6.16 As with the 150 space option, the much larger cost of constructing a twin track section and double platform station, plus the necessary track upgrades, results in a much lower BCR.

7.6.17 It should also be noted that the commentary in paragraph 7.5.10, above, remains applicable to the Do Something 3B option incorporating 550 parking spaces within the facility.

7.6.18 The results of the analysis for the Do Something 3A as described above in 5.2.22 onwards, demonstrated that the economic case for a new rail station at Allander is marginal at best on the existing single track option. The Do Something 3B as described above in 5.2.26 onwards, is clearly not economically viable.

7.7 DETAILED APPRAISAL RESULTS SUMMARY

7.7.1 Table 7-13 below presents a summary of the benefit-cost ratios (BCR's) derived for each option.

Table 7-13: Option Appraisal Comparison by BCR

OPTION	BCR	NOTES
Do Minimum	0.59 / 0.91	10 / 20 Year Assessment
Do Something 1	1.90 (15.46 with private funding)	Phases 2 and 3 in conjunction
Do Something 2A	3.04	
Do Something 2B	1.48	
Do Something 3A	0.76 / 1.17	With 150 and 550 spaces respectively
Do Something 3B	0.44 / 0.73	With 150 and 550 spaces respectively

7.7.2 The detailed appraisal demonstrates that the Do Something 2A option performs optimally in terms of a benefit-cost ratio, against the other appraised options. This is not surprising given the scale of the option in both infrastructure and cost requirements, against the more significant investment required for the Do Something 3 options.

8 PREFERRED OPTION

8.1 BEST BENEFIT-COST RATIO (BCR)

8.1.1 The BCR results suggest that Do Something 2A (below) is the preferred option in terms of benefit-cost ratio.

8.1.2 The Do Something 2A scenario constitutes:

- à Expansion of Milngavie Station Car Park to circa 240 spaces via decking. This work will incorporate landscaping works to enhance visual amenity and screen the car park from Woodburn Way.

8.1.3 The new rail station option BCRs are significantly lower due to the very high capital cost of a new rail halt and the sited location's inability, as a function of geography, neighbouring land use (constraint for development to the east) and proximity to existing rail stations, to draw ample passenger demand from the area.

8.2 BEST OBJECTIVES SCORE

8.2.1 The outline qualitative appraisal presented in Chapter 6 and summarised in Table 8-1, below, suggests that the Do Minimum and Do Something 2A options perform relatively similarly when evaluated against the Study Transport Planning Objectives, the Government's key objectives for STAG appraisal and the identified Deliverability Criteria.

Table 8-1 Option Appraisal Comparison by Objectives

OPTION	OBJECTIVE SCORE
Do Minimum	**25+**
Do Something 1	**20+**
Do Something 2A	**26+**
Do Something 2B	**21+**
Do Something 3A	**8+**
Do Something 3B	**5+**

8.2.2 In many respects, the qualitative appraisal results (based on evidence where available) are reflective of the outcomes of the hierarchy of the benefit-cost ratio for each option.

8.2.3 Do Something 1 performs better than the Do Something 3 rail-based options. An extension to the Bears Way (Phases 2 and 3) generates a medium value for money scheme, and achieves a high score against the objectives as it allows for encouraging / facilitating an increase in cycling on the corridor (segregated), this generates various benefits across journey quality, physical activity and decongestion, as it abstracts people from car trips on the corridor.

8.2.4 The Do Something 2A option performs better than the other options by a significant margin, generating a high value for money scheme with a BCR of 3.04. This option allows an increased uptake of rail-travel which in turn generates benefits of air quality, time savings, accident and revenue.

8.2.5 The Do Something 2B option generated a low value for money scheme with a BCR of 1.48. Whilst it generates a relatively high score against the objectives in theory, as is reflected in the BCR, the distance of transfer from the car park to the station results in a low update of new rail users.

8.2.6 Both Do Something 3 rail-based options required the introduction of a “sensitivity” test around the parking provision for the single track single platform and double track double platform station, to bring the benefit-cost ratio to just above 1, which is still considered to represent “low value for money” in accordance with a Value for Money Assessment. As the parking provision levels require to increase to generate a more positive BCR, however, the “sensitivity” tests do not account for additional land take or the traffic impacts associated with a higher level of trip attraction to the facility, the inclusion of which would lower the BCR again.

8.2.7 The supporting inputs to this study, the analysis itself and the derived BCR’s warrant commentary around why the Do Something 3 options perform poorly in value for money terms, despite the recognition that the infrastructure costs are particularly high (albeit commensurate with schemes of this nature):

- à A new railway station located within reasonably close proximity (comparatively) between two neighbouring stations, inherently reduces the ability of the new station to abstract a significant level of patronage from the existing stations. This would be higher if the Hillfoot and Milngavie Stations were sited further apart;
- à A new railway station would be located “off the beaten” path with respect to its siting from the A81 corridor. As such, there is less attraction for drivers already on the corridor to turn-off from their desired direction of travel: by the time they access the parking, find a space and walk to the station, versus had they continued on their journey directly, the perception remains that they would be closer to their destination for the same duration of time if they continued on their original route. In effect, a station immediately adjacent to the corridor such as Milngavie and Hillfoot are ideal in terms of siting and, indeed, their proximity to the corridor is such that they remain attractive options for current users. The more remote siting of a new station at Allander would attract very limited walking trips as a function of its more remote location from both the A81 corridor and a reasonable scale of residential walk-in catchment.; and
- à A new railway station at Allander will be sited in an area which does not currently, nor is likely to in the future, have an increased residential catchment. The Kilmardinny development (residential and commercial) is not of sufficient scale to generate the necessary levels of rail patronage and there is limited developable land, remaining within a reasonable walk-catchment of the station to warrant it’s being viable now or in the short to medium term. The lack of current and future catchment opportunity to the east of the station is also noted.

8.3 CONCLUSION

8.3.1 Considering the outcomes of the detailed economic analysis and the qualitative assessment of the options, it is clear that Do Something 2A is the preferred option. This option comprises expansion of Milngavie station car park from 134 spaces to circa 240 spaces via decking

8.3.2 The rail based options (Do Something 3A and 3B) do not appear to deliver sufficient value for money, and are much less effective when measured against the Study Transport Planning Objectives, the Government's key objectives for STAG appraisal and the identified Deliverability Criteria.

APPENDICES

APPENDIX A

PROBLEMS, OPPORTUNITIES, ISSUES & CONSTRAINTS

A81 Transport Options Appraisal Study

General Overview of Issues and Constraints - Issues Rationalisation and Sifting

Source	Existing Issues/ Observations/ Reported	Status 2016	Commentary	Action / Next Steps
Aecom 2008 Report and Referenced in 2015 STAG	High car ownership and the use of the private car as the dominant mode of transport for most trip purposes and destinations	Retain	Limited scope to change within study remit: universal issue	Allocate to theme/ rationalise
	The potential development at Kilmardinny will increase the demand for travel along the A81 corridor	Retain	Increase not quantified and level of development not apace with or	Allocate to theme/ rationalise
	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor	Retain	Within context of bus use	Allocate to theme/ rationalise
	Parking facilities at the local rail station is operating above-capacity	Retain	No change	Allocate to theme/ rationalise
	Bus demand is heavily peaked and can be full to standing at key journey times	Reject	Introduction of concession pass has changed this and "standing" most likely the position at Maryhill Road	None required
	There is no priority for buses along the route and journey times do not compare favourably to those of the private car	Retain	No change and with introduction of Bearsway, no scope for bus priority/ corridor on A81	Allocate to theme/ rationalise
	There are no local bus feeder services between the residential areas and the rail stations and bus and rail timetables are not well integrated	Reject	Local feeder services are a luxury, uncommon and insufficient demand anticipated versus promotion of walking/ cycling	None required
	Cycle lanes are discontinuous and often obstructed by parked vehicles	Reject	Introduction of Bearsway alleviates this issue	None required
	Walking routes are perceived to have issues with cleanliness	Retain	No change and infrastructure materials inconsistent	Allocate to theme/ rationalise
	Localised congestion occurs at many key junctions along the route	Retain	No change	Allocate to theme/ rationalise
Aecom 2015 Report - Evidence Review - Key Issues and Constraints	Car usage and ownership high within the study area relative to wider EDC and Glasgow area	Retain	Limited scope to change within study remit: universal issue	Allocate to theme/ rationalise
	Proposed Kilmardinny development will have a notable impact on the transport network	Reject	Reject as an issue as addressed through Dev Planning, but note link to issue above	None required
	Population decline within study area between 2001 - 2011 (can be "constrated" with the population growth in Glasgow)	Reject	Limited scope to change within study remit	None required
	Existing off road walking/ cycling facilities primarily serve the leisure cyclist - some routes convoluted which impacts ability to attract commuters	Reject	Addressed in part through introduction of Bearsway	None required
	Speed of bus services to Glasgow are generally slower through Maryhill compared with study area locations	Reject	Accepted in part, but outwith EDC control to address and outwith extent of study	None required
	Generally bus services to Glasgow City Centre are 20-25 minutes slower than rail	Reject	Nature of on-road mode and not comparing like with like: offers a choice of mode regardless of time	None required
	Low frequency service between the study area and eastern parts of EDC	Retain	Validate whether this is a "feeder service" issue	Allocate to theme/ rationalise
	Available capacity on trains in study area has reduced since 2008	Reject	More 6 car trains have introduced additional capacity	None required
	TA evidence suggests key areas of congestion are on the approaches to the A81 Milngavie road/ B8049 Boclair Road, A81 Glasgow Rd/ A807 Auchenhowie Road, Burnbrae and Canniesburn Toll	Retain	Congestion issues are known but query role of TA's as any new development should be mitigated against through Dev Plan process	Allocate to theme/ rationalise
	Capacity constraints on line (single track between Milngavie and Hillfoot) prevents an increase in frequency and impacts resilience and journey time reliability	Retain	Accepted in part but mindful that some constraints come from wider rail interdependencies	Allocate to theme/ rationalise
	No priority for buses is provided along the route in the study area	Reject	Not possible to provide given Bearsway, however, noted as issue	None required
	Cycling has lowest mode share for journeys to work	Reject	Accepted in part, but also part addressed through introduction of Bearsway	None required
	Bus passenger journeys fallen regionally	Retain	Justification	Allocate to theme/ rationalise
	Private car transport has significantly higher proportion of mode share for journeys to work than any mode	Retain	Limited scope to change within study remit: universal issue	Allocate to theme/ rationalise
	Private vehicle running costs have risen at a lower level than public transport modes	Reject	Noted as an influence to issues but not key in itself	None required
	Many pockets of Bearsden/ Milngavie where walking time to nearest bus stops are in excess of ten minutes	Retain		Allocate to theme/ rationalise
	Many areas are not within a reasonable walking distance of a rail station	Retain		Allocate to theme/ rationalise
	Over half the working population work within Glasgow, with only a quarter remaining in EDC area	Reject	Noted as an influence to issues but not key in itself	None required
Aecom 2015 Report	The lack of cycle storage facilities at key locations, like town centres and rail stations and security of these facilities	Retain	Easily remedied but requires validation: data check required	Allocate to theme/ rationalise
	More cycle infrastructure is needed to encourage more cycling and preference for off-road	Reject	Addressed through introduction of Bearsway, with exception of point above	None required
	Lack of or insufficient street lighting was reported as a barrier to walking and cycling particularly during winter months	Reject	Addressed through introduction of Bearsway, with exception of point above	None required
	Felt there were several missing links around walking and cycling infrastructure	Retain	Perhaps part-addressed through introduction of Bearsway	Allocate to theme/ rationalise
	Inclement weather is a barrier to walking and cycling	Reject	Universal in WoS - can't influence weather	None required
	Lack of parking at train stations and effects of overspill parking on residential streets	Retain	Key issue driven by infrastructure constraints	Allocate to theme/ rationalise
	Resilience in the rail system and some "felt that the line should be double tracked"	Retain	Capacity for passengers is not an issue, but operational constraints (hyndland/ westerton branch) are	Allocate to theme/ rationalise
	Bus service provision is lacking, frequency is poor and journey time to Glasgow is too long	Reject	Anecdotal issue and difficult to validate without patronage data/ passenger surveys.	None required
	Bus services were viewed as less clean and less comfortable compared to rail	Reject	Acceptable "opinion" but not an issue a study of this nature would address	None required
	Inadequate information about bus services viewed as a barrier and lack of real time bus information and timetable changes reduced attractiveness	Retain	Retain to an extent, but difficult to accept entirely with advent of wide internet access and timetable changes are publicised	Allocate to theme/ rationalise
	Need for improved integration of modes e.g ticket option across modes and operators	Retain	Retain but a regional rather than authority issue	Allocate to theme/ rationalise
	Lack of parking is a prevalent problem in Milngavie where it was said to impact on businesses	Retain	Retain	Allocate to theme/ rationalise
	Quality of road surfaces	Retain	Noted from site visit	Allocate to theme/ rationalise
	Ageing population noted to need consideration	Reject	Equality of consideration for all the population	None required
	Poor connectivity with other areas in wider Greater Glasgow Conurbation	Reject	Reasonable comment, but insufficient demand for bus travel to other areas	None required
WSP |PB Site Visit	Milngavie Rail Station car park at capacity and associated over-spill into "other" areas unquantified	Retain	Valid position - visually evidenced and endorsed by consultees	Allocate to theme/ rationalise
	Hillfoot Rail Station car park at capacity with over-spill onto A81 corridor and neighbouring residential streets (unquantified)	Retain	Valid position - visually evidenced and endorsed by consultees	Allocate to theme/ rationalise
	Bearsden and Westerton Station car parks operating to capacity	Retain	Valid position - visually evidenced and endorsed by consultees	Allocate to theme/ rationalise
	Introduction of bearsway is such that stopping buses "block-back" traffic and there is limited opportunity for any dedicated bus lane/ QBC on this stretch of the route	Retain	Valid position - visually evidenced and endorsed by consultees	Allocate to theme/ rationalise
	A81 as a foot/ road way is relatively incoherent by way of use of materials and, therefore, appears untidy/ inconsistent/ poorly maintained	Retain	Valid position - visually evidenced and endorsed by consultees	Allocate to theme/ rationalise
Wider-Noted Issues/ Observations	Proposed location for Allander is removed from the immediate vicinity of A81 Corridor and perception that southbound traffic is "coming away" from direction of travel	Retain	Link to issue above (albeit noted this is outwith realms of study)	None required
	Proposed level of residential development at Kilmardinny is not particularly high to allow a reasonable walk-in catchment to proposed location	Retain	Link to issue above (albeit noted this is outwith realms of study)	None required
	Proposed level of retail/ other development at Kilmardinny is not particularly high to generate in-bound trips by rail	Retain	Link to issue above (albeit noted this is outwith realms of study)	None required
	Noted watercourses in vicinity of access route options to proposed Allander location	Retain	Link to issue above (albeit noted this is outwith realms of study)	None required
	Hillfoot Station substantially constrained by geography/ neighbouring development and limited scope for improvement	Retain	Link to issue above (albeit noted this is outwith realms of study)	None required
	Milngavie Station lower than ground-level for cars/ peds and therefore opportunity for car park enhancements	Retain	Link to issue above (albeit noted this is outwith realms of study)	None required
SPT Meeting	Rail option is politically and locally favoured	Noted	No influence on study	None required
	Hillfoot Rail Station parking demand has continued to grow historically	Noted	Link to issue above	None required
	Double-track between Hillfoot and Bearsden	Noted	Link to issue above	None required
	Decking at Milngavie Station previously refused for visual amenity reasons	Noted	No influence on study	None required
	Westerton branch is a single lead junction which means branch line needs to be clear before mainline trains can move	Noted	Link to issue above (albeit noted this is outwith realms of study)	None required
	A double-lead would alleviate the issue at Westerton and could assist with capacity issues, however, very costly option	Noted	Link to issue above (albeit noted this is outwith realms of study)	None required
	Network resilience is key and a 5 minute train-turnaround time is the very minimum that would be permissable at Milngavie Station	Noted	No influence on study (on basis that timetabling and infrastructure can be overcome)	None required
	Double track betwneen Bearsden and Westerton may give capacity improvements and potentaly more viable than double-track between Hillfoot and Milngavie	Noted	Link to issue above	None required
	Passenger capacity on the line less of an issue verus operational capacity (by and large, currently more 6-car trains available for Milngavie)	Noted	Link to issue above	None required
	Platform length, third line and crossover point at Milngavie Station will be important to determine whether 6 car trains can stand and pass one another	Noted	Link to issue above (albeit noted this is outwith realms of study)	None required
	There is a third line at Milngavie Station but may need additional rolling stock to be purchased	Noted	Link to issue above (albeit noted this is outwith realms of study)	None required
	New Station Criteria is more strict than former, therefore, whilst some gradient/ crests/ troughs etc currently "lived with" they would not be suitable for a new station	Noted	Link to issue above (albeit noted this is outwith realms of study)	None required
	Generally bus capacity is under-used on the A81 corridor	Noted	Link to issue above	None required
	Bus service and corridor improvements are within Glasgow City Council's "gift" and less so EDC due to various constraints on the corriodor	Noted	Link to issue above	None required
	What could be done to improve flow at Maryhill Road? (E.g. Express services)?	Noted	Link to issue above	None required
	Unclear what volume of traffic is end to end on the corridor and what is demand for travel to city centre and elsewhere	Noted	Link to issue above	None required
	Bearsway from Hillfoot to Canniesburn is more problematic	Noted	Link to issue above	None required
	Free passes for 65+ means that elderly and/ or people who are less time-precious, are more interested in taking the bus	Noted	Link to issue above	None required
	Previous consultation highlighted that locals wanted feeder services (but just as a luxury rather than need) to get to town and train station but not Glasgow City Centre	Noted	Link to issue above	None required
	Could not accommodate any more trains in peak hour at Allander because all capacity is gone (operationally on the line)	Noted	Link to issue above	None required
	Bus data is difficult to get hold of and best indications of journey time reliability is timetable information	Noted	Link to issue above	None required
TS Meeting	Need to ensure any assumptions around techncial options are clear	Noted		
	Ensure linkage between policy and issues, TPO's and options are "woven" together	Noted		
	Update problems and constraints to reflect current position	Noted		
	Is it a big enough problem - what are the solutions?	Noted		
	Consider the before and after "safety" record of Bearsway	Noted		
	Were noted complaints from bus service operators made before implementation of Bearsway?	Noted		
	Introduction of a double-lead junction at Westerton may bring benefits to the wider network and essentially, whilst more costly, potentially better value for money	Noted		
	Are bus services a genuine issue? They are in operation and they are reasonably frequent. Can other measures alleviate parking issues from Hillfoot Station on road?	Noted		
	Are there better ways of getting to Milngavie Station/ improving access by other modes?	Noted		

