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Broxbourne Sustainable Transport Study

Report for Borough of Broxbourne

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Summary

Travel patterns in the Borough of Broxbourne are influenced by a range of factors including its proximity to London and the M25; the A10 provides the main road access and there are frequent rail services. Much of the transport activity is aligned north-south in the London to Cambridge corridor with east-west journeys being comparatively difficult. There is evidence of high levels of car ownership and use and relatively poor rates of walking, cycling and bus use. Hence at present the Borough does not demonstrate sustainable transport activity.

Land uses are changing and expected growth means that the pressures on the established transport networks will increase. In locating new development, consideration on how sites are accessed is fundamental to avoid worsening journey lengths and car dependency. The Borough of Broxbourne will need to adopt a more sustainable approach to transport which will require not only a strong approach to development location but also addressing existing transport imbalances and deficiencies.

The north-south corridor through the Borough is defined by its road and rail routes. This provides the basis for further development supported by strengthened transport links. In addition to the high frequency rail services between London and Cambridge, improvements to station access would support increased rail use. Bus services are in place but contrast with those in Transport for London's area to the south of Waltham Cross. Improved bus services with a more complete service, better infrastructure and strong marketing could form the core of improved sustainable links. This would serve Enfield, Waltham Cross, Cheshunt, Greater Brookfield, Wormley, Broxbourne, Hoddesdon, Ware and Hertford. It is also possible to enhance east-west links in the Borough, for example with improved bus services between Cuffley rail station, Goffs Oak/Hammond Street and Cheshunt. A particularly deficiency currently is evident for walking and cycling; comprehensive networks need to be developed to allow easy access between workplaces, education and retail facilities and homes. In addition, links to destinations outside the Borough such as hospitals need to be improved if car dependency is to be avoided.

We recommend that development focuses on the established urban areas of Waltham Cross, Cheshunt, Broxbourne and Hoddesdon. In addition, a particular development opportunity exists with Greater Brookfield. However, the current access arrangements represent poor sustainable practice and this will need to be addressed if Greater Brookfield is to play an effective role as part of a sustainable transport network.

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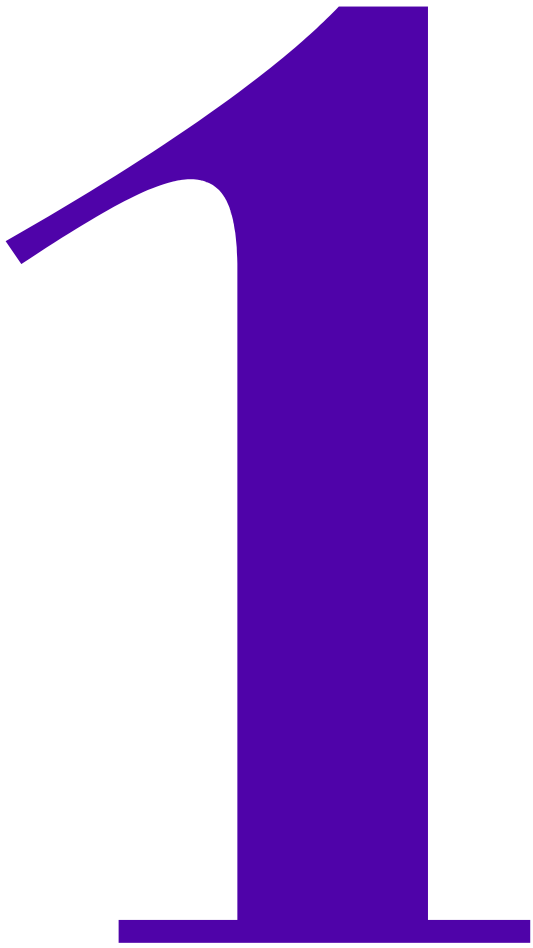


1 Introduction

1.1 Scope of the Study

1.1.1 This study aims to inform the Borough of Broxbourne's Local Development Framework (LDF) Core Strategy regarding transport:

- To provide an assessment of the relative and absolute accessibility of various settlements by sustainable transport and the existing road network;
- To create a robust, evidence-based strategy for housing and employment development on the basis of this transport and accessibility review; and
- To identify realistic options for transport infrastructure and public transport provision and demand management measures and the potential to encourage a more sustainable pattern of travel.

1.1.2 This strategy reflects regional and national policy, whilst also meeting the local needs of the Borough. Inevitably, the location of the area means that movements beyond the boundary, particularly out-commuting, have been taken into account.

1.2 Context

1.2.1 There are a number of influences on the LDF process affecting transport provision and the location of development that will need to be taken into account.

1.2.2 In recent years there has been a significant increase in the demand for travel and in mobility to meet this demand. Lifestyles continue to change and there is a general expectation that journeys can be made for a variety of purposes and that suitable transport networks should be in place to facilitate this. The growth in car ownership has been considerable which has allowed many people to adapt their lives, for example to work some distance from where they live and without being dependant on public transport, this is a national trend.

1.2.3 At a Borough level, the opportunities for car travel are influenced by the close proximity to key routes such as the M25 motorway which allows regular journeys to be made that were previously difficult. Improvements in transport infrastructure have not kept pace with these increases in demand and there are many constraints which hinder potential improvemetns. In addition, it is now recognized widely that it may not be desirable to expand capacity for environmental reasons to meet demand.

1.2.4 Demographic trends are the key factor in housing demand with more people living longer and establishing separate households. This may result in a considerable redistribution of population and a dispersal of employment. It may also affect lifestyle choices as there are expected to be more single person households in the future. Opportunities arise for new types of housing to be constructed to reflect changing needs including a sufficient number of affordable homes to meet demand.

1.2.5 The role of spatial planning is vital in terms of counterbalancing these trends by helping to reduce the need to travel. This can be achieved by locating housing, employment and other land uses in locations where they are well located for regular journey making by sustainable

means and attempting to avoid dispersed land uses and creating a need for longer distance commuting, especially by car.

1.2.6 Changing work patterns have also been evident in recent years. The wide adoption of information communication technologies means that more people can work from home for part or all of the time and this also facilitates other opportunities such as internet shopping with home delivery. More flexible working has also become commonplace with many jobs becoming more adaptable to people's home arrangements. Whilst this has affected the traditional peak journey times, the trend for flexible working should continue to increase.

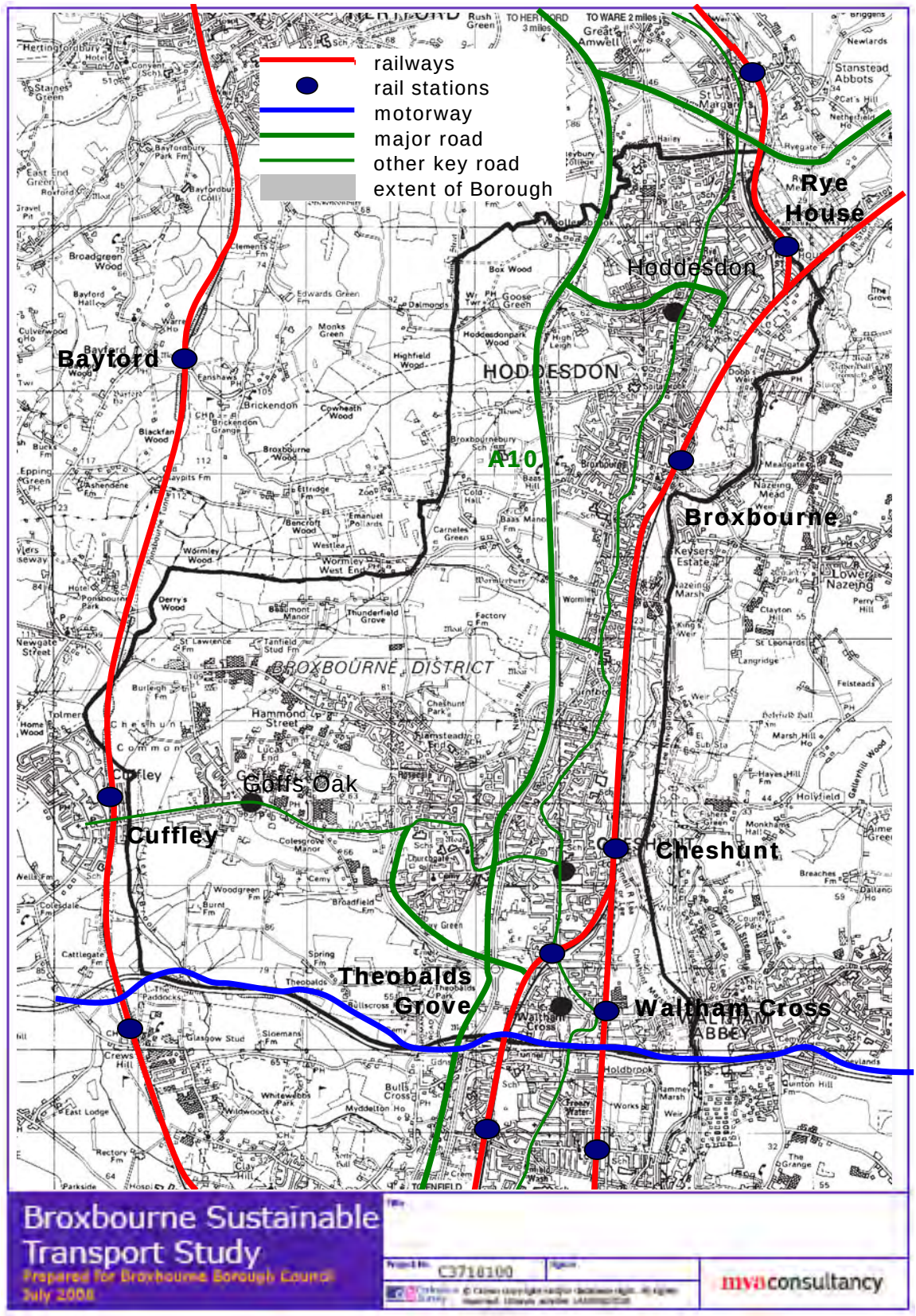
1.2.7 Figure 1.1 shows the key transport links.

1.2.8 In addition to major environmental constraints on the implementation of new transport schemes, there are other constraints such as feasibility and funding availability. For highway schemes, the high cost of implementation can rule out some schemes once mitigation for environmental issues have been taken into account. For public transport, revenue funding is limited and hence it is difficult to operate rural bus links in a commercial market. Many initiatives such as travel plans may not require any built measures but will require ongoing revenue funding.

1.2.9 The scale of planned growth in the Borough is such that the development of extensively large housing sites should be avoided and instead, careful planning could avoid excessive land take. More intensive use of land is likely to be essential to accommodate growth and this could be achievable where sites are well served by rail and bus services, and where they are within walking and cycling distance of related land uses. Additional development may bring new opportunities to support facilities and enhance communities.

1.2.10 More globally, climate change is a challenge for every activity including transport. Emissions from vehicles are a contributor to climate change and measures to reduce emissions need to be encouraged in support of Government policy. The promotion of sustainable transport is an important consideration for the LDF which is affected by the location of development sites.

Figure 1.1 Key Transport Links



1.3 Planned Development

1.3.1 The 2006 Draft East of England Plan stated that Broxbourne must provide 5,600 additional dwellings during the plan period (2001 to 2021). The approved Plan[1] maintains this figure as a minimum. Up to March 2006 1,950 dwellings have been built in the Borough, at an average of 390 per year, leaving 3,650 to be built in the period 2000 to 2021 (requiring an average rate of 240 per year).

1.3.2 A key policy in promoting sustainable development is the re-use of previously developed land for development in order to protect the greenbelt; within Broxbourne the availability of this land is limited. The national target and the target in the adopted local plan is that 60% of development should be on previously developed land. The Borough has also set higher targets as part of its best value performance plan. During the year to 31 March 2007, 80% of new development was on previously developed land, above national and local plan targets. A lack of further available sites will put pressure on the Green Belt and this is recognized by the RSS which calls for a local greenbelt review in Broxbourne. This will identify changes to the boundary needed to meet development need that cannot be met from previously developed sites in the urban area.

1.3.3 To achieve this development, it is vital to adopt the stance of sustainable communities in which transport is at the core. This means that locating homes, employment and services depends on the inter-relationships between them and minimizing the distances wherever possible. It also means that measures to reduce the need to travel need to be promoted so that journeys are avoided at peak times. In addition, measures to enhance public transport, improved walking and cycling facilities will be needed alongside measures that reduce demand for travelling by vehicles.

1.3.4 For the Borough, new development is being considered at a number of locations based on existing centres of activity. There are four centres at Waltham Cross, Cheshunt, Wormley and Turnford (Brookfield) and Hoddesdon which provide employment, retail and other services around which further development could be located. Locating development here would assist in developing an integrated transport infrastructure and support the economic viability of these established centres. Further development at Greater Brookfield could take the form of a new Borouch centre which would also provide a sustainable location for people to reduce unustainable car journeys to centres outside of the Borough. We have investigated these and other possibile options in this study.

1.4 Methodology

1.4.1 In order to produce a robust evidence base for the emerging LDF Core Strategy, we have drawn on a variety of data sources and research methods to compile this report.

1.4.2 To assess the baseline conditions and policy context, we have conducted a literature review covering documents such as the Regional Spatial Strategy for the East of England and the Hertfordshire Local Transport Plan. Data from the 2001 Census has also been used to establish the transport baseline, particularly journey to work data.

[1] Government Office for the East of England (May 2008) *East f England Plan: the revision to the Regional Spatial Strategy for the East of England.*

1.4.3 As well as undertaking site visits we have examined highway and public transport capacities in order to identify the significant routes in the Borough and to highlight any restraints affecting these routes. Highway capacities have been measured based on DMRB standards and congestion reference flow (CRF) calculations. We also reviewed car parking availability in the built-up areas.

1.4.4 Our review of public transport capacity included bus, coach, train, community transport and taxi provision. We obtained data on station use from the Office of Rail Regulation and looked at the service levels available to local stations. We also considered network coverage and service frequency for buses in the area.

1.4.5 We used Accession, a GIS mapping tool built by MVA Consultancy to Department for Transport specifications, to measure accessibility to key facilities via the road and public transport networks. We investigated absolute and relative access to healthcare facilities, employment, education, leisure and retail.

1.4.6 We have determined a development strategy based on the outputs of the data analysis. This included the derivation of a ranking system to show the relative accessibility of each settlement based on access to key facilities. A SWOT (strengths, weaknesses, opportunities, threats) analysis further indicates the factors affecting development in each area.

1.5 Structure of the Report

1.5.1 The remainder of this report is set out as follows:

- Chapter 2 covers the **baseline**, looking at established land uses and the demographic situation in the Borough;
- Chapter 3 provides the **policy context** for taking forward sustainable transport in the Borough;
- Chapter 4 discusses **current transport** provision in terms of the existing networks;
- Chapter 5 provides a **review of the settlements** in terms of accessibility and the scope to promote sustainable modes;
- Chapter 6 sets out the **strategy development** including the potential locations for development, promoting accessibility and the output of the stakeholder meeting; and
- Chapter 7 sets out **conclusions and recommendations**.

2

2 Baseline

2.1 Population

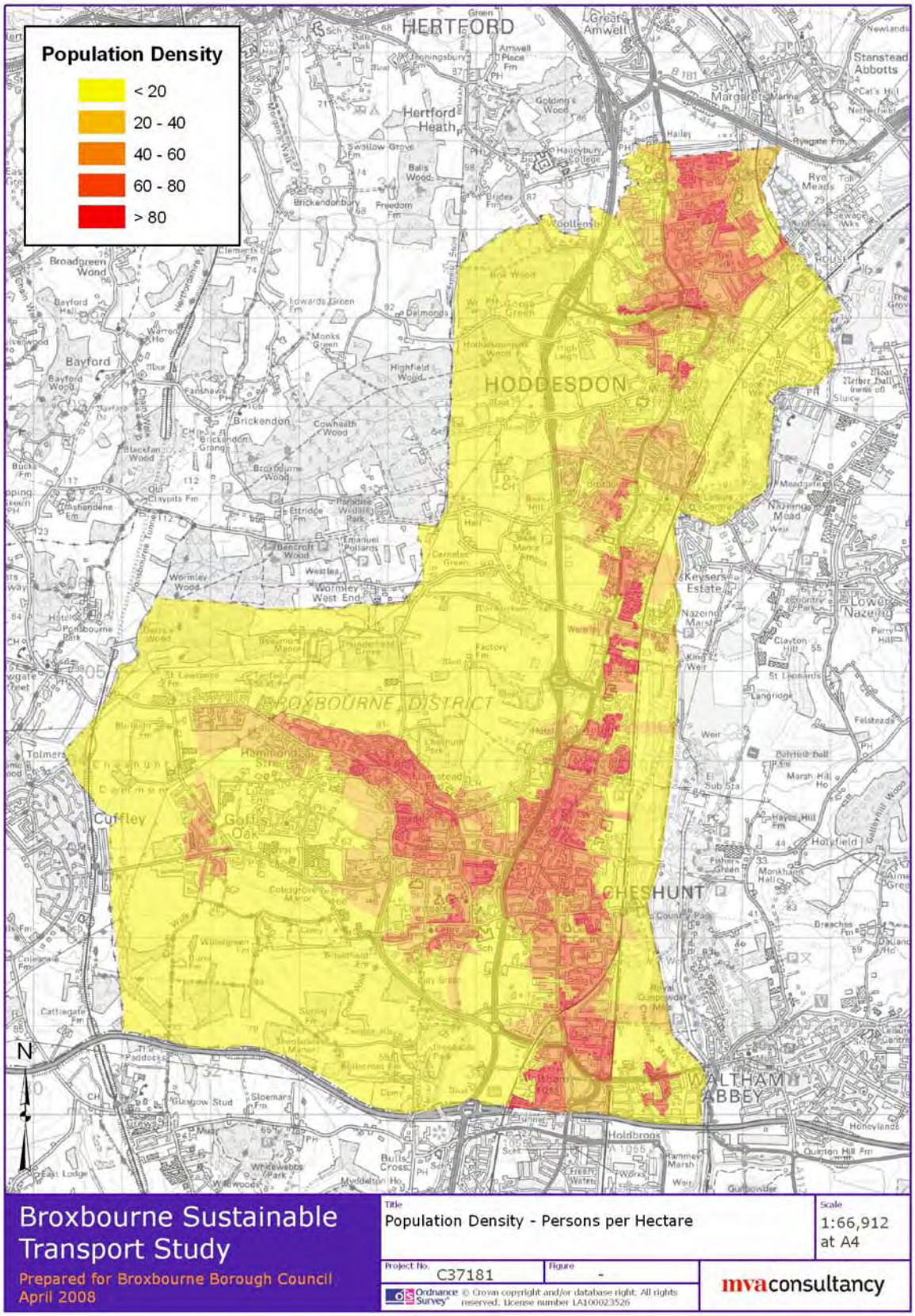
2.1.1 The latest ONS mid-year estimates put the total population of the Borough of Broxbourne at 88,900 in 2006, an increase from the 2001 Census figure of 8,054.

2.1.2 The population density, based on Census 2001 data, is shown in Figure 2.1. According to the Census, the average density is 16.93 people per hectare compared with 6.29 for Hertfordshire as a whole[2]. Figure 2.1 shows that there are variations around this average though, with large parts of the Borough having a population density of less than 19 people per hectare.

2.1.3 There are also concentrated areas of higher population density focused in the north-south corridor running to the east of the A10 where density is above 40 people per hectare and in some areas between 86 to 153 people per hectare in settlements such as Waltham Cross, Wormley and Hoddesdon. However, these concentrations are small but they could provide a focus for further development based on the existing facilities available within centres serving the Borough's residents.

[2] www.hertsdirect.org/infobase

Figure 2.1 Population Density

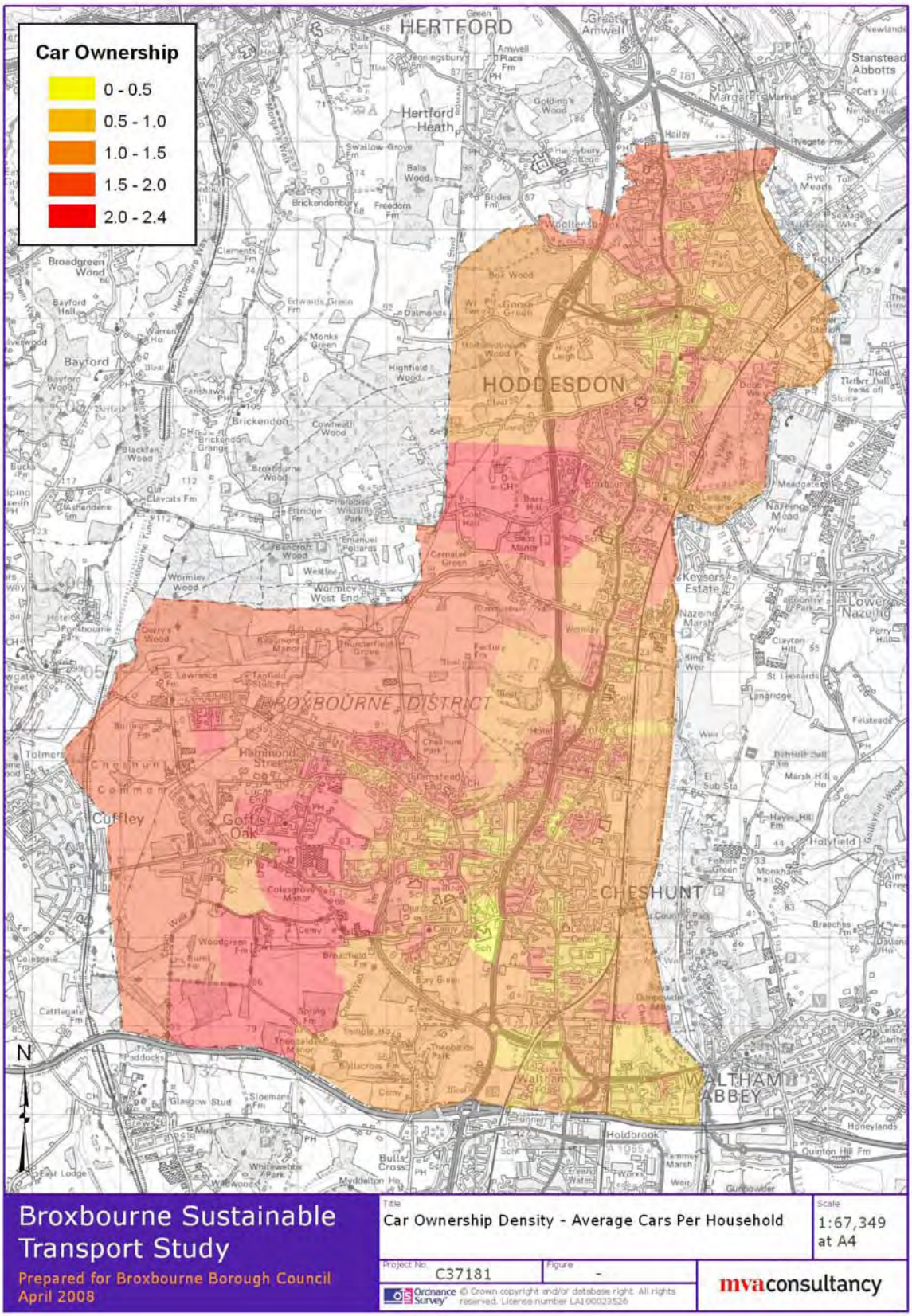


2.2 Car Ownership

2.2.1 Figure 2.2 shows car ownership levels as the average number of cars per household. It indicates that the highest levels of car ownership are in the more rural parts of the Borough to the west. In areas such as Goffs Oak there are over two cars per household on average. Waltham Cross, Hoddesdon and Cheshunt have areas of low car ownership with an average of 0.5 cars or less per household. Car ownership is an important determinant of how and when people travel. Areas of lower car ownership are more likely to use public transport regularly and it is more likely that bus services will be in place around which improvements could be planned with additional development. Car ownership would be expected to be high in those relatively affluent areas such as Goffs Oak and Broxbourne as good access is available to major roads such as the A10 and M25.

Figure 2.2 Car Ownership

2.3



Journey to Work Data

2.3.1 The analysis of journey to work data from Office of National Statistics (ONS) Census 2001 includes mode of travel and distance travelled as well as data on the origin/destination of journey to work trip. Amongst other things this will provide insight into the level of out-commuting in the district, which was highlighted as key issue at the 1991 Census.

2.3.2 For Broxbourne Borough, most of the data was available at Output level, however, 2007 Index of Multiple Deprivation is only available at Super Output level and Origin-Destination data is only available at ward level.

2.4 2007 Indices of Deprivation

2.4.1 Figure 2.3 shows the 2007 Indices of Multiple Deprivation for Lower Super Output Areas (LSOA). Lower Super Output Areas are defined for statistical purposes in order to provide homogenous blocks with similar populations. Deprivation is often allied to low car ownership but is also usually associated with poor accessibility to facilities, even when local bus services are available.

2.4.2 Seven indices are weighted in order to compile the Indices of Multiple Deprivation:

- Income;
- Employment;
- Health, deprivation and disability;
- Education, skills and training;
- Barriers to housing and services;
- Crime; and
- Living environment.

2.4.3 Higher scores indicate higher levels of deprivation based on the above mentioned variables and are represented in Figure 2.3 by the darker red colours. Areas of low deprivation are shown in yellow and light orange. The map indicates that there are few areas of deprivation in the Borough of Broxbourne. The areas with the highest levels of deprivation are found around Waltham Cross, Flamstead End, Wormley and Hoddesdon. Broxbourne and areas to the west of the Borough around Goffs Oak have particularly low levels of deprivation.

2.4.4 Figure 2.4 shows the income levels in the Borough which broadly correspond with areas of higher car ownership in Goffs Oak and to the south of Hoddesdon. In these areas, there is a greater likelihood of people travelling by car, except for commuting journeys by rail, with a relatively low use of sustainable modes. These areas also score low deprivation indices as might be expected. For the more deprived areas which have lower incomes and lower car ownership (Waltham Cross, Cheshunt and Hoddesdon centre), good public transport (mainly bus) is essential to make the connections with employment, education and health facilities. Hence ensuring that sustainable transport is available throughout the Borough addresses the needs of areas with greater mobility need and also areas with currently unsustainable travel patterns.

