

Local Development Framework Site Assessment Study

Draft Final Report

Bracknell Forest Borough Council

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Executive Summary

Bracknell Forest Borough Council is preparing a series of documents which will inform development in the Borough. The first two Development Plan Documents (DPDs) to be produced are the Core Strategy 'A Draft Spatial Framework to 2026' and Site Allocations 'A Draft Approach to Delivering the Spatial Framework of the Core Strategy'.

The Site Allocations Development Plan Document is one of the documents that will form part of the Local Development Framework. This will determine how and where housing, shops, offices, industry, transport and leisure facilities are located over the next 20 years. As part of this process a more detailed analysis of the impacts and constraints associated with the potential development sites is being undertaken. This report represents the analysis in relation to transport

This report describes the process of developing a list of residential cluster groups of sites, ranked in order of priority based upon transport objectives. The basis for the transport objective indicators and the assessment assumptions are fully explained.

From the analysis framework a list of residential cluster sites is derived. This list is ranked in priority order in terms of satisfying the transport objectives. Using the ranked list of sites the transport effects of a typical number of dwelling based upon the potential housing requirement is investigated.

In order to demonstrate the sensitivity of the transport network to differing allocations of development, alternative scenarios were carried out to demonstrate how the different patterns of traffic movement for alternative ranked groups, will affect the capacity of the road network.

The first scenario demonstrated the 2026 base year plus an allocation of top ranked sites. The existing transport network will, on some of the transport corridors, be considerably beyond its theoretical capacity. With the additional new development travel demand, selected from the ranked list of sites, the capacity of the road network is shown as incapable of accommodating this additional traffic without the consequence of severe congestion which will impact on all modes of travel.

The second scenario placed all of the development on one corridor. The result of this scenario showed, as anticipated, significant stress on that corridor which would result in severe congestion. The other corridors retaining the same level of capacity as identified in the 2026 base. The third scenario distributed the development across the corridors that were not over capacity in the base. This resulted in the development being accommodated without exceeding the maximum theoretical capacity of these corridors.

There is a balance to be considered in transport terms, between selecting sites based upon the transport objectives defined in the framework indicators, which lead to a more congested network, versus choosing less preferable sites which maintain a greater extent of the network with flows that are within its operational capacity. The issue of congestion was taken into account with the indicator scores for the ranking. However at this stage, no investigation has been carried out to allow for the ability of new development to mitigate these impacts.

Recommendations are made for additional investigation to obtain further information and to undertake further analysis including transport modelling. A greater understanding of the individual components making up the transport network will need to be obtained in order to evaluate the potential for works to be funded by development that mitigate the impact of additional travel demand on the safety and capacity of the transport networks.



1 Introduction

1.1 BACKGROUND

1.1.1 This report summarises the investigation undertaken as part of an analysis of potential residential development sites from a transport perspective. This analysis will form part of the structured development of the Local Development Framework (LDF) currently being undertaken by the Council.

1.1.2 Prior to undertaking the assessment of sites, the key planning documents which will guide future development in the Borough over the next 20 years were reviewed: The main documents are as follows:

- The **Core Strategy** which sets out a long term planning framework for the Borough including broad locations for future development
- The **Site Allocations** document which will identify specific sites for major development in the Borough over the next 20 years
- The **Sustainability Appraisal report** which reviewed the sustainability of groups of sites utilising Accession to identify key travel times to facilities such as hospital, schools and local shopping centres
- The **Accessibility Strategy 2006-2011** report reviewed accessibility to services for all modes of travel

1.1.3 Review of these documents ensured that appraisal of the sites was undertaken within the context of the information available to the local community and other stakeholders in the creation of the site allocations, and also builds on existing work undertaken by the Borough Council relating to development sites

1.1.4 This assessment study complements these documents and expands on the analysis carried out in the sustainability report. The relevant considerations in the sustainability report were the core spatial strategy objectives which identify the promotion of a transport system which facilitates improved accessibility through greater choice of transport modes.

1.2 STRUCTURE OF THIS REPORT

1.2.1 This technical report provides the basis for which the analysis will be carried out for the remainder of the project. It is divided into the following key chapters;

- Chapter 1- Introduction
- Chapter 2 -Review of policies
- Chapter 3 - Methodology
- Chapter 4 - Baseline Network 2006
 - Baseline methodology
 - Highway network
 - Pedestrian and Cycleway network
 - Public Transport network
- Chapter 5 - Base Network 2026
- Chapter 6 - Cluster Group Ranking



- Chapter 7 - Framework Sensitivity Testing
- Chapter 8 – Conclusions

1.3 APPENDICES

1.3.1 A series of appendices and figures provide further background information and technical detail. Appendix A presents the Appraisal Indicators & Matrix.

1.3.2 The figures provide maps of the study area highlighting the key geographical locations with the sites and cluster groups referred to within the text.

1.3.3 Accession information and the location of Local Transport Plan and town centre travel improvements and other traffic information is also mapped (Figure 7.1 & Figure 7.2) which enables the transport network and key issues to be identified.



2 Policy and Document Review

2.1 INTRODUCTION

2.1.1 To inform the assessment of cluster site groups, a review of relevant policies and documents was undertaken. This chapter consists of:

- A review of relevant policy documents (national, regional and local) and how they inform the site selection process
- A review of data and documents provided by BFBC

2.2 REVIEW OF BACKGROUND POLICY DOCUMENTS

2.2.1 This Chapter provides an overview of national, regional and local transport policy relevant to the Bracknell LDF Site Assessment Study. The identification of the scenarios will be instructed by the policy objectives set out below. The following policy documents have been referred to:

- Government White Papers
- Planning Policy Guidance Note 13: Transport (PPG13)
- Planning Policy Statement 12: Local Development Frameworks
- Planning Policy Statement PPG 3: Housing
- Draft Planning Policy Statement PPS 3: Housing
- RPG 9: Regional Planning Guidance for the South East
- Berkshire Structure Plan (2001 - 2016)
- Bracknell Forest Local Transport Plan (2006 - 2011)

2.3 NATIONAL POLICY

2.3.1 In July 1998 the Government set out its policy for the future of transport in the White Paper 'A New Deal for Transport: Better for Everyone'. The document sets out a guideline to integrate planning and transport at a national, regional, strategic and local level, to ensure that the continual growth in road traffic does not affect quality of life. The objective of the document is defined as being:

'to increase personal choice by improving the alternatives and to secure mobility that is sustainable in the long term'

2.3.2 Government policy on development and its links with transportation and accessibility is reflected within the White Paper and are reinforced in the Planning Policy Guidance (PPG) and their successors, Planning Policy Statements (PPS).

2.4 PLANNING POLICY GUIDANCE 13

2.4.1 Planning Policy Guidance Note 13 (PPG13), published in March 2001, provides advice on transport for new developments. The key aim of PPG13 is to ensure that local authorities carry out their land use policies and transport programmes in ways that help to:

- Promote more sustainable transport choices for people
- Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking, and cycling; and

- Reduce the need to travel, especially by car

2.4.2 The document re-states the key themes of sustainable development that have emerged in recent years. It advises that major developments should be accompanied by a transport assessment, which includes details of access by walking, cycling and public transport.

2.4.3 With regard to residential development, the guidance states that the focus for anticipated residential development should be in existing towns and cities in order to promote more sustainable patterns of development and to make better use of previously developed land. It is anticipated that local planning authorities should:

- Build in ways which exploit and deliver accessibility by public transport to jobs, education and health facilities, shopping, leisure and local services
- Place the needs of people before ease of traffic movement in designing the layout of residential developments
- Seek to reduce car dependence by facilitating more walking and cycling, by improving linkages by public transport between housing, jobs, local services and local amenity, and by planning for mixed use


2.4.4 PPG13 cites public transport as an important ingredient in determining locational policies designed to reduce the need for travel by car. In order to establish a high quality, safe, secure and reliable network of routes, with good interchanges, local authorities are encouraged to:

- Identify the key routes for bus improvements and priority measures
- Ensure, so far as is practicable, that traffic management measures do not impede the effectiveness of public transport services
- Explore the potential, and identify any proposals for improving rail travel, in liaison with the SRA
- Identify the potential for improved interchange between different transport services and between public transport and walking and cycling
- Negotiate for improvements to public transport as part of development proposals
- Work with transport operators and other organisations to improve personal security across the whole journey

2.5 PLANNING POLICY GUIDANCE 3: HOUSING

2.5.1 National Planning Policy Guidance for Housing (PPG3) provides advice on housing issues in development. The guidance places particular emphasis on the importance of integrating decisions on planning and transport in order to reduce the need for travel by car. In order to meet this objective, PPG3 advises local authorities to:

- Seek to reduce car dependence by facilitating more walking and cycling, by improving linkages by public transport between housing, jobs, local services and local amenity, and by planning for mixed use
- Create more sustainable patterns of development by building in ways which exploit and deliver accessibility by public transport to jobs, education and health facilities, shopping, leisure and local services

- 
-
- Provide sufficient housing land but give priority to re-using previously developed land within urban areas, bringing empty homes back into use and converting existing buildings, in preference to the development of Greenfield sites

2.6 DRAFT PLANNING POLICY STATEMENT 3: HOUSING

2.6.1 Emerging policy is in the form of PPS3: Housing and accompanying guidance which will, in due course, replace Planning Policy Guidance Note 3: Housing. The consultation draft was published December 2005 and is also enclosed within Planning Circular 6/98: *Planning and Affordable Housing*.