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General Overview of Issues and Constraints - Issues Refinement

Theme	Issue No.	Issue	Replace with.....
Car Ownership & Usage	1	High car ownership and the use of the private car as the dominant mode of transport for most trip purposes and destinations	There is high car ownership and usage in the area with the private car being the dominant mode of transport
	8	Car usage and ownership high within the study area relative to wider EDC and Glasgow area	
	13	Private car transport has significantly higher proportion of mode share for journeys to work than any mode	
Development & Planning	2	The potential development at Kilmardinny will increase the demand for travel along the A81 corridor	Many areas are not within a reasonable walking distance of a rail station
	15	Many areas are not within a reasonable walking distance of a rail station	
Congestion	7	Localised congestion occurs at many key junctions along the route	Localised congestion occurs at key juntions on the corridor
	10	TA evidence suggests key areas of congestion are on the approaches to the A81 Milngavie road/ B8049 Boclair Road, A81 Glasgow Rd/ A807 Auchenhowie Road, Burnbrae and Canniesburn Toll	
Bus	3	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor
	5	There is no priority for buses along the route and journey times do not compare favourably to those of the private car	Journey times do not compare favourably to those of the private car
	9	Low frequency service between the study area and eastern parts of EDC	
	12	Bus passenger journeys fallen regionally	
	14	Many pockets of Bearsden/ Milngavie where walking time to nearest bus stops are in excess of ten minutes	Many pockets of Bearsden/ Milngavie where walking time to nearest bus stops are in excess of ten minutes
	20	Inadequate information about bus services viewed as a barrier and lack of real time bus information and timetable changes reduced attractiveness	Inadequate information around services and lack of real time information
	27	Introduction of bearsway is such that stopping buses "block-back" traffic and there is limited opportunity for any dedicated bus lane/ QBC on this stretch of the route	There is no opportunity for bus priority on the corridor
Parking	4	Parking facilities at the local rail station is operating above-capacity	Parking facilities at Milngavie , Hillfoot, Bearsden and Westerton Station are operating at capacity
	18	Lack of parking at train stations and effects of overspill parking on residential streets	Overspill parking at Hillfoot Station impacts on the operation of the A81 corridor
	22	Lack of parking is a prevalent problem in Milngavie where it was said to impact on businesses	There is a lack of parking provision in Milngavie
	24	Milngavie Rail Station car park at capacity and associated over-spill into "other" areas unquantified	
	25	Hillfoot Rail Station car park at capacity with over-spill onto A81 corridor and neighbouring residential streets (unquantified)	
	26	Bearsden and Westerton Station car parks operating to capacity	
Walking & Cycling	6	Walking routes are perceived to have issues with cleanliness	Infastructure on the corridor is disjointed in places with quality of routes considered a barrier to walking and cycling
	16	Felt there were several missing links around walking and cycling infrastructure	There is a lack of cycle storage at stations and key locations
	17	Quality of road surfaces	
	23	A81 as a foot/ road way is relatively incoherent by way of use of materials and, therefore, appears untidy/ inconsistent/ poorly maintained	
	28	The lack of cycle storage facilities at key locations, like town centres and rail stations and security of these facilities	
Rail	11	Capacity constraints on line (single track between Milngavie and Hillfoot) prevents an increase in frequency and impacts resilience and journey time reliability	There are capacity constraints on the line between Milngavie and Hillfoot preventing and increase in service frequency and impacting on network resilience and journey time reliability
	19	Resilience in the rail system and some "felt that the line should be double tracked"	
Public Transport	21	Need for improved integration of modes e.g ticket options across modes and operators	There is a lack of integretion across modes including by operators and ticket types

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General Overview of Issues and Constraints - Defining Problems, Opportunities, Issues and Constraints

Theme	2016 Issue	Do you want to do anything about this?	What can you do?	Problems	Opportunities	Issues	Constraints
Car Ownership & Usage	There is high car ownership and usage in the area with the private car being the dominant mode of transport	Can't reduce car ownership through this study	Can help reduce private car use	Congestion		air quality, bus reliability, general car journey time reliability	High car ownership
Development & Planning	Many areas are not within a reasonable walking distance of a rail station	This is a planning & historic development issue and distances to rail stations can't be readily changed	Options are limited due to existing land take			Walking distance of rail station	
Congestion	Localised congestion occurs at key junctions on the corridor	Probably not. Alleviate congestion= improved journey times= invites more car journeys onto the network	Retain the status quo for private/ single occupancy vehicle use	Congestion		air quality, bus reliability, general car journey time reliability	High car ownership
Bus	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor	Available information (advent of internet, social media and travel planning apps) is better, and would dispute that cost is an issue.	More so around reliability of service, quality of information,	Reliability of service and quality of information		Bus use low (despite reasonable frequency)	A81 carriageway widths (both with and without Bearsway); subject to traffic conditions within GCC (outwith study remit); third party reliance on delivery of RTI infrastructure
	Journey times do not compare favourably to those of the private car	Probably not: they never will	Carriageway widths between Kessington and Hillfoot would affect feasibility of bus priority, but overarching constraints are within GCC control	Congestion			A81 carriageway widths (both with and without Bearsway); subject to traffic conditions within GCC (outwith study remit)
	Many pockets of Bearsden/ Milngavie where walking time to nearest bus stops are in excess of ten minutes	This is a planning and historic development issue and distances to bus stops can't be readily changed.	Best addressed through the planning system and not the remit of this study			Walking distance to a bus stop	
	Inadequate information around services and lack of real time information	Yes	Readily resolved through social media, promotion and installation of supporting infrastructure	Quality of information		Bus use low (despite reasonable frequency)	Third party reliance of delivery of RTI infrastructure
	There is no opportunity for bus priority on the corridor	Probably not on a 'corridor' basis, but consideration of pinch-points/ constraints is feasible	Carriageway widths between Kessington and Hillfoot would affect feasibility of bus priority, but overarching constraints are within GCC control			Bus use low	A81 carriageway widths (both with and without Bearsway)
Parking	Parking facilities at Milngavie , Hillfoot, Bearsden and Westerton Station are operating at capacity	Yes	Provide additional parking and rationalise controls	Lack of parking provision at stations	Unmet demand for rail and there is existing passenger capacity on services	additional traffic and inconsiderate parking on the corridor contributing to air quality, bus reliability and general car journey time reliability issues on the corridor	Limited land to provide additional parking and historical position of refused application for decked car park
	Overspill parking at Hillfoot Station impacts on the operation of the A81 corridor	Yes - for various accessibility, safety, and efficiency of operations	Rationalise/ control parking on A81	Lack of parking provision at Hillfoot	Unmet demand for rail and there is existing passenger capacity on services	additional traffic and inconsiderate parking on the corridor contributing to air quality, bus reliability and general car journey time reliability issues on the corridor	Limited land to provide additional parking
	There is a lack of parking provision in Milngavie	Yes	Provide additional parking and rationalise controls	Lack of parking provision at Milngavie	Unmet demand for rail and there is existing passenger on services	additional traffic and inconsiderate parking on the corridor contributing to air quality, bus reliability and general car journey time reliability issues on the corridor	Limited land to provide additional parking and historical position of refused application for decked car park
Walking & Cycling	Infastructure on the corridor is disjointed in places with quality of routes considered a barrier to walking and cycling	Yes	Gap analysis and improvement provision. Establish minimum quality standards for infrastructure, streetscape materials	Low walking and cycling uptake as a result of network conditions	Existing section of new segregated cycle infrastructure and EDC connections onwards to Glasgow	Infrastructure is inconsistent and unkempt, and high traffic volumes reduce uptake of walking and cycling	Funding, maintenance costs and public perception
	There is a lack of cycle storage at stations and key locations	Yes - a comparatively easy fix	Secure cycle parking provision	Lack of cycle parking	Abellio Station Travel Plans and relative ease of introduction	Is there a genuine lack of cycle parking at stations and key locations?	Limited land to provide more cycle parking at Hillfoot and reliance on third party (ScotRail Abellio) to deliver more cycle parking
Rail	There are capacity constraints on the line between Milngavie and Hillfoot preventing an increase in service frequency and impacting on network resilience and journey time reliability	Yes. Noted that there is passenger capacity, but network resilience is limited due to single track section and single-lead junction at Westerton	Increase operational capacity through installation of a double-lead junction at Westerton (wider benefits than just A81/ EDC). Increase operational capacity.		Unmet demand for rail and there is existing passenger capacity on services		Single track section between Hillfoot and Milngavie and limited timetable flexibility
Public Transport	There is a lack of integration across modes including by operators and ticket types	Unclear - needs clarity. SPT Zonecard operational in area and concessionary pass crosses operators and modes.	Is there a demand for interchange functions within EDC (as opposed to in GCC)?				

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General Overview of Issues and Constraints - Extent and Influence of Issues Against Key Transport Planning Criteria

		Mode						Infrastructure						Journeys			Extent			Externals			
Theme	2016 Issue	Walk	Cycle	Bus	Rail	Car	Other	Constraint	Maintenance	Materials	Lack of	Operational	Information	Time	Reliability	Convenience	Local	Wider	Strategic	Economy	Population	Historic Dev	Score (by Issue)
Car Ownership & Usage	There is high car ownership and usage in the area with the private car being the dominant mode of transport					✓								✓	✓	✓	✓	✓	✓		✓		8
Development & Planning	Many areas are not within a reasonable walking distance of a rail station	✓			✓											✓	✓	✓				✓	6
Congestion	Localised congestion occurs at key juntions on the corridor			✓		✓	✓	✓				✓		✓	✓	✓	✓					✓	10
Bus	Perceptions towards public transport are generally indifferent with the quality of available information, frequency and reliability of service, and cost and comfort generally rated poor			✓				✓				✓	✓	✓	✓	✓	✓	✓					9
	Journey times do not compare favourably to those of the private car			✓				✓				✓		✓	✓	✓	✓	✓					8
	Many pockets of Bearsden/ Milngavie where walking time to nearest bus stops are in excess of ten minutes	✓		✓				✓			✓			✓		✓	✓					✓	8
	Inadequate information around services and lack of real time information			✓				✓			✓		✓	✓	✓	✓	✓	✓					9
	There is no opportunity for bus priority on the corridor			✓				✓			✓	✓		✓	✓		✓	✓				✓	9
Parking	Parking facilities at Milngavie , Hillfoot, Bearsden and Westerton Station are operating at capacity				✓	✓		✓			✓	✓			✓	✓	✓	✓	✓			✓	11
	Overspill parking at Hillfoot Station impacts on the operation of the A81 corridor	✓	✓	✓	✓	✓		✓				✓			✓		✓	✓				✓	11
	There is a lack of parking provision in Milngavie					✓		✓			✓					✓	✓			✓		✓	7
Walking & Cycling	Infastructure on the corridor is disjointed in places with quality of routes considered a barrier to walking and cycling	✓	✓				✓	✓	✓	✓		✓				✓	✓					✓	10
	There is a lack of cycle storage at stations and key locations		✓					✓			✓					✓	✓						5
Rail	There are capacity constraints on the line between Milngavie and Hillfoot preventing an increase in service frequency and impacting on network resilience and journey time reliability			✓				✓				✓		✓	✓	✓	✓	✓	✓			✓	10
Public Transport	There is a lack of integration across modes including by operators and ticket types			✓	✓							✓	✓			✓	✓	✓	✓				8
Score (by Key Transport Planning Criteria)		4	3	9	4	5	2	12	1	1	6	9	3	7	9	13	15	10	4	1	1	9	

Legend:
- High/ extensive influence
- Medium/ average influence
- Low/ minor influence

APPENDIX B

RAIL ACCESSIBILITY ASSESSMENT

Date Modified: 08/11/2016

Drawn By: UKCXK707

Key

Walking Distance

0 - 5 minutes (0 - 400 m)

5 - 10 minutes (400 - 800 m)

Milngavie

Allander

Hillfoot

Bearsden

Contains Ordnance Survey data © Crown copyright and database right 2016.

0 0.075 0.15 0.3 0.45 0.6

Kilometres

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CN
Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User

WSP | PARSONS BRINCKERHOFF

TITLE:

A81 Transport Options Study
Rail Accessibility Assessment

File: \\uk.wspgroup.com\central data\Projects\700244xx\70024474 - A81 Transport Options Study\E Models and Drawings\Development\GIS\ArcGIS\Map Documents\Rail Isochrones.mxd

APPENDIX C

DO MINIMUM ASSUMPTIONS AND DATA SOURCES

PARSONS BRINCKERHOFF

SUMMARY_OUTPUTS

Description: *RTI and SCOOT installation - A81* Date: *02/12/2016*

Total impact: Option 1 + Option 2

Results of socio-economic appraisal

	10yrs	20yrs	
	£ PV	£ PV	
Net benefits to passengers and private sector (plus tax impacts)			
1. Bus user journey time saving benefits	379,869	706,085	JT saving benefits from bus priority scheme
2. Revenue benefits - farebox	260,951	465,299	farebox revenue benefits from new bus users as a result of JT saving and RTPI installation
3. Non user benefits - road decongestion	1,180	2,471	mode shift from cars, reduction in car-km
4. Non user benefits - noise, air quality, greenhouse gases, accident benefits and others	241	447	mode shift from cars, reduction in car-km
sub-total (a)	642,241	1,174,302	
Costs to government (broad transport budget)			
1. Grant (capital) costs	813,640	813,640	assume £570,320 capital investment
2. Operating and maintenance costs	276,407	472,357	assume £27,426.97 per annum
3. Indirect taxation	235	379	mode shift from cars, reduction in car-km, disbenefit from fuel consumption tax loss
sub-total (b)	1,090,282	1,286,376	
Net Present Value (NPV) (a-b)	- 448,041	- 112,074	
Benefit Cost Ratio to Government (BCR) (a/b)	0.59	0.91	

Key Benefits assumptions:

Option1: SCOOT bus priority

- Aaverage JT saving per trip 57 seconds
- daily passenger 2027
- annulisation factor 250
- average journey time per trip is assume to 1/3 of the average total journey time for bus 60A, B10, C10, 47A, 28.7minutes per trip
- average journey distance per trip is assume to 1/3 of the average total journey distance for bus 60A, B10, C10, 47A, 4.9miles per trip
- average fare per trip £1.9
- value of time assumed to be £6.04 per hour for non-work other
- car-km is assumed to 1% of the new bus passenger kms as a result of mode shift
- IVT elasticity -0.4 from TRL593

Option2: Real Time Information System

- daily passenger 2071
- annulisation factor 250
- average journey time per trip is assume to 1/3 of the average total journey time for bus 60A, B10, C10, 47A, 28.7minutes per trip
- average journey distance per trip is assume to 1/3 of the average total journey distance for bus 60A, B10, C10, 47A, 4.9miles per trip
- average fare per trip £1.9
- value of time assumed to be £6.04 per hour for non-work other
- improvement benefit value is assumed as 1.47 minutes generalised minutes per trip for RTPI, based on WebTAG
- car-km is assumed to 1% of the new bus passenger kms as a result of mode shift
- IVT elasticity -0.4 from TRL593

APPENDIX D

BEARS WAY ASSUMPTIONS AND DATA SOURCES

APPENDIX D1

AMAT – BEARSWAY PHASE 2

Please answer the following questions with your best estimates to obtain a benefit cost ratio of your scheme.
By varying your answers you can test the importance of the input data on the overall value for money of your scheme.
The answers provided are for the example case study from Appendix B of WebTAG unit A5.1. This case study provides further helpful commentary that users of this tool might want to refer to.

Scheme details

When would the scheme be likely to open? 2018
What is the last year of initial funding? 2019
Decay rate (starting from last year of funding) 10.0%

WebTAG A5.1 explains - the impacts especially of revenue funded initatives such as cycle training or personalised travel planning are likely to diminish year by year following the investment. For the case study here this is likely to be conservative.

Appraisal period (should be the expected asset life, maximum 60) 20 yrs

Costs

Please provide estimates for upfront costs as well as future maintenance costs in the table below. Please enter the full costs of the scheme in the first column and any private sector contribution to those costs in the second. All other funds are assumed to be from local or central Government.

Please use a constant price base and specify the year her 2016
Please refer to WebTAG unit A1.2 to set Optimism Bias 3%

Do Nothing scenario

This is what is most likely to happen if the scheme is not implemented.
The data could for example be from automatic or manual traffic counts.

Number of cycling journeys 188 per day, average length 3.9 km and speed 20 kph
Number of walking journey 0 per day, average length 0.7 km and speed 5 kph
Ideally the data is taken from 'average weekday' in spring or autumn to avoid seasonal bias.
A return trip involves two journeys and would need to be counted as such.
To identify how many individual users this implies, please estimate the share of journeys that form part of a return trip here: 90%

Do Something scenario

Once your scheme has reached it's full impact (ignoring any initial build up here), how would these figures have changed (due to the intervention)?
Number of cycling journeys 250 per day, e.g. from automatic or manual cycle count.
Number of walking journey 0 per day
For simplicity it is assumed that the length and speed of journeys is largely unaffected by the intervention.

Journey Quality impacts

WebTAG units A5.1 and A4.1 provides guidance, the Databook provides suggested values that users might plac
on the improvemed infrastructure your scheme provides. The values are shown in the WebTAG journey quality ta
The improvement over the 'do nothing' scenario should be valued, rather than the absolut level.

For cyclists 2.99 pence per minute 0 pence per trip (e.g. shower facilities
For pedestrians 0 pence per km
As demonstrated in the case study, these values should take account of the proportion of the average journey that would be made on the improved infrastructure.