Figure 2.3 Deprivation Indices

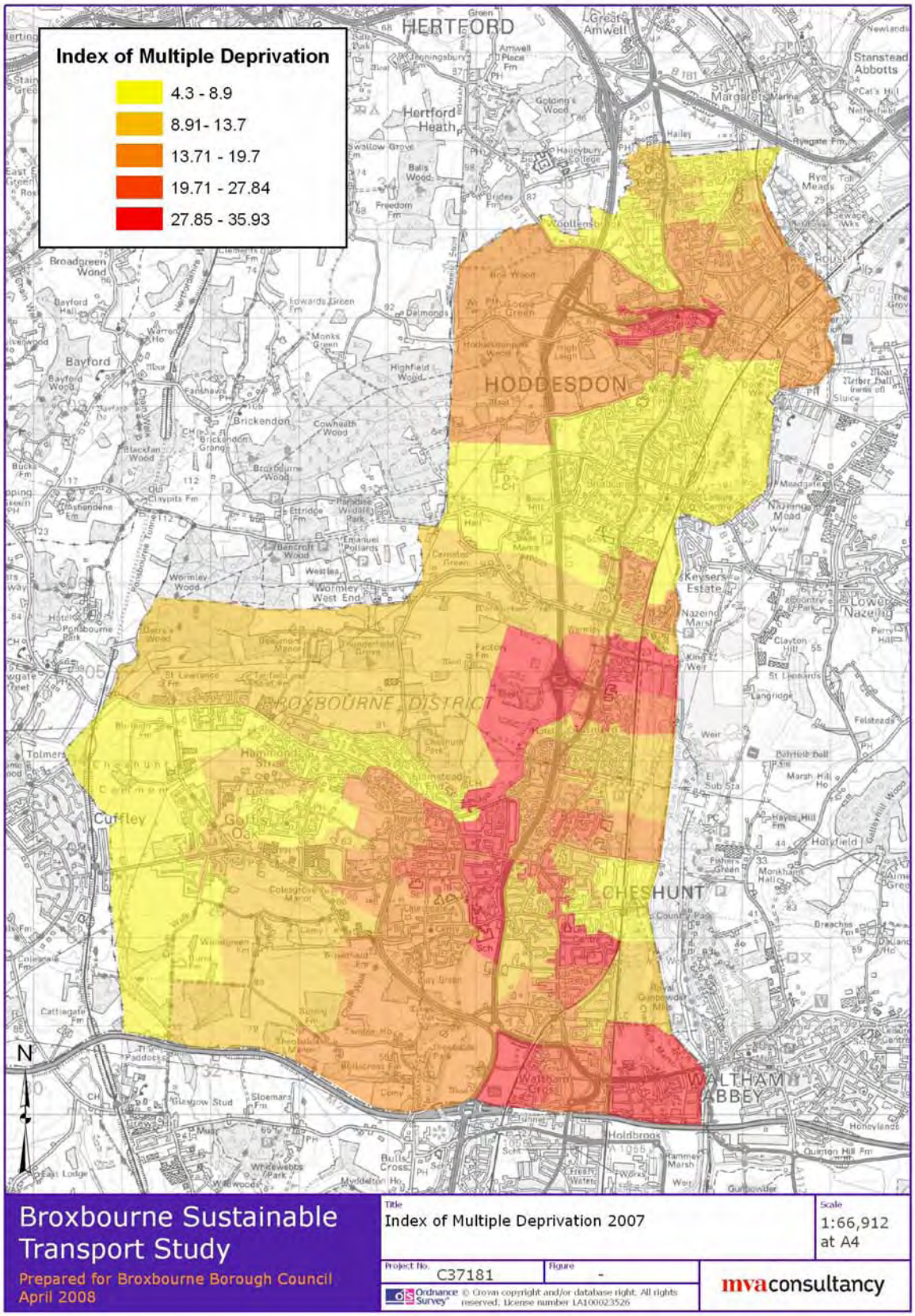
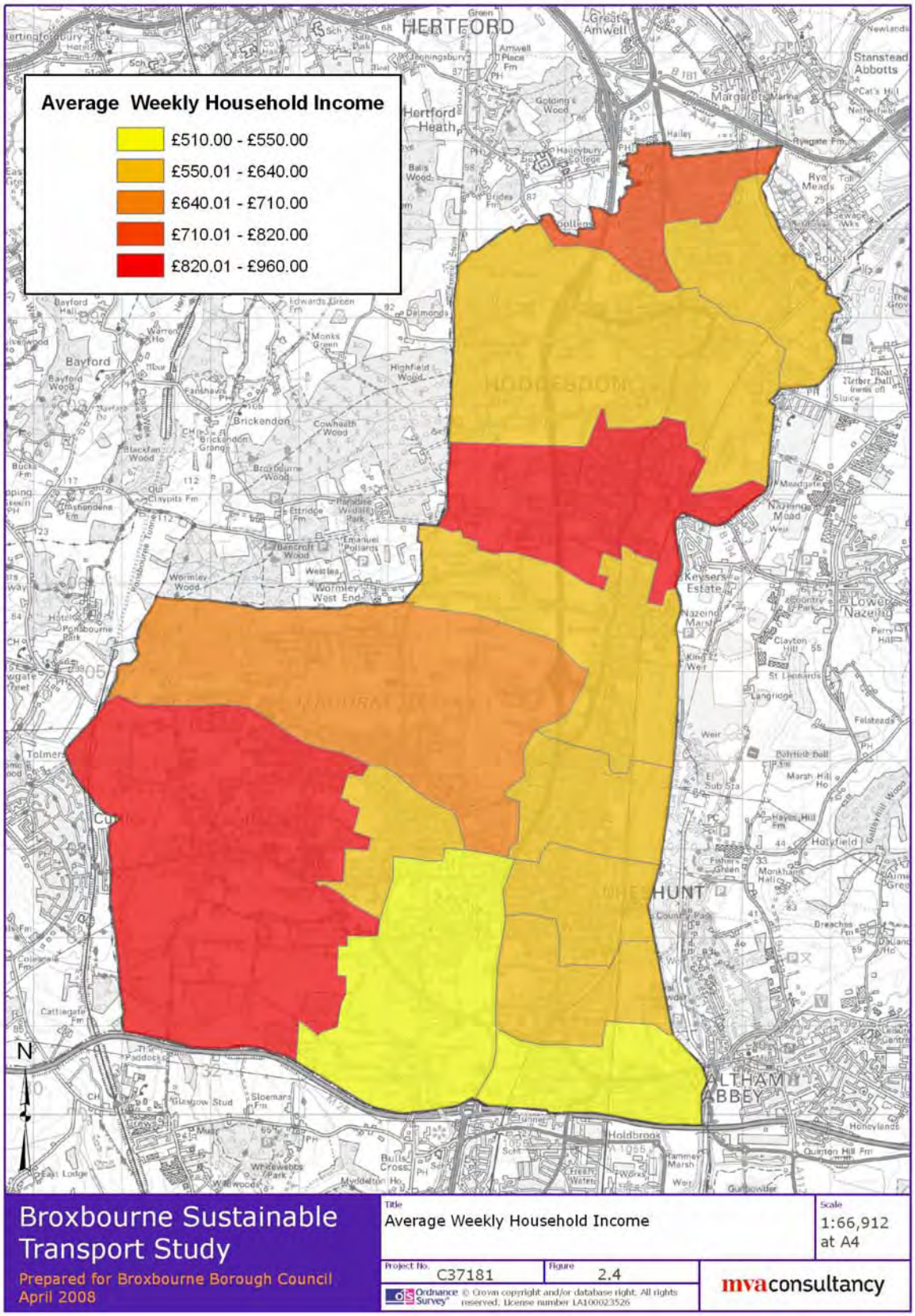


Figure 2.4 Average Total Household Income



2.5 Origin-Destination Data

2.5.1 Origin-destination data is available at ward level and is a reflection of the travel patterns in the country. However, it should be remembered that this data is for 2001 and that car ownership and travel patterns are likely to have continued to change in the intervening period. Since 2001, car ownership has increased and with it car use has increased with more journey opportunities being available to car owners.

2.5.2 We have analysed travel patterns in and around Broxbourne by looking at the destinations of those trips that originate within the Borough and also the origin of trips that have destinations in the Borough, based on Census 2001 data. The results of this analysis are shown in Figures 2.5 and 2.6.

2.5.3 Figure 2.5 shows that the majority of trips that originate in Broxbourne Borough also terminate within the Borough. In each of the local wards, more than 400 trips to work are made per day to the local area. There is also some in-commuting from Hertford and the Waltham Abbey areas, with between 100 – 200 daily trips coming from each of these areas. There is also in-commuting, to a lesser extent, from Potters Bar, Enfield and the outskirts of Harlow and Hertford.

2.5.4 Figure 2.6 shows the level of out-commuting for work from Broxbourne Borough. Outside the Borough, a significant number of Broxbourne residents travel to work in Welwyn Garden City, Westminster, Edmonton, Hertford and Harlow as well as the south west area of the Borough around Potters Bar. Up to 600 trips are made to each of these destinations.

2.5.5 Figures 2.5 and 2.6 also indicate that there is a sizable mismatch between out-commuting and in-commuting i.e. many people travel to destinations outside the Borough, particularly the Greater London area e.g. Enfield but the number working in the Borough from outside is relatively small. Also, the London effect with frequent and rapid rail links to central and outer parts of London has a disproportionate effect on travel patterns while the ease of access to the M25 creates journey opportunities that would otherwise be more difficult.

Figure 2.5 Destinations of Journeys Originating Within Broxbourne Borough

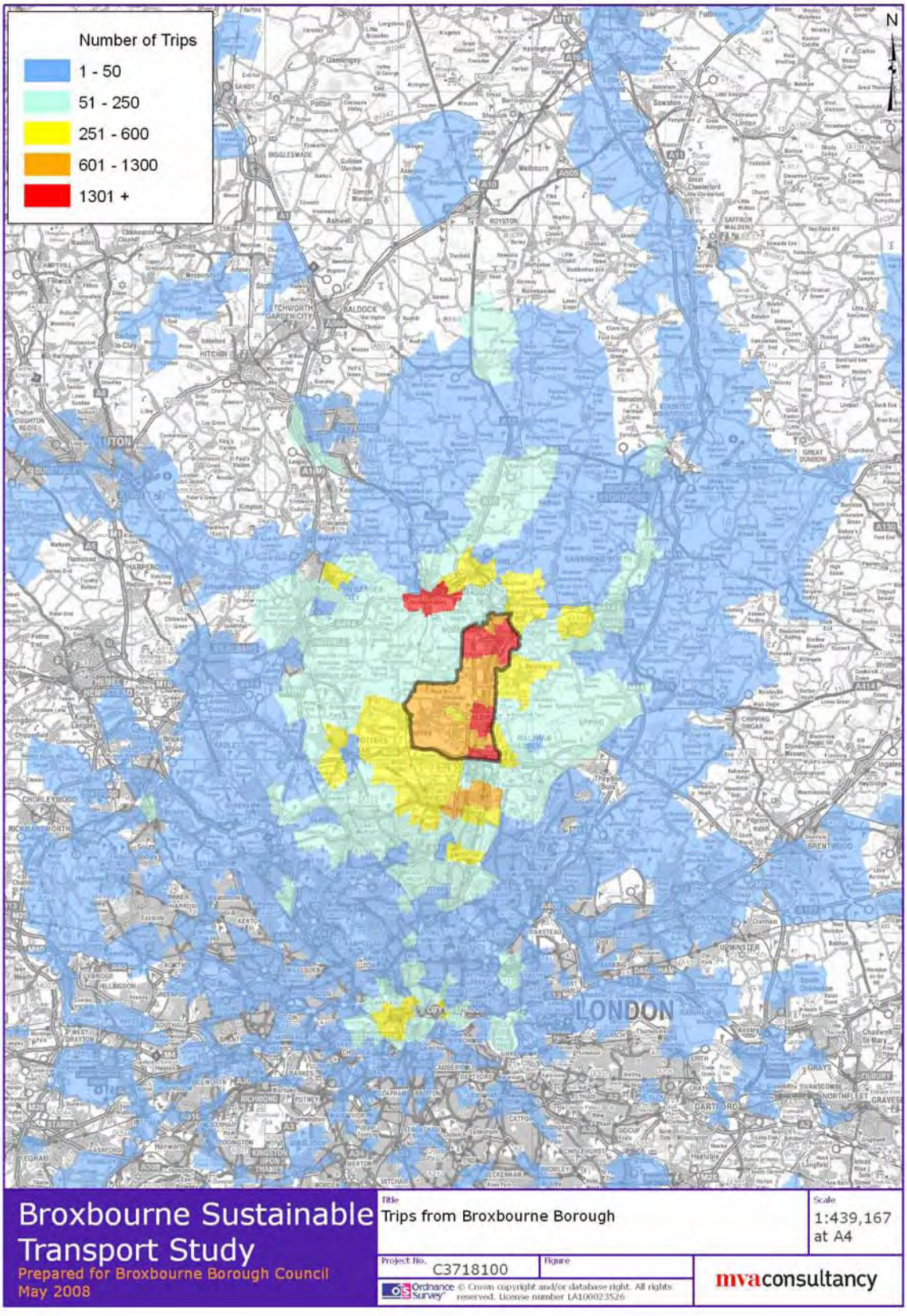
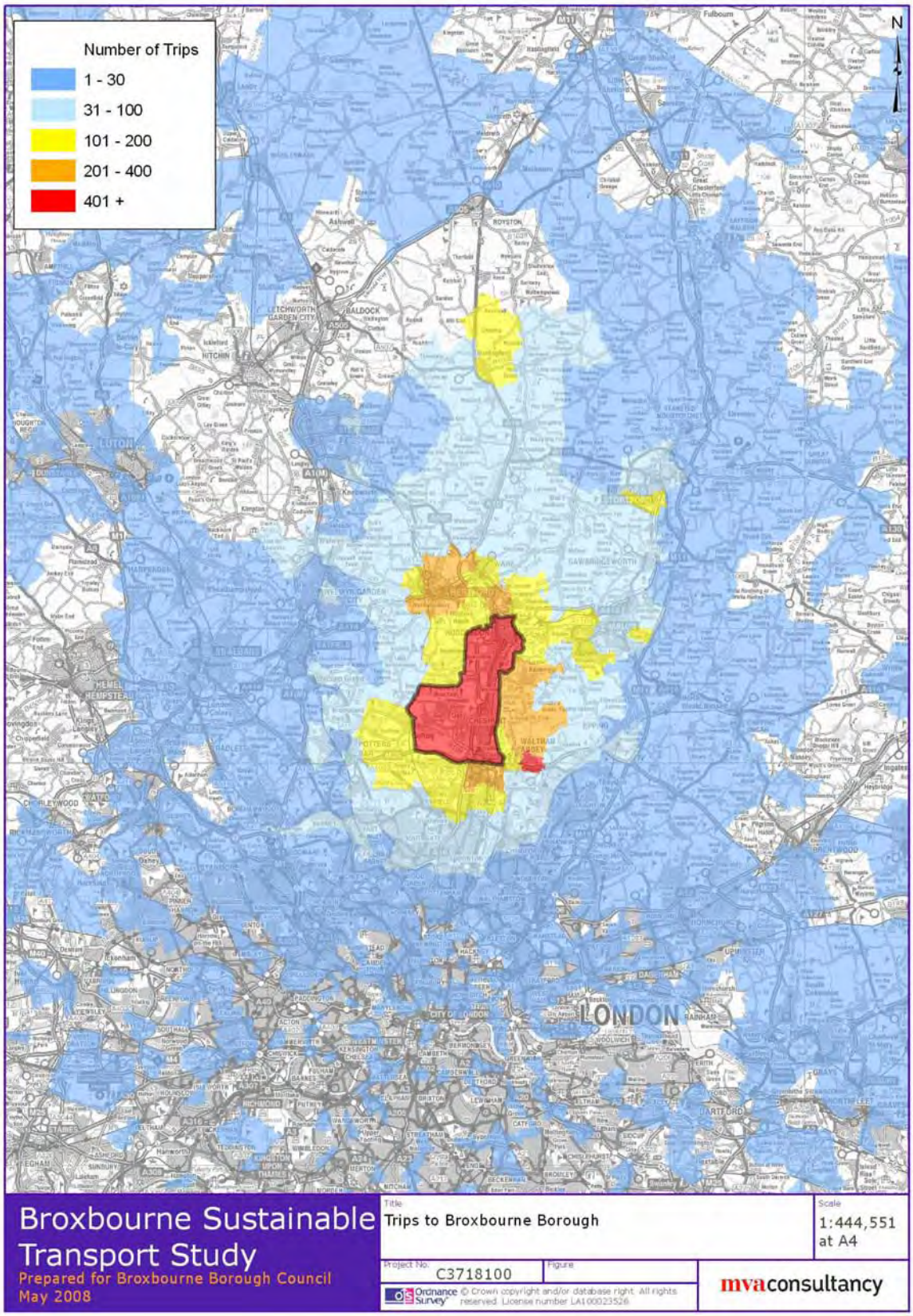


Figure 2.6 Origin of Journeys To Broxbourne Borough

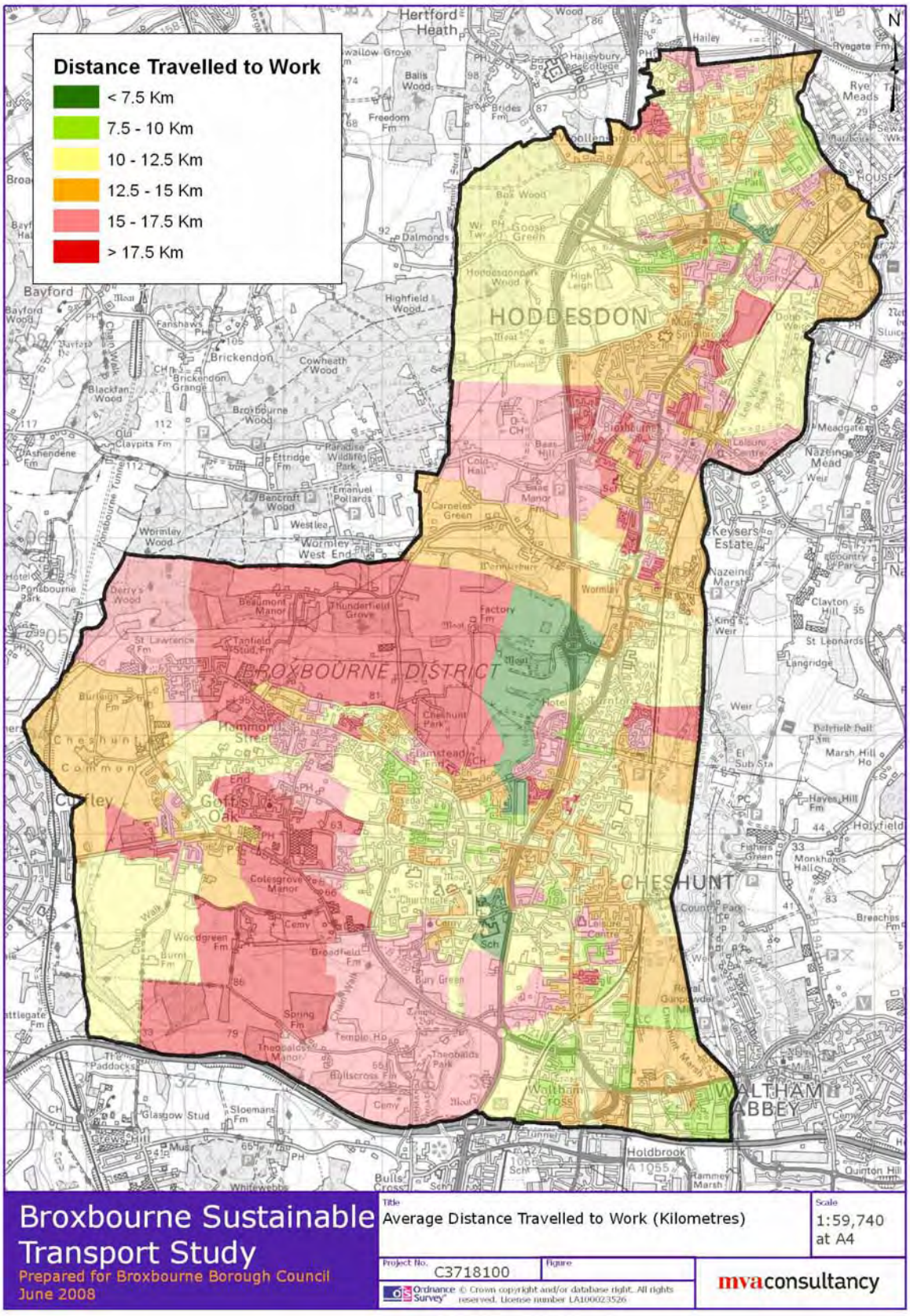


2.6 Distance Travelled

2.6.1 The ONS Origin-Destination data also allows us to calculate the average distance travelled to work by residents in each of the key settlements. Figure 2.7 shows the results of this analysis. According to the Broxbourne Employment Land Review, the average distance travelled to work by residents of Broxbourne Borough is 8.8km. This is less than the average for Hertfordshire as a whole, which is 10.5km.

2.6.2 Distance travelled is often related to the types of employment available and therefore to the level of educational achievement and opportunities of the working population. Areas of relative deprivation tend to have shorter distance journeys as a result.

Figure 2.7 Distance Travelled



2.7 Mode Share

2.7.1 We would expect car to dominate mode share, in common with other parts of Hertfordshire and East of England. However, north London has much higher public transport availability as it is within Transport for London's realm (with the associated support for bus services and different procurement arrangements) and car ownership could be expected to be lower. In terms of accessibility, the location of the Borough in relation to the A10 and M25 allows car journeys to be made relatively easily, although with varying levels of reliability depending on traffic conditions. Creating a more sustainable transport system and demonstrating that new development can feature non-car modes more strongly poses a significant challenge in this context.

2.7.2 Analysis from the Broxbourne Employment Land Review indicates that 60% of Broxbourne residents commute to work by car with a further 5% as car passengers. 7% walk to work and 13% use the rail and/or the underground. However, only around 2% travel to work by bus. Similar patterns of mode share are found in the neighbouring authorities and Hertfordshire as a whole.

2.8 Cheshunt and Waltham Cross Urban Transport Plan Data Report

2.8.1 As part of our data analysis and literature review we have reviewed the 2007 draft data report for the Cheshunt and Waltham Cross Urban Transport Plan. As well as providing useful primary data on demographics, travel and land use in the southern part of the Borough, it can also be used as a cross-check against our own Census data analysis. This section summarises the key information we have taken from this document.

Employment

2.8.2 The principal industrial estates and business parks are Delamere Road, Cheshunt, Britannia Road, and Park Plaza, Waltham Cross. The Brookfield Centre near Cheshunt has expanded into a large retail area and is a major employer in the area.

2.8.3 The major employers (those with 50 or more staff) in this area of the Borough are shown in Appendix A (Tables 1 and 2).

2.8.4 The larger employees, particularly those with active travel plans, are likely to have the greatest potential impacts on journeys to work and could initiate transport measures that development sites could expand on such as car sharing, bus use, walking and cycling. Although the numbers at each site are limited, there will be scope for employers to work together to support sustainable transport initiatives and reduce the number of car journeys.

Traffic Data and Congestion

2.8.5 Traffic data is collected as part of the annual monitoring programme at eight locations. Table 2.1 taking figures from the report shows these locations along with count frequency and the annual average weekday flow at all sites.

Table 2.1 Traffic Count Monitoring Sites in Cheshunt and Waltham Cross

Site No.	Location	Frequency of Count	2006 AAWD (2 way)
135	A10, Gt Cambridge Rd, Cheshunt	Continuous	45,318
301	B156, Goffs Lane, Cheshunt	Annual (April)	14,689
566	B198, Lieutenant Ellis Way, Cheshunt	Continuous	16,156
570	B156, Halfhide Lane, Cheshunt	Monthly	12,975
609	A121, Cheshunt Link Road, Cheshunt	Continuous	25,686
249	B176, Crossbrook St, Waltham Cross	Quarterly & MCC	21,699
261	A121, Station Road, Waltham Cross	Annual (April)	28,741
707	U295, Theobalds Lane, Waltham Cross	Annual (April)	2,563

2.8.6 A number of congestion hotspots were identified in the study, based on anecdotal evidence from council officers and input from the area office, bus companies and council members. Table 2.2, reproduced from the study shows the hotspots and gives further details on the perceived causes of congestion.

Table 2.2 Congestion Hotspots in Cheshunt

Road	Location	Time Period	Cause	Source of Evidence
A10 SB	Great Cambridge Road approach to M25 J25, Waltham Cross	AM Peak	Junction M25	Anecdotal
A10 NB	Junction with College Rd, Cheshunt	PM peak	Traffic signals at College Rd	Anecdotal
A10 NB	Junction with Church Lane, Cheshunt	PM peak	Traffic signals at Church Lane	Anecdotal
A121	Eleanor Cross Rd, Station Rd, Waltham Cross		Traffic lights at Lea Rd and traffic volume	Anecdotal & complaints to local area office

2.8.7 Currently there is no empirical information available on the level of delay at these locations. This will be required if a more detailed analysis is to be undertaken such as determining queue lengths and time delays and hence to extrapolate this to future year data.

Mode Choice

2.8.8 Travelwise Cordon survey data indicates the following regarding overall mode share in Cheshunt and Waltham Cross:

- In Cheshunt, up to 2002 mode share has remained fairly consistent with around 77-78% of AM peak period journeys into the town centre being by car and a further 14-15% by bus;
- In 2002, however, there appeared to be an increase in the car mode share and decline in bus use;
- In 2005 around 7% of journeys into the town centre were made on foot and 1% by cycle. Figures were similar for Waltham Cross. However, it should be noted that there is likely to be undercounting of both these modes as only main roads have been surveyed;
- There has been a general decline in car usage in Waltham Cross down from 81% to 77% mode share; and
- There has also been an increase in bus users from 13% to 15% in 2005.

2.8.9 Frequent bus services run in northbound and southbound directions from Broxbourne to Enfield at a frequency of one every 15 minutes or less. Frequent east/west bound services also run between Hammond Street to Cheshunt and from Waltham Cross town centre to Waltham Abbey, Essex again at a frequency of one bus every 10 minutes or less.

2.8.10 The data suggests that the area reflected national trends of a decline in bus use outside London, a notable contrast with Transport for London-sponsored services to the south.

2.8.11 According to the 2001 census 2.6% of working Cheshunt residents travelled to work by bus. This figure is relatively low and reflects high car ownership rates, the availability of rail services and a lack of east-west public transport services.

2.9 Summary of Baseline Data Available

2.9.1 For the Borough as whole, the main features are as follows:

- Population density is high compared with Hertfordshire but this is due to the concentrations in the main urban centres;
- Car ownership is high and the proportion of journeys made by car is high (60% car driver and 5% car passenger) but this is particularly high in Cheshunt and Waltham Cross reflecting overall income levels, the availability of the road network and the diversity of destinations;
- Some deprivation is evident in parts of the urban areas relative to the more suburban parts of the Borough;
- Average distance travelled to work is less than that for Hertfordshire but his is largely due to the proximity of North and Central London to which a third of commuters travel; and
- The uptake of sustainable modes is relatively poor but bus use is highest in the south of the Borough where a wider range of services is available.

3

3 Policy Context

3.1 Literature Review

The literature review covers a number of key documents including the following which are discussed in more detail below:

- Regional Spatial Strategy (East of England Plan);
- Hertfordshire Local Transport Plan to 2011 (LTP2);
- Hertfordshire Accessibility Strategy;
- Local Plan Second Review 2001-2011;
- Borough-Wide Supplementary Planning Guidance;
- Key Development Sites Update;
- Housing Needs Assessment Report;
- Annual Monitoring Report;
- Broxbourne Community Plan 2007/09; and
- Sustainability Appraisal:
  - Introduction to the Report;
  - Scoping Report: Spatial Issues;
  - Environment Topic Paper;
  - Economic Topic Paper;
  - Broxbourne's Community.

3.2 National Policy Context

3.2.1 A shift in Government policy was marked with Planning Policy Guidance (PPG) 13: Transport[3] which advocated the promotion of more sustainable transport, accessibility to key facilities by public transport, walking and cycling and reducing the need to travel, especially by car. PPG13 drew attention to the need to integrate land use and transport planning more effectively in support of viable public transport and to promote acceptable alternatives to car use; this also envisaged demand management measures such as parking controls in addition to initiatives such as travel planning.

3.2.2 Since PPG13, the climate change agenda has adopted a much higher profile. The Eddington Report[4] made the connections between an efficient and reliable transport network and sustained economic prosperity and any transport constraints will hinder economic productivity and competitiveness.

[3] ODPM (1992) *Planning Policy Guidance 13: Transport.*

[4] Department for Transport (December 2006) *The Eddington Transport Study: The case for action.*

3.2.3 The Department for Transport is refining its strategy 'Towards a Sustainable Transport System'[5] following a consultation period in recognition of key issues that need to be addressed. At several network levels – cross-network (national policy), cities and regional network, national networks, international networks – several key issues are considered:

- Climate change;
- Competitiveness and productivity;
- Equality of opportunity;
- Health, safety and security; and
- Quality of life and the natural environment.

3.2.4 These headings cover significant challenges including reducing harmful emissions to address trends such as economic growth, demographic growth and housing growth. Sustainable transport has a major role to play in meeting wider sustainability objectives.

3.3 East of England Plan

3.3.1 The Regional Spatial Strategy[6] provides the framework for planning and transport in the region, although Broxbourne is also influenced by the London Plan, the equivalent spatial strategy for the capital. It sets out the levels and broad locations for growth in housing and employment across the region with an emphasis on sustainability. The Regional Transport Strategy is included.

3.3.2 Although Broxbourne is not identified as a major centre for growth, development and change, Cambridge, Harlow, Hatfield and Welwyn Garden City are. Activity in these areas could affect Broxbourne, particularly with regard to road links to the north, notably the A10 to access the Cambridge corridor.

3.3.3 In providing land for employment, the Plan advises that locations should 'minimise commuting and promote more sustainable communities by achieving a closer relationship between jobs and homes' and 'maximise the potential use of public transport' (Policy E2).

3.3.4 For Broxbourne, the allocation for housing is 5,600 dwellings in the period 2011 to 2021 of which 1,950 are already built and hence requiring a minimum to be built of 3,650 (around 240 completions per year).

Regional Transport Strategy

3.3.5 Local Transport Plans are required to show conformity with the Regional Transport Strategy (RTS). The RTS has four main objectives:

- 'To manage travel behaviour and the demand for transport with the aim of reducing the rate of traffic growth and ensuring the transport sector makes an appropriate contribution to the required reduction in greenhouse gas emissions;

[5] Department for Transport (November 2007) *Towards a sustainable transport system*.

[6] Government Office for the East of England (October 2007) *East of England Plan: The Secretary of State's proposed changes and further proposed changes to the Draft Revision to the Regional Spatial Strategy for the East of England*.

- 'To encourage efficient use of existing transport infrastructure;
- 'To enable the provision of the infrastructure and transport services necessary to support both existing development and that proposed in the spatial strategy;
- 'To improve access to jobs, services and leisure facilities' (Policy T1).

3.3.6 This requires the appropriate location of development sites, designing for sustainable modes rather than perpetuating car-dependency and a range of supporting measures such as better travel information alongside improved public transport and walking and cycling routes; parking controls will also be required. In addition, inter-urban transport should feature better coach services, improved interchange at rail stations and facilitate east-west links.

3.3.7 Regarding investment priorities, the RTS notes potentially improved access to Stansted Airport which could affect Broxbourne. Schemes funded by central Government include M25 Junctions 16 to 31 widening (Highways Agency funding).

3.4 Hertfordshire Local Transport Plan

3.4.1 The LTP[7] sets out the policy context and proposals for transport across the county and includes an Accessibility Strategy, Bus Strategy and Rail Strategy. The focus is on accessibility with proposals aimed at improving access to key services such as work, health, education and food retail. Problems which the LTP seeks to address include the dispersed structure of employment, the influence of the London area particularly for commuting, lack of east-west transport infrastructure and high car ownership. Traffic congestion is seen as a particular difficulty and the A10 between Cheshunt and Hoddesdon is expected to experience congestion in the future with the M25 adding pressures to the local network. Traffic in Broxbourne is predicted to increase by 14% by 2011 (compared with 2001) and by 26% by 2021.

3.4.2 The LTP has four main objectives:

- Tacking congestion;
- Delivering accessibility;
- Safer roads; and
- Better air quality.

3.4.3 To address these in accordance with Government policy, proposed initiatives include smarter choices (workplace travel plans, bus and rail partnerships, school travel plans, reallocation of road space for sustainable modes, parking controls, pedestrian and cycle measures, traffic calming, etc).

3.4.4 For Broxbourne, the Community Strategy highlighted transport problems including community transport provision, accessibility problems with existing public transport and the need to provide a single point of access for people who face problems accessing public transport.

