

**Appendix B: Cycle Network
Review – Borehamwood and
Elstree (Transport Initiatives, 2009)**

FINAL REPORT

CYCLE NETWORK REVIEW - BOREHAMWOOD & ELSTREE

For: Hertfordshire County Council



By:

Transport Initiatives LLP



January 2009



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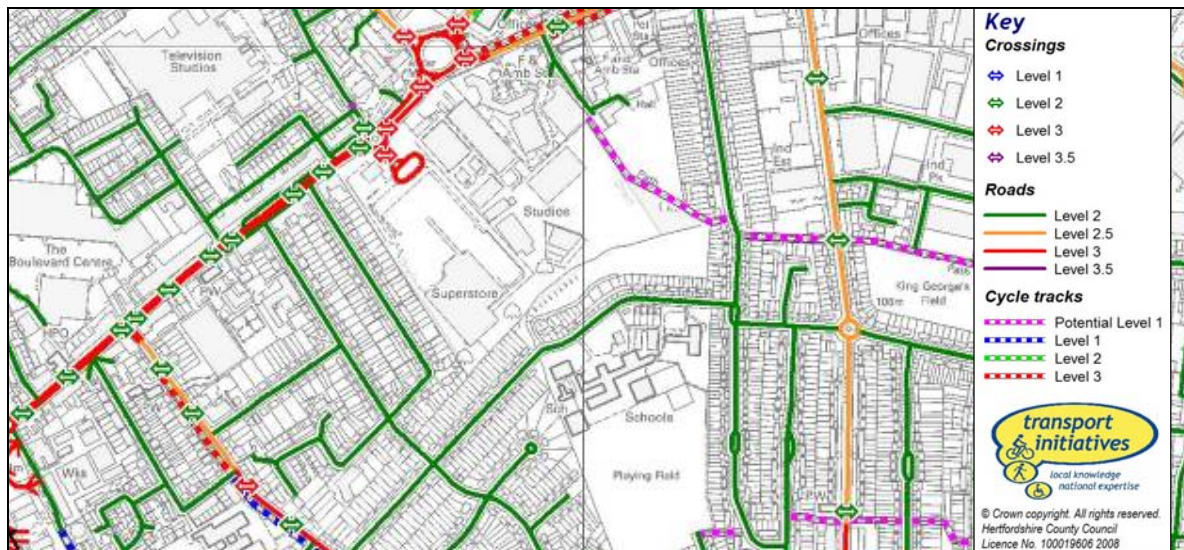
Executive Summary

This study was commissioned by Herts Highways following the adoption of the Borehamwood and Elstree Transport Plan in 2007. Its aims were to investigate the current situation for cycling in the study area, both on- and off-road, and to set out a series of general and detailed recommendations for improvements.

Borehamwood is a town of around 32,000 just north of London. Although it is compact and mostly flat there is a low level of cycling journeys. Previous strategies and measures to improve cycling have focused on a network of recreationally-focused off-road cycle routes. Many of these are substandard, with frequent crossings by side roads. There are also a number of cycle lanes, most of which are narrow. There has been little progress in recent years in providing for cyclists.

This study takes a new approach, based on recent Department for Transport policies set out in *“Manual for Streets”* (2007) and *“Cycle Infrastructure Design”* (2008). These state that improving on-road conditions for cycling should be addressed before considering off-road measures. This could be summed up as could be summed up as “routes for cyclists” as opposed to “cycle routes”.

The first part of the study comprised a Cycle Skills Network Audit (CSNA). This process assess the road and path network in terms of the level of cycle skills needed to use it comfortably and safely, based on the three levels of training in the National Standard for Cycle Training (Bikeability). Crossings are also assessed. These are all assigned one of five CSNA Levels, depending on a variety of factors such as speed and volume of traffic, road width and others. An excerpt from the CSNA is shown below. Further details on the CSNA process, accompanied by more detailed plans, are included in the report and appendices.



Excerpt from CSNA showing Borehamwood town centre

The results from the CSNA were used to inform the second part of the study. This contains a schedule of general and detailed recommendations for area-wide and localised measures to improve and encourage cycling.

The general measures include area-wide proposals, such as a 20mph speed limit for most roads in the area, and localised proposals, such as providing Advanced Stop Lines at all appropriate signalised junctions. The detailed recommendations are all localised and cover 13 separate geographic areas, with three levels of priority. They include an assessment of their practicality, rough level of cost, and a possible timescale for implementation. They include suggestions for new and improved cycle facilities, traffic calming, and redesign of roundabouts to a continental design.

As well as being used to develop infrastructure-based proposals, the output from the CSNA can be used in the development of smarter choice proposals. These could include input to travel plans for both schools and workplaces as well as cycle route maps based on the CSNA levels.

Background

1.1 Location – Borehamwood and Elstree

Borehamwood lies just to the north of London, in Hertsmere District. It has a population of approximately 32,000. Although commonly perceived as a 'commuter town', the number of people commuting *into* the town is in fact nearly as great as those travelling to work elsewhere.

The urban area of Borehamwood is fairly compact (no point is more than 2km from the centre) and is confined by the London-Bedford railway line and major roads. The majority of the town lies east of the railway line and west of the A1 trunk road. Its main retail area is concentrated on and around Shenley Road, with a cluster of public buildings to the east including Hertsmere Borough Council's civic offices. The Shenley Road / Elstree Way corridor is also the main east-west route for traffic through the town, effectively bisecting it. There are fairly high levels of traffic on this route, including goods vehicles. This is despite the traffic restraint measures along Shenley Road which were installed in the 1990s as part of an innovative scheme to improve conditions for pedestrians on mixed priority routes through shopping areas.

Although Borehamwood is compact, walking and cycling have a low modal share of journeys. There are very few dedicated cycling facilities apart from cycle tracks along Elstree Way and part of Shenley Road, and a shared-use footway on the west side of Furzehill Road. These have poor transitions and do not continue across side roads, and also involve detours from cyclists' desire lines. Maintenance is poor, with damage to the cycle track surface along Shenley Road. There are also a few on-road cycle lanes, notably at the Shenley Road/Elstree Way roundabout, but these are inconsistent and narrow.

Elstree is a smaller and older village, separated from Borehamwood by a small green belt. It can only be reached via the B5378 (Allum Lane) or A411 (Barnet Lane). It is dominated by a major crossroads in the centre of the village which is designated as an Air Quality Management Area.



Existing sub-standard cycle track, Elstree Way (by Leisure Centr

1.2 Borehamwood & Elstree Transport Plan

The overall aims of this audit follow the proposals for future work set out in the Borehamwood & Elstree Transport Plan (BETP), adopted in July 2007 by the Hertsmere Highways Joint Members Panel of Hertfordshire County Council. This contains a number of Action Points including one relating directly to improvements for cycling.

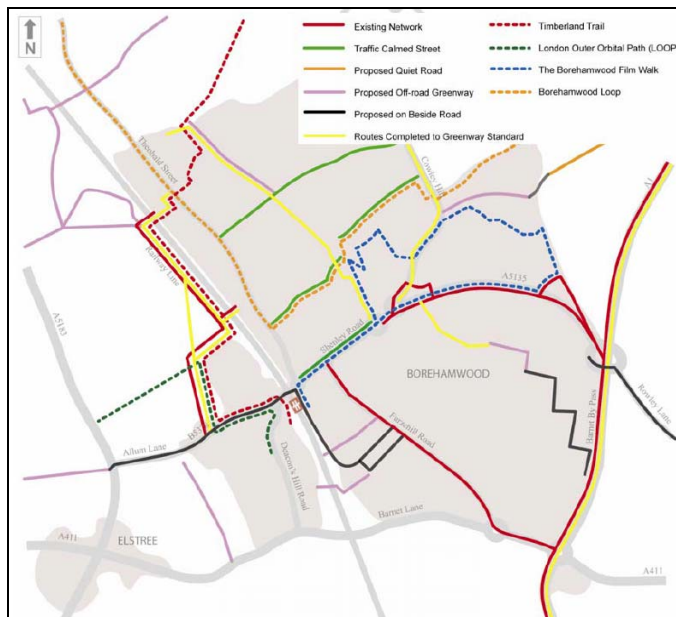
11 Development of cycle priority routes and facilities

Study and scale of scheme will be related to the re-prioritised Greenways network (Action 10 above). There may be an opportunity to contribute to this scheme from existing S106 financial contributions in addition to other sources of funding.

Cycling Action Point, Borehamwood & Elstree Transport Plan (BETP numbering. p. 27)

There are also a number of other Action Points which could have an impact on cycling, including the development of safety programmes and congestion plans along the Elstree Way / Shenley Road corridor, at Elstree crossroads and at Stirling corner roundabout.

A detailed plan is included in BETP showing a combination of existing and proposed routes for cycling (and walking). Some of these are based on new measures for cycling and/or walking, while others are named routes where work has not necessarily been carried out.



Walking and cycling plan, Borehamwood & Elstree Transport Plan

The following is the main objective for this study, based on a revised version of the BETP Action Point listed above:

A Development of measures to encourage and support cycling, including priority routes

An assessment will be made of the suitability of the existing provision for cycling, which will guide the development of infrastructure measures including priority routes and cycle parking as well as other proposals

1.3 Watling Chase Greenways Strategy

The main recent initiative to improve walking and cycling facilities in Borehamwood and Elstree was the Watling Chase Greenways Strategy, adopted in early 2002 (which superseded Hertsmere's 1996 Cycling Strategy). This focused on the development of linear off-road routes, aimed mainly at leisure use.

A number of Greenway routes were introduced following the adoption of the strategy, such as the improved route through Allum Lane Spinney. However little or no development work on the strategy appears to have been carried out since around 2003.

Study approach


2.1 National policy changes

As noted above the most recent initiative to improve cycling infrastructure in Borehamwood and Elstree was the Watling Chase Greenways Strategy, which focused on the development of linear off-road routes. However, national policy has switched away from focus on these types of route as the primary way of encouraging increased cycling and walking.

In Borehamwood and Elstree little progress has been made on the routes in the Greenways Strategy, for a variety of reasons including cost. It might now be beneficial to take a different approach which could lead to a more effective way of providing for existing cycle trips and encouraging new cyclists. This could be summed up as “routes for cyclists” as opposed to “cycle routes”.

The direction of national policy supports just this approach. In 2007 the Department of Transport published “*Manual for Streets*” (MfS) which established the principle that measures intended to benefit cycling (and walking) should first address the broader highway network. This should be designed with a clear focus on encouraging utility trips. MfS considers that segregated or traffic-free routes for cyclists should be developed **only if other highway-based options have been ruled out**. Development of off-road routes should be concentrated where they give an opportunity to offer a high level of service (based on directness, continuity, surface quality and attractiveness).

Local Transport Note 2/08 “*Cycle Infrastructure Design*” (LTN 2/08), published by DfT in October 2008, takes a similar approach:

<p>Consider first</p>  <p>Consider last</p>	Traffic volume reduction
	Traffic speed reduction
	Junction treatment, hazard site treatment, traffic management
	Reallocation of carriageway space
	Cycle tracks away from roads
	Conversion of footways/footpaths to shared use for pedestrians and cyclists

Cycle Infrastructure Design (2008) – Table 1.2 Hierarchy of Provision

Encouraging higher levels of cycling will require a focus on trips for utility purposes, as well as consideration of a broader range of measures than just the development of priority routes (although these will remain important). Most cycling will continue to take place on the wider road network, on routes which will not form part of the priority network. This broader range of work could include transport proposals with a wider remit (e.g. 20mph zones) as well as “Smart” transport proposals (e.g. Travel Plans).

Another important consideration is funding. While overall funding available for cycling might increase, the resources available to develop a dense network of cycle priority routes are likely to remain relatively limited. Experience from elsewhere in Hertfordshire as well as other authorities has clearly shown that only a small number of schemes can be progressed at any one time for a number of practical reasons, especially financial. The approach of setting out a long “shopping list” of proposals serves to raise expectations that are very unlikely to be fulfilled. Simpler, more cost-effective and deliverable on-road measures, based on an innovative approach to the use of shared carriageway space, have great potential to create useful and effective cycle networks over a shorter timescale.

2.2 Cycle Skills Network Audit

The approach taken in the scoping study has built on the work carried out by TI for a number of local authorities, particularly the London Borough of Ealing (with support from Transport for London). The “**Cycle Skills Network Audit**” (**CSNA**) assesses the suitability of the entire highway network (i.e. roads plus all off-road facilities which cyclists can use) in terms of the recently adopted Bikeability standards for cycle training (see table below).