Decongestion benefits

What proportion of new users would most likely be using a car in the do nothing scenario?
for cyclists 22.9%
for pedestrians 0.0%

Which area type from the drop down is most similar to the area your scheme is located in?
Inner and Outer Conurbations

Additional information

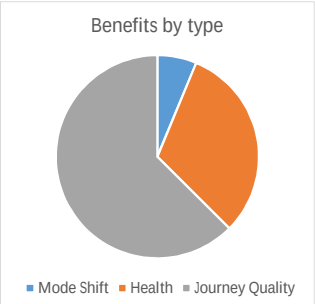
Background Growth
If you have an estimate of the growth in background use (in both scenarios), please set
the annual growth rate 8.10%
the period over which this applies 20 years

Number of days in the year that you would expect the above usage figures 220 days p.a.
In the case study this is assumed to the typical number of working days - but might more appropriately be set to the number of weekdays.

Results

Analysis of Monetised Costs and Benefits (in £'000)

Noise	0.33
Local Air Quality	0.00
Greenhouse Gases	1.06
Journey Quality	552.06
Physical Acitivity (incl. absenteeism)	275.27
Accidents	4.81
Decongestion	54.30
Indirect taxation	-5.56
Private contribution	0.00
Present Value of Benefits (PVB)	882.27
Present Value of Costs (PVC)	366.24
Benefit Cost Ratio (BCR)	**2.41**



Year	Total scheme costs '000£	3rd party contributions '000£
2009		
2010		
2011		
2012		
2013		
2014		
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2016		
2017		
2018	442	0
2019	1	0
2020	1	0
2021	1	0
2022	1	0
2023	1	0
2024	1	0
2025	1	0
2026	1	0
2027	1	0
2028	1	0
2029	1	0
2030	1	0
2031	1	0
2032	1	0
2033	1	0
2034	1	0
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The case study in WebTAG unit A5.1 uses slightly different assumptions on the valuation of decongestion benefits which result in a higher estimated benefit there. This is due to the specfic nature of the case study and to fully replicate this approach here would have increased the complexity of this tool with no apparent benefit.

Please answer the following questions with your best estimates to obtain a benefit cost ratio of your scheme.
By varying your answers you can test the importance of the input data on the overall value for money of your scheme.
The answers provided are for the example case study from Appendix B of WebTAG unit A5.1. This case study provides further helpful commentary that users of this tool might want to refer to.

Scheme details

When would the scheme be likely to open? 2018
What is the last year of initial funding? 2019
Decay rate (starting from last year of funding) 10.0%

WebTAG A5.1 explains - the impacts especially of revenue funded initatives such as cycle training or personalised travel planning are likely to diminish year by year following the investment. For the case study here this is likely to be conservative.

Appraisal period (should be the expected asset life, maximum 60) 20 yrs

Costs

Please provide estimates for upfront costs as well as future maintenance costs in the table below. Please enter the full costs of the scheme in the first column and any private sector contribution to those costs in the second. All other funds are assumed to be from local or central Government.

Please use a constant price base and specify the year her 2016
Please refer to WebTAG unit A1.2 to set Optimism Bias 3%

Do Nothing scenario

This is what is most likely to happen if the scheme is not implemented.
The data could for example be from automatic or manual traffic counts.

Number of cycling journeys 188 per day, average length 3.9 km and speed 20 kph
Number of walking journey 0 per day, average length 0.7 km and speed 5 kph
Ideally the data is taken from 'average weekday' in spring or autumn to avoid seasonal bias.
A return trip involves two journeys and would need to be counted as such.
To identify how many individual users this implies, please estimate the share of journeys that form part of a return trip here: 90%

Do Something scenario

Once your scheme has reached it's full impact (ignoring any initial build up here), how would these figures have changed (due to the intervention)?
Number of cycling journeys 250 per day, e.g. from automatic or manual cycle count.
Number of walking journey 0 per day
For simplicity it is assumed that the length and speed of journeys is largely unaffected by the intervention.

Journey Quality impacts

WebTAG units A5.1 and A4.1 provides guidance, the Databook provides suggested values that users might plac
on the improvemed infrastructure your scheme provides. The values are shown in the WebTAG journey quality ta
The improvement over the 'do nothing' scenario should be valued, rather than the absolut level.

For cyclists 2.99 pence per minute 0 pence per trip (e.g. shower facilities
For pedestrians 0 pence per km
As demonstrated in the case study, these values should take account of the proportion of the average journey that would be made on the improved infrastructure.

Decongestion benefits

What proportion of new users would most likely be using a car in the do nothing scenario?
for cyclists 22.9%
for pedestrians 0.0%

Which area type from the drop down is most similar to the area your scheme is located in?
Inner and Outer Conurbations

Additional information

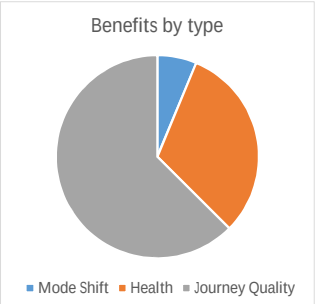
Background Growth
If you have an estimate of the growth in background use (in both scenarios), please set
the annual growth rate 8.10%
the period over which this applies 20 years

Number of days in the year that you would expect the above usage figures 220 days p.a.
In the case study this is assumed to the typical number of working days - but might more appropriately be set to the number of weekdays.

Results

Analysis of Monetised Costs and Benefits (in £'000)

Noise	0.33
Local Air Quality	0.00
Greenhouse Gases	1.06
Journey Quality	552.06
Physical Acitivity (incl. absenteeism)	275.27
Accidents	4.81
Decongestion	54.30
Indirect taxation	-5.56
Private contribution	-345.30
Present Value of Benefits (PVB)	536.97
Present Value of Costs (PVC)	20.94
Benefit Cost Ratio (BCR)	**25.64**



Year	Total scheme costs '000£	3rd party contributions '000£
2009		
2010		
2011		
2012		
2013		
2014		
2015		
2016		
2017		
2018	442	442
2019	1	0
2020	1	0
2021	1	0
2022	1	0
2023	1	0
2024	1	0
2025	1	0
2026	1	0
2027	1	0
2028	1	0
2029	1	0
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2031	1	0
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The case study in WebTAG unit A5.1 uses slightly different assumptions on the valuation of decongestion benefits which result in a higher estimated benefit there. This is due to the specfic nature of the case study and to fully replicate this approach here would have increased the complexity of this tool with no apparent benefit.

APPENDIX D2

AMAT – BEARSWAY PHASE 3

Please answer the following questions with your best estimates to obtain a benefit cost ratio of your scheme.
By varying your answers you can test the importance of the input data on the overall value for money of your scheme.
The answers provided are for the example case study from Appendix B of WebTAG unit A5.1. This case study provides further helpful commentary that users of this tool might want to refer to.

Scheme details

When would the scheme be likely to open? 2019
What is the last year of initial funding? 2019
Decay rate (starting from last year of funding) 10.0%

WebTAG A5.1 explains - the impacts especially of revenue funded initatives such as cycle training or personalised travel planning are likely to diminish year by year following the investment. For the case study here this is likely to be conservative.

Appraisal period (should be the expected asset life, maximum 60) 20 yrs

Costs

Please provide estimates for upfront costs as well as future maintenance costs in the table below. Please enter the full costs of the scheme in the first column and any private sector contribution to those costs in the second. All other funds are assumed to be from local or central Government.

Please use a constant price base and specify the year her 2016
Please refer to WebTAG unit A1.2 to set Optimism Bias 3%

Do Nothing scenario

This is what is most likely to happen if the scheme is not implemented.
The data could for example be from automatic or manual traffic counts.

Number of cycling journeys 98 per day, average length 3.9 km and speed 20 kph
Number of walking journey 0 per day, average length 0.7 km and speed 5 kph
Ideally the data is taken from 'average weekday' in spring or autumn to avoid seasonal bias.
A return trip involves two journeys and would need to be counted as such.
To identify how many individual users this implies, please estimate the share of journeys that form part of a return trip here: 90%

Do Something scenario

Once your scheme has reached it's full impact (ignoring any initial build up here), how would these figures have changed (due to the intervention)?
Number of cycling journeys 130 per day, e.g. from automatic or manual cycle count.
Number of walking journey 0 per day
For simplicity it is assumed that the length and speed of journeys is largely unaffected by the intervention.

Journey Quality impacts

WebTAG units A5.1 and A4.1 provides guidance, the Databook provides suggested values that users might plac
on the improvemed infrastructure your scheme provides. The values are shown in the WebTAG journey quality ta
The improvement over the 'do nothing' scenario should be valued, rather than the absolut level.

For cyclists 2.99 pence per minute 0 pence per trip (e.g. shower facilities
For pedestrians 0 pence per km
As demonstrated in the case study, these values should take account of the proportion of the average journey that would be made on the improved infrastructure.

Decongestion benefits

What proportion of new users would most likely be using a car in the do nothing scenario?
for cyclists 22.5%
for pedestrians 0.0%

Which area type from the drop down is most similar to the area your scheme is located in?
Inner and Outer Conurbations

Additional information

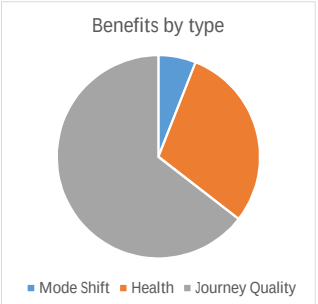
Background Growth
If you have an estimate of the growth in background use (in both scenarios), please set
the annual growth rate 7.10%
the period over which this applies 20 years

Number of days in the year that you would expect the above usage figures 220 days p.a.
In the case study this is assumed to the typical number of working days - but might more appropriately be set to the number of weekdays.

Results

Analysis of Monetised Costs and Benefits (in £'000)

Noise	0.14
Local Air Quality	0.00
Greenhouse Gases	0.44
Journey Quality	252.52
Physical Acitivity (incl. absenteeism)	115.56
Accidents	2.01
Decongestion	23.02
Indirect taxation	-2.28
Private contribution	0.00
Present Value of Benefits (PVB)	391.41
Present Value of Costs (PVC)	267.79
Benefit Cost Ratio (BCR)	**1.46**



Year	Total scheme costs '000£	3rd party contributions '000£
2009		
2010		
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2018	319	0
2019	1	0
2020	1	0
2021	1	0
2022	1	0
2023	1	0
2024	1	0
2025	1	0
2026	1	0
2027	1	0
2028	1	0
2029	1	0
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By varying your answers you can test the importance of the input data on the overall value for money of your scheme.
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Scheme details

When would the scheme be likely to open? 2019
What is the last year of initial funding? 2019
Decay rate (starting from last year of funding) 10.0%

WebTAG A5.1 explains - the impacts especially of revenue funded initatives such as cycle training or personalised travel planning are likely to diminish year by year following the investment. For the case study here this is likely to be conservative.

Appraisal period (should be the expected asset life, maximum 60) 20 yrs

Costs

Please provide estimates for upfront costs as well as future maintenance costs in the table below. Please enter the full costs of the scheme in the first column and any private sector contribution to those costs in the second. All other funds are assumed to be from local or central Government.

Please use a constant price base and specify the year her 2016
Please refer to WebTAG unit A1.2 to set Optimism Bias 3%

Do Nothing scenario

This is what is most likely to happen if the scheme is not implemented.
The data could for example be from automatic or manual traffic counts.

Number of cycling journeys 98 per day, average length 3.9 km and speed 20 kph
Number of walking journey 0 per day, average length 0.7 km and speed 5 kph
Ideally the data is taken from 'average weekday' in spring or autumn to avoid seasonal bias.
A return trip involves two journeys and would need to be counted as such.
To identify how many individual users this implies, please estimate the share of journeys that form part of a return trip here: 90%

Do Something scenario

Once your scheme has reached it's full impact (ignoring any initial build up here), how would these figures have changed (due to the intervention)?
Number of cycling journeys 130 per day, e.g. from automatic or manual cycle count.
Number of walking journey 0 per day
For simplicity it is assumed that the length and speed of journeys is largely unaffected by the intervention.

Journey Quality impacts

WebTAG units A5.1 and A4.1 provides guidance, the Databook provides suggested values that users might plac
on the improvemed infrastructure your scheme provides. The values are shown in the WebTAG journey quality ta
The improvement over the 'do nothing' scenario should be valued, rather than the absolut level.

For cyclists 2.99 pence per minute 0 pence per trip (e.g. shower facilities
For pedestrians 0 pence per km
As demonstrated in the case study, these values should take account of the proportion of the average journey that would be made on the improved infrastructure.

Decongestion benefits

What proportion of new users would most likely be using a car in the do nothing scenario?
for cyclists 22.5%
for pedestrians 0.0%

Which area type from the drop down is most similar to the area your scheme is located in?
Inner and Outer Conurbations

Additional information

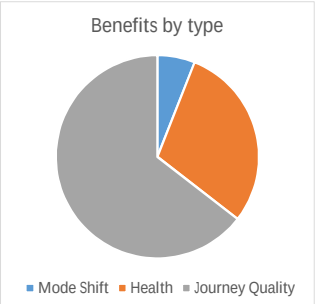
Background Growth
If you have an estimate of the growth in background use (in both scenarios), please set
the annual growth rate 7.10%
the period over which this applies 20 years

Number of days in the year that you would expect the above usage figures 220 days p.a.
In the case study this is assumed to the typical number of working days - but might more appropriately be set to the number of weekdays.

Results

Analysis of Monetised Costs and Benefits (in £'000)

Noise	0.14
Local Air Quality	0.00
Greenhouse Gases	0.44
Journey Quality	252.52
Physical Acitivity (incl. absenteeism)	115.56
Accidents	2.01
Decongestion	23.02
Indirect taxation	-2.28
Private contribution	-249.21
Present Value of Benefits (PVB)	142.20
Present Value of Costs (PVC)	18.58
Benefit Cost Ratio (BCR)	**7.65**



Year	Total scheme costs '000£	3rd party contributions '000£
2009		
2010		
2011		
2012		
2013		
2014		
2015		
2016		
2017		
2018	319	319
2019	1	0
2020	1	0
2021	1	0
2022	1	0
2023	1	0
2024	1	0
2025	1	0
2026	1	0
2027	1	0
2028	1	0
2029	1	0
2030	1	0
2031	1	0
2032	1	0
2033	1	0
2034	1	0
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The case study in WebTAG unit A5.1 uses slightly different assumptions on the valuation of decongestion benefits which result in a higher estimated benefit there. This is due to the specfic nature of the case study and to fully replicate this approach here would have increased the complexity of this tool with no apparent benefit.

APPENDIX D3

AMAT – BEARSWAY PHASES 2 & 3

Please answer the following questions with your best estimates to obtain a benefit cost ratio of your scheme.
By varying your answers you can test the importance of the input data on the overall value for money of your scheme.
The answers provided are for the example case study from Appendix B of WebTAG unit A5.1. This case study provides further helpful commentary that users of this tool might want to refer to.

Scheme details

When would the scheme be likely to open? 2019
What is the last year of initial funding? 2019
Decay rate (starting from last year of funding) 10.0%

WebTAG A5.1 explains - the impacts especially of revenue funded initatives such as cycle training or personalised travel planning are likely to diminish year by year following the investment. For the case study here this is likely to be conservative.

Appraisal period (should be the expected asset life, maximum 60) 20 yrs

Costs

Please provide estimates for upfront costs as well as future maintenance costs in the table below. Please enter the full costs of the scheme in the first column and any private sector contribution to those costs in the second. All other funds are assumed to be from local or central Government.

Please use a constant price base and specify the year her 2016
Please refer to WebTAG unit A1.2 to set Optimism Bias 3%

Do Nothing scenario

This is what is most likely to happen if the scheme is not implemented.
The data could for example be from automatic or manual traffic counts.

Number of cycling journeys 286 per day, average length 3.9 km and speed 20 kph
Number of walking journey 0 per day, average length 0.7 km and speed 5 kph
Ideally the data is taken from 'average weekday' in spring or autumn to avoid seasonal bias.
A return trip involves two journeys and would need to be counted as such.
To identify how many individual users this implies, please estimate the share of journeys that form part of a return trip here: 90%

Do Something scenario

Once your scheme has reached it's full impact (ignoring any initial build up here), how would these figures have changed (due to the intervention)?
Number of cycling journeys 380 per day, e.g. from automatic or manual cycle count.
Number of walking journey 0 per day
For simplicity it is assumed that the length and speed of journeys is largely unaffected by the intervention.

Journey Quality impacts

WebTAG units A5.1 and A4.1 provides guidance, the Databook provides suggested values that users might plac
on the improvemed infrastructure your scheme provides. The values are shown in the WebTAG journey quality ta
The improvement over the 'do nothing' scenario should be valued, rather than the absolut level.

For cyclists 2.99 pence per minute 0 pence per trip (e.g. shower facilities
For pedestrians 0 pence per km
As demonstrated in the case study, these values should take account of the proportion of the average journey that would be made on the improved infrastructure.

Decongestion benefits

What proportion of new users would most likely be using a car in the do nothing scenario?
for cyclists 22.7%
for pedestrians 0.0%

Which area type from the drop down is most similar to the area your scheme is located in?
Inner and Outer Conurbations

Additional information

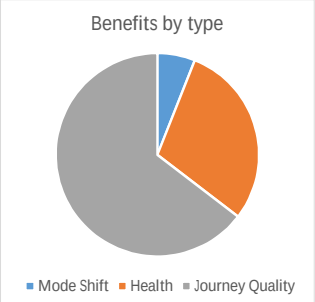
Background Growth
If you have an estimate of the growth in background use (in both scenarios), please set
the annual growth rate 7.60%
the period over which this applies 20 years

Number of days in the year that you would expect the above usage figures 220 days p.a.
In the case study this is assumed to the typical number of working days - but might more appropriately be set to the number of weekdays.

Results

Analysis of Monetised Costs and Benefits (in £'000)

Noise	0.42
Local Air Quality	0.00
Greenhouse Gases	1.35
Journey Quality	778.96
Physical Acitivity (incl. absenteeism)	354.74
Accidents	6.19
Decongestion	71.11
Indirect taxation	-6.97
Private contribution	0.00
Present Value of Benefits (PVB)	1205.80
Present Value of Costs (PVC)	634.05
Benefit Cost Ratio (BCR)	**1.90**



Year	Total scheme costs '000£	3rd party contributions '000£
2009		
2010		
2011		
2012		
2013		
2014		
2015		
2016		
2017		
2018	761	0
2019	2	0
2020	2	0
2021	2	0
2022	2	0
2023	2	0
2024	2	0
2025	2	0
2026	2	0
2027	2	0
2028	2	0
2029	2	0
2030	2	0
2031	2	0
2032	2	0
2033	2	0
2034	2	0
2035	2	0
2036	2	0
2037	2	0
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2067		
2068		
2069		
2070		

The case study in WebTAG unit A5.1 uses slightly different assumptions on the valuation of decongestion benefits which result in a higher estimated benefit there. This is due to the specfic nature of the case study and to fully replicate this approach here would have increased the complexity of this tool with no apparent benefit.