3.4.5 The LTP targets applicable to Broxbourne are shown in Appendix A (Table 3).

[7] Hertfordshire County Council (March 2006) *Local Transport Plan 2006/07-2010/11*.

Bus Strategy

3.4.6 The LTP Bus Strategy[8] sets out the role of the County Council in relation to the provision of bus services and associated journey information. This is set in the context of high car ownership and unreliable operating conditions coupled with difficult supply circumstances. In common with many areas outside London, the number of bus users has been in decline over recent years (see Table 2.6) and operating costs continue to rise.

Table 3.1 Number of Bus Journeys in Hertfordshire 2001/02 to 2004/05

Year	Estimated Number of Passengers (millions)	Annual Change
2000/01	33.9	
2001/02	33.0	-2.6%
2002/03	31.9	-3.3%
2003/04	31.1	-2.6%
2004/05	30.7	-1.3%

3.4.7 Services in East Herts and Broxbourne have been reviewed to establish if changes are required from the point of view of users, operators and local authorities. The Bus Strategy aims to tackle congestion by improving the attractiveness of services, implement priority measures, improving access for people with mobility impairments and improving information.

3.5 Local Plan

3.5.1 The Local Plan[9] sets out development proposals for the Borough and conforms with the then Hertfordshire Structure Plan Review (adopted 1998). The structure and local plans process has been superseded by regional spatial strategies and Local Development Frameworks and hence the Local Plan, although still current, will be replaced in due course.

3.5.2 The Plan defines sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs or aspirations' for which transport plays a crucial role.

3.5.3 Policies are set out which seek to:

- Support an integrated approach to movement which will improve the environment, economy and accessibility of the Borough;
- Reduce the length and number of journeys undertaken by private motor vehicles;
- Encourage alternative means of travel which have less environmental impact;
- Encourage beneficial traffic management; and

[8] Hertfordshire County Council (March 2006) *Hertfordshire's Local Transport Plan 2006/07-2010/11 Bus Strategy*.

[9] Borough of Broxbourne (December 2005) *Local Plan Second Review 2001-2011 Written Statement*.

- Promote equal access for all user groups.

3.5.4 The Plan states that closer integration between modes is supported including interchange in Hoddesdon and Waltham Cross town centres, at rail stations and Waltham Cross bus station. Development proposals should contribute towards interchange, notably at Greater Brookfield. All development proposals are required to demonstrate how they will support sustainable modes and green travel plans will need to be established which take account of parking provision. Specifically, it is noted that 'The general emphasis of policies in the Plan is that new road development is not the answer to traffic congestion' (paragraph 9.5.5).

3.6 Supplementary Planning Guidance

3.6.1 SPG[10] has been published to provide more detail on certain aspects of the Local Plan. This includes a 'sustainability checklist' which raises a number of transport issues such as proximity of development to local facilities, potential for walking, cycling and public transport use, reductions in vehicle use, accessibility for people without cars and parking.

3.6.2 The SPG also sets out parking standards for different land uses based on a zonal structure in which Zone 1 (town centres) allow for 60% of the maximum provision and Zone 2 (accessibility corridor i.e. within 200m of frequent bus services and 400m of rail stations) allow for 75% of the maximum. Variations are based on the introduction of green travel plans and commuted payments are proposed instead of direct parking provision. Cycle parking standards are also provided.

3.7 Housing Needs Assessment

3.7.1 Housing needs have been determined for the Borough[11] on the basis of a postal questionnaire, interviews and database information. While the population is predicted to rise (see Table 2.7), there is expected to be a marginal decline in the number of economically active households and an ageing population, both factors affecting the propensity to travel and the types of journeys made.

Table 3.2 Projected Population Change

Year	Total Population	Change	% Change
2003	86,800		
2006	88,800	+2,000	+2.3
2011	91,800	+3,000	+3.4
2016	94,800	+3,000	+3.3
2021	97,700	+2,900	+3.1
Total		**+10,900**	**+12.6**

Source: DCA 2007.

[10] Borough of Broxbourne (August 2004) *Borough-Wide Supplementary Planning Guidance*.

[11] DCA (2007) *Borough of Broxbourne Housing needs assessment report*.

3.7.2 Property types are skewed towards semi-detached and terraced houses/bungalows, some 80% of the total; these relatively low density types are less suited to strong public transport corridors. There is an exceptional need for affordable housing in the Borough.

3.7.3 Data indicated that 30.7% of respondents in work did so within the Borough and a further 35.8% worked in Greater London, the latter suggesting that strong transport links are an important locational factor.

3.7.4 The Housing Needs Assessment is to be replaced with a Strategic Housing Market Assessment by the end of 2008.

3.8 Annual Monitoring Report

3.8.1 The Borough's Annual Monitoring Report[12] provides a picture of activity in the area and covers the Local Plan and emerging Local Development Framework. It shows that 96% of new residential development is within 30 minutes' public transport access to health, education, retail and employment sites. However, only 52% of recent development is within 30 minutes of a hospital because higher order health provision is outside the Borough and there is a lack of direct links to these locations. Employment sites are also being delivered including Plaza Park close to M25 Junction 25 and warehousing/distribution activities at North East Hoddesdon.

3.9 Community Plan

3.9.1 The Community Plan[13] identified the main transport issues in the area including managing road congestion, managing parking and improving bus services. As the Plan points out, addressing congestion requires more walking, cycling and public transport use rather than making further provision for car use.

3.9.2 Priorities include:

- Improving access to rail stations – on-street parking is causing difficulties around Waltham Cross, Rye Park and Cheshunt and bus and cycle access is generally poor;
- Transport to hospitals – acute hospitals are all outside the Borough and while there is a direct bus link to the Princess Alexandra Hospital in Harlow, there are no direct links to facilities at the QE2 Hospital in Welwyn Garden City or the Lister Hospital in Stevenage;
- Transport for people with disabilities – including access to buses and dropped kerbs but also involving people with learning difficulties as well as people with mobility impairments;
- Transport to schools – problems of parking and lack of exercise;
- Car parking – high car ownership highlights lack of space in some residential areas and town centre parking is limited; and

[12] Borough of Broxbourne (December 2007) *Annual Monitoring Report*.

[13] Broxbourne Borough Council/Local Strategic Partnership (October 2006) *Broxbourne Community Plan 2007/09*.

- Alternatives to the car – increasing the number of cycle routes, improving pedestrian crossings of the A10 in Waltham Cross and co-ordinating bus and rail services.

3.10 Sustainability Appraisal

3.10.1 The Scoping Report for the Sustainability Appraisal[14] encompasses a range of issues that would support a more sustainable approach including consumption and lifestyles, economic change and transport. This points out that ingrained patterns of behaviour severely limit the uptake of sustainable transport almost regardless of the quality of provision. This is likely to be particularly acute in the more affluent parts of the area where car ownership is high and it is more difficult to encourage modal shift. Compounding this, longer distance commuting by car is unlikely to change and locations that are already congested will get worse without a substantial shift to sustainable travel. In addition, air quality will worsen with increasing traffic congestion and increased trip making, particularly around the M25.

3.10.2 The 'sustainability framework' asks if the Local Development Framework will provide for a shift to sustainable transport in terms of:

- Reducing the distances travelled for work and leisure;
- Reducing reliance on the car;
- Reducing road freight movements;
- Encouraging the re-orientation of the transport system with an emphasis on non-car modes; and
- Creating a net reduction in local traffic impacts (and avoid reassignment of traffic).

3.10.3 On transport and accessibility[15], data suggests that despite large out-commuting flows, around 12,500 people from Hertfordshire, Essex and Outer London travel into the Borough to work.

3.10.4 Commuting to London by rail is made difficult by parking problems around stations and capacity issues on the route. Only 60% of residents are within a 200m bus or rail corridor and low uptake of public transport services is exacerbated by high car ownership. Walking and cycling are also less evident than elsewhere. The current lack of sustainable transport can be addressed in part by careful location of essential services and new jobs in relation to housing sites.

3.10.5 While north-south connections by road and rail are good, poor east-west links are a hindrance to other movements. The Lea Valley watercourse is a significant barrier to movement.

3.10.6 The railway serves commuters to London, however it is not well related to Hoddesdon town centre. Around 60% of the Borough is within 400m of a bus stop outside town centres and 200m in urban centres. Despite good links externally, public transport connections between local centres and larger town centres is restricted in the Borough. As a result it is safe to assume that access to public transport for those living in rural areas, or simply away from

[14] Scott Wilson (January 2008) *Broxbourne Sustainability Appraisal Scoping Report: Introduction to the report*.

[15] Scott Wilson (January 2008) *Broxbourne Sustainability Appraisal Scoping Report: Economic Topic Paper*.

local centres, is likely to be very limited. Car dependency is high as a consequence and there is a lack of accessibility from the more rural communities to key community facilities.

4

4 Current Transport Provision

4.1 Current Transport Provision

4.1.1 Broxbourne includes the towns of Waltham Cross, Cheshunt, Broxbourne and Hoddesdon in south east Hertfordshire. The area provides good access to London and other major urban areas but retains a rural feel as it encompasses countryside and the Lee Valley Regional Park. Although a relatively small area, the Borough is located close to London and faces development pressures in common with other parts of the East of England.

4.1.2 Transport links are good with the M25 to the south and the A10 between London and Cambridge. Rail links provided by National Express serve Rye House (Hoddesdon), Cheshunt, Waltham Cross, Broxbourne and Theobalds Grove with direct trains to London Liverpool Street and to Cambridge and Stansted Airport. Both Luton and Stansted Airports are within easy reach. Given its location and the availability of road and rail links, there is a high level of out-commuting. A majority of the resident workforce travels to work outside the Borough. This has a significant impact on the nature and extent of traffic congestion and movement patterns.

4.2 Highway Capacities

4.2.1 The Cheshunt and Waltham Cross Urban Transport Plan Data Report 2007 has some detailed information on traffic flows in the south of the Borough.

4.2.2 Traffic data is collected as part of the annual monitoring programme at eight locations in this area. Table 4.1 taken from the report shows these locations along with count frequency and the annual average weekday flow at all sites.

Table 4.1 Traffic Count Monitoring Sites in Cheshunt and Waltham Cross

Site No.	Location	Frequency of Count	2006 AAWD (2 way)
135	A10, Gt Cambridge Rd, Cheshunt	Continuous	45,318
301	B156, Goffs Lane, Cheshunt	Annual (April)	14,689
566	B198, Lieutenant Ellis Way, Cheshunt	Continuous	16,156
570	B156, Halfhide Lane, Cheshunt	Monthly	12,975
609	A121, Cheshunt Link Road, Cheshunt	Continuous	25,686
249	B176, Crossbrook St, Waltham Cross	Quarterly & MCC	21,699
261	A121, Station Road, Waltham Cross	Annual (April)	28,741
707	U295, Theobalds Lane, Waltham Cross	Annual (April)	2,563

4.2.3 A number of congestion hotspots were identified in the study, based on anecdotal evidence from council officers and input from the area office, and bus companies. Table 4.2, reproduced from the study, shows the hotspots and gives further details on the perceived causes of congestion.

Table 4.2 Congestion Hotspots in Cheshunt

Road	Location	Time Period	Cause	Source of Evidence
A10 SB	Great Cambridge Road approach to M25 J25, Waltham Cross	AM Peak	Junction M25	Anecdotal
A10 NB	Junction with College Rd, Cheshunt	PM peak	Traffic signals at College Rd	Anecdotal
A10 NB	Junction with Church Lane, Cheshunt	PM peak	Traffic signals at Church Lane	Anecdotal
A121	Eleanor Cross Rd, Station Rd, Waltham Cross		Traffic lights at Lea Rd and traffic volume	Anecdotal & complaints to local area office

4.2.4 Currently there is no empirical information available on the level of delay at these locations. This will be required if a more detailed analysis is to be undertaken such as determining queue lengths and time delays and to extrapolate this to future year data.

Highway Capacity

4.2.5 We have investigated traffic data for 2007 for several sites in the Borough to assess the capability of the road network to accommodate additional traffic. Manual Classified Count (MCC) data was obtained for four sites and this was used to determine capacity data based on the Highways Agency's Congestion Reference Flow (CRF) technique. Table 4.3 sets out the figures obtained.

4.2.6 Figure 4.1 shows the location of the MCC and automatic count sites.

Figure 4.1 Location of Traffic Count Sites

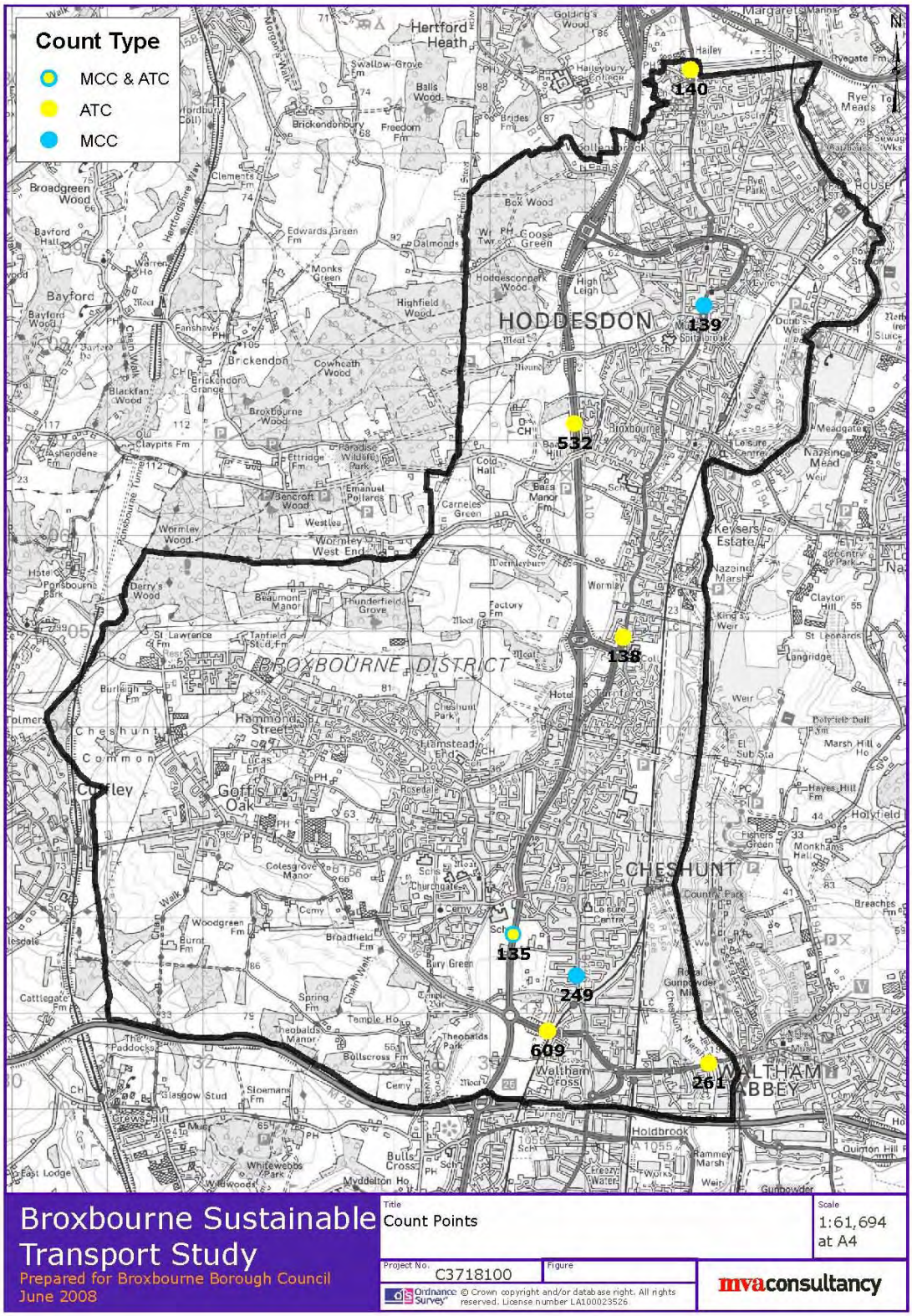


Table 4.3 Congestion Reference Flows

Location	Congestion Reference Flow (CRF) Capacity	Daily Flow (16hr AADT)	Ratio Flow to Capacity (RFC)
Site 139 High Street Hoddesdon	24,788	22,154	0.89
Site 135 A10 Great Cambridge Road, Cheshunt	76,182	48,065	0.63
Site 249 B176 Crossbrook Street, Waltham Cross	29,108	21,747	0.75
Site 606 M25 Jct 24-25 Bulls Cross	140,276	122,606	0.87

4.2.7 Generally, CRF factors above 0.85 are considered high with links approaching saturation point. This suggests that High Street Hoddesdon is busy and is constrained by the limited road space available. The M25 although just outside the Borough boundary carries considerable volumes of traffic as might be expected but the apparent congestion may deter additional future users. From the sites indicated, there does not appear to be a major congestion problem currently, although future traffic growth will add pressures to the highway network and may make journeys less reliable.

4.2.8 Traffic data has been supplied for a number of sites based on Automatic Traffic Count (ATC) figures. This provides a profile of traffic flows over a period (up to one year) and the figures obtained (although not including a breakdown by type of vehicle) can be related to the MCC data discussed above.

Table 4.4 Traffic Count Data

Location	Indicative CRF Capacity	Daily Flow (16hr AADT)	Ratio Flow to Capacity (RFC)
Site 135 A10 Great Cambridge Road, Cheshunt	76,182	46,274	0.61
Site 138 A1170 High Road, Turnford	22,000	22,751	1.03
Site 140 A1170 Ware Road, north Hoddesdon	22,000	15,976	0.73
Site 261 A121 Station Road, Waltham Cross	32,000	31,576	0.99
Site 532 A10 Baas Hill, Broxbourne	70,000	49,276	0.70
Site 609 A121 Winston Churchill Way, Waltham Cross	70,000	24,141	0.35

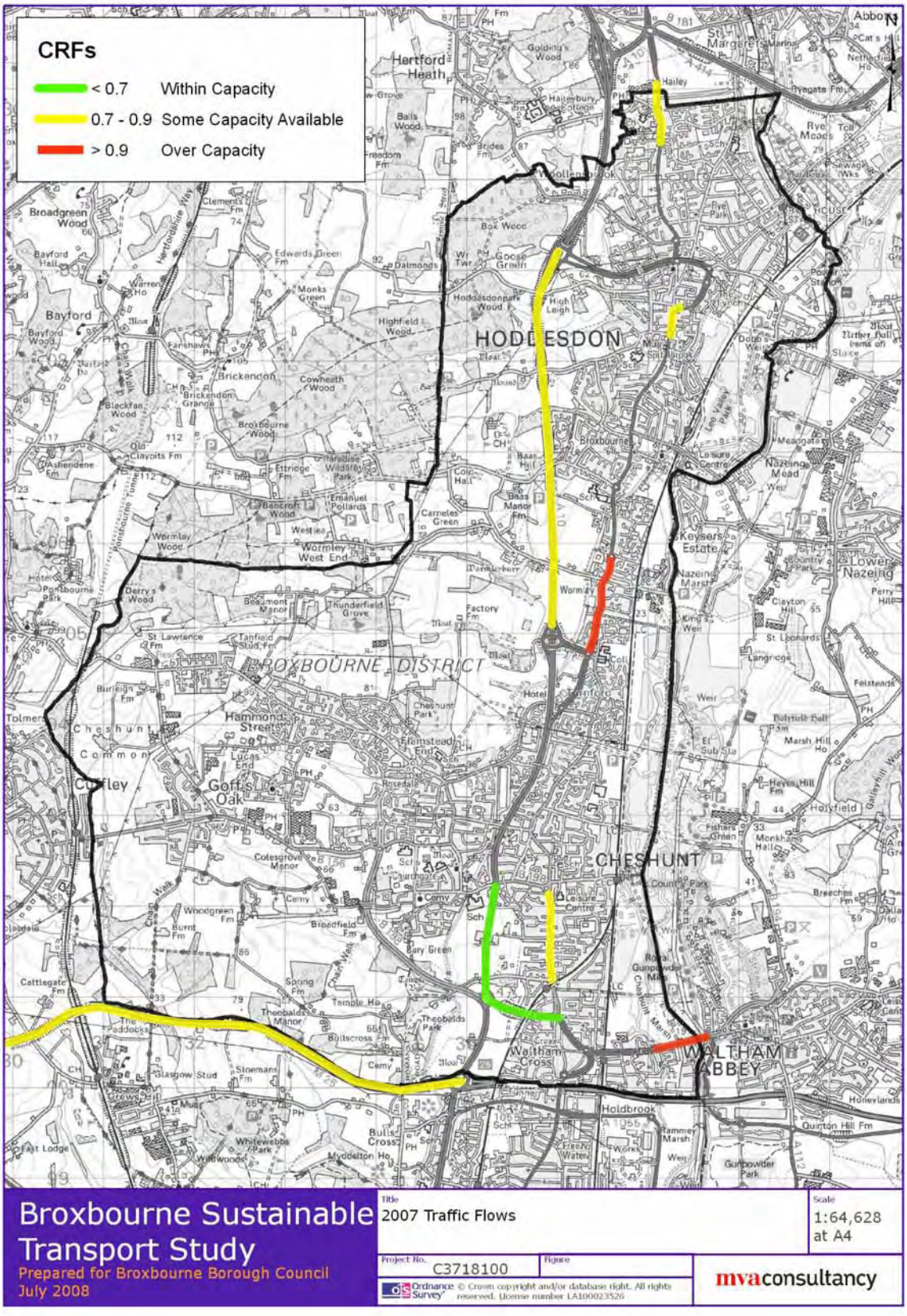
4.2.9 The count data indicates that the A10 dual carriageway operates within its link capacity although junction data has not been made available. It is likely that some delays occur at

the main junctions on the A10 but that these are not excessive given that the road is not operating at full capacity.

4.2.10 There is some evidence of traffic congestion on the A121 Station Road, Waltham Cross. Here the road is single carriageway in contrast to the additional capacity available to the west of the count site. It could be expected that congestion will worsen at this location, especially in an eastbound direction as a result of the capacity reduction from dual to single carriageway. The A1170 High Road, Turnford appears to be operating at around its capacity. This suggests that the road is susceptible to congestion as a result of having many side roads and potential conflicting movements and that peak congestion in the future could cause difficulties. As increasing the capacity at this location would be difficult, the implication is that traffic growth should be minimized by strong promotion of non-car modes.

4.2.11 The A121 Winston Churchill Way, Cheshunt operates well within its dual carriageway capacity. Data for a full year was obtained for three of the sites and this is shown in Appendix A (Figures 1, 2 and 3). Figure 4.2 shows the parts of the network that are currently experiencing problems; these will be exacerbated in future years.

Figure 4.2 Current Highway Network Capacities



4.3 Rail Network

4.3.1 The local rail network and locations of stations is shown in Figure 4.3. The main route through the Borough is between Cambridge and London Liverpool Street. To the west, East Coast Main Line local services provide links to London Kings Cross and Moorgate.

4.3.2 The area is well served by rail with frequent services to London Liverpool Street via Seven Sisters or via Tottenham Hale and to Stratford. To the north, services operate directly to Bishops Stortford and Cambridge and to Hertford East. Connections are available to a wide range of other destinations including Stansted Airport. All services through the Borough are operated by National Express East Anglia and those to the west on the Hertford North line are operated by First Capital Connect.

4.3.3 Network Rail's Capacity Utilisation Index (CUI) is a measure of how much of the available capacity on a section of route is used by trains. This indicates that there are serious capacity problems on the West Anglia route through the Borough, particularly the Lea Valley through Cheshunt and Broxbourne with a CUI above 90%. The Greater Anglia Route Utilisation Strategy predicts changes in passenger numbers and suggests that the West Anglia route will experience growth due to the expansion of Stansted Airport and housing growth.

4.3.4 Significantly, the alignment of the railway means that access to stations is a problem for many residents and achieving a mode shift to rail may be difficult, despite its clear advantages for many north-south journeys.

4.3.5 Network Rail has set out its intentions to improve the West Anglia route[1]. This notes that severe overcrowding takes place between Cambridge and London Liverpool Street and how future growth in passenger numbers can be planned for. In the medium term (to 2014), capacity and performance enhancements are proposed including the use of 12-car trains on all outer suburban services between Cambridge and Stansted Airport to Liverpool Street which require some platforms to be lengthened. New siding space and power supply upgrades will be required. Peak period West Anglia inner suburban services are planned to be 9-car trains e.g. Cheshunt via Southbury. A shuttle service between Cheshunt and Seven Sisters in peak hours is also planned.

4.3.6 In the longer term (to 2019) the removal of level crossings will improve performance on the route. On West Anglia the running of up to an additional six trains an hour at peak times is proposed. Two of these would run through to London Liverpool Street and four would run to Stratford as an alternative terminus. It is anticipated that this will serve the proposed Stratford City Development, relieve crowding on services to Liverpool Street by providing a link to the Victoria Line at Tottenham Hale and enhancing connectivity at Stratford. It is recommended that the West Anglia route via Tottenham Hale is four-tracked between Coppermill Junction and Broxbourne Junction to provide adequate capacity to facilitate the extra services. Further capacity improvements are planned at Stansted Airport to allow additional trains to run to Liverpool Street.

[1] Network Rail (December 2007) *Greater Anglia Route Utilisation Strategy.*

Figure 4.3 Station Locations

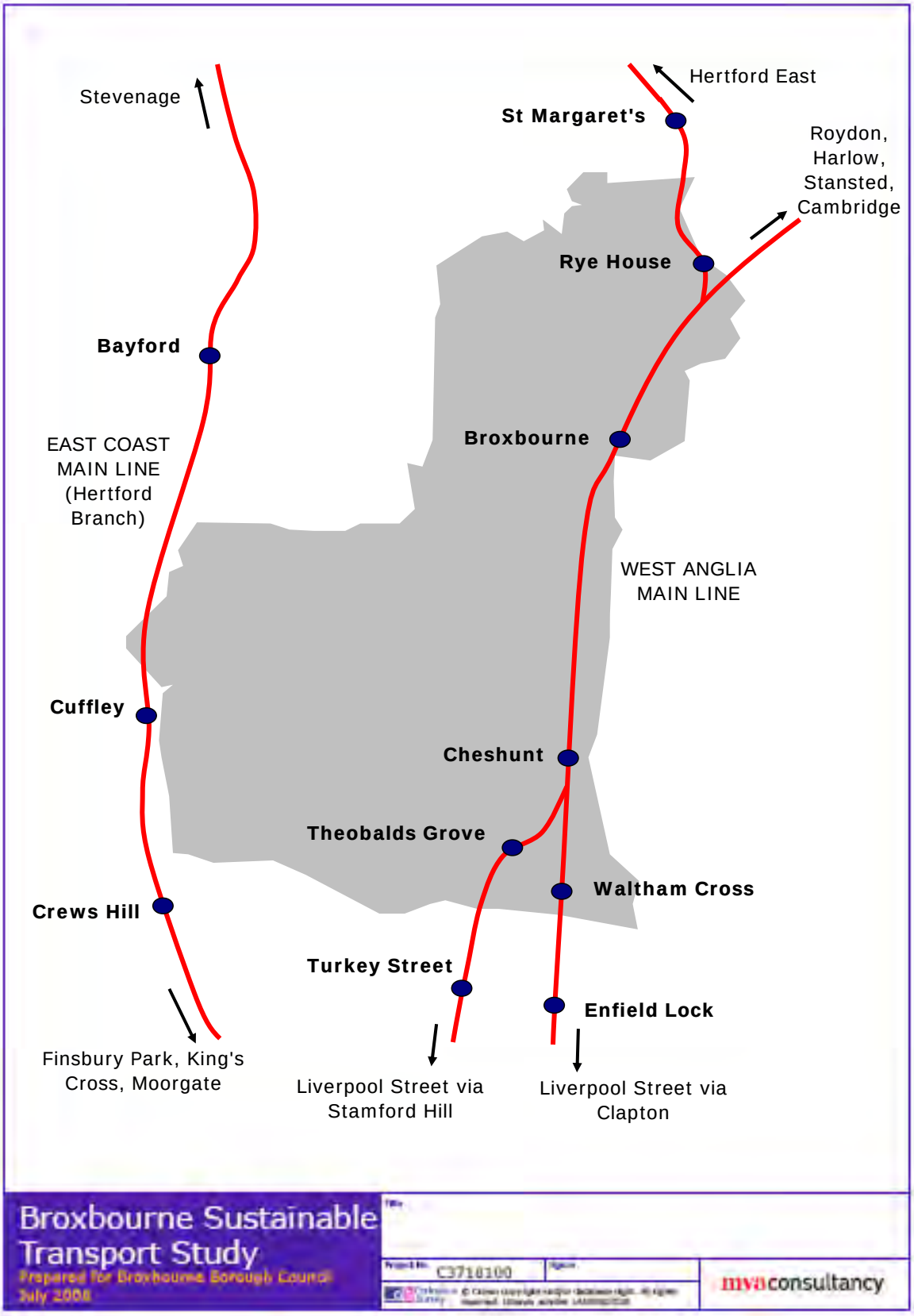


Table 4.5 Station Use (Total Entries and Exits)

Station	2002/03	2004/05	2005/06
St Margaret's	294,763	302,701	300,745
Roydon	95,277	91,905	90,064
Rye House	**264,582**	**312,736**	**312,505**
Broxbourne	**1,355,293**	**1,367,328**	**1,334,843**
Cheshunt	**1,321,617**	**1,408,988**	**1,408,338**
Waltham Cross	**694,717**	**691,640**	**679,556**
Enfield Lock	617,403	595,997	569,880
Theobalds Grove	**268,640**	**302,689**	**268,974**
Turkey Street	276,381	315,901	286,281
Bayford	16,995	23,023	23,338
Cuffley	528,451	555,977	557,199
Crews Hill	24,443	26,593	33,372

Station	change from 2002/03 2004/05	2005/06
St Margaret's	2.7%	2.0%
Roydon	-3.5%	-5.5%
Rye House	**18.2%**	**18.1%**
Broxbourne	**0.9%**	**-1.5%**
Cheshunt	**6.6%**	**6.6%**
Waltham Cross	**-0.4%**	**-2.2%**
Enfield Lock	-3.5%	-7.7%
Theobalds Grove	**12.7%**	**0.1%**
Turkey Street	14.3%	3.6%
Bayford	35.5%	37.3%
Cuffley	5.2%	5.4%
Crews Hill	8.8%	36.5%

Source: Office of Rail Regulation.

