Appendix D: Proposed Scheme Proformas

DISCLAIMER: The scheme proformas included within the UTP are intended to provide an initial indication of the scale and form of potential measures that could be implemented in the future. All schemes intended to be taken forward will be subject to further more detailed investigations prior to implementation. There is potential that not all of the schemes will be taken forward, and those that are taken forward may eventually vary in scale and form to those outlined in the UTP. Schemes which are to be taken forward for further development will be subject to public consultation prior to being included in the County Council's forward programme of works, and implementation.

Scheme Name	**Centennial Park Accessibility** Public Transport, Cycling, Walking	
Scheme Reference	01	
Problem References	PT01	Centennial Way bus facilities
	CY08	Elstree-Edgware cycle route - under-used A41 crossing
	WA02	Centennial Way-Waterfront/Lismirrane Industrial Estates sustainable link
Links to other UTP schemes:		02, 03, 21

Context

Figure 1 – Scheme Location Map

Centennial Park is an established, privately owned, business park located to the south of Elstree and in close proximity to the A41/M1 corridor and with the A1 and M25 within easy reach. Hertsmere Borough Council Revised Core Strategy identifies Centennial Park as a location where development is supported to *"…attract commercial investment, maintain economic competitiveness and provide employment opportunities for the local community"* (Policy CS8). The park has grown to include over 750,000 sq ft of mixed use space. Centennial Park is vehicle dominated with extensive parking within the marked car park areas and also on Centennial Way.

Centennial Park is accessed via Elstree Hill South (A5183) and is directly served by bus route 615 with three stops located in the park – one on the north-eastern footway and two on the southern footway. The 615 serves Hatfield, Borehamwood, Elstree and Stanmore. Service 107 is available on Elstree Hill South and this runs from Edgware to Barnet via Borehamwood. The bus stops within Centennial Park are not marked and access to these is

restricted by the presence of parking (see **Figure 2**).

Waterside Park is a privately owned industrial park located on Elstree Road, close to the junction with the A41/M1 corridor. Waterside Park is served by a number of bus routes on Elstree Road, including services 306 and 951 towards Watford.

The A41 passes to the south of the Centennial Park development and provides links to the M1 and M25.

Cycle facilities are limited in the vicinity of Centennial Park with some shared use / segregated use off-carriageway facilities provided to the south of the Park. Pedestrian facilities at the A41 roundabout are uncontrolled and poorly maintained. Similarly, uncontrolled crossings are the sole method for crossing the roundabout at Elstree Hill South / Centennial Park.

The southern side of the A41 Western Avenue has an existing shared use facility along its length which continues alongside the A41 on the eastern side of the roundabout but no facility exists on the A5183 Brockley Hill. Shared use footways extend from the A41 up to Centennial Park and then cease at the junction with Elstree Hill South.

Figure 2 – Centennial Park bus stop and parking

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
1.1	Centennial Park-Waterside Park sustainable link	Establishing a link between the two industrial parks would improve access for both areas, especially for pedestrians, cyclists and public transport users. Opening up the link between these two parks would improve access to bus services and improve links for pedestrians and cyclists for both parks – see **Figure 5** for details of the area. The link would cater for non-motorised transport and serve as a shared use, pedestrian and cycle route. The facility could be fully shared use or segregated as per requirements but would have to be of adequate width to cater for all users. It is recognised that current land ownership is private and that the aspiration to improve the poor linkages between the sites should be taken forward when development opportunities arise. Deliverability – more than 2 years **COMPLEX**	**£40,000-£50,000**
1.2	Elstree Hill South/A41 Watford Bypass/Brockley Hill roundabout cycle crossing improvements	This measure would provide improved pedestrian and cycle crossing facilities at the A41/A5 roundabout. Crossing the western arm of the junction (A41 Western Avenue) is currently difficult with no formal controlled crossing point. It is recommended that stand-alone Toucan crossings are provided on this arm to aid the north-south movement from Elstree across the A41. The footways to the north and south of the A41 Western Avenue need to be improved as current surfacing is uneven and not comfortable for cyclists or pedestrians. An assessment for the use of a pedestrian crossing on the western arm of the roundabout would be required as per LTN 1/95. This considers location, highway characteristics, visibility, complexity, crossing traffic, vehicles and road accidents to indicate which form of crossing is appropriate. Feasibility advice will also need to be sought from HCC Signals Team to ensure correct provision at the roundabout. Due to the traffic speeds and volume of vehicles on approach to the roundabout from all directions, there may be a preference for any crossing facility	**£200,000 - £300,000**

		to be signal controlled. Where cyclists are proposed to use the route, a Toucan crossing is preferred, see **Figure 6**. Deliverability – 1 to 2 years **STANDARD**	
1.3	Convert Elstree Hill South/A41 Watford Bypass/Brockley Hill junction to signalised crossroads	Provide a fully signalised crossroads in place of the A41 / A5183 roundabout incorporating pedestrian and cycle crossings on all arms. This facility will enable pedestrians and cyclists to access all sides of the junction and reduce the notion that the A41 acts as a barrier to the movement of users to the north and south. A review of all cycle facilities in the area would be required to ensure that facilities can be joined up and no gaps in provision exist. Feasibility advice will also need to be sought from HCC Signals Team to ensure correct provision at the roundabout. Deliverability – more than 2 years **COMPLEX**	**£800,000 - £1M**
1.4	Improved cycle crossing facilities at Centennial Way access roundabout	The footways to the south of Centennial Park roundabout with Elstree Hill South are shared use on both the east and west sides. The crossing facilities at the Centennial Park roundabout are limited to the mouths of each of the junctions, with some confusing signs and difficulties with sightlines (see **Figure 3**). This measure would rationalise the signage at the crossing points, improve tactile paving layouts and ensure that sightlines are adequate for both road users and crossing users (see **Figure 7**).  *Figure 3 – crossing at Centennial Park roundabout*	**£5,000-£15,000**

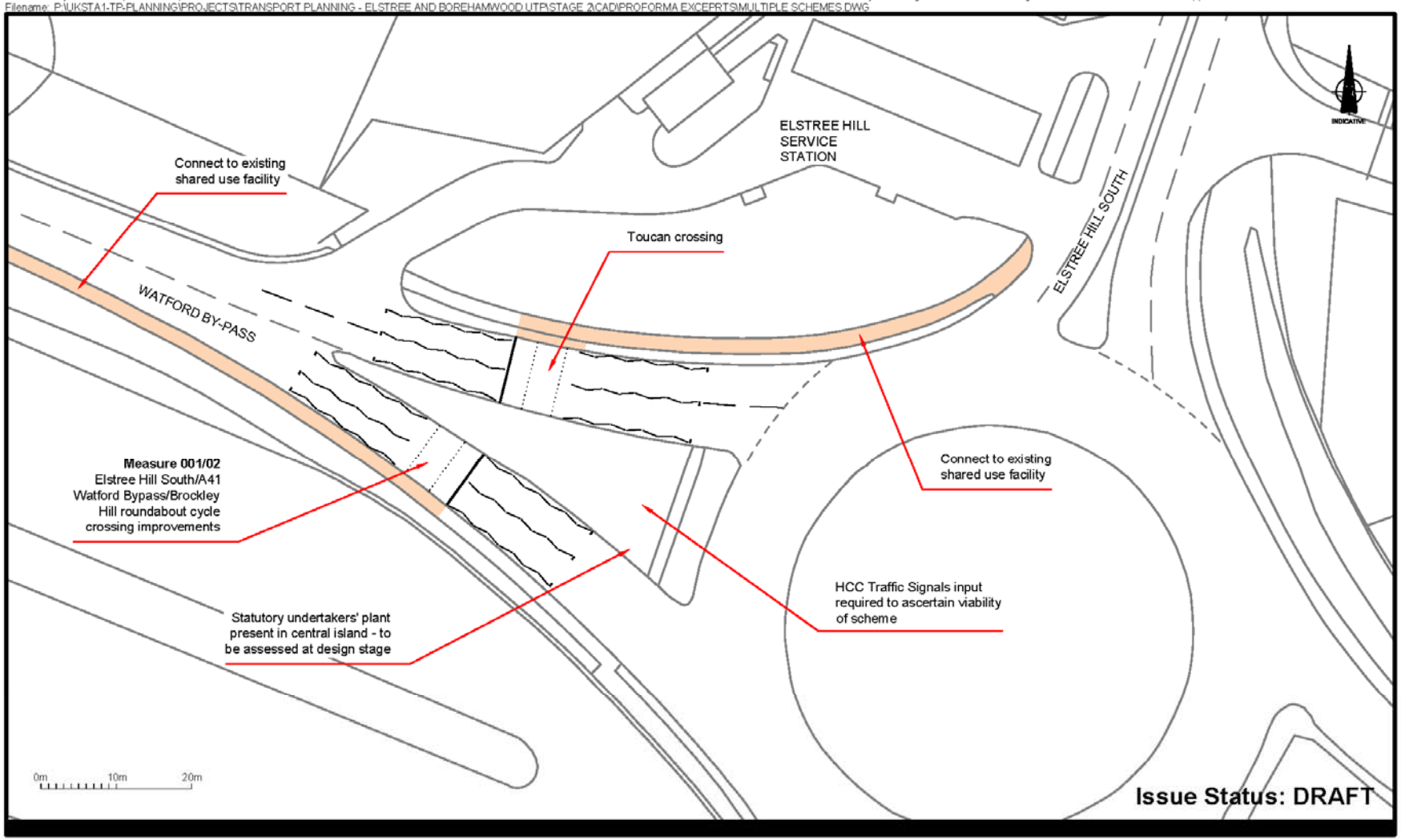
		Deliverability – less than 1 year SIMPLE	
1.5	Improve bus stop facilities within Centennial Park	Bus stops within Centennial Park are not readily accessible due to the presence of parked vehicles. Designation of the carriageway as bus stops would enable buses to stop at the defined location and for users to board buses without entering the carriageway. Some form of enforcement may be required to enable this to be a long term success. Bus stop shelters would improve facilities available for patrons and encourage others to use the facilities. Service information should be integrated into any improvements to the stops. The provision of enhanced facilities may attract users to utilise the available bus services as an alternative to car use. Current bus services are provided for under S106 funds and improvements should be encouraged to ensure provision of bus services is available and viable once funding has been withdrawn. An in-line bus stop with kerb build out could be used to discourage parking at the bus stop locations (see **Figure 4**).  *Figure 4 – Half width bus boarder example* Deliverability – less than 1 year SIMPLE	**£25,000 (per site)**
1.6	Improve/implement cycle provision on Elstree Hill South between Centennial Way and Sullivan Way junction	A shared use facility on the western side of Elstree Hill South between Sullivan Way and the roundabout would provide a link between Centennial Park and the Composers Estate. The footway width here is approximately 1.7m and this would need to be improved to provide a minimum 2.0m (the Roads in Hertfordshire Design	**£10,000-£20,000**

		Guidance states that 2.0m can be used as an absolute minimum and only over short distances where user flow is low – it is estimated that flows are low at this location). A footway build out may be viable at this location due to road narrowing being present in the form of existing line markings. This area could be utilised into a wider footway facility, shared by pedestrians and cyclists. See **Figure 7** for details. Deliverability – more than 2 years **STANDARD**	

Supporting Evidence of Measures/Components

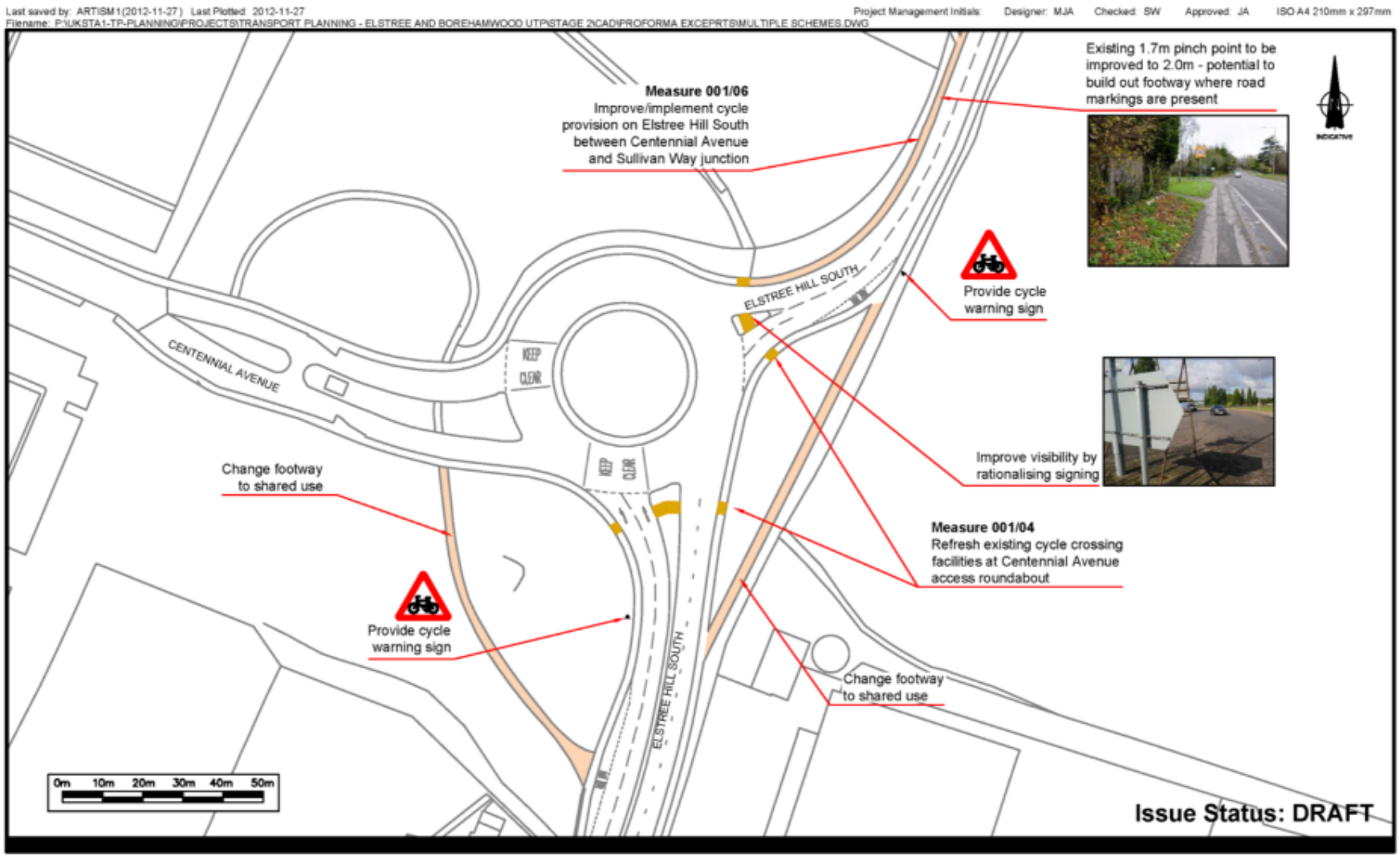
Figure 5 - Centennial Park - Waterside Park Link

Last saved by: ARTISM1(2012-11-27) Last Plotted: 2012-11-27
Filename: P:\UKSTA1-TP-PLANNING\PROJECTS\TRANSPORT PLANNING - ELSTREE AND BOREHAMWOOD UTP\STAGE 2\CAD\PROFORMA EXCERTS\MULTIPLE SCHEMES.DWG
Project Management Initials: Designer: MJA Checked: SW Approved: JA ISO A4 210mm x 297mm



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 6 - Toucan crossing on Watford By-pass



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 7 - Improvements to roundabout

Preferred Option
It is recommended that component measures 1.1, 1.2, 1.4, 1.5 and 1.6 are progressed to improve the cycle and public transport facilities in the vicinity of Centennial Park. As a major employment area it is important that sustainable connections are encouraged and the progression of these measures may facilitate this. It is recognised that there are land ownership issues within Centennial Park and any improvements should be taken forward where future opportunities arise. Measures 1.2 and 1.3 are considered to be a long term scheme that would require an extensive review of the operation of the roundabout. The benefit of providing signal controlled pedestrian and cycle facilities on all arms would need to be established through more detailed work.

Contribution to Objectives / Indicators	UTP Objectives	• Support economic growth and local housing development through the delivery of transport improvements • Improve transport connectivity between transport modes to allow for greater transport flexibility • Improve public transport provision and accessibility • Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
1.1	£40,000-£50,000	
1.2	£200,000 - £300,000	
1.4	£5,000 - £15,000	
1.5	£25,000 (per site)	
1.6	£10,000 - £20,000	
TOTAL COST FOR DELIVERY	**£280,000 - £410,000+**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for Traffic signals, footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	Land ownership within Centennial Park and Waterside Park (i.e. private landowners)

Other Information/Additional Notes:
Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Composer's Estate, Elstree - Sustainable Connections** Cycling	
Scheme Reference	02	
Problem References	CY12	Elstree north to south link
	HC03	AQMA Elstree Crossroads congestion
	HC04	Elstree Crossroads rat-run through Composers Estate
	PK11	Parking abuse around Elstree crossroads
	WA03	Pedestrians - Composers Estate-St Nicolas Primary School linkage
Links to other UTP schemes:		01, 03, 05

Context

Figure 1 – Scheme Location

The Composers Estate is a group of residential roads located to the immediate south-west of the centre of Elstree and forms the main residential area for Elstree. The estate was built in the 1930s and 1940s and has over 200 properties. Some properties have off-street parking but on-carriageway parking is an issue. Car ownership in Elstree (39.88% households have 2 or more cars) is close to the Hertfordshire average (40.35%) and above the England & Wales average (29.42%; 2001 Census).

Elstree Hill South forms the eastern perimeter to the estate, with vehicular access to the estate only via this road. Sullivan Road forms the vehicular and pedestrian access at the southern end of the estate, with access to the centre via Coates Road and Rodgers Close. Pedestrians can access the northern end of the estate via a Pelican crossing over Watford

Road into Schubert Road.

There is an existing issue of vehicles congestion on Elstree Hill South from the roundabout at Centennial Park towards the crossroads junction in Elstree. The Borehamwood and Elstree data report notes that between September 2009 and August 2010, the average speed northbound on Elstree Hill South was between 0 mph and 10 mph, suggesting that congestion is heavy at this location. The congestion can result in drivers attempting to bypass the queue by using Coates Road as a rat-run. This has a point of no entry at its southern end but vehicles have been reported to ignore this and travel north through this point. A decoy camera has been placed next to the no entry sign to deter potential disobedient motorists. The footway has been built out to 3.0m width to reduce the carriageway to a 3.3m southbound running lane.

There are currently no dedicated cycle facilities through the Composers Estate. It is recognised that the Composers Estate could provide a viable alternative for cyclists to the congested section of Elstree Hill South that is considered as a poor environment for cyclists. The 2007 UTP for Borehamwood and Elstree suggested that a route was proposed through the Composers Estate, linking with Watford Road and Aldenham Road. The 2009 Bikeability Audit notes that Elstree hill South and Watford Road are suitable for Level 3 cyclists only, with the Composers Estate classified as Level 2.

Figure 2 – Decoy camera at Coates Road

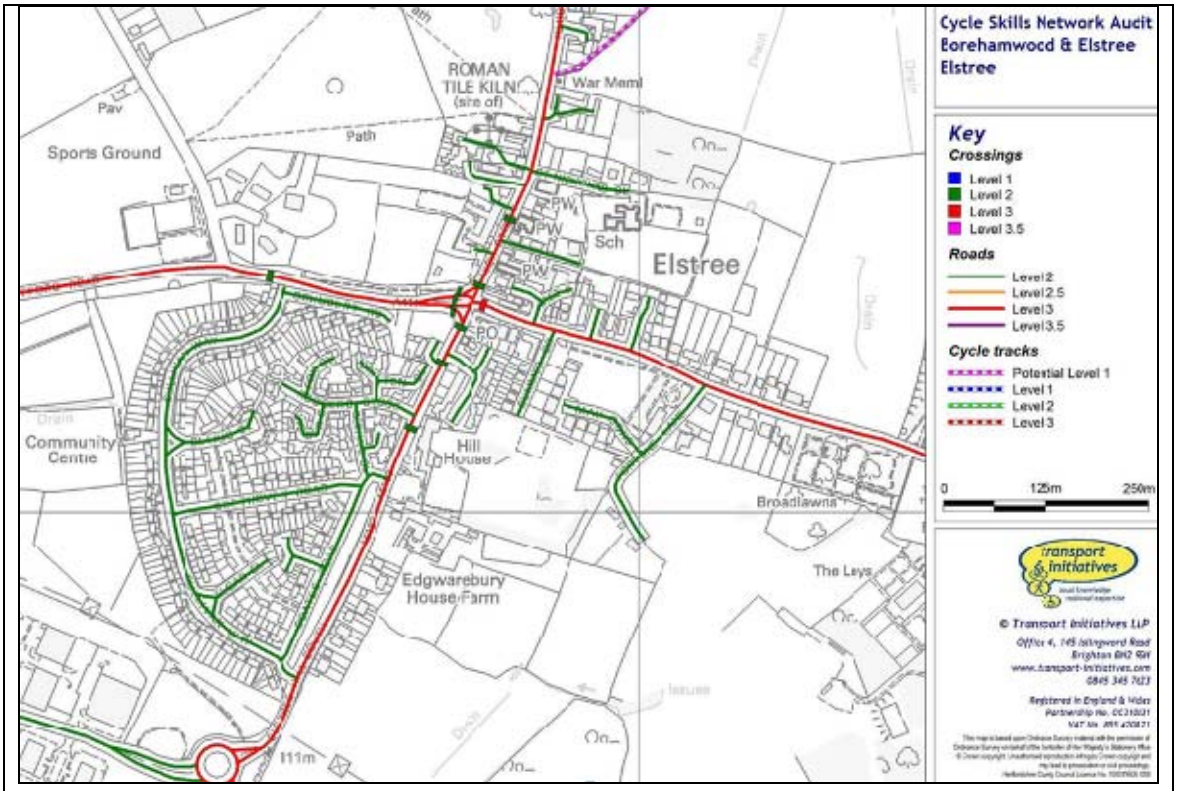


Figure 3 – Elstree Bikeability assessment

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
2.1	Cycle bypass route on Coates Road one-way section / in conjunction with one-way enforcement	Provision of a cycle bypass on Coates Road will enable cyclists to use Coates Road rather than Elstree Hill South in the northbound direction towards Elstree Crossroads (see **Figure 5**). This would provide a lower trafficked route than Elstree Hill South and may also enhance the point of no entry on Coates Road. Issues of rat-running northbound along Coates Road by vehicles have been countered by the deployment of a decoy camera and this should be monitored to check whether the No Entry is obeyed. Police enforcement may be required if the decoy is unsuccessful. Provision of No Waiting At Any Time restrictions (Double Yellow Lines) will protect cycle movements through the by-pass. Deliverability – less than 1 year SIMPLE	**£5,000-£8,000**

2.2	Convert Pelican crossing on Watford Road to Toucan standards	The change in designation of the pedestrian crossing on Watford Road from a Pelican to Toucan crossing would enable cyclists to access Aldenham Road from Composers Estate and vice-versa. The existing crossing is constrained by the presence of narrow footways and bus stop lay bys. It is proposed to relocate the crossing to the east of its existing alignment to enable better access from Sullivan Way and Aldenham Road (see **Figure 6**). The link to Aldenham Road will be undertaken Deliverability – 1 to 2 years STANDARD	**£80,000-£100,000**
2.3	On-road cycle route on Sullivan Way with access in vicinity of Schubert Way/Watford Road and Elstree Hill South junctions	A signed cycle route through the Composers Estate via Sullivan Way would provide cyclists with an alternative to Elstree Hill South. The route would be administered by the provision of road markings and signage, specifically the use of 1057 logos (see **Figure 4**) and cycling signs. Sullivan Road is unclassified and the provision of signing and markings should be the relevant treatment for the type of road. Deliverability – less than 1 year SIMPLE	**£2,000-£5,000**

Supporting Evidence of Measures/Components

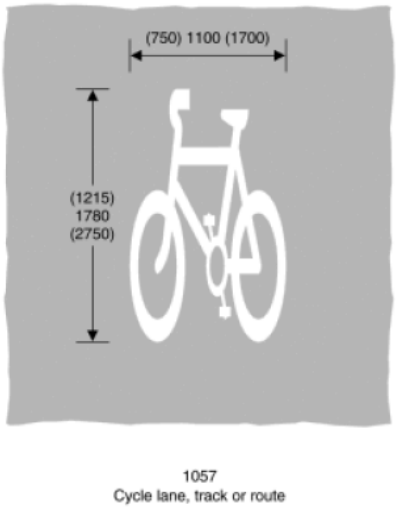
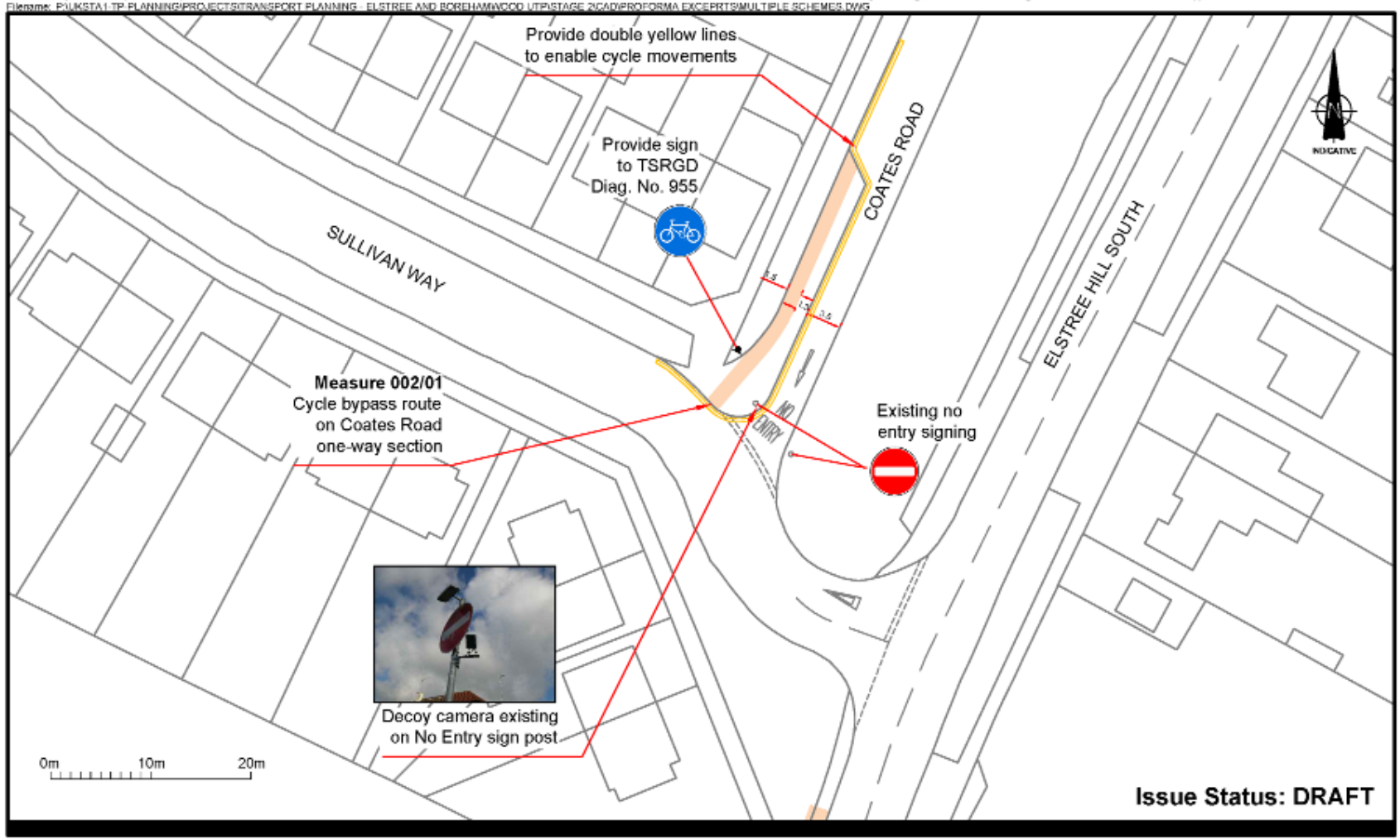


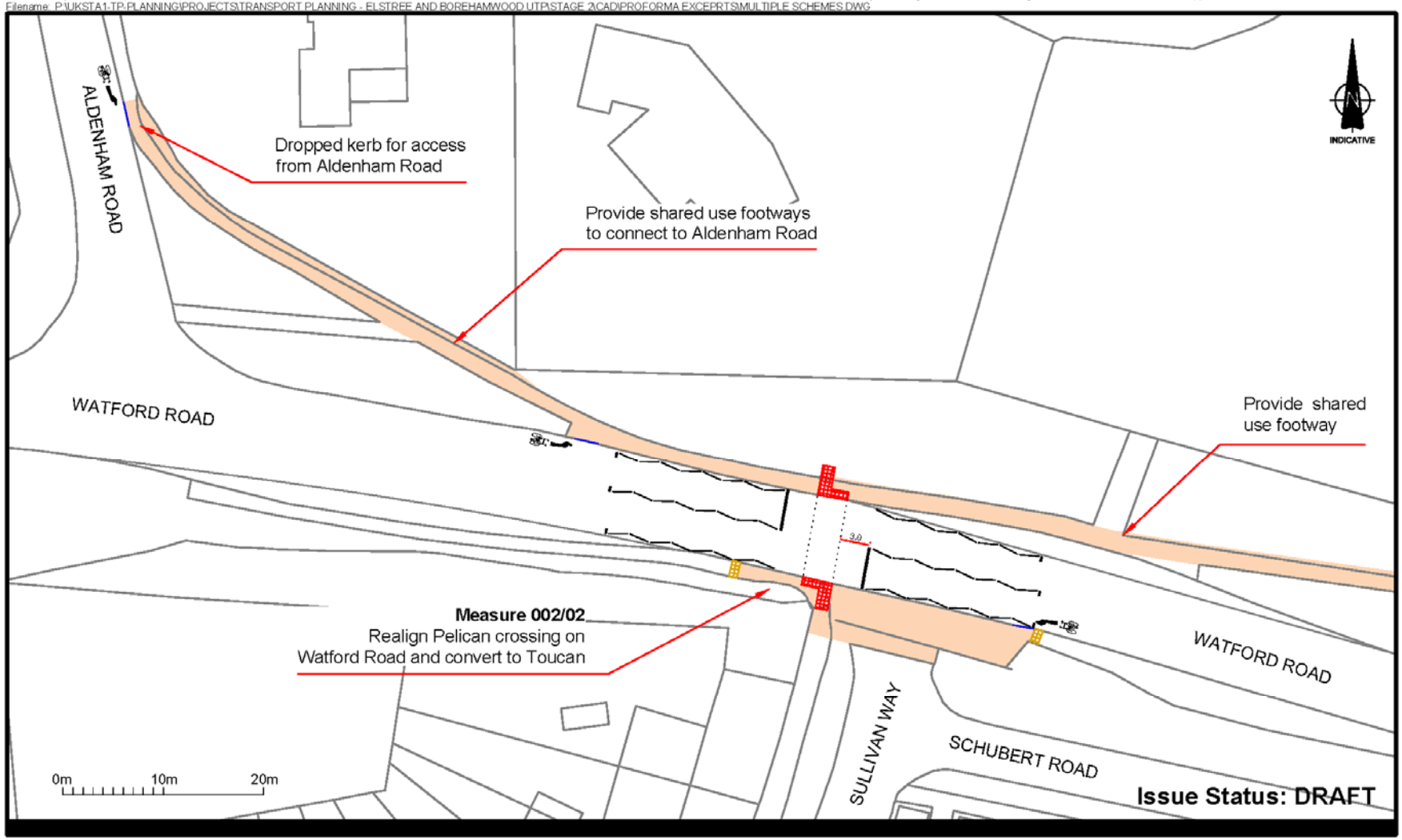
***Figure** 4 – TSRGD Diagram number 1057*



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 5 - Cycle By-pass on Coates Road

Last saved by: ARTISM1 (2012-11-27) Last Plotted: 2012-11-27
Filename: P:\UKSTA1-TP-PLANNING\PROJECTS\TRANSPORT PLANNING - ELSTREE AND BOREHAMWOOD UTP\STAGE 2\CAD\PROFORMA EXCERPTS\MULTIPLE SCHEMES.DWG
Project Management Initials: Designer: MJA Checked: SW Approved: JA ISO A4 210mm x 297mm



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 6 - Toucan crossing on Watford Road

Preferred Option
It is recommended to progress all measures to improve the permeability of the Composers Estate. Component measures 2.1 and 2.3 should be considered to provide an alternative to Elstree Hill South and Measure 2.2 will improve the connectivity between the Composers Estate and Watford Road / Aldenham Road.

Contribution to Objectives / Indicators	UTP Objectives	• Improve transport connectivity between transport modes to allow for greater transport flexibility • Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
2.1	£5,000-£8,000	
2.2	£80,000-£100,000	
2.3	£2,000-£5,000	
TOTAL COST FOR DELIVERY	**£87,000 - £113,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for Traffic signals, footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	Narrow footways may prohibit location of crossing on current alignment. Elstree Crossroads scheme may impact on delivery.

Other Information/Additional Notes:
Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	Elstree Crossroads Junction Improvements **(HCC committed scheme)** Highways and Congestion	
Scheme Reference	03	
Problem References	HC03	AQMA Elstree Crossroads congestion
	HC04	Elstree Crossroads rat-run through Composers estate
Links to other UTP schemes:		02, 05, 21

Context

Figure 1 – Scheme Location

Elstree Crossroads is located in Elstree, approximately 1 mile to the west of Borehamwood. The crossroads is formed by the A5183 Elstree Hill North/Watling Street, A411 Barnet Lane (east), the A5183 Elstree Hill South/Watling Street, and the A411 Watford Road. The current layout is shown in Figure 2 below.

Figure 2 - Elstree Crossroads

The junction is in a built-up village location however it forms an important node where east-west and north-south inter-urban routes intersect. This contributes towards heavy traffic flows throughout the day. Extensive queuing and congestion is commonplace on all arms and is especially severe during peak periods. Additionally, an Air Quality Management Area (AQMA) has been placed on the A5183 High Street, Elstree due to poor air quality associated with the extensive queuing in the area. Furthermore, there are a number of HGV movement restrictions in the area of Elstree Crossroads. The Borehamwood and Elstree Urban Transport Plan, (UTP) 2007 identified the Crossroads as a key issue that needed to be addressed.

The presence of buildings in close proximity to the highway, especially on the eastern side of the junction, restricts the scale and form of interventions that could be implemented to improve the junction. Increasing capacity to a sufficient degree that could allow more traffic through the junction and reduce queues is therefore limited and so a combination of small-scale capacity increases and traffic management must be considered.

As part of the existing layout, there is a banned right turn into Watford Road from A5183 Elstree Hill North except for buses. There are existing weight restriction signs (7.5 tonnes except for loading) on the A411 Barnet Lane East approach. Watford Road currently has two lanes on the approach to the junction with a splitter island between them. There is a central refuge on the Barnet Lane approach and apparatus located on the western side of A5183 Elstree Hill.

A public consultation exercise was undertaken by the County Council from 14th February 2012 to 30th March 2012 on a scheme and a preferred scheme (Option 4) is to be taken forward. This scheme incorporates a number of revisions to the layout of the junction, including widening the northbound approach to create more space for straight-ahead traffic to pass traffic which is turning right into Barnet Lane. The scheme will include technology to detect and prioritise the movement of buses should be incorporated within the proposed scheme.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
3.1	Elstree Crossroads *HCC committed scheme*	A scheme to improve the Elstree Crossroads has been agreed for implementation during 2013/14 (see **Figure 5**) Deliverability within 2 years **COMPLEX**	**£820,000**

Supporting Evidence of Measures/Components

Figure 3 - Elstree Crossroads - Elstree Hill South approach, queuing cars

Figure 4 – Elstree Crossroads - Elstree Hill North approach, queuing cars

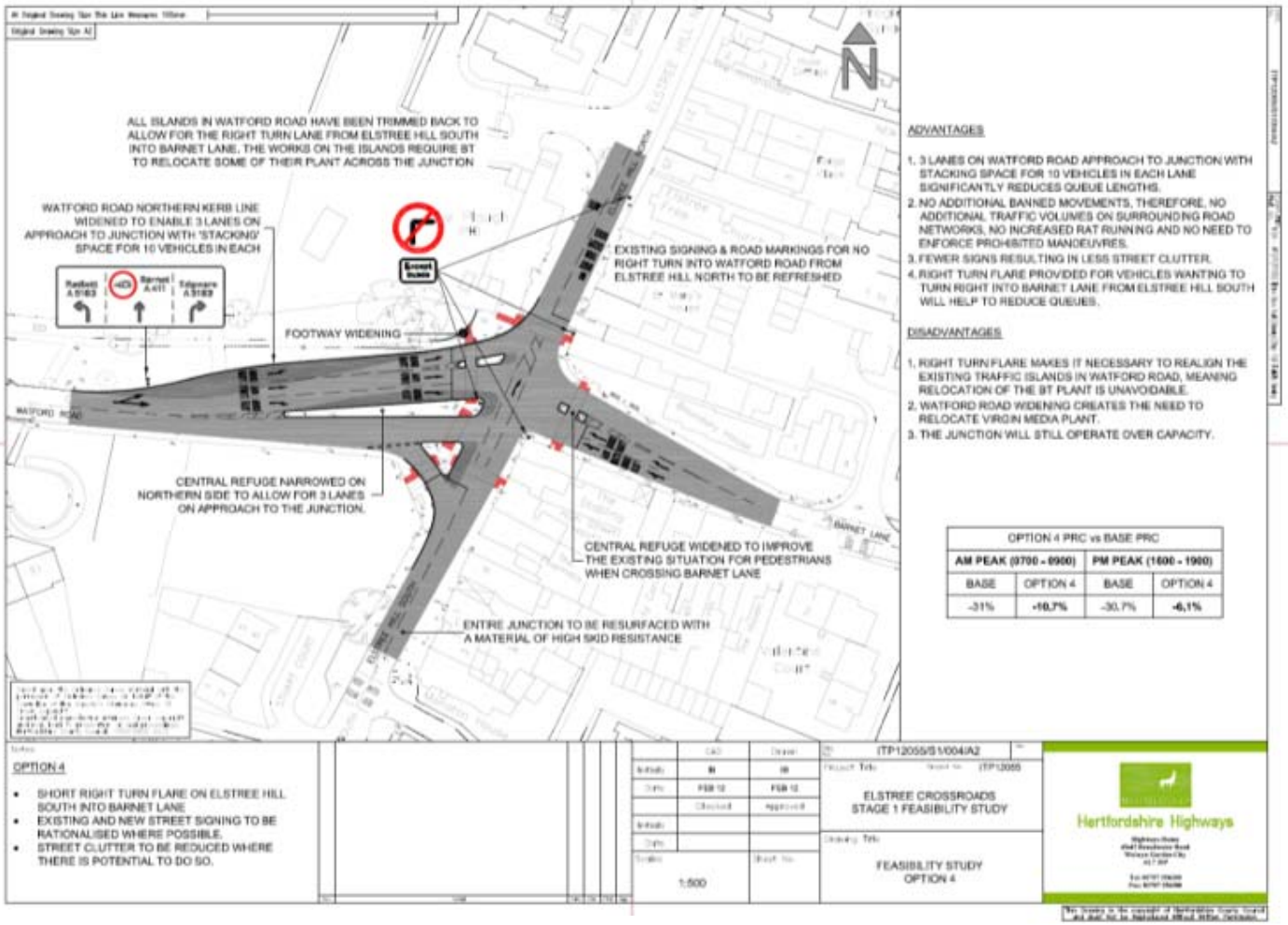


Figure 5 – Elstree Crossroads, – preferred scheme option in development

Preferred Option
The proposed scheme was consulted upon in February/March 2012. A preferred scheme option (4) has been agreed by HCC and works to implement the scheme could commence during 2013. It is considered that this scheme provides the most significant benefit in improving capacity/reducing congestion, incorporating enhancements to pedestrian crossing facilities and parking restrictions to improve the flow of traffic.