Please answer the following questions with your best estimates to obtain a benefit cost ratio of your scheme.
By varying your answers you can test the importance of the input data on the overall value for money of your scheme.
The answers provided are for the example case study from Appendix B of WebTAG unit A5.1. This case study provides further helpful commentary that users of this tool might want to refer to.

Scheme details

When would the scheme be likely to open? 2019
What is the last year of initial funding? 2019
Decay rate (starting from last year of funding) 10.0%

WebTAG A5.1 explains - the impacts especially of revenue funded initatives such as cycle training or personalised travel planning are likely to diminish year by year following the investment. For the case study here this is likely to be conservative.

Appraisal period (should be the expected asset life, maximum 60) 20 yrs

Costs

Please provide estimates for upfront costs as well as future maintenance costs in the table below. Please enter the full costs of the scheme in the first column and any private sector contribution to those costs in the second. All other funds are assumed to be from local or central Government.

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Number of walking journey 0 per day, average length 0.7 km and speed 5 kph
Ideally the data is taken from 'average weekday' in spring or autumn to avoid seasonal bias.
A return trip involves two journeys and would need to be counted as such.
To identify how many individual users this implies, please estimate the share of journeys that form part of a return trip here: 90%

Do Something scenario

Once your scheme has reached it's full impact (ignoring any initial build up here), how would these figures have changed (due to the intervention)?
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Number of walking journey 0 per day
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on the improvemed infrastructure your scheme provides. The values are shown in the WebTAG journey quality ta
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the period over which this applies 20 years

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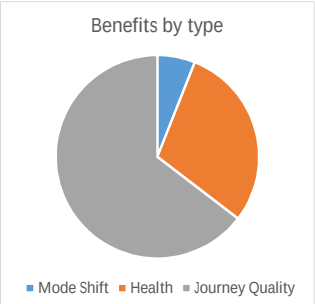
Local Air Quality	0.00
Greenhouse Gases	1.35
Journey Quality	778.96
Physical Acitivity (incl. absenteeism)	354.74
Accidents	6.19
Decongestion	71.11
Indirect taxation	-6.97
Private contribution	-594.52
Present Value of Benefits (PVB)	611.28
Present Value of Costs (PVC)	39.54
Benefit Cost Ratio (BCR)	**15.46**



Year	Total scheme costs '000£	3rd party contributions '000£
2009		
2010		
2011		
2012		
2013		
2014		
2015		
2016		
2017		
2018	761	761
2019	2	0
2020	2	0
2021	2	0
2022	2	0
2023	2	0
2024	2	0
2025	2	0
2026	2	0
2027	2	0
2028	2	0
2029	2	0
2030	2	0
2031	2	0
2032	2	0
2033	2	0
2034	2	0
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2036	2	0
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2070		

The case study in WebTAG unit A5.1 uses slightly different assumptions on the valuation of decongestion benefits which result in a higher estimated benefit there. This is due to the specfic nature of the case study and to fully replicate this approach here would have increased the complexity of this tool with no apparent benefit.

APPENDIX D4

SUMMARY OF MAIN ASSUMPTIONS

DfT Active Mode Appraisal Toolkit
Measure: *Comlpetion of Bearsway Phases 2 & 3*

Required Info		Source	Assumption	Phase 2	Phase 3
Likely opening year		ECC	Based on Bearsway Phase 1	2018	2019
Last year of initial funding		EDC	Based on Bearsway Phase 1	2018	2019
3rd party contributions		EDC	Based on Bearsway Phase 1	100%	100%
Decay rate		Estimate	10% starting from the last year of funding	10%	10%
Appraisal period		Assume 20 years	20 years	20	20
Scheme cost optimism bias		WebTAG unit A1.2	3% - Based on Roads project at Stage 3 (due to cost being taken from already completed project)	3%	3%
Construction/Implementation Cost		EDC	Based on Bearsway Phase 1 & junction upgrage costs	£442,143	£318,929
Annual maintenance costs		EDC	Weekly sweeping during autumn and sweeping and gritting as required	£964	£1,018
Baseline walking journey numbers		DfT & EDC counts		N/A	N/A
Baseline cycling journey numbers		DfT & EDC counts		188	98
Share of journeys forming aprt of a return trip		Estimate	90%	90%	90%
Average walking journey length		Scottish National Travel Survey	1.1 km	N/A	N/A
Average cycle journey length		Scottish National Travel Survey	6.3 km	6.3	6.3
Average walking speed		Estimate	5kph	5	5
Average cycle speed		Estimate	20kph	20	20
Comparative scheme with % increase data		EDC	Based on Bearsway Phase 1	33%	33%
Journey quality impacts		WebTAG units A5.1 and A4.1	2.99 pence / min	2.99	2.99
Proportion of new walkers shift from car in Do Nothing scenaio		Estimate		N/A	N/A
Proportion of new cyclists shift from car in Do Nothing scenaio		Census 2011 & Bearsway Phase 1 cycle counts	Post-scheme % increase factored by Method TtW	22.9%	22.5%
Background growth		DfT cycle counts	High, Low and Medium Scenarios	8.1%	7.1%
Number of days per year that usage figures apply to		Estimate	220 days p.a. estimated	220	220

Bearsway Estimates

	Source of info	Cost/Days	of Bearsway Phas	Estimated cost/time per km
Construction Period	EDC	450	1.4	
Cost	EDC	£470,000	1.4	£335,714.29
Annual Maintenance	Estimate	£1,500	1.4	£1,071.43
Funding				

Junction Upgrading

	Source of info	Cost per junction
Junction Upgrading	EDC	£70,000

	Length (km)	No. of Junctions	Cost	Annual Maintenance	Assumed opening year	Do Something Cycling Journeys
Phase 2	0.9	2	£442,143	£964	2018	250
Phase 3	0.95	0	£318,929	£1,018	2019	130
Total	1.85	2	£761,071	£1,982		380

APPENDIX D5

DECONGESTION BENEFIT CALCULATION

Phase 2											
All people aged 16 to 74	Work mainly at or from home	Underground metro light rail or tram	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
7867	852	10	979	339	39	4768	295	24	105	375	81
6829											

Phase 3											
All people aged 16 to 74	Work mainly at or from home	Underground metro light rail or tram	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
4132	441	4	465	211	25	2473	167	12	41	257	36
3614											

Mode Share (excl. WFH, Cycle & Other)	Phase 2	Phase 3
Underground metro light rail or tram	0%	0%
Train	14%	13%
Bus minibus or coach	5%	6%
Taxi or minicab	1%	1%
Driving a car or van	70%	68%
Passenger in a car or van	4%	5%
Motorcycle scooter or moped	0%	0%
On foot	5%	7%
	100%	100%

Decongestion Benefit	Based on % increase in cycle numbers post-scheme factored by catchment mode share

Phase 2	Phase 3
22.9%	22.5%

APPENDIX E

RAIL APPRAISAL INPUTS AND ASSUMPTIONS

APPENDIX E-1

ROAD TRAFFIC AND PARKING COSTS

DATA SOURCES

1 Weekday Traffic Flow Past Site

2 Development Traffic to Be Added to Road Network

The only committed development in the vicinity is Kilmardinny - confirmed by EDC in email dated 26/10/16

The remaining development on-site will comprise:

492	dwellings	February 201 EDC Planning Board Report
8938	m2 Leisure Centre	2006 TA

However in the Feb 15 Planning Board Report it is noted that, 150 Units on Site E are marked as 'should this site proceed'. Agreed with EDC that these units will not proceed to construction on basis of this uncertainty. Therefore assume:

342 dwellings

Also, there is an existing sports centre on the site, so existing trips to be deducted from total leisure centre trip gen for a facility of that size

Vehicular Trip Rates for Kilmardinny were obtained from the 2006 TA, as below.

Land Use	Time Period																	
	0700-0800		0800-0900		0900-1000		1000-1100		1100-1200		1200-1300		1300-1400		1400-1500		1500-1600	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Residential (per dwelling)	0.09	0.39	0.17	0.64	0.2	0.27											0.37	0.25
Allander Sports Centre (per 100m2)	0.61	0.26	0.8	0.58	1.15	0.56											1.08	1.03

Vehicular Trip Numbers for Kilmardinny were obtained from the 2006 TA, as below.

Land Use	Time Period																	
	0700-0800		0800-0900		0900-1000		1000-1100		1100-1200		1200-1300		1300-1400		1400-1500		1500-1600	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Residential (per dwelling)	31	133	58	219	68	92											127	86
Allander Sports Centre (per 100m2)	55	23	72	52	103	50											97	92
Existing Allander Leisure Trips	-16	-6	-20	-10	-53	-24											-71	-56
Total	70	150	110	261	118	118											153	122

KilmardinnyTrip Distribution

Residential Trips - Kilmrdinny TA App E

Direction	Exit Point	Proportion
North	B8050	3%
	A81 Strathblane Road	2%
	B8030 Main St	6%
East	A807 Auchenhowie Rd	20%
South	A809 Drymen Rd	8%
	Canniesburn Rd	6%
	A739 Switchback Rd	39%
	A81 Maryhill Road	15%
	Boclair Road	1%

Leisure Trips - Kilmrdinny TA App E

Direction	Exit Point	Proportion
North	Various	36%
East	A807 Auchenho	7%
South	Various	57%

No. vehicular trips added to each road section, Kilmardinny (approximated based on direction)

Road Section	Time Period																	
	0700-0800		0800-0900		0900-1000		1000-1100		1100-1200		1200-1300		1300-1400		1400-1500		1500-1600	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
A807	9	28	15	47	17	20											27	20
A81 South	44	101	70	175	75	78											102	80
A81 North	17	21	25	39	26	19											23	22
Total	70	150	110	261	118	118											153	122

Development Phasing

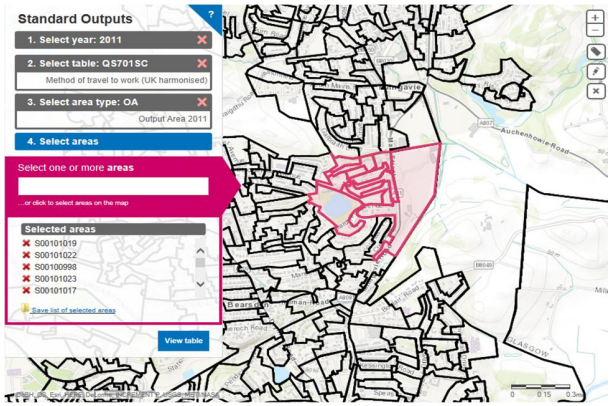
The Kilmardinny residential development construction is already underway, and the TA indicates that construction will advance at a rate of circa 100 units p.a. => residential element fully constructed by 2026.
EDC website indicates Allander Leisure Centre Construction will begin in mid-2020 => also assumed to be operational by 2026
https://www.eastdunbarton.gov.uk/news/major-investment-way-kilmardinny

Modal Split

The Kilmardinny development will add traffic to the roads surrounding the proposed Allander Station. In the absence of a station, it is assumed that modal split will be as present for those properties immediately adjacent the Kilmardinny site.
Modal Split Data was obtained from the 2011 Census for those Output Areas in the vicinity of Allander Station which sit approximately the same distance from Hillfoot and Milngavie Stations. Table QS701SC. Spreadsheet saved here:
..\..\..\I Incoming\161102 Allander Mode Split\Table QS701SC - Travel to Work.xlsx

Resultant Modal Split

Mode	Proportion
Underground, metro, light rail or tram	0%
Train	12%
Bus, minibus or coach	7%
Taxi or minicab	0%
Driving a car or van	70%
Passenger in a car or van	4%
Motorcycle, scooter or moped	0%
Bicycle	2%
On foot	4%
Other	1%



3 In-scope Trips
Weekday Traffic Flows (vehicles excluding free parkers) X Geographically In Scope Trips

4 Journey Time (mins)
Consider journey time from A81 outside potential station to George Square in Glasgow, as per Robroyston.

Car Journey Time
Journey times obtained from both Google Maps and Bing Maps websites, assuming departure at relevent hour from A81 outside Allander Leisure Centre access. Routes along A81 and A807 considered.
See Forecast Year tab for detail

Access Time WSP Estimate
A81/A807 junction to train station car park, departing at 8am on Thursday 3rd November 3 (including parking)

Transfer Time WSP Estimate
Car parking space to platform 2 (per Robroyston)

Egress Time
From George Square to final destination 5 (per Robroyston)

5 Average Speed (km/h)
(Distance from A81 by site access to George Sq)/(Total Journey Time A81 by site access to George Square)
See Forecast Year Tab for journey times and distances.

6 Fuel cost (pence/km)
See Fuel Cost (pence/km) Tab

7 Parking Cost (pence)

An average parking cost has been established by taking an average cost of various parking options in city centre locations. SPT provided a list of city centre car parking options. Only those which offer 8 hour parking and are located within the M8 / Clyde / High Street box were included in study.
The car parking cost has been calculated by taking a mix of car parks located in the city centre that a typical commuter would be attracted to in terms of location and cost. A commuter would generally seek out the most affordable parking option as a priority within a walkable distance to their destination.

Data from table below taken from Car Parking Data provided by SPT

Car Park	Type	Spaces	Cost							
			1	2	3	4	5	6	7	8 / Cost per Day
Cadogan Sq	City Parking - Multistorey	325	180	350	500	750	1000	1200	1440	1680
Cambridge St	City Parking - Multistorey	812	200	400	600	800	1000	1200	1600	1800
Charing Cross	City Parking - Multistorey	433	180	350	500	750	1000	1200	1440	1680
Concert Square	City Parking - Multistorey	698	200	400	600	800	1000	1200	1600	1800
Dundasvale	City Parking - Multistorey	460	120	240	340	440	540	640	740	840
Cathedral Street / GRI	Pay & Display	237	120	240	340	440	540	640	740	840
Dunlop St / St Enoch	Pay & Display	112	140	280	420	600	840	1000	1000	1000
Burnside St / Stow	Pay & Display	25	120	240	340	440	540	640	740	840
Buchanan Galleries	Multi-storey	2000	150	300	450	700	950	1300	1300	1500
Glasgow King St	NCP	620	250	500	600	600	600	600	600	600
George St / Strathclyde	NCP	202	35	650	950	1250	1450	1650	1850	2100
Oswald St	NCP	555	350	650	950	1250	1450	1650	1850	2100
Mitchell St	NCP	184	350	750	1150	1450	1850	2150	2150	2150
Glasshouse	NCP	515	350	650	950	1250	1550	1900	1900	1900
Ingram St	NCP	35	600	600	900	900	900	900	900	900
Average Cost Per Car		7213	203	412	596	807	1011	1237	1377	1536

The average price for parking based on the timescales from 07:00 - 15:00 have been set out below. The cost for parking periods after 10:00 have been reduced as the commuter would not pay the full day's fare so a cheaper charge would apply. It is assumed that commuters parking after 10:00 would remain at the car park until 17:00-18:00

Forecast Year Parking Costs

Assume small % rise in parking cost each year 1%

Future Year Parking Costs excl. Inflation

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	Year
2016	1536	1536	1536	1377	1237	1011	807	596	412	0

Future Parking Including Inflation (WebTAG GDP Deflator Series applied)

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	Year
2016	1969	1969	1969	1766	1586	1296	1035	765	528	0

Future Parking (2010 Prices)

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	
2016	1969	1969	1766	1586	1296	1035	765	528	0	

2017	1551	1551	1551	1391	1249	1021	815	602	416
2018	1567	1567	1567	1405	1262	1031	823	608	420
2019	1582	1582	1582	1419	1274	1042	832	614	424
2020	1598	1598	1598	1433	1287	1052	840	620	428
2021	1614	1614	1614	1447	1300	1062	848	627	433
2022	1630	1630	1630	1462	1313	1073	857	633	437
2023	1647	1647	1647	1476	1326	1084	865	639	441
2024	1663	1663	1663	1491	1339	1095	874	646	446
2025	1680	1680	1680	1506	1353	1106	883	652	450
2026	1696	1696	1696	1521	1366	1117	892	659	455
2027	1713	1713	1713	1536	1380	1128	900	665	459
2028	1730	1730	1730	1552	1394	1139	909	672	464
2029	1748	1748	1748	1567	1408	1151	919	679	469
2030	1765	1765	1765	1583	1422	1162	928	685	473
2031	1783	1783	1783	1599	1436	1174	937	692	478
2032	1801	1801	1801	1615	1450	1185	946	699	483
2033	1819	1819	1819	1631	1465	1197	956	706	488
2034	1837	1837	1837	1647	1480	1209	965	713	492
2035	1855	1855	1855	1663	1494	1221	975	720	497
2036	1874	1874	1874	1680	1509	1234	985	728	502
2037	1893	1893	1893	1697	1524	1246	995	735	507
2038	1912	1912	1912	1714	1540	1258	1005	742	512
2039	1931	1931	1931	1731	1555	1271	1015	750	518
2040	1950	1950	1950	1748	1571	1284	1025	757	523
2041	1969	1969	1969	1766	1586	1296	1035	765	528