4.3.7 The five stations in the Borough are well used, particularly Broxbourne and Cheshunt (see Table 3.5). However, some decline in the number of users has been evident in contrast to the wider trend of significant growth in rail use, even taking into account variations in the way the data has been collected. For comparison, stations outside the Borough have been included which indicates that other stations on the West Anglia route have evidence of both growth and decline. This contrasts with figures for the three nearby stations on the Hertford North branch of the East Coast Main Line (Bayford, Cuffley and Crews Hill) which all demonstrate increases in use. While we have not been able to obtain information on the origins of rail users at each station, it is possible that Borough residents may use services on the East Coast Main Line in preference to those on the West Anglia Main Line due to the location of the stations relative their homes or because of their ultimate destinations.

4.3.8 Tables 4.6, 4.7 and 4.8 indicate the direct train services available, their frequency and the journey times to major destinations.

Table 4.6 Number of Direct Trains Daily

Number of Direct Trains Daily		To					
		London Liverpool Street via Seven Sisters	London Liverpool Street via Tottenham Hale	Hertford East	Bishops Stortford	Cambridge	Stratford
From	Rye House		35	41			4
	Broxbourne	2	84	42	61	42	23
	Cheshunt	37	76	41	55	36	23
	Theobalds Grove	37					
	Waltham Cross		37	39	2		7

Table 4.7 Frequency of Rail Services

Frequency of Service (minutes)		To					
		London Liverpool Street via Seven Sisters	London Liverpool Street via Tottenham Hale	Hertford East	Bishops Stortford	Cambridge	Stratford
From	Rye House		30	30			irregular
	Broxbourne	night only	15	30	20 or 30	30 or 15 in PM peak	30 or 60
	Cheshunt	30	15	30	30	30	30 or 60
	Theobalds Grove	30					
	Waltham Cross		30	30	irregular		irregular

Table 4.8 Typical Train Journey Times

Typical Journey Time (minutes)		To					
		London Liverpool Street via Seven Sisters	London Liverpool Street via Tottenham Hale	Hertford East	Bishops Stortford	Cambridge	Stratford
From	Rye House		41	13			43
	Broxbourne	30	28 or 36	17	20	59	30
	Cheshunt	39	24 or 32	21	24	63	26
	Theobalds Grove	34					
	Waltham Cross		30	24	35		24

4.3.9 Apart from the availability of regular trains and a choice of London destinations (Liverpool Street from stations in the Borough but other options from stations such as Cuffley), the availability of parking at stations may be an influence on how and when journeys are made. Station car parks (according to the National Rail web site) are in place at:

- Waltham Cross: 1 disabled bay, 48 space car park, cycle storage for 6 cycles;
- Cheshunt: 5 disabled bays, 185 space car park, cycle storage for 40 cycles;
- Broxbourne: 5 disabled bays, 480 space car park, cycle storage for 30 cycles;
- Rye House: no disabled bay, no car parking, no cycle storage; and
- Theobalds Grove: no disabled bay, 2 space car park, no cycle storage.

4.3.10 In addition:

- Lee Valley Regional Car Park that also serves Broxbourne station provides approximately 260 spaces;

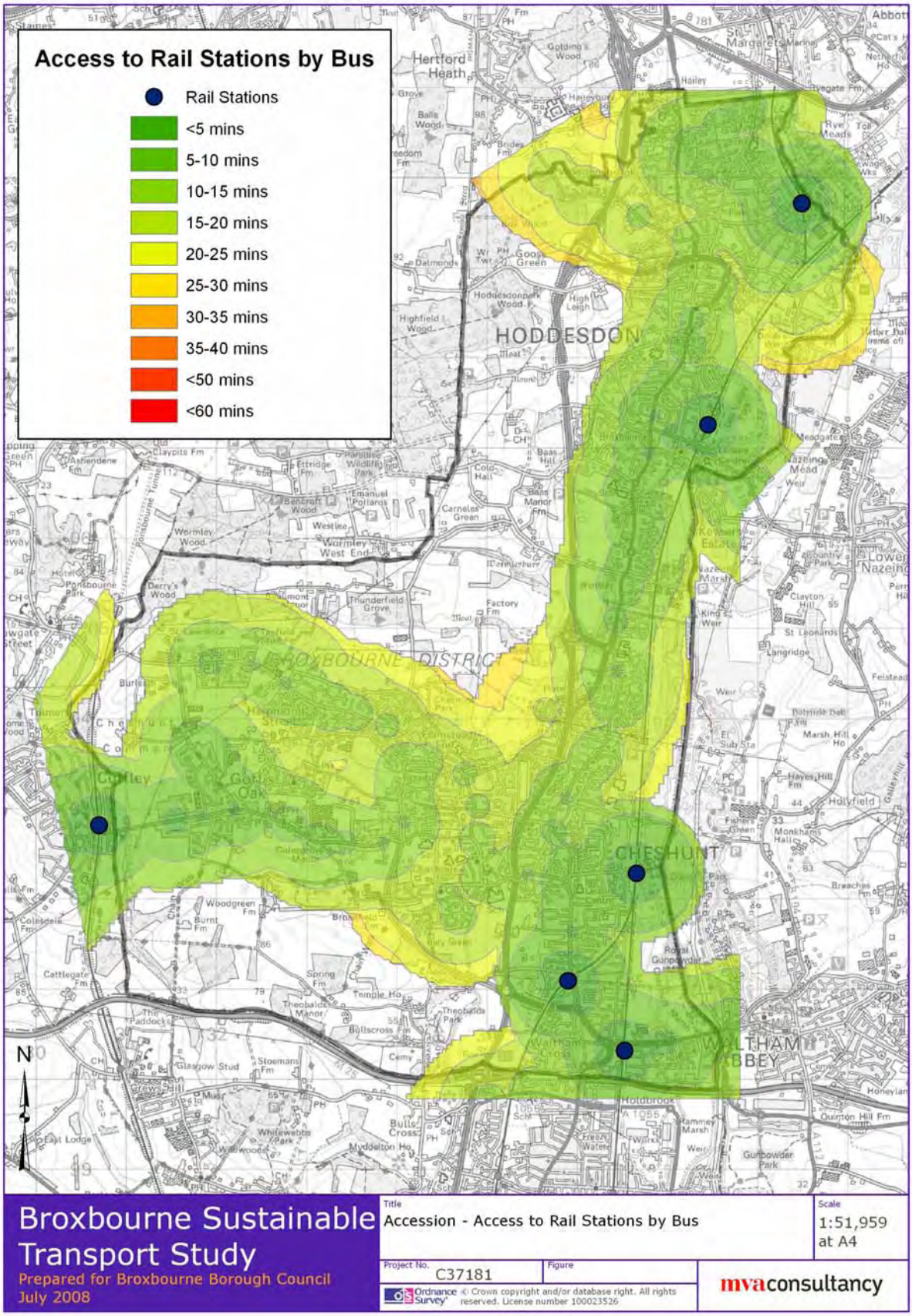
- Theobalds Grove car park which used to be managed by the Council but is now managed by Network Rail has 134 spaces; and
- Additional car parking for Waltham Cross station provided by the Council has 45 spaces.

4.3.11 There is no formal car park at Rye House although on site observations suggest that many commuters park their cars in the surrounding residential roads where there are no parking restrictions. However the Council is looking into providing parking for station users as part of potential developments in that area in the future.

4.3.12 Of the stations located just outside the borough, only Cuffley (216 spaces and 3 cycle spaces) and St Margaret's (35 spaces and 12 cycle spaces) have formal car parks.

4.3.13 Access to rail stations by bus is shown in Figure 4.4. We suggest that a more detailed investigation of how access to stations could be improved together with consideration of station travel plans would be a useful means of raising the profile of rail opportunities and encouraging their use.

Figure 4.4 Bus Access to Rail Stations



4.4 Stansted Airport

4.4.1 Stansted, to the north east of the Borough, is set to expand its capacity and is promoting the construction of a second runway to accommodate 68 million users per year[2]. Currently public transport is used by around 40% of its 8.6 million airport users and this is proposed to increase in the future supported by rail capacity enhancement, and a replacement bus and coach station.

4.5 Public Off-Street Parking

4.5.1 The Borough Council manages a number of public car parks with a total of 878 off-street spaces available (see Appendix A Table 4). Most car parks are pay and display and charges discourage long stay parking with charges of between £4.00 and £5.50 for over four hours and a maximum of six hour stay at Windmill Lane in Cheshunt at a cost of £7.50.

4.5.2 Privately operated car parks are available at:

- Hoddesdon Tower Centre;
- Sainsbury, Hoddesdon;
- Broxbourne rail station;
- Brookfield Centre, Cheshunt;
- Cheshunt rail station;
- Theobalds Grove rail station;
- Waltham Cross Shopping Pavilion; and
- Waltham Cross rail station.

4.6 Accessibility Analysis

4.6.1 In order to assess the level of accessibility to different services and facilities across the Borough we have carried out an accessibility analysis using ACCESSION software. We have calculated journey times by public transport, cycle and on foot to the key attractors of:

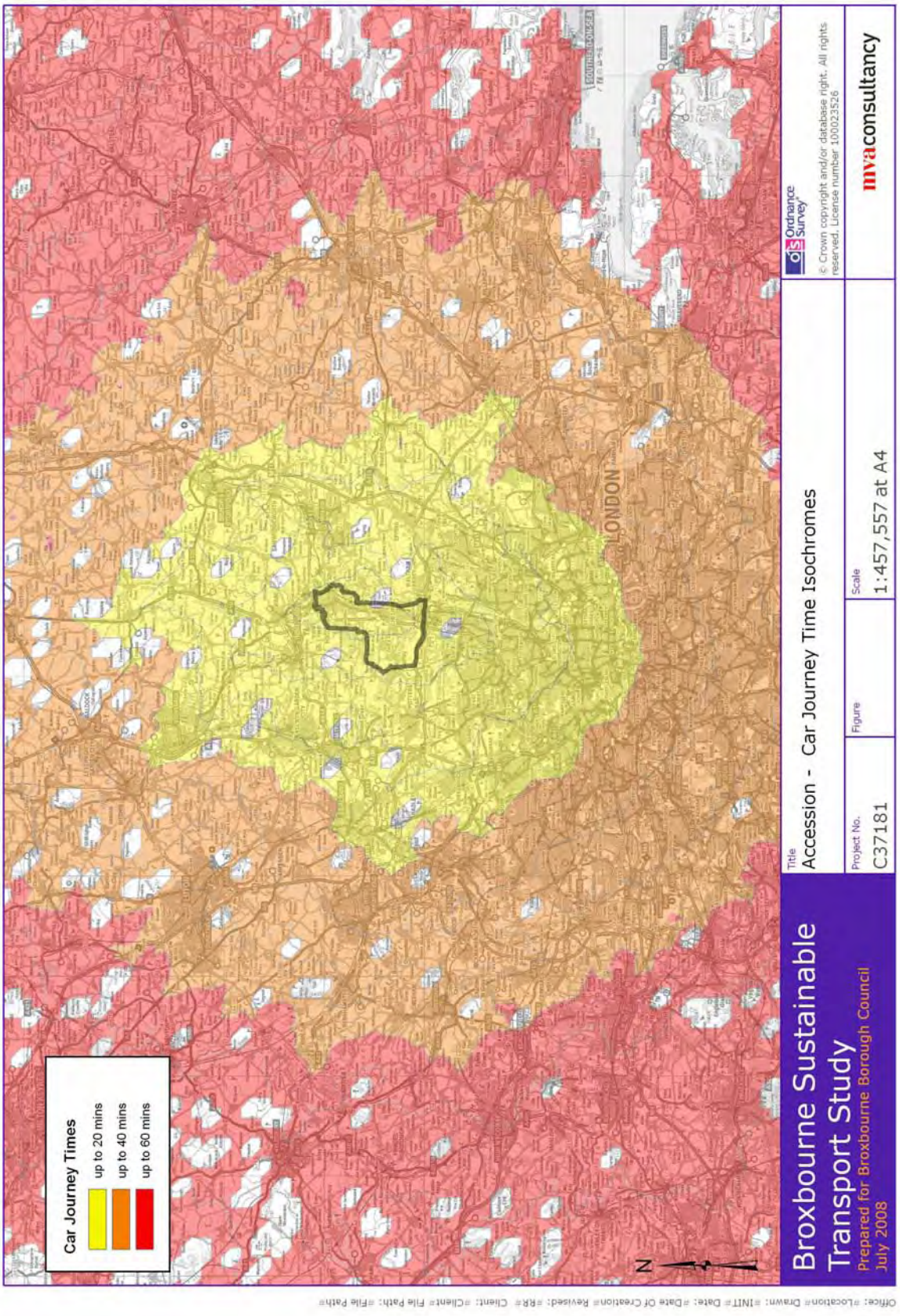
- Education – primary and secondary schools and further education (FE) colleges;
- Employment;
- Healthcare – hospitals and GP surgeries;
- Retail; and
- Leisure.

4.6.2 The calculation of journey times by public transport is for a weekday period between 7am and 10am and also takes account of the walk time to bus and train stops. Whilst our analysis is focused on Broxbourne Borough we have also considered major trip attractors that lie just outside the boundary of the Borough in our analysis.

[2] www.stanstedairport.com

4.6.3 Given the proximity of the Borough to London and the trunk road network, we have analyzed journey times by car to illustrate the wide range of destinations that is possible to reach as shown in Figure 4.5.

Figure 4.5 Isochrones for Car Journeys from Broxbourne Borough



Education

4.6.4 There are a number of primary and seven secondary schools in the district and one Further Education College located near Wormley. All parts of the Borough are within 25 minutes of a primary school by public transport and the majority are less than 15 minutes journey away. As there are fewer secondary schools, access to these by public transport takes longer. Even so, all areas of the Borough are within 35 minutes journey time of a secondary school by public transport and many residents of the main urban areas are within 15 minutes of the nearest secondary school. There is also reasonable access to the FE College by public transport. Those living in Wormley, Broxbourne, Hoddesdon and Cheshunt can reach the college within 20 minutes by public transport. It can take more than 45 minutes to reach the college by public transport from the west of the Borough in places such as Goffs Oak and Hammond Street.

4.6.5 The FE College is around 15 minutes walk or less than 5 minutes cycle for residents of Wormley but for those living further away in places such as Waltham Cross and Hoddesdon. From these towns it would take up to 50 minutes on foot or 20 minutes by cycle to reach the college. Broxbourne and Cheshunt are also approximately 35-40 minutes walk away but no more than 10-15 minutes cycle away from the FE College.

4.6.6 The vast majority of the Borough is within 15 minutes walk of the nearest primary school. Only those areas on the very outskirts of the Borough have a greater distance to walk in order to access a primary school. Those living in the west of the Borough towards Goffs Oak and Cuffley have the furthest to walk (40 minutes or more) to access a secondary school on foot. However, residents of Broxbourne, Hoddesdon, Rye Park and the area around Churchgate are 15 minutes walk or less from their nearest secondary school.

4.6.7 All residents of the Borough can cycle to their nearest primary or secondary school within 20 minutes. The journey time by cycle is even shorter in many of the urban areas, within the majority of residents around 10 minutes or less by cycle to the nearest primary school.