Contribution to Objectives / Indicators	UTP Objectives	• Support economic growth and local housing development through the delivery of transport improvements • Reduce congestion at key traffic hotspots throughout the study area.

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
3.1	£820,000	
TOTAL COST FOR DELIVERY	**£820,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for Traffic signals, footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	*As considered by HCC as part of scheme development*

Other Information/Additional Notes:

Aerial photography has been sourced from ArcGIS Online. Sources**:** ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Scheme Name	**Safer Routes to Schools** Accessibility	
Scheme Reference	04	
Problem References	HC06	High Dependency for inter-town trips
	CY24	Cowley Hill / Hertswood School
	WA07	Shenley Road Roundabouts by HBC offices and Tesco – pedestrian crossing impediment
	WA10	Hertswood School Thrift Farm Lane
Links to other UTP schemes:		07, 08, 09, 10, 20, 21

Context

There are thirteen state schools within or in close proximity to Borehamwood and Elstree and four independent/private schools within the area. ***Figure 1*** shows the location of these schools.

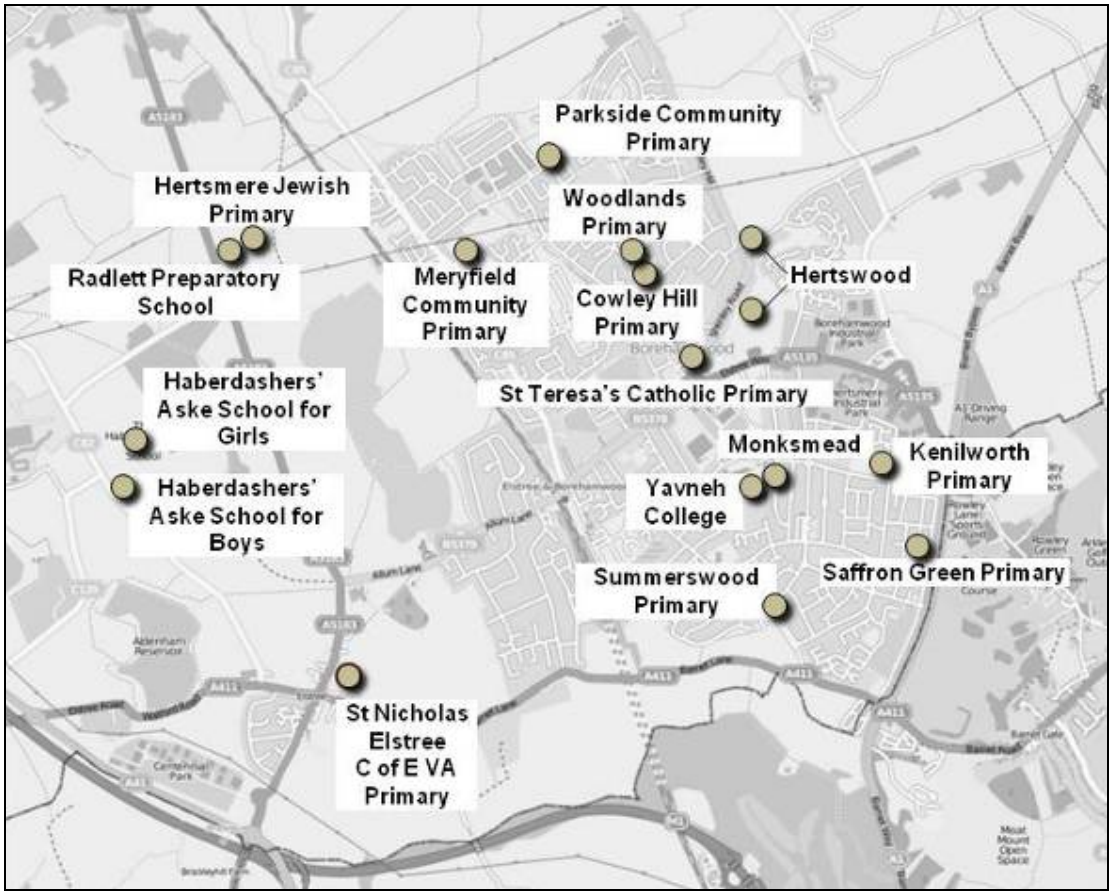


Figure 1 –Location of schools in UTP area (Aldenham School is off plan)

School Travel Plans

A School Travel Plan is a document produced by the school community and any other interested parties in conjunction with Hertfordshire County Council and evaluates the mode of transport students, staff and visitors use to travel to and from a school. The document could also identify current issues and concerns regarding student, staff and visitor journeys to and from a school. After establishing known issues of concern, the School Travel Plan should describe the aims, objectives and targets with which to address issues and promote safety and healthier journeys by encouraging alternative methods of travel to the car such as walking and cycling.

All thirteen state schools in the Borehamwood and Elstree area have a School Travel Plan in place, however some of these are dated and may not acknowledge more recent issues.

Of the four independent/private schools in the area, only Radlett Preparatory School currently has a School Travel Plan in place. The remaining three independent/private schools are in more remote areas between the A5183 and M1/A41 corridors to the west of Borehamwood.

Table 1 lists the local schools and the status of School Travel Plans.

Table 1 – School Travel Plans and 'Safer Routes to Schools' in Schools in and around Borehamwood and Elstree

Name of School	School Travel Plan?	Date of Plan	Reviewed / Up-dated
Cowley Hill Primary	Yes	March '09	July '10
Hertsmere Jewish Primary	Yes	March '07	Dec '11
Hertswood School (Secondary)	Yes	Jan '06	March '10
Kenilworth Primary	Yes	Feb '06	July '10 & Nov '12
Meryfield Community Primary	Yes	Jan '07	-
Monksmead (Primary)	Yes	March '05	Dec '06
Parkside Community Primary	Yes	Sept '01	May '11 & Oct '12
Radlett Preparatory School	Yes	July '10	Dec '11
Saffron Green Primary	Yes	March '06	July '07 & June '10
St Nicolas Elstree CofE Primary	Yes	May '02	Feb '10
St Teresa's Catholic Primary	Yes	March '10	-
Summerswood Primary	Yes	May '09	April '11
Woodlands Primary	Yes	March '04	2007
Yavneh College (Secondary)	Yes	March '08	June '10, & March '12
Aldenham School (Private)	No	N/A	N/A
Haberdasher's Aske School for Boys	No	N/A	N/A
Haberdasher's Aske School for Girls	No	N/A	N/A

The table shows that a number of school travel plans are more than 5 years old and it would be appropriate to review and update these plans to ensure they reflect current issues and set appropriate targets on this basis.

Existing mode share for journeys to/from local schools

Figures 2 and **3** below shows the mode share for the state schools in the area from the 2010 School Census.

Figure 2 (source 2010 DCSF School Census)

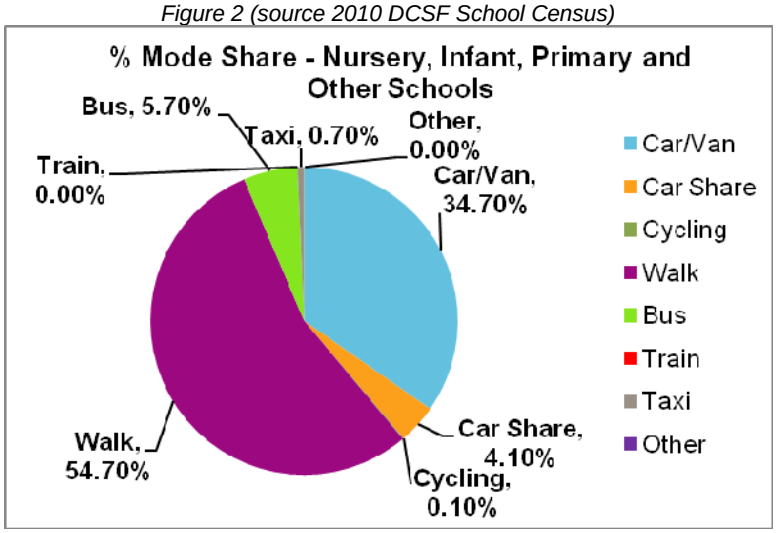


Figure 2 indicates that in 2010 a large share of students, staff and visitors walked to school. This is unsurprising given the fact that Primary School catchment areas tend to be smaller. However, travel by car also makes up a large mode share, although some of this will include members of staff who are less likely to live in the local area. Cycling makes up a very small proportion at 0.1%, however given the relatively short distances students in particular may need to travel, cycling may not be regarded as necessary or attractive.

Figure 3 (source 2010 DCSF School Census)

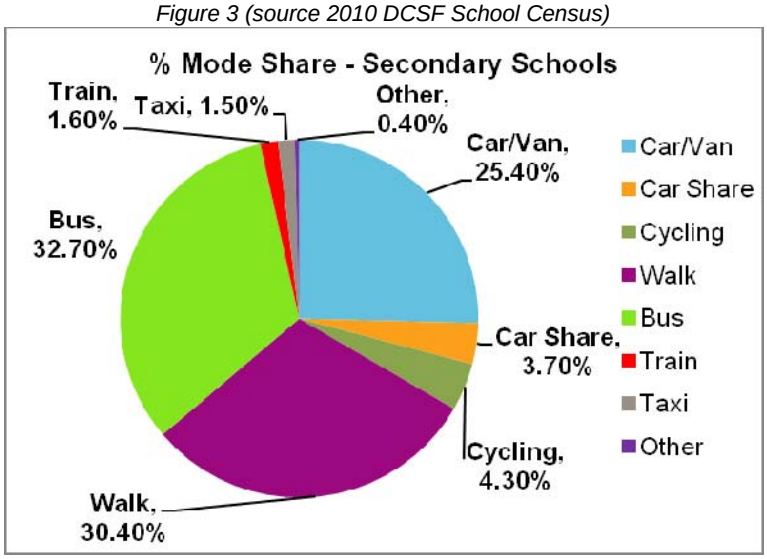


Figure 3 indicates that in 2010, bus, walking/cycling and car were equally popular. The use of the bus gives a clear indication that students, staff and visitors need to travel from further

afield. There are two secondary schools within Borehamwood with no secondary school in Elstree. The two secondary schools will have much larger catchment areas than individual primary schools, potentially covering the whole of the UTP area therefore walking may be less viable as a mode of transport for many.

From these results, it is shown that the car is popular for travel to and from Primary and Secondary schools, and cycling represents a very small proportion. There is potential that cycling could in some circumstances be a viable and attractive alternative to the car for some students, staff and visitors.

HCC's Cycle Strategy indicates that there is strong evidence that if children do not cycle, they are unlikely to take up cycling in adulthood and that children should therefore be a main focus of cycle promotion and encouragement to use their bicycles throughout the county. The Strategy indicates that currently the peak age for boys cycling is around the age of 15 and for girls around the age of 13. Boys (in particular the age group 11-17) make the most journeys per year with around 3% of journeys by cycle whilst girls only make 1% of their journeys by bicycle.

Children's journeys by cycle are mostly for leisure purposes (e.g. visiting friends) which account for over half of their cycle journeys. Journeys to school only account for around 15% of children's journeys, although the data for schools in the UTP area suggest a much lower percentage.

Increased cycling could play a significant role in reducing problems associated with the 'school run', specifically traffic congestion. In addition to reducing peak hour congestion during school term time, the Strategy indicates that measures to encourage cycling can also provide independence that assists a child's personal development and provides exercise to combat obesity and poor health.

Safer Routes to Schools

HCC's Safer Routes to Schools project aims to reduce reliance on the car for the journeys to and from school by promoting the use of sustainable alternatives such as walking, cycling, public transport and a better use of the car through car sharing. This can be achieved by using a mix of engineering and educational means as appropriate. The objective is to reduce child collision casualties, improve the environment around the schools and promote, to both pupils and parents, the health benefits of walking and cycling.

A package of measures such as training in road safety skills for cyclists and pedestrians, initiatives such as walking buses, incentives and promotional activities, curriculum work, highway improvements and the provision of facilities such as cycle parking and waiting shelters could be considered to improve journeys to school.

Each year the Safer Routes to School target group selects a number of schools to take part in a Safer Routes to School Project. Schools are chosen based on a ranking list which assesses various criteria such as whether they have a School Travel Plan, the collision profile, pupils' current mode of travel etc. Schools are also clustered in order to maximise the effectiveness of measures.

The ranking lists are run and analysed annually, from which schemes and initiatives are selected. The aim is to ensure that all schools have a current School Travel Plan, and therefore, prioritisation is primarily based on the willingness of the school to be part of the

programme.

Schools in the area have previously been included in the Safer Routes to School programme

Safer Routes to School should be promoted in the UTP area and be run in conjunction with the implementation of improvements to the cycle network and pedestrian/cycle environment at key junctions (see **Schemes 02, 03, 06, 08, 10, 18, 20, 21 and 22**). Delivery of these schemes should help to promote walking and cycling in preference to the car for journey to school, if pupils' and parents' concerns regarding safety on the roads, or the perception of particular problems which may pose a risk to safety is addressed by improvements proposed.

Bikeability

Bikeability was launched by the Department for Transport through Cycling England in 2007 as cycling proficiency for the 21st century. The scheme is underpinned by a National Standard for cycle training, which clearly defines the outcomes trainees must demonstrate before passing the course.

Bikeability comprise of three levels:

- Level 1 teaches trainees basic bicycle control skills in an off-road environment;
- Level 2 is delivered on road, where trainees learn the basics of on road cycling; and
- Level 3 teaches trainees advanced on road cycling skills.

The majority of training is delivered to Year 5 and 6 primary school pupils (children aged 9-11). There is currently a much lower volume of training delivered to children in Year 7, the first year of secondary school.

DfT has provided funding for Bikeability child training places since the introduction of the scheme and this funding can be accessed by local authorities.

School Journey Planning

HCC operate a useful web-based resource which provides information to allow pupils and parents to plan journeys on foot to school or college. The tool includes an option to plan journeys by bike and offers 'quiet, balanced, advanced' routes. This can be used as part of the 'route planning' either by parents or by the pupils at Bikeability level where route planning is included.

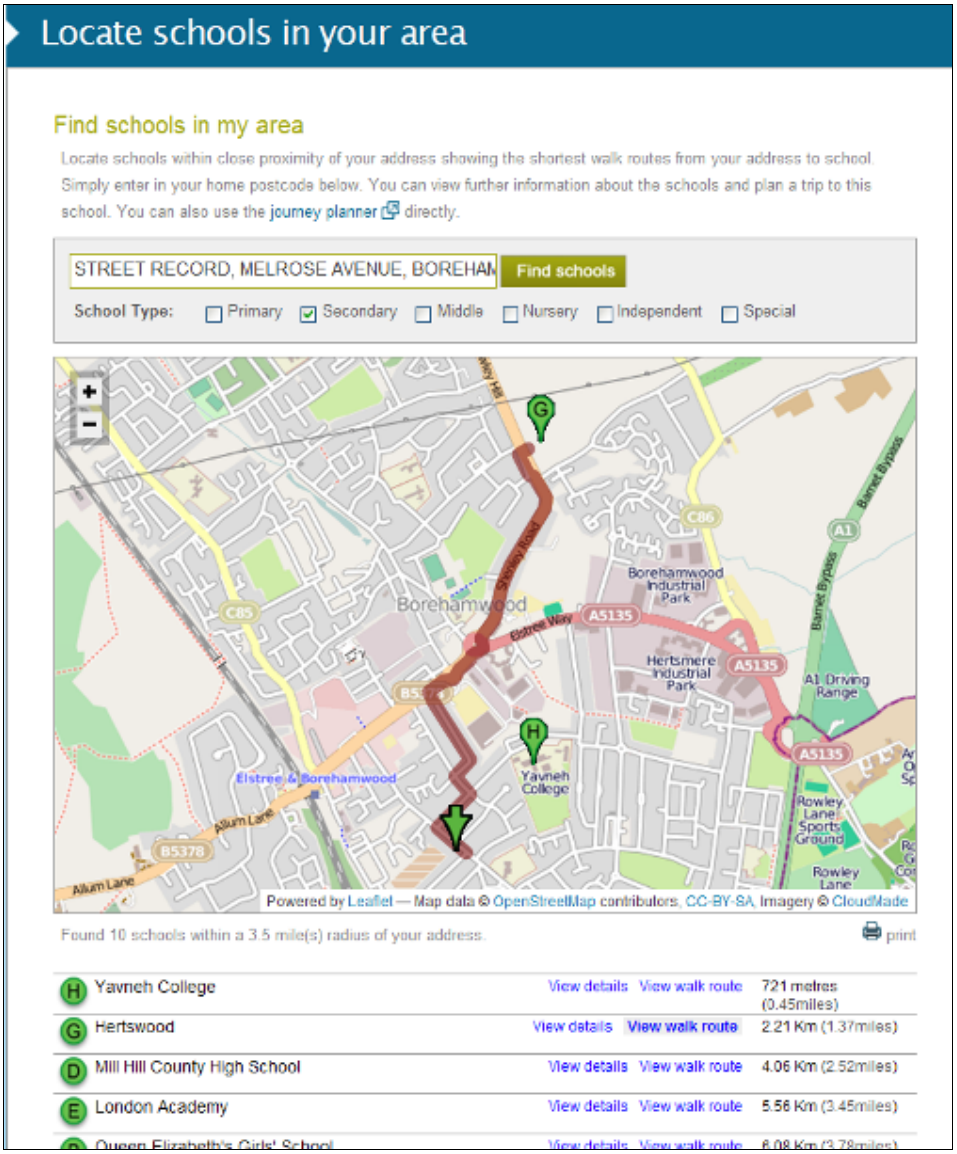


Figure 4 – 'Find schools in my area' Herts Direct website – suggested walk routes

Summary

It is recommended that the package of measures defined under this scheme are implemented in parallel with all schemes proposed under the **Cycling** and **Walking** themes as well as Scheme 20 which addresses highway issues adjacent to Hertswood School.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
4.1	Review and Update School Travel Plans	Encourage and provide assistance to local schools in reviewing and updating their School Travel Plans and establish a new baseline of travel trends prior to the proposed implementation of improvements to walking and cycling routes. The following School Travel Plans should be reviewed and updated as a priority: • Meryfield Primary • Woodlands Primary • Monksmead Primary Deliverability – less than 1 year SIMPLE	**£400-£3,500 per school**
4.2	Implement a Inter-School Travel Forum	Establish an Inter-School Travel Forum, inviting representatives from all schools in the UTP area to raise concerns regarding travel. A meeting could take place quarterly or once a term to discuss issues in detail, and a facility for logging comments or concerns on HCC's website could be provided so that matters could be dealt with in the intervening periods. Deliverability – less than 1 year SIMPLE	**£3,000-£4,000 per annum**
4.3	Bikeability cycle training for school pupils	Undertake a Bikeability cycle training programme at the two secondary schools in advance of or in conjunction with the implementation of new and improved cycle routes in the area, in particular those proposed around Shenley Road/Cowley Hill, Elstree Way and the Well End / Studio Estate area (see also **Schemes 07, 09, 10, 20 and 21**). Deliverability – less than 2 years STANDARD	**£40 per pupil**
4.4	School journey planning – cycle routes	There is a route planner which provides quiet, balanced, advanced routes. It draws its cycle route information from the CycleStreets website/journey planner. Cyclists are encouraged to update the site with information useful to cyclists (for example:- *humps in the road at...*) so there may be potential to add further information. Deliverability – less than 2 years STANDARD	**£20,000-£40,000**

Supporting Evidence of Measures/Components

Preferred Option
It is recommended that School Travel Plans are reviewed and updated as a priority (component 4.1). Scheme component 4.2 is an additional initiative which should be considered especially as a number of schemes are being developed to improve cycle routes in the area. Scheme component 4.3 could be run as a standalone programme and should be considered in conjunction to where cycle schemes are proposed. It is therefore recommended that a cluster of schools broadly situated around the proposed cycle routes within Borehamwood are taken forward to the Safer Routes to Schools project. Scheme 4.4 could be considered as an additional facility to help promote improved routes following their implementation through this UTP.

Contribution to Objectives / Indicators	UTP Objectives	• Improve transport connectivity between transport modes to allow for greater transport flexibility • Improve public transport provision and accessibility • Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
4.1	£ 400-£3,500	Cost per school. Dependent on the level of support needed from the local authority
4.2	£ 3,000 - £4,000	Cost per annum. Dependent on the level of support needed from the local authority
4.3	£ 40	Cost per pupil (of which the pupil contributes £20). These costs valid to end of March 2013
4.4	£ 20,000 – £ 40,000	These costs are for installation of additional software to the HCC web based site. (This could enable I-phones to have the technology for establishing routes.
TOTAL COST FOR DELIVERY	**£** N/A	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*STP and education*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	

Other Information/Additional Notes:

Scheme Name	**Elstree-Borehamwood Inter-Urban Cycle Spine** Cycling	
Scheme Reference	05	
Problem References	CY01	Allum Lane cycling impediment
	CY09	Low proportion of cycle to work trips within and between towns
	CY10	Allum Lane - road bridge over railway
	CY11	Elstree-Allum Lane link
	CY13	Cycle Signing and Wayfinding
	HC01	Station Road-Shenley Road-Theobald Street roundabout
	HC02	Allum Lane-Watling Street junction congestion
	HC06	High car dependency for inter-town trips
Links to other UTP schemes:		02, 03, 04, 06, 18, 21

Context

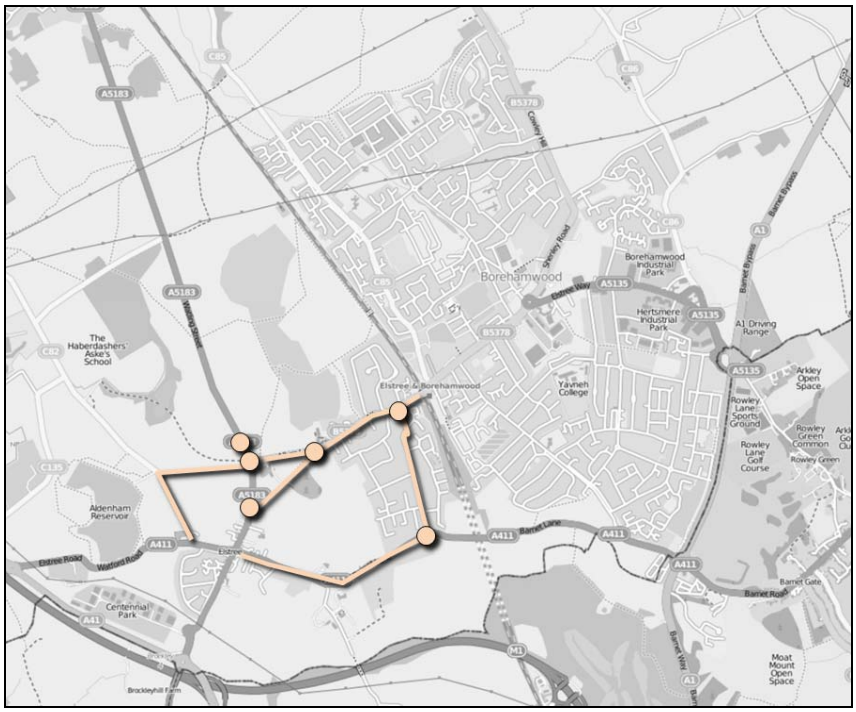


Figure 1 – Scheme Location

Elstree and Borehamwood are connected by B5378 Allum Lane and A411 Barnet Lane. Barnet Lane is not considered suitable for routing of cyclists due to the gradients on the link and high vehicle volumes. Allum Lane is considered a more direct route and provides access to the station for users from Elstree, particularly those travelling towards the railway station and Borehamwood town centre.

According to the 2001 Census data, reported in the Elstree and Borehamwood Data Report,

4.3% people travelling to Borehamwood from Elstree for work did so via bicycle. No journeys by bicycle were recorded for cyclists from Elstree to Borehamwood.

Allum Lane is subject to a 30mph speed limit but the character of the road changes west of the residential area, on the edge of Borehamwood. The rural route with high traffic volumes and unwelcoming gradients has created an inhospitable environment that is likely to discourage cyclists from using the route to cycle between the two areas.

The link between the station and the Allum Lane service road to the west of Deacon's Hill Road requires travelling across the railway bridge to the west of the station. The narrow bridge does not offer conditions conducive to cycling and could discourage cycling (see **Figure 2**).

Figure 2 – Allum Lane Looking east across railway

Figure 3 – Allum Lane Service Road looking east

The service road from just west of Deacon's Hill Road (see **Figure 3**) provides a facility that is separated from the main carriageway of Allum Lane and shelters cyclists from the heavy traffic flow observed along here.

Allum Lane between the service road and the access road, which serves the council operated waste collection site, is undulating and narrow but has some potential for change of use of the southern footway.

The link between Allum Lane and Elstree Hill North that runs via a footpath is currently too narrow to facilitate cycling. The route is narrow between Allum Lane and the Cemetery access road and the section between the Cemetery access road and Elstree Hill North does have some adequate width but would require removal of verges at some locations (see **Figures 4** and **5**).

Figure 4 – Footpath towards Allum Lane

Figure 5 – Footpath looking east towards Cemetery access road

Elstree Hill North is a particularly hazardous section to cycle as it has very steep gradient and is narrow; this forces the cyclists into the primary riding position which holds up traffic – no vehicles can pass due to the narrow lane widths.

Watling Street connects Radlett with Elstree and provides a link to Elstree Hill (for Elstree), Allum Lane (for Borehamwood) and further to the M1 and the A41. The speed limit along Watling Street is 50mph to the north of the houses to the north-east of the Elstree Hill / Allum Lane / Watling Street junction. The speed limit changes to 30mph approximately 300m upstream of the approach to Elstree Hill.

The existing gateway on Watling Street does not have facilities conducive to creating a safe cycling environment. The 900mm build-outs do not have cycle bypasses and this creates a pinch point which benefits speed reduction but forces cycles out into the path of onward traffic.

Average speeds through the gateway have been recorded for the formulation of the Elstree & Borehamwood Data Report during 8am to 9am from September 2009 to August 2010. The outbound speed was measured in excess of 30mph with the inbound speed recorded between 21-29mph.

Gateways are used to indicate the entry into a particular area where a driver's behaviour should change, for example the entry to a village or residential area. They are usually accompanied by a reduction in the speed limit. Horizontal traffic calming often forms part of the gateway feature, which can often cause conflict for cyclists as carriageways are narrowed and cyclists are 'squeezed.'

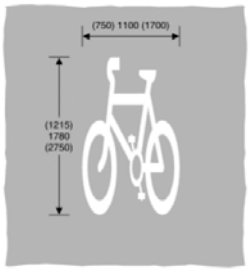
Gateways are administered under the Traffic Advisory Leaflet 13/93 and are discussed in the LTN 2/08 Cycle Design Guidance. There are key principles that cover the use of gateways, including the following:

- Visibility – the location of a gateway should be situated so it is not encountered suddenly. A gateway should be visible over at least the stopping distance for the 85th percentile of the approach speed.
- Islands – these can be used to separate lanes of traffic or to provide refuges for cycle lanes.
- Horizontal elements – build-outs, chicanes, pinch points can support contrasting

coloured surfacing and markings to enhance the affect that the carriageway is narrowed.

- Vertical elements – should not be used in isolation from horizontal elements but can provide suitable physical presence to gateways
- Signs – appropriate to the location, signs should be conspicuous and at the start of a speed limit zone.

TAL 01/97 gives various forms of cycle bypasses for road narrowings. These require a minimum carriageway width of 11.0m to maintain cyclists' alignment. These scenarios should be used wherever possible to provide the most cycle-friendly scenario at gateways.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
5.1	Station Road-Allum Lane to service road link	Access to Elstree and Borehamwood Station requires movement across the railway bridge on Allum Lane. This bridge has a carriageway width of approximately 6.7m but has footway widths of 2.5m to 3.0m. Use of the footway is restricted due to the widths to the east and west of the bridge – these are below 2.0m and it would not be preferable to place cyclists and pedestrians together as a facility (Roads in Hertfordshire design guidance states that mixing pedestrians and cyclists should be a last resort measure). The option here would be to place road markings within the carriageway to highlight the presence of the cycle route from Elstree & Borehamwood Station to the west and onwards to Elstree (see **Figure 6**).  *Figure 6 – TSRGD Diagram Number 1057 – Cycle lane, track or route* The mini-roundabout at Deacon's Hill Road does not create too many issues for cyclists; mini-roundabouts are generally accepted as less problematic than conventional roundabouts (LTN 2/08) and the alternative off-road facility would be difficult to implement due to the narrow footway widths.	**£5,000-£15,000**

		Access to the Service Road to the south of Allum Lane (covered in Component 5.2) can be achieved by using a dropped kerb access point to the west of Deacon's Hill Road and to the east of the bus stop. A facility similar to that shown in **Figure 11** will enable access to the proposed segregated shared path linking to the Service Road. A segregated shared path with 2.0m for pedestrians and 2.0m for cyclists can be achieved from east of the bus stop to the Service Road (see **Figure 12**). Deliverability: Less than 1 year SIMPLE	
5.2	Allum Lane service road on-road cycle provision	The service road to the south of Allum Lane presents an opportunity to use a quieter route. This route would require little intervention to provide a 2-way facility along its length. Some cycle logos as shown in **Figure 6** may aid navigation and highlight the presence of a cycle route to traffic. The tie-ins to Components 5.1 and 5.3 would be important to provide a dedicated facility. Deliverability: Less than 1 year SIMPLE	**£2,000-£5,000**
5.3	Allum Lane service road to Cemetery access junction shared cyclepath/footpath	A shared use cycle facility could be implemented between the unnamed access road to the waste disposal site, to the service road alongside Allum Lane. Footway widths along the southern side of Allum Lane are currently at approximately 2.0m, however, there is scope to widen the footway to 3.0m to meet Roads in Hertfordshire Design Guidance standards. Vehicle flow and speeds along this section, coupled with the gradient and narrow roads, suggests that off-road provision would be the most preferable facility for cyclists. The off-road facility would cater for less confident cyclists and enable Components 5.2 and 5.4 to be linked to create a continuous route. Deliverability: Between 1 to 2 years STANDARD	**£40,000-£60,000**
5.4	Cemetery access junction - Elstree Hill North	a) Via Elle-Dani Farm route The access road to the waste disposal centre off Allum Lane provides an opportunity to utilise the footpath that currently routes from here to the War Memorial on Elstree Hill North. This footpath (public footpath 6) bypasses the junction of Allum	**£20,000-£40,000**

Lane and Watling Street and offers a direct route that would be traffic free. However, widths along this footpath are between 1.5m and 3.0m and a width of 3.5m is required to maintain a 0.5m clearance to vertical obstacles, such as walls and fences (see **Figure 8**). A facility along this section would be sub-standard with land acquisition unlikely. Single file cycling with passing places may be required to facilitate any movement.

The access at the War Memorial would require some modification. Although there is a footway width of approximately 1.6m and a carriageway width of 5.75m, the presence of foliage and the proximity of traffic create an area that is difficult to navigate. Onward travel from this location is via Elstree Hill North and requires travelling along a steep gradient towards Elstree Crossroads.

Deliverability: more than 2 years **COMPLEX**

b) Via Aldenham Park route

The Watling Chase Greenway strategy proposed an off-carriageway link Greenway link between Borehamwood and Aldenham Road along the length of Allum Lane (see **Figure 7**).

Figure 7 – Page 24, Watling Chase Greenway Strategy 2010

The facility along Allum Lane would be best located along the southern footway. The footway would require footways to be built out and would affect statutory undertakers' plant. A pinch point to the west of the Recycling facility access road may present additional issues as any facility here would be less than 2.0m due to the proximity of a retaining wall and bollards. However, a full investigation of available measures should be

		considered at the design stage. At the junction of Allum Lane / Watling Street, a crossing facility is required across the southern arm (Elstree Hill North) to enable access across to the existing London Loop footpath. Due to the carriageway width of 6.5m an uncontrolled crossing would be the best option for flow and usage. A review of the available land within the vicinity of the crossing point may lead to an improved facility on the eastern side of Elstree Hill South. The existing stiles and access controls would need to be modified to accommodate cyclists and other users, such as equine. The link to the Aldenham Country Park would follow Footpath 2 and require upgrade from a footpath to at least a Bridleway. This link would require surfacing, either as a sealed surface (DBM) or an unbound surface (limestone dust) but adequate for cyclists, equine and pedestrians (Connect 2 and Greenways Guidance – see **Figure 8**). Access at the western extent of the Greenway, at its junction with Aldenham Road will be required to complete the route. It is then proposed that the route would continue along Aldenham Road, linking into the improved crossing at Watford Road and into Sullivan Way (see Proforma 02). Deliverability: more than 2 years **COMPLEX**	
5.5	Elstree Hill North route	A link is required from Elstree Hill North War Memorial through to Elstree Crossroads and potentially the Composers Estate, Elstree. This route is limited by the carriageway and footway widths along Elstree Hill North resulting in an option that would have cyclists in the carriageway until a shared access facility across an upgraded Toucan on Roman Road to the north of Elstree Crossroads (close to St Nicholas Church). This would then tie into the facilities to be provided at Elstree Crossroads, with the impediment being the northwest corner of the junction which is very narrow (less than 2.0m around the corner). Deliverability: more than 2 years **COMPLEX**	**£90,000-£120,000**
5.6	Watling Street Physical Gateway Measure	Remove existing kerb build-outs and provide an arrangement similar to that outlined in **Figure 13**. Existing carriageway widths (approximately 9.7m) mean it is not possible to provide cycle bypasses (below the 11m recommended), therefore cycle	**£8,000-£15,000**

		lanes should be provided to ensure that cyclists have a defined space through the transition in speed locations. Deliverability: less than 1 year **SIMPLE**	
5.7	Watling Street 'Soft' Gateway Measure - road markings / signage	Provision of signing (to TSRGD Diag. No. 950) and cycle logos (to TSRGD Diag. No. 1057) in the existing layout of the gateway would improve the conspicuity of cyclists through the facility. These would be simple to implement in accordance with the Traffic Signs Manual chapters 3 and 5. See **Figures 6** and **10**. Deliverability: less than 1 year **SIMPLE**	**£4,000-£8,000**
5.8	Barnet Lane/Deacon's Hill Road route	This will be a sign-posted, on-road route with no physical measures and should only be considered in the event that neither measures 5.3-5.5 cannot be implemented. There is insufficient width on the existing footway to allow shared-use, in particular the western section in Elstree. Whilst there may be opportunity to provide off-road facilities on the footway at the eastern section towards Deacon's Hill Road (guidance recommends an absolute limit of 2m width but acceptable and recommended 2.5 to 3m track widths respectively) provision of intermittent on and off-road sections is likely to be confusing to cyclists and could create conflicts with vehicles where cyclists transfer between the footway and road, a situation which should be avoided. Forward visibility is also poor on some sections with the presence of an established hedgerow demarcating the edge of the highway boundary. The route is likely to most attractive to the more confident cyclists. Transport Initiatives' Cycle Network Review identified Barnet Lane as requiring skills to Level 3 and Deacon's Hill Road as requiring Level 2.5 skills. Barnet Lane is heavily trafficked. Particularly during peak periods, this could be dissuasive to cyclists. This route will be supported by way-finding signage (see **Scheme Proforma 21**).	**£TBC**

		Deliverability: less than 1 year SIMPLE	

Supporting Evidence of Measures/Components

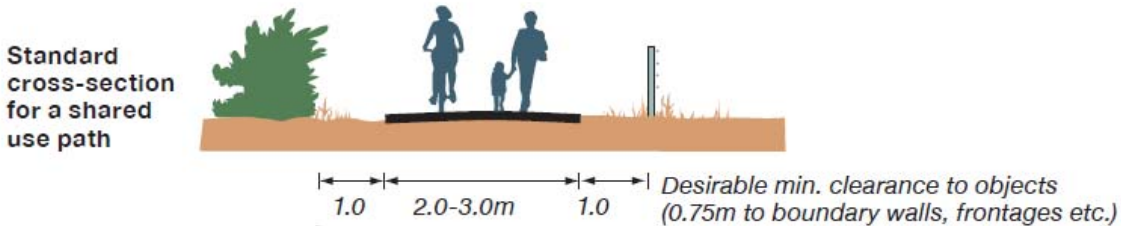


Figure 8 – Sustrans Connect 2 / Greenway Guidelines for shared use path

Figure 9 – A5183 Watling Street gateway (adjacent to cottages)

