ATKINS

East Staffordshire Area Growth Options Study

DRAFT Initial Option Assessment Report

December 2008

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Notice

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1. Introduction

1.1 Atkins Transport Planning has been appointed by Staffordshire County Council (SCC) and East Staffordshire Borough Council (ESBC), as part of the 2003 Call on Commission, to carry out a technical study to understand the implications of proposed growth around Burton-upon-Trent (Burton) on the transportation network. This assessment follows ESBC's selection by the Government as one of the New Growth Points in the West Midlands Region.

Background

1.2 The basis for this assessment has been the original SATURN model developed to assess the feasibility of redeveloping the Drakelow Power Station site (to the south of Burton) and the proposed construction of a new link road from the A38 eastwards to the A511 in Swadlincote.

1.3 It was believed, however, that a refinement of the model was necessary in order to use the model for testing development proposals for the study area. This revised model would need to represent the movement of traffic around the town and in the northern parts of the network in more detail than is currently modelled.

1.4 The updated Burton Transport Model was required to be built with provisions to incorporate the emerging development sites identified from currently ongoing studies, namely, the Residential Land Capacity Study, the Employment Land Capacity Study and the Burton Area Action Plan, and incorporate necessary modifications to allow cross boundary development opportunities to be taken into account.

Purpose of the Burton Transport Model

1.5 The purpose of the Burton Transport Model (BTM) is to:

- **Represent** in more detail the local and other movements in the Burton Area. To increase confidence in the reliability of the model forecast by better representation of base year trip patterns and using a multi-modal approach;
- **Assess** the impact of additional traffic on the performance of highway and transportation networks due to proposed developments;
- **Provide Evidence Base** to support the selection of preferred options through Local Development framework process; and,
- **Develop, Test and Report** the effectiveness of transport strategies that will be put forward to achieve sustainable growth

Report Structure

1.6 This Initial Options Assessment Report summarises the development and the results of the initial option tests for the land use scenarios developed in conjunction with SCC and ESBC.

1.7 Sections contained in this report are as follows:

- Land Use Scenarios;
- Initial Option Assessment; and
- Summary.

Integration into Overall Study

1.8 The overview and scope of the East Staffordshire Area Growth Options Study is detailed in the Atkins report *"East Staffordshire Area Growth Options Study: Inception Report (May 2007)",* the **Inception Report,** which was the culmination of Phase I of the study.

1.9 The study has five key phases, being:

- Phase I Inception;
- Phase II Base Year Model Development;
- Phase III Forecast Model Development;
- Phase IV Initial Option Assessment; and
- Phase V Detailed Assessment.

1.10 This report completes Phase IV of the study which includes the following tasks:

- Task 13 Initial Option Assessment; and
- Task 14 Identification of Key Growth Issues

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2. Land Use Options

2.1 The development of the land use options for the East Staffordshire Growth Options Study has been detailed in the **Land Use Options Report**. This has been undertaken through consultation between SCC, ESBC and Atkins and has resulted in four Land Use Options being developed for further assessment within the model.

2.2 Within these options different levels of both housing and employment allocation has been identified and these are outlined below.

Housing

2.3 The housing allocations have been developed from various sources. These include:

- Burton Town Centre Area Action Plan;
- Housing Land Availability Assessment (HLAA);
- Windfall Sites – Specific site locations unspecified;
- Housing Option; and
- Potential Additional Housing to contribute towards meeting a higher Regional Housing Target that is expected to emerge from the partial review of the Regional Spatial Strategy.

2.4 Based on these data sources some four potential housing scenarios have been developed. A breakdown of the number of units contained within each of the housing options, to be provided between 2006 and 2026, is shown below in Table 2.1.

Table 2.1 – Breakdown of the Housing Options

	Option 1	Option 1 + Additional Housing	Option 2	Option 2 + Additional Housing
Burton Town Centre AAP	500	500	500	500
HLAA	952	952	952	952
Redeveloped industrial sites	2520	2520	2520	2520
Windfall Sites	4021	4021	4021	4021
Housing Option	5146	5146	5260	5260
Additional Housing	-	5120	-	4880
TOTAL	**13139**	**18259**	**13253**	**18133**

2.5 It is noted that the key difference between the options is:

- The exact locations of the sites and number of units for the housing option allocation differs slightly between Option 1 and 2, with a key change being the introduction of Lawns Farm in Option 1 and Option 1 + Additional Housing; and
- The introduction of Additional Housing sites located on the western side of Burton.

Employment

2.6 Two employment scenarios have been developed for this study, namely:

- Employment Option 1; and
- Employment Option 2.

2.7 The key difference between these scenarios is the introduction of the Lawns Farm Development located to the west side of the A38. This site will be a mixed use development incorporating some 1200 households and 55 hectares of employment equating to some 8,400 jobs.

2.8 It is noted that for the purpose of this assessment the land uses for these sites has been based on the following split:

- Office employment (B1) = 33%
- Industrial employment (B2) = 33%
- Warehouse employment (B8)= 33%

2.9 Full details of the methodology applied to convert these employment sites to jobs is outlined in the **Land Use Options Report**.

2.10 A summary of the two employment scenarios is provided in Table 2.2 below. These figures represent the growth in employment sites between 2006 to 2026.

Table 2.2 - Breakdown of the Employment Options

Option	Number of Employment Sites	Gross Site Area (Ha)	Gross Total Number of Jobs	Jobs lost due to housing re-development	Net Total Number of Jobs
Employment Option 1	37	252	30995	6555	24400
Employment Option 2	36	197	22578	6555	16023

Land Use Options

2.11 Table 2.3 shows how the various Housing and Employment scenarios are combined to produce the development test options to be assessed:

Table 2.3 - Development Test Scenario Contents

Land Use Option	Housing Option Included	Employment Option Included
Option 1	Housing Option 1	Employment Option 1
Option 1 + Additional Housing	Housing Option 1 + Additional Housing	Employment Option 1
Option 2	Housing Option 2	Employment Option 2
Option 2 + Additional Housing	Housing Option 2 + Additional Housing	Employment Option2
Option 3	Housing Option 2	Employment Option 1

2.12 Table 2.4 provides an overview comparing the five land use scenarios in terms of housing and job numbers between 2006 - 2016 and 2006 - 2026 and the locations of the sites are provided in Figures 2.1 to 2.4.