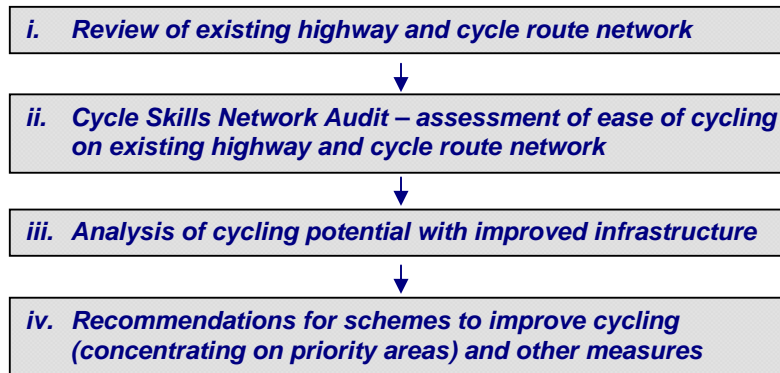
Level 1	<i>Motor traffic-free off-carriageway routes where cycling is permitted, plus streets with extremely low levels of calmed traffic</i>
Level 2	<i>Roads or lengths of a road that cyclists who have achieved Bikeability Level 2 can cycle on and carry out all manoeuvres</i> <i>Cycle tracks which require a degree of attention equivalent to a Level 2 road</i>
Level 2.5	<i>Roads or lengths of a road that cyclists who have achieved Bikeability Level 2 can cycle along and carry out all manoeuvres except turning across traffic</i>
Level 3	<i>Roads or lengths of a road that cyclists who have achieved Bikeability Level 3 can cycle on and carry out all manoeuvres</i> <i>Cycle tracks which require a degree of attention equivalent to a Level 3 road</i>
Level 3.5	<i>Roads or lengths of a road where the level of risk is so high that it is a barrier to even the most experienced cyclists</i>

Bikeability-based cycling skills assessment levels

This has been used to produce a colour-coded “*Level of Service*” plan of the network showing clearly which areas are currently the most conducive to cycling and where the main barriers are to cycling. Following this an assessment can be carried out in more detail of the main actual and potential routes for cycling.

2.3 Study approach

This study therefore has taken a sequential approach to reviewing and developing measures to encourage cycling in the built-up areas of Borehamwood and Elstree. This core of this approach has been to make the best use of the existing highway and other provision for cyclists, and only to recommend works where this can be shown to improve the situation for cycling.



Sequence of work on study

i. Review of existing dedicated cycling provision

This phase comprised a desk-based assessment of the existing highway and cycle route network in order to carry out a scoping of the level of provision for cycling. The results from this were used to inform the next phase.

ii. Cycle Skills Network Audit – assessment of ease of cycling on existing highway and cycle route network

This comprised a detailed audit of Borehamwood and Elstree's roads and cycle tracks (i.e. routes with very little or no motor traffic) in terms of the skill level needed to cycle on them in relative safety. These were classified using a system based on the three core levels of the National Standard for Cycle Training (Bikeability). More details are given in Section 3 below and in Appendix A.

In particular the audit revealed the sections of network which were classified as Level 2.5 and above, i.e. not suitable for less experience or novice cyclists, including most children.

iii. Analysis of cycling potential with improved infrastructure

A brief modelling exercise was carried out to show the effects of improving the sections of the network with the highest CSNA Levels.

iv. Recommendations for schemes to improve cycling (concentrating on priority areas) and other measures

In the final phase the study investigated in detail routes and junctions in the areas agreed with the client to have the highest priority for the development of cycling. A series of detailed recommendations was drawn up for measures to improve conditions for cyclists and hence reduce the skill level needed to cycle safely to most destinations in Borehamwood and Elstree.

This phase also considered non-location specific infrastructure measures e.g. widespread introduction of Advanced Stop Lines (ASLs) and cycle parking, as well the impact of other "Invisible Infrastructure" measures on cycling, such as traffic calming and maintenance.

In addition to proposals for infrastructure-based measures, the study included a brief outline of how “Smarter Choice” techniques might be used to encourage the development of cycling, using measures such as travel planning or enhanced “Bikeability” cycle training.

Cycle Skills Network Audit

3.1 Background

As summarised in 2.2 above, the Cycle Skills Network Audit (CSNA) is a detailed survey of an area's roads and motor traffic free cycle paths to assess the skill level needed to cycle on them in relative safety. These are classified using a system based on the three core levels of the National Standard for Cycle Training (Bikeability). These are:

Level 1 Beginner:

The cyclist has the skills and understanding to be able to make a trip and undertake activities safely in a motor traffic free environment and as a pre-requisite to a road trip.

Level 2 Introduction to Riding on the Road:

The cyclist has the skills and understanding to be able to make a trip safely to school, work or for leisure on quiet roads.

Level 3 Advanced:

The cyclist has the skills and understanding to be able to make a trip safely to school, work or leisure on busy roads and using complex junctions and road features.

For the CSNA these levels have been redefined into 5 levels of classification:

- Level 1** Motor traffic-free off-carriageway routes where cycling is permitted and some streets with very low levels of calmed traffic – *e.g. cycle tracks, paths through parks, shared spaces, cul-de-sacs*. NB some cycle tracks alongside a road may be higher than Level 1 due to frequent junctions at a higher level.
- Level 2** Roads or lengths of a road that cyclists who have achieved Bikeability level 2 can cycle on and carry out all manoeuvres – *e.g. most residential roads, roads with traffic calming*
- Level 2.5** Roads or lengths of a road that cyclists who have achieved Bikeability level 2 can cycle on and carry out all manoeuvres except turning across traffic (i.e. turning right onto or off the road) – *e.g. busier residential roads, mixed priority roads, low-flow distributor roads*
- Level 3** Roads or lengths of a road that cyclists who have achieved Bikeability level 3 can cycle on and carry out all manoeuvres – *e.g. most main roads including smaller roundabouts*
- Level 3.5** Roads or lengths of a road where the level of risk is currently a barrier to even the most experienced and competent cyclists – *e.g. the most difficult/busy main roads and junctions, including most dual carriageways, gyratory systems, large roundabouts and grade-separated junctions with slip roads*

In addition some traffic-free links which are not currently available to cyclists (either by legal or physical restrictions) are classified as **Potential Level 1**.

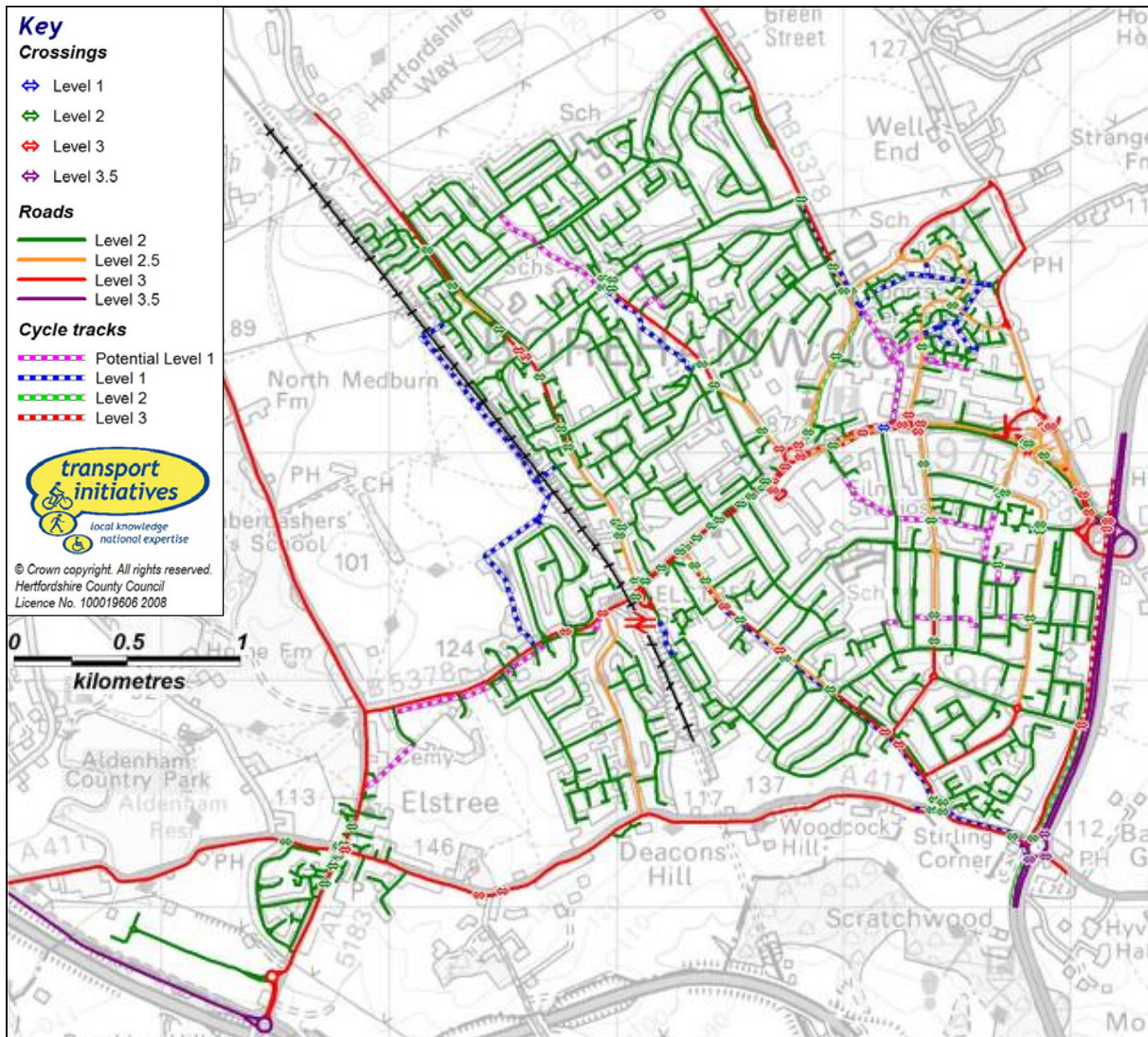
All pedestrian crossings on roads classified higher than Level 2 are also classified using the same criteria. These comprise both crossings which cyclists can currently use while cycling and those where they must dismount. The latter are designed for pedestrian use and hence are assessed from the perspective of a dismounted cyclist wheeling a bicycle.

Appendix A describes the system in more detail.

In order to see the different type of provision (roads, cycle tracks and crossings) in more detail, disaggregated plans are shown below.

3.2 Cycle Skills Network Audit – Borehamwood and Elstree

The plan below shows the results of the CSNA for the whole of Borehamwood and Elstree. Individual areas are shown at a larger scale in Appendix B.



Overall plan of Cycle Skills Network Audit, Borehamwood & Elstree

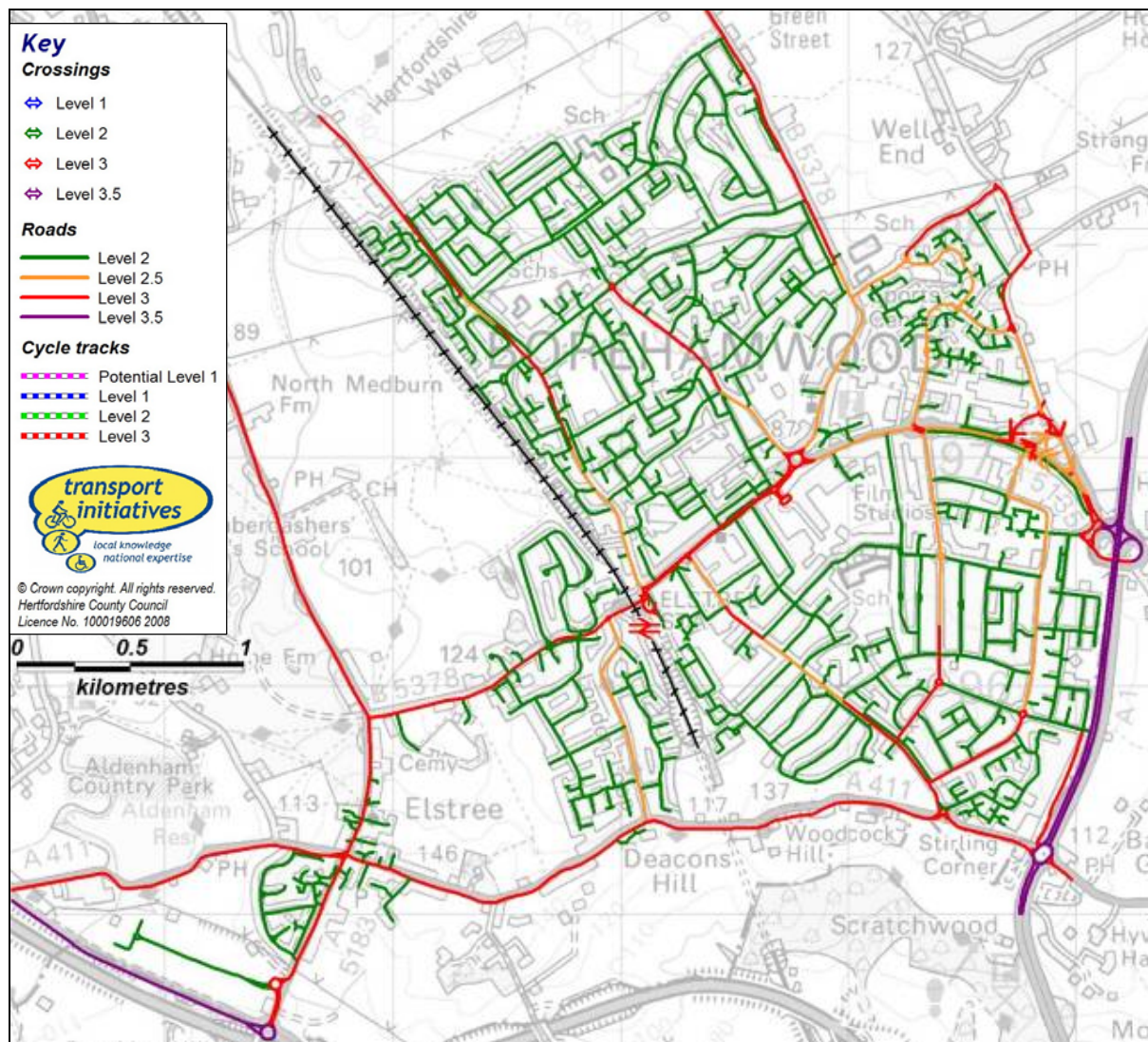
From the overall CSNA plan it can be seen that Borehamwood, and to a lesser extent Elstree, both have areas where cyclists with skill levels equivalent to Bikeability level 2 can travel comfortably. In particular the mainly residential areas in the north of Borehamwood have a good network of Level 2 roads.