1	2017	1565	1565	1565	1403	1260	1030	822	608	420
2	2018	1612	1612	1612	1445	1299	1061	847	626	432
3	2019	1659	1659	1659	1488	1336	1092	872	644	445
4	2020	1709	1709	1709	1533	1377	1125	898	664	458
5	2021	1762	1762	1762	1580	1419	1160	926	684	472
6	2022	1818	1818	1818	1630	1464	1197	956	706	487
7	2023	1877	1877	1877	1683	1512	1236	987	729	503
8	2024	1940	1940	1940	1739	1562	1277	1019	753	520
9	2025	2004	2004	2004	1797	1614	1319	1053	778	537
10	2026	2071	2071	2071	1857	1668	1363	1088	804	555
11	2027	2139	2139	2139	1918	1723	1408	1124	831	574
12	2028	2211	2211	2211	1982	1780	1455	1162	858	593
13	2029	2284	2284	2284	2048	1840	1503	1200	887	612
14	2030	2360	2360	2360	2116	1901	1553	1240	916	633
15	2031	2438	2438	2438	2186	1964	1605	1281	947	654
16	2032	2519	2519	2519	2259	2029	1658	1324	978	675
17	2033	2603	2603	2603	2334	2097	1713	1368	1011	698
18	2034	2690	2690	2690	2411	2166	1770	1413	1044	721
19	2035	2779	2779	2779	2492	2238	1829	1460	1079	745
20	2036	2871	2871	2871	2574	2313	1890	1509	1115	770
21	2037	2967	2967	2967	2660	2390	1953	1559	1152	795
22	2038	3065	3065	3065	2748	2469	2018	1611	1190	822
23	2039	3167	3167	3167	2840	2551	2085	1664	1230	849
24	2040	3272	3272	3272	2934	2636	2154	1720	1271	877
25	2041	3381	3381	3381	3031	2723	2226	1777	1313	906

1	2017	2007	2007	1799	1616	1321	1055	779	538	0
2	2018	1627	1627	1458	1310	1071	855	632	436	0
3	2019	1707	1707	1531	1375	1124	897	663	458	0
4	2020	1792	1792	1607	1444	1180	942	696	481	0
5	2021	1885	1885	1690	1518	1241	991	732	505	0
6	2022	1985	1985	1780	1599	1307	1043	771	532	0
7	2023	2094	2094	1877	1686	1378	1100	813	561	0
8	2024	2211	2211	1983	1781	1456	1162	859	593	0
9	2025	2337	2337	2096	1883	1539	1228	908	627	0
10	2026	2471	2471	2215	1990	1626	1298	959	662	0
11	2027	2611	2611	2341	2103	1719	1372	1014	700	0
12	2028	2760	2760	2475	2223	1817	1451	1072	740	0
13	2029	2917	2917	2616	2350	1920	1533	1133	782	0
14	2030	3084	3084	2765	2484	2030	1621	1197	827	0
15	2031	3260	3260	2922	2625	2146	1713	1266	874	0
16	2032	3445	3445	3089	2775	2268	1811	1338	924	0
17	2033	3642	3642	3265	2933	2397	1914	1414	976	0
18	2034	3849	3849	3451	3100	2534	2023	1495	1032	0
19	2035	4069	4069	3648	3277	2678	2138	1580	1091	0
20	2036	4300	4300	3856	3464	2831	2260	1670	1153	0
21	2037	4546	4546	4076	3661	2992	2389	1765	1219	0
22	2038	4805	4805	4308	3870	3163	2525	1866	1288	0
23	2039	5079	5079	4553	4091	3343	2669	1972	1362	0
24	2040	5368	5368	4813	4324	3534	2821	2084	1439	0
25	2041	5674	5674	5087	4570	3735	2982	2203	1521	0

The cost of car parking per person, relates to the number of people in the car. Below applies typical car occupancies from WebTAG

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
2026	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2041	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

8 Value of Time (pence/min)

Source - Table A1.35: Market Price Values of Time per Vehicle in 2010 based on distance travelled (pence per min, 2010 prices and values)

Vehicle Type & Journey Purpose	7am-10am	10am-4pm
Average Car VOT 2026 pence/min	14.43	13.59
Average Car Occupancy 2026	0.00	0.00
Average VOT pence/min/occupant 2026	#DIV/0!	#DIV/0!
Average Car VOT 2041	19.54	18.41
Average Car Occupancy 2041	0700-0800	0800-0900

Market Price Values of Time (pence per minute), including Inflation

7am-10am	10am-4pm
19.36	18.23
-	-
#DIV/0!	#DIV/0!
36.88	34.74
-	-

DATA SOURCES

8.399 Weekday Traffic Flow Past Site

8.542 Southbound Flows (towards Glasgow) - Average Hourly Weekday - 2015

Count Location	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600
A807 Auchenhowie Road (2014)									
A81 Milngavie Road (2014)									

8.721 Southbound Flows (towards Glasgow) - Average Hourly Weekday - 2027

Count Location	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600
A807 Auchenhowie Road (2014)									
A81 Milngavie Road (2014)									

8.9 Southbound Flows (towards Glasgow) - Average Hourly Weekday - 2042

9.151 The only committed development in the vicinity is Kilmardinny - confirmed by EDC in email dated 26/10/17

9.222 The remaining development on-site will comprise:

17384	dwellings	February 201 EDC Planning Board Report
25830	m2 Leisure Centre	2007 TA

9.366 However in the Feb 15 Planning Board Report it is noted that, 150 Units on Site E are marked as 'should this site proceed'. Agreed with EDC that these units will not proceed to construction on basis of this uncertainty. Therefore assume:

342 dwellings

9.473 Also, there is an existing sports centre on the site, so existing trips to be deducted from total leisure centre trip gen for a facility of that size

9.545 Vehicular Trip Rates for Kilmardinny were obtained from the 2006 TA, as below.

Land Use	Time Period	0700-0801		0800-0901		0900-1001		1000-1101		1100-1201		1200-1301		1300-1401		1400-1501		1500-1601	
		Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Residential (per dwelling)		1.13	0.13	1.43	0.52	2.1	0.85											1.79	1.81
Allander Sports Centre (per 100m2)		1.65	0	2.06	0.46	3.05	1.14											2.5	2.59

9.795 Vehicular Trip Numbers for Kilmardinny were obtained from the 2006 TA, as below.

Land Use	Time Period	0700-0801		0800-0901		0900-1001		1000-1101		1100-1201		1200-1301		1300-1401		1400-1501		1500-1601	
		Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Residential (per dwelling)		386	44	489	178	718	291											612	619
Allander Sports Centre (per 100m2)		147	0	184	41	273	102											223	231
Existing Allander Leisure Trips		-16	-6	-20	-10	-53	-24											-71	-56
Total		517	38	653	209	938	369											764	794

10.12 Kilmardinny/Trip Distribution

10.19 Residential Trips - Kilmrdinny TA App E

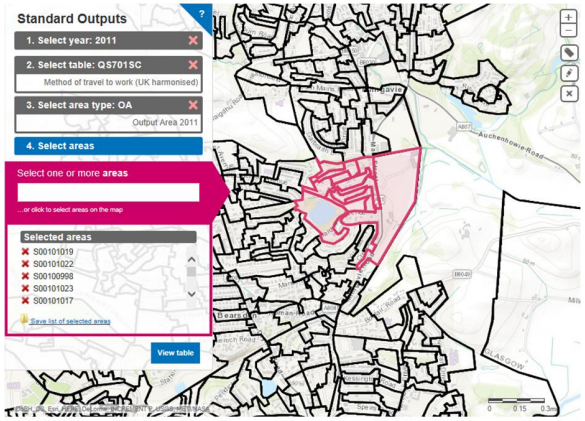
Direction	Exit Point	Proportion
	B8051	18%
North	A81 Strathblane Road	19%
	B8030 Main St	21%
East	A807 Auchenhowie Rd	22%
	A809 Drymen Rd	24%
	Canniesburn Rd	25%
South	A739 Switchback Rd	26%
	A81 Maryhill Road	28%
	Boclair Road	29%

Leisure Trips - Kilmrdinny TA App E

Direction	Exit Point	Proportion
North	Various	36%
East	A807 Auchenho	107%
South	Various	-43%

10.62 No. vehicular trips added to each road section, Kilmardinny (approximated based on direction)

Road Section	Time Period	0700-0801		0800-0901		0900-1001		1000-1101		1100-1201		1200-1301		1300-1401		1400-1501		1500-1601	
		Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
A808		86	8	109	38	159	64											133	136
A81 South		341	27	431	140	621	245											509	527
A81 North		90	3	113	31	158	60											122	131
Total		517	38	653	209	938	369											764	794



10.94 Development Phasing

10.01 The Kilmardinny residential development construction is already underway, and the TA indicates that construction will advance at a rate of circa 100 units p.a. => residential element fully constructed by 2026.

11.05 EDC website indicates Allander Leisure Centre Construction will begin in mid-2020 => also assumed to be operational by 2027

11.08 https://www.eastdunbarton.gov.uk/news/major-investment-way-kilmardinny

11.16 Modal Split

11.19 The Kilmardinny development will add traffic to the roads surrounding the proposed Allander Station. In the absence of a station, it is assumed that modal split will be as present for those properties immediately adjacent the Kilmardinny site.

11.23 Modal Split Data was obtained from the 2011 Census for those Output Areas in the vicinity of Allander Station which sit approximately the same distance from Hillfoot and Milngavie Stations. Table QS701SC. Spreadsheet saved here:

11.26 ..\..\..\I Incoming\161102 Allander Mode Split\Table QS701SC - Travel to Work.xlsx

11.34 Resultant Modal Split

Mode	Proportion
Underground, metro, light rail or tram	0%
Train	12%
Bus, minibus or coach	7%
Taxi or minicab	0%
Driving a car or van	70%
Passenger in a car or van	4%
Motorcycle, scooter or moped	0%
Bicycle	2%
On foot	4%
Other	1%

11.8 In-scope Trips

11.84 Weekday Traffic Flows (vehicles excluding free parkers) X Geographically In Scope Trips

11.91 Journey Time (mins)

11.94 Consider journey time from A81 outside potential station to George Square in Glasgow, as per Robroyston.

12.02 Car Journey Time

12.05 Journey times obtained from both Google Maps and Bing Maps websites, assuming departure at relevent hour from A81 outside Allander Leisure Centre access. Routes along A81 and A807 considered.

12.09 See Forecast Year tab for detail

12.12

12.16 **Access Time** WSP Estimate

12.19 A81/A807 junction to train station car park, departing at 8am on Thursday 3rd November 4 (including parking)

12.23

12.27 **Transfer Time** WSP Estimate

12.3 Car parking space to platform 8 (per Robroyston)

12.34

12.37 **Egress Time**

12.41 From George Square to final destination 11 (per Robroyston)

12.45

12.48 **Average Speed (km/h)**

12.52 (Distance from A81 by site access to George Sq)/(Total Journey Time A81 by site access to George Square)

12.55 See Forecast Year Tab for journey times and distances.

12.59

12.62 **Fuel cost (pence/km)**

12.66 See Fuel Cost (pence/km) Tab

12.7

12.73 **Parking Cost (pence)**

12.77

12.8 An average parking cost has been established by taking an average cost of various parking options in city centre locations. SPT provided a list of city centre car parking options. Only those which offer 8 hour parking and are located within the M8 / Clyde / High Street box were included in study.

12.84 The car parking cost has been calculated by taking a mix of car parks located in the city centre that a typical commuter would be attracted to in terms of location and cost. A commuter would generally seek out the most affordable parking option as a priority within a walkable distance to their destination.

12.87

12.91 **Data from table below taken from Car Parking Data provided by SPT**

				Cost							
Car Park	**Type**	**Spaces**	**383.375**	**695.25**	**1017.125**	**1228.5**	**1430.375**	**1637**	**1635.875**	**9 / Cost per Day**
Cadogan Sq	City Parking - Multistorey	592.4	403.875	728.5	1066.25	1281.676471	1486.779412	1698.147059	1682.323529	1519.809524
Cambridge St	City Parking - Multistorey	608	424.375	761.75	1115.375	1334.852941	1543.183824	1759.294118	1728.772059	1528.702381
Charing Cross	City Parking - Multistorey	623.6	444.875	795	1164.5	1388.029412	1599.588235	1820.441176	1775.220588	1537.595238
Concert Square	City Parking - Multistorey	639.2	465.375	828.25	1213.625	1441.205882	1655.992647	1881.588235	1821.669118	1546.488095
Dundasvale	City Parking - Multistorey	654.8	485.875	861.5	1262.75	1494.382353	1712.397059	1942.735294	1868.117647	1555.380952
Cathedral Street / GRI	Pay & Display	237	506.375	894.75	1311.875	1547.558824	1768.801471	2003.882353	1914.566176	1564.27381
Dunlop St / St Enoch	Pay & Display	260.75	526.875	928	1361	1600.735294	1825.205882	2065.029412	1961.014706	1573.166667
Burnside St / Stow	Pay & Display	218.5	547.375	961.25	1410.125	1653.911765	1881.610294	2126.176471	2007.463235	1582.059524
Buchanan Galleries	Multi-storey	176.25	567.875	994.5	1459.25	1707.088235	1938.014706	2187.323529	2053.911765	1590.952381
Glasgow King St	NCP	134	588.375	1027.75	1508.375	1760.264706	1994.419118	2248.470588	2100.360294	1599.845238
George St / Strathclyde	NCP	91.75	608.875	1061	1557.5	1813.441176	2050.823529	2309.617647	2146.808824	1608.738095
Oswald St	NCP	49.5	629.375	1094.25	1606.625	1866.617647	2107.227941	2370.764706	2193.257353	1617.630952
Mitchell St	NCP	7.25	649.875	1127.5	1655.75	1919.794118	2163.632353	2431.911765	2239.705882	1626.52381
Glasshouse	NCP	-35	670.375	1160.75	1704.875	1972.970588	2220.036765	2493.058824	2286.154412	1635.416667
Ingram St	NCP	-77.25	690.875	1194	1754	2026.147059	2276.441176	2554.205882	2332.602941	1644.309524
Average Cost Per Car		4180.75	537	944	1385	1626	1852	2094	1983	1577

13.59

13.63 The average price for parking based on the timescales from 07:00 - 15:00 have been set out below. The cost for parking periods after 10:00 have been reduced as the commuter would not pay the

13.66 full day's fare so a cheaper charge would apply. It is assumed that commuters parking after 10:00 would remain at the car park until 17:00-18:01

13.7

13.73

Car Park	**Type**	**Parking Cost in Pence**	
		Five	**Day**
Dundasvale - Glenmavis Street	Underground	2051	1609
Burnside Street - New City Road	Pay & Display Covered	1882	1582
Cathedral Precint Car Park 2	Pay & Display not covered	2164	1627
St Enoch Shopping Centre	Multi Storey	#REF!	#REF!
Cambridge Street	Multi Storey	#REF!	#REF!
Q-Park (Sauchiehall St)	Multi Storey	#REF!	#REF!
Buchanan Galleries	Multi Storey	1938	1591
Concernt Square	Multi Storey	#REF!	#REF!
Charing Cross	Multi Storey	#REF!	#REF!
Average		1852	1577
Cost cost divided by two. These figures are applied to the model		#REF!	#REF!

14.24

14.27 **Forecast Year Parking Costs**

14.31

14.34 Assume small % rise in parking cost each year 101%

14.38

14.41 Future Year Parking Costs excl. Inflation

		07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
Year										
2042		1536	1536	1536	1983	2094	1852	1626	1385	944
2043		1551	1551	1551	2003	2115	1871	1643	1398	953
2044		1567	1567	1567	2023	2136	1890	1659	1412	963
2045		1582	1582	1582	2043	2158	1908	1676	1427	973
2046		1598	1598	1598	2064	2179	1928	1692	1441	982
2047		1614	1614	1614	2084	2201	1947	1709	1455	992
2048		1630	1630	1630	2105	2223	1966	1726	1470	1002
2049		1647	1647	1647	2126	2245	1986	1744	1484	1012
2050		1663	1663	1663	2148	2268	2006	1761	1499	1022
2051		1680	1680	1680	2169	2291	2026	1779	1514	1032
2052		1696	1696	1696	2191	2314	2046	1796	1529	1043
2053		1713	1713	1713	2213	2337	2067	1814	1545	1053
2054		1730	1730	1730	2235	2360	2087	1833	1560	1064
2055		1748	1748	1748	2257	2384	2108	1851	1576	1074
2056		1765	1765	1765	2280	2407	2129	1869	1592	1085
2057		1783	1783	1783	2303	2432	2150	1888	1607	1096
2058		1801	1801	1801	2326	2456	2172	1907	1624	1107
2059		1819	1819	1819	2349	2480	2194	1926	1640	1118
2060		1837	1837	1837	2372	2505	2216	1945	1656	1129
2061		1855	1855	1855	2396	2530	2238	1965	1673	1140
2062		1874	1874	1874	2420	2556	2260	1984	1689	1152
2063		1893	1893	1893	2444	2581	2283	2004	1706	1163
2064		1912	1912	1912	2469	2607	2306	2024	1723	1175
2065		1931	1931	1931	2493	2633	2329	2044	1741	1187
2066		1950	1950	1950	2518	2659	2352	2065	1758	1199
2067		1969	1969	1969	2543	2686	2375	2086	1776	1211

Future Parking Including Inflation (WebTAG GDP Deflator Series applied)

		07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
Year										
2042		1969	1969	1969	2543	2686	2375	2086	1776	1211
2043		0	0	0	0	0	0	0	0	0
2044		0	0	0	0	0	0	0	0	0
2045		0	0	0	0	0	0	0	0	0
2046		0	0	0	0	0	0	0	0	0
2047		0	0	0	0	0	0	0	0	0
2048		0	0	0	0	0	0	0	0	0
2049		0	0	0	0	0	0	0	0	0
2050		0	0	0	0	0	0	0	0	0
2051		0	0	0	0	0	0	0	0	0
2052		0	0	0	0	0	0	0	0	0
2053		0	0	0	0	0	0	0	0	0
2054		0	0	0	0	0	0	0	0	0
2055		0	0	0	0	0	0	0	0	0
2056		0	0	0	0	0	0	0	0	0
2057		0	0	0	0	0	0	0	0	0
2058		0	0	0	0	0	0	0	0	0
2059		0	0	0	0	0	0	0	0	0
2060		0	0	0	0	0	0	0	0	0
2061		0	0	0	0	0	0	0	0	0
2062		0	0	0	0	0	0	0	0	0
2063		0	0	0	0	0	0	0	0	0
2064		0	0	0	0	0	0	0	0	0
2065		0	0	0	0	0	0	0	0	0
2066		0	0	0	0	0	0	0	0	0
2067		0	0	0	0	0	0	0	0	0

Future Parking (2010 Prices)