Figure 10 – TSRGD Diagram Number 950 – Cycle route ahead

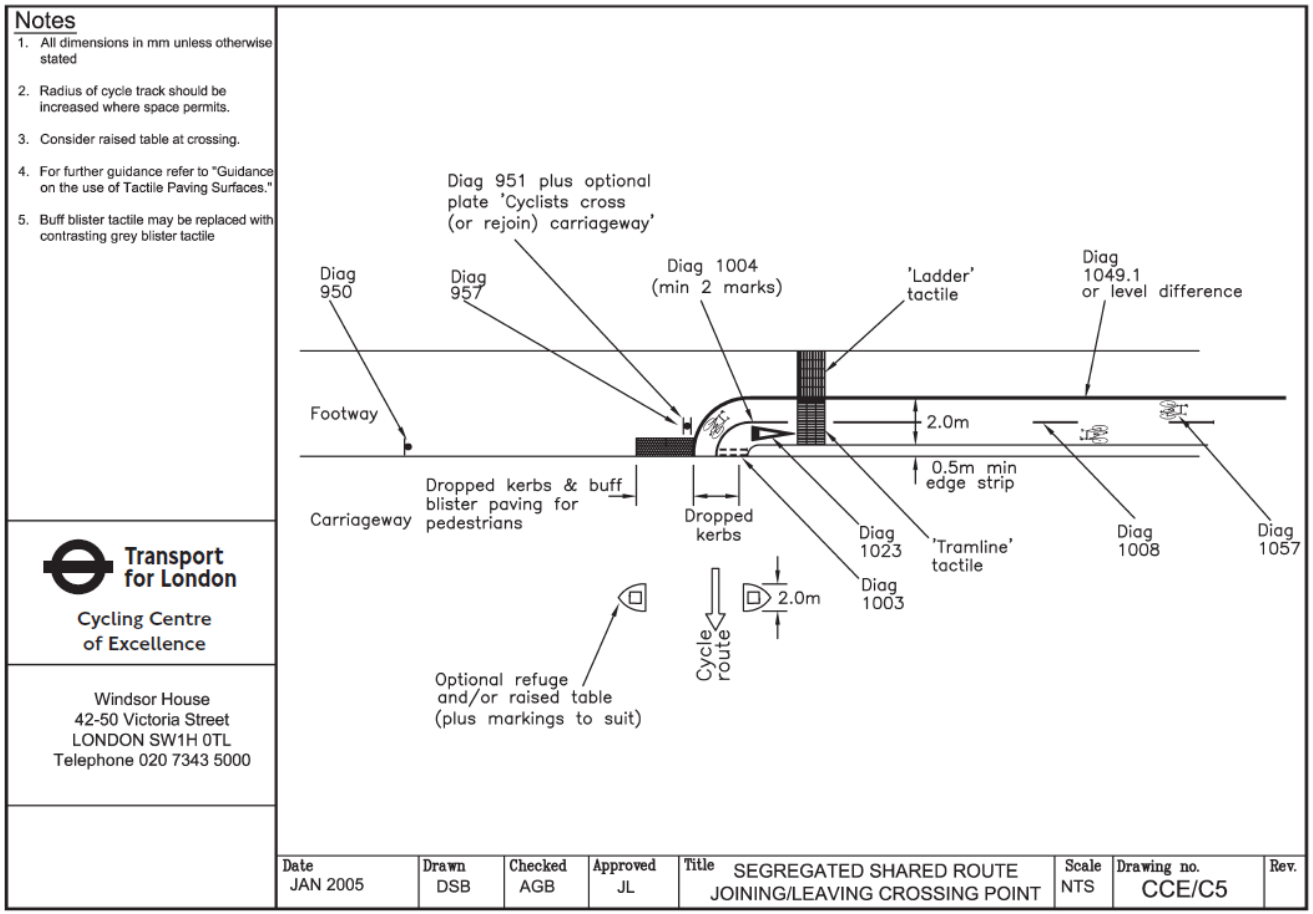


Figure 11 – Typical segregated shared path access

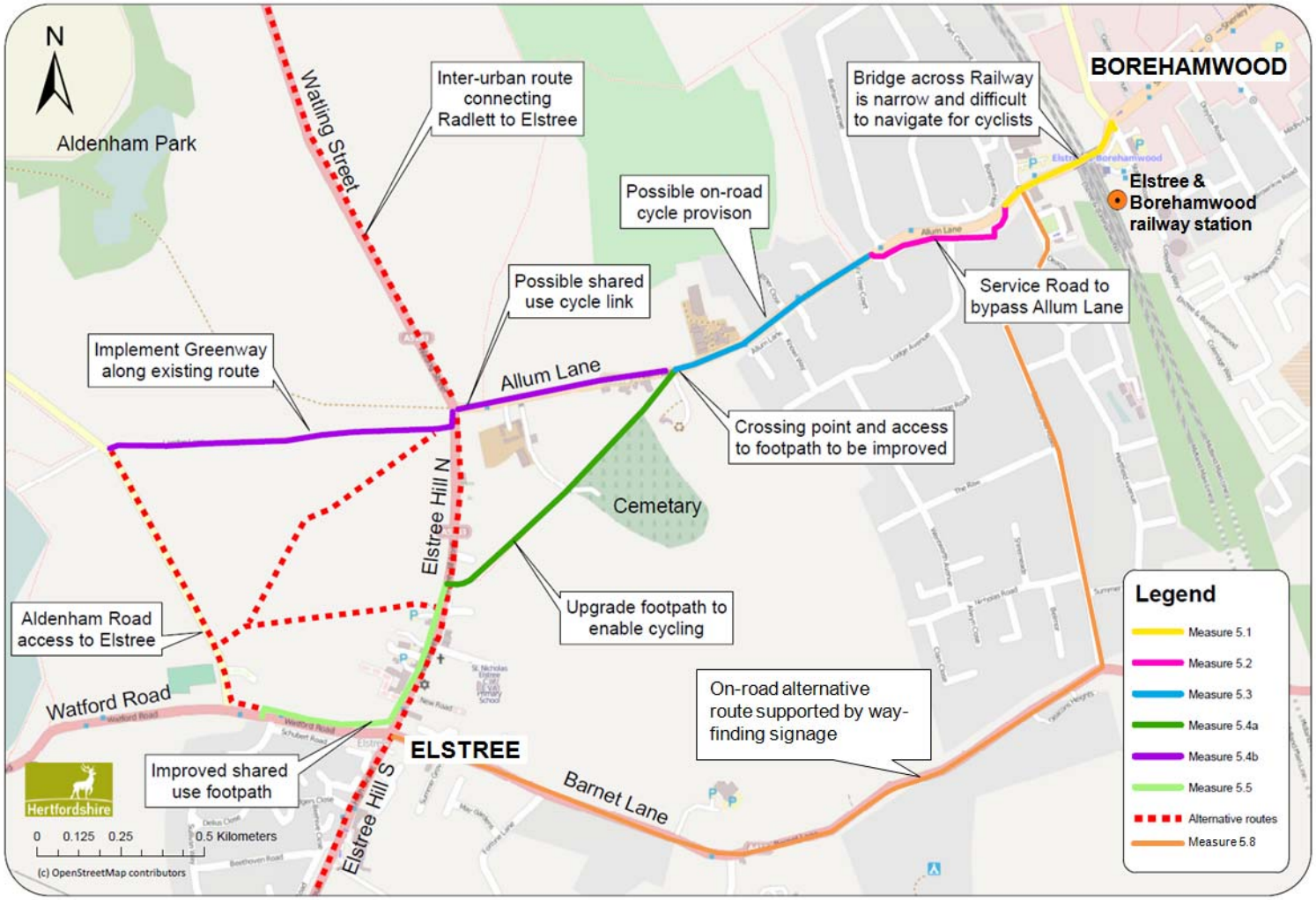


Figure 12 – Elstree and Borehamwood Inter Urban Cycling Spine

Preferred Option
The preferred option and overarching aspiration of the scheme consists of creating a sustainable cycle link between Elstree and Borehamwood via the implementation of Measures 5.1, 5.2, 5.3, 5.4a and 5.5. This option provides the most direct route from Elstree to Borehamwood, and vice versa, but it is recognised that there are considerable issues of land ownership, traffic management interventions and infrastructure modifications to overcome. However, as a strategic route, the option should be progressed to feasibility design to establish whether elements of the route can be implemented (see **Figure 14**). Measure 5.4b is not recommended to be taken forward at this stage due to the issues of widening the footway to provide a shared use facility along Allum Lane. The Greenway link from Elstree Hill North to Aldenham Road could be considered as a further option but the feasibility of onward routing from here would need to be considered. A route has been identified between Radlett and Centennial Park, Elstree that could be incorporated into any feasibility designs that originate from this Proforma. Further routes to the north of Watford Road could be considered to improve permeability through the area. It is recommended that measure 5.6 is progressed as it would remove the issue of the pinch point completely and benefit cyclists using Watling Street. If measure 5.6 is not able to be progressed, measure 5.7 would provide some benefits but not solve all existing issues for cyclists. Measure 5.8 is a potential alternative route to be achieved with on-road provision. It is more likely to be attractive to more-confident and experienced cyclists, with high traffic volumes on Barnet Lane likely to discourage some cyclists. The provision of off-road facilities would be difficult along Barnet Lane, the footway being an insufficient width and forward visibility being poor in parts. Measure 5.8 has been developed as an alternative option to Measures 5.3-5.5. Whilst the measure would not require any physical interventions (wayfinding signage will be provided as part of Scheme Proforma 21) and is therefore likely to be low-cost, it is less likely to be attractive to cyclists of all abilities given that it will be entirely on-road.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
5.1	£5,000 - £15,000	
5.2	£2,000 - £5,000	
5.3	£40,000 - £60,000	
5.4a	£20,000 - £40,000	
5.4b	£20,000 - £40,000	
5.5	£90,000- £120,000	
5.6	£8,000 - £15,000	
5.7	£4,000 - £8,000	
5.8	£TBC	
TOTAL COST FOR DELIVERY	**£TBC £189,000 - £303,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	Land ownership and highway boundary limits are to be considered with permissions sought to alter designations of footpaths and facilities. A wooden bridge located within Aldenham Park has been identified as a potential constraint. Further investigations are required to confirm whether or not (and how) this issue could be overcome. Rights of way through Aldenham Park can currently experience flooding. Measures would be required to prevent potential cycle routes from flooding.

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Station Road/Allum Lane/Theobald Street/Shenley Road Junction Improvements *HCC Scheme in Preparation*** Highways and Congestion	
Scheme Reference	06	
Problem References	HC01	Station Road-Shenley Road-Theobald Street Roundabout
	HC05	Theobald Street Shopping Park access congestion
	CY09	Low proportion of cycle to work trips within and between towns
	CY10	Allum Lane – road bridge over railway
	CY15	Borehamwood east-west corridor
	CY18	Cycle facilities at roundabouts
Links to other UTP schemes:		05, 21

Context

Figure 1 – Scheme Location

The existing mini-roundabout junction of Theobald Street, Shenley Road, Station Road and Allum Lane is recognised as a congestion and accident hotspot. The junction is located at the western end of the main high street in Borehamwood, and is also a major crossroads between two main routes leading into/out of the town from/to the north (Theobald Street) and west (Allum Lane). Station Road provides access for vehicles to the station forecourt (including general vehicle drop-off zone and bus interchange), as well as access to some commercial properties and medium-rise residential blocks.

Sources: ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Figure 2: Aerial view of the Theobald Street-Shenley Road-Station Road-Allum Lane mini-roundabout (image taken prior to alterations to station forecourt and drop-off area)

Junction inter-visibility is poor at some locations, for example traffic approaching the junction from Shenley Road is obscured from view by a building to traffic approaching on the Station Road arm.

The swept paths of large vehicles, notably buses entering/exiting the Station Road arm, need to be accommodated and hence a mini-roundabout dome has to-date provided a suitable un-signalised junction layout that does not restrict the movement of such vehicles. The junction is on a slope that this could present difficulties for some vehicles travelling through the junction.

Some small-scale improvements to pedestrian crossing facilities (including tactile paving) have been implemented in recent years however the junction could still be viewed as hostile to pedestrians and cyclists, despite the fact it acts as a main gateway for passengers accessing the station on foot, and people walking to/from the town centre area. A challenge exists therefore to sufficiently accommodate all modes at this busy and important junction, i.e. improve the pedestrian and cycle environment, improve the flow of traffic through the junction and potentially improve road safety through a better management of all users of the junction.

The junction is a defined congestion hotspot during peak periods as well as a location where accidents occur in the Elstree and Borehamwood UTP Data Report (2012).

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
6.1	Conversion to signal-controlled crossroads *HCC Scheme in Preparation*	A scheme is in preparation by Hertfordshire County Council which will remove the mini roundabout and introduces traffic signals and provides signal-controlled pedestrian crossings on all arms. No turning bans will be enforced (see **Figure 3**). The scheme will include technology to detect and prioritise the movement of buses should be incorporated within the proposed scheme. Deliverability – 1 to 2 years **COMPLEX**	***£801,000***

Supporting Evidence of Measures/Components

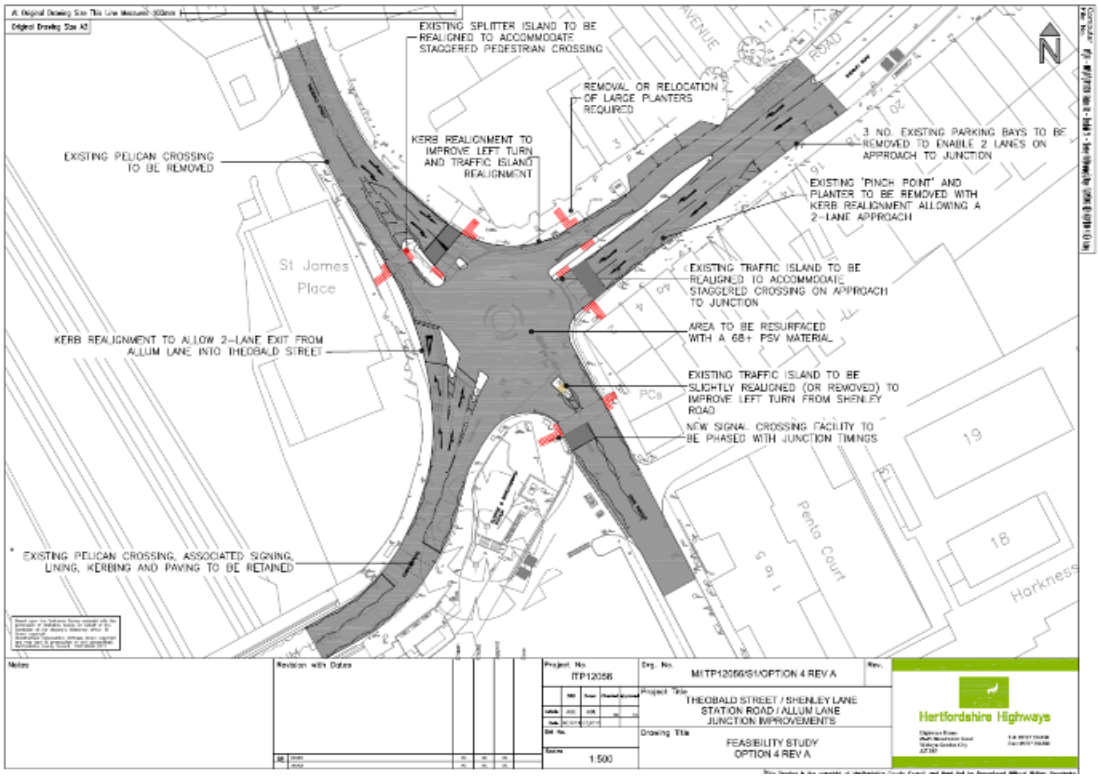


Figure 3 – Feasibility Study Option 4 (HCC)

Preferred Option
Scheme 6.1 is in preparation and has the potential to be delivered during 2013/14.

Contribution to Objectives / Indicators	UTP Objectives	• Support economic growth and local housing development through the delivery of transport improvements • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
6.1	£801,000	Committed Scheme
TOTAL COST FOR DELIVERY	**£801,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for Traffic signals, footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	Scheme in preparation (6.1): no land take issues identified. Traffic modelling has already been undertaken as part of the wider Elstree Way Corridor study work which has identified the need to signalise the junction.

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Aerial photography has been sourced from ArcGIS Online. Sources**:** ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Scheme Name	**Shenley Road-Elstree Way Roundabout** Cycling / Walking / Highways and Congestion	
Scheme Reference	07	
Problem References	CY09	Low proportion of cycle to work trips within and between towns
	CY15	Borehamwood east-west corridor
	CY18	Cycle facilities at roundabouts
	CY21	Shenley Road cycling facilities
	HC06	High car dependency for inter-town trips
	HC07	Shenley Road- Elstree Way – Brook Road roundabout and Tesco roundabout
	WA07	Shenley Road roundabouts by HBC offices and Tesco – pedestrian crossing impediment
Links to other UTP schemes:		N/A

Context

Figure 1 – Scheme Location

The Shenley Road/Brook Road/ Elstree Way Roundabout is situated within the centre of Borehamwood adjacent to Hertsmere Civic Offices, West Herts Business Centre and Elstree Studios. The roundabout is approximately 75 meters in diameter, including the circulatory carriageway, and has five arms: Shenley Road (east and west); Elstree Way; Brook Road and an exit/entry point to Elstree Studios.

Pedestrian crossings facilities are provided on each arm with approximate crossing distances ranging from 12m to 17.5m (excluding pedestrian splitter islands). Cycle lanes can be found

along the entries/exits of the roundabout and are approximately 1m wide. Cycle lanes are provided at different points on the junction however the routes are convoluted, especially across the Brook Road arm which is likely to increase journey times through the junction.

The junction can be heavily trafficked during peak periods and as a result of the junction's size, traffic can reach relatively high speeds making it a hostile environment for pedestrians and cyclists.

Issues had been identified in the 2007 Borehamwood and Elstree Urban Transport Plan, particularly regarding safety and road congestion at this location.

The Core Strategy identifies the Elstree Way Corridor (between the Tesco roundabout and the double roundabout at Manor Way/Studio Way) as having the potential to deliver at least 800 residential units. The area's redevelopment is also an opportunity to tie the area in with the town centre and achieve an improved gateway into the town centre from the west. An Area Action Plan (AAP) is being prepared to guide the area's redevelopment. In order to facilitate the level of development envisaged and to improve connectivity a series of highway and public realm improvements are also required. Hertsmere Borough Council has commissioned AECOM to produce an assessment of transport improvements in the Elstree Way Corridor feed into the AAP. The AAP will consider the following interventions:

a) Shenley Road roundabout will be reviewed and either improved to improve flow and access to key sites, or removed and replaced with two junctions. The removal of the Shenley Road roundabout will open up a development site and together with public realm improvements will improve pedestrian and vehicle connectivity with the town centre;

b) The carriageway width of Shenley Road (west) between the junction with Tesco access road, and junction Elstree Way/Brook Road will be reduced to one lane of general traffic in each direction, plus eastbound cycle lane, and westbound bus lane;

c) The Tesco roundabout will be improved or replaced with signalised junction and bus lanes both into and out of the Tesco site. Access to/from McDonalds will be via Eldon Avenue only with no direct access from Shenley Road; and,

d) On-road cycle lanes to be provided in both directions on Elstree Way and Brook Road

These plans are in progress however it is a large and complex development scheme that may take some years to implement, possibly beyond the lifetime of the UTP. It is therefore necessary to consider small-scale interventions which could be implemented in the intervening period with the aim of improving the pedestrian and cycle environment around the junction.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
7.1	Elstree Way Corridor scheme – Scheme in preparation by HBC	The preferred scheme, currently in development by HBC, will facilitate the level of development envisaged for the Elstree Way Corridor and will improve access for pedestrians and cyclists and provide a better management of traffic.	**Scheme in development**

		The scheme will build upon the Elstree Way Corridor Feasibility Study and Transport Assessment prepared by consultants Colin Buchanan on behalf of the major landowners within the Corridor in 2010, the preferred option from the Feasibility Study is shown in **Figure 4**. Deliverability – more than 2 years **COMPLEX**	
7.2	Interim scheme to increase size of splitter islands/hatching and circulatory markings with the aim of reducing vehicle speeds and improving pedestrians'/cyclists' safety (**Figure 5**)	This interim scheme could be implemented in the shorter term and address concerns regarding pedestrian and cyclist safety. The scheme utilises continental design geometry as specified in DfT Traffic Advisory Leaflet 9/97 'Cyclists at roundabouts: continental design geometry' (1997). The key features of the design plan are single lane entries and exits with widths of 4-5m and a circulatory carriageway width of 5-7m. With the introduction of singular lanes on the Brook Road, Shenley Road east and Shenley Road west arms of the roundabout, vehicle speeds on approach to the junction should be reduced. Works include widening the splitter islands and nearside kerb line by approximately 5-6m on each arm so that only one vehicle may enter the approaches. The capacity of the roundabout would be reduced, encouraging the use by cyclists and improving pedestrian crossings. By widening the splitter islands an additional positive outcome is that the pedestrian crossing distance will be reduced, helping to improve safety for pedestrians. Reducing the circulatory carriageway width has been considered in order to reduce the amount of traffic on the roundabout at any one time and potentially reduce entry-circulating accidents. The reduction in circulatory width could also encourage lower traffic speeds through the junction. This would be achieved by increasing the size of the splitter island outwards by introducing hatching road markings. No cycle lanes will be provided on the circulatory carriageway, however nearside cycle lane approach will be provided on the approach arms. A reduction in vehicle speeds on the entry/exit	**£80,000-£120,000**

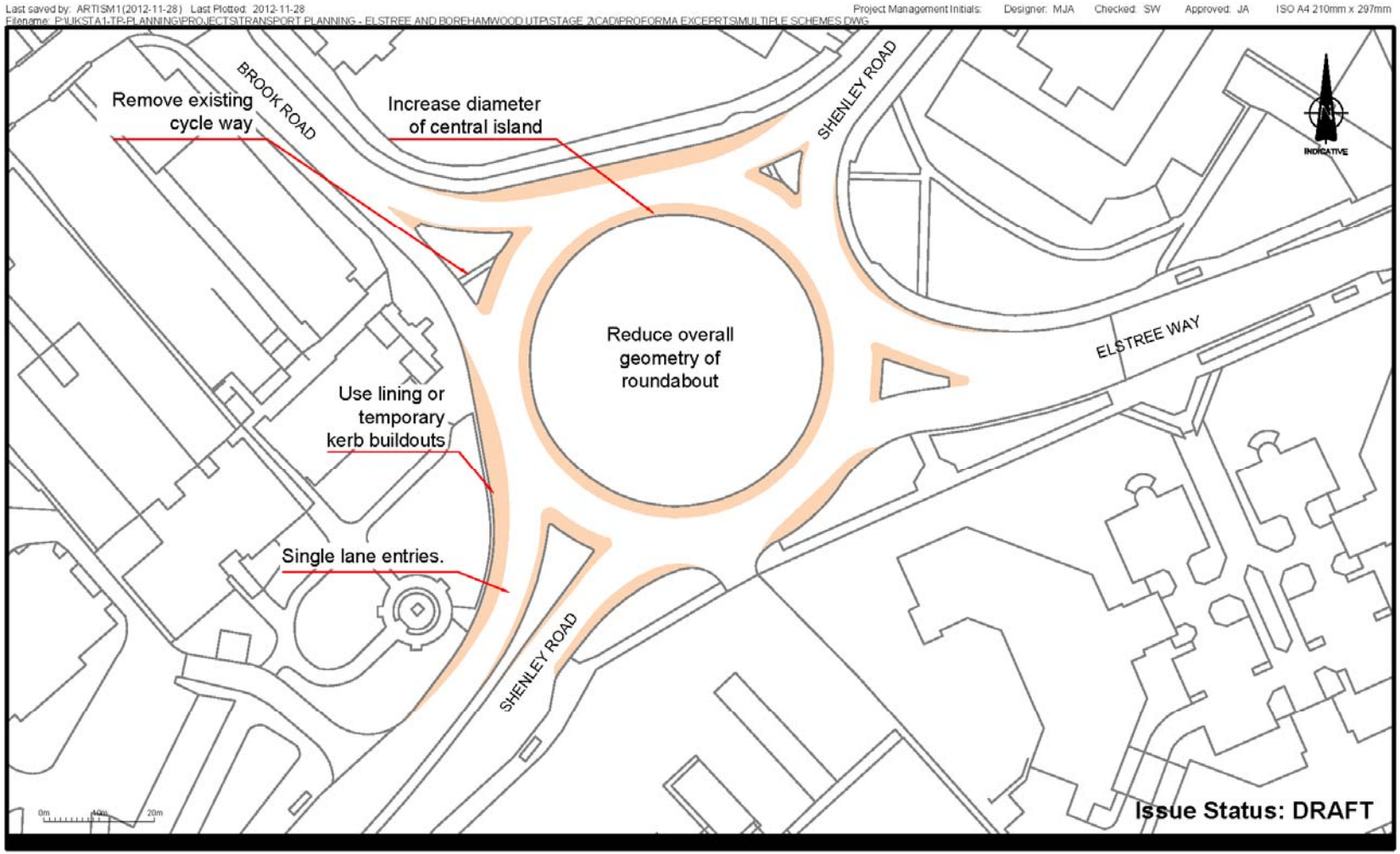
		points of the arms should make pedestrians and cyclists feel safer and more confident in using the facilities provided. Deliverability – Less than 2 years **SIMPLE**	

Supporting Evidence of Measures/Components

Figure 2 – Current pedestrian and cycle crossing on Brook Road entry/exit arm of roundabout which could be viewed as convoluted

Figure 3 – Cycle lane on the Shenley Road entry/exit of the roundabout

Figure 4 – Elstree Way Corridor masterplan (Colin Buchanan, HBC)



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 4 - Shenley Road Roundabout interim measures

Preferred Option
The preferred option is the implementation of the scheme prepared as part of the Elstree Way Corridor Area Action Plan, currently in development by HBC. This should provide significant benefit in reducing congestion and queuing and promoting the use of other sustainable modes of transport in the long term, as well as contribute to wider development objectives. Component 7.2 is designed to be an interim measure which could be implemented at comparatively low cost, and would be primarily for the benefit of cyclists and pedestrians. It is not envisaged that this component would be permanent and would be removed as part of works to install the preferred Elstree Way Corridor Area Action Plan scheme.

Contribution to Objectives / Indicators	UTP Objectives	• Support economic growth and local housing development through the delivery of transport improvements. • Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles. • Encourage reliability of travel through sustainable travel alternatives. • Reduce congestion at key traffic hotspots throughout the study area.

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
7.1	£ N/A	*Scheme in development*
7.2	£80,000-£120,000	
TOTAL COST FOR DELIVERY	**£80,000-£120,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Kenilworth Park-Maxwell Park Sustainable Link** Accessibility	
Scheme Reference	08	
Problem References	PK03	Bullhead Road (Elstree Way end) parking and speed compliance issues
	SP11	Bullhead Road (Elstree Way end) parking and speed compliance issues
	WA09	Manor Way/Kenilworth Park crossing safety
Links to other UTP schemes:		N/A

Context

Figure 1 – Scheme Location

Kenilworth Park is situated to the east of Manor Way and to the north of Kenilworth Drive. It is a large expanse of green space within a mixed use, residential and commercial land use area. The park is bounded by a footpath on the eastern and northern sides, with access restricted by a 'kissing gate', bollard and large gate to control vehicular access at its western entrance at Manor Way.

Maxwell Park is located to the south of Elstree Way and links Bullhead Road to Maxwell Road. It is bounded by Hillside Avenue to the south, Elstree Studios to the west and Bullhead Road to the east. At the eastern entrance to the park, two bollards restrict vehicular access.

Manor Way runs from Ripon Way to Elstree Way and is an important route from north to south in Borehamwood. Bullhead Road also runs from Elstree Way southwards but does not have traffic calming as Manor Way does.

The link between Manor Way and Bullhead Road is up to 9.0m wide with a split level footway and cycle track throughout. There is no designation between the two facilities but they operate side by side with a kerb upstand between the two areas. The cycle track is 2.8-3.0m wide throughout. The western end of the link meets Bullhead Road and vehicular access is restricted by two bollards. The eastern end is not restricted by barriers but the access is narrow with changes in levels to deter vehicles from using the link.

The walking and cycling network is severed by Manor Way and Bullhead Road with no formal crossing facilities across these roads (see **Figures 2** and **3**). The link between the parks is an important route for pedestrians and cyclists and can be enhanced to provide an attractive and comfortable facility.

The Borehamwood and Elstree Bikeability Audit noted that the footpaths between Maxwell Road and Kenilworth Drive / Warwick Road could be Level 1, off-carriageway facilities, suitable for all cycle users. The Audit also recognises that the crossing of Manor Way is suitable for Level 2 cyclists. The 2007 UTP notes that the links between Maxwell Park and Kenilworth Park have been completed to Greenway standard, however, site observations would suggest that further work is required in terms of accessibility to the facilities.

Issues have been raised regarding parking and speeding along Bullhead Road, currently subject to a 30mph speed limit. Data has indicated that speeds are not excessive on Bullhead Road with a 24 hour 85th percentile average of 29mph northbound and 30mph southbound. The perception of high speed remains and coupled with extensive verge parking (observed on site), the environment is regarded as unfavourable for pedestrians and cyclists. There is also concern regarding parking along Manor Way which is considered to obscure visibility of oncoming traffic at the pedestrian crossing adjacent to the Kenilworth Park access on Manor Way.

Figure 2 – Manor Road looking west from Kenilworth Park access

Figure 3 – Bullhead Road looking west towards Maxwell Park

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
8.1	Cycle crossings / speed tables / build-outs on Manor Way (traffic to have priority)	This measure features improvements to the existing crossing point on Manor Way, located at the access to Kenilworth Park. The scheme involves widening the footway on the eastern side to improve visibility for pedestrians and cyclists crossing Manor Way from Kenilworth Park (see **Figure 7**) Access to Kenilworth Park would require improvements as the current arrangement has poor facility for cyclists and mobility impaired users. The replacement of the kissing gate with an A-frame barrier or bollards would deter motorcycle use and provide a better facility for all other users. Deliverability – 1 to 2 years **STANDARD**	**£40,000-£60,000**
8.2	Address cycle provision on Bullhead Road - park link (dog-leg approach)	The link from Kenilworth Park to Maxwell Park requires crossing Bullhead Road via a dog-leg. The recommended measure includes the provision of a raised table crossing with shared use facilities either side connecting to the park and the link to Manor Way (see **Figure 8**). The shared use facilities can be catered on the	**£40,000-£60,000**

		west side of Bullhead Road between the crossing and Maxwell Park as there is currently a 4.0m footway. The recommended minimum for shared use facilities is 2.0m as defined in Roads in Hertfordshire Design Guidance and there is ample room to provide a facility (see **Figure 5**). Deliverability – 1 to 2 years **STANDARD**	

Supporting Evidence of Measures/Components

Ramp gradients are to be provided in accordance with Roads in Hertfordshire Design Guidance (Section 14.2), with a 65mm table top height and 1:20 gradient for the Manor Way table and a 75mm height / 1:20 gradient for the Bullhead Road table (see **Figure 4**). Buses serve Manor Way so a longer table is suggested to improve comfort for bus patrons. Humps should also be sinusoidal in profile so they also provide comfort for cyclists using the route.

Nominal height	Ramp gradient:	10%(1:10)	6.7%(1:15)	5%(1:20)
75 mm	Ramp length:	750mm	1125mm	1500mm
65 mm	Ramp length:	650mm	975mm	1300mm

Figure 4 – Road hump height

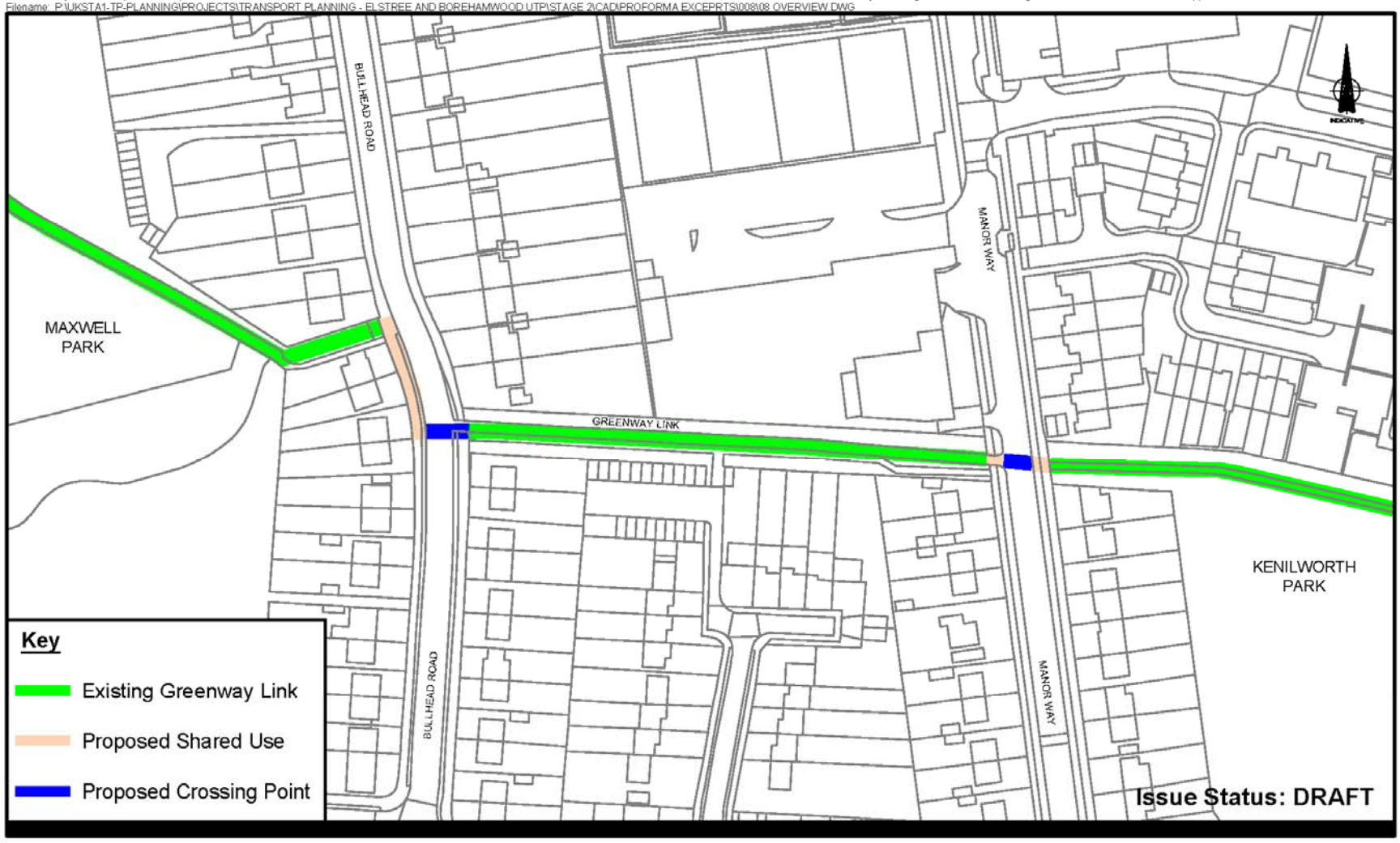
Cycle bypasses were considered for the Bullhead Road facility; however, this has been discounted as a suitable width bypass (minimum 1.2m) could not be provided.

The provision of the shared use facility on Bullhead Road can be provided according to Roads in Hertfordshire Design Guidance (Section 12.9.4) – see Figure 4.

	One Way	Two Way
Recommended	3m	3m
Acceptable Limits	2.5m	2.5m
Absolute Limits	2m *	

Figure 5 – Shared Track Widths

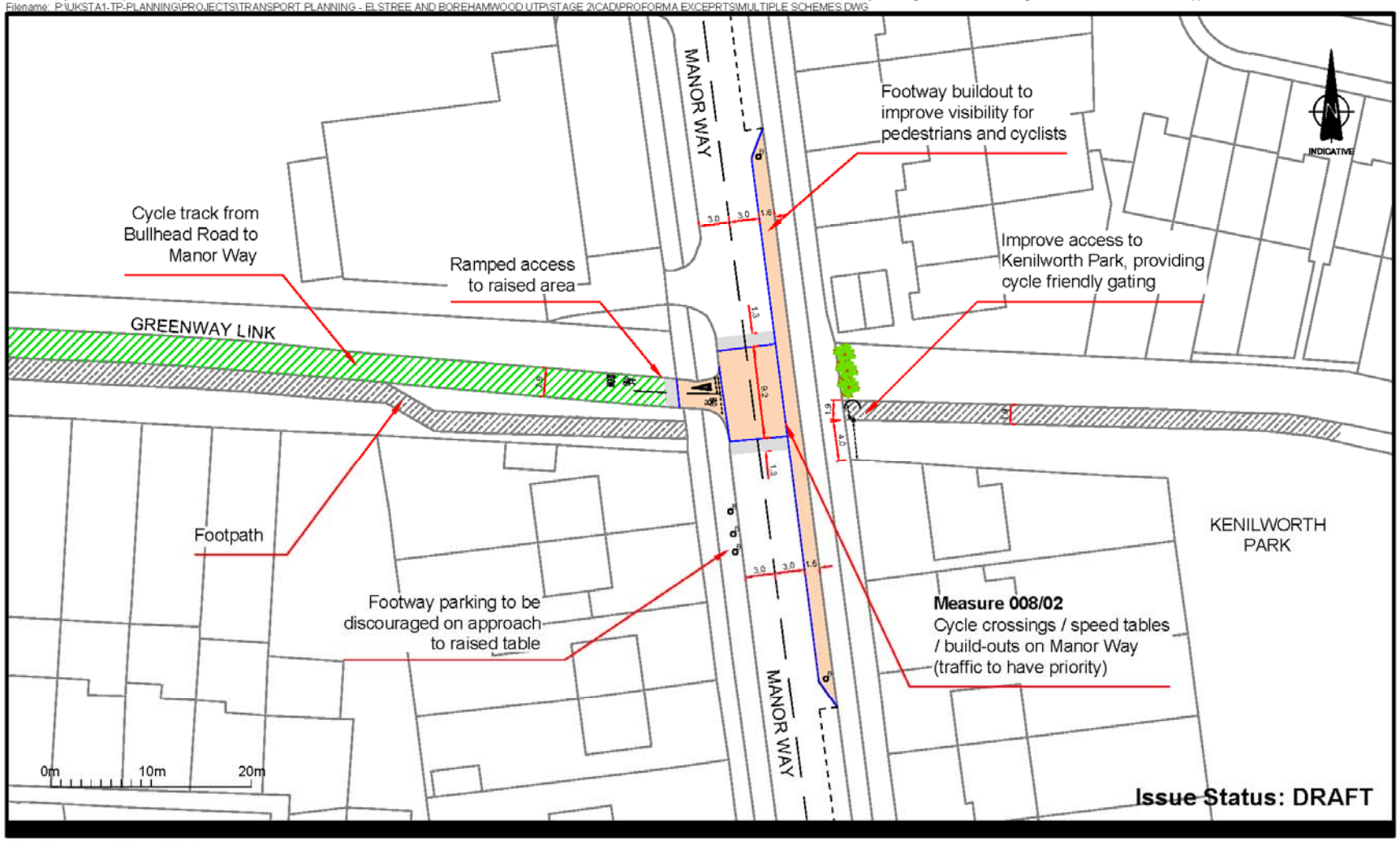
Last saved by: ARTISM1(2013-01-09) Last Plotted: 2013-01-11 Project Management Initials: Designer: MJA Checked: SW Approved: JA ISO A4 210mm x 297mm
Filename: P:\UKSTA1-TP-PLANNING\PROJECTS\TRANSPORT PLANNING - ELSTREE AND BOREHAMWOOD UTP\STAGE 2\CAD\PROFORMA EXCERPTS\008\08 OVERVIEW.DWG



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

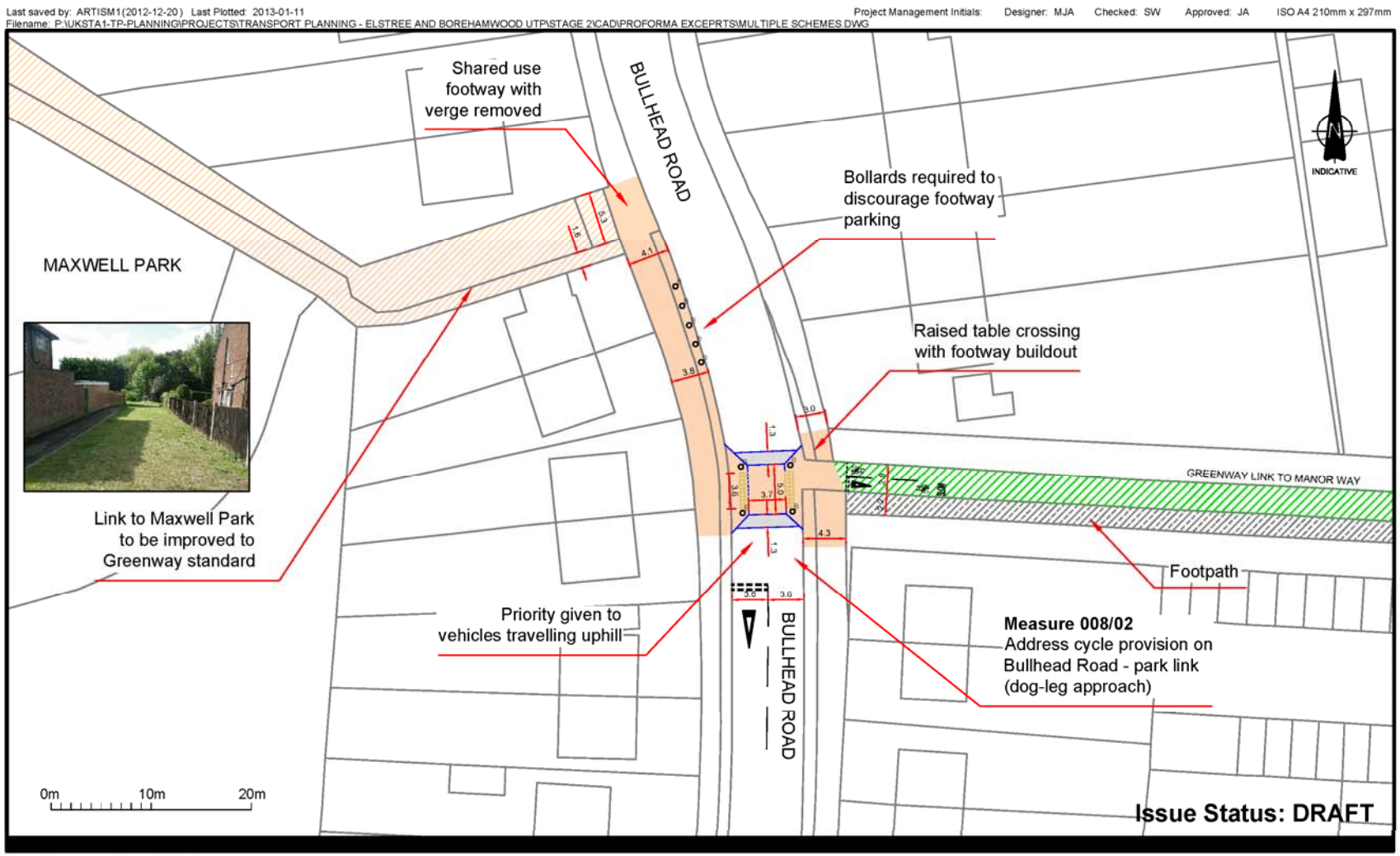
Figure 6 - Maxwell Park - Kenilworth Park Greenway Link

Borehamwood and Elstree UTP
Scheme Proforma 08



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 7 - Manor Way



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 8 - Bullhead Road

Preferred Option
It is recommended that both components are progressed to provide improved permeability and access for pedestrians and cycles from Kenilworth Park to Maxwell Park. The route has the potential to link communities with the centre of Borehamwood and Shenley Road and the provision of improved cycling and walking facilities may help to improve sustainable connections within the town.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
8.1	£40,000-£60,000	
8.2	£40,000-£60,000	
TOTAL COST FOR DELIVERY	**£80,000-£120,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	
Other Information/Additional Notes: Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.	