However in the main these “islands” are separated from each other by Level 2.5 and 3 roads which require Bikeability level 3 skills. Even some of the linking cycle tracks require level 2 or 3 skills.

In particular there is no convenient east-west route which can be used safely by cyclists who are not trained to Level 3. The main east-west corridor, Allum Lane / Shenley Road / Elstree Way is either Level 2.5 or Level 3 for the entire length. Although it can be reached on Level 2 roads, this has a significant negative effect on the accessibility of the town centre, the railway station and the main employment areas.

There are also very few areas where beginner cyclists (i.e. those with Level 1 skills only) can cycle safely and develop improved skills. Only two isolated areas, in the north east of the town and west of the railway north of Allum Lane, have networks of traffic-free routes.

In order to see the different type of provision (roads, cycle tracks and crossings) in more detail, disaggregated plans are shown below.

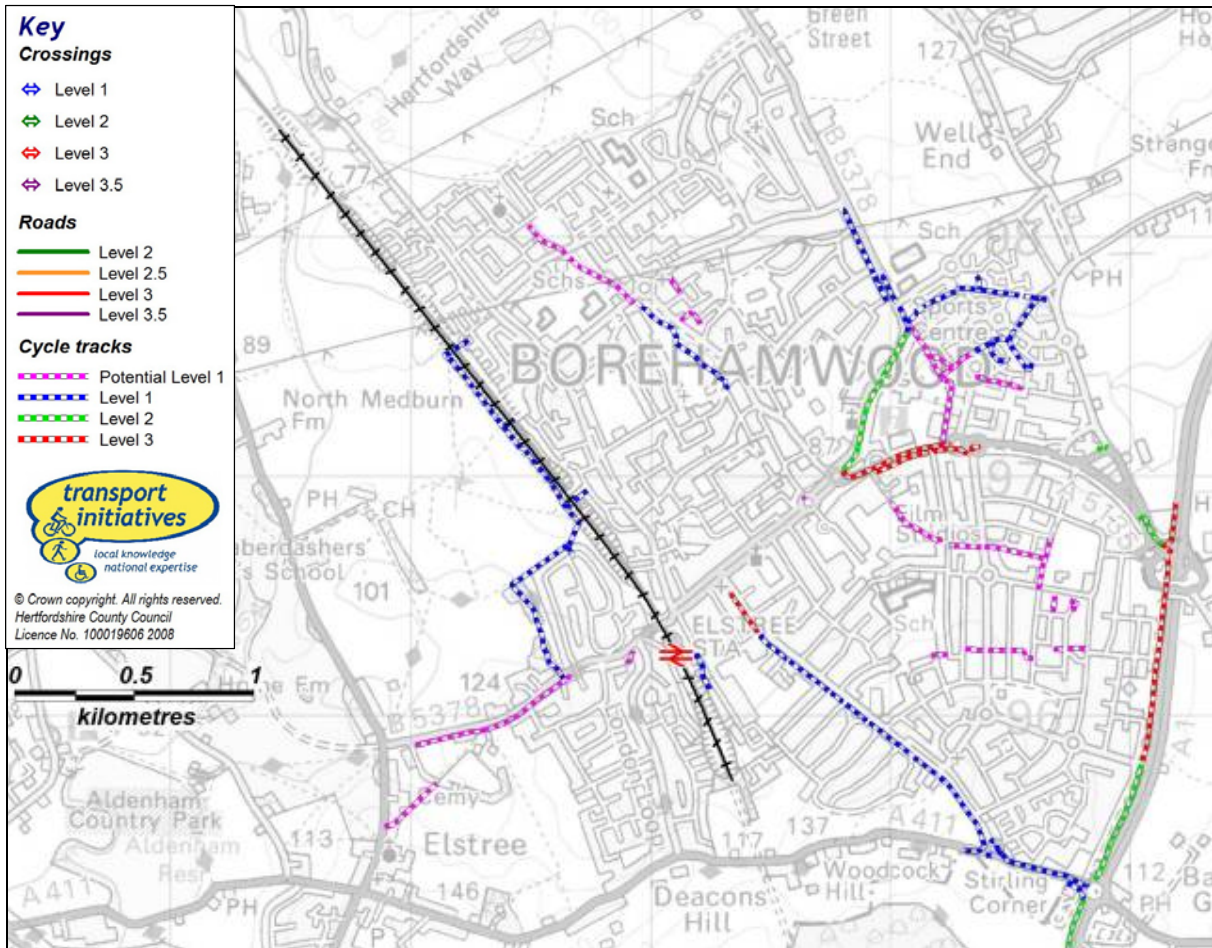


Cycle Skills Network Audit – roads only

The plan above shows the CSNA of the road network only. The Allum Lane / Shenley Road / Elstree Way corridor can be seen clearly to be all Level 2.5 or Level 3. The main distributor roads providing links to the town centre are also all Level 2.5 or Level 3, although there are some stretches where it is possible to bypass these on Level 2 roads.

In addition, it is not possible to cycle between Elstree and Borehamwood on anything other than Level 3 roads. There are also a number of quite significant gradients that will not be conducive to cycling - both in terms of the physical exertion and the effect of cycling uphill on busy, relatively narrow, roads. Hence only the most experienced cyclists will make this trip despite the

short distance between the areas. In particular this will have a major effect on the level of cycling to the station from Elstree.



Cycle Skills Network Audit – cycle tracks and other paths only

The plan above shows both formally designated cycle tracks, such as along Furzehill Road and Elstree Way, as well as other traffic-free links which could be cycled (Potential Level 1).

It can be seen that some sections of cycle track are actually assessed as Level 2 or even Level 3. These occur where the design of the facility requires users to have a higher degree of cycling skill than Bikeability level 1, i.e. they must have experience of cycling in traffic. The assessment of these sections of track is due to factors such as crossings of side roads and private accesses without any provision for cycles. This is the case along the northern section of Furzehill Road, Elstree Way and the eastern section of Shenley Road, where the road has been assessed as Level 2.5. More detailed plans of these sections are given below.

In two of these locations (Furzehill Road and Elstree Way) cycle tracks have been assessed as Level 3 due to the combination of very frequent crossings of the track and a high number of turning movements. These areas are shown in more detail below.

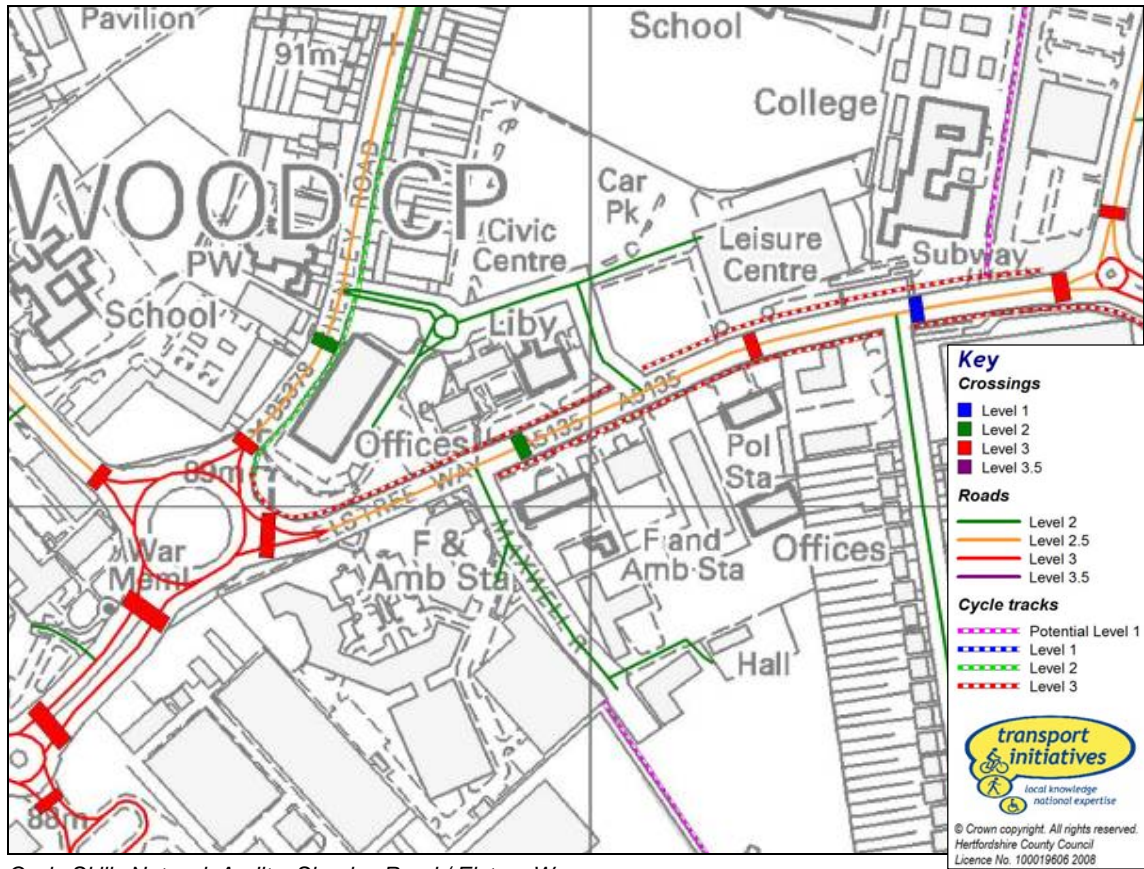
Cyclists using these tracks actually require a higher level of cycling skill than those travelling along the parallel road without making any turns. They may therefore be at more risk using these facilities than if they remained on the carriageway.

The cycle track along the eastern section of Shenley Road has been classified as Level 2. As above this is to the frequent crossings of private driveways, which require more attention to be paid than would be the case for a Level 1 track. However as the road is generally less busy than the other examples there will be fewer turning movements.

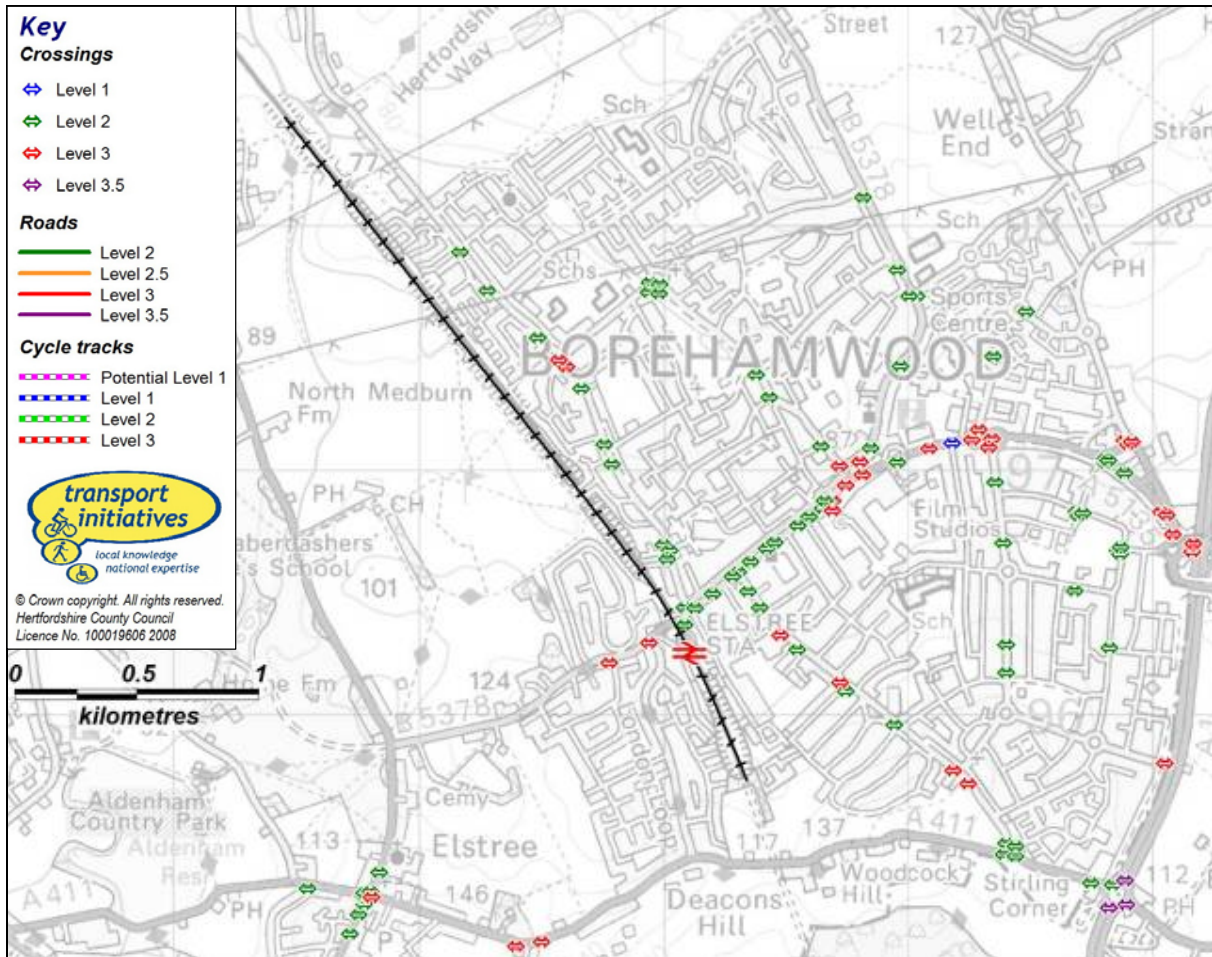
The cycle track alongside the A1 has been assessed at Level 3 due to its close proximity to heavy and fast moving traffic which would be a deterrent to less experienced cyclists.