4.6.8 Figures 4.6 to 4.14 illustrate the relationship between education facilities and residential locations.

Figure 4.6 Accessibility to Primary Schools on Foot

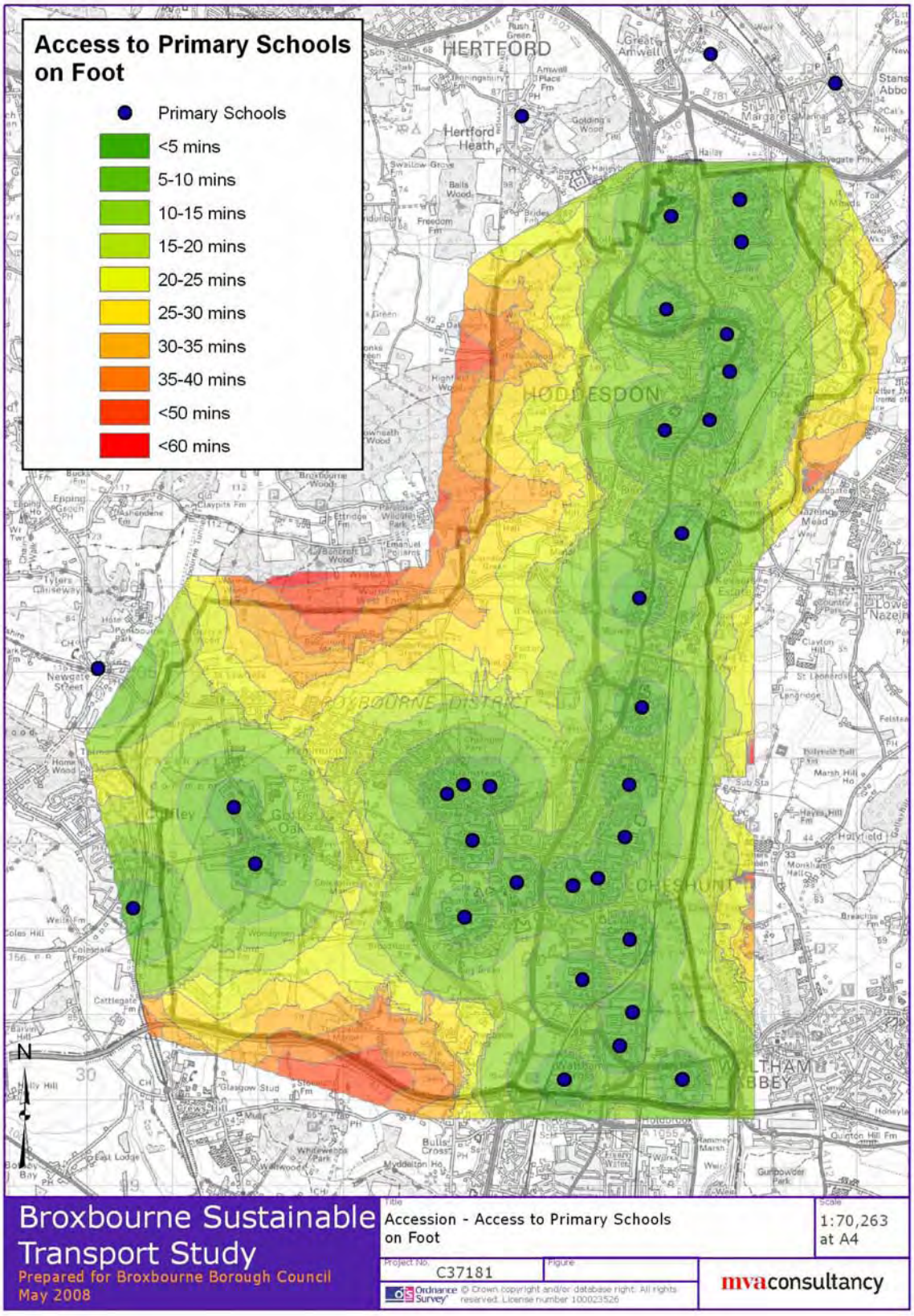


Figure 4.7 Accessibility to Primary Schools by Cycle

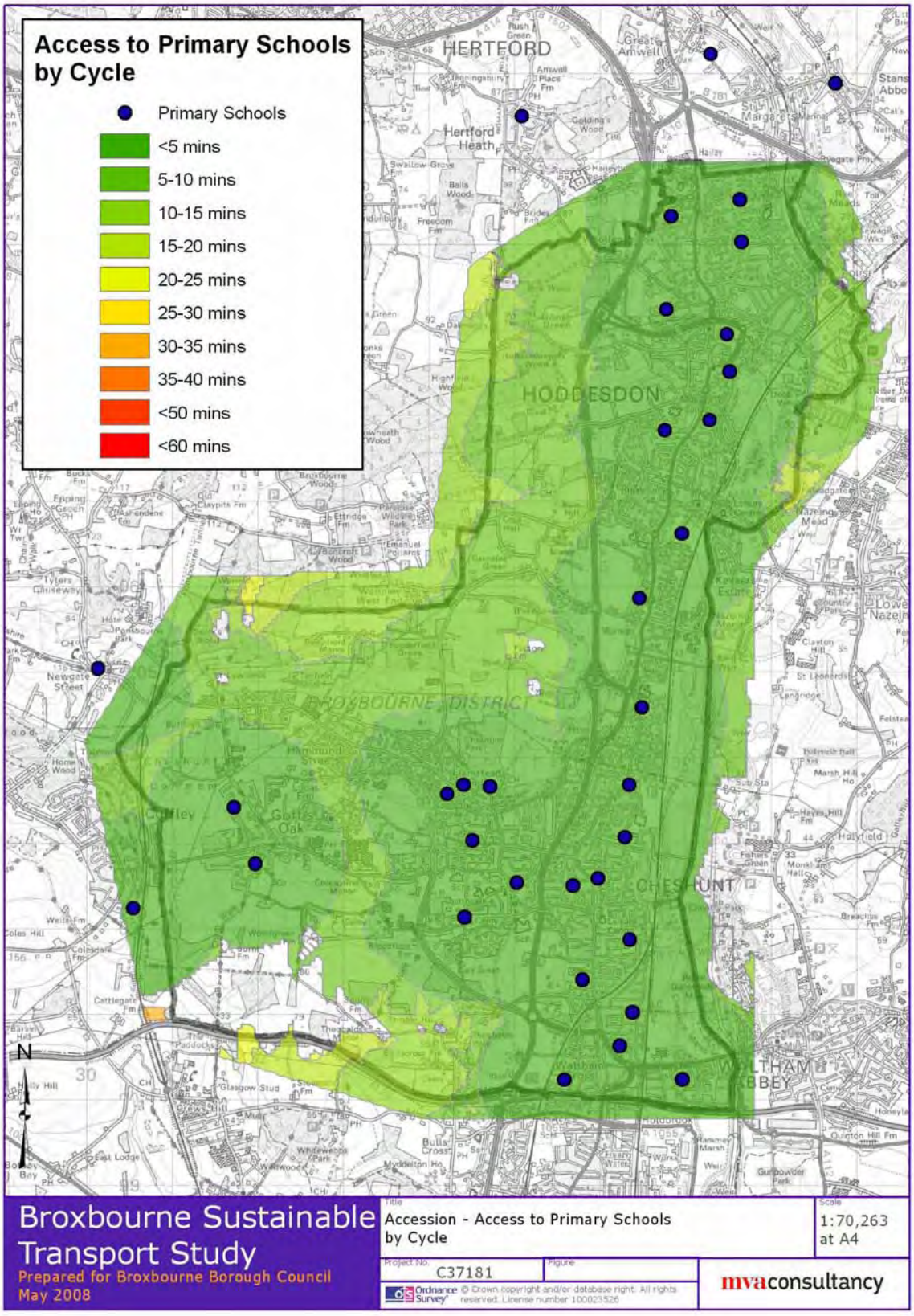


Figure 4.8 Accessibility to Primary Schools by Public Transport

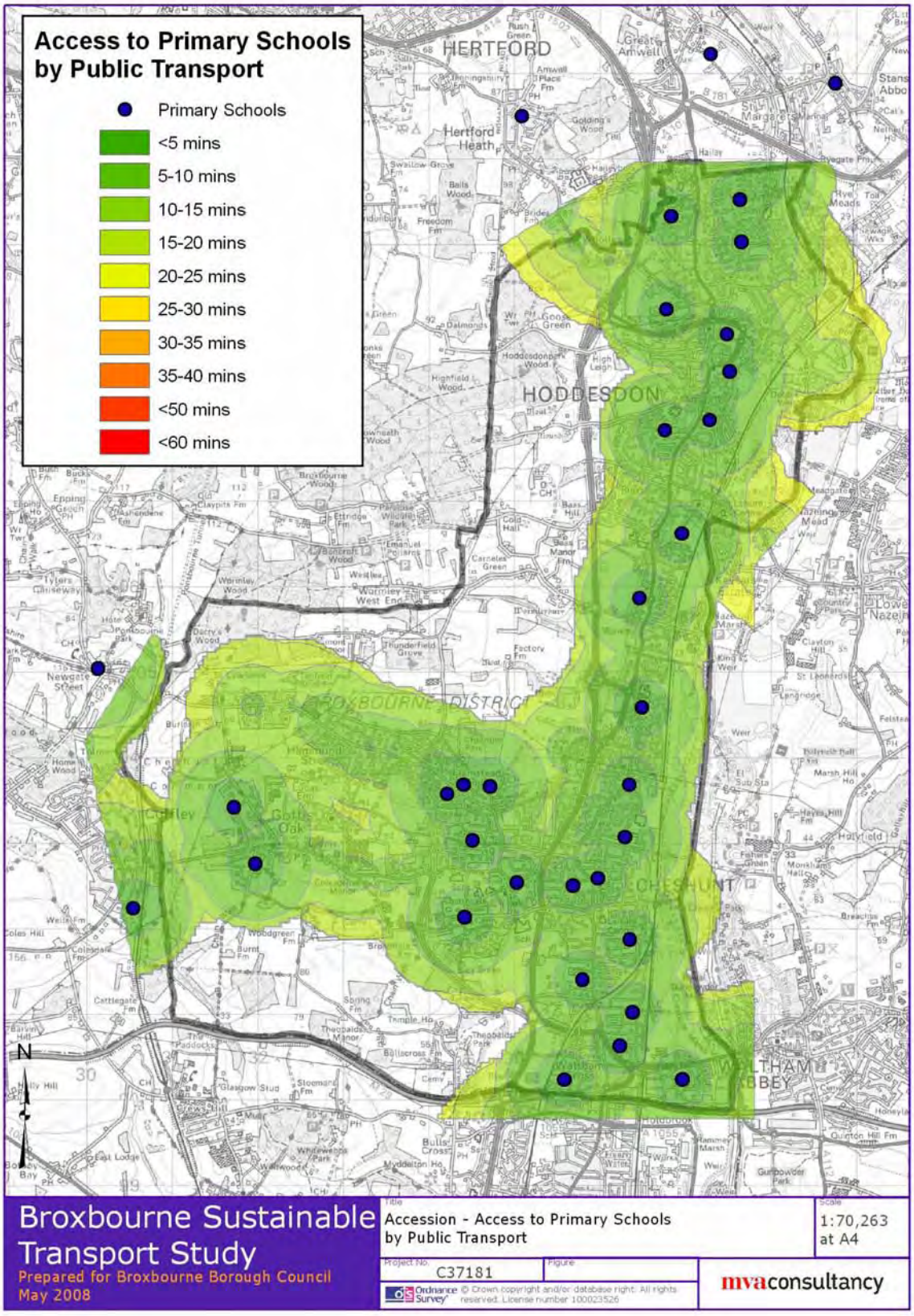


Figure 4.9 Accessibility to Secondary Schools on Foot

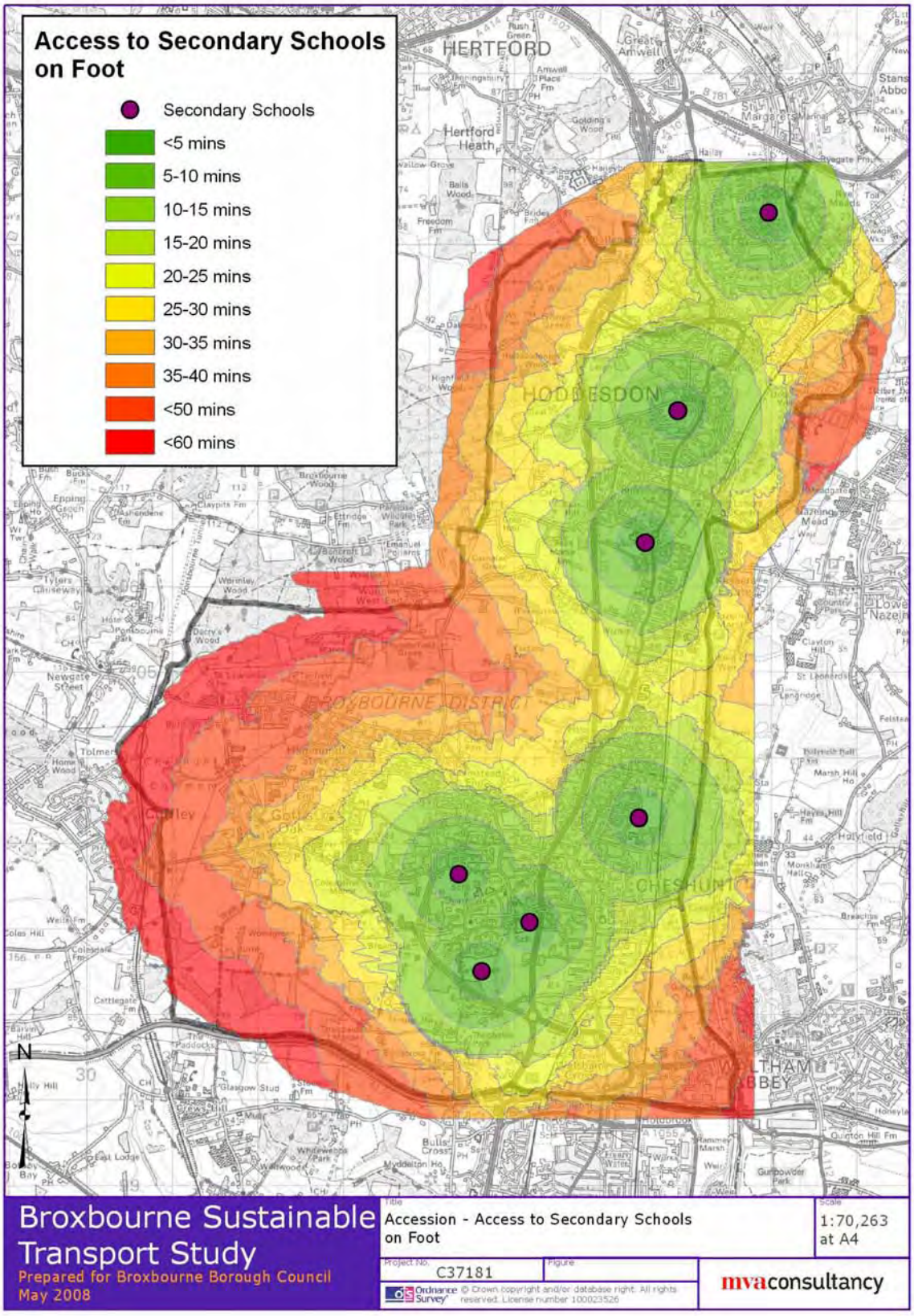


Figure 4.10 Accessibility to Secondary Schools by Cycle

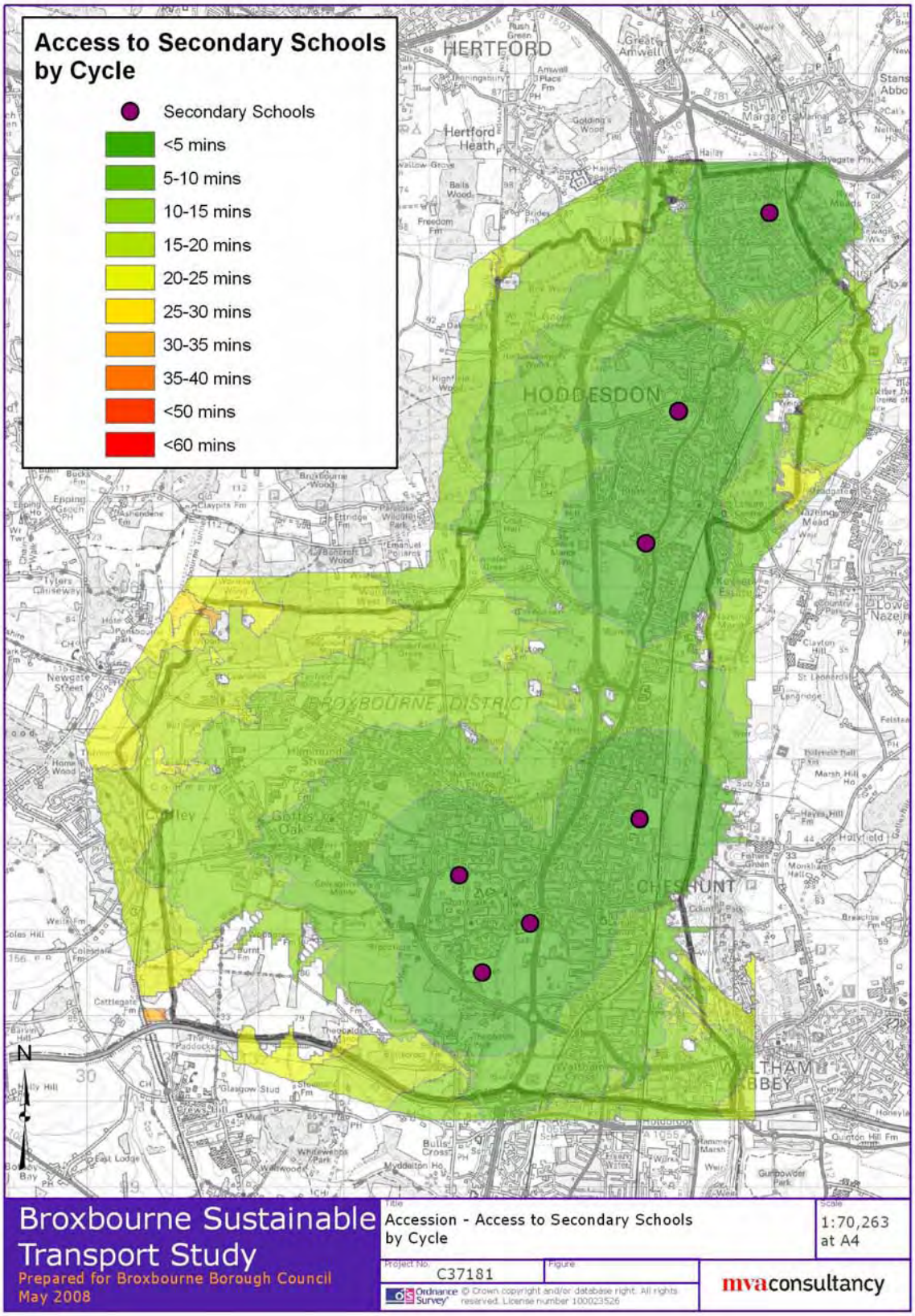


Figure 4.11 Accessibility to Secondary Schools by Public Transport

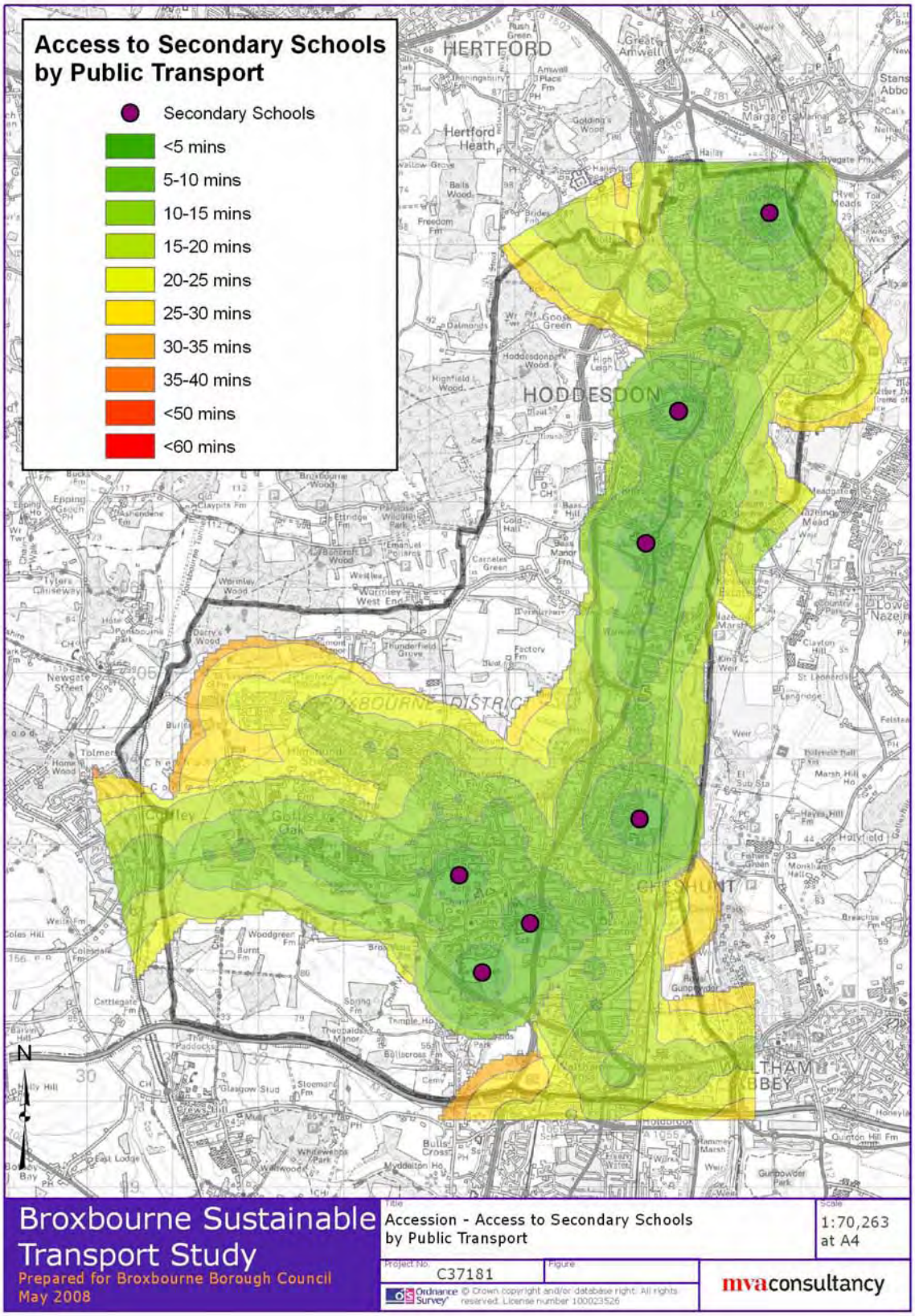


Figure 4.12 Accessibility to Further Education Facilities on Foot

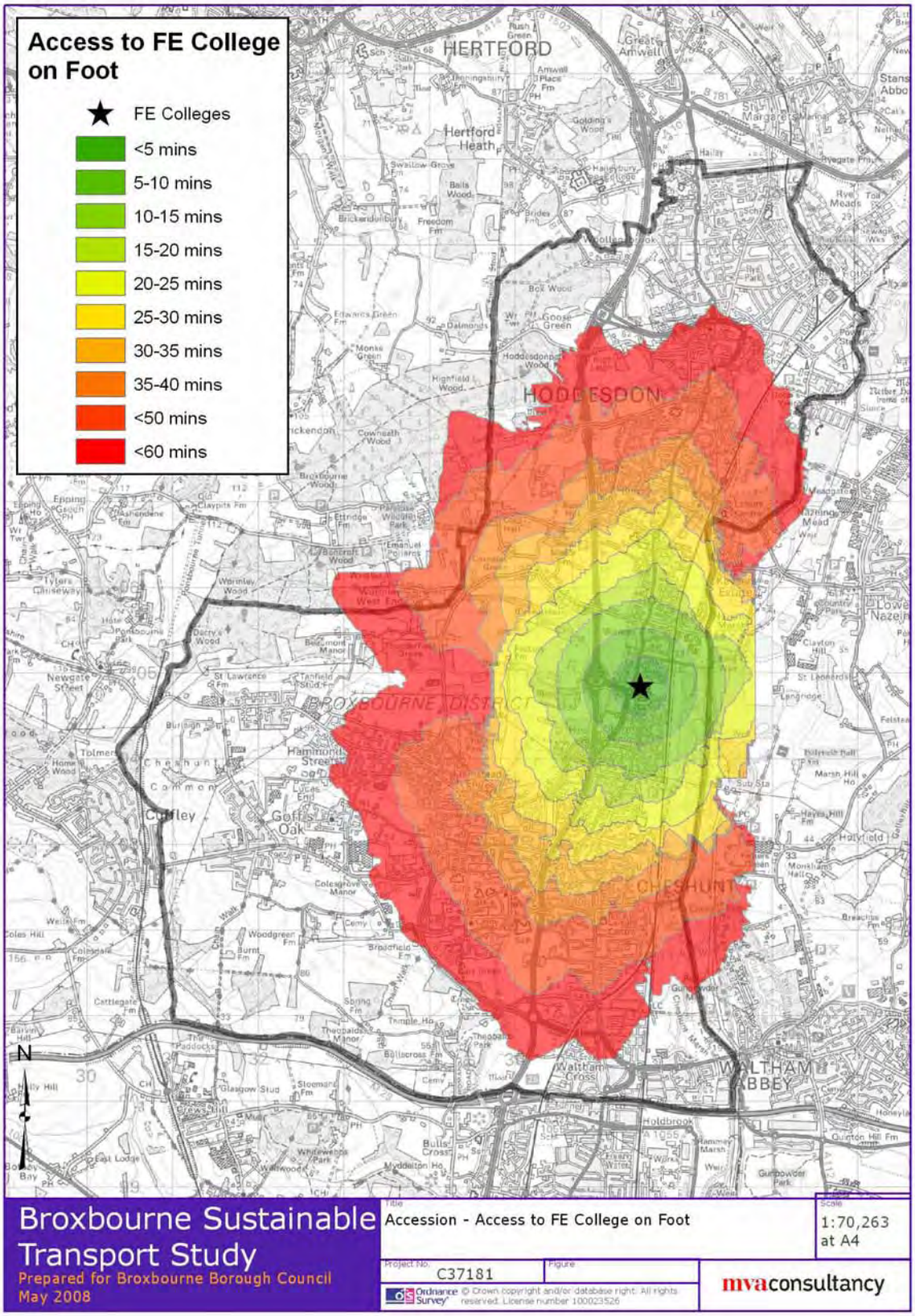


Figure 4.13 Accessibility to Further Education Facilities by Cycle

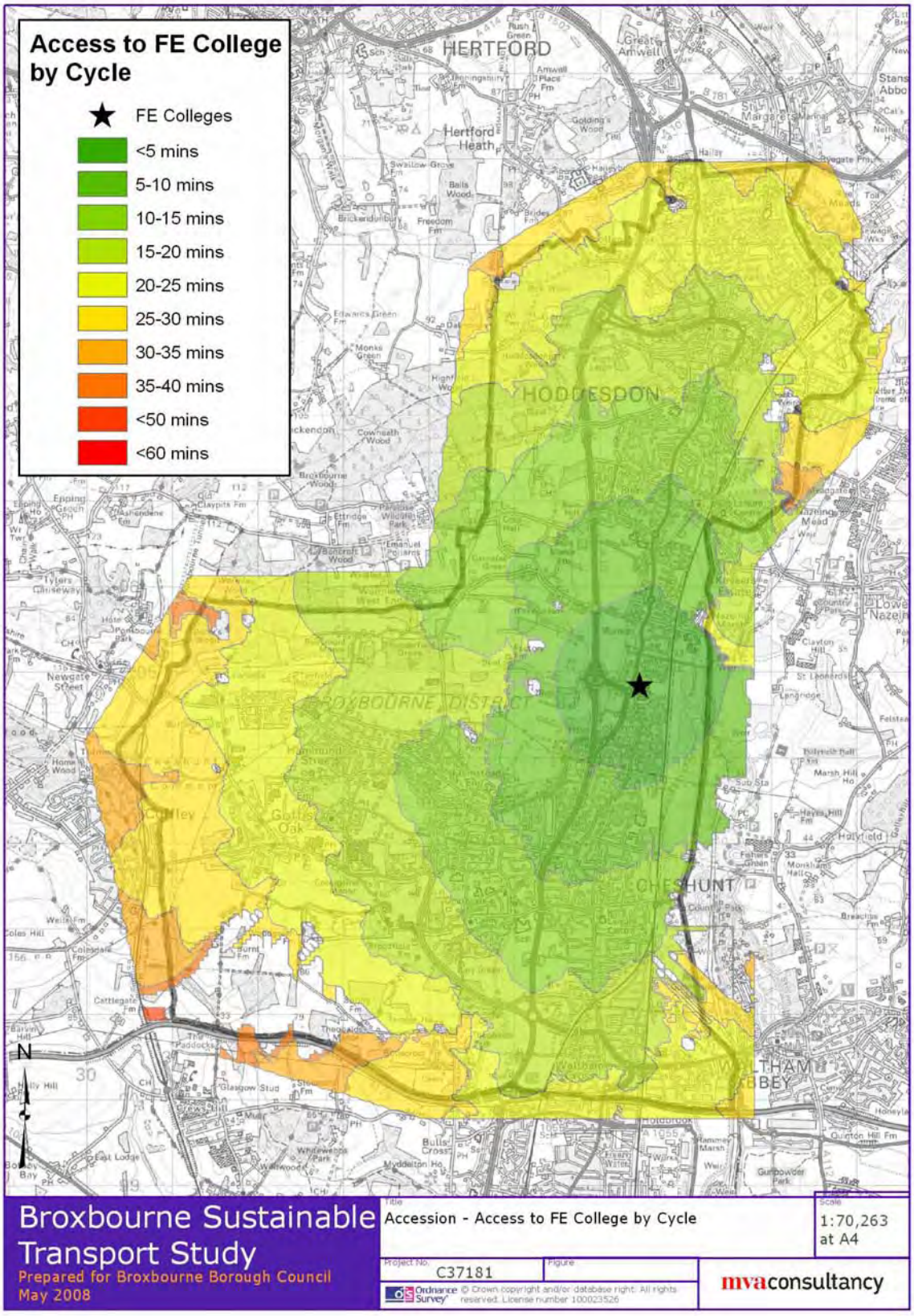
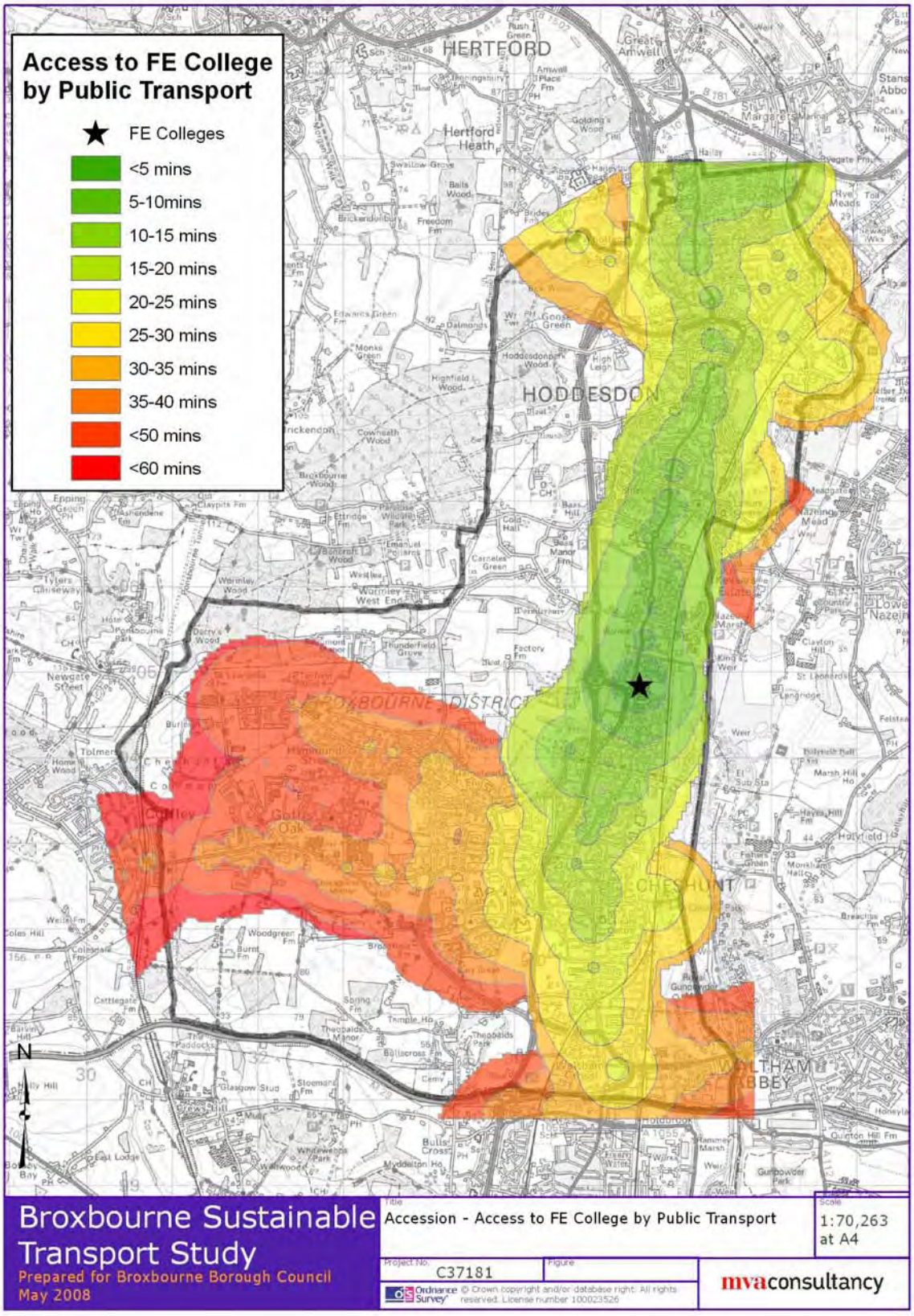


Figure 4.14 Accessibility to Further Education Facilities by Public Transport



Employment

4.6.9 As with many of the key facilities in the Borough, employment opportunities are focused along the spine of the Borough between Waltham Cross and Hoddesdon. Consequently residents in the main towns of Cheshunt, Broxbourne, Hoddesdon, Wormley and Waltham Cross can easily access employment opportunities by public transport, on foot or by cycle. The results of our accessibility analysis show that residents in all these key towns are 10 minutes or less by public transport to employment opportunities.

4.6.10 Residents in these areas can also access employment opportunities on foot with journey times of 20 minutes or less. Only those residents in the west of the Borough towards Goffs Oak would have long walk times (40 minutes or more) to employment. Across the vast majority of the Borough, employment opportunities are within 5 minutes journey time for those with a cycle. Only those on the extreme west of the Borough have a journey time of more than 20 minutes by cycle to employment opportunities.

4.6.11 Access to employment is shown in Figures 4.15 to 4.17.

Figure 4.15 Accessibility to Employment on Foot

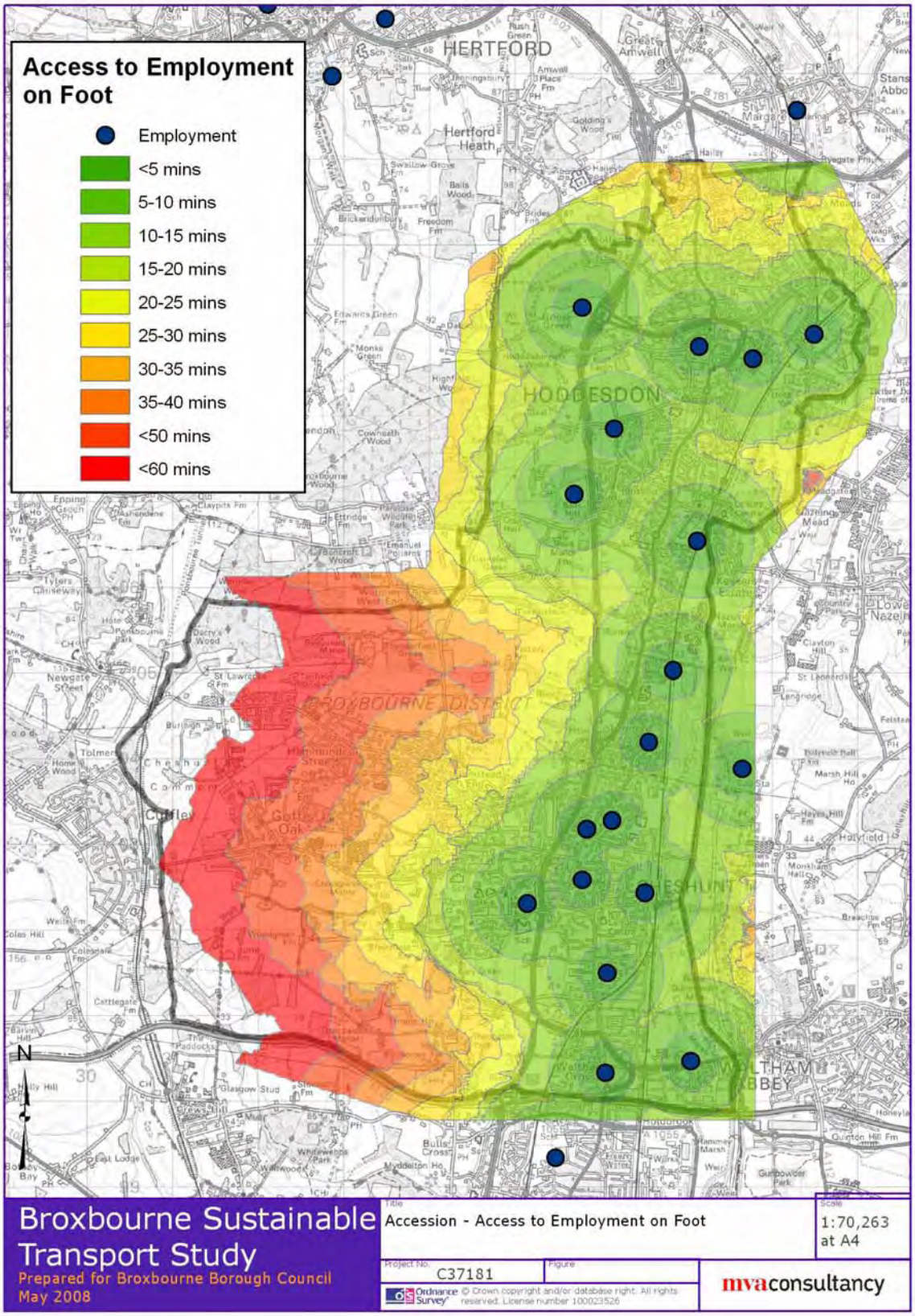


Figure 4.16 Accessibility to Employment by Cycle

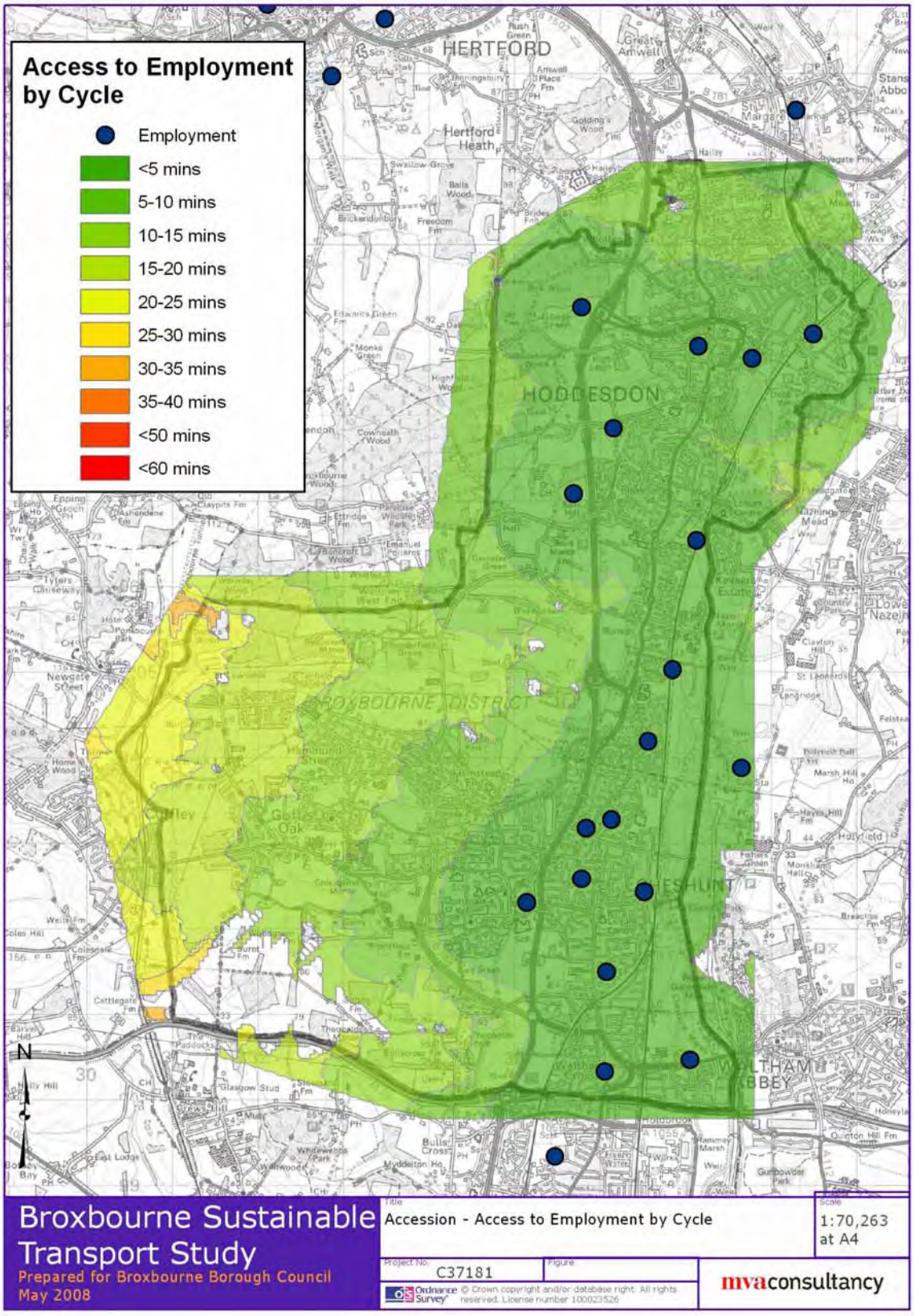
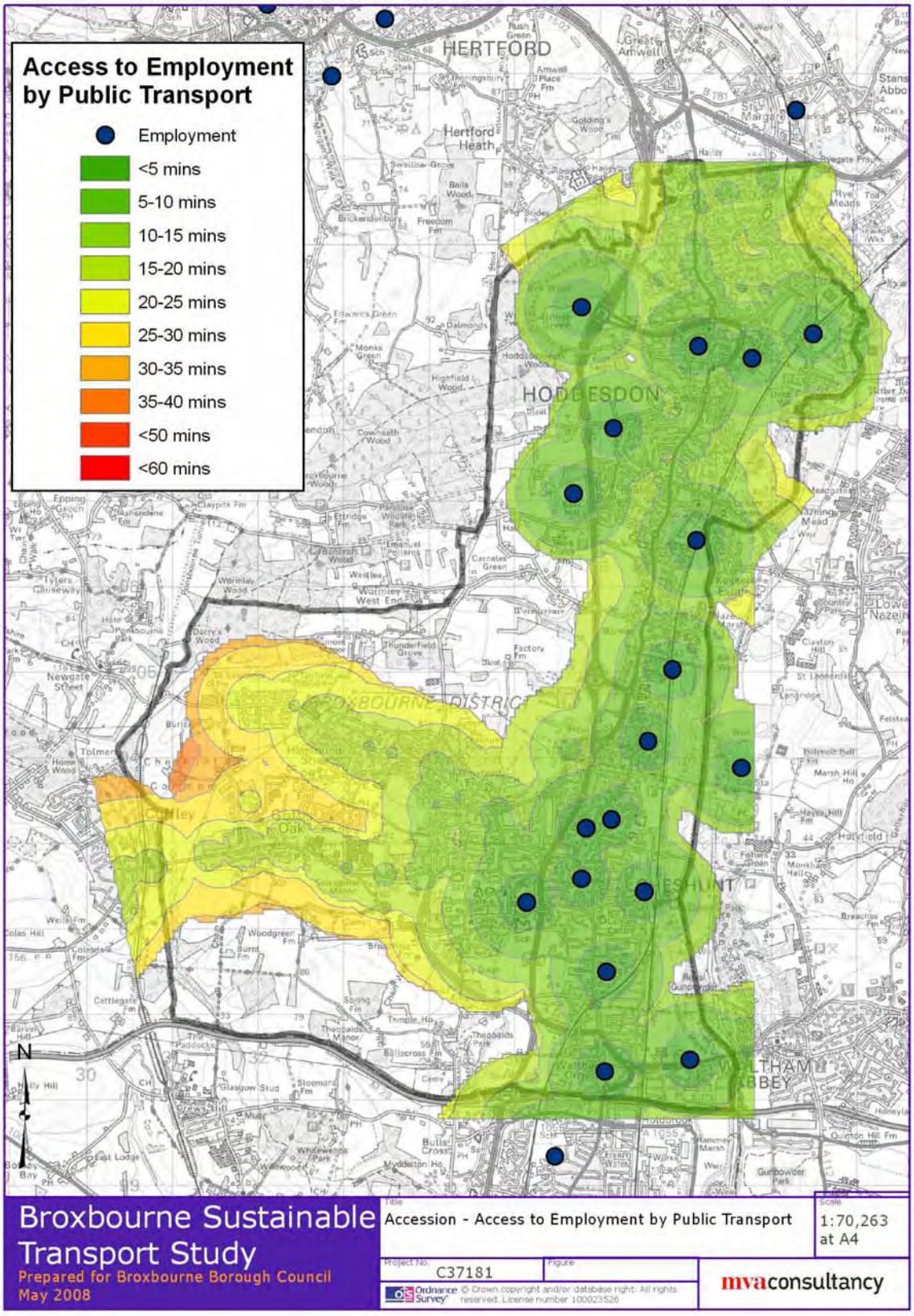


Figure 4.17 Accessibility to Employment by Public Transport



Healthcare

4.6.12 There are reasonable levels of accessibility on foot or by cycle to the GP surgeries in the Borough. Residents anywhere in the Borough are a walk of 60 minutes or less to the nearest GP surgery and for those in the main towns the journey is approximately 10 minutes by foot to the nearest GP surgery. Everywhere in the Borough is within 20 minutes cycle of the nearest GP surgery, with most areas being 5-10 minutes away (see Figures 4.18 to 4.23).