Table 2.4 – Land Use Scenarios to be tested in Burton Transport Model

Development Test Scenario	Housing Option	Employment Option	2006 - 2016		2006 - 2026	
			Total Households	Net Total Jobs	Total Households	Net Total Jobs
Option 1	Option1	Option 1	6501	11054	13139	24400
Option 1 + Additional Housing	Option 1 + Additional Housing	Option 1	6501	11054	18259	24400
Option 2	Option2	Option 2	6501	11054	13253	16023
Option 2 + Additional Housing	Option 2 + Additional Housing	Option 2	6501	11054	18133	16023
Option 3	Option 2	Option 1	6501	11054	13253	24400

2.13 It is noted that the assessment of the land use options has been undertaken at the 2026 forecast year only. Whilst the transport models have been developed for both 2016 and 2026, at 2016 all five options have the same overall allocation of housing and employment. As a result in order to evaluate the effects of the different options it is considered that the 2026 forecast year will provide the best basis for this assessment.

Figure 2.1 – Land Use Option 1

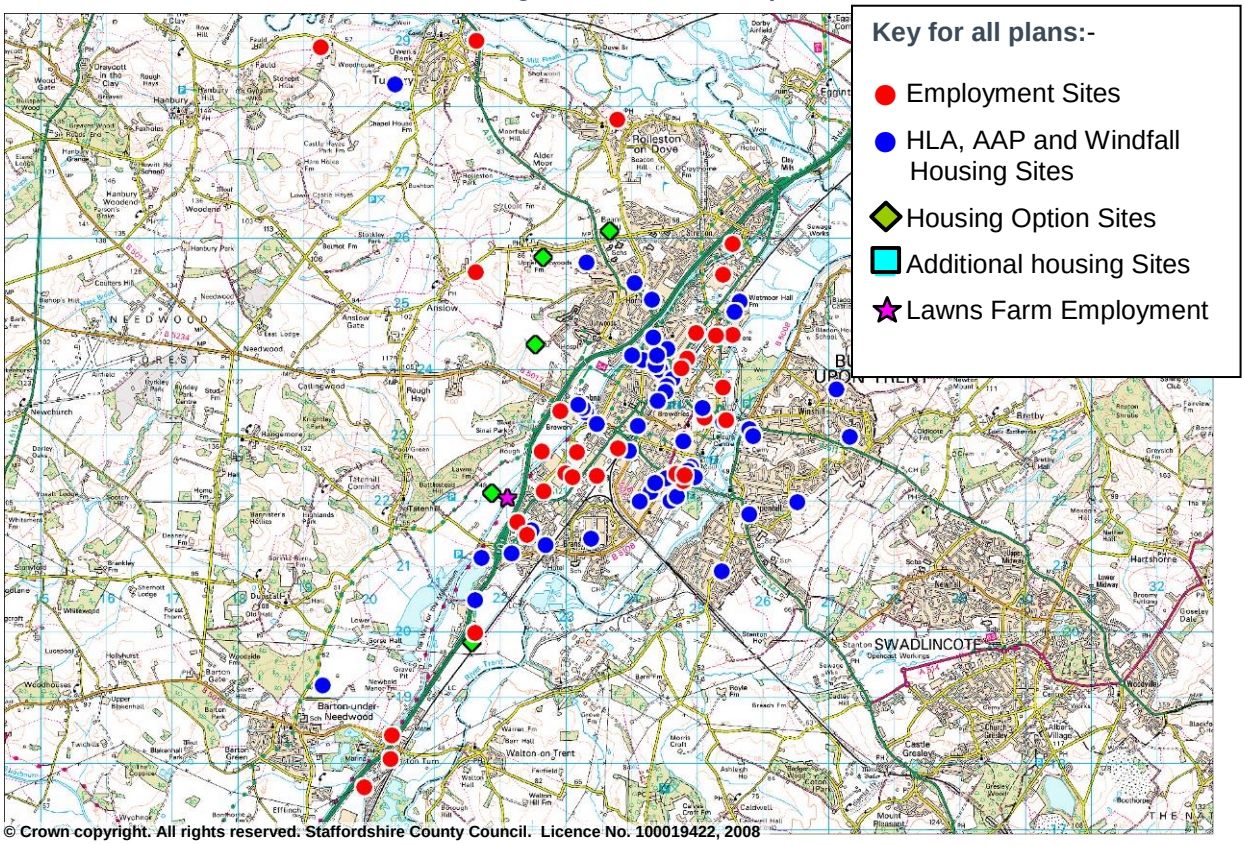


Figure 2.2 – Land Use Option 1 + Additional Housing

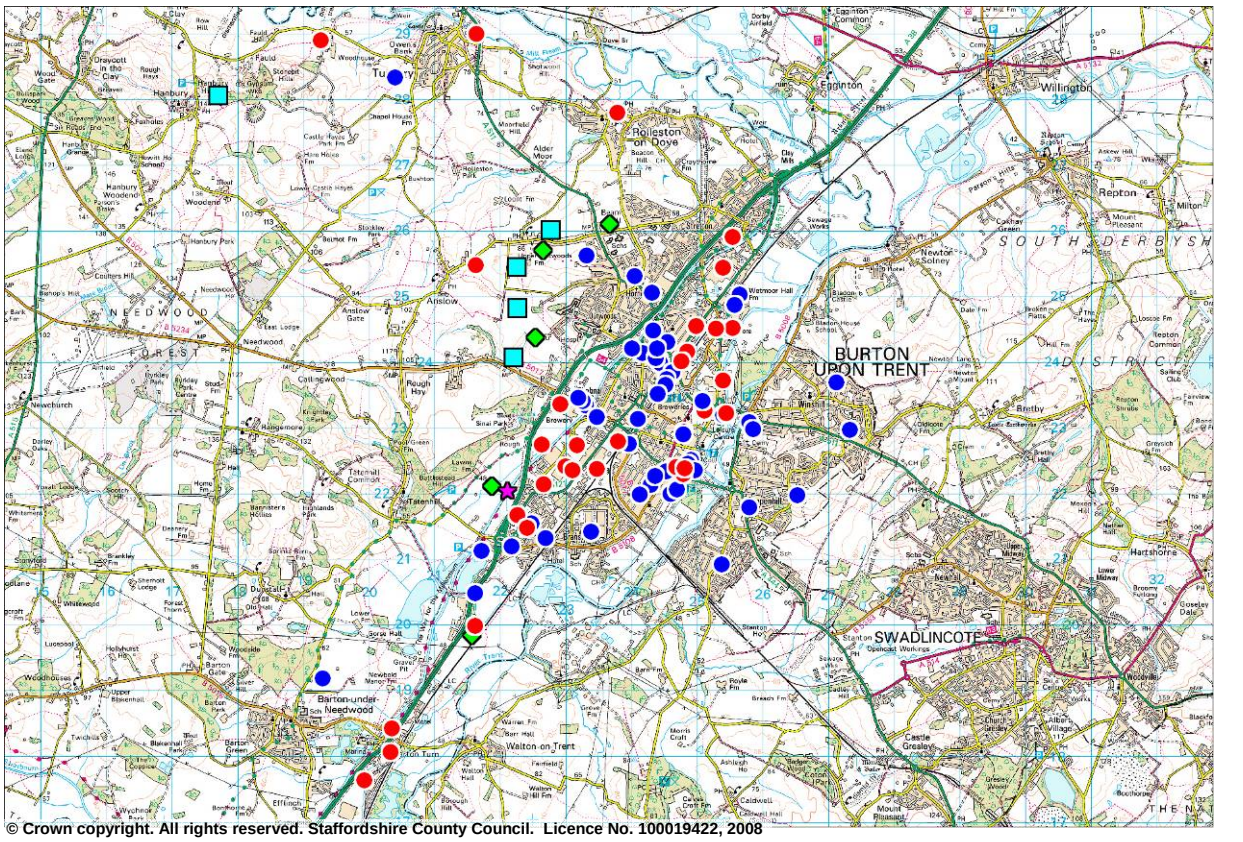


Figure 2.3 – Land Use Option 2

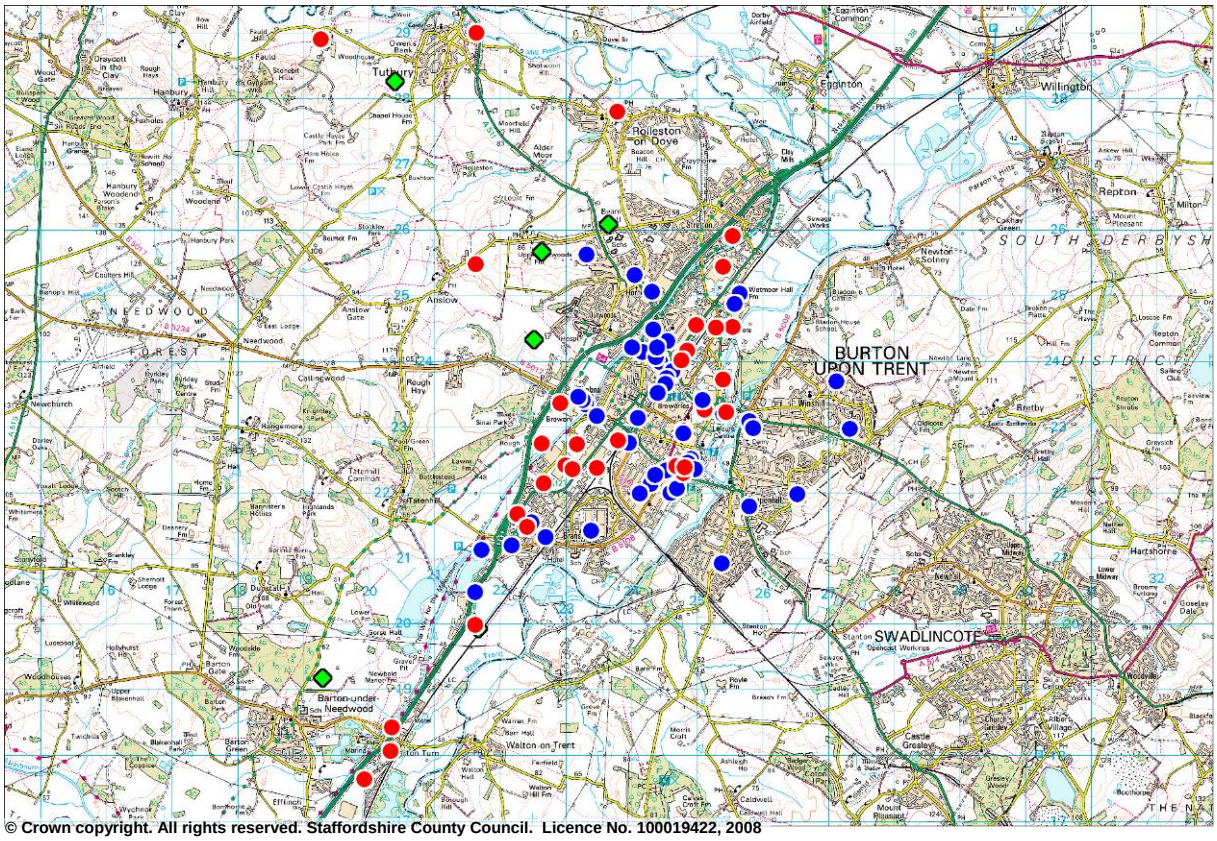


Figure 2.4 – Land Use Option 2 + Additional Housing

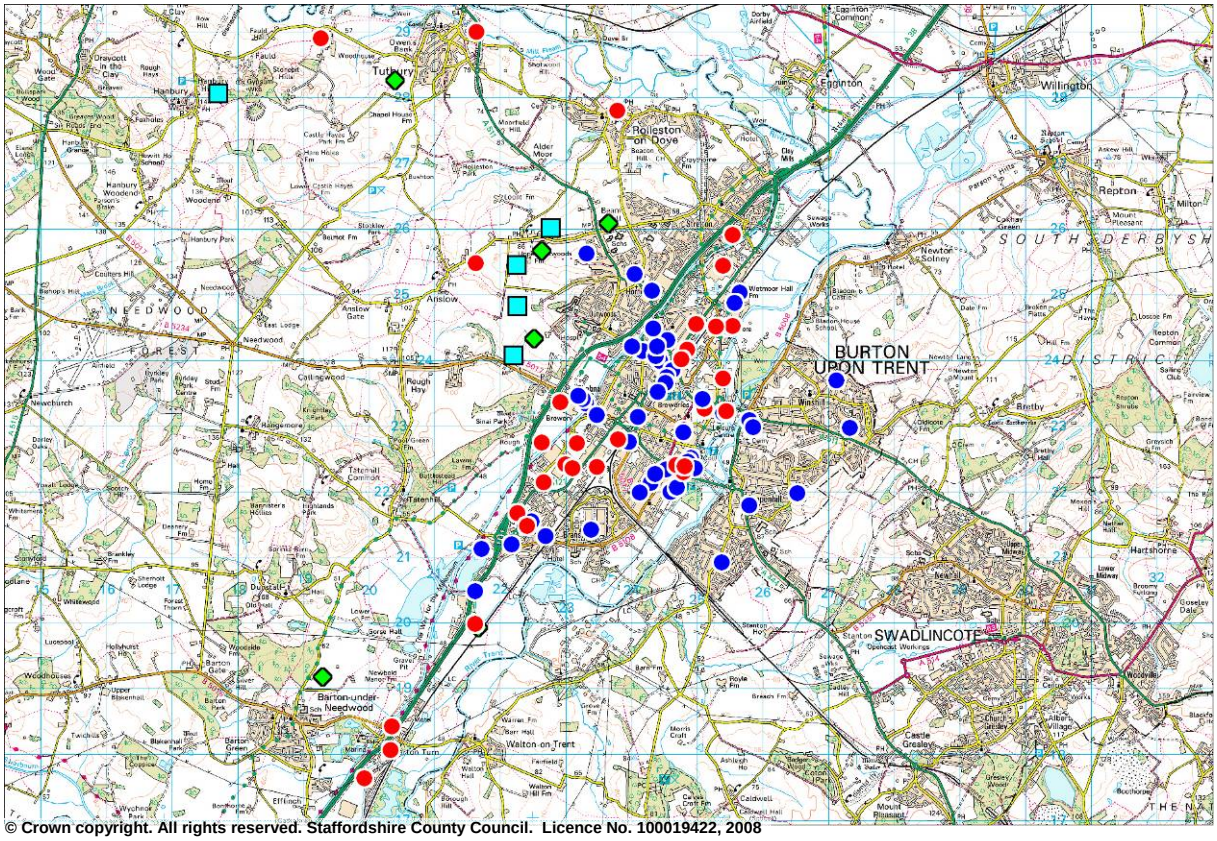
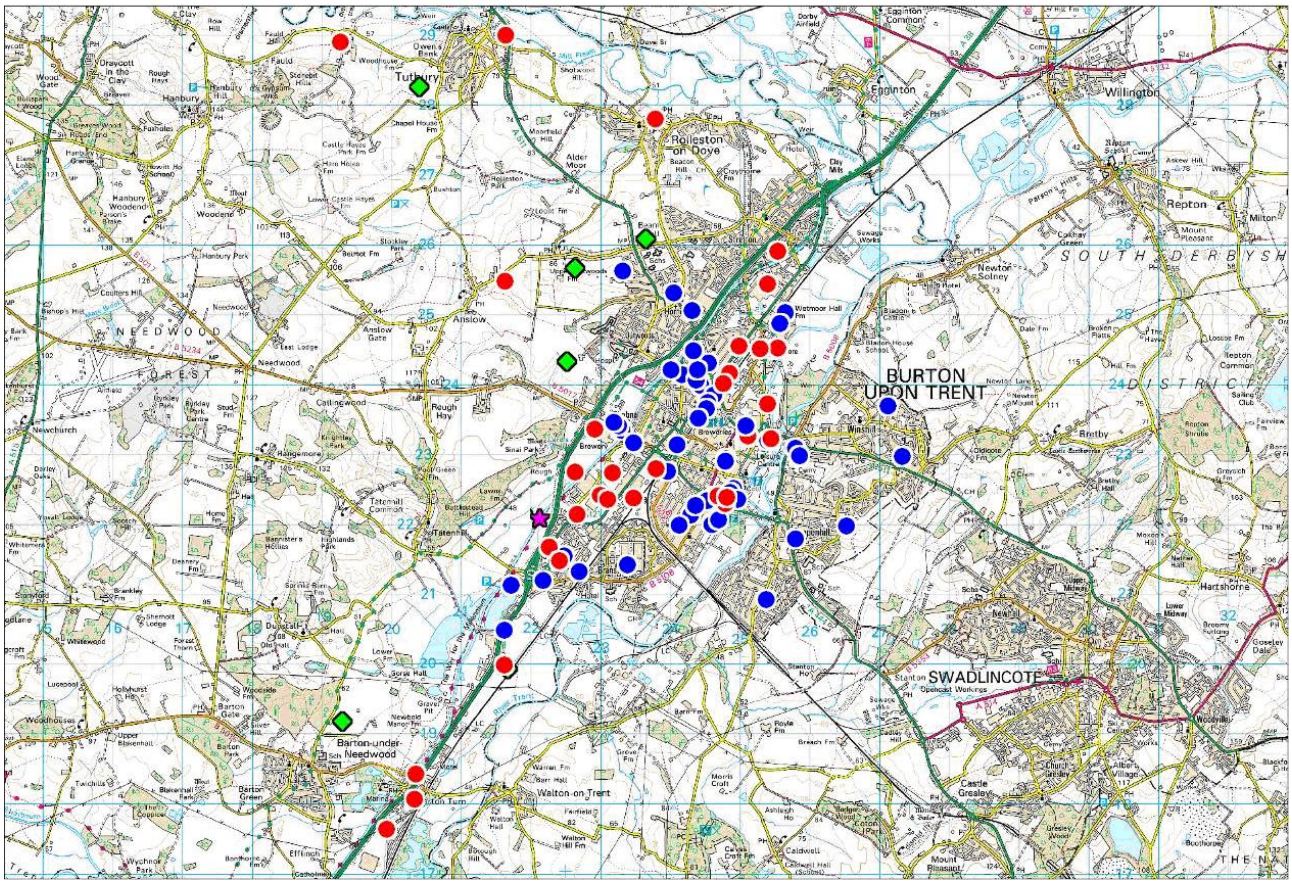


Figure 2.5 – Land Use Option 3



3. Model Assumptions

3.1 The development of the forecast models used in the initial assessment of the land use options has been detailed in the 'Burton Transport Model – Forecasting Report' (the **Forecasting Report**) and may be summarised as follows:

Model years

3.2 Forecast models have been developed for both the 2016 and 2026 AM and PM peak hours. These years have been chosen to reflect the key target dates contained with the new Growth Point Guidance (NGP) and the Regional Spatial Strategy (RSS). Both dates were specified within the study brief. However as noted in Section 2, as the land use options are consistent in 2016 and the assessment undertaken in this report has concentrated on the 2026 forecast year.