Cycle Skills Network Audit – Furzehill Road



Cycle Skills Network Audit – Shenley Road / Elstree Way



Cycle Skills Network Audit – crossings

In general the assessment does not include issues such as kerbs that are not flush, as these do not generally affect the level of cycle skills needed. However problems such as the high kerb between Station Road and the path leading to the new development south of the station will have a deterrent effect

This plan does **not** show all crossing points. Level 2 crossings are shown for roads of Level 2.5 and above and Level 3 crossings for roads of Level 2 and above. Level 2 crossings of Level 2 roads are not shown as there would be no need for cyclists to use these crossings.

It can be seen than most crossings are Level 2, i.e. a cyclist with a skill level equivalent to Bikeability Level 2 would feel able to use the crossing, although this may require dismounting. However there are also many crossings rated at Level 3 even in quieter areas. This is due to a variety of effects such as the crossing width, visibility etc.

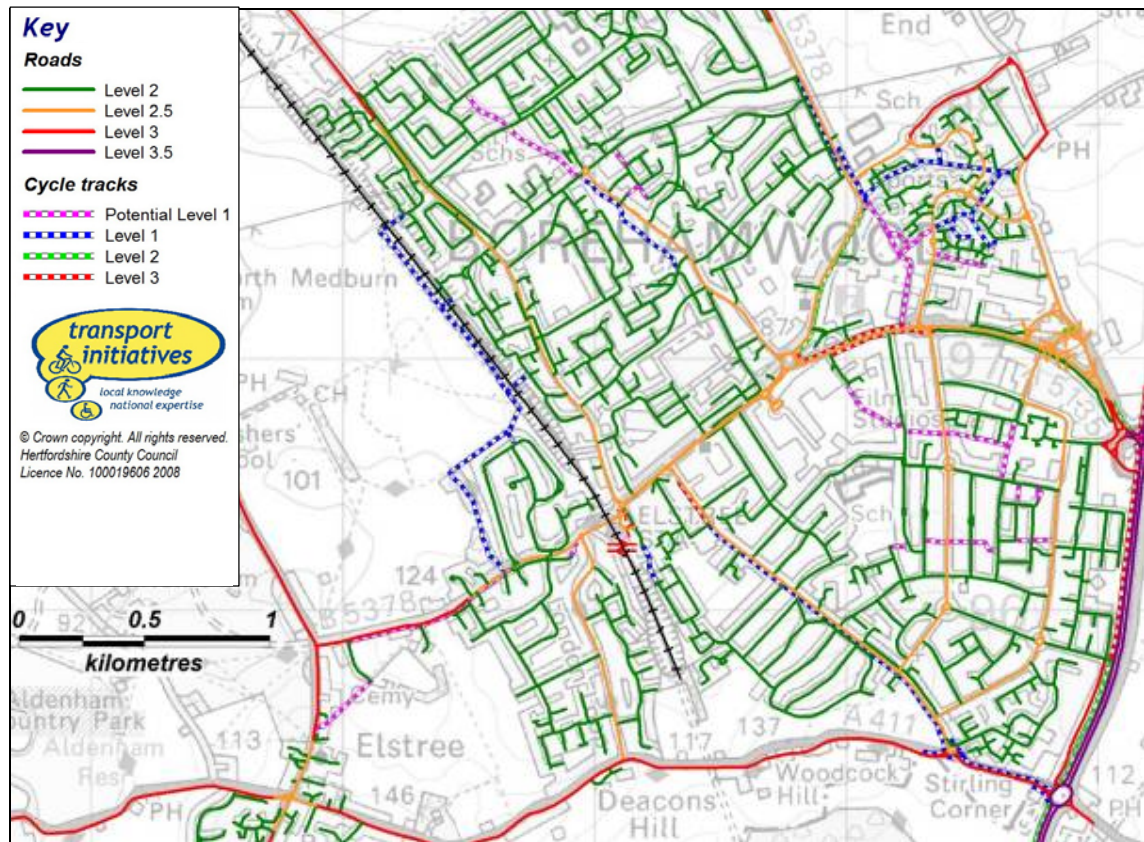
A small number of crossing points, at the Stirling Corner roundabout junction of the A1 and A411, have been rated at Level 3.5 (NB the junction is entirely within the London Borough of Barnet). It has been acknowledged by Transport for London that there is a pedestrian demand to cross Stirling Corner, suppressed due to the intimidating nature of crossing the junction on foot. This is also likely to be the case for cycling.

The crossings involves moving across multiple lanes of fast moving traffic and poses such a high level of risk that even experienced and competent cyclists would not feel comfortable using them.

Analysis of potential improvements

The possible effects of improving the network to increase the number of areas where cyclists of Level 2 can travel safely are shown in the plans below.

The plan below shows the effects of reducing the level of skills needed to cycle on Level 3 roads in the centres of Borehamwood and Elstree. This would result in a large benefit in terms of increased accessibility for cyclists. It assumes that these roads have been made Level 2.5 through a variety of measures such as speed reduction and cycle lanes of adequate width. Note that this would only benefit those travelling along the improved roads and not those crossing them or turning right, unless other measures were also carried out.



Cycle Skills Network Audit – main Level 3 roads improved to Level 2.5

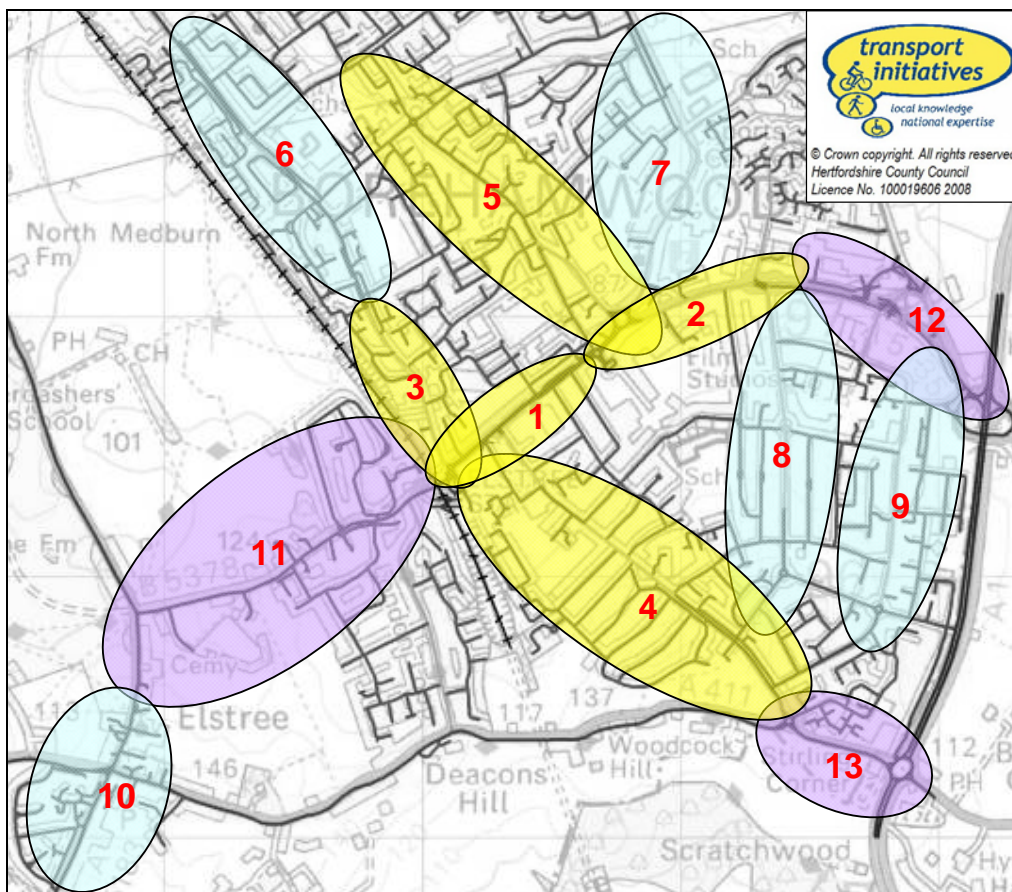
The plan below shows the effect of measures to further improve Shenley Road so that it is Level 2 between Station Road roundabout and the Civic Centre. This would make the town centre and station highly accessible for cyclists and also improve the area for pedestrians.



Cycle Skills Network Audit – as above plus Shenley Road improved to Level 2

Overview of recommendations

5.1 Priority areas for investigation



Priority areas for detailed investigation

The areas listed below were agreed as the basis for investigation of detailed recommendations for improvements for cycling, broken down into three levels of priority.

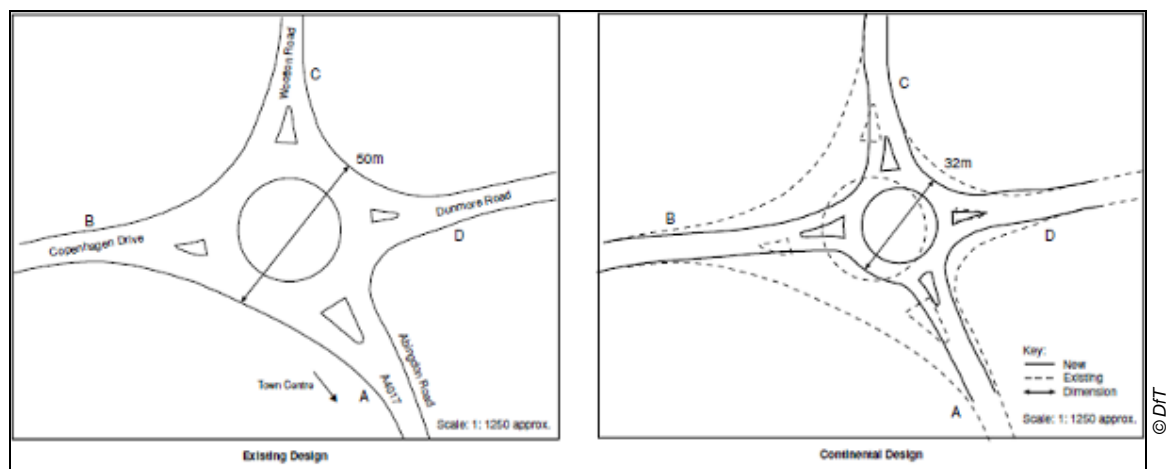
Priority	No.	Area
1st 	1	Shenley Road
	2	Elstree Way west
	3	Theobald Street south
	4	Furzehill Road
	5	Brook Road

2nd		6	Theobald Street north
		7	Cowley Hill
		8	Manor Way
		9	Balmoral Drive
		10	Elstree village
3rd		11	Allum Lane / Elstree north
		12	Elstree Way east
		13	Barnet Lane east

5.2 Summary of detailed measures

The detailed recommendations for improved provision for cycling are set out in Section 6 below. There are a number of common recommendations and these are summarised below.

- Narrow cycle lanes (below 1.25m) should be examined and either widened or removed.
- On roads where there are currently no or very narrow cycle lanes, the possibility should be investigated of removing the centre line to give a narrower central 2-way lane for motor vehicles and reallocating roadspace to provide cycle lanes in both directions
- Roundabouts should be examined and where possible redesigned to meet continental style design (see DfT Traffic Advisory Leaflet 9/97 “*Cyclists at Roundabouts. Continental Design Geometry*” and para. 9.7.3 of DfT LTN2/08 “*Cycle Infrastructure Design*”). The figure below from TAL 9/97 shows an example of the difference between the standard and continental design.



Example of continental design applied to existing roundabout (from DfT Traffic Advisory Leaflet 9/97)

- Car parking in and near cycle facilities should be reviewed to remove locations which obstruct cyclists, reduce visibility or cause some other hazard.

- Where cycle routes cross roads without signals, wide Zebra crossings should be considered. These comprise a wide speed table with a Zebra crossing and a parallel non-priority crossing for cyclists – see example below.



Parallel Zebra and cycle crossing (Chelmsford, Essex)

5.3 Area-wide cycling infrastructure measures

In addition to the detailed recommendations, a number of area-wide recommendations are set out below.

Infrastructure and Traffic Management

- As a priority, a policy should be considered of making the urban area of Borehamwood a 20mph zone (excluding distributor roads). This would follow the example of larger towns and cities such as Portsmouth, Oxford, Norwich and Leicester where the default speed limit is 20mph. While implementation of such a policy would need to be incremental, the adoption of such a policy would send a clear message about local transport priorities.
- A programme should be developed to provide Advanced Stop Lines at all appropriate signalled junctions (i.e. excluding junctions with Level 3.5 roads). As far as possible these should include a reasonable length of lead-in lane
- A programme should be developed to investigate and deliver targeted improvements to cycle provision. Sub-standard measures should be examined in detail and either brought up to standard, redesigned (e.g. as unsegregated shared use) or removed.
- A review should be carried out into locations where persistent anti-social parking causes ongoing problems for pedestrians, cyclists and people with disabilities

Cycle parking

Improved cycle parking was provided in mid-2008 in the town centre, particularly on Shenley Road. However there remains a general shortage of good quality cycle parking outside the town centre.