Scheme Name	**Elstree Way East Cycle Gateway** Cycling	
Scheme Reference	09	
Problem References	CY06	Rowley Lane/Elstree Way one-way system - cycle route
	CY09	Low proportion of cycle to work trips within and between towns
	CY13	Cycle Signing and Wayfinding
	CY15	Borehamwood east-west corridor
	CY17	Elstree Way cycle lanes and tracks
Links to other UTP schemes:		07

Context

Figure 1 – Scheme Location

The A5135 Elstree Way is the main distributor road through the centre of Borehamwood, connecting the A1 Barnet Bypass with the B5378 Shenley Road. The corridor serves the residential areas to the north via Studio Way and the south via Manor Way, Warwick Road and Bullhead Road. The Elstree Way Employment Area is considered to be an important contributor to the creation of sustainable development and the land adjoining the Elstree Way Employment Area, between the A1 and Rowley Lane, is designated as Safeguarded Land for a mix of development (Hertsmere BC Revised Core Strategy, 2011 – Policy CS9).

Policy CS22 of the HBC Core Strategy states that development of Elstree Way will be actively encouraged and that "development should also provide active frontages to Elstree Way where possible to promote the identity of the corridor as a civic and commercial gateway to the borough, should build on the accessibility location of the corridor".

The Elstree Way Corridor Study, completed by Colin Buchanan in 2010, identified that the 'feel' of the town centre should be improved up to the Studio Way roundabouts and involves taming the vehicular dominance of the road. AECOM are currently undertaking the preliminary design of a scheme to remove the roundabout at Elstree Way / Brook Street / Shenley Road and improve conditions along the section of Elstree Way from this junction to Studio Way. Outline proposals include the provision of 2.0m wide on-carriageway cycle lanes as well as off-carriageway schemes.

The Roads in Hertfordshire Design Guidance (RiHDG) states the reallocation of road space as the 4th choice measure in provision of cycle facilities, with traffic speed reduction (1st), traffic volume reduction (2nd) and junction and traffic management (3rd) to be used if possible. The Average Annual Daily Flow of vehicles along Elstree Way was recorded at 16,555 in 2010 (Elstree & Borehamwood Data Report, 2012), suggesting that off-carriageway facilities are required; however, the provision of on-carriageway facilities can be considered if provided as mandatory lanes.

This proforma deals with the section of Elstree Way from Studio Way to Rowley Lane, including the gyratory at the eastern extent. Elstree Way splits off onto Rowley Lane into a gyratory with a discontinuous cycle route which is confusing and potentially hazardous to cyclists (see **Figure 1**). Cycle lane widths are below the acceptable 1.5m limit (RiHDG) of throughout the link. Existing evidence notes that 0.8% of in-commuters to Borehamwood use cycling as a method for getting to work, with 85.5% arriving by car. Travel to work within Borehamwood by cycle is only at 1.3% (Census, 2001).

Figure 2 - Rowley Lane junction

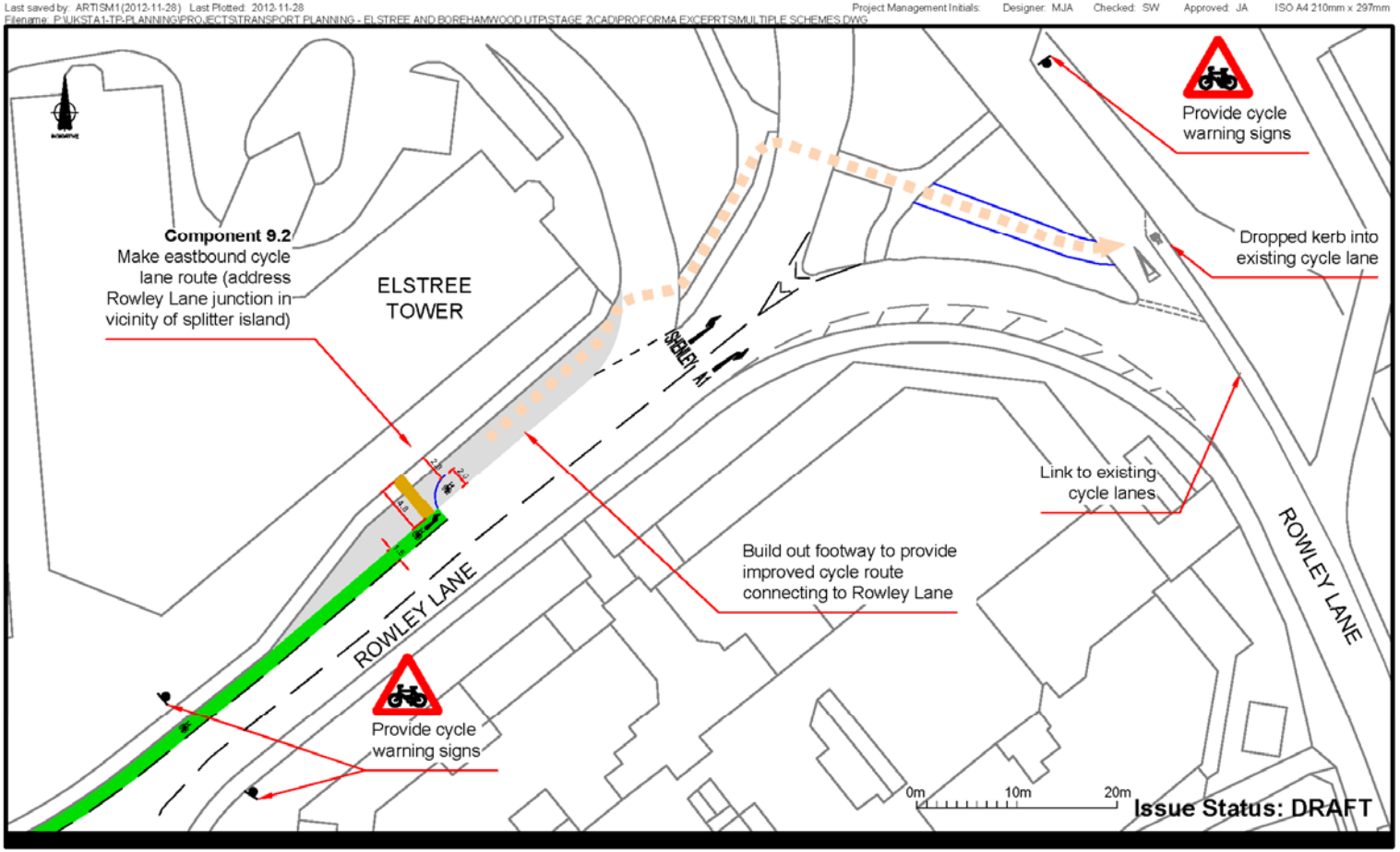
Figure 3 - Rowley Lane (view towards Elstree Way, Borehamwood)

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
9.1	Increase cycle lane widths	Observations on site have recorded cycle lanes at 1.2m which are considered to be sub-standard according to the Roads in Hertfordshire Design Guidance. However, it is recognised that to implement 1.5m cycle lanes, footway widening would be required. HCC has recognised that this would have excessive costs for the section of Elstree Way between Rowley Lane and Studio Way / Manor Way and the refresh of lining would suffice. The on-carriageway facility will be consistent, continuous and direct and feed into the link to the Town Centre, from Studio Way – mirroring the proposed scheme to provide on-carriageway cycle lanes through this section. Deliverability: more than 2 years **STANDARD**	**£4,000-£5,000**

9.2	Make eastbound cycle lane route (address Rowley Lane junction in vicinity of splitter island)	The facility around the gyratory to the east of Elstree Way and at the junction of Rowley Lane is currently difficult to navigate for cyclists. The existing arrangement requires cyclists to use off-carriageway facilities to continue east and is convoluted. The proposal contains two measures: a) Maintain off-carriageway provision due to the speeds and volume of traffic on the carriageway. Cycle lanes will continue from Elstree Way and then cyclists will be directed onto the extended footway in front of Elstree Tower. Cyclists can then cross the two slip roads onto the splitter island on Rowley Lane where they will rejoin the main carriageway (see **Figure 4**). Warning signs to TSRGD Diag. No. 950 will highlight the presence of cyclists for vehicles on all approaches. Whilst it is recognised that cyclists will have to leave the carriageway to navigate the bend, it is noted that provision of a suitable on-carriageway facility is difficult to achieve without vehicle volume or vehicle speed reduction. b) Reduce the gyratory to a single lane, re-distributing the available carriageway to provide a 1.5m cycle lane and 3.5m running lane (**Figure 5**). The traffic lane will increase around the bend due to movements of large vehicles. This measure allows cyclists to remain on the carriageway whilst circulating the gyratory. The nearside to offside manoeuvre is removed as cyclists remain nearside with the left turn accesses to Elstree Tower and Rowley Lane retained but with added protection of cycle lanes. The provision of these facilities will improve the conditions for cyclists travelling east from Borehamwood and raise awareness of their presence to other road users. Deliverability: 1 to 2 years **STANDARD**	**a) £22,000-£30,000** **b) 65,000-£80,000**
9.3	Improve westbound cycle lane route (improve jug-handle commencement of	The crossing of Rowley Lane close to the Holiday Inn, requires improvements due to lack of suitable facilities in this location. **Figure 3** illustrates a sub-standard exit facility for cyclists into cycle lanes that are less than the recommended minimum	**£30,000 -£40,000**

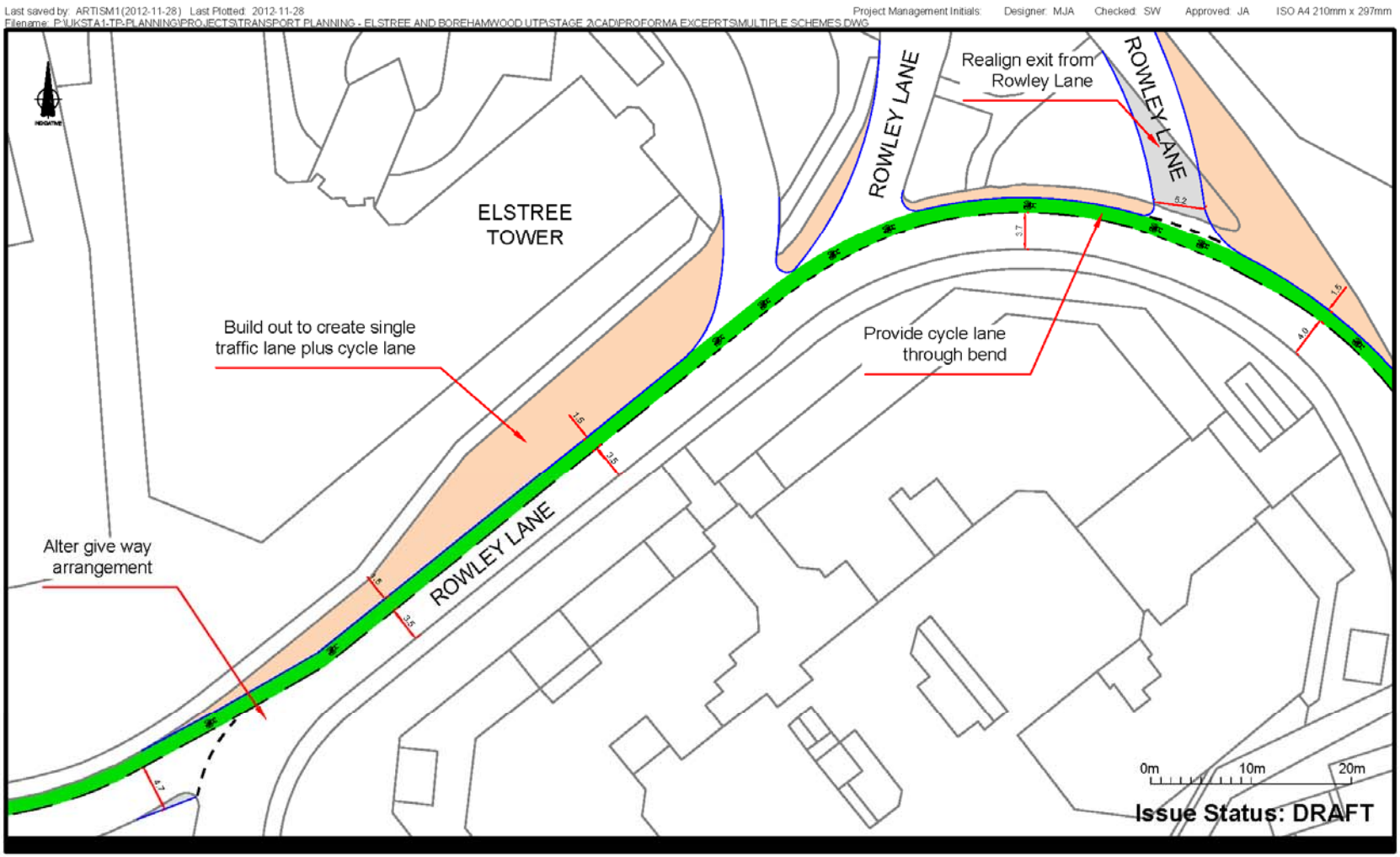
	cycle lane)	width of 1.5m. It is noted that the existing cycle lanes are less than 1.5m throughout the link through to Elstree Way and due to the excessive cost of re-widening although it is recognised that the 1.2m to 1.4m cycle lanes are appropriate. General traffic lanes would remain at 3.0m to 3.1m with a refreshed set of cycle lane markings and signing added. See **Figure 6** for details. Deliverability: 1 to 2 years STANDARD	
9.4	Provide combined east/westbound off-road cycle route	The provision of a shared use off-carriageway cycle facility should be considered last on the hierarchy of cycle provision due to the potential conflict between pedestrians and cyclists. Shared use or segregated footways could be implemented between Studio Way and Rowley Lane in both directions but this facility would not be as continuous or direct as on-carriageway facilities. Any proposals would need to reflect the changes being undertaken as part of the ongoing Elstree Way Corridor scheme to the west of Manor Way / Studio Way. Side roads to industrial parks and units provide challenges to provision of direct, comfortable and continuous cycle facilities. Entry treatments could be used to negate the transition across the side roads; however, due to the frequency of HGVs using Manor Way, York Crescent and Warwick Road, entry treatments may not be appropriate at these locations. Deliverability: 1 to 2 years STANDARD	**£200,000 - £220,000**

Supporting Evidence of Measures/Components



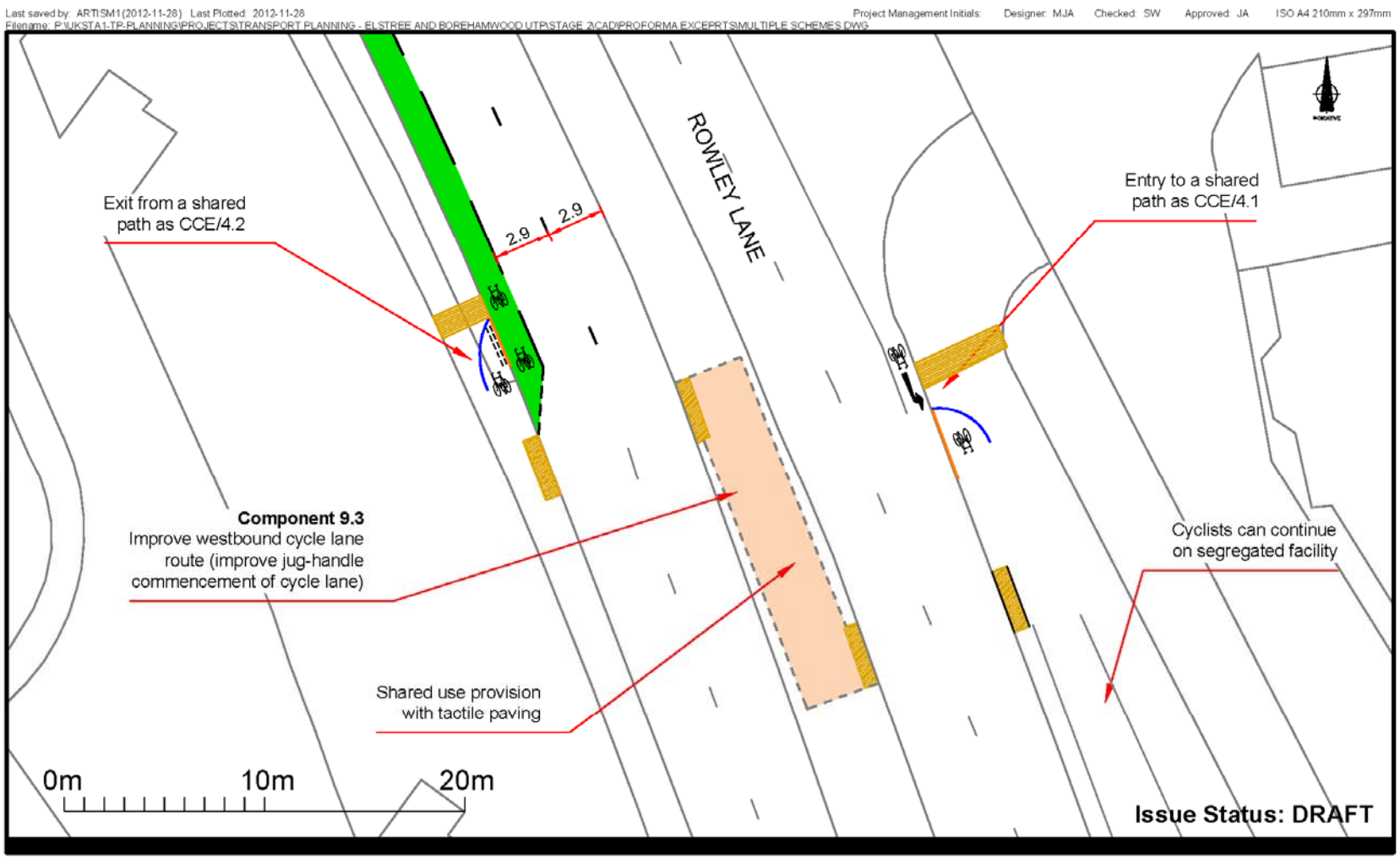
Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 4



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 5



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 6

Preferred Option
A combination of Components 9.1, 9.2 and 9.3 is preferred to provide a continuous and direct cycle route along Rowley Lane and Elstree Way. Component 9.4 is to be considered only if other components cannot be implemented due to site constraints or similar circumstances and may be required in order to be compatible with emerging proposals for Elstree Way Corridor which are currently in development by HBC.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
9.1	£ 4,000- £ 5,000	
9.2a	£ 22,000 – £ 30,000	
9.2b	£ 65,000 – £ 80,000	
9.3	£ 30,000 – £ 40,000	
9.4	£ 200,000 – £ 220,000	
TOTAL COST FOR DELIVERY	**£ 321,000 – £ 375,000**	

Maintenance Liability	~~High~~ Medium Low	*Normal maintenance for footway work, green surfacing and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	AECOM on behalf of HBC are progressing a scheme to provide cycle facilities to the west of Studio Way as part of the Elstree Way corridor development. Any scheme taken forward from this proforma should ensure that it links to these proposals to ensure delivery of consistent facilities.

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Well End-Borehamwood Sustainable Connections** Cycling	
Scheme Reference	10	
Problem References	CY04	Rowley Lane-Hertswood School Links
	CY09	Low proportion of cycle to work trips within and between towns
	CY13	Cycle Signing and Wayfinding
	HC06	High car dependency for inter-town trips
Links to other UTP schemes:		20, 21

Context

Figure 1 – Scheme Location

Well End is a residential area in the east of Borehamwood bounded by Potters Lane to the north, Rowley lane to the east, Elstree Way A5135 to the south, and Shenley Road B5378 to the West. Studio Way and Denham way are the two routes running through the area, with many residential side road cul-de-sacs leading off.

Currently, there are few through routes for cyclists in the area linking residential areas with the town centre, station and schools. Existing routes along the road carriageway are not direct and connect poorly with existing facilities. It is important that cycle facilities connect together to create a network for journeys of varying length and destination. The cycle routes that are present need modification to meet standards set out in the Roads in Hertfordshire: Highway Design Guide. The route widths are not adequate and obstructions have been identified. Several existing cut-through routes exist within the residential area from Rowley Lane to Denham Way and Studio Lane and from Studio Way to Shenley Road Though these are currently footpaths, with modification there is potential for use as cycle facilities.

Cycle facilities need to consider the following when being designed in order to be most effective (Cycle Infrastructure Guidance, Department for Transport) :

- Convenient: routes should serve key destinations, be direct and quick. They should be well marked and signed.
- Accessible: Routes should be continuous, linked up, and provide benefits over private motor vehicle transport.
- Safe: routes and facilities should be perceived to be safe, particularly in relation to motor vehicle traffic.
- Comfort: cycle routes should meet standards for width, surface condition and gradient and cater for all users. Paths should be well maintained and dropped kerbs and tactile paving provided where necessary.
- Attractive: facilities should be integrated with the surrounding environment and aesthetically attractive making people want to stay and use the facility.

The Roads in Hertfordshire Design Guidance (RiHDG) states the reallocation of road space as the 4th choice measure in provision of cycle facilities, with traffic speed reduction (1st), traffic volume reduction (2nd) and junction and traffic management (3rd) to be used if possible. Off-road cycle tracks are to be suggested in Well End where cycle routes follow existing road routes to provide continuity and cater for all cyclist types.

Only 0.8% of journeys to work within Borehamwood are undertaken by bicycle (Census, 2001). A more connected network of cycle facilities would encourage journeys to be made by bicycle. The proximity of Well End to Borehamwood town centre, Hertswood Lower and Upper Schools and Hertsmere Leisure Centre make it an area of potential high cycle usage which could be encouraged by the provision of suitable facilities.

Measures/Components

Ref	Description	Assessment of Suitability	Cost
10.1	Rowley Lane-Denham Way - make route cycle compliant	An existing footpath links Rowley Lane with Denham Way which could be upgraded to a compliant shared use track for cyclists and pedestrians (see **Figure 5**). Currently the path is not of the required width set out in LTN 1/12 which requires a minimum effective width of 3.0m. However, the relatively low flow of pedestrians and cyclists would mean that this section is adequate. Access control facilities should be modified, using bollards or A-frames to allow cycle access, but prevent car or van entry without impeding the access of cycles. Currently, access control is gated, though bollards would allow a less interrupted cycle journey. Presently, the surfacing of the route is poor and resurfacing and vegetation trimming should occur to make the track compliant.	**£15,000-£25,000**

		Implementation of this route would allow a cut through for cyclists across the residential area using a more direct and safe route than is currently offered by on-carriageway cycling. Deliverability: 1 to 2 years SIMPLE	
10.2	Denham Way-Potters Way offroad shared cycle/footpath provision and crossing facilities	10.2a) To link Well End and the Rowley Lane to Denham Road cycle link to the proposed cycle facilities at the Cowley Hill/Shenley Road roundabout, an off-carriageway shared facility is proposed. This route also links Well End with Hertswood Lower School and Hertsmere Leisure Centre. The route is shown in **Figure 5**, and would run along the north side of Potters Lane and Denham Way along the existing footway. For implementation of this route, tactile paving and dropped kerbs are necessary at each of the four side road junctions on Denham Way to create comfortable and continuous facilities and aid usage by the disabled and visually impaired. Where the route crosses Potters Lane at the Potters Lane/Denham Way roundabout, a raised table is proposed. This raises the profile of the shared use crossing and reduces speed of traffic at that point, increasing the safety and perception of safely of the facility (see **Figure 6**). A facility linking Denham Way with Cowley Hill allows continuous trips and a linking of cycle facilities allowing a wide range of journeys. This facility also links Well End with Hertswood School, promoting cycling as a sustainable mode of transport to school for pupils and staff. 10.2b) A second option to link Rowley Lane and Potters Lane is proposed via the footway that runs from Denham Way to Balcon Way. This footpath is shown on **Figure 5** as an alternative route. Deliverability: 1 to 2 years STANDARD	**£40,000-£50,000**
10.3	Rowley Lane-Studio Way-Shenley Road link - make route cycle compliant (potential relocation of bus stop on	The third route links Rowley Lane and Studio Way with Shenley Road (see **Figure 2**). Similarly to the cycle track between Rowley Lane and Denham Way, this route is not of required width for a shared use facility and the surface is of poor quality (see **Figure 3**). Widening, resurfacing and	**£80,000-£110,000**

	Studio Way)	vegetation trimming would be necessary for this route to comply with cycle regulations set out by the DfT. At present, the footpath joins Studio Way at the rear of a bus stop including a bus shelter and litter bin. This creates a pinch point and a conflict between footway pedestrians, users of the existing footpath and the boarding zone of the bus stop. It is proposed that the bus stop is re-located downstream in order to remove the point of conflict including provision of DDA (Kassel kerbing) and a revised clearway. A second section of the route (see Route 3 in **Figure 5**) links Studio Way with Shenley Road. This route again needs widening and a barrier to ensure it complies with regulations. A link between these two routes (marked in red in **Figure 5**) should be investigated, though signage is recommended to direct cyclists to Route 3 using the carriageway of Studio Way. This route provides a direct link towards Hertsmere Leisure Centre and Hertswood Upper School campus on Shenley Road, encouraging cycling within Borehamwood. Deliverability: 1 to 2 years **STANDARD**	

Supporting Evidence of Measures/Components

Figure 2: Existing footpath between Rowley Lane and Denham Way.

Figure 3: Existing footpath linking Rowley Lane with Studio Way.

Figure 4: Signage to link routes 2 and 3 along Studio Way using 'Town Centre' as destination text and omitting national cycle network patch. (TSRGD, 2602.1)

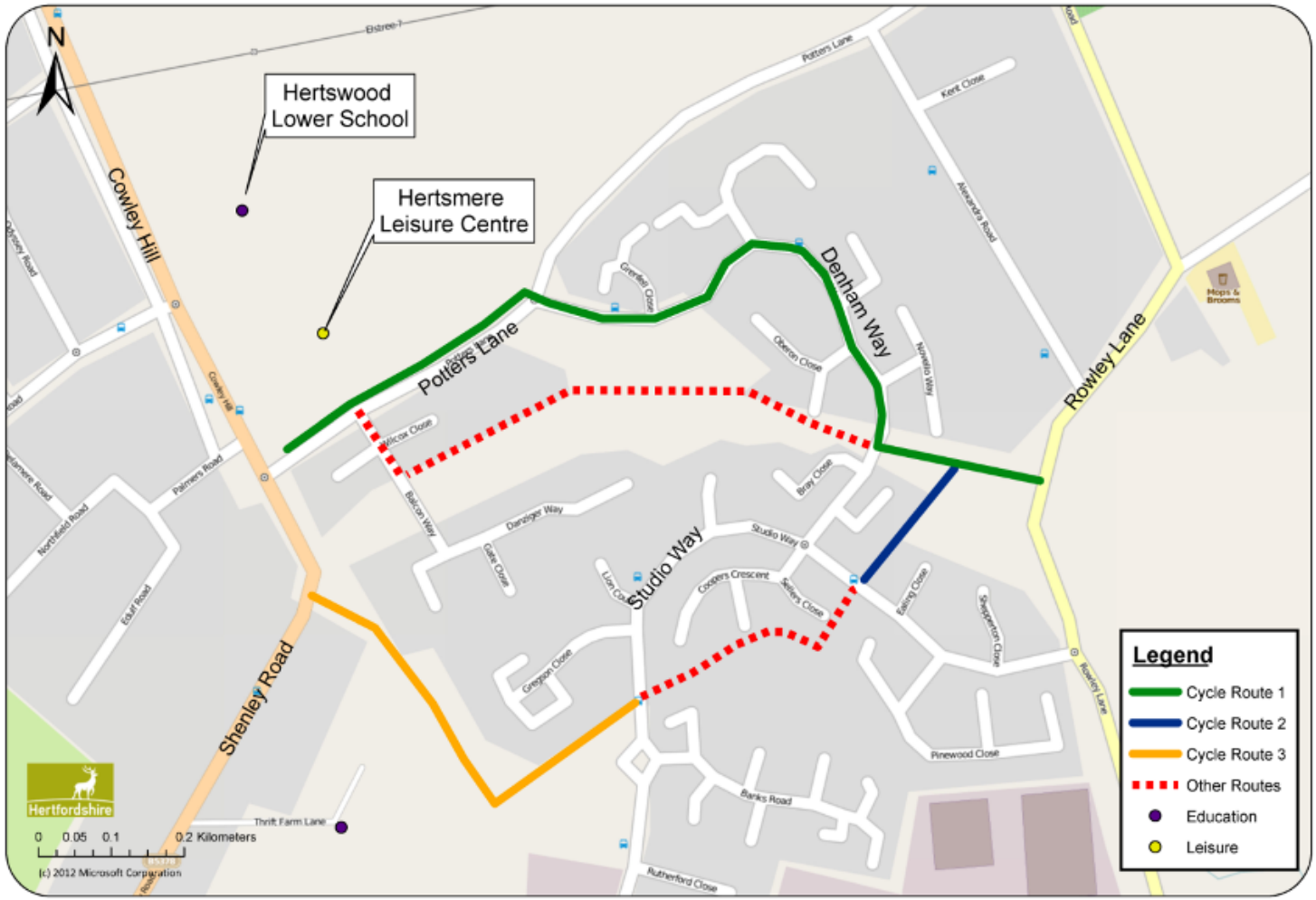
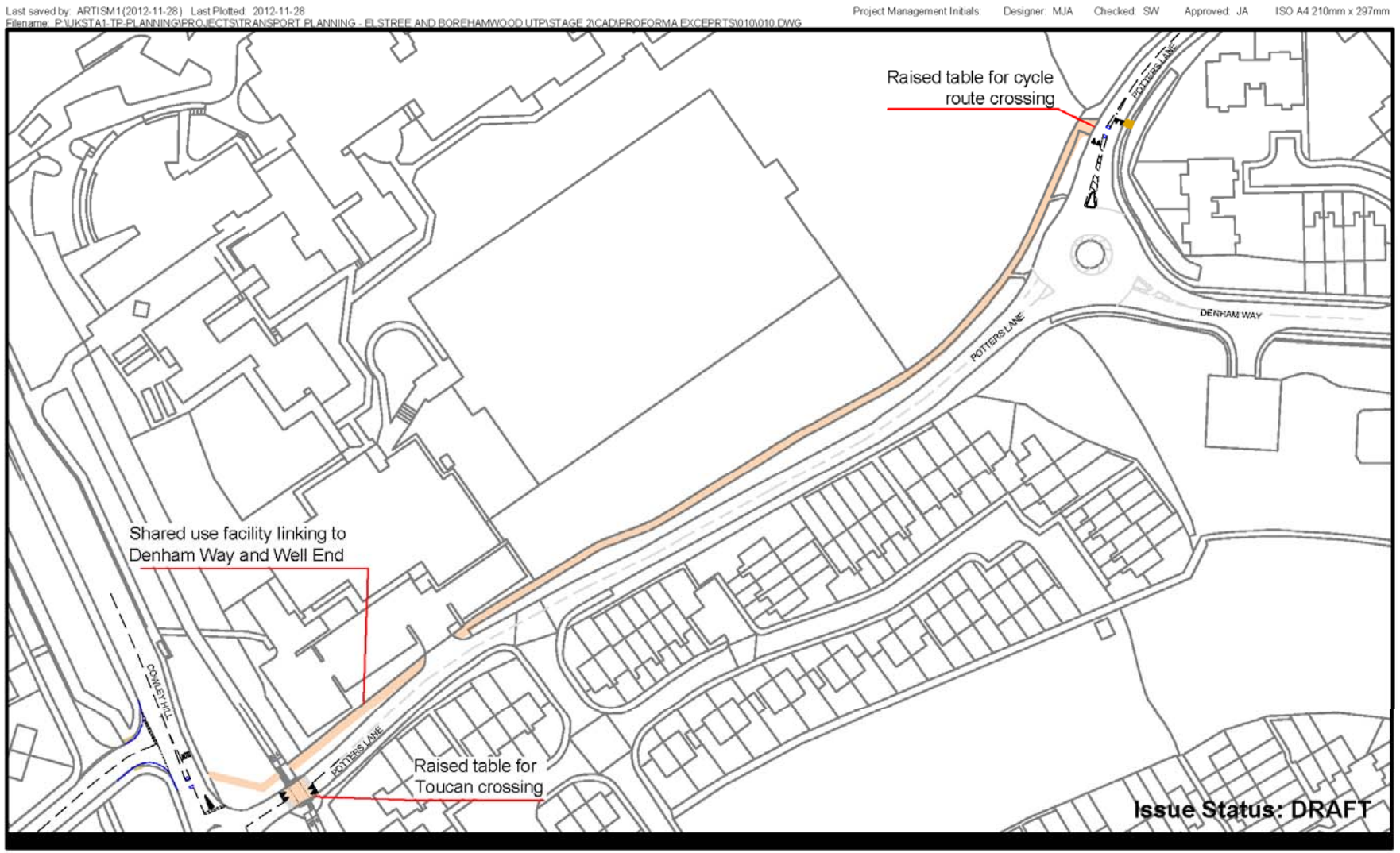


Figure 5: Cycle Connection Routes

Borehamwood and Elstree UTP
Scheme Proforma 10



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 6

Preferred Option
A combination of the proposed component measures is preferred. The routes are designed to act as a network to enable a greater number of journeys from Well End to be undertaken by bicycle using cycle facilities, however all solutions provide benefits individually to the area. Options could be implemented within two years.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
10.1	£15,000 - £25,000	
10.2	£40,000 - £50,000	
10.3	£80,000 - £110,000	
TOTAL COST FOR DELIVERY	**£135,000 – £185,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Stirling Corner Roundabout – Safer Navigation for Pedestrians and Cyclists** Walking / Cycling / Highways and Congestion	
Scheme Reference	11	
Problem References	HC10	Stirling Corner – exit from roundabout/entry to mobile homes site potential speed and safety issue
	CY18	Cycle facilities at roundabouts
	CY25	Stirling Corner cycling environment
	WA04	Pedestrian crossing facilities at Stirling Corner roundabout
Links to other UTP schemes:		N/A

Context

Figure 1 – Scheme Location

The Stirling Corner junction is situated on the south eastern edge of Borehamwood and has five arms:

1) A1 Barnet Bypass from the north (the M25, Hertfordshire, The North);

2) A411 Barnet Road from the east (Barnet);

3) A1 Barnet Bypass from the south (North London);

4) Barnet Lane from the west (Borehamwood), and;

5) Stirling Way (access to an industrial area and Morrison's supermarket).

The A1 is of particular importance as a major trunk route linking London and the North. The A411 runs broadly east-west linking Watford and Barnet, running across the southern edge of

Borehamwood.

The junction is largely outside of Hertfordshire, with only the A411 Barnet Lane arm within the county and therefore not managed by Hertfordshire County Council as local highway authority. The junction itself is managed by Transport for London (TfL) and Barnet Borough Council as local highway authority. The A1 north and south of the junction forms part of the TfL Red Route network of major roads.

The roundabout operates under part-time traffic signals at the A1 Barnet Bypass (north) arm, the A411 Barnet Road (east) arm and the A1 Barnet Bypass (south arm). Signals are in operation during peak times only. Additional lane markings have now been implemented on the western non-signalised section of the circulatory carriageway, marking three/four lanes, with the intention of helping towards the management of traffic.

Figure 2 – A411 Barnet Lane (Borehamwood) – traffic approaching the Stirling Corner junction

TfL undertook a trial removal of traffic signals in 2011, however, journey times and queuing was found to increase as a consequence. In conclusion, TfL has retained the traffic signals on a part-time basis. There have been calls by local residents and motorists for TfL to operate the signals on a 24-hour basis.

Pedestrian and cyclist crossings are provided at each arm of the junction however none of the crossing points are signal-controlled. During peak times, heavy traffic volumes pose a significant risk to pedestrians and cyclists, and act as a barrier and deterrent. At less busy times of the day, risks may be posed by traffic travelling through the junction at higher speeds. Whilst the junction is on the edge of Borehamwood, there are a number of land uses surrounding the junction which could generate pedestrian and cyclist movements and therefore consideration needs to be given towards the condition of these facilities.

An off-road cycle track runs north-south on the eastern side of the A1 and traverses the junction on all arms.

There are a number of different land uses surrounding the junction:

- supermarket on the north western side;
- petrol filling station on the north eastern side;
- restaurant and mobile home park on the southern eastern side; and
- a mobile home park and a row of residences on the south western side.

All of these land uses could contribute towards traffic generation and potentially pedestrian and cyclist movements. The south-western mobile home park (the site of which straddles the

Hertsmere / Barnet border) is accessed via a priority T-junction immediately after the exit from the roundabout on the A411 Barnet Lane.

Several issues have been identified at the Stirling Corner roundabout, and it was recognised in the 2007 Borehamwood and Elstree Urban Transport Plan which highlighted it as a hazardous site. Issues recognised as part of this process include poor cycling and pedestrian crossing facilities, and a specific concern regarding the vehicle access to the south western mobile home park on the A411 Barnet Lane (west arm) where traffic which is exiting the junction and entering the mobile home park does not have sufficient time to signal therefore notifying drivers behind of the intended manoeuvre, with the potential risk of rear-end shunt type accidents.