2.6.2 The document reiterates the aims introduced in PPG3 and amongst other objectives, encourages local authorities to plan new housing in order to:

'Create sustainable, inclusive, mixed communities in all areas. Developments should be attractive, safe and designed and built to a high quality. They should be located in areas with good access to jobs, key services and infrastructure'

2.7 PLANNING POLICY STATEMENT 12: LOCAL DEVELOPMENT FRAMEWORKS

2.7.1 PPS12 sets out the Government's national policies for planning. Within PPS12, emphasis is placed on the importance of the integration of land-use and transport policies:

'The integration of transport and spatial planning is central to the development and delivery of effective local development frameworks...land-use and planning, in turn, needs to take account of the existing transport network and plans for its development'

2.8 RPG9: REGIONAL PLANNING GUIDANCE FOR THE SOUTH EAST

2.8.1 Bracknell falls within the Thames Valley sub-region. RPG9 states that 'the Thames Valley sub-region is characterised by concentrations of business service employment and high-tech, knowledge-based industries and by the increasing pressure on local infrastructure, land resources and house prices.' In addition, that 'further growth in this area therefore needs to occur in a form, which minimises the additional pressures on land and labour resources, particularly in 'hot spots'

2.9 REGIONAL TRANSPORT STRATEGY

2.9.1 The Regional Transport Strategy for the South East of England sets out a vision of a high quality transport system to act as a catalyst for continued economic growth and to provide for an improved quality of life for all in a sustainable and socially inclusive manner.

- **Policy T1:** ...to ensure that policies and proposals:
 - 'encourage development that is located and designed to reduce average journey lengths
 - promote investment that achieves a rebalancing of the transport system in favour of non-car modes as a means of access to services and facilities
 - are consistent with and supported by, appropriate mobility management measures.'



2.10 BERKSHIRE STRUCTURE PLAN 2001 - 2016

2.10.1 The Berkshire Structure Plan 2001 – 2016 was adopted in July 2005 and was produced by the Berkshire Unitary Authorities' Joint Strategic Planning Unit. The Joint Strategic Planning Unit is made up of all six of the Berkshire Unitary Authorities and ensures a consistent and strategic approach to the planning for the County as a whole.

2.10.2 Chapter 9 of the Berkshire Structure Plan 2001-2016 sets out the transport policies for the County. Policy T1: Transport Strategy states that the Councils will use their planning powers to:

- (i) reduce the need to travel, especially by the car
- (ii) promote alternative modes of travel to the car
- (iii) increase the safety of travel
- (iv) provide improved access to jobs, leisure opportunities and services for all members of the community
- (v) secure reliable movement of goods, in a manner compatible with the principles of sustainable development

2.10.3 Policy T4 states:

“All development will take appropriate measures to offset any adverse effects it has for the transport network. Development which generates significant numbers of trips should include the promotion of sustainable alternative modes of travel to the private car, and should take other steps, if required, to minimise the pressure on the transport network.”

2.11 BRACKNELL FOREST BOROUGH COUNCIL LOCAL TRANSPORT PLAN 2006 – 2011

2.11.1 The main transport vision of the LTP is one that aims 'to deliver an effective, efficient and sustainable transport system focussing on the needs of those in the local area, providing choice and reducing congestion whilst maintaining the network in an optimum condition; recognising the Borough in the heart of the Thames Valley'.

2.11.2 In addition to the main LTP vision, the Borough Council wish to see Bracknell Forest as a 'place where all people can thrive: living and working in a clean, safe and healthy environment'. The Core Strategy aimed at achieving this vision is based on the need to:

- Deliver sustainable development
- Support the redevelopment of Bracknell Town Centre as key to the sustainable development strategy; and to ensure
- The provision of appropriate social and physical infrastructure to support new development

2.11.3 The plan focuses around 5 objectives which are related to:

- Maintaining our local roads
- Improving road safety



- Reducing peak hour congestion
- Providing better access to essential services
- Improving public transport

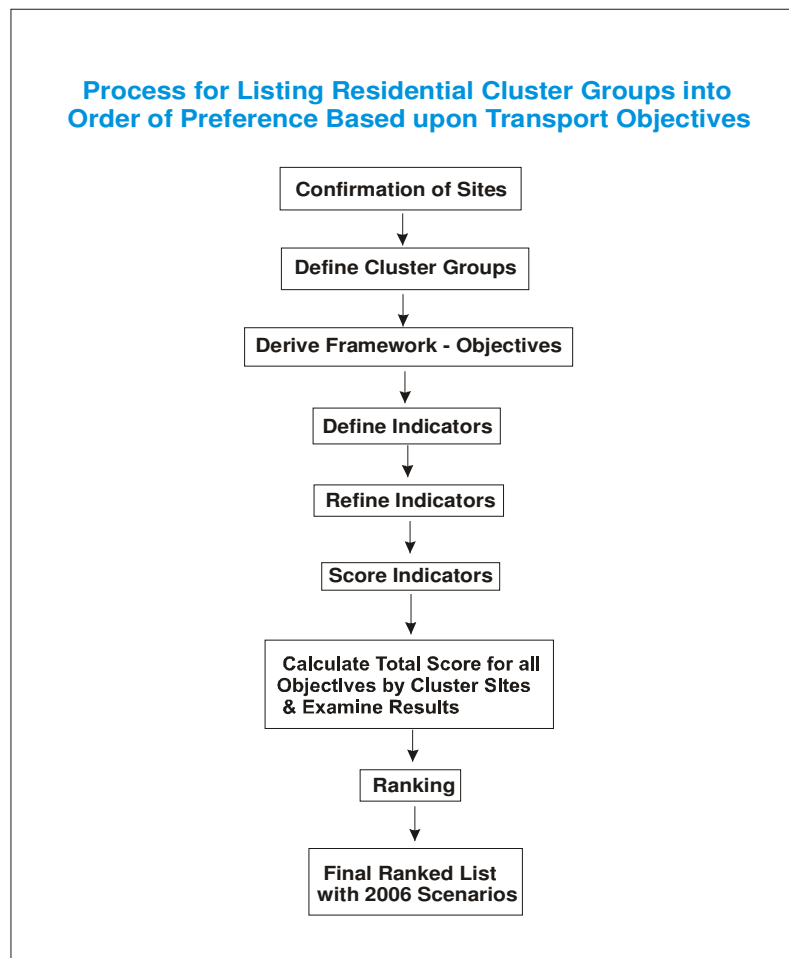
2.11.4 In addition, the LTP sets out targets to improve public transport patronage, improve accessibility to services and improve safety on Bracknell Forest's roads.


3 Methodology

3.1 OVERVIEW

3.1.1 The process used for analysing the sites and providing a ranked list is as shown in Table 3.1. The remainder of this chapter discusses the approach developed for each stage on this flowchart;

Table 3.1: Framework Process





3.1.2 The methodology seeks to take into account the issues associated with delivering the vision for Bracknell as described in the policy objectives described within the LTP. From these it is apparent that the fundamental issues to be accounted within the study are:

- The impact of proposals to improve access to Bracknell Town centre
- How transport improvements can be delivered at a local level to assist in meeting
- Transport policy objectives for the network and accommodate proposed development
- The role of public transport and traffic management measures to achieve a change in the mode split for travel within the study area
- The role of development contributions in assisting the programme for capital expenditure that has been developed
- The need for proposed developments to have a positive impact on the development of Bracknell town centre and to build upon the transport enhancements already secured

3.2 CONFIRMATION OF SITES

3.2.1 The initial assessment undertaken for the Bracknell Forest Borough Local Development Framework has specified certain key categories of site:

- Urban Housing Potential Sites
- Urban Extensions
- Sites not chosen

3.2.2 These sites were considered within the sustainability appraisal for all planning aspects but were not clustered in any way. For this transport assessment, the sites have been clustered into 20 groups, which have been agreed with BFBC and are consistent with those for other assessment methodologies.