- A programme should be developed to provide cycle parking facilities at main destinations, using Sheffield stands or equivalent
- The proposed improvements to cycle parking at Elstree & Borehamwood station should be implemented as a priority

Signing

Signing and continuity of provision is very variable throughout Borehamwood and Elstree. Improving this would add to convenience, continuity and the 'profile' of cycling.

- A review of cycle signing across the area should be carried out in order to develop a cycle signing strategy
- A programme of works should then be drawn up to introduce new signs and improve existing provision.

In parallel with the signing review a detailed review of all potential traffic-free links should be carried to produce a programme of works to make available to cyclists. There are many missed opportunities that could easily be put right, including many short paths that could be shared to create links with minimal expense and good signing and hence extending the cycle network and increasing coherence and continuity.

- Review short traffic-free links and develop a programme of works to open these up to cyclists where possible, including appropriate signing

5.4 Proposals for smart measures (i.e. non-infrastructure)

These would require input from the Travel Plan team at Hertfordshire County Council.

- Cycle route information and promotional activities – to include a revised cycle map based on the CSNA levels for roads and cycle tracks
- Workplace Travel Plans to promote cycling more actively
- School Travel Plans to include local CSNA plans and to promote cycling more actively
- Bikeability training to be established for children outside Year 6 as well as for adults

Detailed recommendations

6.1 Assessment of recommendations

The output from this phase comprises detailed recommendations on how to address issues which have an impact on the level of cycling skills needed to cycle safely. A description is given of the specific problem leading to the recommendation, with a summary of the potential benefits. There is also an estimate of the level of cost, an assessment of the practical and/or other difficulties in achieving the recommendation, and a priority for the recommendation.

Benefits

The benefits have been considered in terms of the five key criteria for good practice in cycle provision, as set out in DfT Local Transport Note 1/04 *“Policy, Planning and Design for Walking and Cycling”*. These are commonly used as the guidelines for developing provision that encourages cycling.

- *Convenient*
- *Accessible*
- *Safe*
- *Comfortable*
- *Attractive*

Practicality

While all the recommended measures are desirable, the practicality ranking refers to how practicable it would be to introduce a recommended measure. It should be noted that a number of measures that are ranked as most practical may nevertheless require real political commitment to implement. The overall scores indicate the following levels of practicality:

- M** *Best carried out as part of the maintenance programme (e.g. resurfacing) or when other highway works are being undertaken*
- 1** *Relatively inexpensive to introduce in both design and implementation, and should provide good return for minimal cost (“quick wins”)*
- 2** *Could be more expensive but generally should provide a reasonable return in giving more advantage to cyclists and pedestrians*
- 3** *Potentially expensive with the level of return uncertain*
- 4** *May be desirable but may also be impractical/very difficult to implement, or have negative outcomes beyond the area to be treated.*

Cost level

The cost estimates for individual schemes have been ranked as follows:

Low	<£10k
Medium	£10K - £50K
High	£50K - £100K

Major >£100K

Timescale

The levels of time-based priorities for the recommendations are:

Immediate Immediate action required to deal with an issue that is causing a hazard

Short Schemes of highest benefit to cyclists in the study area

Medium More investigation is needed and hence work will only be possible in the medium-term (i.e. within the current LTP period)

Long Complex project requiring more detailed consideration including possible modelling and public consultation (long-term i.e. next LTP period)

6.2 Cycling priority areas

Section 5.2 above give more details on recommendations that occur a number of times, such as continental style roundabouts.

Recommendations highlighted in green are “quick wins” –measures that could be implemented at relatively low cost in the short term.

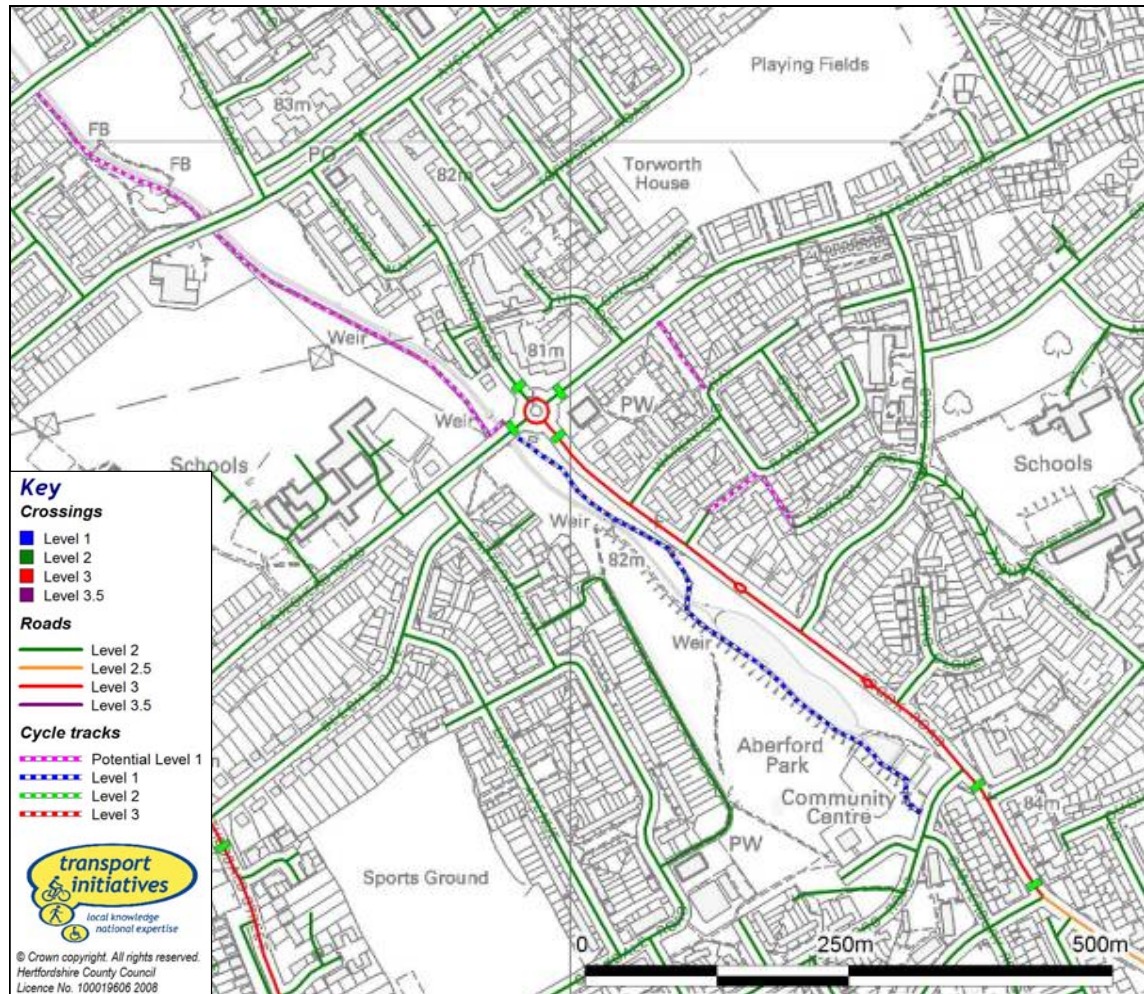
Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practicality	Cost level	Priority
Area-wide						
ALL	All non-distributor Rds	2/3	<ul style="list-style-type: none">Introduce area-wide 20mph speed limitsIntroduce traffic calming schemes using humps/cushions to reduce vehicle speeds and obviate the need for any specific measures for cyclists	N/A		
ALL	Signalled junctions	2/3	<ul style="list-style-type: none">Provide Advanced Stop Lines at appropriate junctions, with lead-in lanes	N/A		
ALL	Destinations (shopping areas etc.)	2/3	Improved cycle parking: <ul style="list-style-type: none">Individual Sheffield standsShelters with Sheffield stands at main locations	N/A		
ALL	All routes	2/3	<ul style="list-style-type: none">Review cycle direction signing to establish clear and consistent approach	N/A		
1st priority						
1	Shenley Rd/ Station Rd roundabout	3	1. Remodel to continental design.	3	High	Medium
			2. Reduce circulating space and entry exit speeds by hatching or overrun areas	1	Medium	Short
1	Shenley Rd link	3	1. Introduce elements of 'shared space' with access restrictions limiting through-traffic	3	Medium	Medium

Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practicality	Cost level	Priority
	(Theobald St – Elstree Way)		2. Review parking, waiting and weight restrictions and improve enforcement	2	Low	Immediate
			3. Investigation of long-term option of pedestrian priority zone	4	Major	Long
1	Shenley Rd/ Furzehill Rd roundabout	3	1. Remodel to continental design	2	High	Medium
			2. Reduce circulating space and entry exit speeds by hatching or overrun areas.	1	Medium	Short
1	Shenley Rd/ Eldon Ave junction (incl. Tesco access road)	3	1. Remodel to continental design.	2	High	Medium
			2. Reduce circulating space and entry exit speeds by hatching or overrun areas.	1	Medium	Short
			3. Install toucan crossing or wide ramped zebra to provide pedestrian/cycle link north side of Shenley Rd and Eldon Ave	2	Medium	Medium
			4. Install wide ramped zebra across Tesco access roads	2	Low	Short
			5. Extend cycletrack facilities on both sides of roundabout and by the war memorial to offer alternative to using roundabout	1	Medium	Short
2	Shenley Rd/ Brook Rd/ Elstree Way roundabout	3	1. Remodel to continental design and remove cycle lanes	2	High	Medium
			2. Reduce circulating space and entry exit speeds by hatching or overrun areas	1	Medium	Short
			3. Provide for pedestrian/cycle crossing movements with wide ramped zebra (esp. Brook Rd) or toucan crossing.	2	Medium	Short
2	Elstree Way (Shenley Rd – Studio Way) link	3	1. Widen cycle tracks to 3m where possible (minimum of 2m) with flat-top ramps and traffic giving way to the track at side roads and private accesses	2	High	Medium
			2. Provide on-road advisory cycle lanes (minimum width 1.5m)	M	Low	Immediate
			3. As 2. plus removal of road centre lines to assist with speed limit compliance	1	Low	Short
			4. Both 1 & 3 (parallel routes for cyclists with different levels of experience)	2	High	Medium
			5. Provide toucan or wide ramped zebra to replace subway crossing	2	High	Short
2	Elstree Way/ Studio Way/ Manor Way roundabout	3	1. Remodel to continental design and remove cycle lanes	2	High	Medium
			2. Reduce circulating space and entry exit speeds by hatching or overrun areas	1	Low	Immediate
			3. Improved cycle lanes might be incorporated as part of the remodelling and hatching	1	Low	Immediate

Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practicality	Cost level	Priority
3	Theobald St (Shenley Rd to Croxdale Rd) link	Mostly 2.5 (3 at Croxdale Road jn)	1. Review the mini roundabouts and centre dome heights to reduce entry/exit speeds	2	Low	Short
			2. Consider trial of 1.5m cycle lanes between a 'core traffic lane' of 3.7m width (i.e. remove centre line)	1	Medium	Short
			3. Ensure continuity of 1.5m cycle lanes through refuges plus mini roundabouts where possible	1	Low	Short
			4. Consider 'cushion' traffic calming scheme to slow traffic speeds and remove need for any specific cycling measures	2	Medium	Short
4	Furzehill Rd (Shenley Rd to Brownlow Rd) link	3	1. Improve the existing cycle track to best practice standards with measures to prevent obstruction by parked vehicles	2/3	Medium	Medium
			2. Develop alternative route to Shenley Rd via Drayton Rd with cycle gap in road closure	1	Low	Short
			3. Review road space to improve safety and convenience of on-road cycling	2/M	Low	Immediate
4	Furzehill Rd (Brownlow Rd to Barnet Lane) link	3	1. Improve the existing cycle track to best practice standards with crossing measures to access side roads on northern side	2/3	Medium	Medium
			2. Review road space to improve safety and convenience of on-road cycling. Consider removal of centre hatching and road centre lines, plus uphill advisory cycle lane.	2/M	Low	Immediate
			3. Extend traffic calming along length of link	2	High	Medium
			4. Investigate alternative route to Elstree & Borehamwood station via Station Rd and route through new development	2	Medium	Short

Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practicality	Cost level	Priority
5	Brook Rd (Gateshead Rd to Shenley Rd) link	3	1. Create cycle gap in closure of Eldon Ave with bollards to prevent obstruction by parked vehicles	1	Low	Immediate
			2. Improve and extend existing off-highway route through Aberford Park (see plan below) with attention to detail of signing, flush kerbs, crossing arrangements etc.	1	Medium	Short
			3. Provide an alternative northern route via Ranskill Rd, Norton Close, Winstre Rd (one-way n/b – make 2-way for cyclists), Brode-water Rd, Broughinge Rd, Fairway Ave	1	Medium	Short
			4. Upgrade ex. pelican crossing of Brook Rd at Fairway Ave. to toucan crossing (by St Teresa's Primary School)	2	Medium	Short
			5. Ensure proposed traffic calming scheme fully takes into account cycle-friendly measures	2	High	Medium

Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practicality	Cost level	Priority