Addressing all of the issues at this busy and strategically important junction would require a joint approach between all interested authorities including Hertfordshire County Council, TfL, Barnet Borough Council and also potentially the Highways Agency who manages the A1 north of the A5183 Rowley Lane grade-separated junction. Such an approach should be explored in the long-term as traffic flows are unlikely to reduce and problems which occur at present may intensify in future years.

This scheme proforma instead focuses on small-scale interventions dealing with affect only the A411 Barnet Lane (west) arm. The interventions comprise of two optional components which are described below and deal specifically with pedestrian/cyclist crossing and mobile home park access issues discussed above.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
11.1	*Increase the size of the splitter island to improve cycle/pedestrian crossing facilities.*	 *Figure 3 - A411 Barnet Lane exit (looking towards entry and supermarket beyond)* This measure involves the increase in size of the splitter island on the island's south-western and western faces, thus reducing the width of the running carriageway on the exit. The purpose of increasing the size of the island is to allow for the realignment of the pedestrian and cyclist crossing route. The lamp post will therefore no longer form an obstruction and as a consquence of shifting the track over the length of the waiting area is maintained. Tactile paving will be introduced at both ends of the track on the splitter island. The track should be 1.5m wide.	**£5,000 - £10,000**

Increasing the size of the splitter island should not infringe upon exit width requirements at roundabouts as stipulated in DMRB TD16/07 (**Figure 7/8**). The current exit width is approximately 8.6m and DMRB recommends a minimum of 7.0m-7.5m. The crossing distance will be reduced as a consequence of this measure which could give greater confidence to pedestrians and cyclists. The footway/cycleway approach on the northern side of Barnet Lane (the nearside to the entry) will be realigned approximately 1m westwards and widened to 1.5m. Tactile paving will also be introduced in line with Guidance for the use of Tactile Paving Surfaces (1999).

Consideration will need to be given to the presence of utilities adjacent to the existing footway/cycleway. Tactile paving will also be introduced on the southern side of Barnet Lane (nearside to the exit). This increased size of the splitter island will prevent motorists from turning right from the mobile home park. Where this has been observed, it is recognised that the rear end of cars encroaches into the exit carriageway from the roundabout, and this may therefore increase the risk of accidents.

Figure 4 - Splitter island on A411 Barnet Lane (west) arm. Obstruction across the cycle path. Only a small area for cyclists/pedestrians to wait.

Furthermore, tactile paving will also be introduced on the Stirling Way arm (nearside and offside entry and exit) with a minimum crossing width of 1.2m.

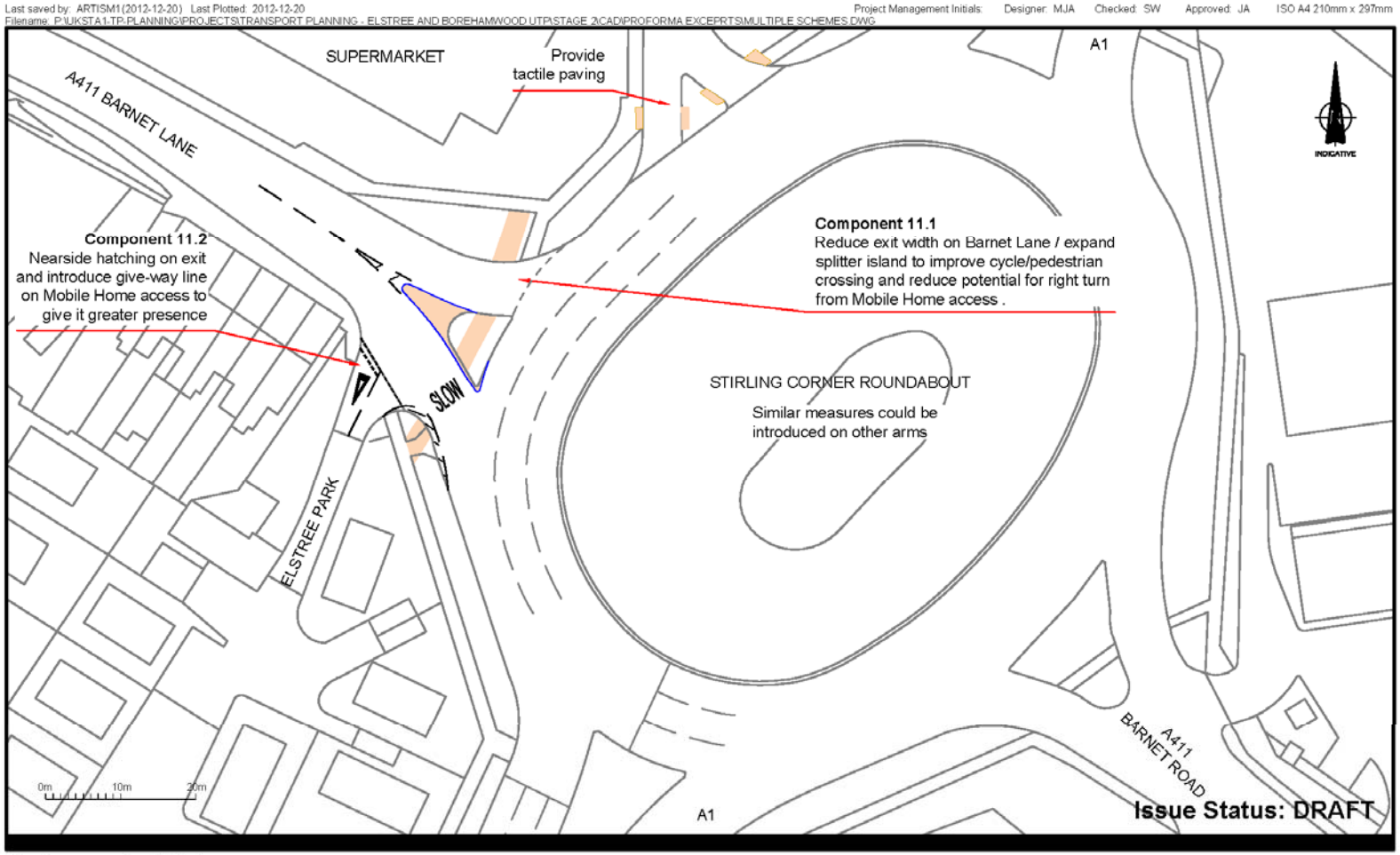
		Deliverability – Within 1 year **SIMPLE**	
11.2	*Nearside hatching on exit, introduce give-way line on Mobile Home Park access to give it greater presence, introduce red-coloured surfacing within hatching area (Fig 6)*	 *Figure 5 – Accessibility issues at south-western mobile home site on the Barnet Lane arm of Stirling Corner Roundabout.* The mobile home access point is situated immediately adjacent to the A411 Barnet Lane exit of Stirling Corner roundabout. This measure is aimed at increasing the presence of the access. The introduction of give-way markings and nearside hatching, extending between the outer edge of the roundabout circulatory carriageway and the nearside entry kerbline of the park access will improve visibility of the access. The new hatching could be provided in combination with red-coloured surfacing and in accordance with advice set out in DMRB TA81/99. The existing hatching provided adjacent to the splitter island would also be subject to coloured surface treatment for continuity. The small area of nearside hatching will give the mobile home access point a greater presence by means of a minor deflection. Deliverability – Within 1 year **SIMPLE**	**£2,000 - £5,000**

Supporting Evidence of Measures/Components

The 2007 Borehamwood and Elstree Urban Transport Plan, provides a framework to focus transport improvements and manage congestion in Borehamwood and Elstree over the next five years.

The Consultation on the trial removal of the traffic signals located at Stirling Corner roundabout on the TfL network – Consultation Report (2011) (TfL Streets) provides an overview of a scheme undertaken by TfL in 2011 at the Stirling Corner roundabout. TfL are responsible for maintaining and operating traffic signals across Greater London.

Road safety consultation on 'absolutely lethal' Stirling Corner, Borehamwood Times (2012).



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 6 - Stirling Corner

Preferred Option
The two components are closely interlinked and the preferred option would be to implement them both together, however, they could work independently. In combination, the two components could help to reduce vehicle speeds on the exit, provide greater presence to the mobile home park access and improve the pedestrian and cycle crossing facilities.

Contribution to Objectives / Indicators	UTP Objectives	• Support economic growth and local housing development through the delivery of transport improvements. • Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities. • Promote active travel modes throughout the study area to encourage active and healthy lifestyles. • Reduce congestion at key traffic hotspots throughout the study area.

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
11.1	£5,000 - £10,000	
11.2	£2,000 - £5,000	
TOTAL COST FOR DELIVERY	**£7,000 - £15,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works, red surfacing and signing*

Deliverability of Preferred Option	**Simple – 'quick win', could be delivered within 1 year**
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~

Delivery Issues	*No immediate delivery risks are recognised however the junction is heavily trafficked and implementing the measures is likely to cause some short-term disruption. There is no visible trace of Statutory Undertakers Plant at the location of the component measures.*

Other Information / Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Cycle parking at Key Local Facilities (Borehamwood)** Cycling and Accessibility	
Scheme Reference	12	
Problem References	CY02	Manor Way shops cycle parking
	CY03	Leeming Road shops – cycle parking
	CY05	Hartforde Road shops – cycle parking
	CY07	Rossington Avenue shops – cycle parking
	CY09	Low proportion of cycle to work trips within and between towns
	CY13	Cycle Signing and Wayfinding
	CY16	Manor Way cycle on-road facilities
Links to other UTP schemes:		21

Context

Figure 1 – Location of Borehamwood Local Shopping Parades

There is a lack of cycle parking facilities at local shopping parades in Borehamwood. The introduction of dedicated, easy to use, convenient and secure cycle parking facilities can encourage more sustainable travel behaviour and may be a viable alternative to the car for some journeys.

The Hertfordshire County Council (HCC) Cycle Parking Guide emphasises a number of key principles for the provision and location of cycle parking facilities:

- ***Visible*:** Cycle parking should be easy to find and well signed.

- ***Accessible*:** Cycle facilities should be as close as possible to the cyclist's destination and should be able to get to without detours.
- ***Safe and secure*:** Stands must provide the confidence to users that a parked bicycle will be there on the owner's return.
- ***Easy to use*:** They should be easy to use by everyone.
- ***Fit for purpose*:** Stands should be able to support all types of bicycles.
- ***Well managed, maintained and monitored*:** Parking levels should be regularly monitored to both establish the need for extra provision and identify abandoned bikes. Maintenance is required to continue the upkeep of the cycle parking facilities and managed to provide optimal services to the user.

Other principles which should be considered include the need for facilities to be covered, connected, attractive, linked to other services, which all contribute to *"producing guidance on the design and implementation of cycle parking, including levels of parking to be provided by development;…"* (pg 3).

The preferred cycle parking facilities by the HCC are the Sheffield Stand for suitable applications and covered parking is preferred for long stay parking locations (HCC Cycle Parking Guide).

There are a number of local shopping parades across Borehamwood. Each comprises of at least three retail units, and no cycle parking is currently available:

- Manor Way
- Leeming Road
- Hartforde Road
- Rossington Avenue
- Croxdale Road
- Howard Drive

The location of these local shopping parades is shown in **Figure 1.**

Furthermore, cycle parking is also lacking at the following local facilities:

- Hertsmere Borough Council Civic Offices
- The Point (leisure venue), Shenley Road
- Borehamwood Shopping Park (see **Scheme 17**)

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
12.1	Introduce cycle stands at Manor Way shopping parade *HCC scheme in preparation*	Manor Way shopping parade is located to the south of Borehamwood town centre and has a number of shops for local residents, with parking facilities for vehicles. However, there are currently no parking facilities for cyclists, which provide no encouragement to those wanting to park their bike in a safe and secure environment. HCC are currently developing a streetscape improvement scheme adjacent to the shops which comprises of the following: • New dropped crossings on the northern and southern splitter islands • Carriageway re-surfacing • Footway repairs • Provision of Sheffield cycle stands • Realignment and repainting of bollards • Removal of guard railing, signs and posts • Potential improvement to lighting • Remarked / refreshed road markings • Replacement of damaged signs and posts • Removal of vegetation • Cleaning of block work on footways and parking bays. The scheme identifies two areas for cycle stands, one on the north-west corner of the mini roundabout junction adjacent to the service road access at the southern end of the shopping parade, and the other at the northern end of the shopping parade adjacent to the service road exit. **Figure 7** is the feasibility drawing for HCC's streetscape improvements. Elements of this streetscape improvement could serve as inspiration for similar improvements to other shopping parades, in addition to cycle parking. Deliverability – within 1 year **SIMPLE**	**£2,000 - £5,000**

12.2	*Introduce cycle stands at Leeming Road shopping parade*	 *Figure 2 - Leeming Road Shopping Parade* Leeming Road shopping parade is situated north of Borehamwood town centre. It was observed that there is a lack of parking for bicycles in the area and that the introduction of cycle stands would be appropriate as there are wide footways and spaces to implement around 4 cycle stands. A particular area identified as appropriate for cyclists is the space adjacent to the dental clinic (see **Figures 4 and 8**) and the area opposite, adjacent to another shop. The individual areas could fit three Sheffield stands. These areas would not require any alterations to the existing footway as it is situated in an area free of clutter/street furniture. A cycle parking sign (see **Figure 6**) may need to be introduced to ensure the cycle stands are visible to the public. Deliverability – within 1 year SIMPLE	**£3,000 - £6,000**
12.3	*Introduce cycle stands at Hartforde Road shopping parade*	Hartforde Road shopping parade is situated directly south of Borehamwood town centre. It currently has no cycle parking facilities and a bus stop is located in the vicinity. An area identified as being part of the footway separating Hartford Road shopping parade with Hartforde Road entrance (see **Figures 5 and 9**) is considered to be a suitable location to provide three new Sheffield cycle stands. The area would require some alterations to levels and improvement to surfacing in order to ensure that an adequate area for parking is provided. Extension of the area may also be required however this is unlikely to affect current car parking facilities significantly.	**£5,000 - £10,000**

		Extents of tactile paving are located adjacent to the proposed cycle parking stands where pedestrians are encouraged to cross. However, this is unlikely to be negatively affected by the introduction of any cycle stands. Deliverability – within 1 year **SIMPLE**	
12.4	*Introduce cycle stands at Rossington Avenue shopping parade*	Rossington Avenue shopping parade is located north west of Borehamwood town centre and has limited vehicle parking and no cycle parking facilities. A bus stop is located close to the shopping parade. A potential area for the placement of three Sheffield cycle stands is situated at the end of the Rossington Avenue shopping parade (see **Figure 10**) adjacent to the Shooting Star public house. Extending the pavement by approximately 2.0-3.0m would provide an area suitable for cycle stands as it would be close to the shops. Some additional level alterations would be required to create an even surface for cycle stands. Deliverability – within 1 year **SIMPLE**	**£5,000 - £10,000**
12.5	*Introduce cycle stands at Croxdale Road shopping parade*	Croxdale Road shopping parade is located in the north east of Borehamwood. The parade has six shops with on street parking adjacent. No cycle parking facilities were identified in the area There are two areas identified as being appropriate places to construct three Sheffield cycle stands (see **Figure 11**). One location can be found adjacent to a controlled parking sign between Croxdale road and Linton Avenue. The area is located next to the shopping parade, and can easily cater for the three stands. Area two is situated at the opposite end to area one, beside the corner of the end shop. It is able to accommodate a number of cycle stands and is adjacent to the shopping parade. Either option can be considered viable and sustainable with regard to encouraging people to use these cycling facilities rather than by car. Deliverability – within 1 year **SIMPLE**	**£2,000 - £8,000**

12.6	*Introduce cycle stands at Howard Drive shopping parade*	Howard Drive shopping parade is located in the eastern part of Borehamwood. The parade has eight shopping units with on street parking adjacent. No cycle parking facilities are identified in the area One suitable location has been identified as being appropriate to accommodate three Sheffield cycle stands (see **Figure 12**) – in the south-eastern corner of the grassed area at the western end of the shopping parade. Deliverability – within 1 year **SIMPLE**	**£2,000 - £5,000**
12.7	*Introduce cycle stands at Hertsmere Borough Council Civic Offices*	Cycle stands will be introduced at Hertsmere Borough Council Civic Offices for use by staff and visitors. A suitable location is yet to be identified. Deliverability – within 1 year **SIMPLE**	**£2,000 - £5,000**
12.8	*Introduce cycle stands at The Point*	Cycle stands could be accommodated near to the entrance to The Point leisure venue which can be accessed from Shenley Road (adjacent to the Bank). A number of stands could be accommodated on the left-hand side when approaching the venue from Shenley Road, between the large venue sign-column and the existing shrubbery, so as not to obstruct the service road access. Deliverability – within 1 year **SIMPLE**	**£ 2,000-£5,000**

Supporting Evidence of Measures/Components

Figure 3 – Manor Way potential location of cycle stands

Figure 4 – Leeming Road potential location of cycle stands

Figure 5 – Hartforde Road potential location of cycle stands

Figure 6 – Sign indicating parking place for pedal cycle

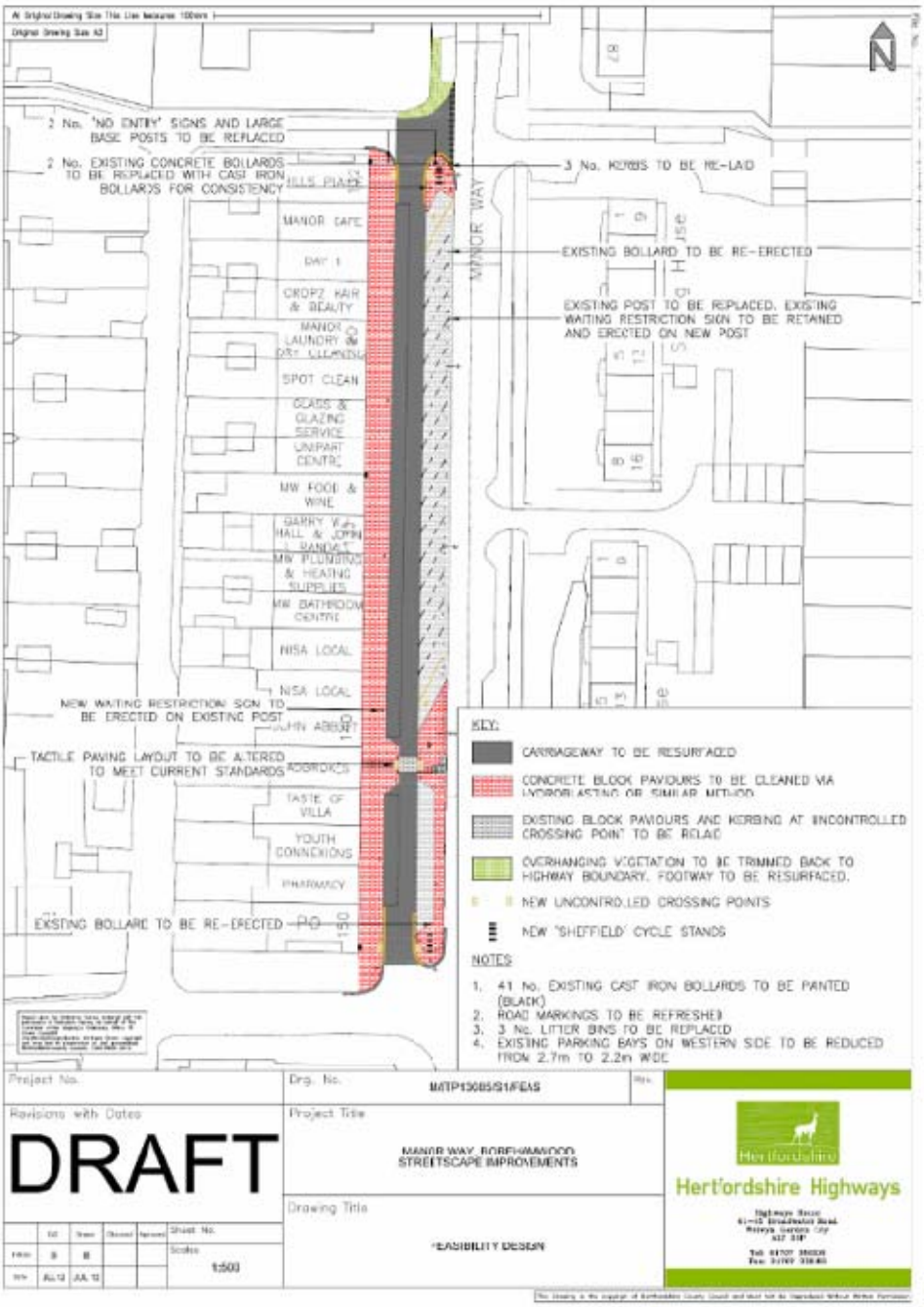


Figure 7 – Manor Way (streetscape improvements feasibility drawing, HCC)

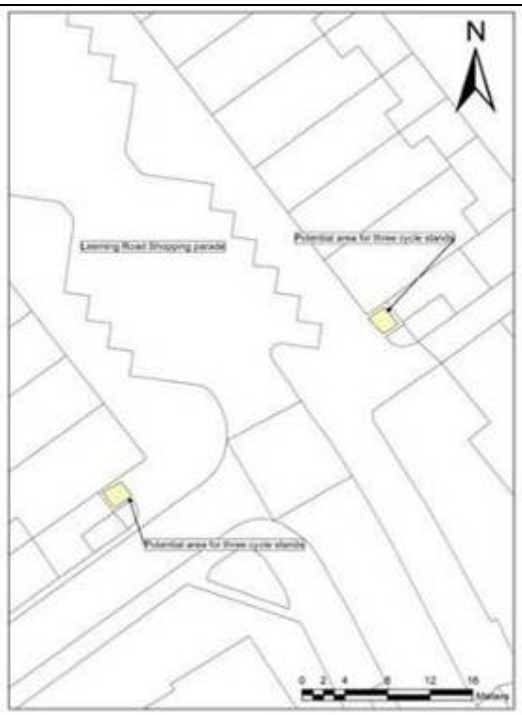


Figure 8 – Leeming Road potential location for cycle stands

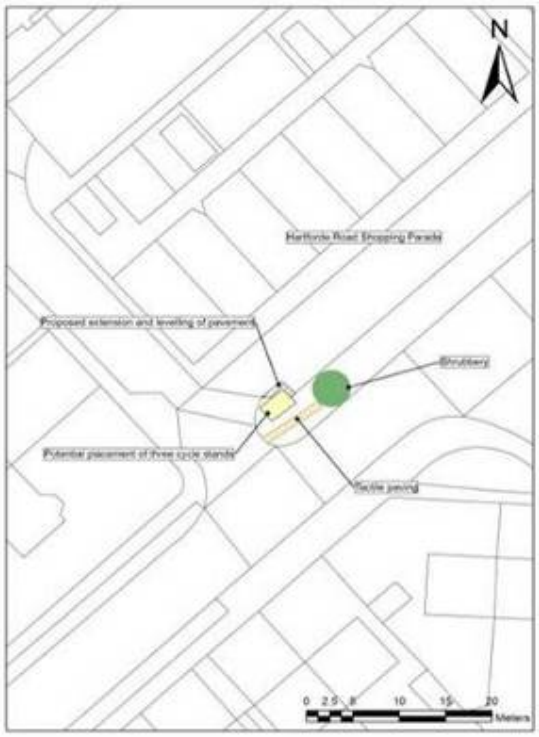


Figure 9 – Hartforde Road potential location for cycle stands

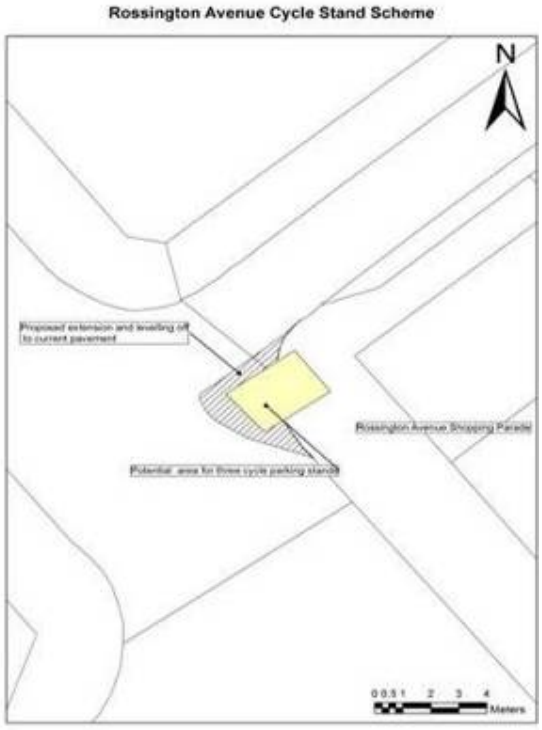


Figure 10 – Rossington Avenue potential location for cycle stands

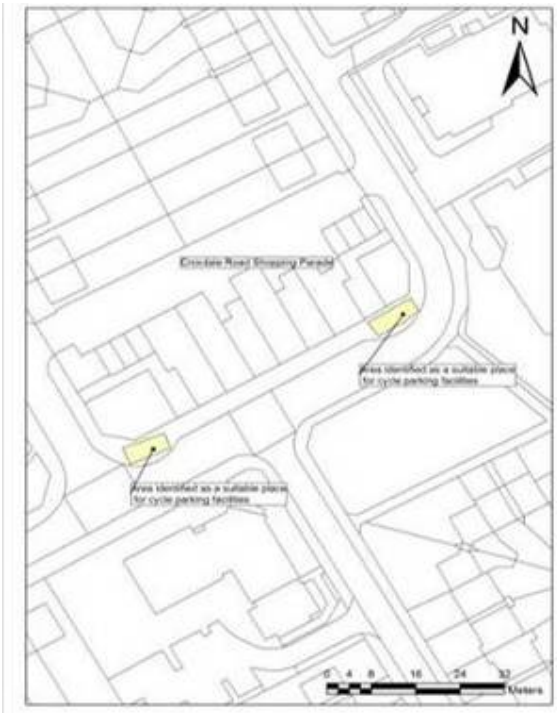


Figure 11 – Croxdale Road potential locations for cycle stands

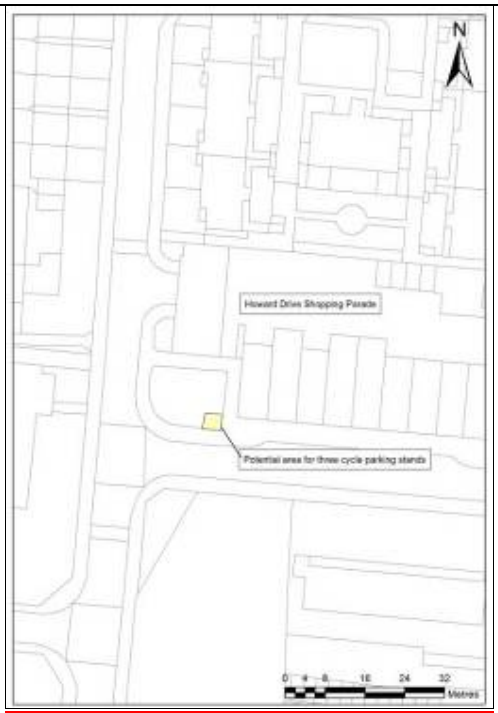


Figure 12 – Howard Drive potential locations for cycle stands

Preferred Option
It is recommended that the combination of components 12.1, 12.2, 12.3, 12.4, 12.5 and 12.6 are proposed as they would significantly contribute to creating new cycle facilities that can encourage cycling and support the LTP and UTP objectives. A scheme at Manor Way (12.1) is also ready in development by HCC. Cycle stands proposed at Leeming Road (12.2), Rossington Avenue (12.5) and Croxdale Road (12.5) should be considered a higher priority as they are all located reasonably close to the existing Greenway which runs via Aberford Park and they could be signposted from this route.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles. • Encourage reliability of travel through sustainable travel alternatives.

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
12.1	£2,000 - £5,000	
12.2	£3,000 - £6,000	
12.3	£5,000 - £10,000	
12.4	£5,000 - £10,000	
12.5	£2,000 - £8,000	
12.6	£2,000 - £5,000	
12.7	£2,000 - £5,000	
12.8	£2,000 - £5,000	
TOTAL COST FOR DELIVERY	**£ 23,000- £54,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Cycle stands only*

Deliverability of Preferred Option	**Simple – 'quick win', could be delivered within1 year**
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	*More detailed consideration needs to be given to the provision of cycle stands to ensure there is no detrimental loss of footway, that cycle stands do not cause an obstruction to pedestrians and that cyclists' approach and exit from the cycle stand area does not increase the risk of collisions.* *Consideration also needs to be given to forward visibility, especially where cycle stands are proposed in the vicinity of junctions (e.g. Manor Way) and it will need to be ensured that driver's envelope of visibility in and around junctions is not interrupted by the presence of cycle stands.*

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Balmoral Drive/Ashley Drive Parking Management** Parking / Public Transport	
Scheme Reference	13	
Problem References	PK10	Balmoral Drive footway parking
	CY14	Balmoral Drive/Ashley Drive anti-social parking
	PT07	Manor Way/Balmoral Drive – non bus compliant traffic management measures
Links to other UTP schemes:		N/A

Context

Figure 1 – Scheme Location

Footway parking has been observed at several locations across Borehamwood where vehicles are parked fully or partly on the footway, or on verges within the highway boundary. Vehicles parked across part or all of the footway can be disruptive to pedestrians, potentially forcing them to step into the road, cross to the footway on the opposite side of the road (thus creating an unnecessary detour) which could pose safety risks to pedestrians, especially those with mobility problems.

There could be several reasons for footway parking, including:

- insufficient off-road parking facilities;
- on-road parking restrictions;
- a perception that parking on the road leaves the vehicle vulnerable to accidents or would be disruptive to the flow of traffic;
- parking in sight of properties; and

- convenience.

In some instances, vehicles which are parked entirely in the road may cause disruption to the general flow of traffic, including buses and cyclists.

The Highway Code in Rule 244 states that *"Your MUST NOT park partially or wholly on the pavement in London, and should not do so elsewhere unless signs permit it".*

In 2011, the Department for Transport gave all councils in England permission to use signs to indicate a local pavement parking ban. A local authority can make a traffic regulation order (TRO) to prohibit footway parking on a designated length of highway or over a wider area. This means local authorities can target problem areas rather than applying a blanket ban.

Alternatively, local authorities can use physical measures such as high kerbs or bollards to prevent vehicles mounting the footway where footway parking is a particular problem. Such measures have the advantage of being largely self-enforcing however they are not always considered suitable, for instance on roads where there is a high frequency of vehicle crossovers serving residential properties. Footway and roadside parking has also been observed adjacent to existing speed cushions. This can be inconvenient to cyclists and to buses.

Measures/Components

Ref	Description	Assessment of Suitability	Cost
13.1	Double yellows protecting speed cushions (Balmoral Drive and Ashley Drive)	Protection of speed cushions from vehicular parking will improve alignment for cyclists and buses. The provision of double yellow line 'No Waiting At Any Time' restrictions would enable correct movement of vehicles and especially buses, over the speed cushions, creating more comfortable conditions for bus users. The spacing of the cushions along Balmoral Drive and Ashley Drive will mean that the protection of cushions by double yellow lines will leave suitable areas for vehicles to park in between. **Figure 3** presents a typical layout for double yellow line protection of speed cushions. Deliverability: less than 1 year **SIMPLE**	**£8,000-£12,000**
13.2	Bollards on footway adjacent to bus stops and double yellows (Balmoral Drive)	Footway parking has been observed immediately adjacent to bus stops on Balmoral Drive. Such parking could cause obstruction to passengers boarding/alighting buses, pedestrians walking to/from or past bus stops, and to buses which may not be able to pull up alongside the designated bus stop area which can cause issues for passengers transferring from the bus to the path and vice versa. The measure comprises of the introduction of bollards immediately adjacent to the bus stops adjacent to bus stop near Kenilworth Drive and near Warren Grove	**£2,000-£5,000**

		(northbound stops only). Deliverability: less than 1 year SIMPLE	
13.3	Introduce edge line prohibition of stopping at bus stops and DDA-compliant raised kerb at bus stops on Balmoral Drive	It is not a legal requirement for a bus stop to have any highway markings associated with it, however it is good practice for bus stops to be 'protected' by the provision of a 'bus cage'. This will discourage inconsiderate parking which may prevent the bus from being able to align parallel to the kerb - ideally the bus should be able to align within 50mm of the kerb edge. The bus cage must have a single yellow edge line along the nearside edge of the highway (see TSM Chapter 5 and TSRGD 2002 – diagram 1025.1) supported by a 'no waiting' plate. In order for passengers to be able to benefit from this important accessibility design feature, there need to be boarding points pitched at a similar height level to the bus boarding platforms. The idea is that the bus boarding platform and the kerbside should be at the same height, enabling level boarding and alighting, particularly for elderly passengers and those in wheelchairs, parents with buggies and persons carrying heavy loads. 'Kassel' kerbs, which are preferred by Hertfordshire County Council, guide the nearside wheels of a bus to correctly align with the kerbside, without causing excessive damage to the tyre wall. Raised 'Kassel' kerbs should be provided at four bus stops on Balmoral Drive, each 7m in length. The raised kerbs, in combination with full bus stop markings as described above, should discourage footway parking immediately adjacent to the bus stops and protect the bus stop area. Deliverability: Less than 1 year SIMPLE	**£20,000-£30,000**

Supporting Evidence of Measures/Components

Sources: ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Figure 2 – Issue Location

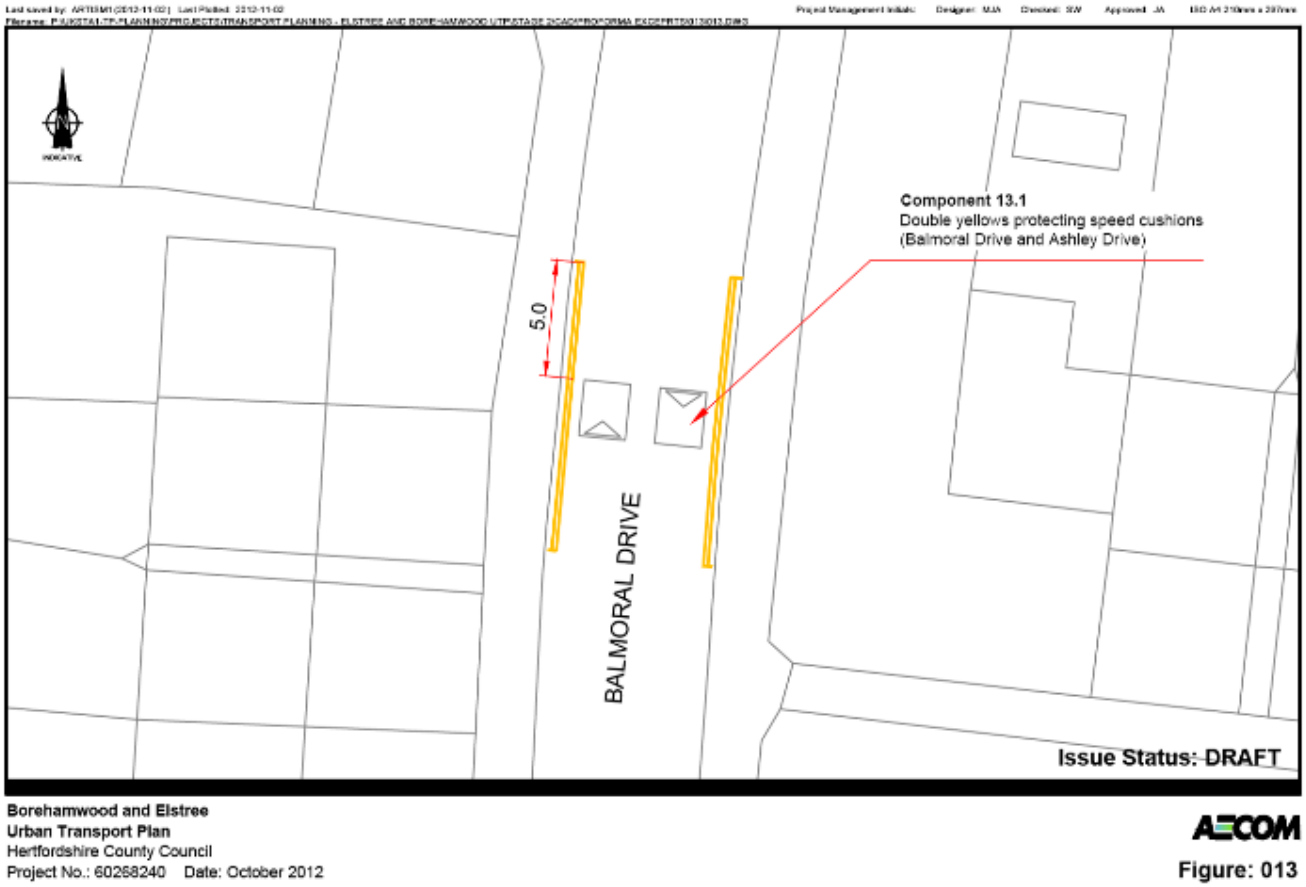


Figure 3 – Example double yellow lines protecting speed cushions on Balmoral Drive and Ashley Drive

Preferred Option
The provision of Schemes 13.1, 13.2 and 13.3 are recommended to be progressed as they offer a combined mitigation of the existing problem of footway parking and inconvenient parking along Balmoral Drive and Ashley Drive.

Contribution to Objectives / Indicators	UTP Objectives	• Improve public transport provision and accessibility

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
13.1	£8,000-£12,000	
13.2	£2,000-£5,000	
13.3	£20,000-£30,000	
TOTAL COST FOR DELIVERY	**£30,000-£47,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for signing*

Deliverability of Preferred Option	**Simple – 'quick win', could be delivered within1 year**
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	TRO amendments required and statutory measures need to be followed.

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Aerial photography has been sourced from ArcGIS Online. Sources**:** ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Scheme Name	**Car Parking Variable Message Signs** Parking	
Scheme Reference	14	
Problem References	HC01	Station Road-Shenley Road –Theobald Street roundabout
	HC05	Theobald St Shopping Park access congestion
	HC07	Shenley Road roundabouts congestion hotspots
	PK05	Studio Way prevalent on-road parking
	PK09	CPZ parking displacement on adjacent streets
Links to other UTP schemes:		N/A

Context

The main public car parking facilities in Borehamwood are operated and maintained by Hertsmere Borough Council. The three highlighted are:

- Furzehill Road, south west of the town
- Brook Road, north west of the town
- Civic offices, north east of the town centre

Other significant parking facilities which are not operated by Hertsmere Borough Council including the Borehamwood Shopping Park (Theobald Street), the Tesco Extra superstore and Elstree and Borehamwood Railway Station.

An issue was raised regarding congestion occurring within the Town Centre area, in particular on Theobald Street in the vicinity of the popular Shopping Park at weekends, with vehicles queuing from the main road to wait for spaces to become available. The 695 spaces provided at this Shopping Park are free of charge for the first three hours.

Motorists could be better informed about available parking spaces across Borehamwood. A Variable Messaging System (VMS) aims to help direct public to car parks where spaces are available, reducing time wasted searching and queuing for spaces and the congestion that might ensue as a result.

Variable Message Signs can be deployed at suitable decision-making points on main routes heading towards the town centre. The main routes into Borehamwood are described below.

Allum Lane, located South West of Borehamwood town centre, is a B road (B5378) that connects to the A5183 which runs through Elstree. Annual average weekday flow of traffic data in 2010 indicates 11,751 motorists use this road, and issues with congestion and parking have arisen as a result of being heavily used and being of particular importance for commuters coming into the town from the South and South East. The road is within close proximity to a number of car parks, including the Furzehill Road car park, railway station car park and Shopping Park.