3.3 SITE CLUSTER GROUP APPROACH TO TRANSPORT CONSIDERATIONS

3.3.1 To simplify the analysis process individual sites were aggregated into 'cluster groups' where they were close together and could be serviced in a similar way. Considerations were as follows:

- The clusters group potential housing sites into land areas that are balanced to evaluate the costs and benefits of any number of proposed facility locations
- Groups of features based on proximity or measures of similarity to produce districts that are contiguous, compact, and balanced
- Cluster grouping can specify a maximum cluster group size or capacity



3.3.2 The rationale behind the grouping of the sites was as follows:

- sites that were in similar locations of the Borough
- sites that could be combined to produce a larger consolidated development

3.3.3 Table 3.2 below repeats the Table 2.1 identified in 'Bracknell document – Core Strategy & Site Allocation Accessibility Analysis Report' and provides the following site grouping. BFBC has identified a total of 108 sites for which an accessibility audit has been undertaken. Figure 1 (see appendix) presents the location of the sites. The sites range from small to large, urban to countryside and new submissions to those already with planning permission.

3.3.4 The sites have been grouped into 20 clusters. These clusters are presented in Table 3.2 below.


Table 3.2 – Site Grouping

Group Number	Sites Number
1	32, B44, B42
2	31, 30, 83
3	86,34
4	B36, B37, B39, B40, 76
5	43, 33, 130
6	B27, B45, 36, 35
7	25, 66
8	27, 29, B5, B7
9	93, 28, 24,22, 21, 90, 99, 98,B3
10	132, 20, 123
11	75, 131, 124, 39, 42
12	129, 26, 14, 69, 12, Part54, B11, 73, 95, 7, 8, 6, 11, 84
13	128, 9, 92, 91 Part54
14	13
15	80, 81, 82, 79, 77, 96, 97
16	89, 70
17	Part54, 85, 87, 5, 3, 127, 126, 4, 125, 122, 78, 74, 44,49
18	1, 2, 94
19	72, 46, 47, 45, 17, 40, B46, B17, 19, B21, B22, B20
20	B24, 18, 15, 16, 37, 67, B26

3.3.5 The list of clusters in the table above is taken from Table 2.1: Groups of Sites from the Core Strategy & Site Allocation Accessibility Analysis Report (BFBC).

3.4 ACCESSION MAPPING

3.4.1 In order to assist the presentation and analysis of material for the site assessment study, GIS tools, such as MapInfo and Arcview, were used. These allow the display of the transport and geographical information of the proposed development sites and cluster groups on a base map for the study area. This assisted with demonstrating the locations of development sites and cluster groups, and allowed presentation of the related transport network and data, such as bus routes or the key highway network.



3.4.2 Accession, as a public transport accessibility assessment tool, was applied to assist in accessibility assessment for the development sites, and Figure 6.1, 6.2 and 6.3 show the accessibility levels to the proposed cluster groups.

3.5 ASSESSMENT FRAMEWORK METHODOLOGY

OBJECTIVES

3.5.1 An assessment framework was developed to analyse the potential of each cluster group in transport terms. The objectives were derived from the BFBC Local Transport Plan and set down the key criteria used to evaluate the sites and site clusters. The LTP process analysed regional and national objectives and from these established a series of transport objectives which related to Bracknell Forest. This list of objectives has been adopted for the LDF assessment framework as follows:

- To continue to minimise the decline of the state of Bracknell Forest's road network
- To continue to improve road safety within Bracknell Forest
- To reduce peak hour congestion
- To provide better access to essential services by means other than the car
- To improve public transport

3.5.2 Full use has been made of the Draft Sustainability Appraisal Report in developing these objectives where a number of issues are common to transport namely:

- Access to essential facilities
- Redevelopment of the Town Centre
- Reducing congestion and journey times
- Air quality (whilst this is not strictly relevant to transport there is an inverse link between travel and air quality)

3.5.3 An overall rating score for each cluster group will be derived for each objective using a series of indicators as described below.

INDICATORS

3.5.4 Indicators were developed for each objective to assist in measuring the sustainability of each cluster site. The benefits of using indicators to assess each objective are that:

- Indicators are quantified information which identify and inform how issues affect the selected objectives.
- Indicators allow the relative importance of different components of an objective to be measured
- Indicators can be used through the scenario testing to monitor changes to particular objectives
- Indicators can be used to enable the broader issues to be distilled into a measurable figure (the measurement may be a small component of meeting the objective)

3.5.5 Indicators have been selected on the basis that they can inform the defined objectives and can be used to measure individual sites or cluster groups.



The proposed indicators have been selected for their ability to collect baseline data to examine the current and future status of each transport objective. Sufficient information will be required to inform the assessment process:

- How good / bad is the current situation, including trends over time?
- How far is the current situation from thresholds, objectives or targets?
- Are particularly sensitive or important elements of the transport network affected?
- Are the problems of a large or small scale, reversible or irreversible, permanent or temporary, direct or indirect?
- How difficult would it be to offset or remedy any impact?
- Have there been significant cumulative or synergistic effects over time? Are there expected to be such effects in the future?

3.5.7 The maintenance objective, which is *"to continue to minimise the decline in the state of Bracknell Forest's road network"*, has not been included as one of our report indicators, as it is considered not to be directly a transport issue and therefore not directly relevant to this study.

3.5.8 The last objective, which is *"to improve public transport"* has not been individually included. This is because it has been covered by all the indicators as listed in Table 3.3.

3.5.9 The list of quantitative derived indicators that have been used for each objective is shown in Table 3.3.

Table 3.3 Assessment Matrix

Objective	Indicator
Congestion	Congestion Reference Flow
	Congestion Hotspots
	Road Improvements
	Accident Rates
Road Safety	Cycling Provision
	Pedestrian Provision
	Access by foot to local services
Accessibility	Physical Barriers
	Access to Town Centre
	Access to Local Centres
	Access to External Centres
	Public Transport access to Town Centre
Public Transport	Public Transport Improvements
	Utilising Existing Infrastructure
	Access to local rail stations / long distance bus services


SCORING OF INDICATORS

3.5.10 The method of scoring the indicators was the same as the one adopted from the Scoring of Options tables (taken from Sustainability report). This is in the same style and has used the same guidance {Task A3 in the ODPM guidance (2005)} followed in the other reports produced by BFBC. The consistency of scoring methodology allows the transfer of the scores for input to an overall analysis framework for assessment.

Table 3.4 Indicator Scoring

Indicator description	Score
The option will have a very positive impact on the transport objective	++
The option will have a slightly positive impact on the transport objective	+
The option will have a negligible or neutral impact on the transport objective. A recorded neutral effect does not necessarily mean there will be no effect at the project level, but shows that at this strategic level there are no identifiable effects.	0
The option will have a slightly negative impact on the transport objective	-
The option will have a very negative impact on the transport objective	--
The outcome of the option could be dependant upon implementation or more detail is required to make an assessment	i
The impact of an issue cannot be predicted at this stage	?

3.5.11 Alongside each score there is space for commentary which, where necessary, allows an explanation and justify the reasoning behind it. These comments help guide mitigation measures in the next stages of the transport study.



3.5.12 The transport objectives have not been ranked in a hierarchy of importance but simply allow each objective to be represented. However, the objectives do not necessarily have equal weighting

EXAMINING AND REFINING SCORES

3.5.13 Following on from the scoring, the result has been examined as set out. Certain transport issues are of particular significance in the Borough and therefore have been highlighted. Professional judgment has been used to gauge some of the indicators with a weighting applied to balance the distortion of trends from the double counting or other distortions that can occur with certain indicator factors.

TOTAL SCORES BY SITE AND OBJECTIVE

3.5.14 These totals are obtained by 'adding up' of the numbers of + and – will not necessarily signify a preference of one option over another. There may be both a positive and negative impact on the objective, so this has been shown as + / -. A cumulative impact has not been shown (i.e. 0) because this could mask important negative impacts which could be enhanced by mitigation.

3.5.15 The scores are detailed in Appendix A. The scores were totalled to give the site's overall transport index.

ASSUMPTIONS

3.5.16 The assumptions made in deriving each indicator will be fully explained at the scenario report stage. It is assumed that data and information supplied by BFBC and other reliable sources and external agencies are correct. Whilst options are tested using the assumption that only one policy is being implemented, in reality it will be a package of measures with interactions between them.

3.6 METHODOLOGY FOR TESTING THE ASSESSMENT FRAMEWORK

3.6.1 Having established the above framework and scoring process, a structured process for testing this framework is required. This is achieved by the following:

- Development of 2006 Baseline covering highway and sustainable modes networks
- 2026 Base again covering highway and sustainable modes networks, but accommodating known changes due to committed developments, LTP measures and town centre regeneration measures
- 2026 Base with scenario tests. This allowed the assessment of corridors with public transport or highway improvements to identify how a given cluster of sites could be delivered.

2006 BASELINE

3.6.2 Information describing the transport baseline provides the basis for predicting and monitoring of transport accessibility and traffic impacts. Measures to mitigate these impacts can also be considered with prospective funding being realised from the development site cluster groups through the S106 process.

3.6.3 The baseline network endeavours to acknowledge existing pressures on the transport system. The subsequent task will be to consider scenarios which will identify future trends and potential enhancements that can be realised through the development process.