Off-highway route through Aberford Park parallel to Brook Road

Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practical- ity	Cost level	Priority
2nd priority						
6	Theobald St (Croxdale Rd to Rossington Avenue) link	2.5 - 3	1. Review mini roundabouts and centre dome heights to reduce entry/exit speeds	2	Low	Short
			2. Consider a trial of 1.5m cycle lanes between a 'core traffic lane' of 3.7m width.	1	Medium	Medium
			3. Continue 1.5m cycle lanes through refuges and add mini roundabouts where possible.	1	Low	Medium
			4. Consider 'cushion' traffic calming scheme to slow traffic speeds	2	Medium	Medium
7	Cowley Hill link / Hertswood School	3	1. Establish better continuity between cycle tracks and route along service roads	1	Low	Short
			2. Introduce traffic calming scheme (may require cushions)	2	Medium	Medium
			3. Review school travel plan to encourage cycling			
8	Manor Way (Elstree Way to Ripon Way) link	2.5	1. Extend traffic calming throughout the link.	2	High	Long
			2. Remove centre hatching.	M	Low	Immed- iate
			3. Add cycle lanes and remove road centre lines and hatching	1/M	Medium	Immed- iate
			4. Remodel mini roundabouts to reduce through speeds.	2	Medium	Medium
8	Cranes Way (Manor Way to Furzehill Rd) link	3	1. Extend traffic calming throughout the link.	2	Medium	Medium
9	Balmoral Drive link	2.5	1. Consider measures to reduce anti-social parking.	2	Medium	Short
9	Ashley Drive link	3	1. Consider extending traffic calming measures (cushions).	2	Medium	Short
			2. Control pavement parking.	2	Low	Immed- iate
10	Elstree village (incl. link between High Street and 'composers estate')	3	1. Undertake detailed study of link between war memorial footpath and 'composers estate' via High Street (some widening and conversion of footways is possible, esp. on west side of High Street to Beethoven Rd)	3	High	Medium
			2. Improve the traffic signal junction for pedestrians crossing the Barnet Lane arm	2	Medium	Medium

6.3 Other areas

Area	Location	CSNA Level	Recommended measures in order of preference	Ranking (see key above)		
				Practicality	Cost level	Priority
3rd priority						
11	Allum Lane link (east)	3	1. Provide link between Allum Lane service road and roundabout at Deacon's Hill Rd.	1	Medium	Immediate
			2. Review traffic lane configuration over the railway bridge to provide 1.2m cycle lanes (poss. uphill only) and a central core traffic lane, with centre line removed	2	Medium	Short
			3. Provide new pedestrian/cycle bridge (possibly shared with station footbridge) or wider replacement bridge	4	Major	Long
11	Allum Lane Spinney path	1	1. Improve signing of Greenway between Allum Lane and Red Road bridge and alongside west side of railway	1	Low	Immediate
11	Allum Lane link (west)/ Elstree north	3	1. Convert footway on south side of Allum Lane to shared use, up to cemetery access road	2	High	Medium
			2. Improve and convert footpath from cemetery to war memorial at Elstree (may not be cost-effective to achieve acceptable gradient)	3	High	Medium
			3. Provide 'jug handle' facility needed to access proposed link from Elstree High Street	3	Medium	Medium
12	Elstree Way (Studio Way – Rowley Lane) link	2.5	1. Widen cycle lanes to 1.5m	1/M	Low	Immediate
12	Rowley Lane/ Elstree Way gyratory junction	2.5	1. Review the gyratory to provide wider advisory cycle lanes (1.5m minimum) with appropriate lanes where left turning traffic is likely to cross the path of cyclists.	1	High	Medium
			2. Narrower traffic lanes to encourage slower speeds through the gyratory	1	Medium	Medium
13	Barnet Lane east (Furzehill Road – A1) link	3	1. Provide cycletrack continuity over redundant access with improved link into retail park	1	Medium	Short
			2. Review crossing arrangements at the Barnet Lane / Furzehill Road roundabout to minimise detours from desire lines	3	Medium	Medium
13	A1 Stirling Corner roundabout	3.5	1. Request TfL / Highways Agency / London Borough of Barnet to carry out detailed study of improved crossing arrangements for pedestrians and cyclists	4	Major	Long

Appendix

Methodology for Cycle Skills Network Audits (CSNA)

Purpose

The purpose of this methodology is to provide clear guidance on the **Cycle Skills Network Audit (CSNA)**. The CSNA classifies sections of roads, junctions and off-carriageway facilities usable by cyclists by the Bikeability standard that cyclists would need to have achieved to be able to ride on them in comparative safety. Bikeability is the name given to the UK National Standard for Cycle Training.

The guidance first explains the benefits of carrying out an audit. It then explains the three Bikeability levels of achievement and how these have been adapted into five levels for the purposes of the audit. It then gives detailed explanations of the characteristics that define roads at each of the levels. Finally the guidance explains how an audit should be carried out.

Benefits

The information provided by a Cycle Skills Network Audit can be used in a number of ways. An audit can be used for some of the following:

- Production of maps or guides for local cycle users enabling them to plan journeys based on their level of skill
- Identifying barriers to cycling and accessibility. Audits include assessment of pedestrian crossings by their Bikeability levels
- Targeting of cycle training to schools where improved skills are most needed within their catchment areas
- Identification of roads and other routes where a more detailed assessments, such as a CERS2 (Cycle Environment Review System 2) audit, could be carried out

Bikeability (National) Standard Levels

The Bikeability Standard has three levels of achievement:

Level 1 Beginner

The cyclist has the skills and understanding to be able to make a trip and undertake activities safely in a motor traffic free environment and as a pre-requisite to a road trip.

Level 2 Introduction to Riding on the Road

The cyclist has the skills and understanding to be able to make a trip safely to school, work or for leisure on quiet roads.

Level 3 Advanced

The cyclist has the skills and understanding to be able to make a trip safely to school, work or leisure on busy roads and using complex junctions and road features.

Cycle Skills Network Audit Levels

The three Bikeability levels have been used as a base to classify the existing road network but have been expanded slightly for the purposes of the CSNA, adding two new categories.

Routes

Roads or any off-carriageway route which cyclists are permitted to use, whether highway or not, are categorised as follows:

- Level 1** Motor traffic-free off-carriageway routes where cycling is permitted and some streets with extremely low levels of calmed traffic *e.g. cycle tracks, paths through parks, shared spaces, private road cul-de-sacs.*
NB not all cycle tracks alongside roads will be Level 1.
- Level 2** Roads or lengths of a road that cyclists who have achieved Bikeability level 2 can cycle on and carry out all manoeuvres *e.g. most residential roads, roads with traffic calming*
Cycle tracks which require a degree of attention equivalent to that needed on a Level 2 road *e.g. cycle tracks on shared-use footways crossing frequent side roads or private accesses*
- Level 2.5** Roads or lengths of a road that cyclists who have achieved Bikeability level 2 can cycle on and carry out all manoeuvres except turning across traffic (i.e. turning right onto or off the road) *e.g. busier residential roads, mixed priority roads, low-flow distributor roads – especially where there is a wide cycle lane*
- Level 3** Roads or lengths of a road that cyclists who have achieved Bikeability level 3 can cycle on and carry out all manoeuvres *e.g. most main roads including smaller roundabouts*
Cycle tracks which require a degree of attention equivalent to that needed on a Level 3 road
- Level 3.5** Roads or lengths of a road where the level of risk is so high it is a barrier to even the most experienced and competent cyclists *e.g. the most difficult/busy main roads and junctions, including most dual carriageways, gyratory systems, large roundabouts and grade-separated junctions with slip roads*

In additions some traffic-free links which are not currently available to cyclists (either by legal or physical restrictions) are classified as **Potential Level 1**. For example, this might include a path

between two cul-de-sacs which is wide enough to be shared by pedestrians and cyclists but has a “No cycling” sign. It could also include a bridleway with a poor quality surface.

Crossings

In addition to assessing the cycling conditions, all pedestrian and cycle crossing points (on roads classified Level 2.5 or higher) are identified. These are classified as Level 1, 2 and 3 and the characteristics for these are based on those for routes. These comprise both crossings which cyclists can currently use while cycling (e.g. Toucan crossings) and those where they must dismount (e.g. Zebra crossings). The latter are designed for pedestrian use and hence are assessed from the perspective of a dismounted cyclist wheeling a bicycle.

It should be noted that for crossings there is no Level 2.5 as they will either be at Level 2 or Level 3. Level 2.5 is **only** used to denote roads where a cyclist trained to Bikeability level 2 will not feel safe when turning across traffic and so would be advised to dismount and cross as a pedestrian. Occasionally there may be some Level 3.5 crossings, where the level of risk is so high that their use is not considered advisable.

In each case the type of characteristics expected for each level is described. A classification will usually be made when a combination of these characteristics are observed. However, it is possible that a single factor (e.g. traffic speed) may lift a section of road into a higher level.

Carrying Out the Audit

Initial scoping

An initial scoping of the area can be carried out establishing the roads most likely to be classified higher than level 2 and devising a plan of campaign for the practical audit. A quick cycle round the area on the roads identified as probably higher than level 2 will then help familiarise the auditors with the area, although the audit may begin without such a ride having been undertaken.

Roads classified higher than Level 2

These are generally major routes through an area and mixed residential/local distributors. Some apparently minor residential roads may be used as rat runs which may raise the level of classification. For all these roads the auditors need to make measurements of road widths. Measurements should be made at regular intervals:

- where road width may be the factor that would give a higher classification
- where there is an obvious change in road width
- where regular parking on one or both sides of the road change the effective road width for through traffic (measure of both total road width and available carriageway width should be made at these points)
- where there are pedestrian islands the width of each carriageway lane and of the island should be recorded
- at any other points where the auditors feel width may be a factor

The pedestrian crossings on these roads should all be classified and recorded.

Roads classified level 2 or less

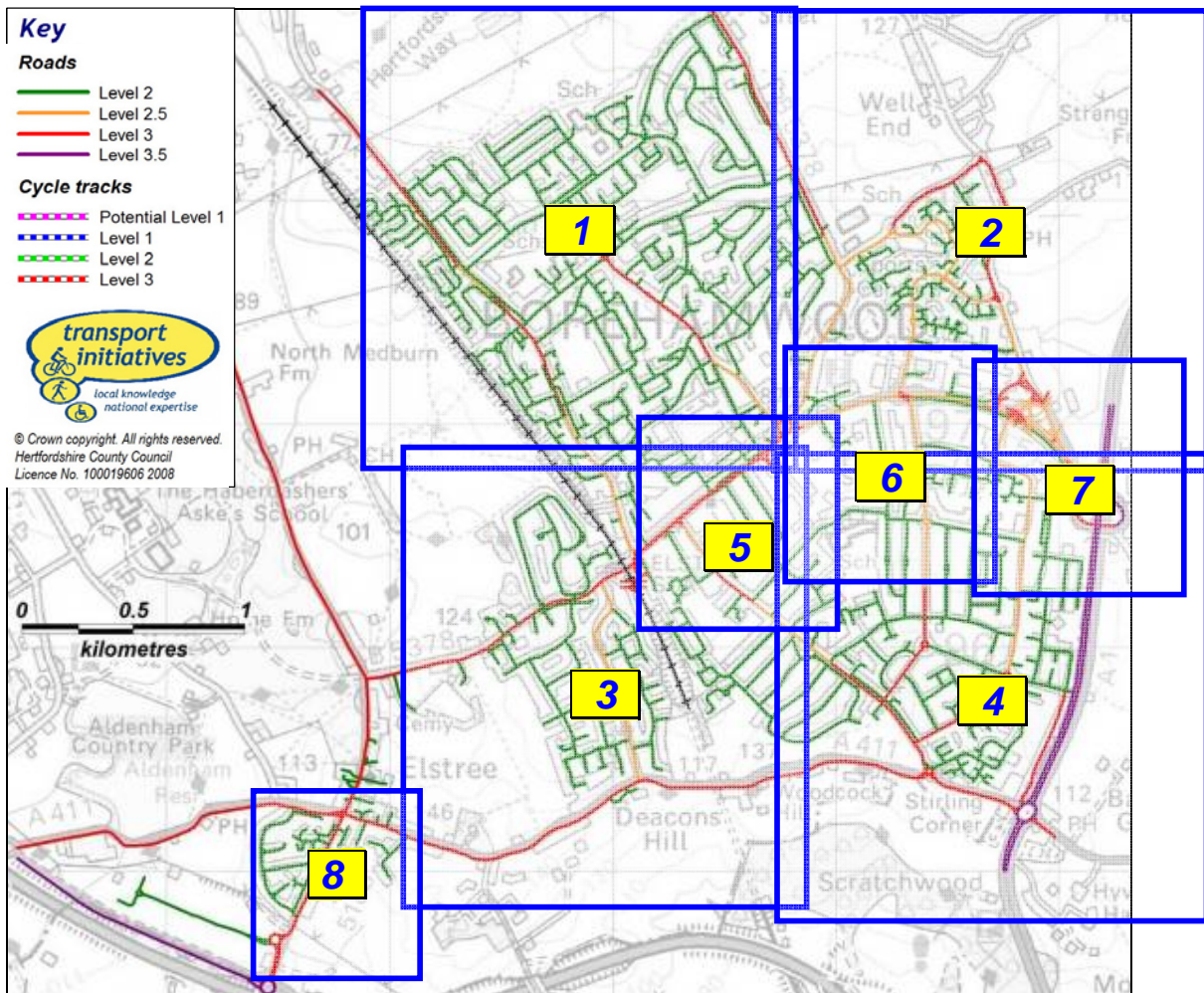
Estate roads and terrace streets will usually have very similar characteristics. It should not be necessary to ride along every one of these roads. After consulting the map it will often be possible to cycle along each residential distributor and view down the lesser residential streets from their ends to confirm their status.

In some residential streets the width of available carriageway (may be that within lines of parked cars on either side of the street) can be a factor in classification at level 2. However, in this case the level of traffic should allow any measurement to be carried out by a single auditor. Observation may also preclude measurement as it may be obvious that the road width is too narrow for two vehicles to pass.