Theobald Street is located on the western edge of Borehamwood and is a distributor road that adjoins Shenley Road (the main high street) near to the railway station. The road attracts an annual average weekday flow of approximately 10,169 vehicles and is considered to be a key route for motorists and commuters travelling accessing Borehamwood town centre from the north-western parts of the town, and Radlett and St Albans beyond. The shopping park

located nearby is an issue resulting in congestion on the road caused by motorists queuing to enter the car park.

Furzehill Road, situated to the south west of Borehamwood town centre is considered to have visible issues concerning car parking and the resultant displacement from the Car Parking Zone on some adjacent roads including Oakwood Avenue. The road is a major access route from the south, including the A411 and A1 as well as southern areas of Borehamwood. The route has an annual average weekday flow of 10,272 vehicles (in 2010).

Shenley Road is classed as a B road (B5378) and has adjoining minor roads from the east and with several coming from the A1. The section of interest extends from the large roundabout junction with Brook Road and Elstree Way (adjacent to the Civic Offices) to the Potters Lane mini-roundabout (adjacent to Hertswood School).

Elstree Way (A1535) runs through to the Town Centre of Borehamwood from the east and takes a large amount of traffic coming off the A1. It has the highest annual weekday average flow (2010) of 16,555 according to the UTP data report (2012). Issues have been highlighted with the road being regarded as a congestion hotspot and having street parking issues. A VMS Scheme is deemed suitable to tackle these issues due to the ability to inform drivers who can then make suitable decisions regarding parking. The sign should be positioned so that it can capture trips that could be approaching the town centre on Studio Way.

Brook Road is a minor road located centrally within Borehamwood. Heading south it leads to Elstree Way/ Shenley Road roundabout, where issues have been raised over congestion hotspots, parking problems in and around the surrounding road networks, which needed to be addressed. Brook Road is likely to capture local residents and may also attract some commuter trips from further afield however these are unlikely to be significant in number.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
14.1	*VMS on Allum Lane (between Deacon's Hill and Station Road)*	There are a number of issues regarding the layout and location of the potential VMS along Allum Lane (between Deacon's Hill and Station Road) such as potential obstruction of the sign from trees, reduced visibility for motorists. The issues observed are likely to reduce the effectiveness of the VMS in this particular location and so is unlikely to be deemed as a suitable place to construct a VMS. Therefore, a sign placed further west on Allum Lane, prior to the Deacon's Hill mini roundabout, would be more appropriate. This would have the disadvantage of not capturing motorists who enter Borehamwood on Deacon's Hill Road however this is not a major route.	**£30,000-£40,000**

		Deliverability within 2 years **STANDARD**	
14.2	*VMS on Theobald Street (north of Shopping Park access)*	Currently the location of Theobald street (downstream of the Stratfield Road junction and bus lay-by) has suitable characteristics that fit with criteria for having a VMS on site. A combination of a wide pathway plus grass verge and good visibility from upstream suggests a suitable decision point for the display of car park information. Deliverability within 2 years **STANDARD**	**£30,000-£40,000**
14.3	*VMS on Furzehill Road (e.g. between Oakwood Ave and Hillside Ave)*	Furzehill Road (between Oakwood Avenue and Hillside Avenue junctions) is considered to be a suitable decision location to have a VMS sign. The location has good visibility from upstream due to a low density of plant coverage and has a wide pathway and grass verge area which could accommodate a sign. The one issue attributed with the placement of the sign is the precence of the cycleway on the intended pathway, which may be obstructed to a minimal degree. Consideration also needs to be given to crossovers serving residences on the western side of the road and it must be ensured the sign does not become an obstruction in terms of visibility for vehicles exiting from the properties. Deliverability within 2 years **STANDARD**	**£30,000-£40,000**
14.4	*VMS on Shenley Road (upstream of Hertsmere BC council office car park access)*	There are unlikely to be any significant environmental constraints in this particular location. A positive characteristic noted is the slightly elevated grass verge, which would give motorists a clear view, although forward visibility may be obscured by the large tree which is also present on the verge. This location is likely to be an appropriate decision making point for parking information in Borehamwood, which in turn can help reduce congestion and parking issues along this stretch of road. Locations downstream could be more limited as Shenley Road is built-up with vehicle crossovers at regular intervals. Deliverability within 2 years **STANDARD**	**£30,000-£40,000**
14.5	*VMS on Elstree Way (east of Shenley Road/Brook Road roundabout)*	The proposed construction of a VMS sign on Elstree Way is unlikely to encounter any significant environmental constraints, with some vegetation coverage and potential temporary visibility obstructions when buses stop, however consideration would need to be given to the	**£30,000-£40,000**

		presence of a VMS sign within the emerging Elstree Way corridor development plans. The wide shared pedestrian/cyclepath. The VMS placement will give motorists car parking information at a suitable decision making point could reduce congestion problems on Elstree Way downstream. Deliverability within 2 years **STANDARD**	
14.6	Brook Road (opposite Hartford Road).	VMS in this location would be situated on the footway so incoming traffic can view the information it displays. There is a potential issue with the sign's proximity to nearby dwellings. Brook Road is expected to capture a number of motorists who live in Borehamwood who drive to the town centre due to a number of roads joining from residential estates, which will contribute to reducing car parking issues within the area. Deliverability within 2 years **STANDARD**	**£30,000-£40,000**

Supporting Evidence of Measures/Components

The Traffic Advisory Leaflet ITS4/03 Parking Guidance and Information (2003) sets out a list of components needed to fulfil the needs of VMS within an area. Items that need to be considered include *"operational costs, maintenance and communication costs and the development of roles and responsibilities for the partners" (pg 1).* Fulfilling these criteria will provide a safe, efficient and environmentally friendly transportation network.

Hertfordshire County Council's report on Intelligent Transport Systems Strategy (ITTSS), Variable Message Signs and Car Park Guidance Systems 2009/10 – 2019/20, as part of their Local Transport Plan, proposed the identification of a VMS strategy with the intention of reducing congestion in town centres across the country, in doing so allowing motorists at key points on the road network to make informed decisions. Allum Lane/Shenley Road from the south west, Furzehill Road from the south east, Manor Way from the south east, Elstree Way from the east, Rowley Way/Studio Way from the east, Shenley Road from the north, Brook Road from the west and Theobald Street from the west are all recognised as key traffic routes in the report.

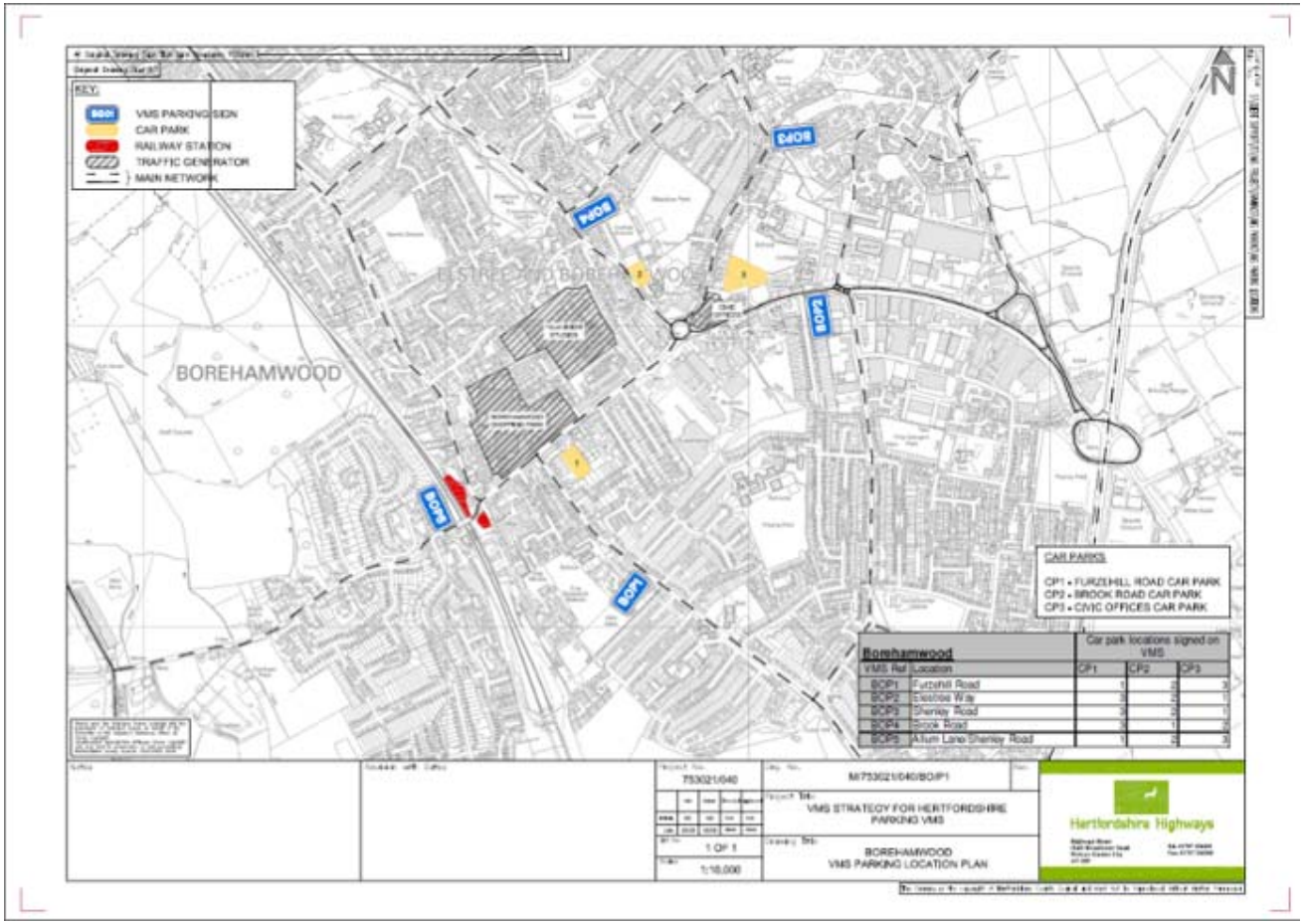


Figure 2 – Hertfordshire Highways recommended VMS locations in Borehamwood.

Figure 3 – Main car parking facilities in Borehamwood (private and public)

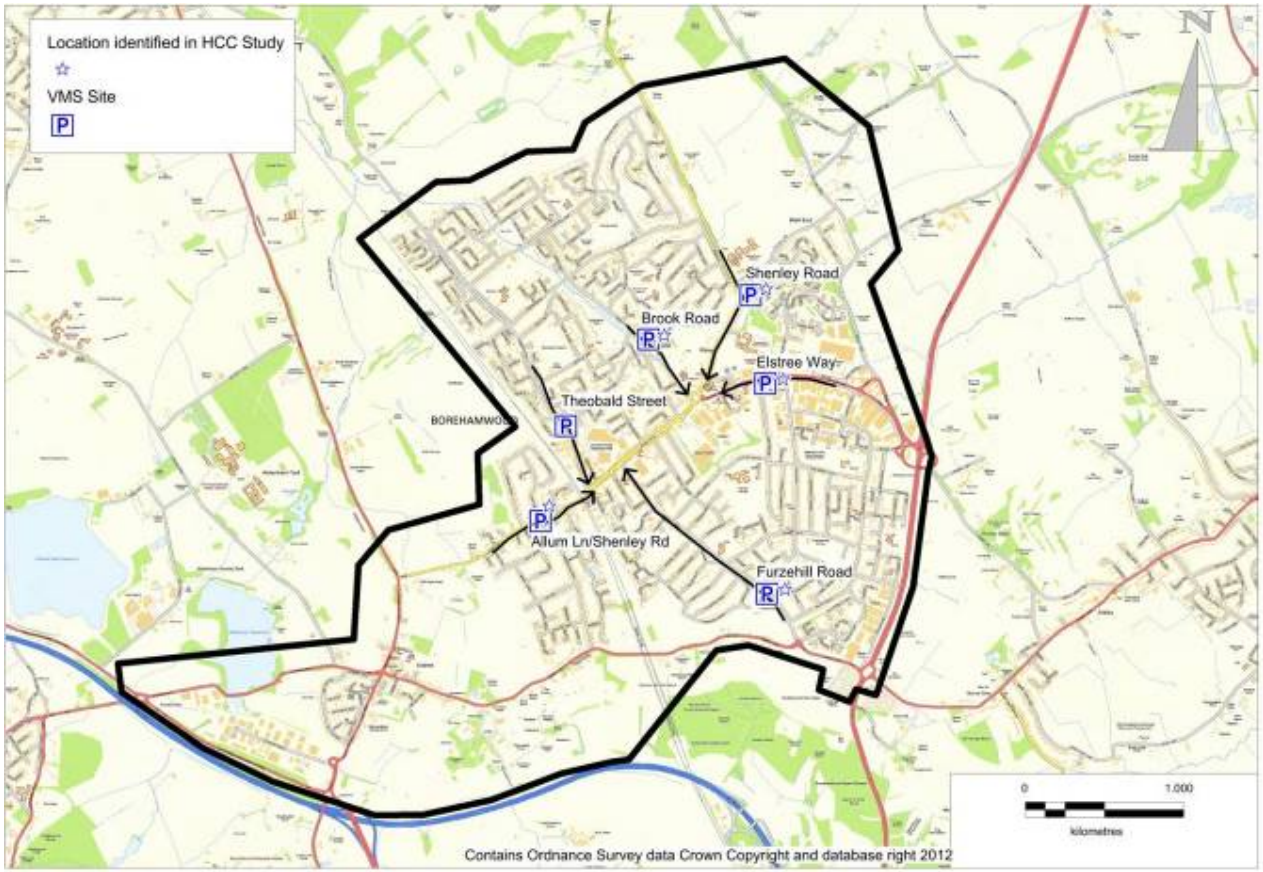


Figure 4 – Potential and suggested VMS locations in Borehamwood.

Preferred Option

The preferred option is a combination of all the components as this will provide the most effective way of informing motorists of parking information at suitable decision points on the way into Borehamwood town centre. However, the signs could work effectively in isolation on particular routes and the following rank order of implementation is suggested:

Rank	Site	Pros	Cons
14.1	Theobald Street	Main route capturing trips from the north (including Radlett).	Built-up area including residential which may not be suitable for a VMS sign
14.2	Furzehill Road	Main route capturing inbound trips from the south (including external trips from the A1 and A411). Large verge area and footway/cycleway which could accommodate a VMS sign.	Built-up area including residential which may not be suitable for a VMS sign
14.3	Allum Lane	Main distributor route capturing trips from the west including parts of Borehamwood, Elstree and Watford/Bushey beyond.	Suitable locations limited between Deacon's Hill Road and railway bridge therefore location west of Deacon's Hill Road would be necessary.
14.4	Elstree Way	Main route capturing trips from the east (including external trips from the A1). Large verge area could accommodate a VMS sign.	May not capture many internal trips from Borehamwood as it is a predominately commercial area.
14.5	Shenley Road	Main distributor route capturing trips from north-eastern parts of Borehamwood and from outside the UTP area (including Shenley)	Built-up area including residential which may not be suitable for a VMS sign
14.6	Brook Road	Local distributor route capturing trips predominately from within Borehamwood and some external trips (including those routing away from the Theobald Street and Shenley Road/Cowley Hill corridors)	Built-up area including residential which may not be suitable for a VMS sign. Suitable locations are more limited.

Contribution to Objectives / Indicators	UTP Objectives	• Support economic growth and local housing development through the delivery of transport improvements • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Reduce congestion at key traffic hotspots throughout the study area.

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
14.1	£30,000 - £50,000	
14.2	£30,000 - £50,000	
14.3	£30,000 - £50,000	
14.4	£30,000 - £50,000	
14.5	£30,000 - £50,000	
14.6	£30,000 - £50,000	
TOTAL COST FOR DELIVERY	**£180,000 - £300,000**	

Maintenance Liability	~~High~~ Medium ~~Low~~	*VMS signing likely to require increased maintenance*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	*Subject to confirmation of statutory undertaker plant (subterranean plant) and highway boundary checks*

Other Information/Additional Notes:

Scheme Name	**Newark Green Width Restriction Refresh (including HCC scheme in preparation)** Highways and Congestion	
Scheme Reference	015	
Problem References	HC09	Newark Green – damage to width restriction measures/damage to vehicles
Links to other UTP schemes:		N/A

Context

Figure 1 – Scheme Location

A Traffic Road Order can be enforced which prohibits all vehicles exceeding an indicated width from being driven along a particular road. The order may be imposed to prevent entry to roads physically incapable of accommodating larger vehicles or to protect the environment, by obstructing unnecessary intrusion by large vehicles.

A two-way width restriction is in place on Newark Green, located approximately 70m west of the A5135-A1 Rowley Lane roundabout. Newark Green is a residential street which leads to Balmoral Drive and Tempsford Road, both of which are also predominantly residential. It is understood the width restriction measure has been in place since 1987, its legacy being to discourage or prevent inappropriately large goods vehicles which are heading towards the Hertsmere Industrial Park from routing through the residential area by mistake. Signage at the roundabout directs lorries towards the A5135 Rowley Lane exit at the roundabout which leads to the Hertsmere Industrial Park, Elstree Way and Borehamwood Town Centre beyond.

Vehicles are restricted to 7ft in width. The width restriction measure comprises of a kerbed splitter island and four bollards although on occasion some have been removed and not necessarily immediately replaced during 2012. The island is preceded by SLOW road markings and signage at the Rowley Lane roundabout exit in addition to hatching which

emphasises the narrowing of the carriageway on both approaches to the island.

Signage and bollards were replaced during Summer 2012. There is evidence that bollards have already been damaged by passing vehicles (see **Figure 3**). There are proposals to lengthen the island by approximately 2m (approximately 1m in each direction). Width restriction prohibitory signs have been replaced at the width restriction and blue.

Local residents have raised concern with regard to the position of the existing measure as highlighted in local media reports. There have been calls for the width restriction measure to be relocated eastwards closer to the roundabout exit. Residents have voiced concern that vehicles which exceed the width are exiting the roundabout in error, and disruption and damage ensues when they either attempt to travel through the restriction or they reverse out of/turn around in Newark Green.

Whilst the measure is in place to restrict/prevent large vehicles from entering the residential area, it is also very likely to have the effect of slowing down all vehicles including cars. The relocation of the width restriction closer to or at the exit from the Rowley Lane roundabout may be hazardous as exiting vehicles which are travelling at higher speeds when circulating the roundabout would need to slow down on the approach to the width restriction measure, therefore if it was to be relocated closer to the roundabout this could mean that vehicles would be required to decelerate on the roundabout circulatory carriageway. This could increase the risk of rear end shunts and congestion. The Design Manual for Roads and Bridges indicates a minimum width of an exit from a roundabout of between 7m and 7.5m, tapering to a minimum of 6m at the back of the splitter island (TD16/07).

A further consideration regarding any relocation of the width restriction closer to the roundabout is the presence of roadside parking adjacent to the Newark Green roundabout entry. Relocating the width restriction may impinge on this parking area, resulting in a need to reduce spaces or remove it entirely which may not be desirable to motorists who use this parking area.

The focus of any additional improvements in this scheme proforma over and above those already in progress (described above, see also component 15.1 below) should therefore be to increase awareness of drivers on the roundabout of the width restriction ahead. This can be achieved by way of additional or enhanced replacement signage which is described under component 15.2 below.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
15.1	Increase island width, replacement bollards, replacement/ additional signage *(HCC scheme in preparation)*	Already partially implemented (Summer/Autumn 2012), this component measure involves lengthening the width restriction splitter island by approximately 2m (1m in each direction). Existing width restriction prohibitory signs have been replaced. Advance direction signs incorporating the 7ft width restriction prohibitory sign will be installed on the nearside and offside of the Newark Green roundabout exit (replacing existing dated signage) and advance direction sign incorporating the prohibitory sign positioned on the A1 southbound exit slip approach in replacement of the exiting goods vehicle directional sign (which may be considered unclear) (see **Figure 4**). **Figure 5** shows the broad location of the proposed additional/replacement signs. Deliverability: Within 1 year **SIMPLE**	**£5,000-£10,000**
15.2	Altered or additional road markings to advise motorists of width restriction ahead, additional signage and double yellow restriction *(potential enhancement scheme)*	Hatching is already present on the exit of the roundabout, channelling traffic into a single lane on the Newark Green exit and on the circulatory carriageway. The hatching encroaches into the circulatory carriageway, therefore traffic in the nearside lane approach on the upstream A1 southbound slip road arm is likely to be channelled towards the Newark Green exit without merging with traffic from the offside lane of the A1 southbound slip road arm or driving over the hatching. No destination road markings are provided on the A1 southbound slip road to advise motorists of the appropriate lane to use. The hatching area on the circulatory carriageway will be reduced so that it does not cross the outer edge of the circulatory carriageway. Hatching will be retained on the Newark Green exit adjacent to the splitter island. This will enable two lanes of traffic to circulate the roundabout adjacent to the Newark Green splitter island. To add presence, 'dragons teeth' markings will be implemented on the Newark Green exit. Road destination road markings will be provided on the southbound A1 slip road approach to the roundabout to advise drivers travelling towards the A1583 Borehamwood to use the offside lane.	**£2,000-£5,000**

		Parking has been observed to encroach into the circulatory carriageway on occasions. Double yellow lines will be introduced on a short section of the circulatory carriageway adjacent to the Newark Green entry. An advanced direction sign (see example in **Figure 6**) will be installed on the A1 southbound slip road approach indicating the width restriction on the Newark Green exit. Deliverability: Within 1 year **SIMPLE**	

Supporting Evidence of Measures/Components

Figure 2 – View westwards of the width restriction measure (October 2012)

Figure 3 – View southwards of the width restriction measure (October 2012)

Figure 4 – View eastwards of the width restriction measure (October 2012)

Figure 5 – View eastwards from Newark Green towards A1 southbound slip roads arm (hatching area shown on the left) (October 2012)

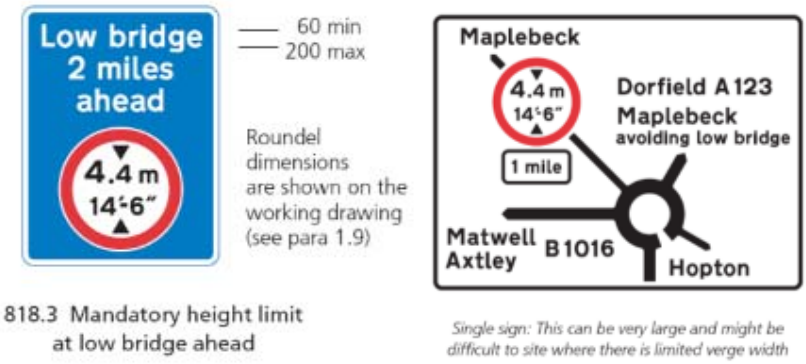


Figure 6 – Examples of the incorporation of prohibatory signs within advance directional signage (TSM Chapter 5, p.31)

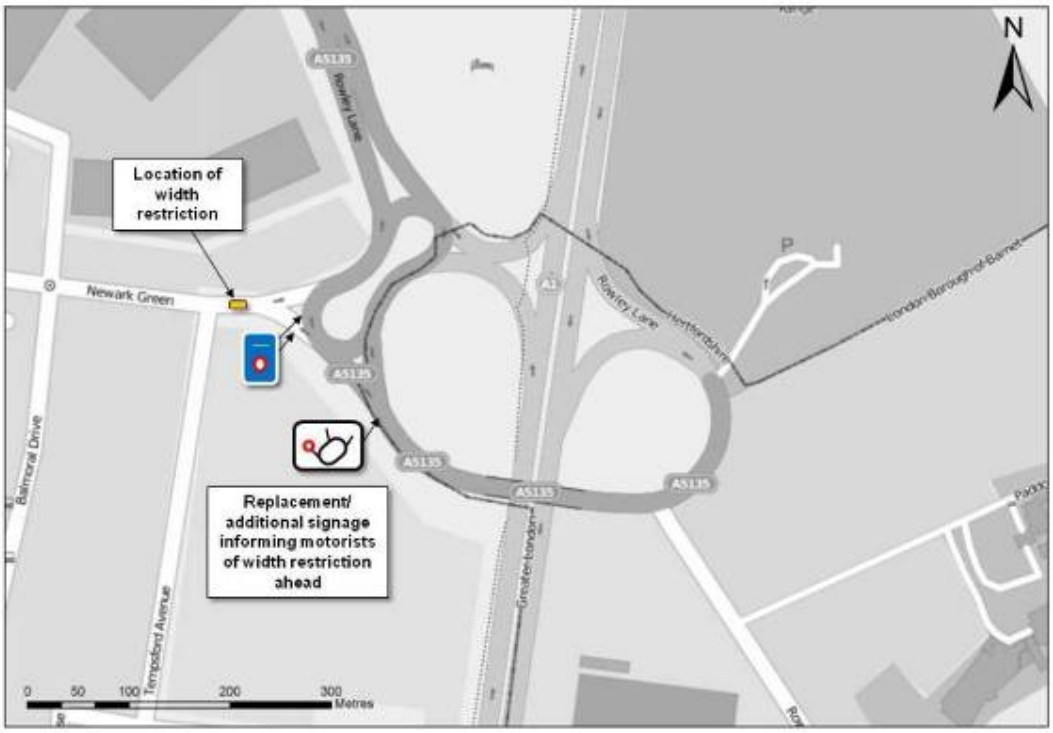


Figure 7 – Potential location of proposed additional/replacement signs

Preferred Option
A scheme is in preparation at the site (component 15.1 above). Component 15.2 is supplementary, and is designed to aid the flow of traffic through the junction and potentially address existing road markings (or absence of) which may lead to confusion with drivers of large vehicles.

Contribution to Objectives / Indicators	UTP Objectives	• Improve the safety and security of residents and other road users.

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
15.1	£5,000-£10,000	
15.2	£2,000-£5,000	
TOTAL COST FOR DELIVERY	**£7,000-£15,000**	

Maintenance Liability	~~High~~ Medium ~~Low~~	*Street furniture on Width restriction is likely to be vulnerable and may require replacing regularly.*

Deliverability of Preferred	**Simple – 'quick win', could be delivered within1 year**

Option	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	*None identified*

Other Information/Additional Notes:

Scheme Name	**HGV weight restriction – A411 Barnet Lane** Highways and Congestion	
Scheme Reference	16	
Problem References	HC11	Review of weight restriction
	HC12	Barnet Lane HGV cut through
	SP02	Deacons Hill Road-Barnet Lane junction
Links to other UTP schemes:		03, 11

Context

Weight restrictions can be imposed for different purposes including structural and environmental reasons, and are a legal control on a specified vehicle weight (or width) mainly on heavy goods vehicles, on certain roads and routes.

Restrictions prevent large vehicles from using inappropriate roads, routes and areas in order to reduce danger to pedestrians and other road users, prevents damage to buildings, roads and bridges, preserves the character and environment of an area, and can reduce and manage congestion.

Restrictions are subject to a Traffic Regulation Order (TRO) and associated procedures. Regulatory signs are erected to give effect to the TRO and to assist the police in carrying out its enforcement. The Police can have limited resources to enforce this type of restriction and restrictions which limit access can fall into disrepute and can be difficult to enforce. Permitting access for loading/unloading however is necessary for local businesses and residential properties.

Installation of restriction signs may be viewed as ineffective, therefore alternative physical measures could be considered to prevent any abuse of the restrictions. However, physical restriction measures are not appropriate in all situations and should not be applied unless there is a suitable alternative route for the displaced traffic.

Vehicle weight restrictions are signposted at multiple locations across Borehamwood, Elstree and the surrounding area. Three types of weight restrictions are in place which are summarised described below. Other weight restrictions are enforced on minor routes across the UTP area and not all are detailed in this proformas.

1) Goods vehicles exceeding the maximum gross weight indicated on the goods vehicle symbol (7.5 tonnes) – Prohibited. See **Figure 1**.
2) A permitted variant of the above specifying 18 tonne maximum gross weight with time restrictions
3) Entrance to a controlled parking zone applying to goods vehicles over maximum gross weight shown (5 tonnes) (supplemented with the bus symbol). See **Figure 2**.

Figure 5 shows the locations of identified signs on the main distributor routes in the UTP area and adjacent streets. **Figure 5** shows that a 7.5 tonne maximum gross weight restriction is in place on several key routes entering Borehamwood. The placement of these signs forms two

cordons across the southern part of Borehamwood as well as an enforcement corridor on the A411 Barnet Lane extending from the Elstree Crossroads to the Furzehill Road/Farriers Way roundabout. Furthermore, there is a large restriction cordon in place to the north of Borehamwood, extending to Shenley.

Figure 5 also shows that 18 tonne maximum gross weight restrictions are in place on the A411 east and west arms at the Stirling Corner roundabout (on the exit from the junction) which specify restrictions between Monday-Friday Midnight-7am and 8pm-Midnight, Saturday Midnight-7am and 7pm-Midnight and Sunday at anytime, except for permit holders. The purpose of these restrictions is to prohibit large heavy goods vehicles from routing off the A1 north-south primary route.

The A1 Barnet Bypass south exit and the A411 Barnet Road east exit (1 ¾ miles downstream) from the Stirling Corner Roundabout also mark the commencement of the Low Emissions Zone (LEZ) to encourage the most polluting heavy diesel vehicles driving in Greater London to become cleaner. The LEZ covers most of Greater London and is managed by Transport for London (TfL). To drive within it without paying a daily charge, certain polluting vehicles must meet emissions standards that limit the amount of particulate matter (a type of pollution) coming from their exhausts. The charge for vehicles which exceed the emissions threshold is £100 or £200 per day depending on the vehicle type.

A further restriction is enforced on Elstree Hill South (southbound) from a point approximately 20m downstream of the exit from the signalised crossroads. This sign specifies a controlled parking zone applying to goods vehicles over 5 tonnes maximum gross weight restriction and to buses. This zone covers the full extent of Elstree Hill South and beyond, excluding the A41 Watford Bypass (north of the A41 Brockley Hill Roundabout). A similar sign is also positioned on A411 Barnet Lane, east of the crossroads.

An issue has been raised regarding the effectiveness of the current weight restrictions in place in the area including the 7.5 tonne weight restriction applied to the A411 Barnet Lane. The A411 may be an attractive inter-urban route for goods vehicles which have neither an origin nor destination within the UTP, for instance goods vehicles travelling from Watford to Barnet or beyond. The route may also be attractive as a cut through to other more strategic routes such as the A1 and A41, and/or potentially longer but more suitable alternative east-west routes such as the M25 and A414 to the north and the A41 Edgware Way/Watford Bypass via the Apex Corner junction to the south (which can experience severe congestion especially during peak times of the day). The latter route falls within the Greater London LEZ.

In comparison to these more strategic, higher-quality routes, the A411 Barnet Lane may not be considered a suitable substitute. Any review of weight restrictions would need to consider potential methods of reinforcing the effectiveness of weight restrictions including the A411 Barnet Lane, and considers measures to encourage alternative and more suitable routes for lorries with neither an origin nor destination in the local area.

An area around the Elstree Crossroads junction is a designated Air Quality Management Area (AQMA). The crossroads experiences severe congestions during peak periods and whilst there is no evidence to indicate that this is occurring, wholly or in part, as a result of

inappropriate large goods vehicle movements, the routing of large goods vehicles through the junction which are potentially ignoring the weight restrictions could potentially be contributing towards congestion.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
16.1	Review HGV weight restrictions in the area, with A411 Barnet Lane potential experimental scheme	Police have the powers to stop vehicles and where a breach of the weight restriction has occurred they can issue a Fixed Penalty Notice (FPN) or report drivers for summons. Police also administer cautions and advice notices to drivers, which are followed up by either letter or visits to operating companies. Permanent enforcement such as vehicle-detection cameras is unlikely because of the resources and costs, and whilst it may be possible to check the maximum gross weight of vehicles against vehicle databases, a system such as this will not determine the origin/destination of vehicles, i.e. those that may be travelling to/from areas within the restriction for loading/unloading, and FPNs may subsequently be disputed. This measure includes the review of existing restrictions and investigation of potential revisions to restrictions to make them more manageable and effective so that the Police could enforce them in line with their current methodology. A trial experimental revised restriction on the A411 Barnet Lane could be considered which could reduce the length of the restriction to enable the Police to observe lorries entering and exiting the restriction area. Further discussions and joint working with Hertfordshire Police will be required to take this measure forward. Deliverability 1-2 years **STANDARD**	**£8,000-£10,000**

16.2	Implement additional HGV directional signage	Implement directional signs at key decision points to support A411 Barnet Lane weight restriction. Proposed locations: 1) At the A41/A411 Roundabout on A411 Elstree Road splitter island – directing lorries travelling towards, Borehamwood, Barnet and the A1 to pass the exit (e.g. sign type '2806' TSRGD – see **Figure 3**) 2) At the A41/A411 Roundabout on A41 (south) splitter island – directing lorries travelling towards the Stirling Way Industrial Estate, Borehamwood to exit onto the A41 south (e.g. sign type '2806' TSRGD – see **Figure 3**) 3) At the A41/A5183 Elstree Hill South Roundabout on the A5183 Elstree Hill South splitter island – directing lorries travelling towards the Stirling Way Industrial Estate, Borehamwood to pass the exit (e.g. sign type '2806' TSRGD – see **Figure 3**) 4) At the A41/A5183 Elstree Hill South Roundabout on the A5183 Elstree Hill South splitter island – directing lorries travelling towards the Stirling Way Industrial Estate, Borehamwood, to exit onto the A41 south (e.g. sign type '2806' TSRGD – see **Figure 3**) 5) At the Stirling Corner Roundabout on the A1 Barnet Bypass (south) splitter island – directing lorries travelling towards Centennial Park, Elstree, and Watford and Bushey to exit onto the A1 South (e.g. sign type '2806' TSRGD– see **Figure 3**)* 6) At the A5183 Watling Street/Allum Lane T-junction – sign advising the route to be followed to Borehamwood and Barnet via A41 (e.g. sign type '2806.1' TSRGD – see **Figure 4**) 7) At the A5183 Watling Street/A411 Watford Road/Barnet Lane 'Elstree Crossroads' junction, e.g. located on the lamp column adjacent to the New Road junction – sign advising the route to be followed towards Borehamwood and Barnet via the A41 (e.g. sign type '2806.1' TSRGD– see **Figure 4**) 8) At the Apex Corner junction * – sign advising the route to be followed to Borehamwood and Barnet via the A1 North (e.g. sign type '2806' TSRGD– see **Figure 3**)*	**£10,000-£20,000**

		9) At the Apex Corner junction * – sign advising the route to be followed towards Watford via the A41 (e.g. sign type '2806' TSRGD– see **Figure 3**)* * Sign will be located outside of Hertfordshire. Consultation with necessary approvals from Barnet Borough Council and TfL will be required. The proposed locations of directional signs are shown in **Figure 5**. Deliverability –1 to 2 years STANDARD	

Supporting Evidence of Measures/Components

(Figures 1-4 have been obtained from the Traffic Signs Regulations and General Directions 2002)

Figure 1

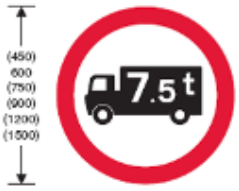


Figure 2

Figure 3

Figure 4

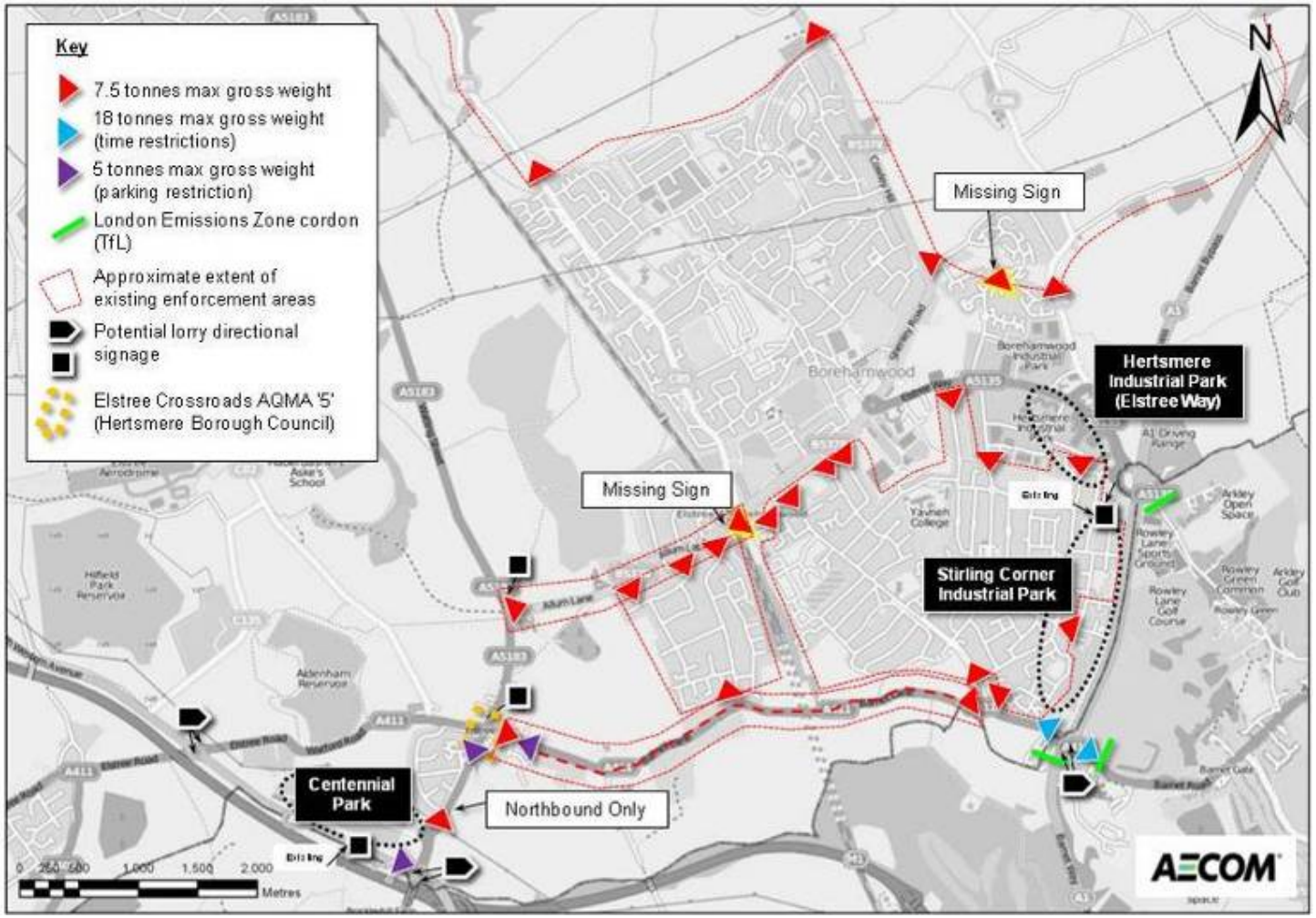


Figure 5 – Proposed Locations for Directional Signage and existing Weight Restrictions

Preferred Option
A review of existing weight restrictions across the area (16.1) is highly recommended and this may include a trial experimental revised restriction approach on the A411 Barnet Lane. The signing strategy (component 16.2) has some potential to advise HGV drivers who are driving through the existing weight restriction unwittingly of alternative routes, and therefore it may be considered a cost-effective measure to introduce in advance of any changes to the existing weight restriction.