3.6.4 This transport analysis framework targets a list of indicators and baseline data. However, this can be modified to take into account additional information that may be obtained from traffic evaluation techniques employed later in the development process. For instance information from a transport model (highlighted in the Local Transport Plan) may become available as the plan develops.

3.6.5 Local transport/traffic data is presented in this report. Anticipated changes in the data due to aspirations in national, regional and transport plan policies has been identified and will be developed further at the scenario stage.

3.6.6 Information obtained from other documents has been employed; particularly the information contained within the sustainability and accessibility reports. Also there is additional account given to the spatial report (A Draft Spatial Framework for 2026) with analysis of the Borough in the transport context with an explanation of any figures and data given.

3.6.7 Baseline Data provides the indicators and data relevant to the Core Strategy and Site Allocations documents. It also draws attention to “hot spots” in the transport network which need to be addressed by the development of a targeted improvement and monitoring programme.

3.7 DEFINING THE URBAN CENTRES

3.7.1 A key element in the analysis of the cluster groups was the assessment of accessibility to urban centres. For clarity a series of assumptions were made to define the key centres to which people in Bracknell Forest are more likely to travel.

Table 3.5: Key Centres

Description	Areas
Local Centres	Binfield, North Ascot, Crowthorne, Sandhurst Winkfield, Warfield, Chavey Down, Newell Green
External Centre	Camberley, Reading, Wokingham, Farnborough, Maidenhead, Slough, London, Heathrow, Staines, Ascot, Bagshot

The local centres above include the major settlement areas, Sandhurst, Crowthorne Winkfield and Binfield, and the smaller areas North Ascot, Warfield, Chavey Down, and Newell Green.

3.7.3 In terms of the external centres, the areas including London, Newbury, Basingstoke, Guildford and Southampton have been considered as the major centres. However, the Government’s accessibility modelling package, Accession, defaults to assign the nearest destination, which means, for example, any trips to Basingstoke will go to Reading instead. Therefore, the list of external centres was narrowed down to the key centres in the vicinity of Bracknell Forest shown in Table 3.5.



4 Baseline Network 2006

4.1 HIGHWAY NETWORK

4.1.1 Travel on the road network is the key method of transport within Bracknell and by far the most significant mode of travel on the road network is by car. This section will look at the methodology used to assess the sustainability of the development clusters in terms of the impact on the highway network. As a starting point a base-line has been developed which looks at developing key indicators on which the performance of the highway network can be assessed. This baseline will then be updated during the scenario testing process so that the impact of traffic growth and also the potential impact of the development clusters can be assessed and potential mitigating measures can be considered.

METHODOLOGY

4.1.2 In order to assess the feasibility of each of the cluster sites, a baseline transport network was developed. This took key elements of existing data and combined them to provide a representation of the current situation of the highway network in Bracknell. Data that will feed into this process was:

- Traffic Flows
 - AM Peak - a measure of traffic flow in the morning peak, from 8am to 9am
 - AADT - Average Annual Daily Traffic is a measure of the yearly average 24 hour traffic flow at a location for all days of the week. It is a useful measure as it smoothes out variations in traffic flow from month to month
 - AAWT - Average Annual Weekday Traffic is a similar measure to AADT except that excludes data obtained at the weekend. This is because traffic flow profiles differ between a weekday and a weekend
- Journey Times from cluster group to town centre

JOURNEY TIME ANALYSIS

4.1.3 Journey times can be calculated for car and bus journeys between each cluster and the town centre. This information can be used to estimate modal choice between each cluster and the town centre. However, following a review of the accessibility scoring matrix, modal choice has been removed from the matrix. The reason for its removal is that it is felt that other indicators on the matrix sufficiently inform whether public transport would be encouraged and/or be attractive. Including a score solely for modal choice would effectively result in 'double counting'.

4.1.4 The removal of the modal choice indicator means that comparing journey times between car and bus is no longer necessary.

SATURATION FLOW ANALYSIS

4.1.5 **Data source** – Bracknell Town Centre Regeneration Assessment

4.1.6 Saturation flow analysis on links has been used to analyse potential future problems on the Bracknell road network. Percentage saturation figures (demand/capacity) have been calculated using figures from the Bracknell Town Centre Regeneration Assessment.

4.1.7 No figures have been presented for the 2006 network. Saturation figures for the 2026 network are shown in Figure 13.

BASELINE YEAR TRAFFIC FLOWS

Data source – Bracknell Town Centre Regeneration assessment

4.1.8 Figures from the Bracknell Regeneration Assessment have been used in the absence of any other data being available. For scenario testing, in the absence of a traffic model to test the impact of each of the clusters, work already carried out for the Bracknell Regeneration Assessment will be used to assess the future year traffic. The baseline data for the AM Peak is shown in the table below and also contained in Figure 9

Table 4.2 Cluster Route Traffic Flow

Site	AM Peak Flow (veh/h)
1	1849
2	1097
3	3053
4	1441
5	1532
6	4852
7	3544
8	4025
9	802
10	3105
11	5358
12	1931
13	1508
14	824
15	3559
16	1653
17	1531
18	822
19	237
20	867
21	1762
22	2347

CONGESTION HOTSPOTS

Data Source – local knowledge

4.1.9 Congestion hotspots have been identified on routes from each of the clusters to the Town Centre. This review has identified specific routes which show up as potential problems due to congestion. Local knowledge has been used to identify potential problem junctions. The number / severity of congestion hotspots that a route from a specific cluster to the town centre contains has been used to score each cluster in the scoring matrix.

HIGHWAY IMPROVEMENTS

4.1.10 **Data source** – Bracknell Forest LTP, Bracknell Regeneration Assessment

4.1.11 In order to assess the operation of the highway network in the future, any further improvements need to be accounted for. Future year road schemes were investigated to see what impact they may have on the road network. A list of schemes was obtained from the BFBC LTP and the work carried out on the Bracknell Regeneration Partnership. These are shown in the table below and diagrammatically in Figure 7.2.

Table 4.3 Location of Transport Improvements

Schemes Identified in Bracknell Regeneration Partnership: Transport Assessment (Figure 7-1)
Junction 23 Horse & Groom Roundabout
Junction 25 Leisure Centre Roundabout
Junction 30 Coral Reef Roundabout
Junction 31 Swinley Bottom Gyratory
Junction 20 Twin Bridges
Junction 18 Proposed Peacock Farm Roundabout
Junction 19 Doncastle Way Roundabout
Junction 02 John Nike Way Roundabout
Junction 33 Maidenhead Road / Forest Road
Junction 34 Newell Green/Forest Road / Warfield Street / Osborne Lane
Junction 11 Running Horse Roundabout
Junction 12 Renault Garage Roundabout
3M Roundabout
Met Office Roundabout
Church Road Junction
Station Roundabout
Market Street
Southern Ring / Western Ring / Station R
Princess Square Car Park Access
Southern Ring Pelican Crossing
High Street Car Park Egress to Market Street & Market Street Pelican
Market Street / Skimpedhill Lane / Bus Station
Additional Schemes Identified in the LTP (Figure 7-2)
A329/A322 corridor –Wokingham boundary to the Surrey boundary
A3095 corridor from the A30 to the A329 in Bracknell
A332 from Swinley to the Windsor and Maidenhead boundary



4.2 BASELINE PUBLIC TRANSPORT NETWORK

4.2.1 The bus is the main mode of public of transport within Bracknell Forest. The majority of services are focused towards Bracknell town centre and are run by First. Figure 4 shows both frequent and less frequent bus services that run through Bracknell Forest, as well as the location of train stations.

RAIL

4.2.2 Figure 4 also shows the location of four train stations within Bracknell Forest. Bracknell and Martin's Heron are on the Reading to London Waterloo main line. Sandhurst and Crowthorne are on the Reading to Gatwick Airport service. Both lines converge at Wokingham, to the west of Bracknell.

4.2.3 Martin's Heron is only 2km away from Bracknell station. Four trains an hour run between the two stations in each direction during the peak times and two or three trains an hour during the inter-peak. In the current situation it is likely most people would choose to use the bus between Martin's Heron and Bracknell.

4.2.4 In order to travel by train from Sandhurst and Crowthorne to Bracknell passengers have to interchange at Wokingham. The need to change between trains, in the current situation, makes the bus a more attractive public transport option between the two towns. These factors explain why bus is the predominant public transport mode in Bracknell Forest.

BUS

4.2.5 Frequent bus services in the Bracknell area are branded as 'Overground' services. Each service has a unique colour livery and generally run every 20 to 30 minutes. These services mainly operate within the Bracknell urban area, with the exception of service 190 that runs to Reading and service 194 that runs to Camberley. These services are shown in Yellow on Figure 4.

4.2.6 Less frequent bus services are not branded and are mainly town-to-town services serving more rural destinations. These services generally run every 1 to 2 hours and serve destinations outside the Bracknell Forest Boundary such as Maidenhead, Ascot and Slough. These services are shown in Blue on Figure 4.