Access to Hospitals

4.6.13 There is one hospital in the Borough located in Cheshunt, and a number of GPs surgeries. Access to these healthcare facilities across the Borough by public transport is relatively good with residents of all the main towns being no more than 20 minutes away from a GP surgery. Because the hospital is located in the south of the Borough in Cheshunt, residents in the north of the Borough have a journey time of approximately 40 minutes by public transport to reach the hospital. Some residents are up to 50 minutes away from the hospital by public transport.

4.6.14 As a result of the location of the hospital anyone north of Wormley cannot access the hospital on foot as they would have a journey time of more than an hour. Due to the geographical nature of the Borough, only residents in close proximity of the hospital in Cheshunt can access the hospital by foot. Levels of accessibility by cycle are greater with residents as far north as Turnford able to access the hospital in 15 minutes and every part of the Borough is within an hour's cycle ride.

4.6.15 For other specialist healthcare purposes, Borough residents are required to travel to hospitals some distance away. This presents difficulties for many, particularly those without access to a car. Major hospitals include the Lister Hospital in Stevenage, the QE II in Welwyn garden City and in Harlow. These are not centrally located and while bus services are in place, journeys can require interchange and hence an element of uncertainty. For car users, journey times can be unpredictable and parking can be a problem. There may be scope to improve bus services to major healthcare facilities, particularly if healthcare providers can contribute to the operating costs on the grounds that staff and patients will have improved journey reliability and there is potential to relieve parking difficulties on-site and in the vicinity of the hospitals.

Figure 4.18 Accessibility to GP Surgeries on Foot

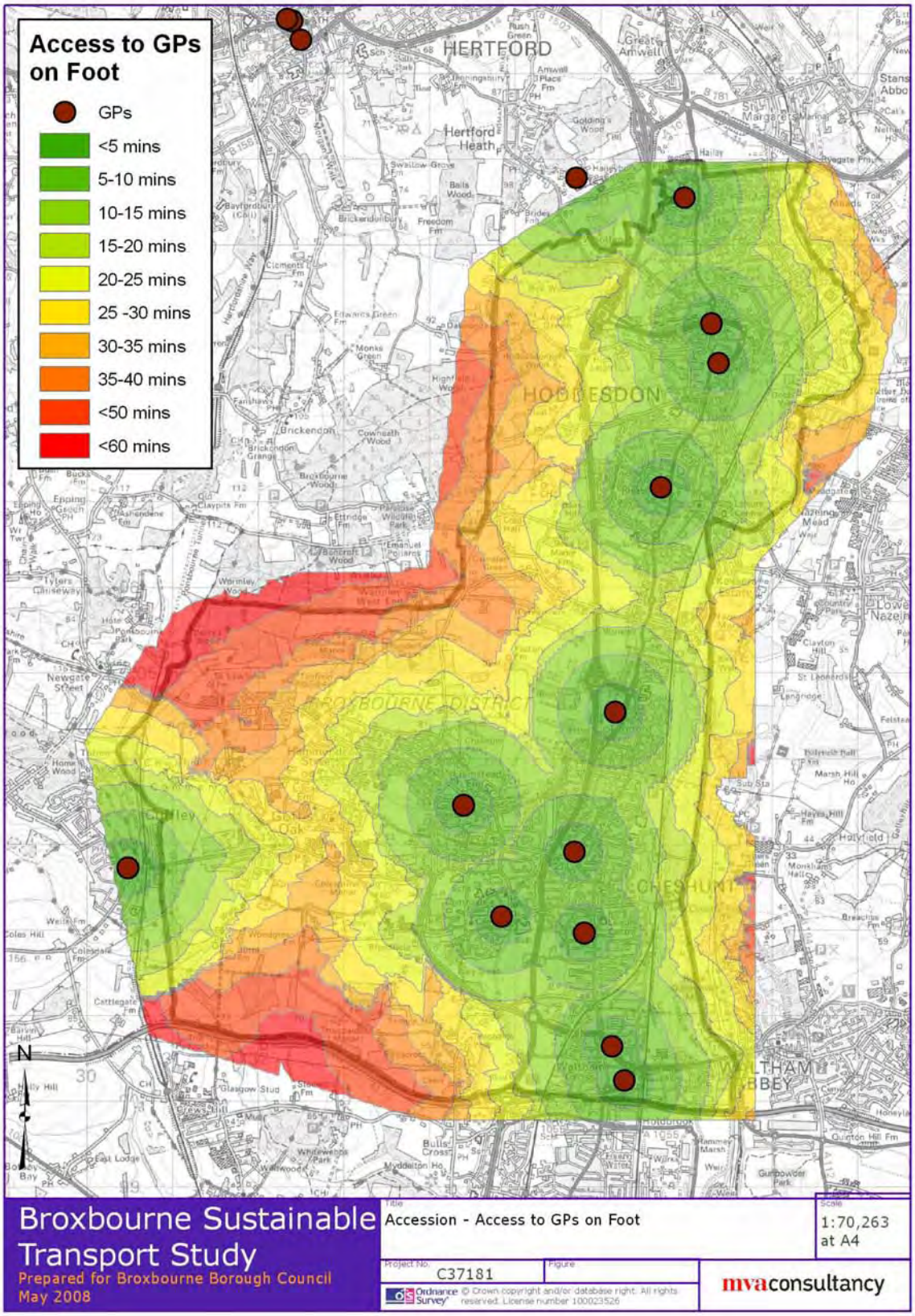


Figure 4.19 Accessibility to GP Surgeries by Cycle

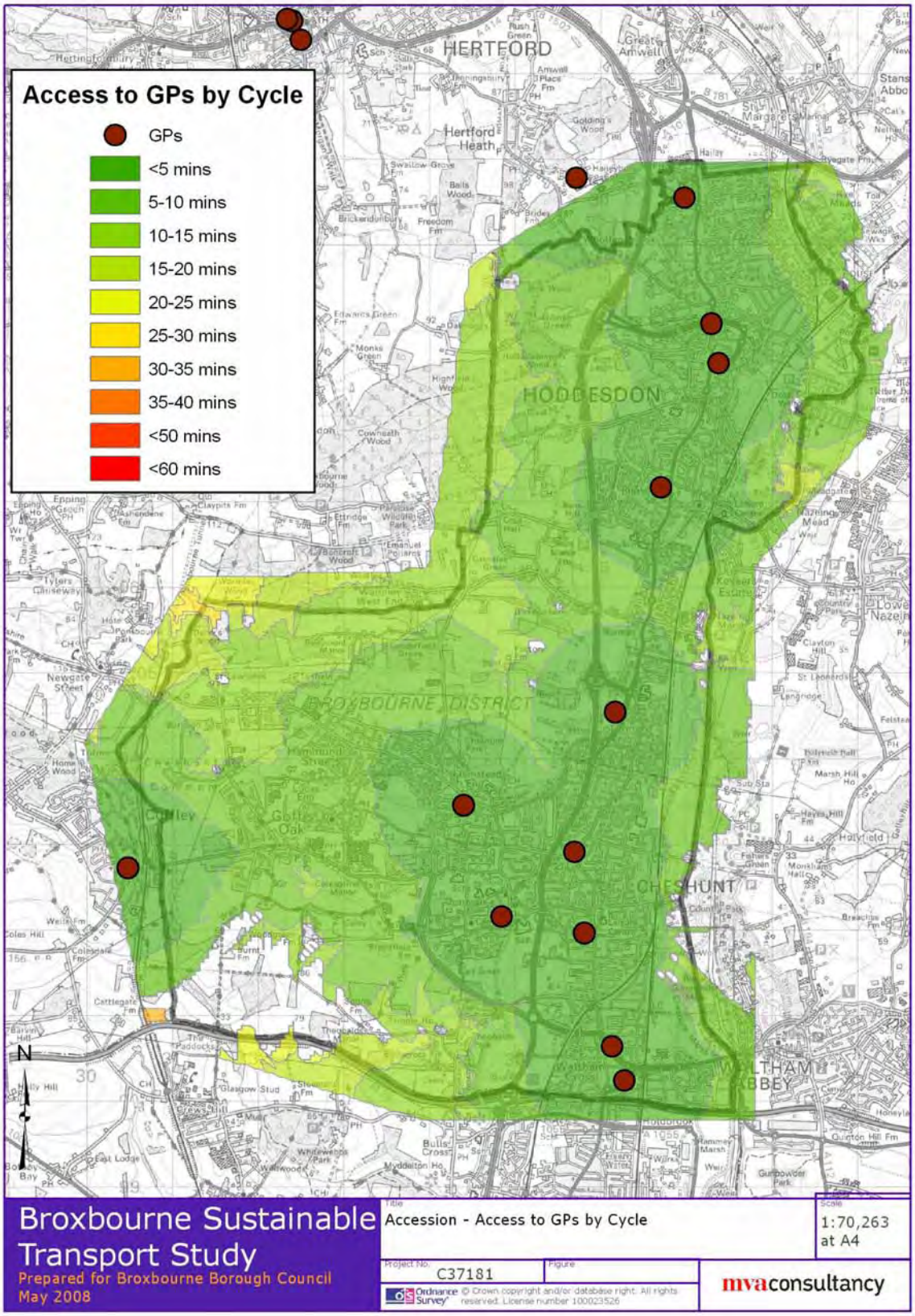


Figure 4.20 Accessibility to GP Surgeries by Public Transport

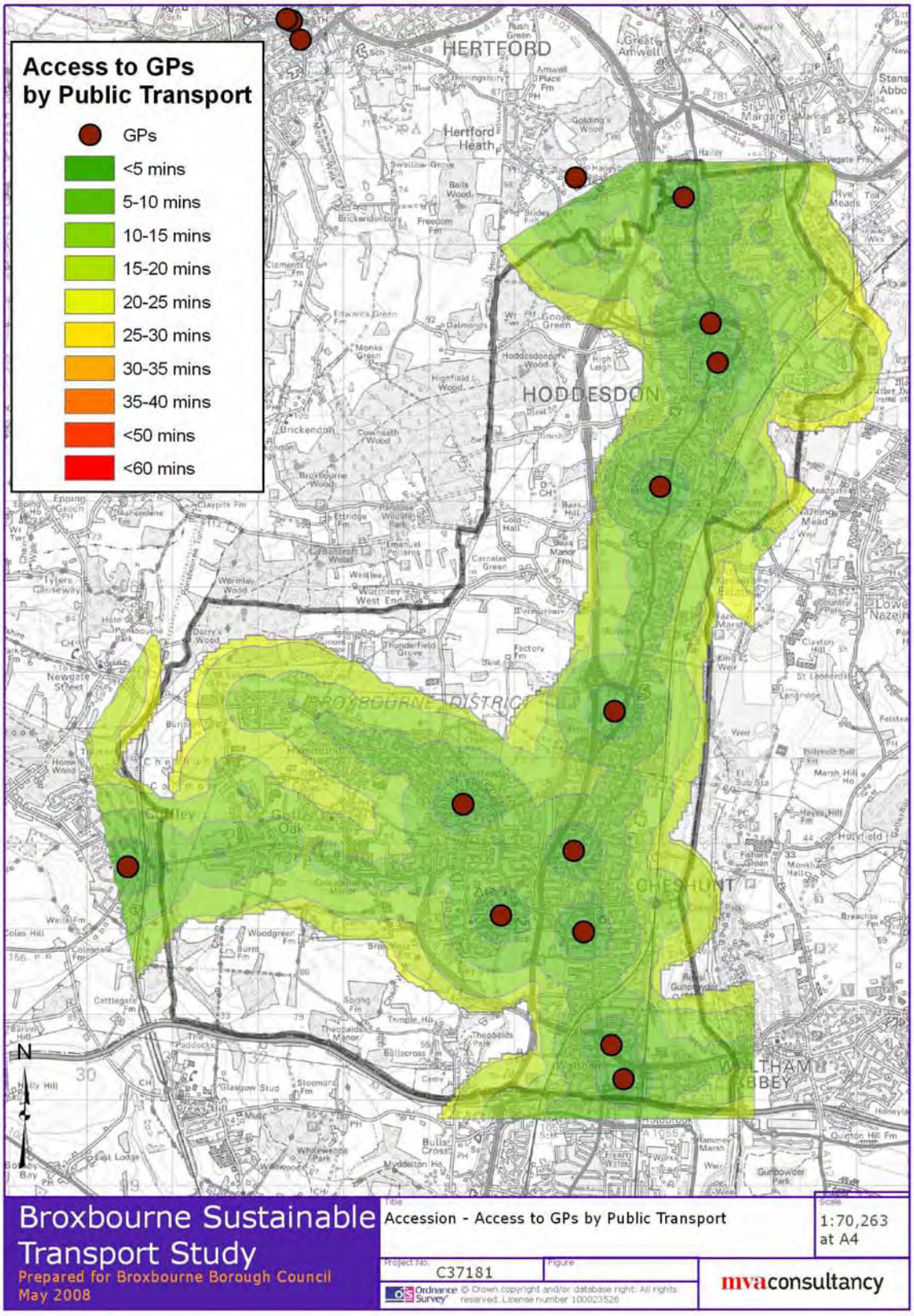


Figure 4.21 Accessibility to Hospitals on Foot

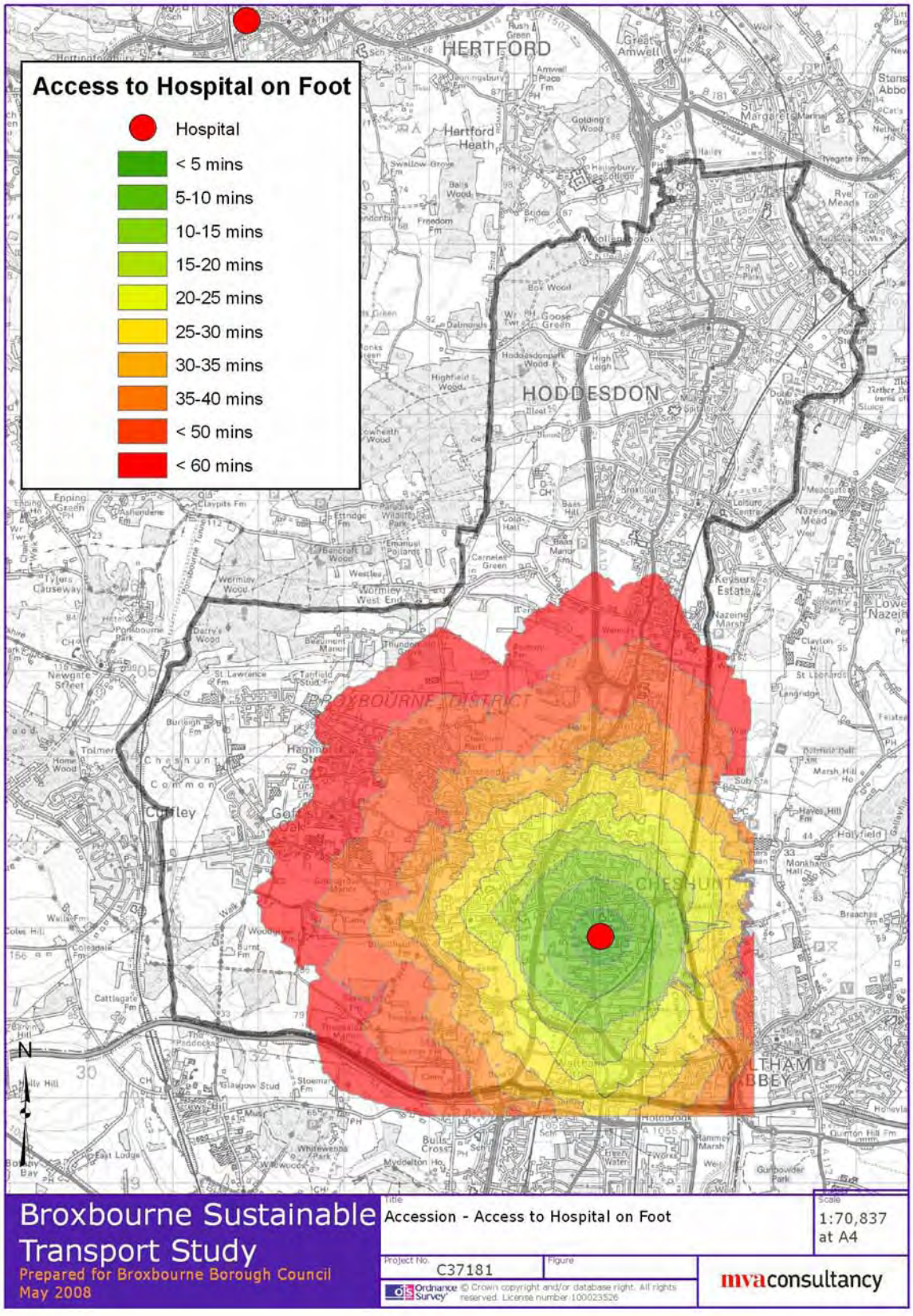


Figure 4.22 Accessibility to Hospitals by Cycle

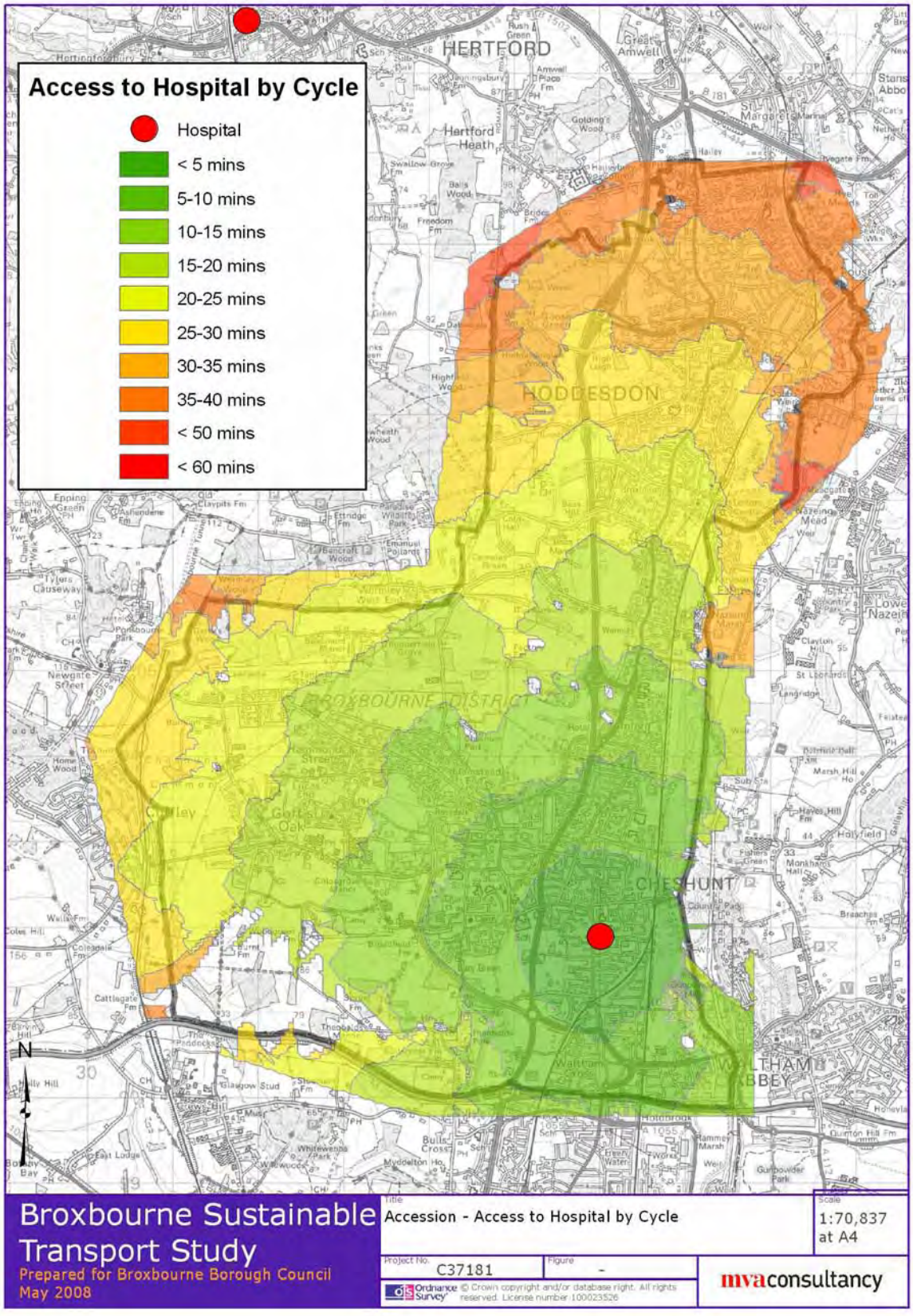


Figure 4.23 Accessibility to Hospitals by Public Transport

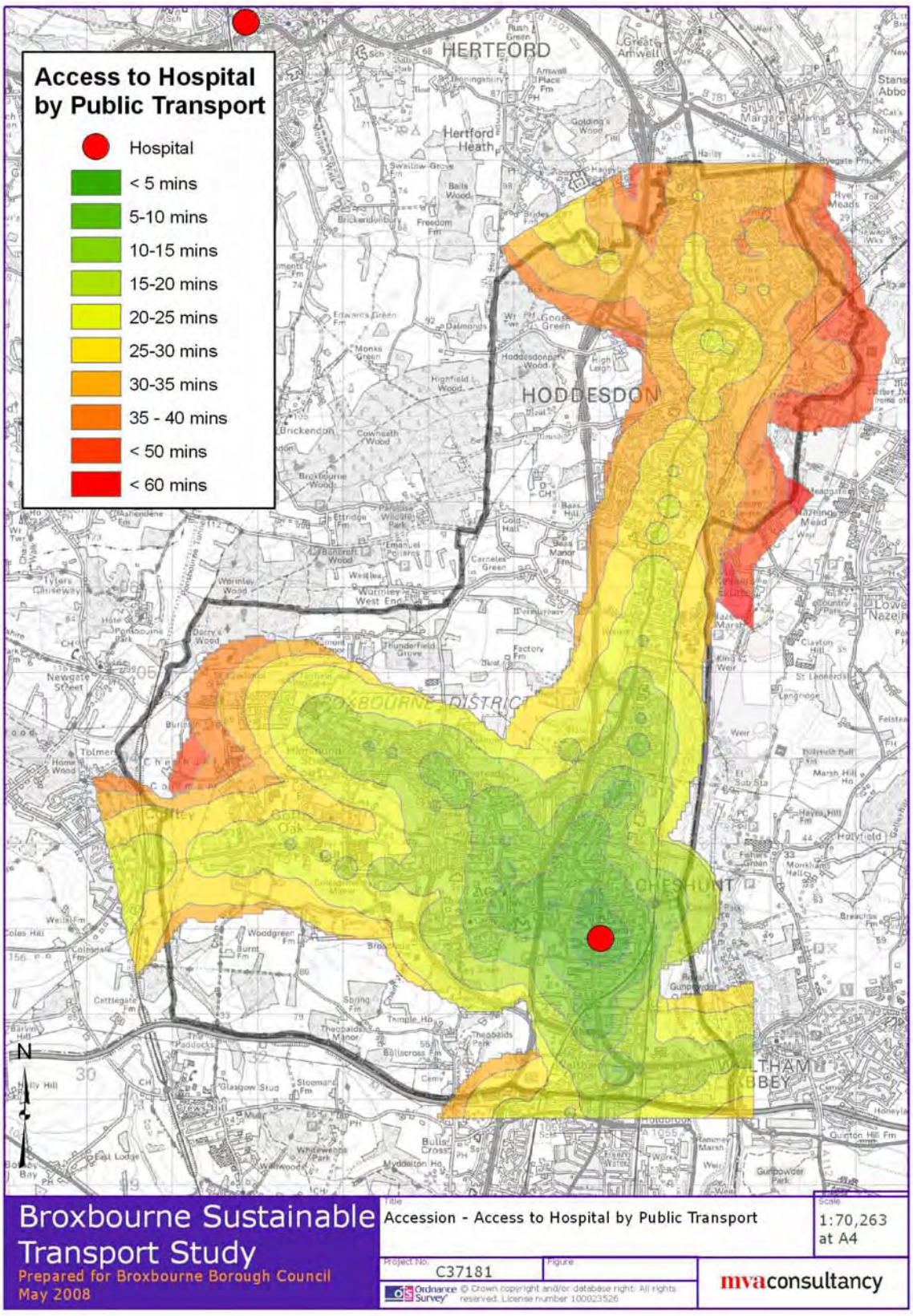
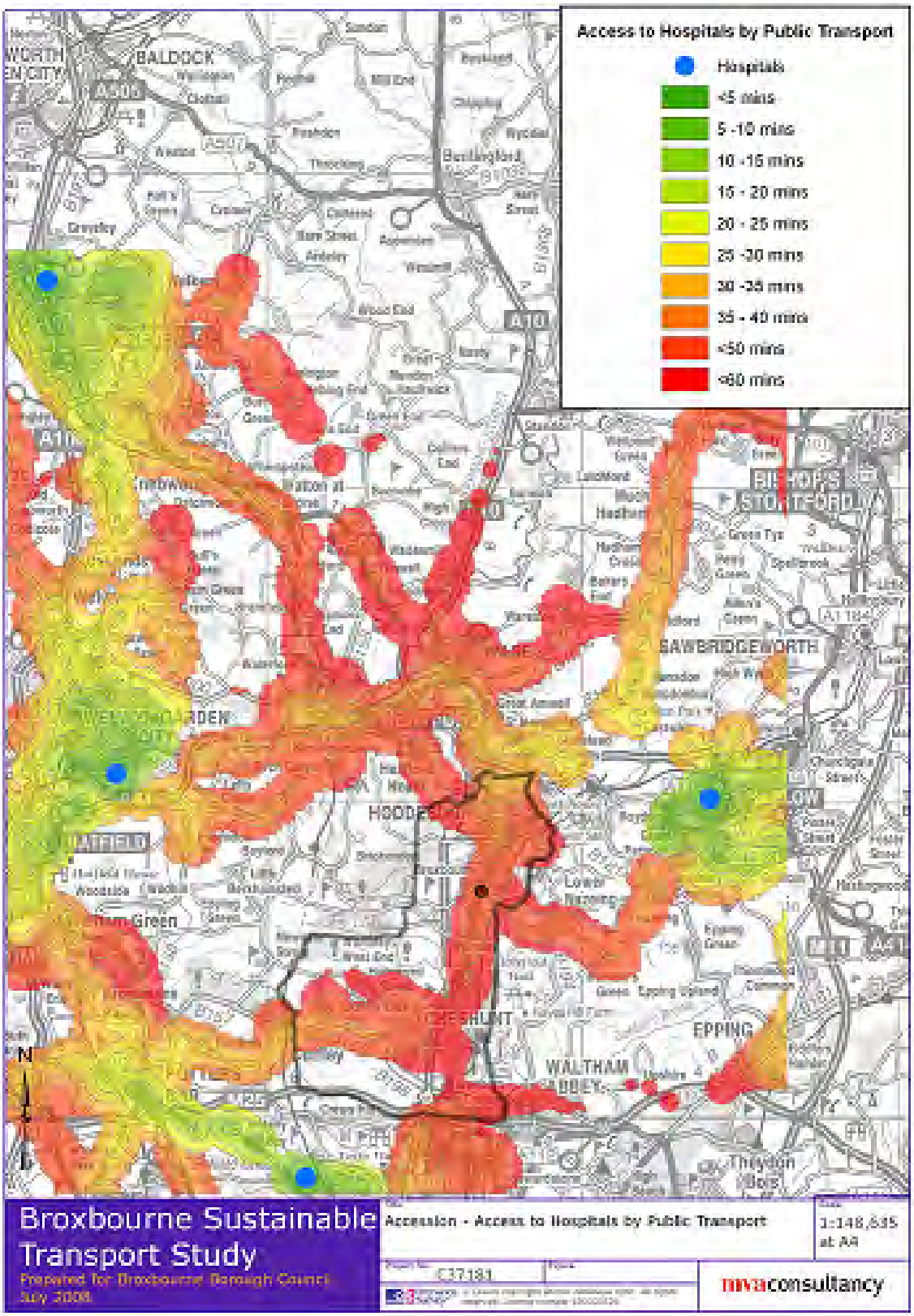


Figure 4.24 Accessibility to Hospitals Outside the Borough by Public Transport



Retail

4.6.16 There are retail opportunities in the Borough in Waltham Cross, Cheshunt, Turnford and Hoddesdon. In addition there is the retail offer at Brookfield (M&S, Tesco and a number of smaller units) for which access is predominantly by car. Therefore access to retail along the north-south corridor is good with locations alongside the A10 able to reach retail opportunities within 5 to 10 minutes journey on public transport. The majority of the Borough is no more than 20 minutes journey by public transport from a retail centre. As with access to many other key facilities, areas to the west around Goffs Oak are least accessible, but even these areas are no more than 30-35 minutes away from retail opportunities by public transport.