Contribution to Objectives / Indicators	UTP Objectives	

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
16.1	£8,000-£10,000	
16.2	£10,000-£20,000	
TOTAL COST FOR DELIVERY	**£18,000-£30,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	The signing strategy has potential strategic consequences in terms of traffic flow distribution. A risk is that it could direct lorries towards the LEZ and lorries may as a consequence incur costs. Consideration may therefore need to be given to further advisory signage warning lorries that taking the advised alternative route could mean that payment of the LEZ will be required. Signs are however already provided on approaches to the LEZ. Consultation and any necessary approvals from Barnet Borough Council and TfL may be necessary prior to the implementation of the signing strategy although no fundamental changes to existing restrictions are being proposed. Consultation and approval from Hertfordshire Police is required.

Other Information/Additional Notes:

Scheme Name	**Borehamwood Shopping Park – Cycle Access from Theobald Street** Cycling	
Scheme Reference	17	
Problem References	HC05	Theobald St Shopping Park access congestion
	CY09	Low proportion of cycle to work trips within and between towns
	CY13	Cycle Signing and Wayfinding
Links to other UTP schemes:		08

Context

Figure 1 – Scheme Location

Theobald Street is a distributor route on the western edge of Borehamwood, terminating at the roundabout at Elstree and Borehamwood Station and Shenley Road. The road attracts an Annual Average Weekday Flow of 10,169 vehicles (2010) and is considered to be a key route for motorists and commuters accessing Borehamwood town centre from the north-western parts of the town, and Radlett and St Albans beyond.

The Borehamwood Shopping Park is located in the town centre and heavily used car park is accessed from Theobald Street, which runs to the west of the shopping park. At weekends it has been observed that vehicles often queue on Theobald Street, waiting for car park spaces to become available. The 695 spaces provided at the Borehamwood Shopping Park are free of charge for the first three hours.

Sources: ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Figure 2 - Theobald Street mini-roundabout access to the Borehamwood Shopping Park

Currently, access to the shopping park from Theobald Street for pedestrians and cyclists is poor due to a lack of facilities. Vehicular access is from a mini-roundabout on the main road, and there are no designated facilities for cyclists to access the park; access is entirely on carriageway using the existing mini roundabout. Pedestrian crossing facilities on this section of Theobald Street are limited to two refuges approximately 40m upstream from the mini-roundabout in each direction. Industrial and commercial units with extensive dropped kerb access line the western side of the road, making the addition of a signalised crossing facility challenging.

There are no signs to the cycle parking facilities at the shopping park. The Borehamwood Shopping Park has some existing cycle stands, though these are in several locations and are poorly signed. There are singular stands located at the fronts of retail units, and larger sets of multiple stands: two sets near the entrance to the car park with 10 stands in total, and a further set of 5 stands at the rear of the retail units. These facilities are not clearly marked, difficult to locate and not close to the retail units – the destination of the cyclists' journey. The Hertfordshire County Council (HCC) Cycle Parking Guide emphasises a number of key principles for the provision and location of cycle parking facilities:

- Visible: Cycle parking should be easy to find and well signed.
- Accessible: Cycle facilities should be as close to the cyclist's destination as possible and should be able to get to without detours.
- Safe and secure: Stands must provide the confidence to users that a parked bicycle will

be there on the owner's return.

- Easy to use: They should be easy to use by everyone.
- Fit for purpose: Stands should be able to support all types of bicycles.
- Well managed, maintained and monitored: parking levels should be regularly monitored to both establish the need for extra provision and identify abandoned bikes.

Both access and parking facilities currently limit the potential for sustainable and low carbon cycle journeys being made to the shopping park. The remedial options are developed to fulfil the Hertfordshire Cycle Strategy goal to "*encourage more people to cycle more often"* (Hertfordshire Cycling Strategy, February 2007).

Figure 3 – Singular bike rack at the Borehamwood Shopping Park.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
17.1	Implement cycle route (mixture of on/off-road provision)	Cycle specific facilities need to be provided to encourage cyclists to travel to the Shopping Park. The high daily traffic count of over 10,000 vehicles and assumed speeds of between 25 and 30mph suggests that cycle lanes or tracks are most appropriate for Theobald Street (based on diagram 4.12.1.2 in 'Roads in Hertfordshire: Highway Design Guidance 3rd edition'). On road advisory cycle lanes would not be possible due to the narrow width of the carriageway (approximately 8.0m based on OS base); however, shared use footway facilities along the length of Theobald Street would not be ideal either. Integration of cyclists into the carriageway should be encouraged, and facilities	**£110,000 - £130,000**

		provided where necessary. It has been identified that a cycle route at the entrance to the shopping park would encourage cycle journeys and aid the safety and route finding for cyclists using the route. From the south a shared use facility is proposed, involving a Toucan crossing to replace the uncontrolled crossing on the south side of the mini-roundabout (see **Figure 4**). Dropped kerb access from the carriageway to the crossing would be implemented. A crossing assessment to LTN 1/95 and 2/95 would need to be undertaken in order to determine the provision of the most appropriate facility in this location. Signs directing cyclists towards the Shopping Park and cycle parking locations are to be provided from the mini roundabout using a variant of TSRGD Diag. No. 2604 (**Figure 6**) and as specified in the HCC Cycle Parking Guide. Clear and safe cycle facilities will encourage journeys to the Borehamwood Shopping Park to be made by bicycle. Deliverability – more than 2 years STANDARD	

17.2	Introduce cycle stands and signage at Borehamwood Shopping Park.	Location of cycle stands in the Borehamwood Shopping Park is difficult. Stands are not close to the main retail units and need sufficient signage. Well advertised cycle parking that conforms to the HCC Cycle Parking Guide will encourage cycling as an alternative mode of transport. It is proposed that further Sheffield stands are provided close to the frontage of the retail units. Suggested locations for these stands are shown in **Figure 7**. Three locations have been identified for new additional stands on the main footways at the edge of the car park. Each location has space for five new stands which are to be placed 90° to the kerb (see **Figure 8**). New and existing cycle stands need to be well signposted so they are visible and accessible. Signs to TSRGD Diag. Nos. 968 and 968.1 (see **Figure 9**) should be installed at the site of each cycle stand location, and signs TSRGD Diag. No. 2603 (see **Figure 10**) at visible locations within the car park enabling cyclists to locate stands easily, as prescribed in the HCC Cycle Park Guide . Visible and secure cycle stands would encourage short journeys to be made by bicycle and encourage those who normally drive to cycle instead This component will occur on private property and is therefore subject to discussion with the land owner of the shopping park. Deliverability – 1 to 2 years **SIMPLE**	**£5,500-£15,000**

17.3	Improve walking and cycling environment along Theobald Street between Shenley Road and Borehamwood Shopping Park	It has been recognised that the pedestrian and cycle environment along Theobald Street between the Shopping Park and Shenley Road is challenging. Footway widths are narrow and the link is vehicle dominated. It is proposed that a review of this link is undertaken to assess the quality of pedestrian and cycle provision. The layout of parking and loading provision should be reviewed to provide benefits to non-motorised users, including some improvements to the area in terms of looks and feel. There is the potential for two single vehicle parking bays half on / half off the carriageway adjacent to the plumbing/bathroom retail unit (where footway parking has been observed). **Figure 10** illustrates the area to be investigated and should take into account developments proposed in Proforma 06. The provision of a connection through Keystone Passage is also to be considered in alliance with the improvements to the parking within the Shopping Park. Signage could be used to enhance this route for pedestrians and cyclists. Deliverability – 1 to 2 years **STANDARD**	**£6,000-£9,000**

Supporting Evidence of Measures/Components

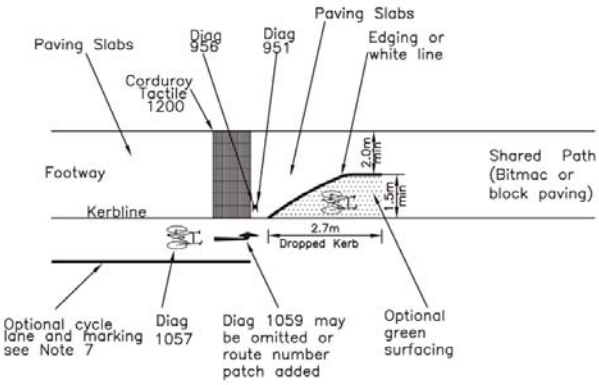


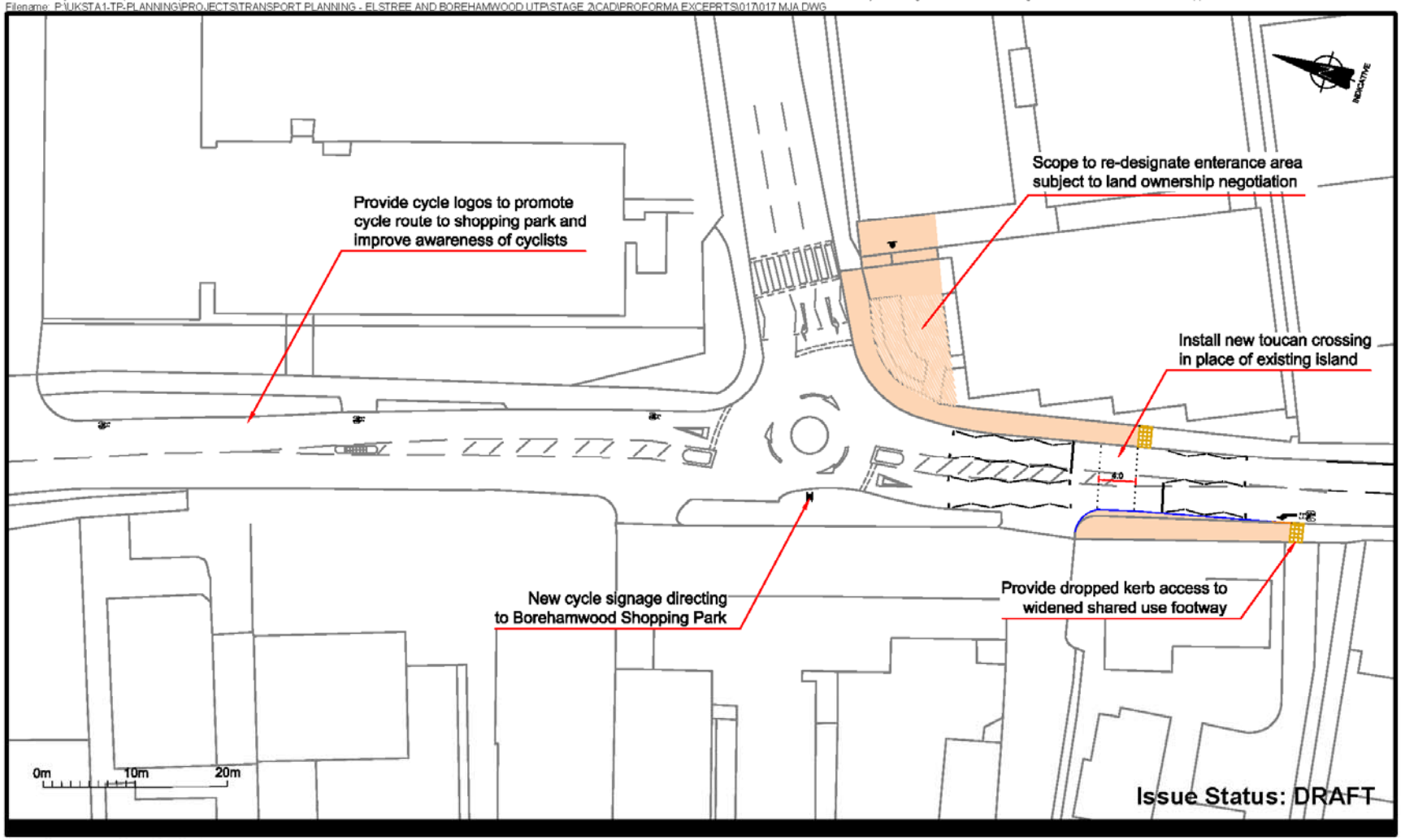
Figure 4 – Drawing CCE/C4.1 from the LCDS showing entry to a shared use area

Figure 5 – TSRGD Sign No. 2604 for variation and use to sign Borehamwood Shopping Park.

Hertfordshire AECOM

Last saved by: ARTISM1 (2012-11-27) Last Plotted: 2012-11-27
Filename: P:\UKSTA1-TP-PLANNING\PROJECTS\TRANSPORT PLANNING - ELSTREE AND BOREHAMWOOD UTP\STAGE 2\CAD\PROFORMA EXCERPTS\017\017 MJA.DWG

Project Management Initials: Designer: MJA Checked: SW Approved: JA ISO A4 210mm x 297mm



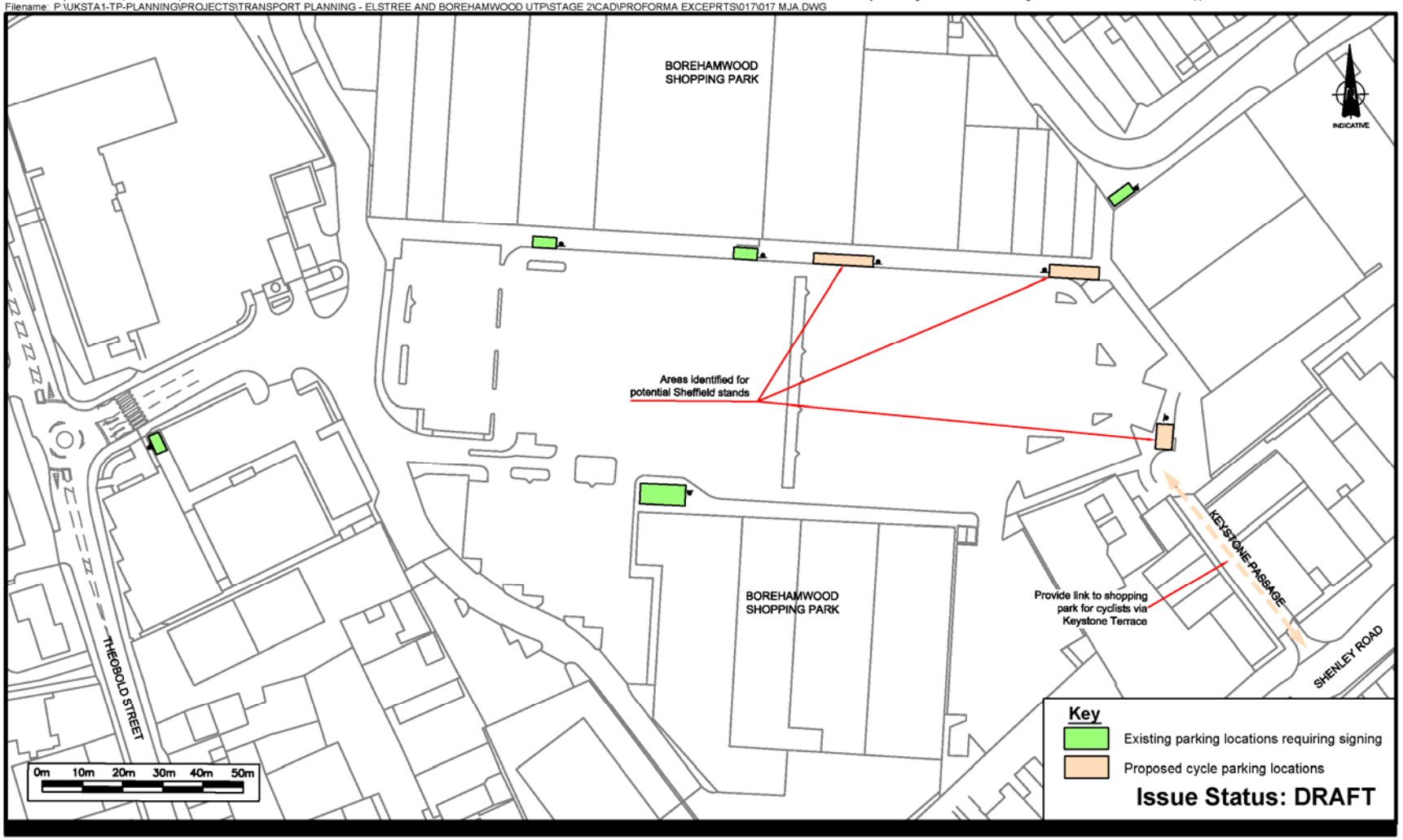
Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

AECOM

Figure 6 - Entrance to Borehamwood Shopping Park

Last saved by: ARTISM1(2012-12-18) Last Plotted: 2012-12-18
Filename: P:\UKSTA1-TP-PLANNING\PROJECTS\TRANSPORT PLANNING - ELSTREE AND BOREHAMWOOD UTP\STAGE 2\CAD\PROFORMA EXCEPRTS\017\017 MJA.DWG

Project Management Initials: Designer: MJA Checked: SW Approved: JA ISO A4 210mm x 297mm



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 7 - Cycle Parking at Borehamwood shopping park

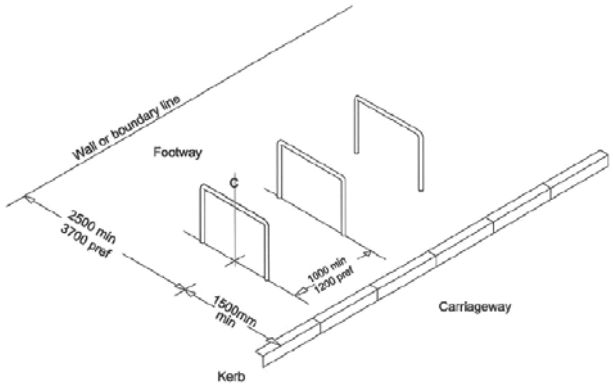


Figure 8 –Sheffield cycle stand layouts (HCC Cycle Parking Guide).

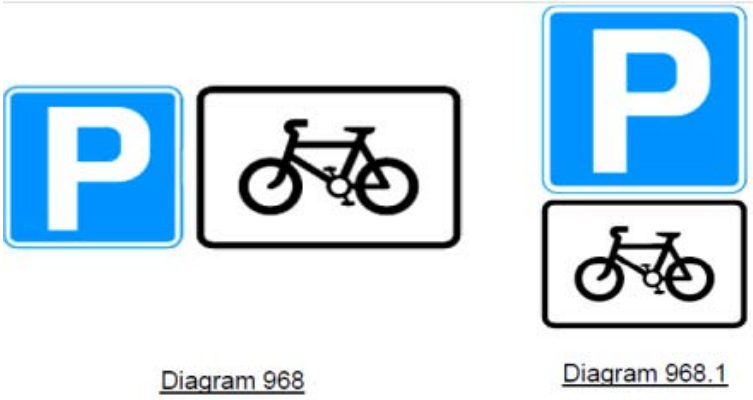
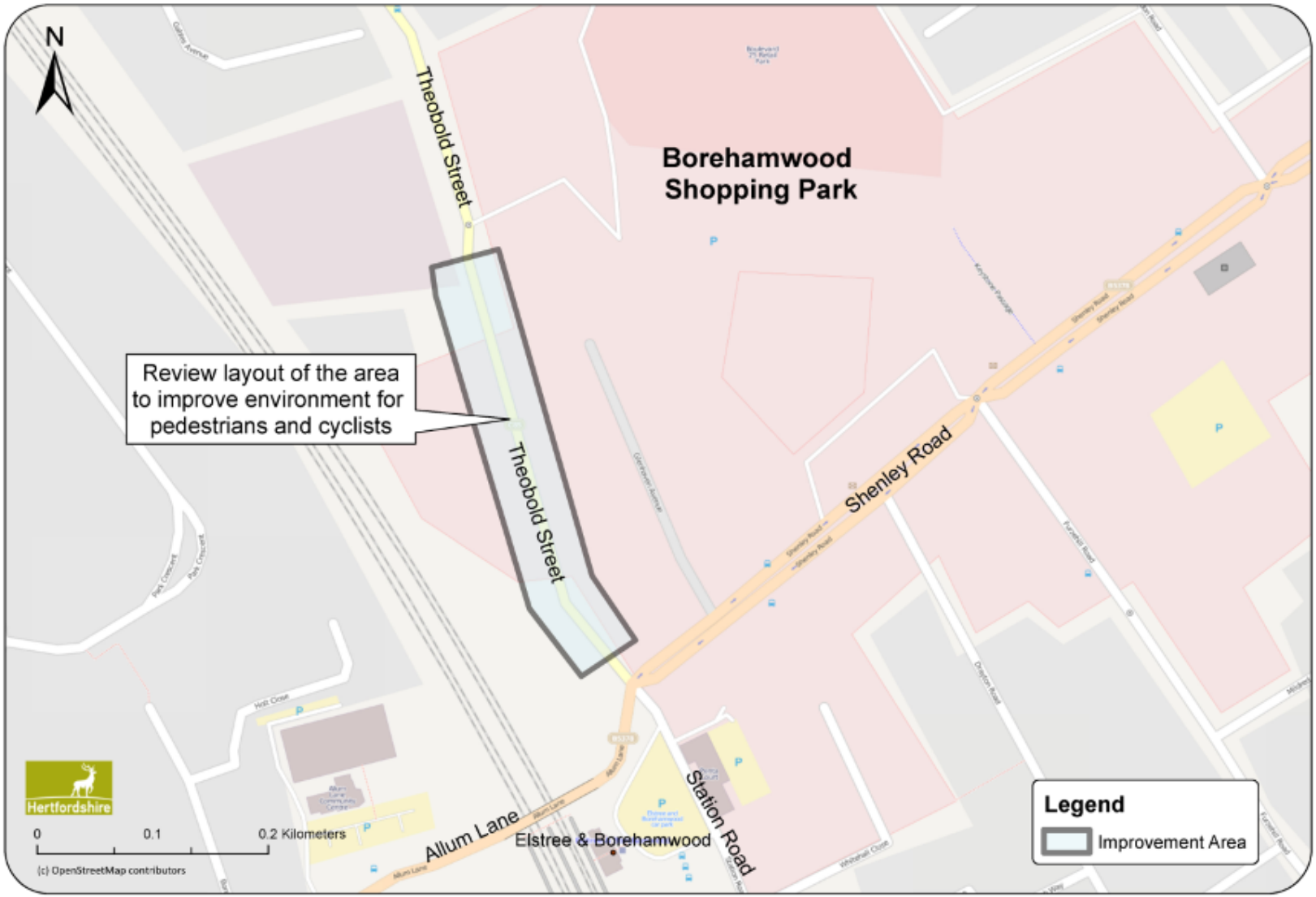


Figure 9 – TSRGD Diag. Nos. 968 and 968.1 used to highlight the locations of cycle parking facilities

Figure 10 – TSRGD Diag. No. 2603 used to highlight the location of cycle parking

Figure 11 - Theobold Street Improvement Area



Preferred Option
It is recommended that proposal 17.2 be implemented prior to 17.1 as 17.2 can be achieved in a short space of time subject to land owner agreement and alone may increase cycle numbers without the introduction of 17.2. The benefits of scheme 17.1 may be limited if cycle parking options are limited. Measure 17.3 should be taken forward where the opportunity arises to improve the area for non-motorised users and reduce the domination of traffic through this section.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
17.1	£110,000 - £130,000	
17.2	£5,000 - £15,000	
17.3	£6,000-£9,000	
TOTAL COST FOR DELIVERY	**£121,000 - £154,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for Traffic signals, footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	Liaison with landowners required (site is managed by Jones Lang LeSalle)

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Aerial photography has been sourced from ArcGIS Online. Sources**:** ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community

Scheme Name	**Allum Lane/Deacon's Hill Footway Enhancements** Walking	
Scheme Reference	18	
Problem References	WA01	Allum Lane Community Centre pedestrian linkage
	WA05	Low proportion of walk to work trips within towns
	WA06	Deacons Hill lack of dropped kerbs
Links to other UTP schemes:		05

Context

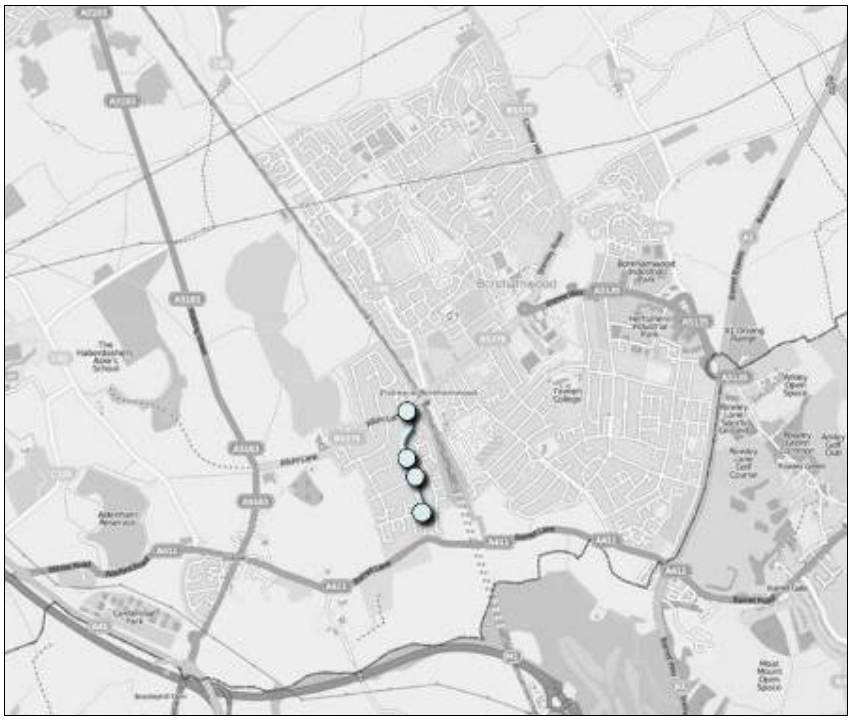


Figure 1 – Scheme Location

Deacon's Hill Road connects the B5378 Allum Lane and the A411 Barnet Lane and is subject to a 7.5 tonne lorry weight ban, has traffic calming measures and has waiting restrictions operating between 8am to 6.30pm from Monday to Saturday. As a result of these traffic management measures, Deacon's Hill Road is relatively free of on-street parking and footway parking during the daytime. Footways are of adequate width throughout, however, a lack of dropped kerbs and tactile paving create issues for pedestrians crossing side road junctions. It was observed that re-surfacing of the footways along Deacon's Hill Road had taken place in Autumn 2012 but no improvements were made to side road junctions.

A mini-roundabout controls traffic movement at the junction of Deacon's Hill Road and Allum Lane, a three armed junction with a petrol station and private access in close proximity. Allum Lane forms the main connecting route between central Borehamwood and Elstree, via Elstree Hill and Roman Road, and as a result has a significant level of vehicle flow. This was

recorded as 11,751 annual average weekday flow (Elstree & Borehamwood Data Report, 2012).

Figure 2– Allum Lane / Deacon's Hill Road

Crossing facilities at the mini-roundabout are potentially difficult for pedestrians due to the absence of tactile paving and inadequately aligned dropped kerbs on all arms.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
18.1	Introduce dropped kerbs / speed tables at junctions on Deacons Hill	All side roads along Deacon's Hill Road require dropped kerbs and tactile paving to enable pedestrians to cross. These side road junctions are shown in **Figure 3** and listed below: • Deacons Close • Hartfield Avenue • The Rise • Nicholas Road • Summer Hill Alterations to the junctions are possible to reduce pedestrian crossing widths and ease pedestrian movement. Two options have been proposed: a) Introduce tightened kerblines at Hartfield Avenue, Nicholas Road and Summer Hill. The mouths of the junctions are currently wide and footway buildouts would reduce the crossing	**£10,000-£20,000**

		movements and also reduce vehicle entry and exit speeds. The Design Manual for Roads and Bridges (DMRB – TD42/95) suggests a minimum circular radius of 10.0m for simple junctions and the three side roads noted above have radii of between 12.0m and 15.0m. These could be reduced to closer to 10.0m to reduce crossing widths. b) Introduce entry treatments with raised crossing areas at the junctions of all side roads to reduce entry speeds and improve pedestrian crossings. Entry treatments could be applied at all side road junctions shown in **Figure 3**. Deliverability: less than 1 year STANDARD	
18.2	Improve pedestrian crossing facilities at Allum Lane / Deacon's Hill mini roundabout	The component consists of providing tactile paving and dropped kerbs at crossing points on Allum Lane arms at the Deacon's Hill Road mini roundabout. All crossing points shall be provided with tactile paving to the standards laid out in Guidance on the use of Tactile Paving Surfaces and dropped kerbs shall be flush with the carriageway. The bus lay-by on the exit of the eastern arm of Allum Lane can be modified to improve the crossing of the existing facility. A slight build out would enhance the crossing point and still enable a single decked bus to access the bus stop with access for bus patrons kerbside (see **Figure 4**). Deliverability: less than 1 year SIMPLE	**£5,000-£15,000**
18.3	Pedestrian signing to Elstree and Borehamwood Station	It has been highlighted that pedestrian wayfinding could be enhanced along Deacon's Road to identify routing to the train station. Signs could be provided that show minutes to the station rather than distances to encourage walking along the improved pedestrian environment. Signs at each decision point (i.e. side road junction) could be implemented. Deliverability: less than 1 year SIMPLE	**£4,000-£6,000**

Figure 3 – Deacon's Hill Pedestrian Environment

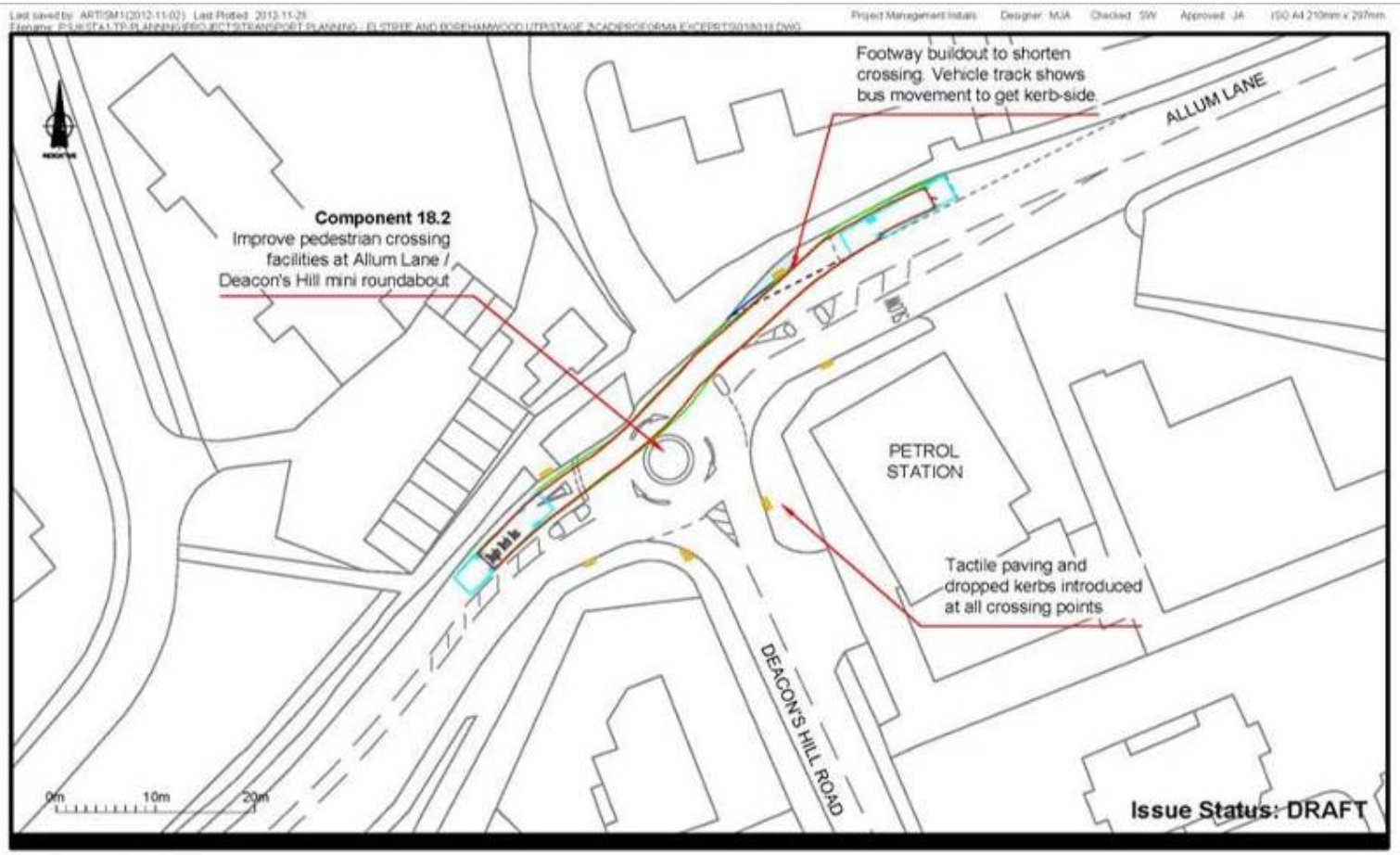


Figure 4 - Deacon's Hill Roundabout Improvements

Preferred Option
All components should be implemented to improve walking conditions along Deacon's Hill Road. The crossing facilities at the Allum Lane and Deacon's Hill Road roundabout are very important as the existing provision is sub-standard and could discourage users from crossing at this location. Pedestrian wayfinding will improve routing along the road.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
18.1	£10,000-£20,000	
18.2	£5,000-£15,000	
18.3	£4,000-£6,000	
TOTAL COST FOR DELIVERY	**£19,000-£41,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	

Other Information/Additional Notes:

Existing highway dimensions are based on OS mapping provided by HCC and / or site measurements. It is recommended further survey work is carried out to provide a full assessment of available widths during feasibility design.

Scheme Name	**Managing Disruptive Parking (including displacement parking from Controlled Parking Zone)** Parking	
Scheme Reference	19	
Problem References	PK09	CPZ parking displacement on adjacent streets
Links to other UTP schemes:		N/A

Context

Roadside parking which is perceived as being disruptive, obstructive or in abundance, has been raised as an issue at several discrete locations in Borehamwood, in particular on roads at the perimeter of the Controlled Parking Zone (CPZ) and as a widespread issue affecting Borehamwood.

The CPZ was introduced by Hertsmere Borough Council to address the increasing parking/traffic related problems experienced by residents and businesses. The main aim of the CPZs introduced so far has been to discourage rail commuters and long stay parking by motorists visiting the town centre, on residential streets. An objective of the CPZ is to encourage modal shift if, for instance, the walk distance from parking the car is extended and becomes unattractive.

It is difficult to determine with confidence what is or is not displaced parking from the Controlled Parking Zone, as opposed to parking attributed to the properties it occurs adjacent to, however prevalent parking has been observed at locations where there appears to be suitable off-road parking facilities for residents.,.

Addressing displaced or prevalent parking could have unforeseen consequences and therefore measures to address the issue should be given careful consideration.

Measures/Components

Ref	Description	Assessment of Suitability	Cost
19.1		Undertake a review of roadside parking, assessing the extent of the Controlled Parking Zone, the measures (if present) which control or manage parking provision on roads immediately adjacent to the CPZ which may be attractive to motorists, review the appropriateness of existing controls to determine whether any additional/new controls are required to address the effects of displacement where this is determined as being significantly disruptive. Deliverability – within 1 year **STANDARD**	

Supporting Evidence of Measures/Components

Preferred Option

Contribution to Objectives / Indicators	UTP Objectives	• Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
19.1	£ TBC	
TOTAL COST FOR DELIVERY	**£ TBC**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for footway works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	*Any amendments to parking arrangements will need to take into account bus accessibility/congestion.*

Other Information/Additional Notes:

Scheme Name	**Safe and Sustainable Access to Hertswood School** Accessibility	
Scheme Reference	20	
Problem References	CY21	Shenley Road Cycling Facilities
	CY24	Cowley Hill/Hertswood School
	PK04	Shenley Road footway parking
	SP07	B3578 Cowley Hill/Shenley Road potential speed compliance issue
	WA10	Hertswood School – Thrift Farm Lane access
Links to other UTP schemes:		04, 07, 10

Context

Hertswood School has had Travel Plan in place since March 2011. The Travel Plan identifies a number of transport issues on roads adjacent to the two school sites, including inconsiderate parking by parents dropping off/picking up children on Shenley Road, Potters Lane and Cowley Hill, and the overflow of pedestrian movements into the roadway on Thrift Farm Lane during peak times.

Key statistics from the Travel Audit undertaken for the Travel Plan:

- 48.3% of pupils travel to/from school on foot, 35.6% are escorted by car, 1.7% cycle and 13.8% travel by public transport.
- 44.2 said they would like to walk, 16.4% said they would like to cycle, 25.9% said they would like to be taken by car, and 1.7% said they would like to travel by bus to/from school.
- 94.9% of staff travel by car (68.4% live over 5 miles from the schools)

These statistics indicate that the car is a dominant mode of access to/from the school and that pupils have expressed a desire to travel to/from school by bike.

The Travel Plan identifies the following objectives:

1) Encourage all users of the school's facilities…to walk or cycle to school safely.
2) Reduce the number of cars on school…related journeys
3) Raise awareness of safety and environmental issues amongst the school community and all users of the school's facilities.
4) Together with our community partners to find ways to reduce the impact of traffic along Shenley Road and to improve pedestrians' safety
5) To work with Hertfordshire County Council, Hertsmere Borough Council and the Police to reduce the nuisance of illegal parking in Shenley Road and find a long-term solution to the inadequate access to the Upper School.

Parking across footways on Shenley Road has been observed outside of the school during peak times.

Traffic speed data has been requested for Shenley Road and Cowley Hill adjacent to the

schools. The road is subject to a 30mph speed limit.

Parking on the pavement can obstruct and seriously inconvenience pedestrians and people in wheelchairs. Parking across the footway has been observed on Shenley Road on the section between Thrift Farm Lane and the Shenley Road-Elstree Way-Brook Road roundabout. This section of footway, which also serves as a shared cycleway, is popular with pupils travelling to/from the Hertswood School sites.

In 2011, the Department for Transport gave all councils in England permission to use signs to indicate a local pavement parking ban. Prior to this, councils had to gain special signs authorisation from Government each time they wanted to put a pavement parking ban in place. A local authority can make a traffic regulation order (TRO) to prohibit footway parking on a designated length of highway or over a wider area. This means the Council can target problem areas rather than applying a blanket ban.

Alternatively, local authorities can use physical measures such as high kerbs or bollards to prevent vehicles mounting the footway where footway parking is a particular problem. Such measures have the advantage of being largely self-enforcing. However, these are not considered suitable on this section of highway because of the frequency of vehicle crossovers serving residential properties and the effect this would have on the cycleway.

Off-street parking is available at most properties on this section of road and the occurrence of pavement parking could be for convenience, insufficient space off-street parking and no parking bays available on street. The most southerly section of Shenley Road in question is within the Controlled Parking Zone for Borehamwood.

There are three related and complimentary schemes being considered as part of the UTP which could improve access to the school by bike and may encourage modal-shift from the car:

Scheme 04 addresses School Travel Plans in the area and proposes that a cluster of schools, including Hertswood School, take part in the Safer Routes to School project managed by HCC.

Scheme 07 aims to implement continental-style design principles at the Shenley Road-Elstree Way-Brook Road roundabout which should improve pedestrian and cyclist safety and reduce traffic speeds. The junction is likely to be traversed by Hertswood School pupils who live in parts of Borehamwood to the south of the Elstree Way/Shenley Road east-west corridor and this scheme will therefore contribute towards improving access to Hertswood School.