4.3 BASE LINE PEDESTRIAN AND CYCLE NETWORK

4.3.1 Bracknell has a well developed network of footways and cycleways. The cycle network, which includes a number of shared footpath/cycleways, is shown in Figure 4. This network is concentrated around the Bracknell urban area, but does extend to cover Crowthorne and Sandhurst.

4.3.2 National Planning Policy Guidance (PPG) 13 states that walking should be encouraged for journeys less than 2km and cycling should be encouraged for journeys less than 5km.

4.3.3 The table below indicates which sites are within 2km and which sites are within 5km of Bracknell's Town Centre. Site cluster groups 1-4, 14-16 and 18 are more than 5km away from Bracknell Town Centre.

4.3.4 The closest site cluster groups to Bracknell Town Centre are 11, 12, 19 and 20. All four of these site cluster groups are within 2km of the town centre and walking could be encouraged between the site cluster groups and Bracknell's Town Centre.



Table 4.4: Current Footway/Cycleway Provision to Development Cluster groups and Distance to Bracknell Town Centre

Cluster group Number	Within 2km of Bracknell Town Centre	Within 5km of Bracknell Town Centre
1		
2		
3		
4		
5		
6		✓
7		✓
8		✓
9		✓
10		✓
11	✓	✓
12		✓
13		✓
14		✓
15		
16		
17		✓
18		
19	✓	✓
20	✓	✓



5 Base Network 2026

5.1 INTRODUCTION

5.1.1 In order to assess the feasibility of each of the cluster site groups, a base transport network has been developed. This takes key elements of existing data and combines them to provide a representation of the 2026 base situation of the transport network serving Bracknell.

5.2 BASELINE TO BASE 2026 METHODOLOGY

5.2.1 In order to evaluate the scenarios, initially the 2026 base has to be established. The steps required to make the transition from the 2006 baseline to the 2026 base are as follows:

- The transport network baseline has been established which defines each modal network at the baseline of 2006. This was then used to project to a 2026 base by using growth and known changes that will occur due to the improvements identified in:
 - The Town Centre Redevelopment
 - LTP Transport Improvements
 - Accordance with policy objectives
- The assumptions made in evaluating trends which cause the change from the 2006 baseline are clearly set out so that they can be examined for their reality.
- In order to align the transport networks (road, public transport, pedestrian and cycle) into one combined base which can be used to measure the accessibility to the town centre, it is important to understand and define the relationship that each network has on each other. For instance congestion at road junctions will both affect the highway network and will impact on bus travel time.

5.3 HIGHWAY NETWORK

BASE HIGHWAY NETWORK 2026

5.3.1 This section details the work carried out in order to generate a base case situation in 2026. This base provides the input data required to assess the indicators developed in 2026. A starting point of 2006 has already been developed and this will be used as a starting point to generate the 2026 scenario.

5.3.2 In the Bracknell Regeneration Assessment report, 2026 traffic flows are calculated; these are displayed in Table 5.1 below. They are shown diagrammatically in figure 12.

Table 5.1 Traffic Flow in 2026

Site	AM Peak Flow (veh/hr)	% Growth from 2006
1	2309	25
2	1370	25
3	3469	14
4	1624	13
5	1782	16
6	5868	21
7	3731	5
8	5084	26
9	941	17
10	3739	20
11	5161	-4
12	2205	14
13	1827	21
14	986	20
15	3972	12
16	3680	23
17	2052	34
18	1179	43
19	347	46
20	1188	37
21	1617	-8
22	2971	27

5.3.3 It is possible to see that overall the traffic flows grow by 25% in the 20 years from 2006 to 2026. Also it is important to note that due to reassignment assumptions made in the Bracknell Regeneration Assessment Report, some of the traffic flows actually decrease in 2026. This is a limitation of the spreadsheet model used as in reality reassignment to the less trafficked route or trip previously suppressed would fill any reduction in trips.

5.3.4 Growth in traffic flows has been applied using the same assumptions as set out in the Bracknell Town Centre Regeneration assessment. In Chapter 5 of Transport Assessment the methodology for calculating the traffic growth has been set out. The main driver for growth is the increase in shopping trips to Bracknell Town Centre following the regeneration of the shopping area. Potential demand for additional developments within the town centre has been incorporated, along with traffic growth in external areas (taken from the TVMMS model).

5.3.5 The growth in traffic flows does not take account of progress that would have been made towards the LDF targets for housing provision by 2026. For this reason these flows can be used for the 2026 'without development' base network.



CONGESTION HOTSPOTS

5.3.6 The following hotspots have been identified in consultation with BFBC:

- Major junctions around Bracknell Town Centre
- The A322 / A329 Corridor
- The A329 London Road
- A3095 Blackwater Valley to Twin Bridges roundabout

5.3.7 When assessing the viability of the LDF sites, allowance will be made in the scoring of the indicators if the trips generated would have to travel through these routes. However, some of these congestion problems will be mitigated in 2026 by Bracknell Town Centre Regeneration improvements.

ACCIDENT ANALYSIS

5.3.8 In order to assess the suitability of each LDF cluster, the number of accidents on each of the key road network corridors has been looked at. If a particular route has a poor accident record, it will score negatively in the indicator assessment.

SATURATION FLOW ANALYSIS

5.3.9 In order to gain a thorough understanding of the implications of proposed development on the existing highway network within Bracknell, it is first necessary to identify the existing situation. In understanding the existing capacity of the road network and the current traffic levels that are experienced along key links within the network, it is possible to assimilate the effects of the development and therefore to identify where issues are arising.

5.3.10 A series of links within the existing highway network have been identified which connect the identified clusters with Bracknell town centre. These links are shown in Figure 13.

5.3.11 Figure 12.5 of the Buchanan 'Bracknell Town Centre Regeneration' report (2004) enabled the identification of the two-way saturation along each of these links. In addition, it was also possible to specifically identify the busiest section along each link. With this information established, it was possible to extract the two-way flows for the identified links from Table 12.2 of the same report. Using guidance from DMRB Volume 5, Section 1, 58.4% was applied to the two-way flow figures to obtain the existing one-way flow along each link.

5.3.12 One-way Capacity on each link has again been taken from Table 12.2 of the same report. Where only two way capacities were available these were divided by 2 to obtain one-way capacities. Capacities have been checked against those quoted in Capacity on Urban Links, DfT to assure that they appear realistic.

5.3.13 The maximum existing saturation flow has been calculated using the data for existing flow and maximum capacity. The resultant figures are shown in Figure 13. The maximum saturation provides a clear understanding of the level of spare capacity, if any, which is available along each link to absorb development traffic.



5.4 PUBLIC TRANSPORT 2026 NETWORK DEVELOPMENT

BUS

5.4.1 The bus services using these highway networks are similarly affected with resultant delay in predicted arrival times during peak hours.

5.4.2 The 2026 base includes improvements to bus frequency, bus priority measures and other investments identified through both the LTP process and the re-development of Bracknell's Town Centre. Improvements proposed include doubling the frequency of all the town's bus services. However, this will not advantage one cluster site over any of the others. The 2026 base is discussed in more detail in the next section

5.4.3 To overcome delay to bus services provision of dedicated bus lanes or the provision of High Occupancy Vehicle (HOV) lanes can be provided. A new bus lane will be provided on the Bagshot Road A320 in conjunction with the Town Centre Redevelopment requirements. Similarly a new bus lane from Peacock Farm past the Southern Industrial Area and Wildridings to town centre is provided at the Peacock Lane Park and Ride facility and these are included on the 2026 Base.

RAIL

5.4.4 Rail is not the main public transport mode for accessing Bracknell Town Centre. Therefore, any improvements planned by Network Rail or any future holder of the South West Trains franchise will not have a significant and direct impact on the ranking of the sites.

PUBLIC TRANSPORT NETWORK

5.4.5 The 2026 Public Transport Network was developed in Accession using assumptions from the Bracknell Town Regeneration report. The following assumptions were used:

- All bus frequencies double by 2026
- A new Park and Ride site at Peacock Farm comes online with a frequency in the AM peak of 1 bus every 10 minutes
- A bus corridor is developed on the Bagshot Road increasing the frequency of buses to 1 bus every 15 minutes.

The results of these changes can be seen in Table 5.2 below:

Table 5.2 Journey Time to Bracknell Town Centres in 2006 & 2026 by Public Transport

Cluster	Average distance to town centre (km)	Average Journey Time to town centre by bus 2006 (mins)	Average Journey Time to town centre by bus 2026 (mins)
1	11	40	40
2	12.4	40	40
3	9.9	40	40
4	8.4	30	30
5	7.5	30	25
6	2.8	15	15
7	3.7	20	20
8	4	20	15
9	3.8	15	15
10	2.9	15	10
11	2	10	5
12	2.5	15	15
13	3.1	15	15
14	4.9	25	25
15	8.4	40	40
16	7	30	25
17	3.8	20	20
18	5.7	40	40
19	less than 1	5	5
20	1.3	5	5

5.4.6 The Accession isochronal map can be found in Figure 6.1 which shows visually the travel time to Bracknell town centre.