Do Minimum Networks

3.3 A Do Minimum network has been developed and has incorporated proposed schemes as defined in the following:

- Burton Urban Area Transport Model Study; and
- Burton Town Centre Area Action Plan.

3.4 Full details of each scheme are provided in the '**Forecasting Report'**.

Forecast Demand Matrices

3.5 Forecast demand matrices have been developed for each of the five initial land use options outlined in Section 2. These have accounted for the following:

- Development type and gross floor areas as specified by ESBC;
- Development proposals identified within the Town Centre Area Action Plan;
- Household densities of 40 units per Hectare;
- Development vehicle trip rates, as agreed with the Highways Agency;
- Light vehicle trip distributions based on the 2001 Journey to Work Census data;
- Heavy vehicle trip distribution has been based on existing heavy vehicle movements across the study area;
- Account has been made for trips between new developments to ensure that double counting is removed,. This process is discussed in detail within the '**Forecasting Report'**; and
- Overall matrix growth constrained to TEMPRO growth factors, adjusted to account for the forecast levels of household and job growth within the study area for each of the five land use options.

3.6 Based on this the overall matrix totals for the Base Year and 2026 land use options are as follows.

Table 3.1 – Land Use Options Matrix Totals

Year	Option	AM Peak	PM Peak
2007	Base Year	56090	51537
2026	Option 1	74195	69852
	Option 1 + Additional Housing	75025	70587
	Option 2	72935	68167
	Option 2 + Additional Housing	73616	68767
	Option 3	74289	69959

3.7 Overall it can be seen that Option 1 + Additional Housing provides the highest overall level of trips across the model. This is consistent with the higher levels of both houses and jobs associated with this option.

Forecast Assignments

3.8 As demand for the road network increases over time so does the level of congestion. This increase in journey time for trips can result in various responses including:

- Decide to continue to travel;
- Re-schedule the journey (to a different time period, when it is less congested);
- Mode shift (e.g. car to bus); and
- Decide to no longer travel (suppression).

3.9 As a result an elasticity approach has been adopted. This enables these responses to be accounted for in the future year assignment and reduces the potential for unrealistic growth to occur in a congested network. Details of this approach is outlined in the **'Forecasting Report'.**

3.10 It is noted that as this response reflects individuals responses to increased congestion over time, no elasticity is allowed to those users of the new developments as these will be new trips.

3.11 Overall the model matrix totals have been reduced by a maximum of 2% in 2026 as a result of the elasticity effects of increased congestion.

4. Performance Indicators

4.1 A key stage in the BTM is the definition of the preferred land use option. At present some five key options have been defined and modelled as outlined in Sections 2 and 3.

4.2 In determining the preferred option, an initial assessment has been undertaken of the key performance indicators for each. This assessment has focussed on the 2026 forecast year as it is recognised that the options are consistent at 2016.

4.3 The assessment of the options has considered the appropriateness of each against a series of criteria. In developing this criteria it is recognised that the Partnership for Growth and Government support for East Staffordshire as a New Growth Point is dependent on the following conditions, as outlined in the DCLG Advice - Annex C: Conditions of Partnership for Growth, namely:

- Exploit existing public transport networks in determining the most sustainable locations for growth;
- Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;
- Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport; and
- Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.

4.4 As a result, the assessment of the options has concentrated on the merits of each option against the key issues for the region. These issues have been grouped into the following objectives to address the DCLA requirements:

- Impact on all users;
- Impact on strategic routes;
- New Development Trips;
- Network Impacts;
- Environmental impacts;
- Access to Existing Public Transport; and
- Access to non motorised modes.

4.5 These criteria have been further split into 18 local sub objectives to provide a comprehensive assessment of the options. The overall Key Performance Indicators (KPI's) are shown in Table 4.1.

4.6 The assessment of the five land use options against the KPI's is summarised in the following section.

Table 4.1 – Key Performance Criteria

Objective	Local Sub Objective
Impact on all users	Vehicle Hours
	Vehicle Kilometres
	Average Speed
	Average vehicle distance per trip
	Demand
Impact on strategic routes	Change in Flow on the A38 Trunk Road
New Development Trips	Development Trip Vehicle Hours
	Development Trip Vehicle Kilometres
	Development Trip Average Speeds
	Development Trip average trip length
	Development Demand
Network Impacts	Junctions
	Links
Environmental Issues	Impact on CO2 emissions
	Impact on NOX emissions
Access to Existing Public Transport	Total Number of existing services passing the developments
	Direct access to Rail
Access to non motorised modes	Access to national cycle network

5. Initial Option Assessment

5.1 This section outlines the assessment of the Key Performance Indicators (KPI's) and the comparison of these for each land use option.

5.2 For all of the objectives outlined in Section 4, the performance of each of the final options have been compared against these criteria, and the options subsequently ranked between 1 to 5, with 5 being the worst, according to how they compared against each other.

5.3 The rankings were reviewed to allow options to be, for example, second-equal, if the differences between two options were insignificant.

5.4 Appendix A – Detailed Evaluation of Options contains the detailed qualitative and quantitative information used for the rankings, and shows how the options were ranked for each of the 18 local sub-objectives. The methodology used to rank the options against each objective is also described.