4.6.17 However, walk and cycle times from these western parts of the district to retail opportunities are considerably longer. Residents of Goffs Oak would have to travel more than 50 minutes on foot to reach a retail centre. Cycle times from this area are approximately 20-25 minutes and the majority of the Borough is less than 15 minutes cycle ride from the nearest retail opportunities.

4.6.18 Figure 4.24 to 4.26 shows the accessibility to retail facilities.

Figure 4.25 Accessibility to Retail Facilities on Foot

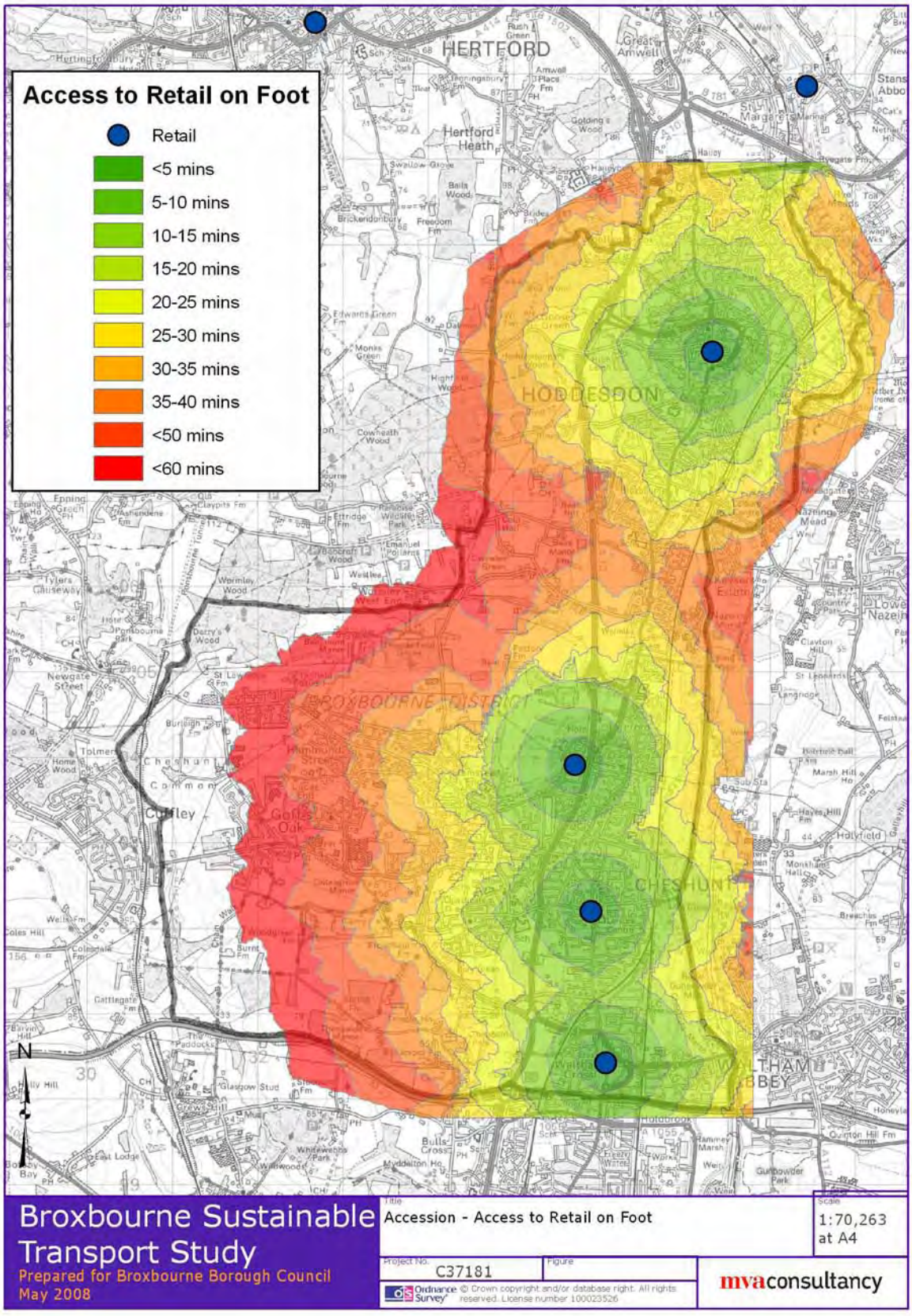


Figure 4.26 Accessibility to Retail Facilities by Cycle

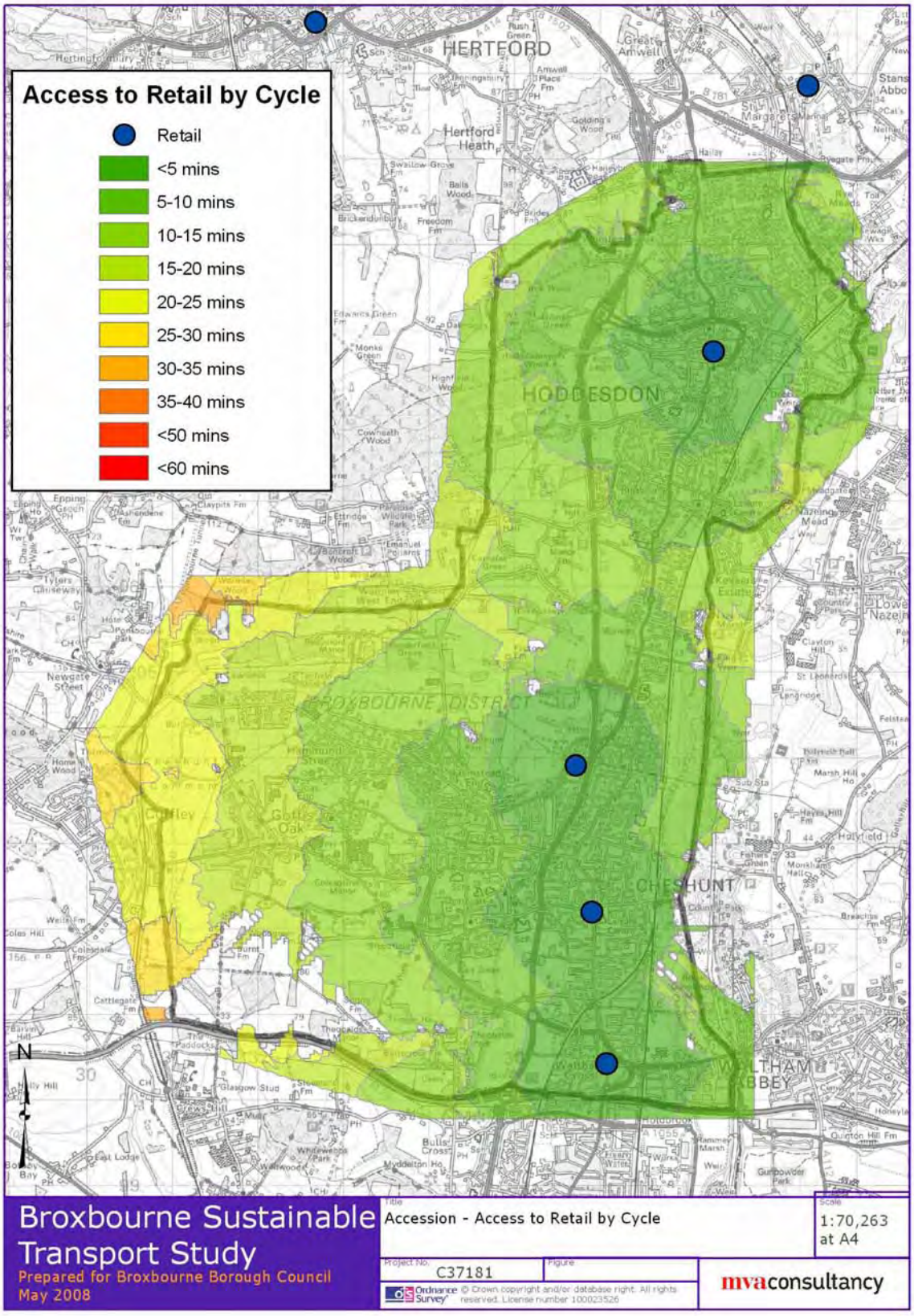
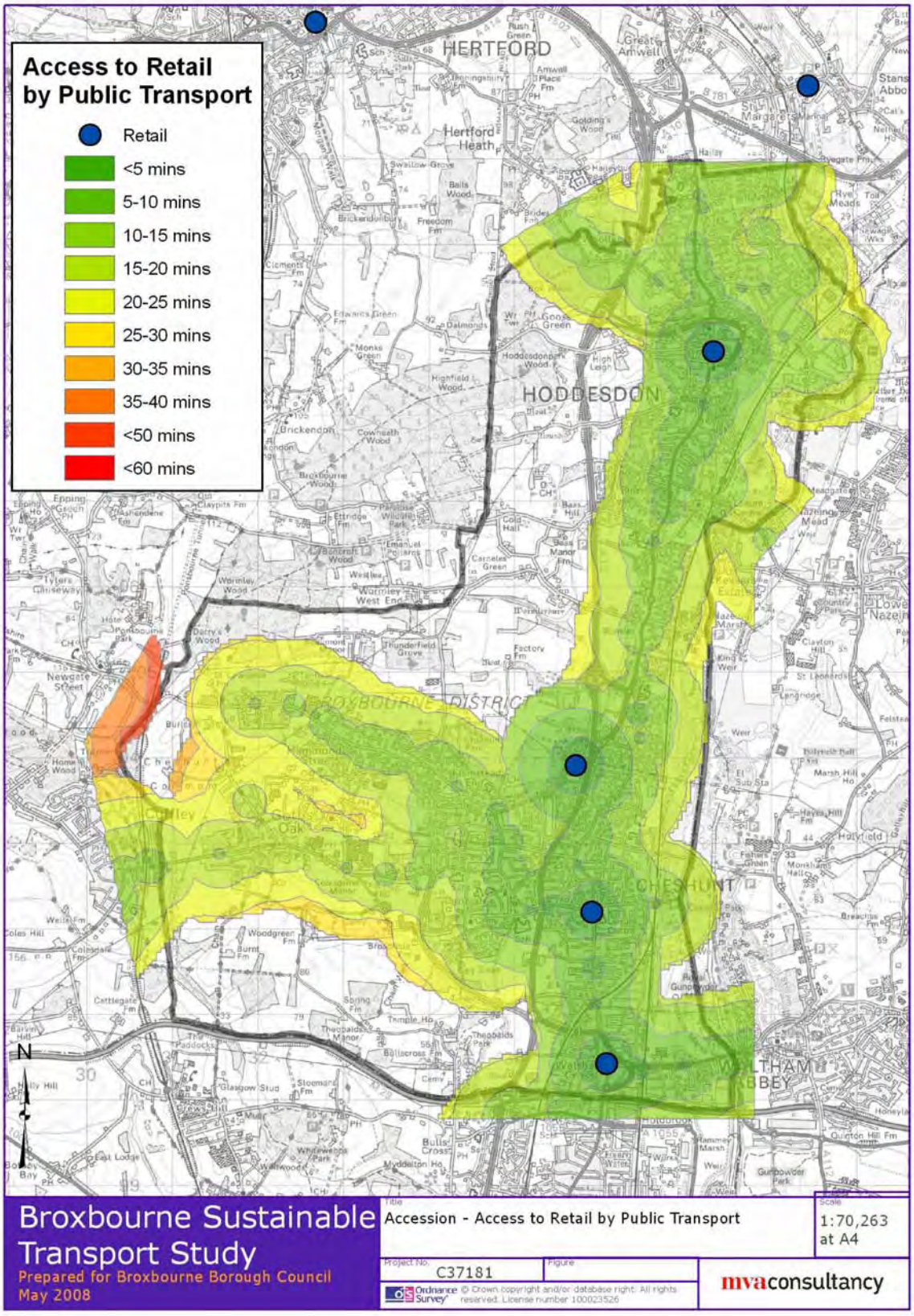


Figure 4.27 Accessibility to Retail Facilities by Public Transport



4.7 Bus Services

4.7.1 Local bus services are operated by a number of providers including the following:

- Arriva London;
- Arriva The Shires and Essex;
- Regal Busways;
- Metroline;
- Stansted Transit; and
- Trustline.

4.7.2 Figure 4.26 shows the frequency of services at peak times – the interpeak service pattern is mainly the same. For north-south access linking the town centres, a regular service (310/311) operates throughout the day. However, Transport for London-sponsored services to Waltham Cross represent a higher quality of service than those in place in Hertfordshire due to the different funding and procurement arrangements. Some east-west services are in place such as Uno 341/641 between Hatfield and Hertford and Hoddesdon, Broxbourne, Wormley and Turnford and Stansted Transit 392 between Harlow and Broxbourne/ Hoddesdon.

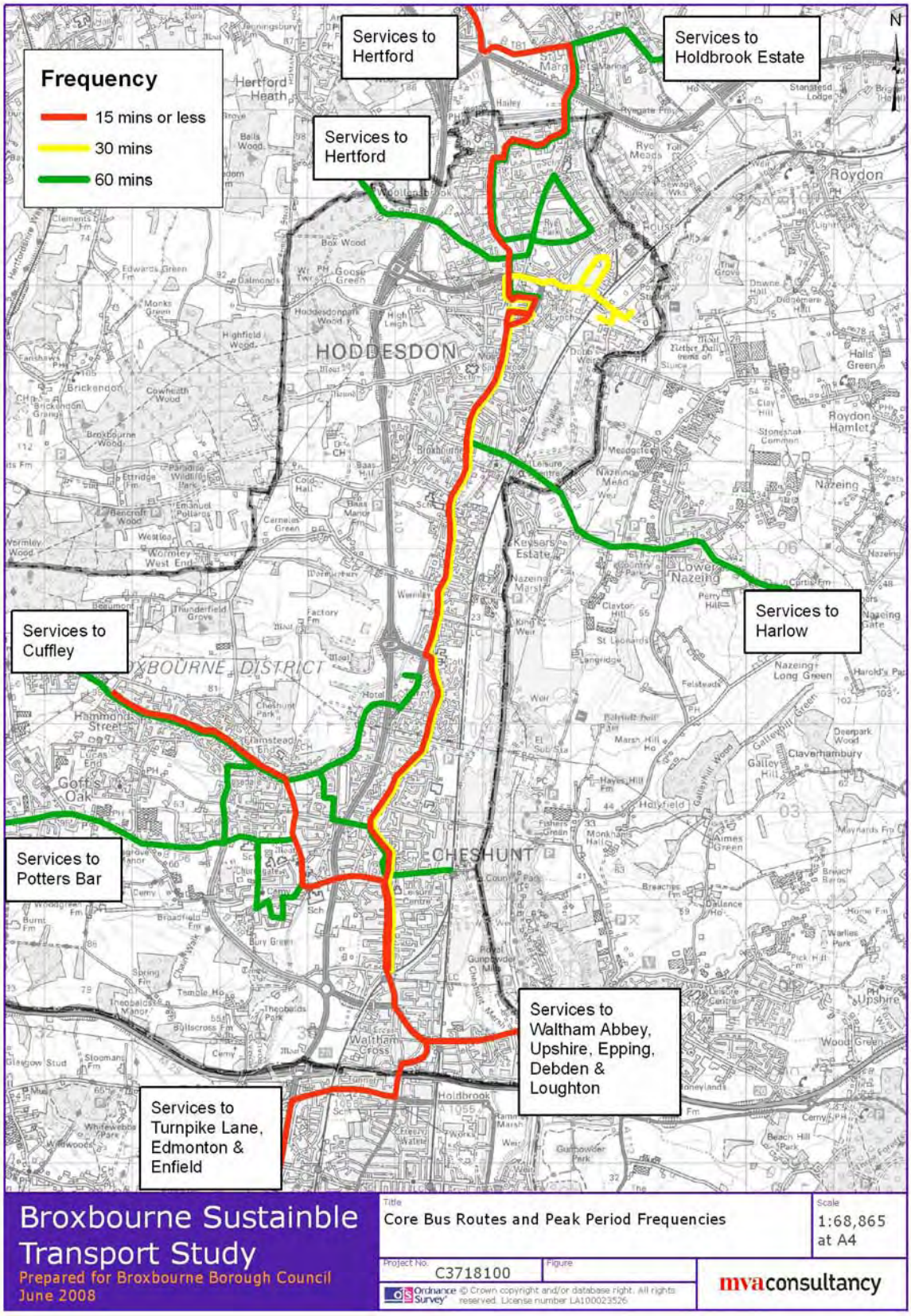
4.7.3 Scheduled coach services do not feature in the Borough although National Express services are available from Waltham Abbey, Stansted Airport, Hatfield, Hertford and Harlow.

4.7.4 Arriva 310/311 is the main service in the north-south corridor. This operates at a 30 minute frequency between Hertford and Waltham Cross alternately via Ware Station and St Margaret's/Hundred Acre Estate. A supported hourly evening service is operated by Trustline and the hourly Sunday service is also operated under contract.

4.7.5 Hertfordshire County Council has set out its requirements for bus provision associated with development sites[3] (as shown in Appendix A Table 5) which recommends a frequency of at least 15 minutes for the more substantial urban areas and for key corridors. Other considerations are indicated including the distance from all occupied premises to a bus stop (400m or 200m e.g. in town centres) with suitable walking routes. The guidance suggests that developer contribution can be allocated to support bus services and this could supplement existing services e.g. 310/311 on the north-south core route.

[3] Hertfordshire County Council (February 2008) *Passenger transport in new developments: a guide for Hertfordshire*.

Figure 4.28 Level of Peak Bus Services



4.8 Taxis

4.8.1 261 Hackney Carriage vehicles are licensed by the Borough of which 16 are wheelchair accessible. 112 private hire vehicles are licensed of which 25 are wheelchair accessible and are used mainly for contract journeys for people with mobility impairments.

4.8.2 Taxis provide a useful role where bus services are limited or unavailable or when individuals have particular needs that cannot be met by other means. However, integration with other modes tends to be limited (e.g. to and from rail stations) and there may be scope to integrate taxi services more fully with community transport in the Borough and possibly longer distance bus services.

4.8.3 Taxi ranks are limited in number:

- Waltham Cross: High Street (9 spaces), Eleanor Cross Road car park (2 spaces) Waltham Cross rail station (6 spaces), Theobalds Grove rail station (2 spaces);
- Cheshunt: Lynton Parade Turners Hill (4 spaces);
- Brookfield: Tesco; and
- Hoddesdon: High Street (3 spaces), Rye House rail station (2 spaces).

4.8.4 There may be scope to increase the number of ranks for example in town centres, at leisure centres etc. It may also be possible to use taxis for journeys to work as part of travel plans where parking is limited and the potential for shared use could be identified.

Leisure

4.8.5 We have not considered leisure activities in detail as this would cover a wide range of activities and locations, many of which are beyond the boundaries of the Borough. The Lee Valley and Epping Forest to the east provide recreational locations while other leisure pursuits are available in urban centres. The proximity to London also means that regional and world class activities are within reach.

4.8.6 The White Water Rafting Event for the 2012 Olympic Games will take place on a site in Waltham Cross. Although not within the scope of this study, the legacy effect of the site is relevant in that there will be journeys associated with the site subsequently and, as with other locations, these journeys should be made by sustainable means particularly rail.

4.9 Data Gaps

4.9.1 Some deficiencies in data have become apparent. There is limited traffic flow information in relation to turning movements at junctions. As such, link capacity data has been used to indicate the current capacities of the network.

5

5 Review of Settlements

5.1 Waltham Cross

5.1.1 The busy town centre has the ambiance of the North London communities a short distance to the south. The dual carriageway road links have a severance effect and a mixture of land uses is evident including car-orientated retail and other facilities.

5.1.2 Two stations are located in the town – Waltham Cross and Theobalds Grove – on different branches of the Liverpool Street main line. As well as good access to the A10/M25, the A121 Eleanor Cross Road provides access to Waltham Abbey to the east.

Waltham Cross Station

5.1.3 Waltham Cross station has very limited car parking space and is severed from much of the town by the adjacent dual carriageway. Theobalds Grove station is well located adjacent to the main road and the residential area to the east but there is limited catchment to the west. However, the station is poorly presented; the car park opposite (NCP managed) does not appear to be well used probably as reflection of the train service compared with other stations and vehicle security.

Theobalds Grove Station

5.1.4 The bus station is well located in relation to the town centre and has a rage of facilities for users. Buses on TfL and Hertfordshire services use the facility but the standard of vehicles on offer varies considerably with several operators using the bus station.

Waltham Cross Bus Station

5.1.5 The further development of the Park Plaza business park site will provide additional local employment within walk and cycle reach of many of the town's population. Its location adjacent to the M25 offers easy access by car from a wide range of origins.

5.2 Cheshunt

5.2.1 The town centre is orientated around the road links although pedestrian crossings are evident to provide the necessary links. A limited range of retail facilities exists.

Cheshunt district centre

5.2.2 Cheshunt has a rail station on the main Liverpool Street route. This is some distance from the town centre and housing areas to the west of the A10 (e.g. Bury Green and Churchgate). The station is located to the east of a residential area and is opposite the Delamare Road commercial area with a large number of employees. The predominant business in Delamare Road is Tesco who provide substantial car parking for their staff although access to the business area is only available via residential roads. Given the employment available nearby, there is potential scope for use of the station for inward journeys to work as well as London-bound commuting. The station car park was observed to be virtually full indicating a strong level of out-commuting.

Delamare Road, Cheshunt

5.2.3 The town has good road access via the A10 and is within easy reach of the M25, allowing journeys to be made by road in all directions without difficulty other than unpredictable congestion. The B176 Turners Hill/High Street provides the local connection to the Borough's existing town centres of Hoddesdon and Waltham Cross. Cheshunt has local retail and other facilities e.g. banks but these are limited in scope and number.

5.3 Goffs Oak / Hammond Street Area

5.3.1 This largely residential area is located around the B156 on an east-west axis between Cuffley and Cheshunt. There are few local facilities but rail services are available at Cuffley to the west and Cheshunt to the east. Some bus services provide these connections but most journeys are made by car. Cheshunt and Brookfield provide the focus for local retail and other activity. The Hammond Street residential areas focus on Hammond Street Road/Longfield Lane which is a minor road without strong demand for buses and is relatively remote from the town centre and station. Inevitably, car use predominates as a result of the location and design. The areas of Goffs Oak, Laurel Park, Hammond Street and Rosedale are mainly low to medium density housing, however the lack of infrastructure and sustainable transport links will hinder any future development proposals within this area.

5.4 Greater Brookfield

5.4.1 Brookfield Shopping Centre is an out-of-town retail facility situated just off the A10 in Wormley and Turnford. It includes a number of large high street names and associated free parking. There are proposals to expand the existing facilities with additional retail to create a viable centre and to provide housing. Due to its location and the retail on offer it is likely that access to the centre will be car-orientated. Bus services currently serve the centre and could be improved.

5.4.2 Brookfield is isolated from the established built-up areas to the east of the A10 dual carriageway and despite the presence of a footbridge over the A10, access to the centre by walking and cycling is severely constrained. This could be overcome because the proximity of the centre to where people live is apparent but the severance effects persist in the absence of new infrastructure to enable local access by sustainable modes.

Retail offer at Brookfield

5.4.3 We discuss transport options for Brookfield further in Chapter 6.

5.5 Wormley

5.5.1 Although close to the A10, access to Wormley and Turnford is limited to the junction with the A1170 to the south and the A1170 at Hoddesdon to the north. The main access is via the A1170 High Road Wormley which although providing a key north-south function is a local road in character. The nearest rail stations are Broxbourne and Cheshunt, both require vehicular transport for access. However, the distance between most of the housing areas and the main road is easily walkable and there is potential for more people to use the buses available.

B176 at Wormley

5.6 Broxbourne

5.6.1 Broxbourne has limited local retail facilities centred on the main road. There is scope for improving bus services on the north-south axis to provide links to larger centres. The location of Broxbourne rail station is significant and allows journeys to be made in the north-south corridor, locally and beyond. Use of rail requires good walk links from the area around the A1170 (the main focus) to be attractive to potential users. The residential area to the west of the A1170 is likely to be beyond walking distance to the rail station for many people and the bus connections on the main road are less attractive than car use, particularly relatively short journeys to Hoddesdon for retail and other purposes.

A1170 High Road, Broxbourne

5.7 Hoddesdon

5.7.1 Hoddesdon has an active town centre and evidence of growth with new retail facilities (e.g. Aldi) and sizable higher density residential development in the town centre. The focus of the High Street provides an attractive core although the ring road (A1170 Charlton Way and Dinant Link Road) have a severance effect. A number of small public car parks are located around the core and further vehicle exclusions from the High Street area would reinforce the stronger features of the centre and development just beyond could be encouraged.

Recent residential development in Taverners Way, Hoddesdon

5.7.2 Local employment is available in the Essex Road/Pindar Road area and this could be expanded to accommodate additional jobs to provide for additional local housing. Rye House station is situated to the northeast of the town and could be used to access the employment opportunities but is unlikely to attract many users from the residential parts of the town given its locations at the edge of the built-up area, especially as it has no formal off-street parking and bus links are poor. Much of the residential area to the north of the town (Bridle Way, Hailey, Rye Park) is characterized by car journeys, the circular bus services caters for the needs of a minority. For road connections, the town is well located in relation to the A10 which provides access to Hertford and other settlements in the Cambridge corridor and to the M25 to the south.

High Street, Hoddesdon

6

6 Strategy Development

6.1 Overview

6.1.1 Table 6.1 sets out the strengths, weaknesses, opportunities and threats associated with each of the town centres as potential development locations in terms of transport links. This suggests that the established retail centres at Waltham Cross, Cheshunt, Hoddesdon and Brookfield could contribute to growth. Within the north-south corridor, other areas such as Broxbourne and Wormley could accommodate some growth in that they are located on the core north-south route (A1170) and the railway.

6.1.2 The residential areas of Goffs Oak and Hammond Street are less well placed to accommodate development in transport terms as they are more remote from employment, retail and other facilities and are removed from rail and bus services.

6.1.3 Three strands of a strategy emerge which need to be applied together to achieve lasting change in favour of sustainable transport:

- Reducing demand;
- Managing existing networks; and
- Investment.

6.1.4 **Reducing demand** will be difficult in the Broxbourne context. This is because the area is predominantly car-orientated with the advantage of the A10 and M25 links to a wide range of destinations. This is supported by the design of the housing areas throughout the Borough which allow easy car access and do not feature strong walking and cycling routes. Bus services are limited to certain corridors and the quality of the service available does not appeal to a wider market. The location of the railway on the eastern margin of the built-up area requires users to drive to the station, the walking and cycling catchments being limited by distance. Unfortunately, the evidence of recent development at Canada Fields, Turnford reinforces a scenario of car-dependency.