		07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
Year										
2042		1969	1969	1969	2543	2686	2375	2086	1776	1211
2043		0	0	0	0	0	0	0	0	0
2044		0	0	0	0	0	0	0	0	0
2045		0	0	0	0	0	0	0	0	0
2046		0	0	0	0	0	0	0	0	0
2047		0	0	0	0	0	0	0	0	0
2048		0	0	0	0	0	0	0	0	0
2049		0	0	0	0	0	0	0	0	0
2050		0	0	0	0	0	0	0	0	0
2051		0	0	0	0	0	0	0	0	0
2052		0	0	0	0	0	0	0	0	0
2053		0	0	0	0	0	0	0	0	0
2054		0	0	0	0	0	0	0	0	0
2055		0	0	0	0	0	0	0	0	0
2056		0	0	0	0	0	0	0	0	0
2057		0	0	0	0	0	0	0	0	0
2058		0	0	0	0	0	0	0	0	0
2059		0	0	0	0	0	0	0	0	0
2060		0	0	0	0	0	0	0	0	0
2061		0	0	0	0	0	0	0	0	0
2062		0	0	0	0	0	0	0	0	0
2063		0	0	0	0	0	0	0	0	0
2064		0	0	0	0	0	0	0	0	0
2065		0	0	0	0	0	0	0	0	0
2066		0	0	0	0	0	0	0	0	0
2067		0	0	0	0	0	0	0	0	0

15.45 The cost of car parking per person, relates to the number of people in the car. Below applies typical car occupancies from WebTAG

15.49

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
2056	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2071	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

15.63

15.67

15.7 **Value of Time (pence/min)**

Source - Table A1.35: Market Price Values of Time per Vehicle in 2010 based on distance travelled (pence per min, 2010 prices and values)

Vehicle Type & Journey Purpose	7am-10am	10am-4pm
Average Car VOT 2026 pence/min	14.43	13.59
Average Car Occupancy 2027	0.00	0.00
Average VOT pence/min/occupant 2027	#DIV/0!	#DIV/0!
Average Car VOT 2042	19.54	18.41
Average Car Occupancy 2042	0.00	0.00

Market Price Values of Time (pence per minute), including Inflation

7am-10am	10am-4pm
19.36	18.23
-	-
#DIV/0!	#DIV/0!
36.88	34.74
-	-

APPENDIX E-2

ROAD AND RAIL JOURNEY COSTS

Traffic Flows Past Site (i.e. on A807 + A81), without development

NOTE WAITROSE ONLY OPENED IN 2015
=> trips not included in baseline

Year	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	Annual Change	STEP OUTPUT
2014	283	1020	1298	1036	967	1024	1080	1073	1109		EDC Counts ATC AHWT Summary.xlsx
2026	293	1057	1344	1072	1001	1060	1119	1111	1148		1.036 STEP factor 2014-2026
2027	294	1059	1347	1075	1004	1063	1121	1113	1151	1.002	STEP factor 2026-2032 - total change assumed to
2028	294	1061	1350	1077	1006	1065	1123	1116	1153	1.002	
2029	295	1064	1353	1079	1008	1067	1126	1118	1156	1.002	
2030	296	1066	1356	1082	1010	1070	1128	1121	1158	1.002	
2031	296	1068	1359	1084	1012	1072	1131	1123	1161	1.002	
2032	297	1071	1362	1086	1015	1074	1133	1125	1163	1.002	1.013 STEP only provides growth factors up to 2032.
2033	297	1073	1365	1089	1017	1077	1136	1128	1166	1.002	Assume same rate of growth continues for duration, in absence of alternative information.
2034	298	1075	1368	1091	1019	1079	1138	1130	1168	1.002	
2035	299	1078	1371	1094	1021	1081	1141	1133	1171	1.002	
2036	299	1080	1374	1096	1024	1084	1143	1135	1173	1.002	
2037	300	1082	1377	1098	1026	1086	1146	1138	1176	1.002	
2038	301	1085	1380	1101	1028	1088	1148	1140	1179	1.002	
2039	301	1087	1383	1103	1030	1091	1151	1143	1181	1.002	
2040	302	1089	1386	1106	1032	1093	1153	1145	1184	1.002	
2041	303	1092	1389	1108	1035	1096	1156	1148	1186	1.002	
2042	303	1094	1392	1110	1037	1098	1158	1150	1189	1.002	
2043	304	1097	1395	1113	1039	1100	1161	1153	1192	1.002	
2044	305	1099	1398	1115	1042	1103	1163	1155	1194	1.002	
2045	305	1101	1401	1118	1044	1105	1166	1158	1197	1.002	
2046	306	1104	1404	1120	1046	1108	1168	1160	1199	1.002	
2047	307	1106	1407	1123	1048	1110	1171	1163	1202	1.002	
2048	307	1109	1410	1125	1051	1113	1174	1165	1205	1.002	
2049	308	1111	1413	1128	1053	1115	1176	1168	1207	1.002	
2050	309	1113	1417	1130	1055	1117	1179	1171	1210	1.002	
2051	309	1116	1420	1132	1058	1120	1181	1173	1213	1.002	
2052	310	1118	1423	1135	1060	1122	1184	1176	1215	1.002	
2053	311	1121	1426	1137	1062	1125	1187	1178	1218	1.002	
2054	311	1123	1429	1140	1065	1127	1189	1181	1221	1.002	
2055	312	1126	1432	1142	1067	1130	1192	1183	1223	1.002	
2056	313	1128	1435	1145	1069	1132	1194	1186	1226	1.002	
2057	313	1131	1438	1147	1072	1135	1197	1189	1229	1.002	
2058	314	1133	1442	1150	1074	1137	1200	1191	1231	1.002	
2059	315	1136	1445	1152	1076	1140	1202	1194	1234	1.002	
2060	316	1138	1448	1155	1079	1142	1205	1196	1237	1.002	
2061	316	1141	1451	1157	1081	1145	1207	1199	1239	1.002	
2062	317	1143	1454	1160	1083	1147	1210	1202	1242	1.002	
2063	318	1146	1457	1163	1086	1150	1213	1204	1245	1.002	
2064	318	1148	1461	1165	1088	1152	1215	1207	1248	1.002	
2065	319	1151	1464	1168	1091	1155	1218	1210	1250	1.002	
2066	320	1153	1467	1170	1093	1157	1221	1212	1253	1.002	
2067	320	1156	1470	1173	1095	1160	1223	1215	1256	1.002	
2068	321	1158	1473	1175	1098	1162	1226	1218	1259	1.002	
2069	322	1161	1477	1178	1100	1165	1229	1220	1261	1.002	
2070	323	1163	1480	1180	1103	1167	1231	1223	1264	1.002	
2071	323	1166	1483	1183	1105	1170	1234	1226	1267	1.002	
2072	324	1168	1486	1186	1107	1172	1237	1228	1270	1.002	
2073	325	1171	1490	1188	1110	1175	1240	1231	1272	1.002	
2074	325	1173	1493	1191	1112	1178	1242	1234	1275	1.002	
2075	326	1176	1496	1193	1115	1180	1245	1236	1278	1.002	
2076	327	1179	1499	1196	1117	1183	1248	1239	1281	1.002	
2077	327	1181	1503	1199	1120	1185	1250	1242	1284	1.002	
2078	328	1184	1506	1201	1122	1188	1253	1244	1286	1.002	
2079	329	1186	1509	1204	1124	1191	1256	1247	1289	1.002	
2080	330	1189	1513	1207	1127	1193	1259	1250	1292	1.002	
2081	330	1192	1516	1209	1129	1196	1261	1253	1295	1.002	
2082	331	1194	1519	1212	1132	1198	1264	1255	1298	1.002	
2083	332	1197	1523	1215	1134	1201	1267	1258	1301	1.002	
2084	333	1199	1526	1217	1137	1204	1270	1261	1303	1.002	
2085	333	1202	1529	1220	1139	1206	1273	1264	1306	1.002	
2086	334	1205	1533	1223	1142	1209	1275	1266	1309	1.002	

Development Traffic Flows (Added to A81 south + A807, both southbound)

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
2026 onwards	129	222	99	0	0	0	0	0	100

Traffic Flow Past Site with Development

		07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00
2026	0	422	1278	1443	1072	1001	1060	1119	1111	1248
2027	1	423	1281	1446	1075	1004	1063	1121	1113	1250
2028	2	423	1283	1449	1077	1006	1065	1123	1116	1253
2029	3	424	1285	1452	1079	1008	1067	1126	1118	1255
2030	4	425	1288	1454	1082	1010	1070	1128	1121	1258
2031	5	425	1290	1457	1084	1012	1072	1131	1123	1260
2032	6	426	1292	1460	1086	1015	1074	1133	1125	1263
2033	7	427	1295	1463	1089	1017	1077	1136	1128	1265
2034	8	427	1297	1466	1091	1019	1079	1138	1130	1268
2035	9	428	1299	1469	1094	1021	1081	1141	1133	1270
2036	10	429	1302	1472	1096	1024	1084	1143	1135	1273
2037	11	429	1304	1475	1098	1026	1086	1146	1138	1276
2038	12	430	1306	1478	1101	1028	1088	1148	1140	1278
2039	13	431	1309	1481	1103	1030	1091	1151	1143	1281
2040	14	431	1311	1484	1106	1032	1093	1153	1145	1283
2041	15	432	1314	1487	1108	1035	1096	1156	1148	1286
2042	16	433	1316	1490	1110	1037	1098	1158	1150	1289
2043	17	433	1318	1494	1113	1039	1100	1161	1153	1291
2044	18	434	1321	1497	1115	1042	1103	1163	1155	1294
2045	19	435	1323	1500	1118	1044	1105	1166	1158	1296
2046	20	435	1326	1503	1120	1046	1108	1168	1160	1299
2047	21	436	1328	1506	1123	1048	1110	1171	1163	1302
2048	22	437	1330	1509	1125	1051	1113	1174	1165	1304
2049	23	437	1333	1512	1128	1053	1115	1176	1168	1307

Vehicle Operating Costs - Fuel

Fuel Price (Resource Cost + Duty + VAT, 2010 Prices)	Petrol (p/l)	Diesel (p/l)	Electric (p/kwh)	Source: WebTAG Table A 1.3.7
2010	118.29	120.36	53.64	
2011	131.96	137.05	65.31	
2026	130.76	137.81	65.15	
2041	138.13	145.18	66.39	

Fuel Consumption (l/km, WebTAG)

Fuel consumption is estimated using a function of the form: L=a/v+b+c.v+d.v^2
L = consumption, expressed in litres per kilometre
v = average speed in kph
a, b,c and d are parameters defined for each vehicle category per Table A.1.3.8

WebTAG Table A 1.3.8:	Fuel consumption parameter values (litres/km, 2010)			
	Parameters			
Vehicle Category	a	b	c	d
Petrol Car	1.119322	0.044005	-0.000081	0.000002
Diesel Car	0.492146	0.062182	-0.000591	0.000005
Petrol LGV	1.950833	0.034528	0.000068	0.000004
Diesel LGV	1.396883	0.033477	-0.000230	0.000008
OGV1	1.812903	0.326784	-0.004948	0.000043
OGV2	2.893292	0.603481	-0.008637	0.000065
PSV	5.980055	0.245278	-0.003065	0.000031
	Energy consumption parameter values (kWh per km,)			
Electric Car	0.12564			

Forecasts based on car vehicle type.

Fuel efficiency improvements based on WebtTAG Table A 1.3.10a, again Car vehicle type.

	2010		2011		2026				2041 (No change assumed post 2035)		
Speed (kph)	Petrol (l/km)	Diesel (l/km)	Electric (kwh/km)	Speed (kph)	Petrol (l/km)	Diesel (l/km)	Electric (kwh/km)	Speed (kph)	Petrol (l/km	Diesel (l/km)	Electric (kwh/
17	0.1091715	0.082427928	0.12564236	17	0.0705337	0.0587185	0.1252507	17	0.0643637	0.0548132	0.1257274
18	0.1055179	0.080391267	0.12564236	18	0.0681732	0.0572676	0.1252507	18	0.0622097	0.0534588	0.1257274
19	0.1022543	0.078533195	0.12564236	19	0.0660646	0.0559440	0.1252507	19	0.0602856	0.0522232	0.1257274
20	0.0993229	0.07682832	0.12564236	20	0.0641706	0.0547295	0.1252507	20	0.0585573	0.0508217	0.1257274
21	0.0966768	0.075256083	0.12564236	21	0.0624611	0.0536095	0.1252507	21	0.0569973	0.0500440	0.1257274
22	0.0942780	0.073799666	0.12564236	22	0.0609112	0.0525720	0.1252507	22	0.0555830	0.0490755	0.1257274
23	0.0920947	0.072445172	0.12564236	23	0.0595007	0.0516071	0.1252507	23	0.0542958	0.0481748	0.1257274
24	0.0901007	0.071181024	0.12564236	24	0.0582124	0.0507066	0.1252507	24	0.0531202	0.0473342	0.1257274
25	0.0882738	0.069997495	0.12564236	25	0.0570320	0.0498635	0.1252507	25	0.0520431	0.0465471	0.1257274
26	0.0865952	0.068886355	0.12564236	26	0.0559476	0.0490720	0.1252507	26	0.0510535	0.0458082	0.1257274
27	0.0850492	0.067840594	0.12564236	27	0.0549487	0.0483270	0.1252507	27	0.0501420	0.0451128	0.1257274
28	0.0836219	0.066854203	0.12564236	28	0.0540265	0.0476243	0.1252507	28	0.0493006	0.0444569	0.1257274
29	0.0823017	0.065922001	0.12564236	29	0.0531736	0.0469603	0.1252507	29	0.0485222	0.0438370	0.1257274
30	0.0810782	0.065039499	0.12564236	30	0.0523831	0.0463316	0.1252507	30	0.0478009	0.0432502	0.1257274
31	0.0799426	0.064202786	0.12564236	31	0.0516494	0.0457356	0.1252507	31	0.0471314	0.0426938	0.1257274
32	0.0788872	0.063408442	0.12564236	32	0.0509675	0.0451697	0.1252507	32	0.0465091	0.0421655	0.1257274
33	0.0779050	0.062653459	0.12564236	33	0.0503330	0.0446319	0.1252507	33	0.0459301	0.0416635	0.1257274
34	0.0769901	0.061935184	0.12564236	34	0.0497419	0.0441202	0.1252507	34	0.0453907	0.0411858	0.1257274
35	0.0761371	0.061251268	0.12564236	35	0.0491908	0.0436330	0.1252507	35	0.0448878	0.0407310	0.1257274
36	0.0753413	0.060599621	0.12564236	36	0.0486766	0.0431688	0.1252507	36	0.0444186	0.0402977	0.1257274
37	0.0745983	0.059978381	0.12564236	37	0.0481966	0.0427263	0.1252507	37	0.0439806	0.0398846	0.1257274
38	0.0739045	0.059385882	0.12564236	38	0.0477483	0.0423042	0.1252507	38	0.0435715	0.0394906	0.1257274
39	0.0732564	0.058820626	0.12564236	39	0.0473296	0.0419015	0.1252507	39	0.0431894	0.0391147	0.1257274
40	0.0726510	0.058281268	0.12564236	40	0.0469385	0.0415173	0.1252507	40	0.0428325	0.0387560	0.1257274
41	0.0720855	0.057766594	0.12564236	41	0.0465731	0.0411507	0.1252507	41	0.0424991	0.0384138	0.1257274
42	0.0715574	0.057275503	0.12564236	42	0.0462319	0.0408008	0.1252507	42	0.0421877	0.0380872	0.1257274

Fuel Cost by Distance (p/km, 2010 prices)

2010	2011	2026	2041 (No change assumed post-2035)

Speed (kph)	Petrol (p/km)	Diesel (p/km)	Electric (p/km)	Speed (kph)	Petrol (p/km)	Diesel (p/km)	Electric (p/km)	Speed (kph)	etrol (p/km)	Diesel (p/km)	ectric (p/km)
17	12.9140537	9.9206616	8.2063056	17	9.2231151	8.0920876	8.1601700	17	8.8902628	7.9575107	8.3469517
18	12.4818664	9.6755380	8.2063056	18	8.9144503	7.8921451	8.1601700	18	8.5927374	7.7608934	8.3469517
19	12.0958059	9.4519087	8.2063056	19	8.6387289	7.7097351	8.1601700	19	8.3269665	7.5815171	8.3469517
20	11.7490400	9.2467174	8.2063056	20	8.3910715	7.5423647	8.1601700	20	8.0882467	7.3780431	8.3469517
21	11.4360381	9.0574900	8.2063056	21	8.1675280	7.3880156	8.1601700	21	7.8727707	7.2651479	8.3469517
22	11.1522749	8.8822019	8.2063056	22	7.9648666	7.2450366	8.1601700	22	7.6774231	7.1245468	8.3469517
23	10.8940123	8.7191811	8.2063056	23	7.7804175	7.1120637	8.1601700	23	7.4996306	6.9937853	8.3469517
24	10.6581352	8.5670338	8.2063056	24	7.6119559	6.9879601	8.1601700	24	7.3372486	6.8717457	8.3469517
25	10.4420267	8.4245894	8.2063056	25	7.4576130	6.8717711	8.1601700	25	7.1884757	6.7574889	8.3469517
26	10.2434729	8.2908576	8.2063056	26	7.3158074	6.7626887	8.1601700	26	7.0517877	6.6502206	8.3469517
27	10.0605875	8.1649944	8.2063056	27	7.1851921	6.6600246	8.1601700	27	6.9258862	6.5492639	8.3469517
28	9.8917538	8.0462767	8.2063056	28	7.0646124	6.5631889	8.1601700	28	6.8096581	6.4540387	8.3469517
29	9.7355782	7.9340810	8.2063056	29	6.9530730	6.4716731	8.1601700	29	6.7021441	6.3640448	8.3469517
30	9.5908528	7.8278669	8.2063056	30	6.8497113	6.3850364	8.1601700	30	6.6025125	6.2788489	8.3469517
31	9.4565256	7.7271639	8.2063056	31	6.7537759	6.3028949	8.1601700	31	6.5100393	6.1980735	8.3469517
32	9.3316761	7.6315601	8.2063056	32	6.6646093	6.2249128	8.1601700	32	6.4240907	6.1213883	8.3469517
33	9.2154953	7.5406937	8.2063056	33	6.5816339	6.1507948	8.1601700	33	6.3441098	6.0485030	8.3469517
34	9.1072695	7.4542453	8.2063056	34	6.5043399	6.0802806	8.1601700	34	6.2696053	5.9791614	8.3469517
35	9.0063665	7.3719322	8.2063056	35	6.4322758	6.0131394	8.1601700	35	6.2001418	5.9131368	8.3469517
36	8.9122243	7.2935029	8.2063056	36	6.3650402	5.9491661	8.1601700	36	6.1353327	5.8502275	8.3469517
37	8.8243418	7.2187332	8.2063056	37	6.3022752	5.8881780	8.1601700	37	6.0748328	5.7902536	8.3469517
38	8.7422705	7.1474225	8.2063056	38	6.2436605	5.8300113	8.1601700	38	6.0183335	5.7330543	8.3469517
39	8.6656079	7.0793909	8.2063056	39	6.1889087	5.7745192	8.1601700	39	5.9655576	5.6784851	8.3469517
40	8.5939919	7.0144762	8.2063056	40	6.1377611	5.7215696	8.1601700	40	5.9162559	5.6264160	8.3469517
41	8.5270956	6.9525322	8.2063056	41	6.0899843	5.6710431	8.1601700	41	5.8702033	5.5767299	8.3469517
42	8.4646232	6.8934267	8.2063056	42	6.0453670	5.6228319	8.1601700	42	5.8271962	5.5293204	8.3469517

Proportion of Cars Using Each Fuel Source (WebTAG Table A1.3.9)

	Petrol	Diesel	Electric
2010	59.27%	40.73%	0.00%
2011	57.01%	42.96%	0.03%
2026	44.42%	52.48%	3.10%
2041 (No change assumed post 2035)	44.46%	50.23%	5.31%

2026 (in 2010 prices)									
07:00	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**	
27	21	24	25	25	25	25	26	26	Average speed
6.94	7.76	7.30	7.17	7.17	7.17	7.17	7.05	7.05	Average trip fuel cost (pence/km)

2041 (in 2010 prices)									
07:00	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**	
26	17	22	24	25	25	25	25	25	Average speed
6.92	8.39	7.44	7.16	7.03	7.03	7.03	7.03	7.03	Average trip fuel cost (pence/km)

2026 (assuming inflation to 2026)									STILL UNCLEAR ON WHETHER SHOULD BE APPLYING INFLATION AT THIS POINT
07:00	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**	
27	21	24	25	25	25	25	26	26	Average speed
9.31	10.41	9.80	9.62	9.62	9.62	9.62	9.46	9.46	Average trip fuel cost (pence/km)

2041 (assuming inflation to 2041)									
07:00	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**	
26	17	22	24	25	25	25	25	25	Average speed
13.06	15.84	14.03	13.51	13.27	13.27	13.27	13.27	13.27	Average trip fuel cost (pence/km)

Is this information used elsewhere? If so, need to discount to 2010.