5.5 A summary of each of the sub objectives is provided in Table 7.2 below. The key points to note are as follows:

Impact on All Users

5.6 The assessment of the impacts on all users has noted the following:

- Option 2 provides the lowest overall vehicle hours and kilometres whilst Option 1 + Additional Housing provides the highest level. This is consistent with the level of development flow introduced into the network;
- Overall average speeds show a minimal variance between the options, ranging from 56.3kph to 61.5kph. Overall Option 1 + Additional Housing has the slowest overall network average speed due to the higher level of growth in this scenario;
- Option 1, Option 1+ Additional Housing and Option 3 have the lowest overall average trip distance across the network. This may be due in part to the introduction of additional employment in the Lawns Farm area, which would have the effect of reducing the distance for existing movements to access employment. It is noted, however, that the changes in average distance are small ranging between 18.3km and 19.0km; and
- Overall, the level of development demand is consistent with the level of household and employment provided in each option. As a result Option 2 has the lowest overall demand whilst Option 1 + Additional Housing provides the highest.

Impact on Strategic Routes

5.7 The assessment of the changes in trips of the A38 through Burton has shown the following:

- The lowest overall impact on all sections of the A38 is with Option 2. This is consistent with the level of demand associated with this option;
- In all scenarios the northbound flow levels on the A38 south of Burton are 'approaching' or are 'at' capacity of the A38 of around 4000 vehicles per hour and direction with between 3600 and 4000 vehicles across the scenarios;
- To the north of Burton, the AM Peak forecast flow levels are broadly consistent with around 3000 vehicles northbound and 3700 vehicles southbound; and
- In the PM Peak, however, flow levels in the northbound direction north of Burton reach up to 4200 vehicles in Option 1 + Additional Housing. This level of flow would exceed capacity for this section.

Table 5.1 - Option Evaluation Summary Table

Objective	Local Sub Objective	Potential Options				
		Option 1	Option1 + Additional Housing	Option 2	Option2 + Additional Housing	Option3
Impact on all users	Vehicle Hours	3	5	1	3	3
	Vehicle Kilometres	3	5	1	3	3
	Average Speed	3	5	1	3	3
	Average vehicle distance per trip	2.5	1	4.5	4.5	2.5
	Demand	3.5	5	1	2	3.5
Impact on strategic routes	Change in Flow on the A38 Trunk Road	4	4	1	2	4
New Development Trips	Development Trip Vehicle Hours	2	5	1	4	3
	Development Trip Vehicle Kilometres	2	5	1	3	4
	Development Trip Average Speeds	3	5	1	4	2
	Development Trip average trip length	3.5	3.5	1	2	5
	Development Demand	2	5	1	4	3
Network Impacts	Junctions	4	5	1	2	3
	Links	3	5	1	2	4
Environmental Issues	Impact on CO2 emissions	3	5	1	2	4
	Impact on NOX emissions	3	5	1	2	4
Access to Existing Public Transport	Percentage of development land with access within 350m of a minimum existing half hourly service	5	4	1	3	2
	Direct access to Rail	4	4	1	1	3
Access to non motorised modes	Access to national cycle network	3	5	1	4	2
	Percentage of development land with access to the town centre within 15 minutes	3	5	1	4	2
Overall Average Ranking (Assuming Even Weighting)		**3**	**5**	**1**	**2**	**4**

Key: 1 = best, 5 =worst

5.8 A review of the effects of the options on the A38 junctions, discussed below, has highlighted that for Option 1, Option 1 + Additional Housing and Option 3, due to the Lawns Farm development traffic, queuing is predicted back onto the A38 based on the current configuration of the junction. This therefore highlights that remedial measures will be required to minimise the potential effects.

Impacts on New Development Trips

5.9 The assessment of impacts on new development trips has shown that:

- The pattern of vehicle hours, kilometres and average speeds results are broadly consistent with the 'All Users' assessment with Option 2 providing the best statistics and Option 1 + Additional Housing providing the worst statistics compared to all other options;
- Average trip length for development trips, however, differs compared to the 'All Users' assessment, with Option 3 providing the highest overall average distance, followed by Option 1 and Option1 + Additional Housing. This difference with the 'All Users' results is due to the fact that this indicator relates to development trips only and hence does not reflect the change in distance with their journey were the development site not included. Consequently whilst there is additional employment provided in these options, the locations of them are on the outskirts of Burton at Lawns Farm and as a result, trips may have to travel slightly further to these developments compared to the other employment zones within Burton; and
- The level of demand from the developments is consistent with the level of household and jobs supplied, hence Option 2 and Option 1+ Additional Housing provide the lowest and highest overall demand respectively.

Network Impacts

5.10 An assessment has been undertaken of the overall network impacts in the key study area. These have considered the following:

- Average junction stress – where the volume to capacity (V/C) ratio is >85%
- Average link stress on the approach to each junction – where the volume to capacity (V/C) ratio is >85%
- A V/C ratio has been used as the criteria for this indicator as it is recognised that where V/C increases above 85% then the link or junction is assumed to be at capacity and hence any additional flow may cause increased delays and queuing (i.e. over capacity).

5.11 Diagrams showing links and junctions >85% within the key simulation network for each option and time period are provided in Appendix B. In addition, average vehicle queue length plots are also presented to identify potential locations of excessive queuing and blocking back in the highway network.

5.12 This indicator has highlighted the following:

- Overall the number of links and junctions with stress levels >85% are broadly consistent with the levels of Additional Housing and jobs provided in each option as expected; and
- Consequently the Option 1 + Additional Housing would require the most transport interventions to reduce the impacts of congestion across the simulated area.

Environment

5.13 A review of the environmental indicators extracted from the SATURN model runs has been undertaken. It is noted that SATURN provides only a simplified emissions model and hence the validity of these results should be considered in this light. The results do, however, provide a like for like comparison of the options and hence the results have highlighted the following:

- For both the Carbon Dioxide and Nitrogen Oxide levels the order of the options in term of lowest to highest levels is in line with the level of traffic demand as would be expected. This also reflects the increase in congestion associated with higher flow levels.

Access to Public Transport

5.14 This indicator considers access to both bus and rail from the developments. A diagram showing the bus routes, the location of the train station and the developments associated with Option 1 + Additional Housing is shown in Figure 5.1.