5.5 PEDESTRIAN AND CYCLE 2026 NETWORK DEVELOPMENT

5.5.1 It is not envisaged that any major improvements are made to the existing cycle and pedestrian network. Each individual site will include measures to connect it to the existing cycle and pedestrian network. Those sites that will be scored higher will be those close to the Town Centre, local centres and/or external centres. This is because the closer a site is to these centres the more likely that residents will walk or cycle.



6 Cluster Group Ranking

6.1 INTRODUCTION

6.1.1 This section explains how each indicator has been applied to the 20 possible clusters of development in Bracknell. The section also presents the order by which the clusters have been ranked once also indicator scores have been calculated. The Appraisal Indicators and Matrix are presented in Appendix A of this report.

6.1.2 Each indicator is scored between -2 points to +2 points. -2 is the equivalent to '- -' and +2 is equivalent to '+ +' as used in the ODPM guidance. The range from -2 to +2 has been used as it means a total score for each cluster can be calculated, by adding together the scores for individual indicators.

6.2 APPLICATION OF INDICATORS

CONGESTION

Congestion Reference Flow

6.2.1 The saturation flows on the links have been analysed. The methodology behind this analysis is discussed in more detail in the previous section (5). Congestion is high on most routes into Bracknell. The two corridors that experienced the highest levels of congestion were the A3095 southbound towards the town centre and the A3095 northbound, again, towards the town centre. In the scoring system any clusters that rely on these two corridors to access the town centre have been scored -2 points. All other clusters are scored equally 0 points.

Congestion Hotspots

6.2.2 A number of congestion hotspots have been identified. These were selected following consultation with Bracknell Forest Council officers. The hotspots that were selected are as follows:

- The A322/A329 Corridor
- A329 London Rd
- A3095 Blackwater Valley

6.2.3 Any cluster that is connected to the town centre via a route that passes through a hotspot has been scored -1 point. Clusters that are connected to the town centre via a route that does not pass a hotspot are scored 2 points.

Road Improvements

6.2.4 A series of junction improvements were proposed in the Bracknell Town Centre Regeneration Environmental Statement (November 2004) for the roads surrounding the town centre. These are listed in Table 6.1 below.

Table 6.1: Identification of Major Junction Improvements

Junction Numbers as shown on Figure 7.1	Description of Improvement
2 - Major	Realignment and enlargement of existing roundabout and additional approach lanes
18	Partial signalisation of roundabout provided by others
19	Signalisation of existing roundabout
20 - Major	New fly through to A329 Berkshire Way/ Downshire Way; Capacity improvements to circulating carriageway
33	addition of right turn lane to B3034 Forest Road
34	Signalisation and provision of right turn lane
11	widening of approaches to roundabout
12	widening of approaches to roundabout
23	Approaches widened and signalised with bus priority
25	Partial signalisation and spiral markings
30	Signalisation of approaches
31	Additional lane to A322 Bagshot Road (North) approach and circulating carriageway

6.2.5 Clusters are scored positively if they benefit from these junction improvements. If a cluster is connected to the town centre via a route through one of more junction improvements it is scored 1 point. If a cluster is connected to the town centre via a route through one of the two major junction improvements, identified in Table above, it is scored 2 points.

ROAD SAFETY

Accident Rates

6.2.6 The total accident cost per 100 million vehicle kms has been calculated for the route between each cluster and the town centre. This is done by multiplying the accident rates for fatal, severe and slight accidents by cost associated with each accident. Costs per accident type are taken from the COBA Design Manual, DfT.

6.2.7 The accident rate indicator was scored as follows:

Table 6.2 Accident Rate Scoring

Accident Cost per 100 million vehicle kms	Score
£0 - 500,000	- 2 points
£500,000 - £1,000,000	- 1 point
£1,000,000 - £1,500,000	0 points
£1,500,000 - £2,000,000	+ 1 point
£2,000,000 +	+ 2 points



Cycling and Pedestrian Provision

6.2.8 A review was carried out of the cycle and pedestrian network in the Bracknell area. Clusters that sit within the cycle and pedestrian network score 2 points. Those clusters that are on the edge of the cycle and pedestrian network score 1 point. Clusters that are away from the cycle and pedestrian network score -2 points.

ACCESSIBILITY

Access by foot to local centres

6.2.9 An assessment of accessibility to local centres from all potential development sites was carried out in the Bracknell Forest Draft Sustainability Report. Scoring in the Draft Sustainability Report is similar to the scoring used in this report, in that it ranges from -2 to 2 points. Accessibility to local centres from each potential development site was scored as follows:

6.2.10 Journeys by foot to local centres take:

- 0-10 mins = 2 points
- 10-20 mins = 1 point
- 20-30 mins = 0 points
- 30-40 mins = -1 point
- 40 mins = -2 points

6.2.11 Scores for each of the 20 clusters have been calculated by averaging the scores of potential development sites in each cluster.

Physical Barriers

6.2.12 A review was undertaken to identify the existence of physical barriers. For clusters where a physical barrier restricts movement between the cluster and the town centre a -2 point score was given. For clusters where no physical barrier exists a 2 point score was awarded.

Access to Town Centre

6.2.13 The network of frequent and less frequent bus services has been reviewed along with distance between the cluster and the town centre and cycle and pedestrian provision. Clusters have been scored in the following manner:



Table 6.3: Access to Town Centre Scoring

Characteristic	Score
The site is more than 5km from the town centre	- 2 points
The site is 2-5km from the town centre and public transport, walking and cycling provision is poor	- 1 point
The site is 2-5km from the town centre and public transport, walking and cycling provision is good	0 points
The site is less than 2km from the town centre, but public transport, walking and cycling provision is poor	+1 point
The site is less than 2km from the town centre and public transport, walking and cycling provision is good	+2 points

Access to External Centre (Half Weighted)

6.2.14 A similar review to that carried out on access to town centres was conducted for access to external centres. The external centres considered were as follows:

- Wokingham
- Camberley
- Ascot

6.2.15 It is considered that having good access to external centres is not as beneficial or sustainable as having good access to Bracknell town centre. For this reason scoring for access to external centres has been 'half-weighted'.

PUBLIC TRANSPORT

Public Transport access to Town Centre

6.2.16 The network of frequent and less frequent bus services was reviewed, along with distance to Town Centre to determine the level of public transport provision to the town centre. The clusters were scored as follows:

- Public Transport is poor and the site is more than 5 km from the town centre = -2 points
- Public Transport is poor, but the site is less than 5km from the town centre = -1 point
- Public Transport is good, but more than 5km from the town centre = 1 point
- Public Transport is good, and the site is less than 5km from the town centre = 2 points

Public Transport Improvements

6.2.17 Each cluster has been scored to reflect how well it would support improvements to public transport. An assumption has been made that 500 households are required to support 1 extra bus and that 1 extra bus is required for each additional 2km away from the frequent bus network.



6.2.18 Those clusters that are already on the frequent bus network or that can support an extension to the frequent bus network are scored 2 points. Those clusters that are away from the frequent bus network that cannot support an extension to the frequent bus network are scored -2 points.

LTP Public Transport Improvements

6.2.19 One LTP Public Transport improvement scheme has been identified. This improvement scheme is the Bagshot Rd Bus Lane. Cluster 6 benefits most from this public transport improvement and is scored 2 points. Cluster 20 partly benefits and is scored 1 point. All other clusters are scored 0 points.

Proximity to Rail Station

6.2.20 Clusters have been scored 1 point if they are within 800m of one of the smaller stations in Bracknell, namely Martins Heron, Crowthorne and Sandhurst. For clusters that are within 800m of Bracknell's main station 2 points are awarded.

Proximity to Long Distance Bus Routes

6.2.21 Bus route 700 passes connects clusters 17, 19 and 20 to Central London. Cluster 19 has been awarded 2 points as the bus route runs through the middle of this cluster. The bus route serves clusters 17 and 20 less well and so these clusters have been scored 0 points. All other clusters have been scored -2 points.

6.3 RESULTING RANKING OF CLUSTERS

6.3.1 Each cluster has been scored against all the indicators listed above. The total score for each cluster has been calculated. The final score for each cluster is presented in Table 6.3 below and the scoring for each cluster against each indicator is presented in Appendix A.

6.3.2 The clusters are presented in the order of their total score. In addition, the clusters are grouped into five bands. Clusters can either be picked by running down the list in order or picking a site from the relevant band, as each band contains sites or similar characteristics.

6.3.3 A number of sensitivity tests are conducted in the next section (7) to assess the effect on the network of developing different groups of clusters on the highway network.