Model Inputs 2026

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	
Car Traffic Flow Past Site (2014 growthed to 2026)	293	1057	1344	1072	1001	1060	1119	1111	1148	See Forecast Year sheet Assumed that Kilmardinny residents would walk or cycle to new station. And would not be abstracted from Road => will not add to base flows for abstraction
% of Traffic with Free Car Parking	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	Assumption unchanged from previous assessment.
% of Traffic heading towards City Centre	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	See Data Sources Sheet
% of Traffic not travelling to the City Centre	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Car Occupancy (2026)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mode Choice Sensitivity Parameter (Lambda)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	Assumption unchanged from Robroyston assessment.
Value of time (pence / min / occupant, 2026 prices)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

Scheme Assumptions

Car Journey Time (mins) 2026 (A81 by Station Access to George S	26.04	33.58	29.96	28.31	28.05	28.05	28.05	27.67	27.80	See Forecast Year sheet
Fuel cost (pence/km, 2026 prices)	9.31	10.41	9.80	9.62	9.62	9.62	9.62	9.46	9.46	See Fuel Cost (pencekm) sheet
Distance (km) A81 by Station to George Sq	11.90	11.90	11.90	11.90	11.90	11.90	11.90	11.90	11.90	See Forecast Year sheet
Parking Cost (pence, 2026 prices)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	See Data Sources sheet. If rail return ticket cost is split across two legs, parking cost should be too.

New Rail Halt Assumptions - Optimistic (Higher range)

Transfer Time (mins)	4	4	4	4	4	4	4	4	4	**PDFH notes that 'Valuations of walk and wait time are conventionally expressed in equivalent units of in-vehicle time. The convention has been to value walk and wait time at twice the rate of in-vehicle time.**
Rail Fare (2026 prices)	0	0	Cost	0	0	0	0	0	0	See Data Sources Spreadhseet
Access Time (mins)	3	3	3	3	3	3	3	3	3	Confirmed by SPT 2016
Rail Travel Time (mins)	21	21	21	21	21	21	21	21	21	Assumption based two trains per hour, and waiting time equal to half headway between trains. Had uggested assumption of 4tph, but SPT challenged this and 2tph is in agreement with Aecom and ORS reports.
Rail Wait Time (mins)	15	15	15	15	15	15	15	15	15	Again doubled given that value of walk time double that of drive time, per PDFH.
Egress Time (mins)	10	10	10	10	10	10	10	10	10	Assumption unchanged from previous assessment. The constant for rail is = 30 / 1.2.
Mode Constant (mins)	25	25	25	25	25	25	25	25	25	

New Rail Halt Assumptions - Pessimistic (Lower range)

Transfer Time (mins)	4	4	4	4	4	4	4	4	4	See Data Sources Spreadhseet
Rail Fare	0	0	Cost	0	0	0	0	0	0	See Data Sources Spreadhseet
Access Time (mins)	3	3	3	3	3	3	3	3	3	See Data Sources Spreadhseet
Rail Travel Time (mins)	21	21	21	21	21	21	21	21	21	Confirmed by SPT 2016
Rail Wait Time (mins)	15	15	15	15	15	15	15	15	15	Assumption based on half headway between trains.
Egress Time (mins)	10	10	10	10	10	10	10	10	10	Assumption unchanged from previous assessment. Time to travel from station to final destination.
Mode Constant (mins)	30	30	30	30	30	30	30	30	30	As per pessimistic case for Robroyston

Annualisation Factor 312

Model Inputs 2041

	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	
Car Traffic Flow Past Site (2014 growthed to 2041)	303	1092	1389	1108	1035	1096	1156	1148	1186	See Forecast Year sheet Assumed that Kilmardinny residents would walk or cycle to new station. And would not be abstracted from Road => will not add to base flows for abstraction
% of Traffic with Free Car Parking	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	Assumption unchanged from previous assessment.
% of Traffic heading towards City Centre	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	See Data Sources Sheet
% of Traffic not travelling to the City Centre	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Car Occupancy (2041)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mode Choice Sensitivity Parameter (Lambda)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	Assumption unchanged from Robroyston assessment.
Value of time (pence / min / occupant, 2010 prices)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Scheme Assumptions										
Car Journey Time (mins) 2041 (A81 by Station Access to George Sq	27.92	40.95	32.13	29.17	28.90	28.90	28.90	28.51	28.64	See Forecast Year sheet
Fuel cost (pence/km, 2041 prices)	13.06	15.84	14.03	13.51	13.27	13.27	13.27	13.27	13.27	See Fuel Cost (pencekm) sheet
Distance (km) A81 by Station to George Sq	11.90	11.90	11.90	11.90	11.90	11.90	11.90	11.90	11.90	See Forecast Year sheet
Parking Cost (pence, 2026 prices)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	See Data Sources sheet. If rail return ticket cost is split across two legs, parking cost should be too.
New Rail Halt Assumptions - Optimistic (Higher range)										
Transfer Time (mins)	4	4	4	4	4	4	4	4	4	**PDFH notes that 'Valuations of walk and wait time are conventionally expressed in equivalent units of in-vehicle time. The convention has been to value walk and wait time at twice the rate of in-vehicle time.**
Rail Fare	NCP	-35.00	670.38	1160.75	1704.88	1972.97	2220.04	2493.06	2286.15	See Data Sources Spreadhseet
Access Time (mins)	3	3	3	3	3	3	3	3	3	Confirmed by SPT 2016
Rail Travel Time (mins)	21	21	21	21	21	21	21	21	21	Assumption based two trains per hour, and waiting time equal to half headway between trains. Had uggested assumption
Rail Wait Time (mins)	15	15	15	15	15	15	15	15	15	of 4tph, but SPT challenged this and 2tph is in agreement with Aecom and ORS reports.
Egress Time (mins)	10	10	10	10	10	10	10	10	10	Again doubled given that value of walk time double that of drive time, per PDFH.
Mode Constant (mins)	25	25	25	25	25	25	25	25	25	Assumption unchanged from previous assessment. The constant for rail is = 30 / 1.2.
New Rail Halt Assumptions - Pessimistic (Lower range)										
Transfer Time (mins)	4	4	4	4	4	4	4	4	4	See Data Sources Spreadhseet
Rail Fare	NCP	-35.00	670.38	1160.75	1704.88	1972.97	2220.04	2493.06	2286.15	See Data Sources Spreadhseet
Access Time (mins)	3	3	3	3	3	3	3	3	3	See Data Sources Spreadhseet
Rail Travel Time (mins)	21	21	21	21	21	21	21	21	21	Confirmed by SPT 2016
Rail Wait Time (mins)	15	15	15	15	15	15	15	15	15	Assumption based on half headway between trains.
Egress Time (mins)	10	10	10	10	10	10	10	10	10	Assumption unchanged from previous assessment. Time to travel from station to final destination.
Mode Constant (mins)	30	30	30	30	30	30	30	30	30	As per pessimistic case for Robroyston

Annualisation Factor 312

Delay and Value of Time - New Station at Allander

Northbound services
Two minutes will be added to all existing northbound journeys to Milngavie => all existing exits at Milngavie.

Data below taken from ORR 2014-15 Estimates of Station Usage

Exits_Season	Exits_Full	Exits_Reduced	Exits_Total
151,261	131,702	216,214	499,177

Entries and Exits at Milngavie the same

Profile of Trips to Origin Zone/Milngavie

	Season	Full	Reduced	Annual Total	Daily Total
AM Peak	37,815	26,340	21,621	85,777	275
Inter Peak	7,563	26,340	64,864	98,768	317
PM Peak	98,320	72,436	108,107	278,863	894
Other	7,563	6,585	21,621	35,770	115
	151,261	131,702	216,214	499,177	1,600

	No. Services Arrivin	No. Passengers per Service
AM Peak (6am-9am)	8	34.37
Interpeak (10am to 4pm)	24	13.19
PM Peak (4pm to 6pm)	8	111.72
Evening (6pm or Midnight)	16	7.17
	56	

Southbound Services
Two minutes will be added to all existing southbound journeys prior to Allander => all existing entrances at Milngavie.

Data below taken from ORR 2014-15 Estimates of Station Usage

#REF!	#REF!	#REF!	#REF!
151,261	131,702	216,214	499,177

Profile of Trips to Glasgow

	Season	Full	Reduced	Annual Total	Daily Total
AM Peak	105,883	65,851	249,589	421,322	1,350
Inter Peak	15,126	32,926	149,753	197,805	634
PM Peak	22,689	26,340	99,835	148,865	477
Other	7,563	6,585	-	14,148	45
	151,261	131,702	499,177	782,140	2,507

	No. Services Arrivin	No. Passengers per Service
AM Peak (6am-9am)	10	135.04
Interpeak (10am to 4pm)	24	26.42
PM Peak (4pm to 6pm)	8	59.64
Evening (6pm or Midnight)	13	3.49
	55	

Profile of Trips to Origin Zone

	Season	Full	Reduced
AM Peak	25%	20%	10%
Inter Peak	5%	20%	30%
PM Peak	65%	55%	50%
Other	5%	5%	10%
	100%	100%	100%

Source: Scotland Route Utilisation Strategy - Working Paper Baseline

Profile for trips to Glasgow from Glasgow Urban Conurbation

	Season	Full	Reduced
AM Peak	70%	50%	50%
Inter Peak	10%	25%	30%
PM Peak	15%	20%	20%
Other	5%	5%	0%
	100%	100%	100%

Source: Scotland Route Utilisation Strategy - Working Paper Baseline

Table A3 Peak Profiles*

	Season	Full	Reduced	NSPPG tickets	Other
Origin Zones					
AM Peak	**25%**	**20%**	**10%**	**10%**	**10%**
Inter Peak	**5%**	**20%**	**30%**	**30%**	**30%**
PM Peak	65%	55%	50%	50%	50%
Other	5%	5%	10%	10%	10%
Total	100%	100%	100%	100%	100%
Mixed					
AM Peak	**50%**	**45%**	**30%**	**30%**	**30%**
Inter Peak	**5%**	**20%**	**30%**	**30%**	**30%**
PM Peak	40%	30%	30%	30%	30%
Other	5%	5%	10%	10%	10%
Total	100%	100%	100%	100%	100%
Destination Zones					
AM Peak	**60%**	**30%**	**40%**	**30%**	**30%**
Inter Peak	**40%**	**55%**	**35%**	**30%**	**30%**
PM Peak	0%	15%	25%	30%	30%
Other	0%	0%	0%	10%	10%
Total	100%	100%	100%	100%	100%
Profile for trips to Glasgow from selected SPT sectors					
AM Peak	**70%**	**50%**	**50%**	30%	30%
Inter Peak	**10%**	**25%**	**30%**	30%	30%
PM Peak	15%	20%	20%	30%	30%
Other	5%	5%	0%	10%	10%
Total	100%	100%	100%	100%	100%
Profile for trips to Edinburgh from selected suburban Edinburgh sectors					
AM Peak	**80%**	**30%**	**40%**	30%	30%
Inter Peak	**20%**	**40%**	**25%**	30%	30%
PM Peak	0%	20%	20%	30%	30%
Other	0%	10%	15%	10%	10%
Total	100%	100%	100%	100%	100%

APPENDIX E-3

RAIL OPERATION AND CONSTRUCTION COSTS

DATA FROM PREVIOUS PROJECTS TO INFORM OPERATING COSTS

Data for a previously constructed 250 space Park & Ride car park

Operating Requirements	Estimated Cost (2012)
Premises Repairs	3000
Shelter Maintenance, Cleaning, Repair, etc.	2400
Park Mark Accreditation	150
Waste Disposal	500
Mechanical/Electrical	2100
Gully Cleaning, etc.	1000
Pest Control	100
Car Parking Equipment	6000
TOTAL – UPKEEP & MAINTENANCE	£15,250
Electricity	4800
TOTAL – ELECTRICITY	4800
Cleaning Materials	2984
Insurance	500
Winter Maintenance	4000
Ticket Printing & Promotion	1000
Landscaping	1400
TOTAL – INSURANCE, TICKETING & OTHER	9884
CCTV & Security Equipment	705
TOTAL – CCTV & SECURIT	705
Business Rates	8058
TOTAL – BUSINESS RATES	8058
Total Site Operating Cost- Per Site	£38,697

Above is based on 250 space car park used for models in Sheffield and Doncaster

Allander 150 space Park & Ride car park (Used in 2012)

Operating Requirements	Estimated Cost	Factor Up (pro rata)	
Premises Repairs	1800	0.6	
Shelter Maintenance, Cleaning, Repair, etc.	1440	0.6	
Park Mark Accreditation	150	1	http://www.britishparking.co.uk/write/Documents/safer%20parking/29(
Waste Disposal	500	1	
Mechanical/Electrical	1260	0.6	
Gully Cleaning, etc.	600	0.6	
Pest Control	100	1	
Car Parking Equipment	3600	0.6	
TOTAL – UPKEEP & MAINTENANCE	£9,450		
Electricity	2880	0.6	
TOTAL – ELECTRICITY	2880		
Cleaning Materials	1790.4	0.6	
Insurance	500	1	
Winter Maintenance	2400	0.6	
Ticket Printing & Promotion	600	0.6	
Landscaping	3500	2.5	Given enhanced landscaping proposed
TOTAL – INSURANCE, TICKETING & OTHER	8790.4		
CCTV & Security Equipment	705	1	
TOTAL – CCTV & SECURIT	705		
Business Rates	4834.8	0.6	
TOTAL – BUSINESS RATES	4834.8		
Total Site Operating Cost- Per Site	£26,660		

The figures were factored to 150 to take account of the smaller no. spaces at the Allander P&R.
Not all the figures were doubled as this would not be representative of the costs involved in the day to day operation of the facility

Rail Operating Requirements	Quantity	Estimated Cost	Source
Station Operating Costs			
Long Term Charge	1	£60,000 - £35,500	(MVA, 2009) - (SDG, 2011)
Ticket Machine Lease	2	£4,000	Northern Rail (2011)
Utility Costs		£8,000 - £1,616	(MVA, 2009) - (SDG, 2011)
CCTV Maintenance per new station	1	£3,230	(SDG, 2011)
Cleaning and Maintenance Costs		£65,000 - £50,000	(MVA, 2009) - (SDG, 2011)
Insurance	1	£445	(SDG, 2011)
Additional Unit Costs			
Leasing of additional 4 car electrical multiple unit	1	£425,000	NorthernRail (2011)
Insurance for additional unit	1	£2,000	Northern Rail (2011)
Cleaning for additional unit	1	£10,416	Northern Rail (2009)
Extra Capital Costs (EGIP)			
Signalling changes		£100,000	Angus Robertson Network Rail
IECC screen chasnge costs		£25,000 - £30,000	Angus Robertson Network Rail
EGIP portals		£75,000	Angus Robertson Network Rail

WYPTE - Revenue and Costs Summary (SDG, 2011)
A New Station at North Pole Road (MVA, 2009)

Blackford Railway Station Re-opening (Aecom, 2010)
Station operating costs assumed £60,000

Rail Operating Costs	Robroyston	Estimated Cost	Relative to Robroyston Estimate	
Long Term Charge	£35,500	£35,500	As per Robroyston	
Ticket Machine Lease	£4,000	£2,000	50%	Assume half no. ticket machines since only one platform
Utility Costs	£2,000	£1,500	75%	Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
CCTV Maintenance per new station	£3,230	£1,615	75%	Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
Cleaning and Maintenance Costs	£50,000	£37,500	75%	Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
Insurance	£500	£500	As per Robroyston	
Total	£95,230	£78,615		

CONSTRUCTION COSTS

Car Parks, Turning Areas & Access Carriageway

Received from Neil Sturrock (SPT) via email dated 18/08/15

Item	Robroyston 2015	Allander 2015	Relative to Robroyston	
Site Clearance	137,782	41,335	30%	150 spaces proposed at Allander, whereas we were looking at 500 at Robroyston
Groundworks Contractor Mobilisation & Testing	32,500	9,750	30%	
Earthworks	226,951	68,085	30%	
DDSM	405,060	121,518	30%	