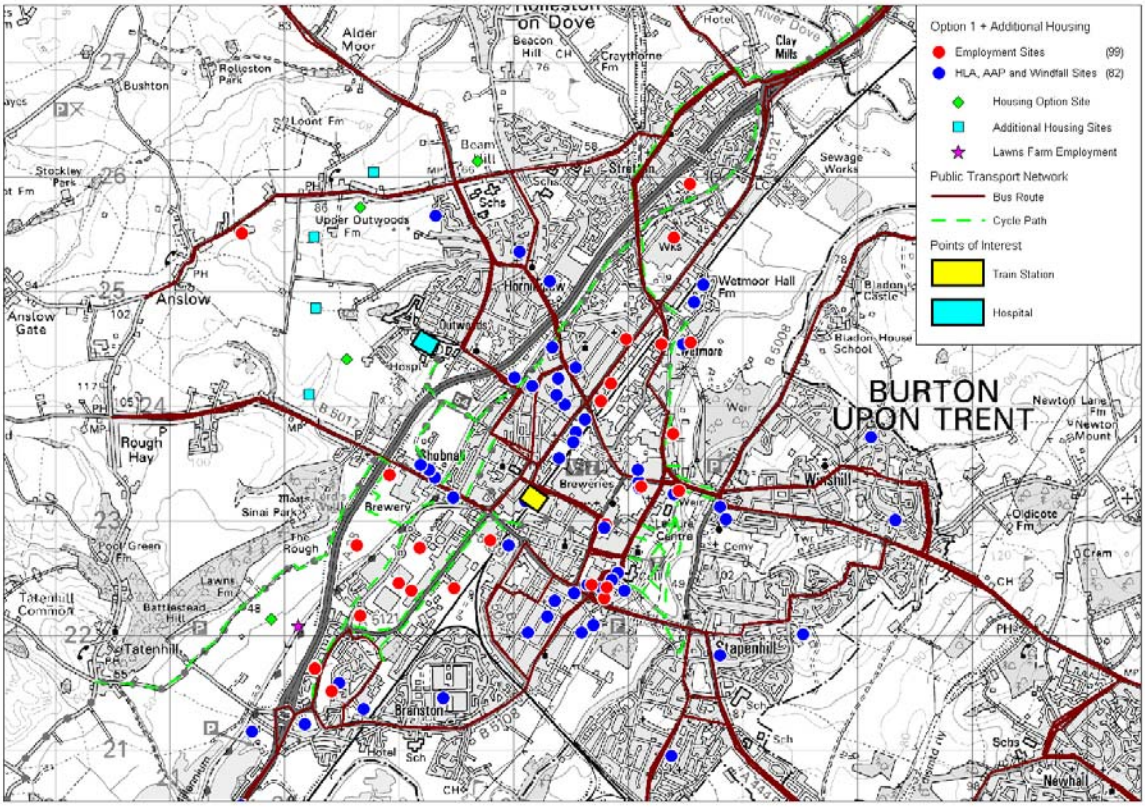
5.15 It is considered reasonable that patrons walk up to 350 metres to a bus stop. Therefore, the diagram in APPENDIX C - Bus access within 350 metres of an existing half hourly or better service demonstrates the feasible area bus-using patrons could begin their journeys.

5.16 This assessment will only consider those bus stops with a maximum 30 minute frequency. It then considers the proportion of the land use served by the public transport network as a key performance indicator.

5.17 The results of this methodology highlight the following:

- The land use option that has the best access to the bus network is Option 2 where 21% of the land use can access a frequency bus service within 350 linear metres;
- Option 1 is the least successful and only provides public transport access to 9% of the land use; and
- Direct Access to the existing rail station is through various existing services. These services provide access to the north and north west of Burton and the Winshill / Stapenhill areas. As a result, access to the Lawns Farm site is limited at present and hence Option 1 and Option 1 + Additional Housing have been scored lower accordingly.

Figure 5.1 – Access to Public Transport and Cycle Networks



Access to Non Motorised Modes

5.18 This indicator considers what proportion of land use can access the town centre within 15 minutes through cycling. This excludes travel along the A38 and assumes cycle speed of 16kph.This has indicator has highlighted the following;

- Due to the spatial nature of the cycle routes, all options will provide access to the cycle network for a high number of sites;
- Option 2 offers the best access to the town centre for cyclists with 60% of cyclists able to make the journey to the town centre within 15 minutes;
- Option 3 follows closely behind Option 2 with 56% of the land area within 15 minutes cycle ride of the town centre; and
- Both the additional housing options performs less favourably, providing town centre access to 34% and 38% of non-motorised users respectively.

Effects of Key Developments

5.19 In addition to the indicators assessed above it is recognised that two key sites are the focus for the differences between the five options. These are:

- Lawns Farm; and
- Additional Housing located to the north west side of Burton on Trent.

5.20 As a result a review of the impacts of these two key locations has been undertaken and is summarised below:

Effects of Lawns Farm

5.21 The proposed Lawns Farm development is a greenfield mixed use site which lies west of the A38 between Branston Road and B5017 Forest Road, and is included in Land Use Option 1 and Option 1+ Additional Housing. This site includes both residential and employment land uses and as a result it has been assumed that there will be internal movements between them, thus reducing the overall trips generated by the site. Consequently, whilst no specific guidance is provided regarding the level of intra development trips, a reduction of 30% of the new residential trips have been assumed for this initial stage of the study. This reduction is broadly in line with other studies undertaken in areas such as North Northamptonshire and ensures that an overestimation of the trips generated from the site is not undertaken.

5.22 For Option 3, only the employment element of the Lawns Farm development is included, thus no intra trips have been deducted.

5.23 Access for the development has been assumed as per the SCPD plan prepared by Williams Environmental Design. A new single carriageway distributor road is proposed to run northwest from a new arm on the A38 / Branston Road / A5121 Wellington Road Junction which will service the site. The new road is proposed to turn to the northeast and have a second northern access point on B5017 Forest Road just west of the A38 overbridge. This junction has been assumed to be priority controlled with single lane approaches, aside from the western approach on Forest Road which is assumed to have a right turn bay to access the site. It has been assumed (at this stage) that this route is only for Lawns Farm development traffic, and that through traffic will be banned from using it to access the A38 and vice versa.

5.24 Highway conditions around Lawns Farm were assessed by comparing the five modelled land use Options for the 2026 AM and PM Peaks, with the development only fully included in Option 1 and Option 1 + Additional Housing. These impacts are presented in Appendix B.