Table 6.4: Ranking of Cluster Groups

Bands	Cluster Number	Cluster Size (Number of Households)	Total Score
Band 1 Most favourable Score greater than 12	20	863	16.0
	19	1885	14.0
Band 2 Score greater than 6 to 12	10	456	11.5
	11	732	10.5
	8	2581	7.5
Band 3 Score greater than 0 to 6	6	117	6.0
	12	2518	6.0
	7	1300	4.5
	9	3843	4.5
	2	425	1.0
	4	186	1.0
Band 4 Score less than 0 to -6	5	2565	-2.5
	17	6390	-2.5
	13	416	-3.0
	1	42	-5.0
	14	9	-5.5
	16	682	-5.5
Band 5 Least favourable sites Score less than -6	15	1059	-6.5
	3	194	-8.0
	18	297	-12.5



7 Framework Sensitivity Testing

7.1 OVERVIEW

7.1.1 This chapter explains what impact different groupings of clusters have on the network. In chapter 3 the process intended for examining the site clusters was explained and Table 3.1 set out the process.

7.1.2 The process provides a ranked list of scores which have been determined from the indicators. The ranked list of sites produced by the framework is the preferred option from the transport objective perspective.

7.1.3 It is understood that the transport perspective is only one of the many views to be taken of the LDF allocation. Other considerations, for instance, planning; environmental and social inclusion will be taken into account and a framework for the massed LDF objectives can be prepared. The scores from the transport matrix can be fed into the overall framework. The overall framework mechanism can then be applied and the ranked list of cluster or individual sites can be undertaken.

7.1.4 Once this has been carried out and the ranked list from the massed LDF objectives obtained, the requisite number of dwellings can be selected from the top bands of the cluster list to provide the housing allocation.

7.1.5 The impact of the increased travel needs associated with the new dwellings and gauged in terms of the impact of trips on the network, will increase the ratio of flow versus capacity on each link.

7.1.6 Figure 13 shows the existing saturation flows for the network. There are different figures from those shown in the Buchanan Town centre redevelopment report because they have taken into account the tidal flow direction of the traffic which is predominantly higher toward the town centre in the morning peak hour and away from the town centre in the evening peak hour. In this review of the figures it is identified that a number of corridors will be approaching or above the theoretical maximum capacity for the 2026 base year.

SENSITIVITY TESTS

7.1.7 Sensitivity tests can be used as a way of developing alternative demonstrations of potential results based on different cluster grouping to provide an understanding of the impacts on the transport network. By comparing the alternative results an understanding of the variety of transport impact can be gained.

7.1.8 The three sensitivity tests carried out are as follows:

- Test 1 - Top Ranking Sites - The impact of developing all top ranking clusters is observed.



- Test 2 – All on One Corridor - A selection of top ranking clusters have been made that concentrate development on one particular corridor. The corridor which had the most top ranking sites was that to the North West of the town centre. This corridor includes links 4, 5, 6 and 7. The aim of Test 2 is to utilise synergy to give highest trip densities.
- Test 3 – Distributed across Corridors - The aim of Test 3 is to balance impact on the highway network. A number of corridors are already over 100% saturation. Test 2 has picked certain clusters in a way that does not increase saturation flows on any further corridors above 100%.

7.2 CORRIDOR APPROACH

7.2.1 A broad corridor approach has been defined which divides the routes accessing Bracknell town centre into five corridors. These corridors are illustrated in Figure 11.

7.2.2 These corridors could then be evaluated for stress in the 2026 Base in the “without development” and “with development” scenarios either individually or in a combination of corridors.

7.3 HOUSING ALLOCATION

7.3.1 The proposed housing allocation for the Bracknell Forest area is shown in table 7.1 below. During the sensitivity testing allocations total 10,000, which is 780 less than the 10,780 figure in Table 7.1. The reason for this is that it is assumed that a small number of housing developments would occur alongside those proposed in each sensitivity test.

Table 7.1 Housing Requirement across Four Plan Periods¹

Plan Period	Housing Requirement
<i>2001-2006</i>	<i>1950 not included</i>
2006-2011	2695
2011-2016	2695
2016-2026	5390
Total 2006-2026	10780

7.4 METHODOLOGY FOR CALCULATING FUTURE TRIP RATES

7.4.1 A methodology has been devised in order to estimate the number of trips each cluster will generate on the highway network. This information will be then used to determine whether any links become over saturated as a result of clusters being developed.

¹ Draft Approach to the Delivery of the Spatial Framework for Bracknell Forest Page 25



Proposed Trip Rates

7.4.2 Analysis of the estimated vehicle trip rates for each identified cluster has been carried out utilising data from the TRICS database. This uses actual trip data from existing developments which are selected based on comparable characteristics, including size and regional locality, to the identified clusters. A figure of 0.41 vehicle trips per household has been used for the AM Peak (8-9am). This figure is taken from 'houses privately owned' survey category as this was the highest trip rate from the categories available.

7.4.3 This trip rate has been applied to the development sizes in order to establish the likely number of vehicle trips in the AM Peak from each of the identified clusters.

7.4.4 Origin / Destination Journey to Work Analysis

7.4.5 It was considered that the earlier assumption that 70% of all development trips would travel towards Bracknell town centre required strengthening with firm data. In order to do this an analysis of the Census 2001 origin / destination journey to work data was undertaken.

7.4.6 The origin ward for each cluster was identified which enabled all destination data from that specific ward to be extracted from the Census database. The Census data lists all journeys to work that currently originate from a specific ward. For each of these journeys an assumption is made as to what route out of Bracknell would be taken. For example, trips to destinations accessed by the M3, such as Basingstoke, from Cluster 2 (located to the south of Bracknell town centre) would travel south, away from the centre.

7.4.7 In undertaking this process it was possible to establish the proportion of trips from each cluster that would be travelling towards and away from the town centre and therefore providing a more robust assumption as to the impact of trips on each of the identified links.

7.4.8 The proportion of trips in 2001 is assumed not to change in 2026. With the regeneration of the town centre a change would be probable. A factor to correct this could be applied but no data was available to determine the factor.

7.5 RESULTING IMPACT ON LINKS

7.5.1 This section shows the impact on links of each of the three sensitivity tests. These are presented in the tables below, in full in Appendix B and graphically in figures 14, 15 and 16.

7.5.2 In the first test the effect of developing those clusters that were ranked highest is investigated. Table 7.2 shows that 3 links (4, 5 and 6) would change from having capacity to being over capacity, by 109 – 126%. In addition, the first test increases saturation on link 1 which is already 163% saturated.

Table 7.2 Impact on Links: Test 1 - Top Ranking Sites

Link	Description	Existing Saturation	Future Saturation
1	A3095 Southbound towards Town Centre	163%	187%
3	B3018 Southbound towards Town Centre	34%	47%
4	B3048 Eastbound towards Town Centre	98%	126%
5		91%	113%
6		93%	109%
7	A329 Eastbound towards Town Centre	73%	84%
15	A322 Northbound towards Town Centre	66%	67%

Note: No Capacity data available for link 3. Capacity on link 3 taken as similar to link 4 (both B road urban single carriageways)

7.5.3 A number of transport corridors have been identified and are presented in Figure 11. The second test concentrates development around one corridor. The corridor chosen is the north west corridor, as a number of high scoring clusters are located on this corridor. The first test showed that links 4, 5, and 6 (which are located in the north west corridor) become saturated when clusters in the north west corridor are developed. In the second test these links are again over saturated, this time by 109% - 148%. However, capacity does still exist on link 7 following development of clusters.

Table 7.3 Impact on Links: Test 2 – All on One Corridor

Link	Description	Existing Saturation	Future Saturation
4	B3048 Eastbound towards Town Centre	98%	148%
5		91%	141%
6		93%	109%
7	A329 Eastbound towards Town Centre	73%	86%



7.5.4 As has been discussed above a number of links are already over saturated. The third test was to select clusters in locations that did not result in any further links becoming over saturated. In order to do this not all of the highest ranking clusters have been used.