Any identified crossings on Level 2 roads should be recorded although they will never be classified at higher than Level 2.

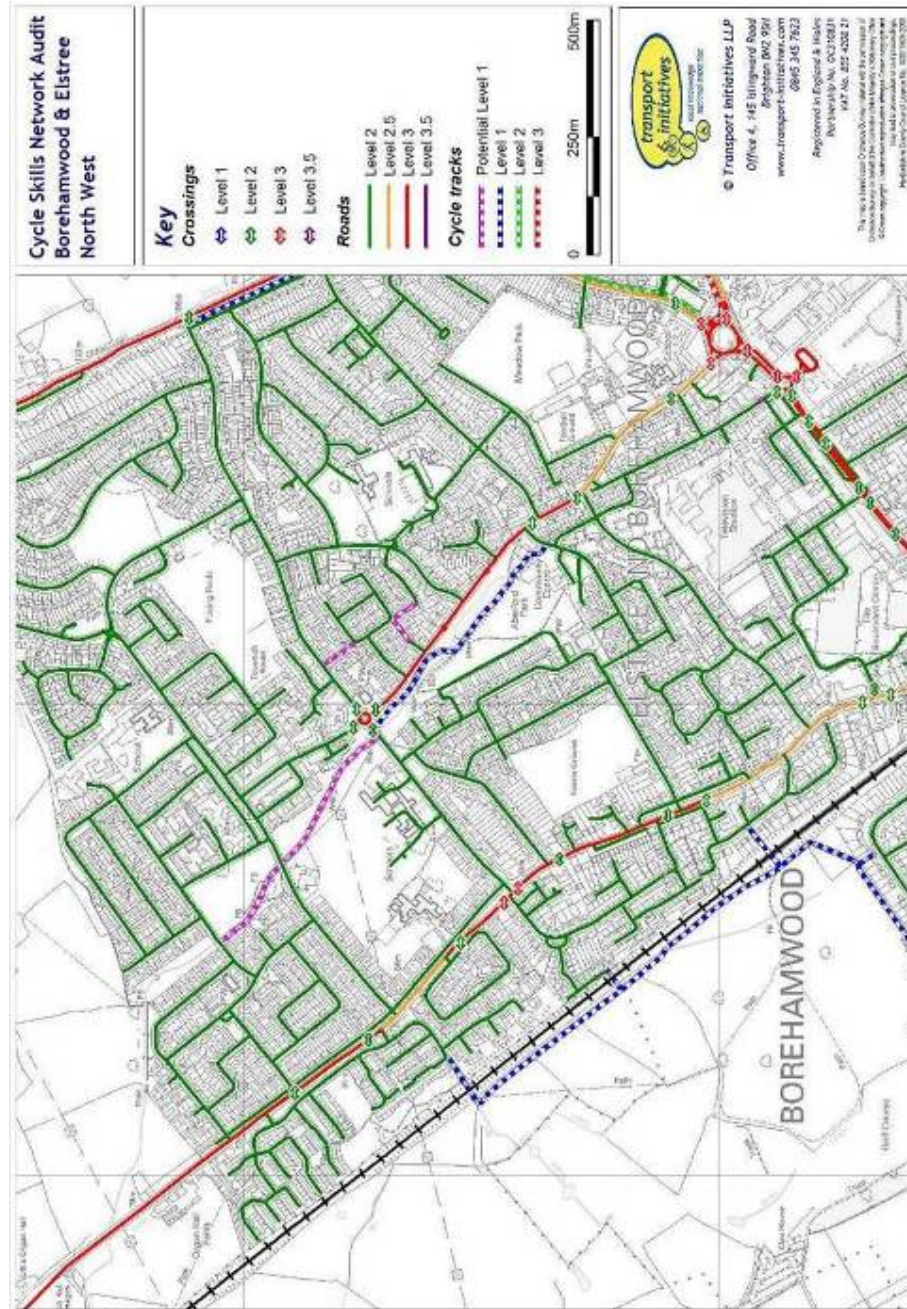
Appendix B

Large scale plans of CSNA - Borehamwood & Elstree

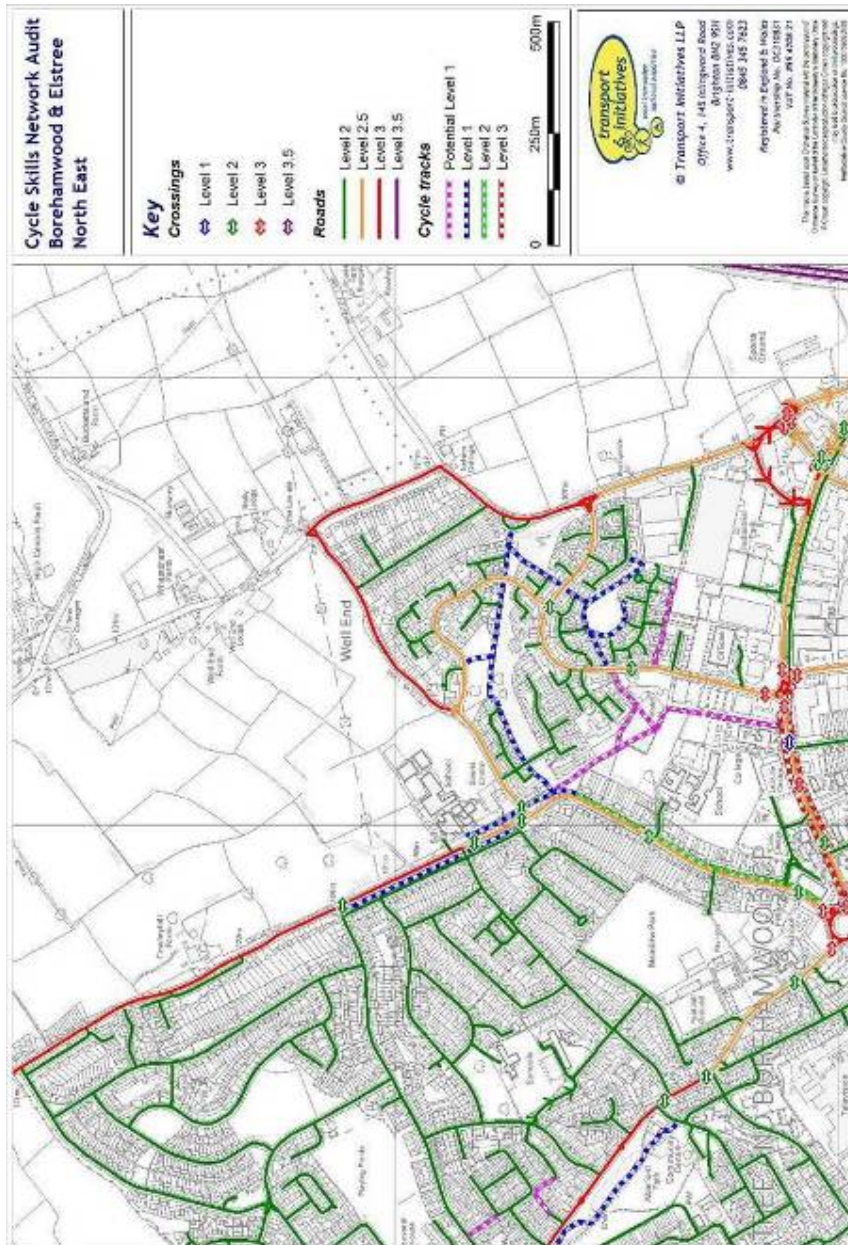


1. **Borehamwood – North West (approx. scale 1:10,000)**
2. **Borehamwood – North East (approx. scale 1:10,000)**
3. **Borehamwood – South West (approx. scale 1:10,000)**
4. **Borehamwood – South East (approx. scale 1:10,000)**
5. **Borehamwood town centre (Shenley Road) (approx. scale 1:4,000)**

6. ***Borehamwood – Elstree Way west (approx. scale 1:4,000)***
7. ***Borehamwood – Elstree Way east (approx. scale 1:4,000)***
8. ***Elstree village (approx. scale 1:5,000)***



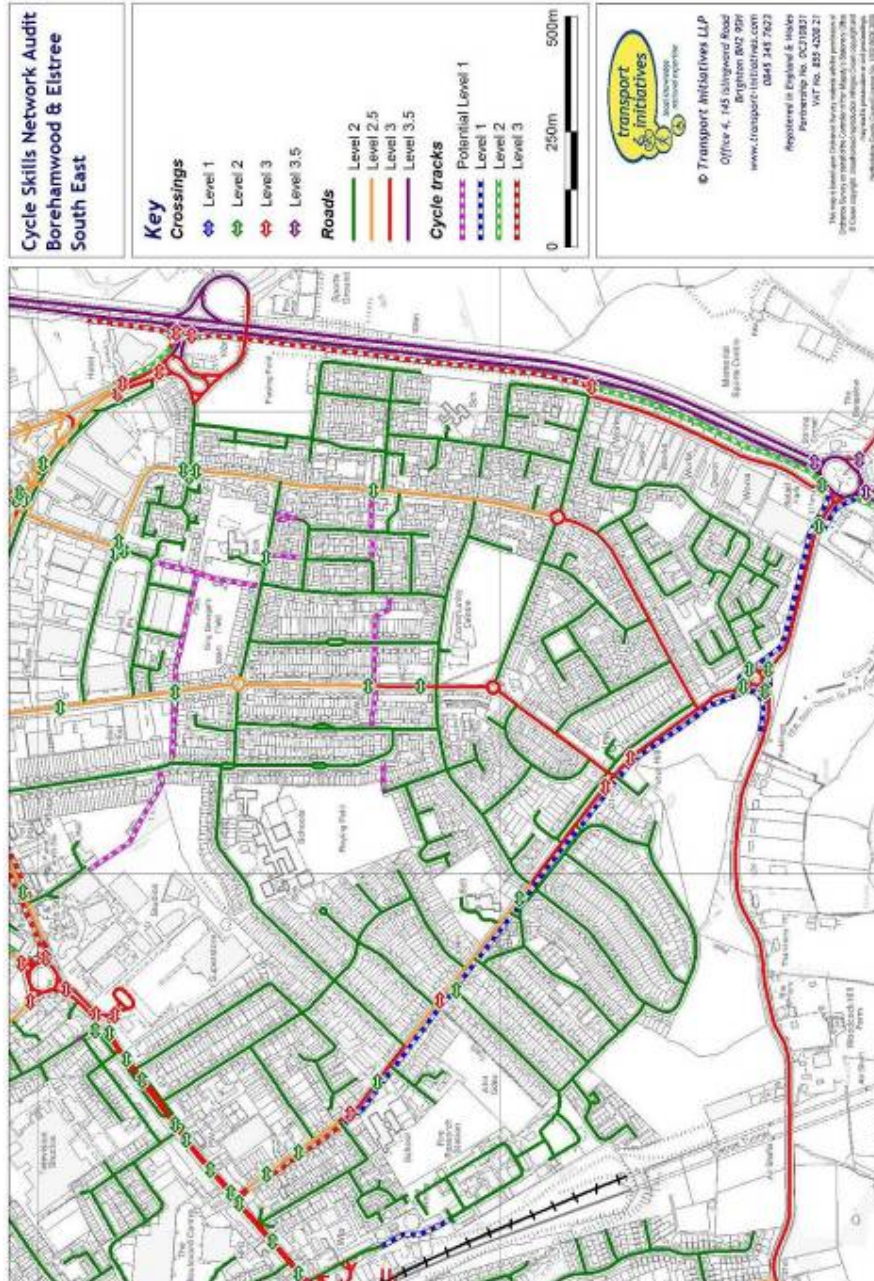
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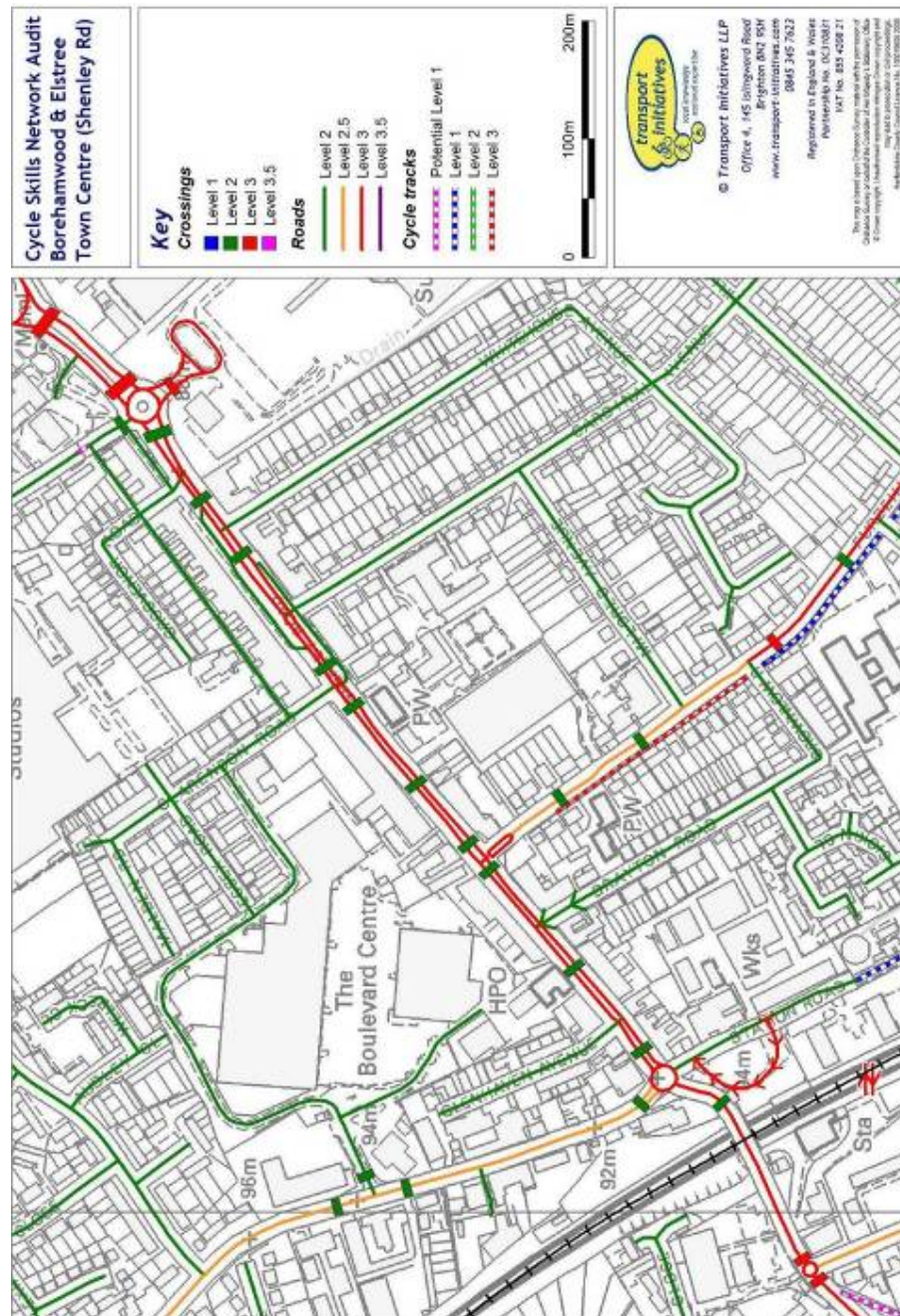
2. *Borehamwood – North East*