5.25 The main points from the assessment of Lawns Farm are as follows:

- The high demands for access to the development are putting significant pressure on the existing A38 / Branston Road / A5121 Wellington Road Junction. In both the Option 1 and 1 + Additional Housing Options, traffic is predicted to queue back onto the A38 from the roundabout on both the northbound and southbound offslips in the AM Peak;
- Similarly, the southbound off slip diverge at the same junction has exceeded a V/C ratio of 85% in both Lawns Farm Options;
- The junction of the northern access of the Lawns Farm site onto B5017 Forest Road is over capacity on the western approach into the development in the AM Peak. This congestion is mainly due to heavy eastbound traffic queuing on Forest Road heading into Burton, and also right turning traffic accessing the development from the north;
- Both the northern and southern accesses to the development exceed a V/C ratio of 100% in the PM Peak in both Options, and therefore queuing is forecast for traffic exiting the development. The additional housing, and therefore traffic demand on the network in Option 1 + Additional Housing is predicted to exacerbate these conditions from the Option 1 Scenario. This indicates that the access arrangements (as currently modelled) are insufficient to cope with the forecast demand;
- The A5121 Wellington Road / A5189 Shobnall Road roundabout is forecast to exceed 85% V/C in the 2026 AM Peak; and
- The westbound carriageway on Bitham Lane, east of Rolleston Road is also forecast to reach capacity with the development of Lawns Farm in the AM Peak, however this is more likely a side effect of re-routing traffic due to the increased demand and congestion around the development.

5.26 The above observations also apply to Option 3 which only includes the employment element of the Lawns Farm development.

Effects of Additional Housing

5.27 Both Options 1 + Additional Housing and 2 + Additional Housing comprise significant additional residential developments in the area west and northwest of Burton. This additional residential demand is loaded onto relatively rural single carriageway roads. To enable the development traffic in the Beamhill Road area to reach the highway network without incurring unreasonable delay, the capacity of the existing signalised junction at Outwoods (A511 Tutbury Road / Beamhill Road / Harehedge Lane) has been assumed to be significantly upgraded. Therefore, the Do Minimum networks incorporate a concept signalised junction to ensure the initial option assessment is not overly influenced by access issues.

5.28 Highway conditions for the additional housing were assessed by comparing the four modelled land use Options for the 2026 AM and PM Peaks, with the development only included in the Option 1+Additional Housing and Option 2+Additional Housing scenarios. These impacts are shown graphically in Appendix B.

5.29 The main points from the assessment of the additional housing are as follows:

- The high demands for access to the additional housing to the northwest of Burton are putting significant pressure on the B5017 Shobnall Road and Beamhill Road corridors. These are the primary routes for the new residential demands feeding Burton, but are only existing single carriageway highways;
- In the AM Peak with additional housing, Beamhill Road and Hopley Road are predicted to be over capacity in the outbound direction for commuters exiting the residential developments. In the Option 1+Additional Housing scenario, Postern Road is also forecast to be at over capacity in the southbound direction;

- In the PM Peak with additional housing, eastbound traffic on Beamhill Road and southbound on A511 Tutbury Road are considered to be exceeding capacity with V/C ratios exceeding 90%. The junction at A511 Horninglow Road / Victoria Crescent is also at capacity; and
- Traffic demands on the B5017 Shobnall Road eastbound are exceeding capacity in the AM Peak in all four growth scenarios, with over capacity links from the Shobnall Street junction. The congestion increases significantly with the additional housing provisions in Option 1+Additional Housing and Option 2+Additional Housing with 152% and 127% V/C ratio predicted respectively. Heavy queuing is also forecast as a result of the capacity issues.

6. Summary

6.1 Overall this assessment has highlighted the impacts of the five development options on the key indicators outlined above. The indicators assessed within this report have been developed to address the key requirements for the Partnership for Growth and Governments support for East Staffordshire as a New Growth Point, as outlined in the DCLG Advice - Annex C: Conditions of Partnership for Growth, namely

- Exploit existing public transport networks in determining the most sustainable locations for growth;
- Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;
- Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport; and
- Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.

6.2 Overall it is considered that the indicators assessed within this report have highlighted that as traffic levels increase between the options the levels of impact on the overall network increase accordingly. Whilst this has lead to an overall indication that Option 2 will provide the lowest effect the key decision to be made will be:

6.3 “Are the additional impacts of the higher growth options considered acceptable by SCC, ESBC and the HA?”

6.4 The key results against the DCLG advice has highlighted the following

Exploit existing public transport networks in determining the most sustainable locations for growth;

- Around 21% of trips to and from development sites in Option 2 have access to an existing half hourly service within a 350m walk;
- The Lawns Farm and Additional housing developments have limited existing services available in their vicinity and hence additional public transport links, as part of the overall remediation package, would be required to provide a sustainable link to the town centre and the employment areas; and
- At present direct access to the rail station would be limited for both Lawns Farm and Additional Housing sites.

Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;

- Option 1 + Additional Housing demonstrates that there may be a slight reduction in overall average journey distance travelled. This is due to the inclusion of additional 8400 jobs within Burton and hence provides a more sustainable option and aligns directly with this criteria; and
- Countering this reduction in journey length, however, is the increased delays, congestion and associated effects on the environment within Burton resulting from the higher flow level incurred by Option 1 and Option 1 + Additional Housing;

Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport; and

- All sites around Burton on Trent have reasonably close access to the existing cycle network. It is noted that the Lawns Farm site has direct access to cycle route 54 which passes through the site; and
- Consideration of the access to the town centre within a 15 minute cycle, however, highlights that Option 2 provides access for 60% of the development whilst Option 1 + additional housing provides access for only 34% of the development.

Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.

- Traffic flows on the A38 in Option 1, Option 1 + Additional Housing and Option 3 are broadly higher than Options 2 and 2+ Additional Housing;
- In addition these options also have a greater effect on the A38 Branston junction, due to the Lawns Farm development site, which is shown to have queuing back onto the A38 based on its current configuration. It is recognised, however that remedial measures may mitigate this effect; and
- The high demands for access to the additional housing to the northwest of Burton are putting significant pressure on the B5017 Shobnall Road and Beamhill Road corridors. Whilst these are not strategic routes they do represent primary routes for the residential demands feeding Burton, however these routes are, at present only single carriageway highways. As a result significant capacity improvements or other transport interventions may be required along these routes.

6.5 Based on these results the following next stages are proposed:

- Submission of the Initial Option Report to SCC and ESBC;
- Discussions and presentation of findings;
- Agreement of preferred Option; and
- Detailed assessment of preferred Option.