DATA FROM PREVIOUS PROJECTS TO INFORM OPERATING COSTS

WRW 250 space Park & Ride car park

Operating Requirements	Estimated Cost (2012)
Premises Repairs	3000
Shelter Maintenance, Cleaning, Repair, etc.	2400
Park Mark Accreditation	150
Waste Disposal	500
Mechanical/Electrical	2100
Gully Cleaning, etc.	1000
Pest Control	100
Car Parking Equipment	6000
TOTAL – UPKEEP & MAINTENANCE	£15,250
Electricity	4800
TOTAL – ELECTRICITY	4800
Cleaning Materials	2984
Insurance	500
Winter Maintenance	4000
Ticket Printing & Promotion	1000
Landscaping	1400
TOTAL – INSURANCE, TICKETING & OTHER	9884
CCTV & Security Equipment	705
TOTAL – CCTV & SECURIT	705
Business Rates	8058
TOTAL – BUSINESS RATES	8058
Total Site Operating Cost- Per Site	£38,697

Above is based on 250 space car park used for models in Sheffield and Doncaster

Allander 500 space Park & Ride car park (Used in 2012)

Operating Requirements	Estimated Cost	Factor Up (pro rata)
Premises Repairs	6600	2.2
Shelter Maintenance, Cleaning, Repair, etc.	5280	2.2
Park Mark Accreditation	330	2.2 http://www.britishparking.co.uk/write/Documents/safer%20parking/29
Waste Disposal	1100	2.2
Mechanical/Electrical	4620	2.2
Gully Cleaning, etc.	2200	2.2
Pest Control	220	2.2
Car Parking Equipment	13200	2.2
TOTAL – UPKEEP & MAINTENANCE	£33,550	
Electricity	10560	2.2
TOTAL – ELECTRICITY	10560	
Cleaning Materials	6564.8	2.2
Insurance	1100	2.2
Winter Maintenance	8800	2.2
Ticket Printing & Promotion	2200	2.2
Landscaping	3080	2.2
TOTAL – INSURANCE, TICKETING & OTHER	21744.8	
CCTV & Security Equipment	1551	2.2
TOTAL – CCTV & SECURIT	1551	
Business Rates	17727.6	2.2
TOTAL – BUSINESS RATES	17727.6	
Total Site Operating Cost- Per Site	£85,133	

The figures were factored to 150 to take account of the smaller no. spaces at the Allander P&R.
Not all the figures were doubled as this would not be representative of the costs involved in the day to day operation of the facility

Rail Operating Requirements	Quantity	Estimated Cost	Source
Station Operating Costs			
Long Term Charge	1	£60,000 - £35,500	(MVA, 2009) - (SDG, 2011)
Ticket Machine Lease	2	£4,000	Northern Rail (2011)
Utility Costs		£8,000 - £1,616	(MVA, 2009) - (SDG, 2011)
CCTV Maintenance per new station	1	£3,230	(SDG, 2011)
Cleaning and Maintenance Costs		£65,000 - £50,000	(MVA, 2009) - (SDG, 2011)
Insurance	1	£445	(SDG, 2011)
Additional Unit Costs			
Leasing of additional 4 car electrical multiple unit	1	£425,000	NorthernRail (2011)
Insurance for additional unit	1	£2,000	Northern Rail (2011)
Cleaning for additional unit	1	£10,416	Northern Rail (2009)
Extra Capital Costs (EGIP)			
Signalling changes		£100,000	Angus Robertson Network Rail
IECC screen chasnge costs		£25,000 - £30,000	Angus Robertson Network Rail
EGIP portals		£75,000	Angus Robertson Network Rail

WYPTE - Revenue and Costs Summary (SDG, 2011)
A New Station at North Pole Road (MVA, 2009)

Blackford Railway Station Re-opening (Aecom, 2010)
Station operating costs assumed £60,000

Rail Operating Costs	Robroyston	Estimated Cost	Relative to Robroyston Estimate
Long Term Charge	£35,500	£35,500	As per Robroyston
Ticket Machine Lease	£4,000	£2,000	50%
Utility Costs	£2,000	£1,500	75%
CCTV Maintenance per new station	£3,230	£1,615	75%
Cleaning and Maintenance Costs	£50,000	£37,500	75%
Insurance	£500	£500	As per Robroyston
Total	£95,230	£78,615	

Assume half no. ticket machines since only one platform
Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
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CONSTRUCTION COSTS

Car Parks, Turning Areas & Access Carriageway

Received from Neil Sturrock (SPT) via email dated 18/08/15

Item	Robroyston 2015	Allander 2015	Relative to Robroyston
Site Clearance	137,782	151,560	110%
Groundworks Contractor Mobilisation & Testing	32,500	35,750	110%
Earthworks	226,951	249,646	110%
DDSM	405,060	445,566	110%

500 spaces proposed at Robroyston

DATA FROM PREVIOUS PROJECTS TO INFORM OPERATING COSTS

WRW 250 space Park & Ride car park

Operating Requirements	Estimated Cost (2012)
Premises Repairs	3000
Shelter Maintenance, Cleaning, Repair, etc.	2400
Park Mark Accreditation	150
Waste Disposal	500
Mechanical/Electrical	2100
Gully Cleaning, etc.	1000
Pest Control	100
Car Parking Equipment	6000
TOTAL – UPKEEP & MAINTENANCE	£15,250
Electricity	4800
TOTAL – ELECTRICITY	4800
Cleaning Materials	2984
Insurance	500
Winter Maintenance	4000
Ticket Printing & Promotion	1000
Landscaping	1400
TOTAL – INSURANCE, TICKETING & OTHER	9884
CCTV & Security Equipment	705
TOTAL – CCTV & SECURIT	705
Business Rates	8058
TOTAL – BUSINESS RATES	8058
Total Site Operating Cost- Per Site	£38,697

Above is based on 250 space car park used for models in Sheffield and Doncaster

Allander 500 space Park & Ride car park (Used in 2012)

Operating Requirements	Estimated Cost	Factor Up (pro rata)
Premises Repairs	6600	2.2
Shelter Maintenance, Cleaning, Repair, etc.	5280	2.2
Park Mark Accreditation	330	2.2 http://www.britishparking.co.uk/write/Documents/safer%20parking/29
Waste Disposal	1100	2.2
Mechanical/Electrical	4620	2.2
Gully Cleaning, etc.	2200	2.2
Pest Control	220	2.2
Car Parking Equipment	13200	2.2
TOTAL – UPKEEP & MAINTENANCE	£33,550	
Electricity	10560	2.2
TOTAL – ELECTRICITY	10560	
Cleaning Materials	6564.8	2.2
Insurance	1100	2.2
Winter Maintenance	8800	2.2
Ticket Printing & Promotion	2200	2.2
Landscaping	3080	2.2
TOTAL – INSURANCE, TICKETING & OTHER	21744.8	
CCTV & Security Equipment	1551	2.2
TOTAL – CCTV & SECURIT	1551	
Business Rates	17727.6	2.2
TOTAL – BUSINESS RATES	17727.6	
Total Site Operating Cost- Per Site	£85,133	

The figures were factored to 150 to take account of the smaller no. spaces at the Allander P&R.
Not all the figures were doubled as this would not be representative of the costs involved in the day to day operation of the facility

Rail Operating Requirements	Quantity	Estimated Cost	Source
Station Operating Costs			
Long Term Charge	1	£60,000 - £35,500	(MVA, 2009) - (SDG, 2011)
Ticket Machine Lease	2	£4,000	Northern Rail (2011)
Utility Costs		£8,000 - £1,616	(MVA, 2009) - (SDG, 2011)
CCTV Maintenance per new station	1	£3,230	(SDG, 2011)
Cleaning and Maintenance Costs		£65,000 - £50,000	(MVA, 2009) - (SDG, 2011)
Insurance	1	£445	(SDG, 2011)
Additional Unit Costs			
Leasing of additional 4 car electrical multiple unit	1	£425,000	NorthernRail (2011)
Insurance for additional unit	1	£2,000	Northern Rail (2011)
Cleaning for additional unit	1	£10,416	Northern Rail (2009)
Extra Capital Costs (EGIP)			
Signalling changes		£100,000	Angus Robertson Network Rail
IECC screen chasnge costs		£25,000 - £30,000	Angus Robertson Network Rail
EGIP portals		£75,000	Angus Robertson Network Rail

WYPTE - Revenue and Costs Summary (SDG, 2011)
A New Station at North Pole Road (MVA, 2009)

Blackford Railway Station Re-opening (Aecom, 2010)
Station operating costs assumed £60,000

Rail Operating Costs	Robroyston	Estimated Cost	Relative to Robroyston Estimate
Long Term Charge	£35,500	£35,500	As per Robroyston
Ticket Machine Lease	£4,000	£2,000	50%
Utility Costs	£2,000	£1,500	75%
CCTV Maintenance per new station	£3,230	£1,615	75%
Cleaning and Maintenance Costs	£50,000	£37,500	75%
Insurance	£500	£500	As per Robroyston
Total	£95,230	£78,615	

Assume half no. ticket machines since only one platform
Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway
Assume 75% of maintenance costs since stations tend to have greater provision on one platform anyway

CONSTRUCTION COSTS

Car Parks, Turning Areas & Access Carriageway

Received from Neil Sturrock (SPT) via email dated 18/08/15

Item	Robroyston 2015	Allander 2015	Relative to Robroyston
Site Clearance	137,782	151,560	110%
Groundworks Contractor Mobilisation & Testing	32,500	35,750	110%
Earthworks	226,951	249,646	110%
DDSM	405,060	445,566	110%

500 spaces proposed at Robroyston

APPENDIX E-4
BENEFIT TO COST RATIO SUMMARY TABLES

BCR - Single Platform

Optimistic - 150 Spaces

BCR Calculation		2010 Prices and values
Carbon	£	162,400
Time - Non users (Decongestion Benefits)	£	21,936,762
VOC Costs - New users	£	2,444,766
Accident Benefits	£	2,308,823
Revenue	£	7,794,812
Total Benefits	**£**	**34,647,564**

Time - Existing users (wider disbenefit)	£	28,007,783
Local funding	£	-
Capital Costs	£	6,036,970
Developer Contribution	£	-
Operating costs	£	1,588,578
Indirect Tax Cost	£	914,432
Total Costs	**£**	**36,547,762**

Core BCR **0.95**

Optimistic - 550 Spaces

BCR Calculation		2010 Prices and values
Carbon	£	603,518
Time - Non users	£	27,525,158
VOC Costs - New users	£	8,731,666
Accident Benefits	£	8,309,423
Additional Revenue	£	18,636,287
Total Benefits	**£**	**63,806,052**

Time - Existing users (wider disbenefit)	£	28,007,783
Local funding	£	-
Capital Costs	£	8,050,760
Developer Contribution	£	-
Operating costs	£	2,470,924
Indirect Tax Cost	£	3,201,476
Total Costs	**£**	**41,730,942**

Core BCR **1.53**

Pessimistic - 150 Spaces

BCR Calculation		2010 prices and values
Carbon	£	165,035
Time - Non users	£	8,128,725
VOC Costs - New users	£	2,419,544
Accident Benefits	£	2,308,274
Revenue	£	8,005,927
Total Benefits	**£**	**21,027,507**

Time - Existing users (wider disbenefit)	£	28,007,783
Local funding	£	-
Capital Costs	£	6,036,970
Developer Contribution	£	-
Operating costs	£	1,588,578
Indirect Tax Cost	£	907,866
Total Costs	**£**	**36,541,196**

Core BCR **0.58**

Pessimistic - 550 Spaces

BCR Calculation		2010 Prices and values
Carbon	£	282,147
Time - Non users	£	13,226,803
VOC Costs - New users	£	4,337,321
Accident Benefits	£	3,880,358
Additional Revenue	£	10,250,707
Total Benefits	**£**	**31,977,336**

Time - Existing users (wider disbenefit)	£	28,007,783
Local funding	£	-
Capital Costs	£	8,050,760
Developer Contribution	£	-
Operating costs	£	2,470,924
Indirect Tax Cost	£	1,616,669
Total Costs	**£**	**40,146,135**

Core BCR **0.80**

Average - 150 Spaces

BCR Calculation		2010 prices and values
Carbon	£	164,057
Time - Non users	£	15,032,744
VOC Costs - New users	£	2,432,155
Accident Benefits	£	2,308,549
Revenue	£	7,900,370
Total Benefits	**£**	**27,837,874**

Time - Existing users (wider disbenefit)	£	28,007,783
Local funding	£	-
Capital Costs	£	6,036,970
Developer Contribution	£	-
Operating costs	£	1,588,578
Indirect Tax Cost	£	911,149
Total Costs	**£**	**36,544,479**

Core BCR **0.76**

Average - 550 Spaces

BCR Calculation		2010 Prices and values
Carbon	£	442,833
Time - Non users	£	20,448,395
VOC Costs - New users	£	6,534,494
Accident Benefits	£	6,094,891
Additional Revenue	£	14,443,497
Total Benefits	**£**	**47,964,109**

Time - Existing users (wider disbenefit)	£	28,007,783
Local funding	£	-
Capital Costs	£	8,050,760
Developer Contribution	£	-
Operating costs	£	2,470,924
Indirect Tax Cost	£	2,409,072
Total Costs	**£**	**40,938,538**

Core BCR **1.17**

DfT - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/255126/value-for-money-external.pdf

How should a Value for Money assessment by undertaken?

The initial Value for Money category is identified based upon the Benefit Cost Ratio (BCR) of the scheme, using monetised impacts in line with WebTAG guidance. These categories are

- poor VfM if the BCR is less than 1.0
- low VfM if the BCR is between 1.0 and 1.5
- medium VfM if the BCR is between 1.5 and 2.0
- high VfM if the BCR is between 2.0 and 4.0
- very high VfM if the BCR is greater than 4.0

BCRs - Double Platform

Optimistic - 150 Spaces

BCR Calculation	2010 Prices and values
Carbon	£ 162,400
Time - Non users (Decongestion Benefits)	£ 21,936,762
VOC Costs - New users	£ 2,444,766
Accident Benefits	£ 2,308,823
Revenue	£ 7,794,812
Total Benefits	**£ 34,647,564**

Time - Existing users (wider disbenefit)	£ 28,007,783
Local funding	£ -
Capital Costs	£ 32,882,172
Developer Contribution	£ -
Operating costs	£ 1,588,578
Indirect Tax Cost	£ 914,432
Total Costs	**£ 63,392,964**

Core BCR	**0.55**

Optimistic - 550 Spaces

BCR Calculation	2010 Prices and values
Carbon	£ 603,518
Time - Non users	£ 27,525,158
VOC Costs - New users	£ 8,731,666
Accident Benefits	£ 8,309,423
Additional Revenue	£ 18,636,287
Total Benefits	**£ 63,806,052**

Time - Existing users (wider disbenefit)	£ 28,007,783
Local funding	£ -
Capital Costs	£ 32,882,172
Developer Contribution	£ -
Operating costs	£ 2,470,924
Indirect Tax Cost	£ 3,201,476
Total Costs	**£ 66,562,354**

Core BCR	**0.96**

Pessimistic - 150 Spaces

BCR Calculation	2010 prices and values
Carbon	£ 165,035
Time - Non users	£ 8,128,725
VOC Costs - New users	£ 2,419,544
Accident Benefits	£ 2,308,274
Revenue	£ 8,005,927
Total Benefits	**£ 21,027,507**

Time - Existing users (wider disbenefit)	£ 28,007,783
Local funding	£ -
Capital Costs	£ 32,882,172
Developer Contribution	£ -
Operating costs	£ 1,588,578
Indirect Tax Cost	£ 907,866
Total Costs	**£ 63,386,398**

Core BCR	**0.33**

Pessimistic - 550 Spaces

BCR Calculation	2010 Prices and values
Carbon	£ 282,147
Time - Non users	£ 13,226,803
VOC Costs - New users	£ 4,337,321
Accident Benefits	£ 3,880,358
Additional Revenue	£ 10,250,707
Total Benefits	**£ 31,977,336**

Time - Existing users (wider disbenefit)	£ 28,007,783
Local funding	£ -
Capital Costs	£ 32,882,172
Developer Contribution	£ -
Operating costs	£ 2,470,924
Indirect Tax Cost	£ 1,616,669
Total Costs	**£ 64,977,547**

Core BCR	**0.49**

Average - 150 Spaces

BCR Calculation	2010 prices and values
Carbon	£ 164,057
Time - Non users	£ 15,032,744
VOC Costs - New users	£ 2,432,155
Accident Benefits	£ 2,308,549
Revenue	£ 7,900,370
Total Benefits	**£ 27,837,874**

Time - Existing users (wider disbenefit)	£ 28,007,783
Local funding	£ -
Capital Costs	£ 32,882,172
Developer Contribution	£ -
Operating costs	£ 1,588,578
Indirect Tax Cost	£ 911,149
Total Costs	**£ 63,389,681**

Core BCR	**0.44**

Average - 550 Spaces

BCR Calculation	2010 Prices and values
Carbon	£ 442,833
Time - Non users	£ 20,448,395
VOC Costs - New users	£ 6,534,494
Accident Benefits	£ 6,094,891
Additional Revenue	£ 14,443,497
Total Benefits	**£ 47,964,109**

Time - Existing users (wider disbenefit)	£ 28,007,783
Local funding	£ -
Capital Costs	£ 32,882,172
Developer Contribution	£ -
Operating costs	£ 2,470,924
Indirect Tax Cost	£ 2,409,072
Total Costs	**£ 65,769,951**

Core BCR	**0.73**

DfT - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/255126/value-for-money-external.pdf

How should a Value for Money assessment by undertaken?

The initial Value for Money category is identified based upon the Benefit Cost Ratio (BCR) of the scheme, using monetised impacts in line with WebTAG guidance. These categories are

- poor VfM if the BCR is less than 1.0
- low VfM if the BCR is between 1.0 and 1.5
- medium VfM if the BCR is between 1.5 and 2.0
- high VfM if the BCR is between 2.0 and 4.0
- very high VfM if the BCR is greater than 4.0

APPENDIX F
RAIL PASSENGER DEMAND MODELS (ELECTRONIC ONLY)