Table 7.4 Impact on Links: Test 3 – Distributed across Corridors

Link	Description	Existing Saturation	Future Saturation
3	B3018 Southbound towards Town Centre	34%	81%
7	A329 Eastbound towards Town Centre	73%	86%
15	A322 Northbound towards Town Centre	66%	67%

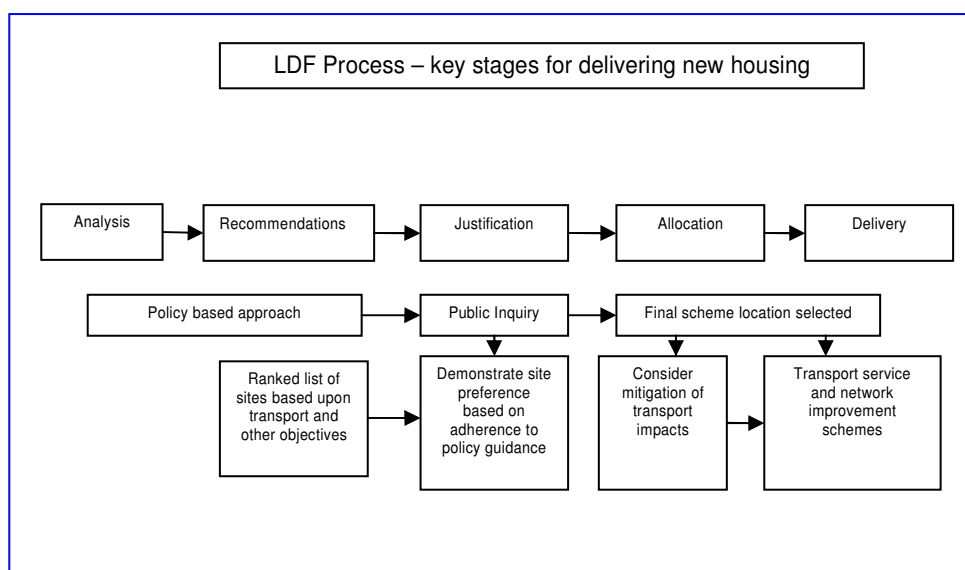
7.5.5 The third test demonstrates that it is possible to distribute development in a way that does not result in any further links becoming over saturated. However, to do this some top ranking clusters (against transport objectives) are excluded. Once the top ranking clusters against all objectives have been determined there is likely to be trade off between choosing these and not over saturating corridors.

8 Conclusion

8.1 CONTEXT

8.1.1 This report should be considered in context with the other supporting LDF documents. The objective of the process and how it is intended to be used for the delivery of future residential sites over the next twenty years is illustrated with the key stages diagram. Table 8.1 refers.

Table 8.1 Key stages for delivering new housing



8.1.2 This report outlines the policy based approach. The objective of this report was to provide a ranked list of sites from the transport perspective. The appraisal framework produced has achieved a method of residential cluster site selection based upon indicators derived from measurable transport objectives.


8.1.3 The impact of the implementation of the residential site allocation, based upon the base year transport network, has been assessed in terms of the traffic flow versus capacity. The resulting figures have shown that the majority of the highway network will be above the theoretical maximum capacity for the 2026 base year.

8.1.4 The sensitivity of the transport network to cope with alternative scenarios of development has been tested by changing the ranked list of sites from the framework. Three tests have demonstrated the variation in impact on the network that would be obtained by altering the allocations.

8.1.5 There is a balance to be considered in transport terms, between selecting sites based upon the transport objectives defined in the framework indicators, which lead to a more congested network, versus choosing less preferable sites which maintain a greater extent of the network with flows that are within its operational capacity.

8.1.6 The issue of congestion was taken into account with the indicator scores for the ranking. However at this stage, no investigation has been carried out to allow for the ability of new development to mitigate these impacts.

8.1.7 Recommendations are made for additional investigation to obtain further information and to undertake further analysis including transport modelling. A greater



understanding of the individual components making up the transport network will need to be obtained in order to evaluate the potential for works to be funded by development that mitigate the impact of additional travel demand on the safety and capacity of the transport networks.

8.1.8 The report, in terms of analysis, concludes at this point. Further work is now identified. This falls into two categories either separately or jointly;

- Further information
- Further analysis

FURTHER INFORMATION

8.2.1 The collection of baseline data was carried out and where information was not available assumptions have been made and explained. To increase the strength of the Framework it is recommended that further information is obtained.

8.2.2 To fully assess the current and future transport networks. Projections from the 2006 baseline to the 2026 base have been reliant upon the predictions contained within the Bracknell Town Centre Regeneration report. Some of the information included in the report is not substantiated with supporting documentation and is accepted in good faith. However, to ensure that the recommendations are robust preference would be to validate this information with supporting independent information.

8.3 FURTHER ANALYSIS REQUIRED

8.3.1 Further analysis is required to understand the trend in modal transfer. The improved public transport measures are intended to create a trend of increased bus use and reduced car mode of travel.

8.3.2 Variation of the trip end destinations proportions will have a significant impact on the transport corridors. One of the intentions of the Town Centre redevelopment was to draw back a significant level of traffic which currently leaves the Bracknell area. Bearing this in mind, the trip end ratio can be adjusted to create more Town Centre dominance so that the consequence of this on the transport networks can be evaluated.

8.3.3 The objective of further analysis would be to enable BFBC to make informed decisions as to which sites should be prioritised for development. Analysis may be necessary to focus upon individual site assessments; the output from which will drive impact mitigation measures against transport assessment.

MODELLING

8.3.4 No specific traffic model exists for the Bracknell area although the Bracknell Forest Borough Council LTP identifies the need for the development of a traffic model in 2006 – 2007. This study uses an assumption led methodology for looking at the highway network of Bracknell. A traffic model would make the assessment more robust. The traffic impact of the site traffic in 2026, has been based upon existing work carried out for the Bracknell Town Centre Development. Traffic flows on key links were derived from a spreadsheet based model which has significant limitations.

8.3.5 A traffic model could be used to provide a robust assessment of the forecast year with realistic traffic flows, taking into account the reassignment that would occur due to new highway schemes or increased congestion on the network. A traffic model would also highlight which junctions were operating close to or at capacity providing important information on where improvements would be needed.



TRIP DISTRIBUTION

8.3.6 Trip distribution and the travel patterns arising from new developments are far more robust when a full traffic model is used in comparison to a spreadsheet model. Each of the development site clusters could be loaded into the transport network to determine where the extra trips would travel on the network and what impact that would have. Without modelling it is difficult to assess the impact of the development traffic on the highway network as assumptions on origins and destinations had to be made which are potentially inaccurate.

TRAVEL TIME

8.3.7 Information for further study would promote the measuring of travel time. This would enable the traffic model to be validated against actual observed journey times in Bracknell. This would be a more robust method of assessing the future year network as additional congestion in the future years would be taken into account of in the travel time to the town centre.

8.3.8 The exiting information is insufficient to undertake any detailed analysis of modal shift in future years. It is therefore difficult to take account of any modal shift that may occur when looking at the suitability of each of the development clusters in transport terms. A traffic model would allow changes in journey time and distance to be taken account of in the generalised cost of travel. This would subsequently allow the possibility of calculating modal shift in the future.

TRIP ENDS

8.3.9 Currently the level of people leaving the Borough to access jobs (28,958) is approximately balanced with inbound workers (30,742). With the town centre redevelopment the employment pattern will change.

8.3.10 Route studies should be carried out in order to assess the feasibility of potential improvements that could be provided to investigate the impact of the residential development.

8.3.11 The feasibility of innovative transport options such as express bus corridors should be considered.


8.3.12 The potential impact of congestion charging should be modelled. Monitoring information should be obtained to validate the assumptions made such as traffic growth modal transfer etc.

8.4 MITIGATION

8.4.1 Mitigation refers to any approach which is aimed at avoiding, preventing, reducing or compensating for significant adverse impacts related to satisfying the additional transport demand caused by the proposed new development.

8.4.2 Mitigation in transport terms can take a variety of forms, however it is mostly reliant upon technical measures being applied prior to or during implementation. Measures such as the following can be employed;

- Network Improvements
- Junction safety and capacity improvements
- Link safety and capacity

-
- 
- Dedicated bus lanes
 - High Occupancy Vehicle Lanes
 - Variable Message Signs
 - Service improvements
 - Real Time Information and Urban Traffic Monitoring and Control to enhance Public Transport service

8.4.3 The introduction of these measures would have an impact on the safety, capacity and journey times for the network. The consequence of these impacts should be evaluated and the Framework adjusted accordingly. Some of the sites/groups of sites assessed in this analysis will be large enough to generate the need for additional facilities on, or in close proximity to the site which will greatly improve their accessibility. The analysis undertaken here has not built into the calculation.

8.5 CONCLUSIONS

8.5.1 A List of sites and framework has been delivered. Based upon this further work is required and WSP recommend that further information and analysis is undertaken.

8.5.2 A framework for the massed LDF objectives can be prepared. The scores from the transport matrix can be fed into the overall framework. The overall framework mechanism can then be applied and the ranked list of cluster or individual sites can be obtained.

8.5.3 Once this has been carried out and the ranked list from the massed LDF objectives obtained, the requisite number of dwellings can be selected from the top bands of the cluster list to provide the housing allocation.

8.5.4 The impact of the increased travel needs associated with the new dwellings and gauged in terms of the impact of trips on the network needs to be assessed.

8.5.5 It is recommended additional study is undertaken to obtain further information and further analysis including transport modelling. A greater understanding of the individual components making up the transport network will need to be obtained in order to evaluate the potential for works to mitigate the impact of additional travel demand on the safety and capacity of the transport networks.

Appendices, Figures & Tables

Appendices

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- B. Route Saturation Calculations

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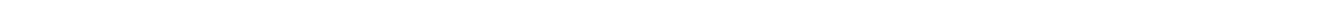


Appendix A Appraisal Indicators and Matrix





Appendix B Route Saturation Calculations





Figures