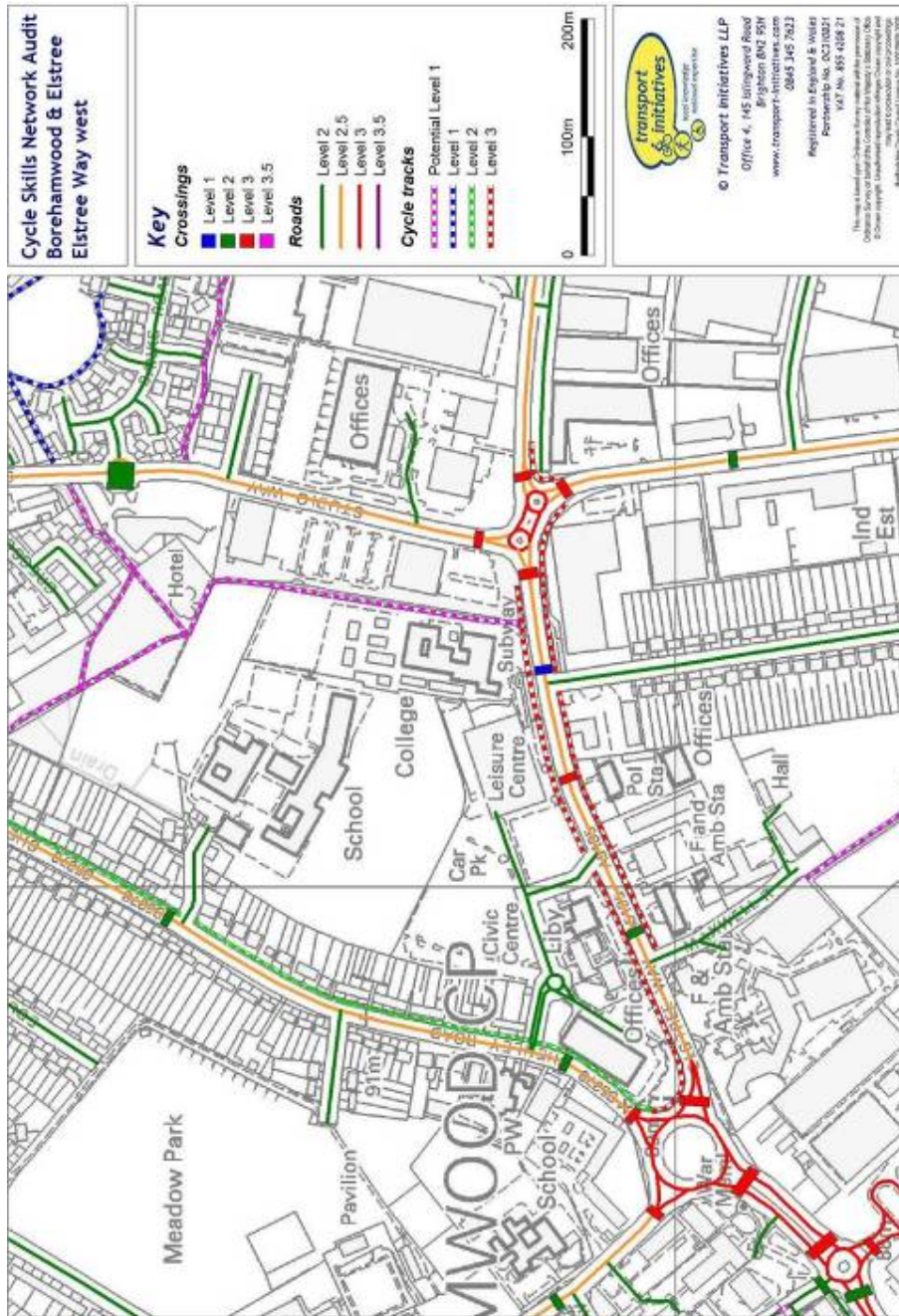
3. Borehamwood – South West



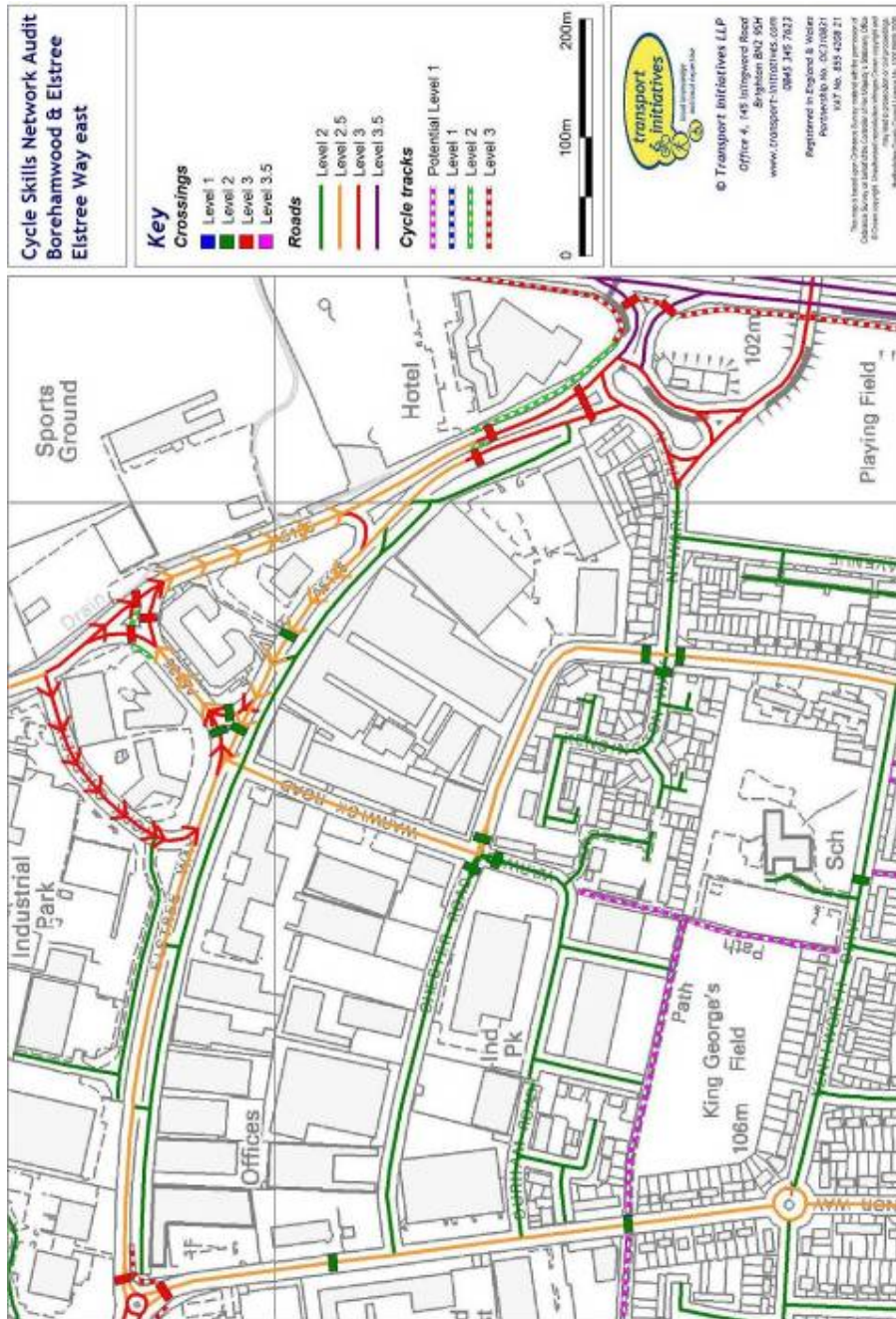
4. *Borehamwood – South East*



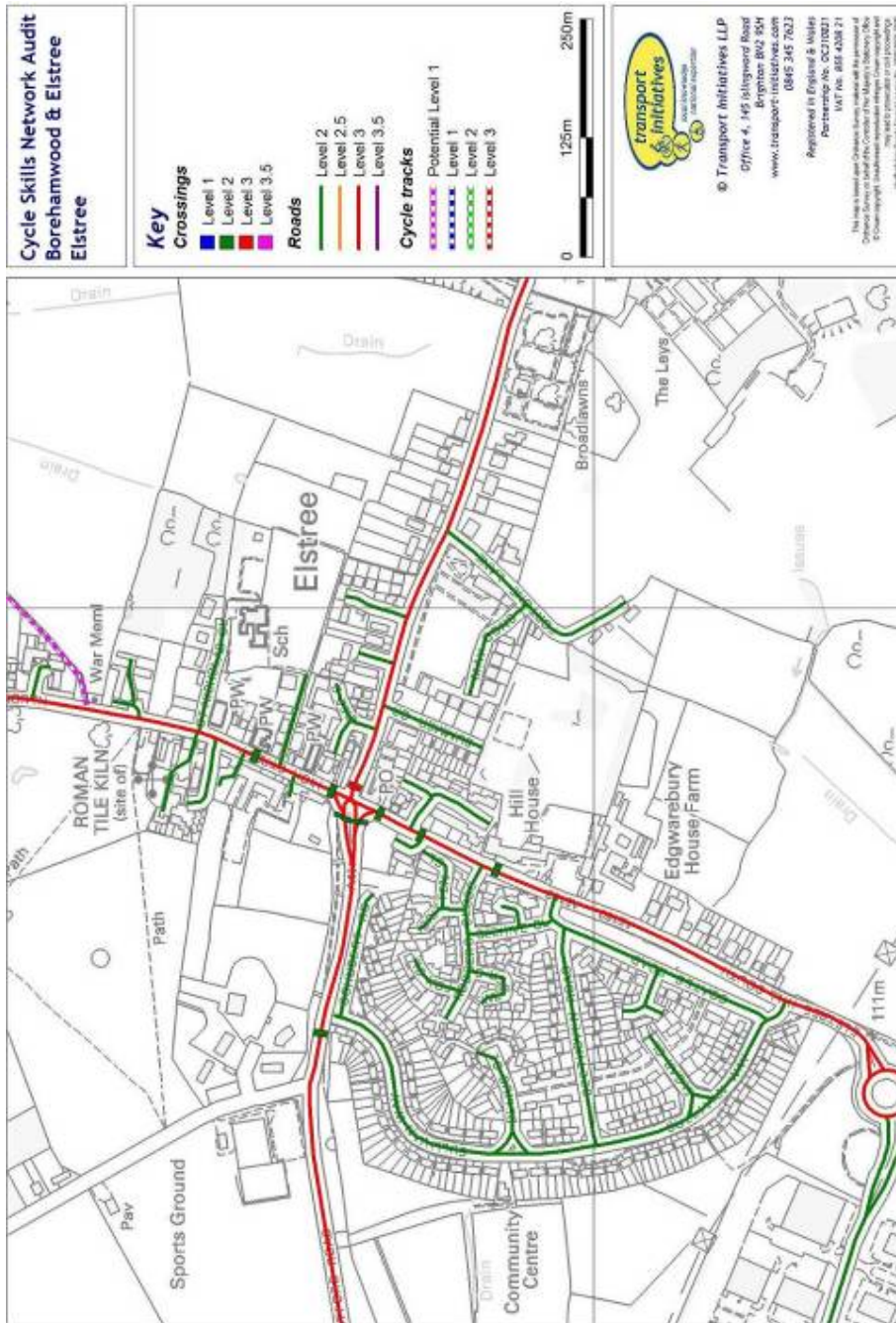
5. *Borehamwood – town centre (Shenley Road)*



6. Borehamwood – Elstree Way west



7. Borehamwood – Elstree Way east



8. Elstree village