6.1.5 For this situation to change, demand for car travel must be reduced and growth in car travel restrained. This can only be achieved if alternatives are in place and hence measures must be introduced to allow sustainable modes to play a greater role. This is very significant as development takes place as the area as a whole (old and new) must work in an integrated way to allow sustainable journeys to be made. Hence measures such as well defined, safe walking routes must be in place. A comprehensive cycle network is required, linking key areas to avoid short car journeys; this includes the provision of suitable crossings of the busier roads. The bus service needs to appeal to a wider market and this includes not only service availability but fares relative to car parking at destinations, information availability and evening and Sunday services. Better links to the good rail services available should be created.

6.1.6 **Managing the existing networks** requires the reduction in demand for local road journeys coupled with measures to deal more effectively with traffic congestion. In the Borough, maintaining the A10 as the key artery is particularly important. Facilitating access to development sites such as Greater Brookfield is a basic requirement but should not be at the

expense of reliable journeys on key routes. Efficient traffic management becomes a key issue and is related to the various demands, particularly at peak times.

6.1.7 **Investment** in infrastructure will be necessary to support sustainable modes. It is also important to invest in measures which contain demand and improve existing networks and this will include initiatives such as travel plans for workplaces and schools. Construction of large scale infrastructure in unlikely to offer a long term solution and is also unlikely to attract sufficient funding from the sources available currently.

6.1.8 This type of approach is fully compatible with the objectives of the Hertfordshire Local Transport Plan, the Regional Transport Strategy and current national policy.

Table 6.1 SWOT Analysis

Location	Strengths	Weaknesses	Opportunities	Threats
Waltham Cross	Close to north London employment and local opportunities; Two rail stations; Adjacent to A10 and M25; Regular bus services with TfL links	Limited range of local facilities services No cycle network	Some development possible to support local bus services and interaction cycling links	Out-commuting and other journeys attracted to destinations south of M25
Cheshunt	Local centre with some employment; Rail station; Adjacent to A10 and close to M25; On A1170 north-south link; Regular bus services	Limited range of local facilities; No cycle network	Some development possible to enhance local facilities and support better bus services	Rail commuting is at expense of local containment
Goffs Oak/ Hammond Street	Established residential areas	No rail station; Very limited local facilities; Limited bus services; No cycle network	Buses between Cuffley rail station and Cheshunt could be promoted	Dispersed housing does not support viable bus services
Greater Brookfield	Adjacent to A10; Retail function established.	No rail station; Limited bus services; No cycle network; Poor walk access	Scope to extend to create new Borough centre with appropriate layout and design to support sustainable modes of travel and improve accessibility	Bus improvements needed to avoid car dependency; Free parking encourages car use; Development will encourage more dispersed car-based travel unless strong, integrated measures are included for new and existing sites

Wormley	On A1170 north-south link; Regular bus services	Further from rail stations than other parts of built-up area; Limited local facilities; No cycle network	A1170 bus services could be improved as core Hertford to Enfield route linked with rail stations	Reliant on alternatives to car use
Broxbourne	On A1170 north-south link; Rail station; Regular bus services	Limited local facilities; No cycle network	A1170 bus services could be improved as core Hertford to Enfield route linked with rail stations	Better local facilities needed to reduce demand for travel
Hoddesdon	Local centre with some employment; On A1170 north-south link; Rail station on eastern edge; Regular bus services; Well placed for access to A10 and M25	Limited range of local facilities; No cycle network	A1170 bus services could be improved as core Hertford to Enfield route linked with rail stations	More local employment needed to reduce out-commuting

6.2 Appraisal Matrix

6.2.1 Table 6.2 shows an appraisal matrix for each of the proposed development locations against a number of criteria. For situations in which there could be a positive contribution, a score of 1 is recorded; where there is a particularly good case, a score of 2 is recorded. While this is a simplistic approach, it does indicate where priorities should lie. Greater Brookfield offers opportunities to reduce car journeys to centres outside the Borough and hence scores for reducing car dependency and making better use of the transport network.

Table 6.2 Appraisal Matrix

Location for Development Sites	Addressing Growth Needs								Wider Issues					
	Enables planned housing development	Supports the creation of and/or access to significant employment opportunities	Supports ways of increasing access to goods and/or services that do not increase car dependency	Promotes improved operation and best use of the existing transport network	Potential for bus use	Potential for rail use	Potential for walking	Potential for cycling	Transport policy compatibility	Deliverability	**Scoring total**	**Wider considerations**	**Rank**	**[high, medium, low priority]**
Waltham Cross	1	1	1	1	2	1	2	1	1	1	**12**	2	1	**H**
Cheshunt	1	1	1	1	1	2	2	1	1	1	**12**	2	1	**H**
Greater Brookfield	2	1	2	1	1	0	1	1	0	2	**11**	2	3	**H**
Hoddesdon	1	1	1	1	1	1	2	1	1	1	**11**	2	3	**H**
Wormley	1	0	1	1	1	0	1	1	0	1	**7**	1	6	**M**
Broxbourne	1	0	1	1	1	1	1	1	1	1	**9**	2	5	**M**
Goffs Oak/ Hammond Street	1	0	0	0	0	0	0	1	0	1	**3**	1	7	**L**

6.3 Ranking

6.3.1 On the basis of the evidence available, we suggest that the following ranking is adopted:

- High potential:
  - Waltham Cross;
  - Cheshunt;
  - Greater Brookfield (especially with measures to support sustainable modes); and
  - Hoddesdon.
- Medium potential:
  - Wormley; and
  - Broxbourne.
- Low potential:
  - Goffs Oak/Hammond Street.

6.4 Greater Brookfield Potential

6.4.1 For Greater Brookfield to be developed further, attention needs to be given to the proximity of residential, retail and employment areas in relation to each other and the established town centres. These must be connected so that walk and cycle trips are not only achievable but

more attractive than car use and bus links for longer journeys must be given a higher profile than at present. The retail core supports further residential development but the dispersed travel patterns associated with journeys to work by car must be overcome to avoid traffic congestion on the major routes, notably the A10.

6.4.2 A key issue is identifying a new Borough centre. The current retail area surrounds large areas of car parking which is not a suitable town centre feature and the local road network makes connections difficult for sustainable modes. As mentioned above, the separation of the retail area from housing areas creates a lack of unity which must be overcome to create a sense of identity and cohesion. Hence new housing and associated land uses must be located close to the existing facilities but strong integration through design is needed to bring together a Borough centre concept. This must give significant priority to walking, cycle routes and secure parking and bus access, not just car movements alone. Failure to take this approach – and remedy the failings of the development completed to date – will ensure that the area is car-orientated into the future and sustainable transport will not be supported or secured.

Proposed Development at Brookfield

6.4.3 The proposals for development at Brookfield[19] sets out the principles for a strategic site close to the A10 including residential, retail, leisure and community facilities as part of a mixed site. It features a new link road through Greater Brookfield to the A10 Turnford interchange which is described as being 'essential to achieve the objectives of the approved local plan, but without such provision the highway infrastructure will soon become overburdened'. This link road would be through Green Belt but would define the site such that a significant number of dwellings could be accommodated. The existing Brookfield site is described as having a disjointed layout with poor pedestrian environment.

6.4.4 It is noted that the Borough Local Plan requires the development to address traffic congestion and future transport capacity and also to create a sustainable centre and a focus for public transport. It is also intended to refocus the centre towards pedestrian priority.

6.4.5 New walking and cycling routes are proposed. To make the area function in a sustainable way, complete walk/cycle routes need to be identified within and beyond the site. This requires safe crossings for pedestrians and cyclists of roads (especially with increased traffic) which provide superior means of access compared with car; adding sections of cycle route alongside roads is not sufficient to ensure a mode shift from car. A link with the Canada Fields site alongside the waterway needs to be integrated with routes within the housing areas and overcome the severance effects of Great Cambridge Road. The provision of suitable infrastructure for pedestrians and cyclists and better bus services is fundamental to the sustainability of the site. Not only should there be provision to make sustainable modes the preferred option but they also offer a means of reducing traffic movements and hence avoiding congestion problems into the future.

6.4.6 For bus access, priority measures should allow access that is more direct than access by car. This allows more reliable and quicker journeys by bus compared with car use ad raises the

[19] CBRE on behalf of Bayfordbury Estates Limited (March 2008) *Greater Brookfield: response to Broxbourne Borough Council Strategic Housing Land Availability Assessment*

profile of services. For residential areas, buses should be given a priority route so that the are conspicuous and unimpeded to support their use in preference to car use.

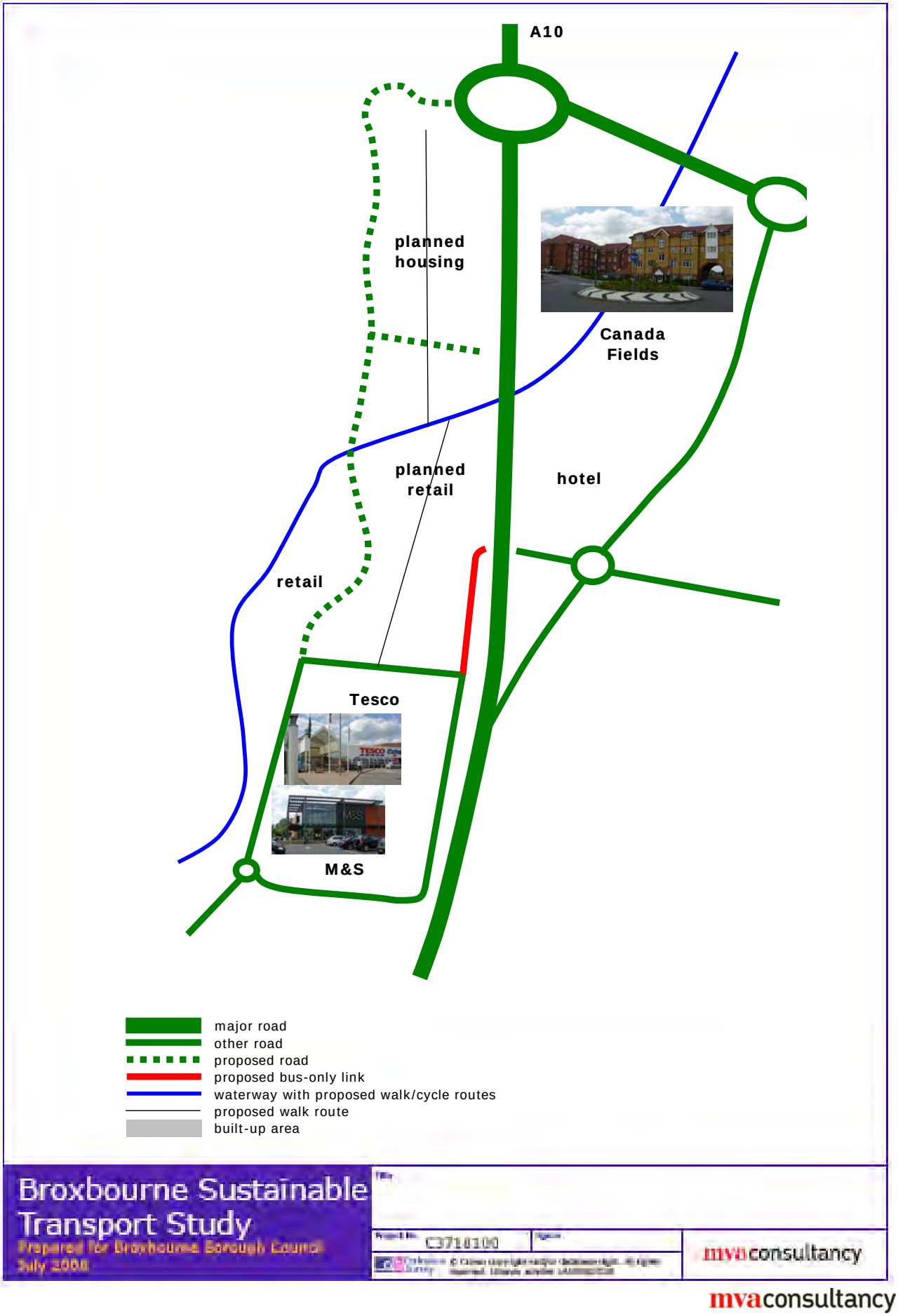
Access to Brookfield retail area

6.4.7 There may be opportunities for shared retail/residential parking or for reduced provision if a quality bus service and other sustainable links can be provided.

6.4.8 Overall, the location of Greater Brookfield suggests that it relates well to the A10 and hence is attractive to car users. As a result, pressures on the highway network are expected to increase. Measures for pedestrians and cyclists need to provide an attractive alternative to car use and integrate well with the existing built-up area. The location of Brookfield some distance from the established town centres and rail stations suggests that bus use will need to be made preferable to car use.

6.4.9 The arrangements proposed by the developer are shown in Figure 6.1.

Figure 6.1 Proposed Development at Greater Brookfield



6.4.10 It would be possible for the development to place sustainable transport at its core and in doing so, remediate some of the existing arrangements for accessing retail and other land uses. This would require re-orientation of the site around a core bus link with full walking and cycling routes in parallel and to provide access to locations throughout the development. Where possible, this core route would be segregated from other traffic (see Figure 6.2). Bus routes should be integrated with the existing network to link Brookfield with Cheshunt town centre and rail station and Waltham Cross. Walking and cycling routes should be extended towards Rosedale/Hammond Street/Goffs Oak and towards Wormley and Cheshunt. For car access and delivery vehicles, a separate access would be required which would be less direct than the bus access and would be linked to the various car parks. This approach would ensure that sustainable modes are the chosen means of travel but maintaining car access to the site without supporting car dependency.

6.4.11 Greater Brookfield offers considerable potential to accommodate much of the Borough's planned development but this must be designed carefully to overcome problems of severance and traffic congestion.

6.5 Proposed Measures to Facilitate Development

6.5.1 For each of the towns considered, a number of measures could be implemented to support development sites and growth across the Borough.

6.5.2 Main north-south corridor:

- Improve the existing bus services to provide a high frequency core service between Enfield and Ware:
  - **Enfield** town centre (Enfield Town station), Southbury Road (Southbury station), A1010 Hertford Road (Enfield Highway, Freezy Water);
  - **Waltham Cross** bus station, Theobalds Road station, B176 Crossbrook Street;
  - **Cheshunt**, B176 Turner's Hill, High Street Cheshunt;
  - Turnford (diverting to **Greater Brookfield**), **Wormley**, A1170 High Road;
  - **Broxbourne;**
  - **Hoddesdon** High Street/Charlton Way, Dinant Link Road, Stansted Road (Rye Park);
  - **St Margaret's** station, B181, A1170 Pepper Hill, Amwell Hill, London Road;
  - **Ware** station, Ware town centre; and
  - **Hertford**.

6.5.3 Main east-west corridor:

- Waltham Abbey to Cuffley:
  - **Waltham Abbey;**
  - A121 Station Road/Eleanor Cross Road (Waltham Cross station), **Waltham Cross** bus station, B176 Crossbrook Street;
  - B198 College Road (**Cheshunt** town centre), Churchgate; and

- B156 Goffs Lane, Cuffley Lane, **Cuffley** station.

- Cuffley to Cheshunt via Brookfield:
- **Cuffley** station;
- Newgatestreet (Goffs Oak), Hammondstreet Road, **Hammond Street;**
- Longfield, Brookfield Lane (Flamstead End), Brookfield Lane West, **Brookfield Centre;**
- Great Cambridge Road (Canada Fields), Hertford Regional College, High Road **Turnford**; and
- Cadmore Lane, Delamare Road (Cheshunt station), Windmill Lane, **Cheshunt** town centre.

6.5.4 These types of service operate at a regular frequency with few diversions creating an easy to understand and reliable service, joining housing, retail, leisure and residential areas and transport interchanges.

6.5.5 Measures that could be applied in support of a sustainable transport strategy are set out below.

Waltham Cross

- Improved walk access to Waltham Cross rail station to overcome severance of roads e.g. new signal crossings;
- Possible expansion of Waltham Cross station parking capacity;
- Refurbishment of Theobalds Grove rail station;
- Plan for town centre, denser development including housing as well as commercial with other uses e.g. warehouse retail further from centre;
- Develop safe cycle network;
- Implement travel plan for Park Plaza employment area to support sustainable travel.

Cheshunt

- Support expansion of retail offer at Turners Hill/College Road;
- Develop safe cycle network;
- Promote rail use to/from Delamare Road employment area.

Goffs Oak / Hammond Street

- Provide safe and conspicuous walk and cycle routes towards Cheshunt;
- Consider better bus links around Hammond Street, Rosedale and Goffs Oak housing estates with associated marketing and infrastructure improvements and link with Greater Brookfield.

Greater Brookfield

- Review current provision for walking including safe links to Cheshunt and Turnford;
- Improve cycle access to the retail area, preferably with separate routes from road links with high vehicle numbers;

- Consider options for the creation of a new Borough centre with strong design and a clear focus which is not dependent on provision for car movement and parking;
- Review options for bus access to avoid delays caused by other traffic with a priority route and incorporate services into the north-south core corridor and east-west corridor.

Wormley

- Support limited development that is orientated around bus services and links based on the A1170 High Road;
- Develop cycle network to key destinations.

Broxbourne

- Encourage development that is well located in relation to the A1170 High Street and Station Road
- Develop cycle network to key destinations e.g. rail station.

Hoddesdon

- Support denser development around town centre with strong walk links;
- Develop cycle network within the town and towards Brxbourne;
- Improve walk and cycle access to Essex Road/Pindar Road employment area e.g. to Rye House station and town centre;
- Promote bus use throughout residential areas to the north of the town.

6.6 Public Transport Provision

6.6.1 The rail service to the Borough is unlikely to be improved as it currently offers a high service frequency and intensive timetable. However, the stations could be improved and there may be scope to extend some station parking facilities. At Broxbourne and Cheshunt, creation of decked car parks would allow for the redevelopment of space for other purposes. The location of stations at the edge of the built-up area means that walk and cycle links are essential and should be of an appropriate quality i.e. well lit, signed and with good road crossing points.

6.6.2 Buses are a major element of a sustainable transport strategy. The current provision in the Borough is mixed with the TfL influence in Waltham Cross and a variety of operators elsewhere offering a differing quality of service. The bus service must be co-ordinated and effective in meeting people's needs so reliability and quality are key. Arriva The Shires and Essex provides services and could take a lead in upgrading the existing services with the support of the local authorities to provide priority measures where possible and comprehensive stop improvements. A Borough-wide Quality Partnership would provide a mechanism for this scale of improvement, supported by Hertfordshire County Council, the Borough Council and all the operators in the area.

6.6.3 Buses may also provide the means to link major health facilities so that Broxbourne residents can access healthcare (and employment opportunities) at hospitals in Welwyn Garden City,

Stevenage and Harlow. Further investigation would be needed to assess the viability of a proposed bus service to major health facilities.

6.7 Demand Management Measures

6.7.1 Demand management attempts to reduce demand for travel particularly by car in recognition of the fact that continuing growth in car use cannot be accommodated and does not meet sustainability objectives.

6.7.2 Promoting sustainable transport generally involves some form of demand management as one of the strands of a strategy. No measures are apparent in the Borough but TfL's Congestion Charge zone for Central and West London is a conspicuous reminder of possible measures to address traffic impacts in major urban areas. While this type of measure would be inappropriate for small towns, it is evident that public perceptions are changing and that demand management measures may gain acceptance in certain circumstances.

6.7.3 While road user charging is the most usually cited measure, current legislation also allows for the introduction of a Workplace Parking Levy. This involves charging employers for providing car parking on a scale and timetable determined by the promoter. Parking is a determinant of how and when people travel and hence it would be appropriate to review parking arrangements in the Borough in the context of a sustainable transport strategy. Even without the more radical step on introducing a Workplace Parking Levy - Nottingham is the only promoter at present – parking control can play a key role in the overall strategy.

6.7.4 Addressing the availability of parking at the workplace is important. If spaces are available and are low cost or free to users, then people will use them. Changing availability through the development control process for new land uses, particularly employment sites, is a means of influencing demand while charging a realistic amount will support moves to other modes of travel. The availability of parking at rail stations is important to those people who live furthest from the station but other possible options may exist such as walking and cycling.

6.7.5 Allied to parking controls is the availability of alternatives to car use. A focus on improved bus services, walking and cycling can be achieved through the implementation of travel plans. This helps people to understand their travel behaviour and to explore other possibilities that will benefit them personally and the wider community in reducing the negative impacts of traffic. Travel plans can be adopted for workplaces, schools, residential and other sites and are often required as planning conditions.

6.8 Encouraging Sustainable Travel

6.8.1 Broxbourne does not currently feature sustainable travel measures on a significant scale for a variety of reasons including proximity to London activities and limited bus services. However, rail provides very good links for north-south movements.

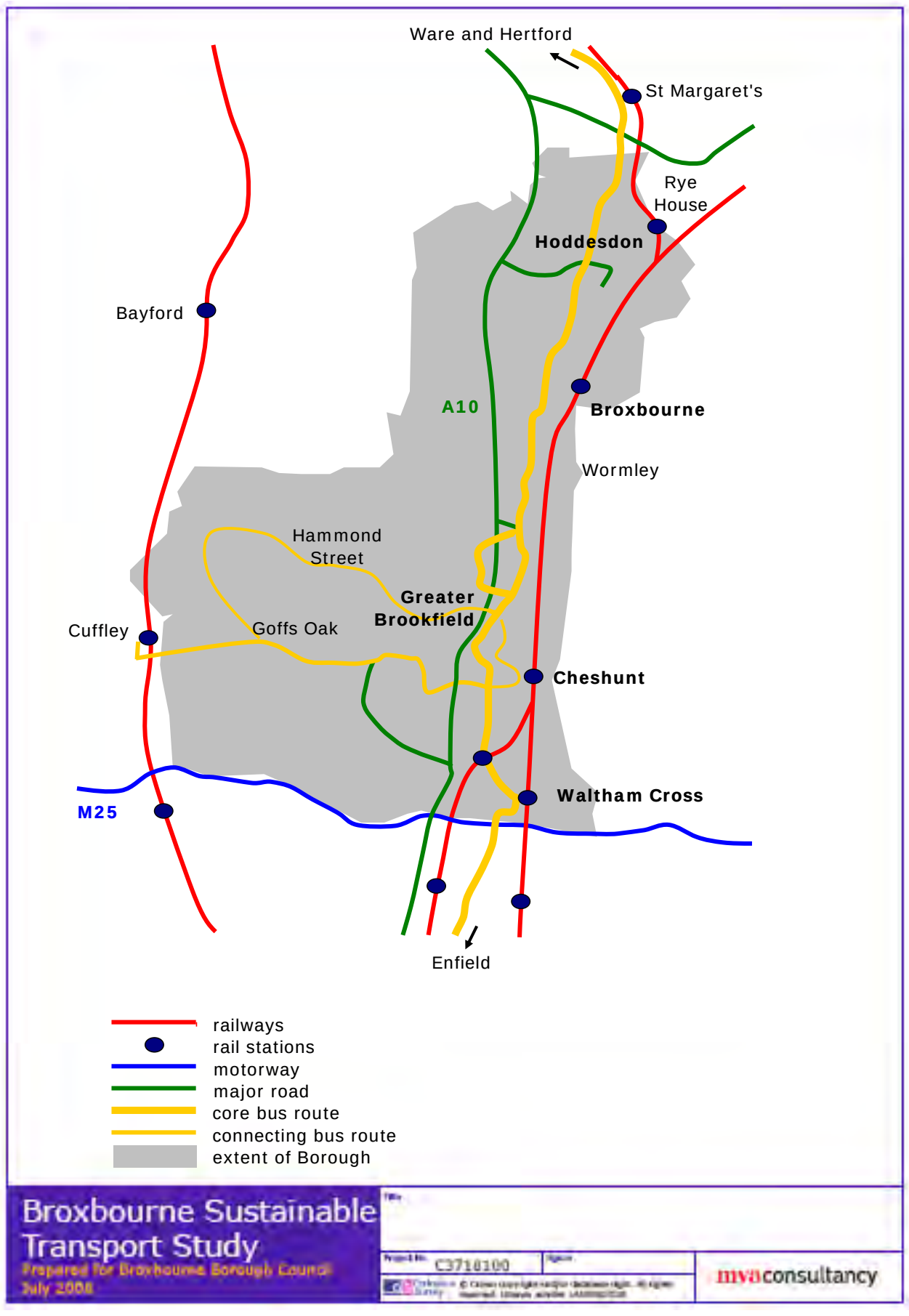
6.8.2 Particular features that could be improved including walking with an extensive network of local routes but meeting a variety of needs, not just journeys within residential areas. Comprehensive routes should aim to overcome severance effects of major roads and link housing and employment sites.

6.8.3 Cycling offers considerable potential. There is currently no defined network across the Borough and few engineering measures. Both on- and off-road measures are required to overcome the practical barriers to cycling. One weak link in the chain of a cycle route will deter use. This may take the form of a poor road crossing, severance by a major road or railway and lack of secure cycle parking. Cycling also has personal health benefits which improve people's quality of life and help to address Government health objectives. Core cycling routes should be identified in detail but should cover the main north-south corridor (Waltham Cross, Cheshunt, Turnford, Wormley, Broxbourne, Hoddesdon) with a clear connection through Greater Brookfield to Hammond Street and Goffs Oak. Where possible this should be separate from the main Great Cambridge Road/High Road/High Street with accesses to residential and employment areas. Links to rail stations should also be made with appropriate facilities for road crossings.

6.8.4 The bus services available to the north of Waltham Cross are generally of lower quality than those available to the south in TfL's area as a result of different market supply arrangements. However, buses offer major opportunities to link communities with facilities, particularly where land uses are dispersed and there is a variety of destinations. However, achieving a shift towards bus use requires more than supply changes (extended timetables, improved frequencies, accessible vehicles, easier ticketing, etc) and part of the package must involve travel planning, wider demand management measures and bus priority measures.

6.8.5 Figure 6.3 illustrates the proposed strategy with a focus on a core north-south bus corridor (building on the existing 310/311 services) and maintaining the benefits of the rail links together with a bus service linking the communities in the south west part of the Borough including an expanded Brookfield with Cheshunt. Comprehensive walking and cycling networks should also be promoted.

Figure 6.2 Transport Strategy



7

7 Conclusions and Recommendations

7.1 Conclusions

7.1.1 The Borough has a number of established centres in the north-south corridor which should form the basis for further growth. However, the apparent car dependency in the area, even including recent development locations, suggests that creating sustainable transport options will require considerable effort to accommodate not only additional development but also to apply similar principles to the established built-up areas.

7.1.2 The high frequency rail service provides unbeatable access to northern central parts of London although the stations are located to the eastern edge of the built-up parts of the Borough. Bus services vary in quality but could provide better services in the north-south corridor linked with new development sites as part of a comprehensive transport strategy. Other potential elements of a sustainable strategy include promoting walking and cycling much more widely and creating new infrastructure to provide attractive networks.

7.1.3 In locating development sites, the most appropriate locations include:

- **Waltham Cross**:
  - An established centre with high levels of activity;
  - Two rail stations;
  - Access to Olympic site;
  - Bus station with services to North London.
- **Cheshunt**
  - Local centre;
  - Rail station;
  - Local employment.
- **Hoddesdon**
  - Established centre;
  - Local employment;
  - Rye House station to access northern residential areas.
- **Greater Brookfield**
  - Core retail activities established but measures needed to overcome severance by the A10 and lack of walking and cycling routes;
  - Better bus links need to be created to link with other parts of the Borough;
  - Potential development needs to focus on new town centre with good access by all modes, not just car.

7.1.4 Other locations where development could be accommodated include:

- **Broxbourne**
  - Rail Station;

- Local retail and other facilities.

- **Wormley/Turnford**
  - Limited local facilities but could orientate around improved bus service.

7.1.5 The area of **Goffs Oak** and **Hammond Street** area has limited potential due to its location away from the main north-south corridor. However, local buses could be improved to link with Cuffley station to the west and Cheshunt and Brookfield to the east. There is potential to create walking and cycling networks.

7.2 Recommendations

7.2.1 We recommend the following to support growth through the LDF process:

- Consider the context of national, regional and local transport and land use planning policy to create a culture of sustainable transport which can inform the LDF process and move towards a more sustainable approach;
- Locate housing and employment in and around the Broough's centres of Waltham Cross, Cheshunt, Brookfield and Hoddesdon in order to take advantage of local facilities available and provide a catalyst for further sustainable transport improvements;
- Where possible develop housing sites close to the Borough's rail stations;
- Working in partnership with operators and developers, improve bus services particularly the north-south corridor (improving services 310/311) to link communities with a high quality service on a more frequent basis than at present with improved infrastructure;
- Improve the existing east-west bus links from Cuffley station through Goffs Oak and Hammond Street to Cheshunt (and potentially Waltham Cross and Waltham Abbey) to provide an acceptable alternative to car use;
- Bus services should accommodate the demand for journeys to work and hence include employment areas such as Essex Road/Pindar Road (Fairview Estate, Impresa Park and Trident Industrial Estate) in Hoddesdon, Delamere Road in Cheshunt and areas of commercial activity in Waltham Cross;
- Develop a co-ordinated approach to Greater Brookfield with a clear plan to improve existing access, remove barriers to movement by sustainable modes and develop sites with good walking and cycling access, linked with local bus services;
- Consider how to improve bus access to major healthcare facilities outside the Borough;
- Review public off-street parking provision and pricing and assess the opportunities to limit parking provision on new development sites;
- Initiate an extensive travel planning programme to inform local people of their travel options and develop more sustainable travel patterns.

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