Scheme 10 aims to improve cycle connectivity between Well End and Borehamwood via the Studio Way estate which includes a new designated cycle route linking Rowley Lane and Potters Lane via Denham Way which will improve access to the school.

All these schemes provide a comprehensive package of measures to improve access to Hertswood school (and potentially nearby primary schools) and potentially increase safety for pupils travelling to/from school on foot or by bike.

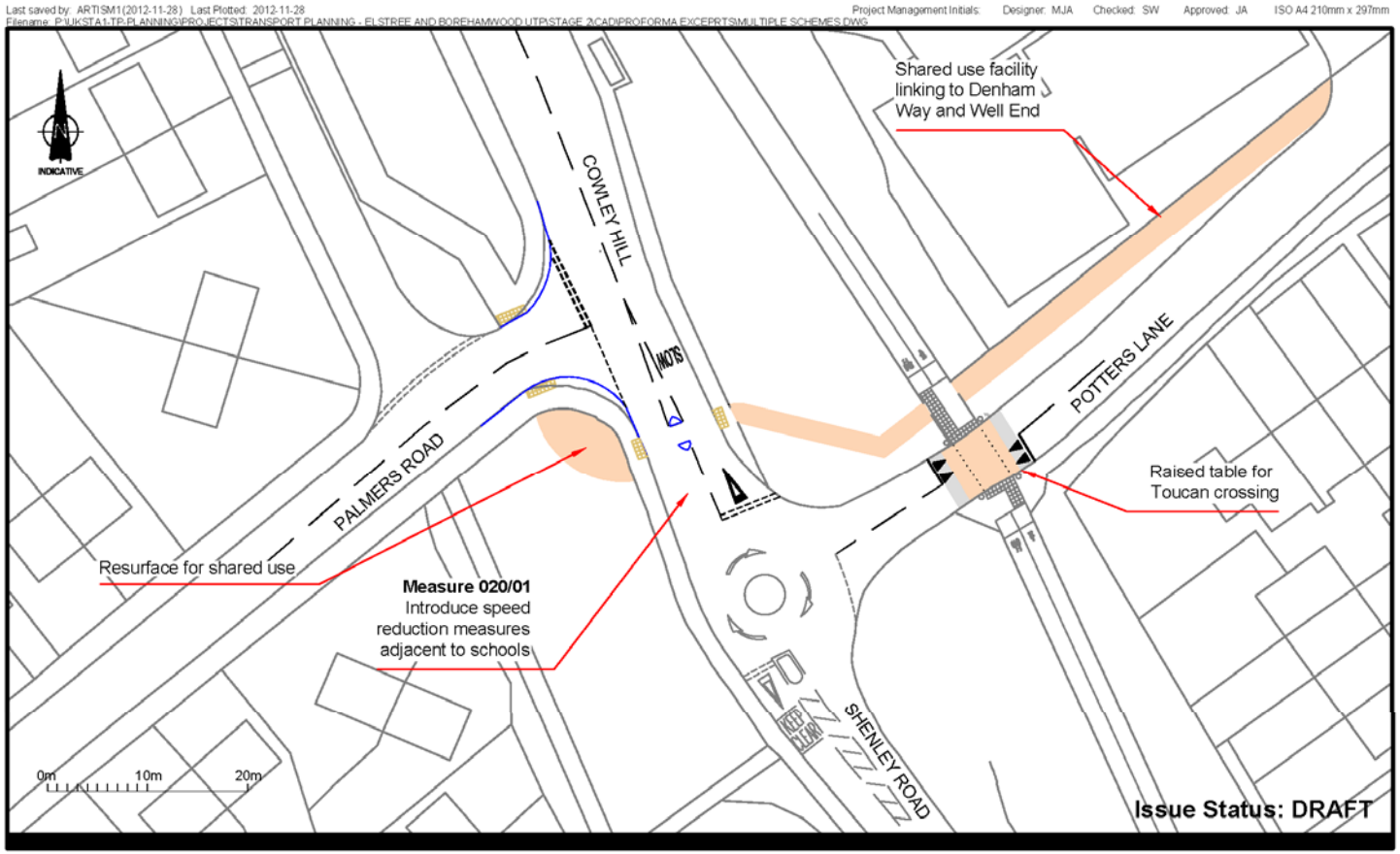
Traffic speed data is awaited to indicate existing 85th percentile speeds exceed the 30mph speed limit in accordance with the process detailed in HCC's Speed Management Strategy.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
20.1	Improve pedestrian environment around Thrift Farm Lane access	a) A raised junction / flat-top hump (minimum plateau length of 2.5 metres, and minimum hump length of 3.7 metres (in accordance with DfT LTN 1-07) will be introduced at the pedestrian crossing on Shenley Road adjacent to the Thrift Farm Lane access. b) The footway approaches to the Thrift Farm Lane crossing will be widened to improve the envelope of visibility on approach to the junction for both pedestrians and motorists. The pathway on Shenley Road is a designated cycleway, therefore a green surface treatment will be added to the Thrift Farm Lane crossing with tactile paving and give-way markings on either side to distinguish between live carriageway and foot/cyclepath provision. The small area of vegetation on the southern side of Thrift Farm Lane adjacent to the existing dropped kerb will be removed to widen the footpath area and improve junction indivisibility. The existing guard-rail will be extended eastwards as far as the lamppost, litter bin and vehicle crossover. c) Introduction of 'Children going to school or playground' road markings on south-westbound approach (upstream of pelican crossing adjacent to existing warning sign) and north-eastbound approach (upstream of Thrift Lane junction adjacent to existing warning sign). Deliverability – Between 1 to years STANDARD	**£30,000-£50,000**
20.2	Implement parking management measures on Shenley Road (north and south of Thrift Farm Lane)	a) Implement a ban on footway parking on a length of Shenley Road (eastern side) between Thrift Farm Lane and Civic Offices Car Park access. Implementation of regulatory signs.	**£5,000-£10,000**

		 *Figure 1 – No footway parking signs* b) Implement marked parking bays at selected intervals, between the edge of the CPZ and a point broadly halfway between the controlled crossing adjacent to the Thrift Farm Lane junction and the traffic island (south of where the road bends). The approximate locations of the bays are shown in **Figure 4**. Deliverability – Within 1 year **SIMPLE**	
20.3	Introduce speed reduction measures adjacent to Hertswood school sites	The locations of the following component elements are shown in **Figure 4**. a) Widen the existing footway on the south-west corner of Palmers Road/Cowley Hill to accommodate a short section of cycleway linking the existing cycleway on the western side of Cowley Hill and the proposed cycleway on the northern side of Potters Lane. Amend the radii on the northern and southern sides of Palmers Road at the junction with Cowley Hill. b) Widen the existing footway linking the pedestrian crossing to the shared cycle/foot way on the eastern side of Cowley Hill in order to accommodate a cycle lane and provision of cycle lane give-way markings thus giving priority to north-south cyclists. c) Provision of tactile paving at all designated crossing points between HBC Civic Offices and Gateshead Road mini roundabout, where there is currently no provision. d) Provision of guard-railings at selected points	**£30,000-£50,000**

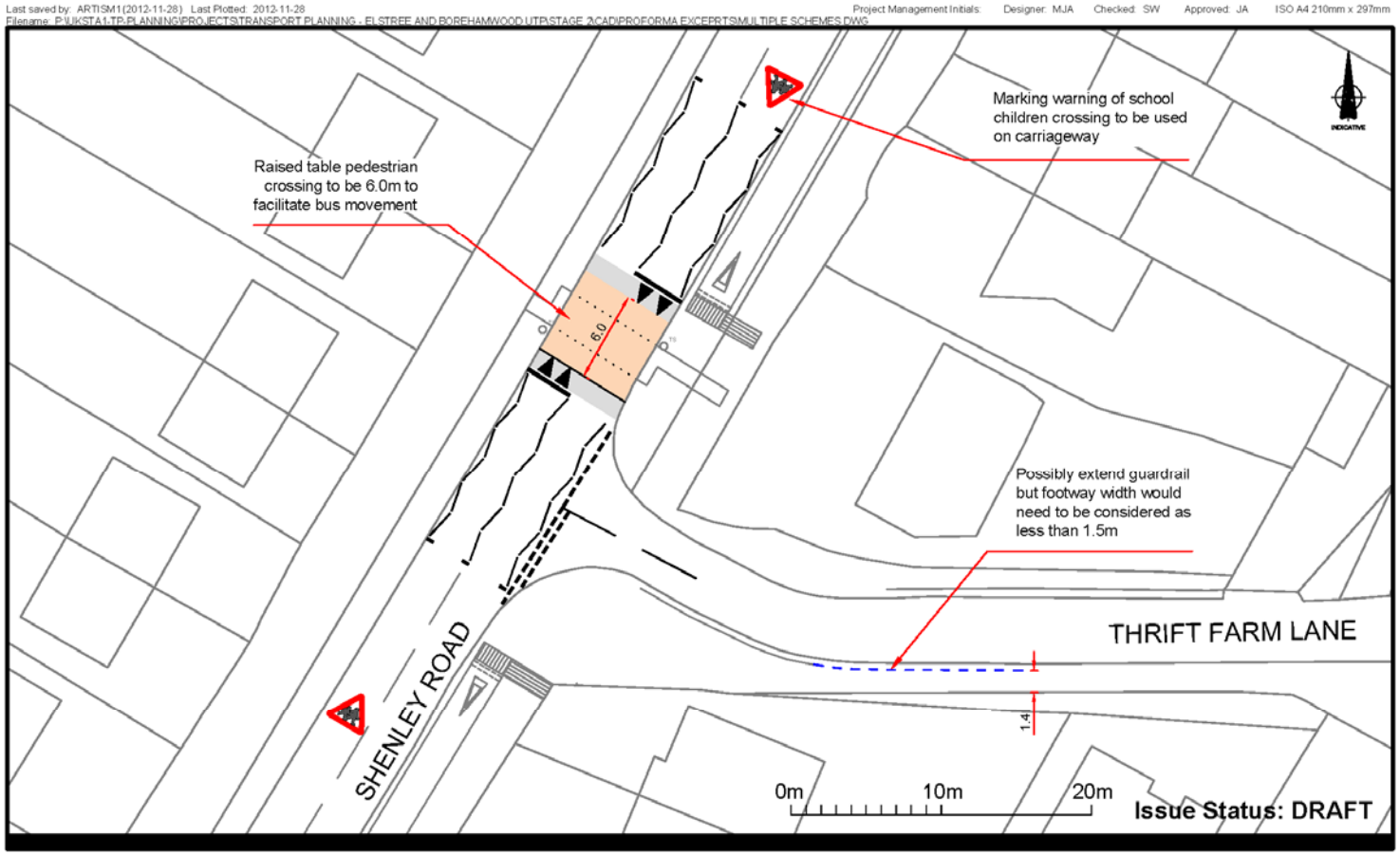
		to discourage pedestrians/cyclists from crossing at inappropriate locations. e) Implement a raised table at the existing Pelican Crossing on Potters Lane approach to Cowley Hill mini-roundabout and convert the crossing to Toucan Crossing standards. f) Implement a raised table at the existing Pelican Crossing on Cowley Hill just south of the Hartforde Road mini roundabout. g) Implement a raised table at the existing Pelican Crossing on Shenley Road located to the south of the car park access. h) All new cycle lanes to receive green coloured surface treatment to increase presence and separation of footway. i) Two pairs of speed cushions will be introduced on Cowley Hill between the Gateshead Road and Hartforde Road mini roundabouts at the locations of the two existing traffic islands. The islands are approximately 80m apart. The islands will be removed as the carriageway width is approximately 6.5m and there will not be sufficient clearance on either side of the island to accommodate the cushions. A third pair of cushions will be introduced at a location approximately 80m to the north of the most northerly of the two traffic islands, which will also be provided without a traffic island. A standard cushion height of 65mm (maximum width 1.6m) will be provided because the route is used by emergency vehicles and buses. As there will not be sufficient space to accommodate the safe passage of cyclists around the speed cushions, wayfinding signage will be provided on the southbound approach to the Gateshead mini roundabout, the northbound approach to the Hartforde Road mini roundabout, and on the south-western side of the Palmers Road junction (adjacent to the proposed widened footway/cycleway) advising cyclists of the off-road cycleway on the western side of Cowley Hill. Required signage will be implemented to advise of the presence of the humps ahead. Deliverability – Between 1 to 2 years **COMPLEX**	

Supporting Evidence of Measures/Components



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 2



Borehamwood and Elstree
Urban Transport Plan
Hertfordshire County Council
Project No.: 60268240 Date: October 2012

Figure 3

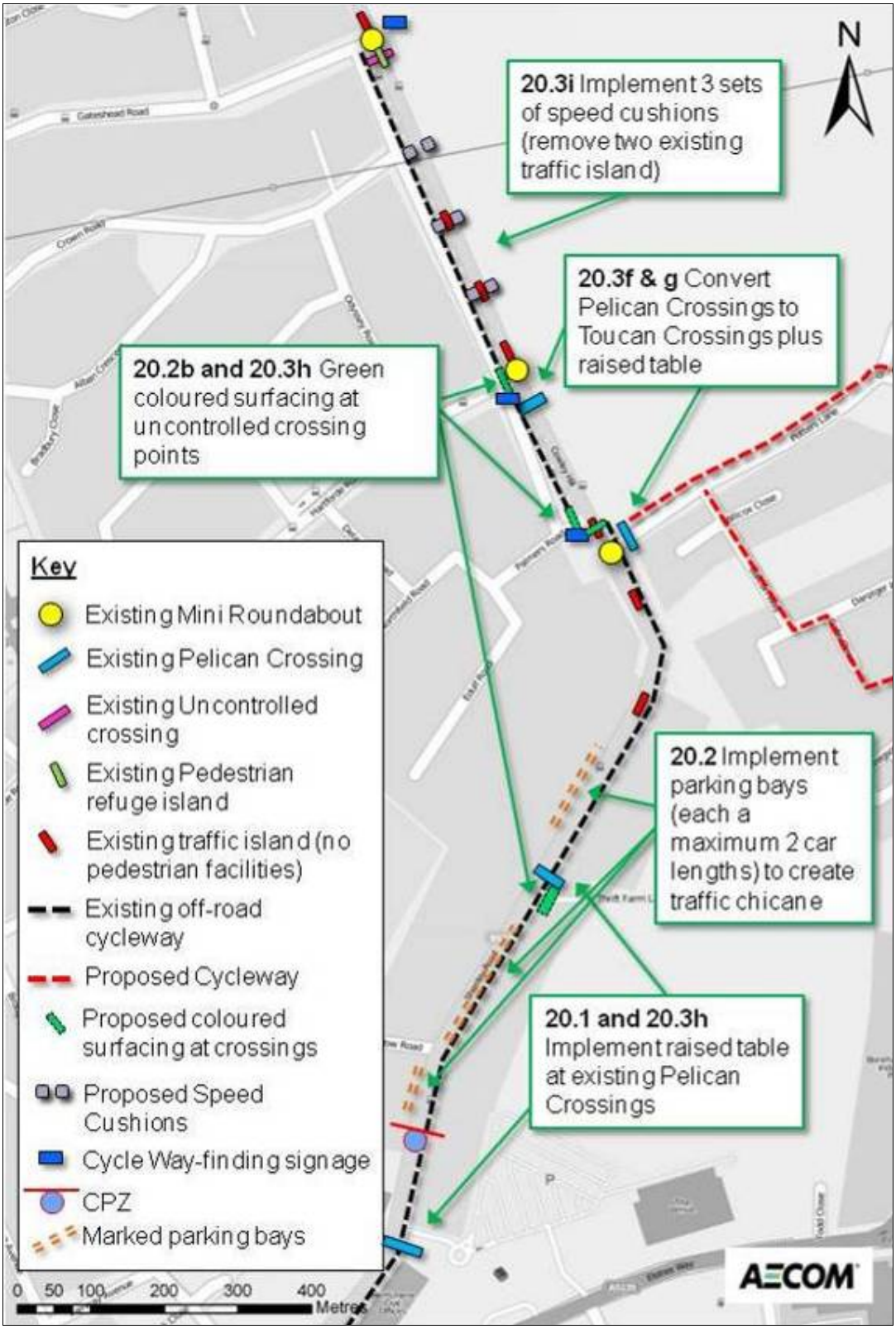


Figure 4 – Location of proposed component measures (indicative)

Preferred Option
Components 20.1 and 20.3 would provide a coherent road environment and is the preferred option to take forward. Component 20.2 is recommended to come forward in conjunction with components 20.1 and 20.3 as it should contribute towards making a more friendly cycle and pedestrian environment in the vicinity of the school and provide a form of traffic speed management by creating informal chicanes around parking bays when bays are occupied

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
20.1	£30,000 - £50,000	
20.2	£5,000 - £10,000	
20.3	£30,000 - £50,000	
TOTAL COST FOR DELIVERY	**£65,000 - £110,000**	

Maintenance Liability	~~High~~ Medium Low	*Normal maintenance for footway works, green surfacing and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	*The provision of parking bays will depend on sufficient space between existing residential vehicle crossovers. An initial assessment indicates that a maximum 2 car bay could be provided at any location.* *Detailed site investigations are required to establish the additional drainage requirements at the proposed flat top humps. These are normally in the form of gullies, on both sides of the carriageway on the uphill side (DfT LTN 1-07)*

Other Information/Additional Notes:

Scheme Name	**Cycle Wayfinding – Promoting the Connections** Cycling and Accessibility	
Scheme Reference	21	
Problem References	HC01	Station Road-Shenley Road-Theobald Street roundabout
	HC06	High car dependency for inter-town trips
	CY09	Low proportion of cycle to work trips within and between towns
	CY13	Cycle Signing and Wayfinding
	CY18	Cycle facilities at roundabouts
	PK08	Elstree and Borehamwood Station - lack of parking spaces
	PT01	Centennial Way bus facilities
	WA05	Low proportion of walk to work trips within towns
	WA07	Shenley Road Roundabouts by HBC offices and Tesco - pedestrian crossing impediment
Links to other UTP schemes:		01, 02, 05, 06, 07, 08, 09, 10, 12, 17, 20

Context

Figure 1 – Location Plan

Successful cycle and pedestrian networks rely on the implementation of various forms of infrastructure. The provision of a pedestrian and cycling signing system that caters for utility and recreational travel is important in the delivery of infrastructure that meets the DfT's five key design criteria (LTN 2/08):

- Convenience
- Accessibility

- Safety
- Comfort
- Attractiveness

Signing can enhance trip experiences for pedestrians and cyclists, performing an informative and reassuring role in the urban environment. A holistic approach should be undertaken to cater for pedestrians and cyclists.

Existing provision for cycle signing in the UTP area is inconsistent and often does not provide information relevant to cycle users. Whilst cycling is a low participation activity in Borehamwood and Elstree, the objective is to increase the level of use through the provision of greater facilities. Providing an adequate overlay of cycle signing and wayfinding will enhance the existing and proposed network of cycle routes and facilities.

The 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 in recent years.

The 2007 Urban Transport Plan for Borehamwood and Elstree illustrated the existing network for cycling and walking within the study area (see **Figure 2**).

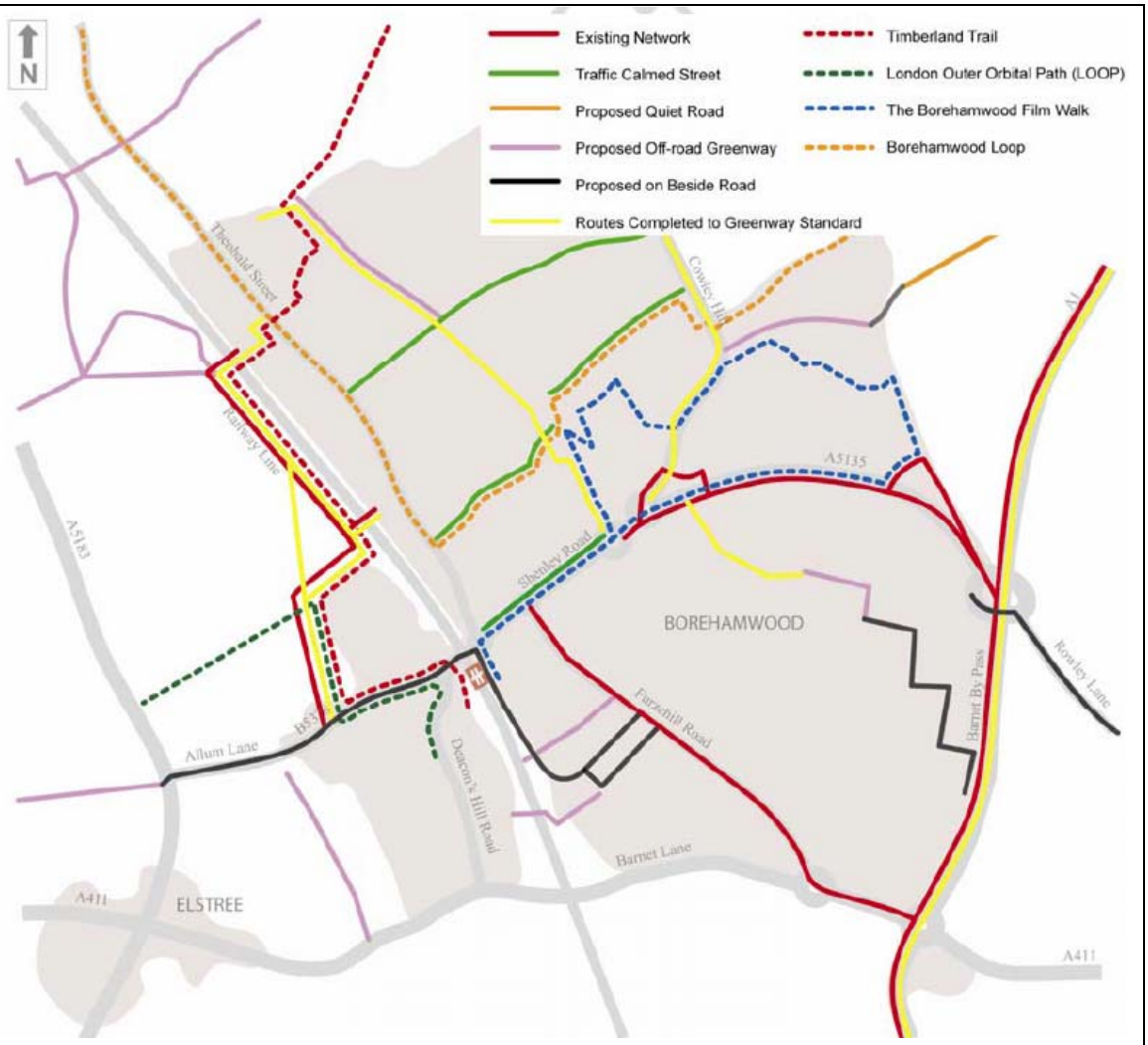


Figure 2 – Walking and Cycling Plan, Borehamwood and Elstree UTP, 2007

In addition, pedestrian route signage is limited throughout the urban areas, with little information regarding routes to key destinations and associated journey times. People could be more inclined to walk or cycle if accurate journey time was available, reducing the reliance on the car, whilst fulfilling numerous objectives outlined in Hertfordshire's LTP3. The following wayfinding measures are therefore proposed to enhance the environment for walkers and cyclists, and to encourage mode shift from the private car, focussed on broad corridors.

<table>
<tr><th colspan="4">Measures/Components</th></tr>
<tr><th>Ref</th><th>Description</th><th>Assessment of Suitability</th><th>Cost</th></tr>
<tr><td>21.1</td><td>Elstree - Composers Estate - Centennial Way</td><td>The composition of Elstree requires wayfinding on a linear and area basis. Elstree Crossroads is the focal point of settlement with routes originating from this point. Major destinations are listed in Table 1 and are important locally and on a wider scale.

<table><tr><th>Destination</th><th>Type</th></tr><tr><td>Centennial Park</td><td>Commercial</td></tr><tr><td>Waterfront Industrial Park</td><td>Commercial</td></tr><tr><td>St Nicholas Primary School</td><td>Education</td></tr><tr><td>Aldenham Park</td><td>Recreation</td></tr><tr><td>Aldenham Reservoir</td><td>Recreation</td></tr><tr><td>Composers Estate</td><td>Residential</td></tr><tr><td>Allum Lane Cemetery</td><td>Visitor</td></tr></table>
Table 1 – Key destinations in Elstree
This list is not exhaustive but should be considered in a hierarchical manner so that information is disclosed progressively and provided in a simple, clear format.

The cycling route from the A41 to Elstree Crossroads and through to Elstree Hill North is important in connecting commercial, residential and leisure land uses. Promotion of the route could enhance use for commuters and leisure cyclists. Signing located at key decision points, with accurate distances, will inform current users and potential users alike. Figure 6 identifies the routes that should be signed.

Deliverability: 1 to 2 years STANDARD</td><td>£50,000-£300,000</td></tr>
<tr><td>21.2</td><td>Elstree – Borehamwood link</td><td>Connecting Elstree with Borehamwood is discussed in Proforma 05. The promotion of existing and potential cycle routes in the area should be considered to encourage use of the route by cyclists.

Signing should be located at key decision points with distances indicated for onward travel destinations (see Figure 3). This component should be taken forward in association with other options within this proforma. However, the provision of signing linking Elstree and Borehamwood can be undertaken independently if required but would rely on the completion of the Inter Urban cycle spine (see Proforma 05) to be successful.

Deliverability: 1 to 2 years STANDARD</td><td>£50,000-£300,000</td></tr>
</table>

<table>
<tr>
<td>21.3</td>
<td>Borehamwood</td>
<td>Wayfinding in Borehamwood should cater for both pedestrians and cyclists. An indicative layout of potential signing locations for Borehamwood has been considered and is shown in Figure 6. Signing should be provided at all key decision points, transport interchanges and in the vicinity of schools, employment and leisure facilities.

Cycle route signing is designated under the Traffic Signs Regulations and General Directions, 2002 and takes the form of blue signing with distances or times to destinations as required (see Figures 3 and 4).
 

Figure 3 - Example of cycle signing
 

Figure 4 – Example of pedestrian signing
Pedestrian wayfinding kiosks or minilith products, such as those used in Legible London, could also be installed in Borehamwood to provide information to pedestrian and cycle users (see Figure 5). Table 2 details a list of key destinations within Borehamwood.
<table>
<tr><th>Destination</th><th>Type</th></tr>
<tr><td>Elstree Film Studios</td><td>Commercial</td></tr>
<tr><td>Borehamwood Shopping Park</td><td>Commercial</td></tr>
<tr><td>Hertsmere Borough Council</td><td>Commercial</td></tr>
<tr><td>Tesco Supermarket</td><td>Commercial</td></tr>
<tr><td>Elstree Way Employment Area</td><td>Commercial</td></tr>
<tr><td>Town Centre</td><td>Commercial</td></tr>
<tr><td>BBC Elstree Studios</td><td>Commercial</td></tr>
<tr><td>Stirling Retail Park</td><td>Commercial</td></tr>
<tr><td>Hertswood School</td><td>Education</td></tr>
<tr><td>St. Teresa's Catholic Primary School</td><td>Education</td></tr>
<tr><td>Saffron Green Primary School</td><td>Education</td></tr>
<tr><td>Woodlands Primary School</td><td>Education</td></tr>
<tr><td>Parkside Community Primary School</td><td>Education</td></tr>
<tr><td>Meryfield Community Primary School</td><td>Education</td></tr>
<tr><td>Summerswood Primary School</td><td>Education</td></tr>
<tr><td>Kenilworth Primary School</td><td>Education</td></tr>
<tr><td>Aberford Park</td><td>Recreation</td></tr>
</table>
</td>
<td>£50,000-£300,000</td>
</tr>
</table>

Borehamwood Football Ground	Recreation
Meadow Park	Recreation
Maxwell Park	Recreation
Kenilworth Park	Recreation
The Ark Theatre	Recreation
The Venue	Recreation
Public Library	Civic
Elstree & Borehamwood Station	Transport

Table 2 – Key destinations in Borehamwood

This list is not exhaustive but should be considered in a hierarchical manner so that information is disclosed progressively and provided in a simple, clear format.

Deliverability - 1 to 2 years **STANDARD**

Supporting Evidence of Measures/Components

See **Figures 4** and **5** on the following pages for wayfinding locations.

Figure 5 – Typical Wayfinding minilith (Legible London)

Figure 6 - Elstree and Borehamwood Wayfinding

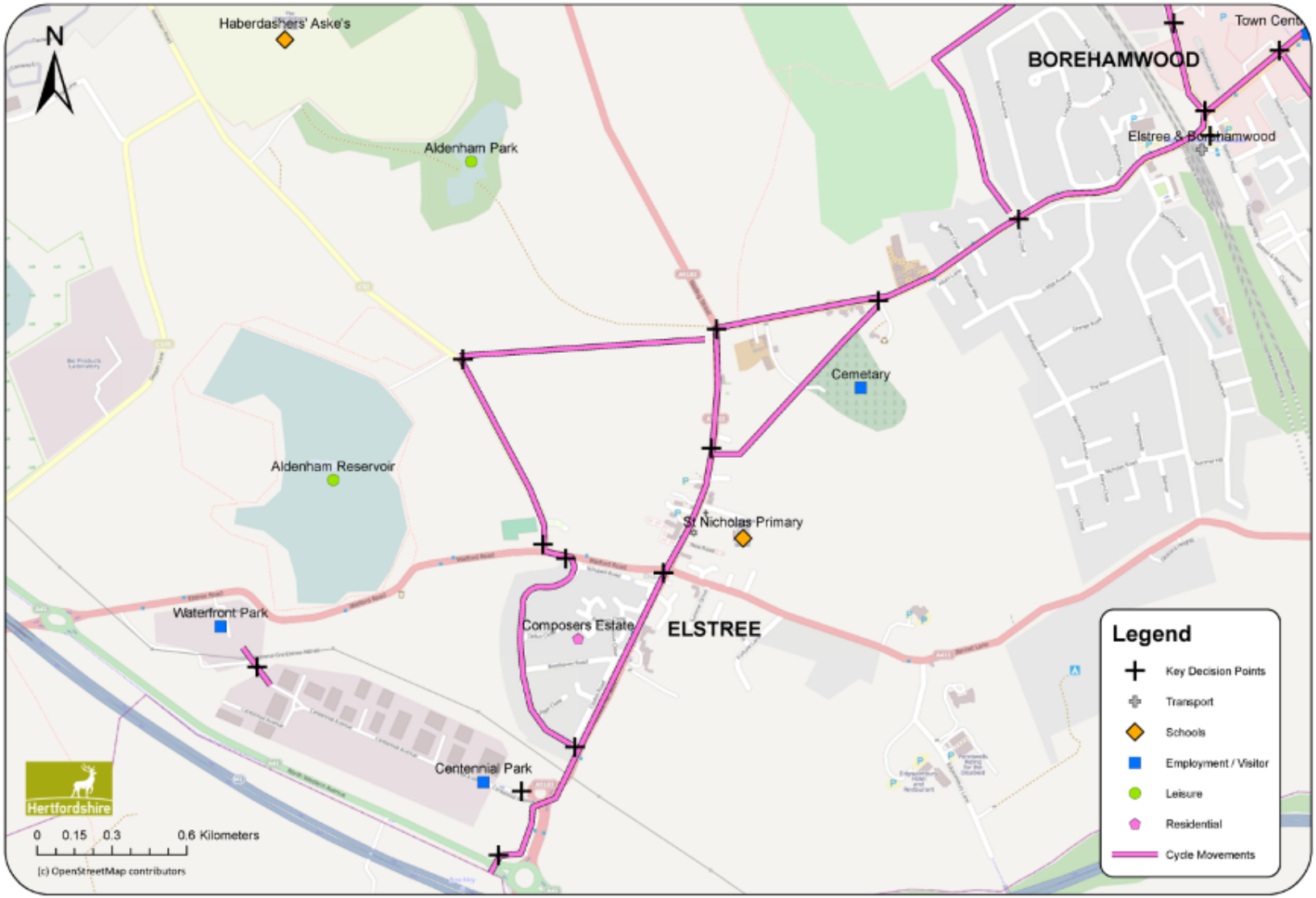


Figure 7 - Borehamwood Wayfinding

Preferred Option
It is recommended that all three groups of wayfinding measures are progressed as they can provide significant benefits to the cycling and walking infrastructure in Borehamwood and Elstree. It is recommended that the signing of cycling and pedestrian facilities is undertaken in line with the delivery and implementation of other UTP schemes to ensure consistency and promotion. Through the implementation of these measures, in addition to improved cycle links and pedestrian crossings, connectivity between key destinations by foot and by bike will be improved throughout the study area. These measures will assist in the shift of priority from the private car to healthier, sustainable short journeys.

Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity across Elstree, Borehamwood and Well End through a cohesive and attractive network of walking and cycling facilities • Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Encourage reliability of travel through sustainable travel alternatives

Outline Cost Analysis of Preferred Option		
Design and Implementation	**Indicative Cost**	**Notes**
21.1	£50,000 - £300,000	
21.2	£50,000 - £300,000	
21.3	£50,000 - £300,000	
TOTAL COST FOR DELIVERY	**£150,00 – £900,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	Potential land ownership issues.
Other Information/Additional Notes: Location of signing subject to confirmation by utility users and landowners.	

Scheme Name	**Speed Compliance Response** Speed	
Scheme Reference	22	
Problem References	SP01	Shenley Road Town Centre Speed Signage
	SP03	Tempsford Avenue potential speed compliance issue
	SP05	Melrose Avenue
	SP06	Well End Road potential speed compliance issue
Links to other UTP schemes:		17, 19

Context

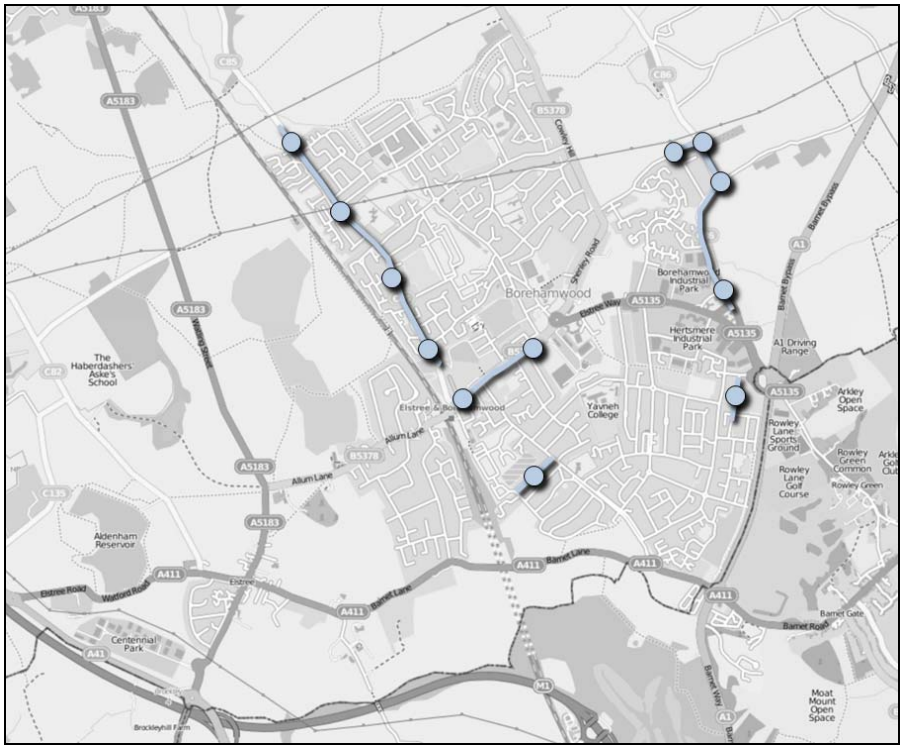


Figure 1 – Scheme Locations

The following traffic speed data has been obtained and it has been determined that the average 85th percentile speed in a 24 hour period exceeds the ACPO threshold in nearly all cases and therefore consideration should be given to potential measures to increase compliance with the posted speed limits. The purpose of using these criteria is set out in HCC's Speed Management Strategy.

Table 1: Speed Data

	Speed Limit (mph)	Direction	Average 85%ile Speed (mph) (in 24hr period)	Direction	Average 85%ile Speed (mph) (in 24hr period)
Well End Road	30	NW	**39**	SE	**43**
Rowley Lane (between industrial estate and Studio Way roundabout)	30	N	**42**	S	**42**
Melrose Avenue	30	NE	**35**	SW	**35**
Tempsford Avenue	30	N	34	S	34
Theobald Street	30	N	**35**	S	**37**

In addition speed data for Shenley Road (Borehamwood Town Centre – traffic calmed section) indicates average speeds of less than 20mph in the AM (0800-0900) and PM peak (1700-1800), and less than 10mph on the section immediately west of the Furzehill mini roundabout junction. 85th percentile data has not been obtained for this section of road and data is awaited.

The following schemes have been developed which address speed-related issues:

Scheme 08 – Scheme proposes an improved cycle/foot crossings on Bullhead Road which will help to reduce speeds

Scheme 20 – Scheme to address access issues to Hertswood School includes the proposal to implement speed tables on Cowley Hill and Shenley Road (this scheme has been compiled without a check of speed data)

A description of the characteristics of each road where speed compliance issues have been identified is provided below:

Well End Road / Rowley Lane / Potters Lane – The section in question is between the Potters Lane and the one-way Rowley Lane gyratory. A 30mph speed limit is in place. The section is on the edge of town and drivers travelling northwards may travel at excessive speeds because of the semi-rural/semi-urban environment. At the northern end, Well End residences are set back from the road, separated by a large verge area and long drive-ways. No roadside parking has been observed and is considered unlikely to be a common occurrence therefore there is potentially few or no features or obstacles which might encourage greater compliance with the speed limit. Double solid white lines are present in the centre of the road to prohibit overtaking. At the southern end of Rowley Lane, there are no houses, and commercial land uses are set back from the road. The road also widens which may encourage excessive speeds. Potters Lane between Well End Road and Alexandra Road is narrow, partly on a gradient. Dwellings and a footway are located on the southern side of Potters Lane. An established hedgerow lines the northern side of the road, and there is no footway present on the northern side. The hedgerow partly restricts forward visibility and vehicles may have difficult in passing at points along the section.

Melrose Avenue – This is a wide residential street in Borehamwood which is used by buses

(route B3). A speed table area is provided at the western end at the mini roundabout junction with Vale Avenue and Wordsworth Gardens. Whilst not a main distributor route, Melrose Avenue does provide a route between the Coleridge Way/Shakespeare Avenue housing estate and Furzehill Road, and may therefore incorporate some through traffic movements. A 30mph speed limit is in place.

Tempsford Avenue – This is a residential street adjacent to a large park, Tempsford Green. On the section between Newark Green and Wansford Park, parking bays are marked on both sides of the road and a footway is only provided on the western (residential) side of the road. The road is straight, and with the marked parking bays the road is clear of on-street parking which may encourage higher traffic speeds. A 30mph speed limit is in place. Data summarised in Table 1 above indicates that the 35mph ACPO threshold is not exceeded and therefore the scheme is unlikely to be eligible for LTP funding related to speed. However the scheme could have benefits other than speed reduction, specifically the improved access to Tempsford Green for pedestrians.

Theobald Street – This is a distributor route providing access to Borehamwood from areas to the north including Radlett. The corridor is mixed in character from the edge of Borehamwood in the north to the junction with Shenley Road, Station Road and Allum Lane in the south. The northern and mid sections are characterised by wide verges with a series of parallel service roads which provide access to residential properties. There is less active frontage on these sections. In contrast, there is more active frontage on the southern section of Theobald Street, and on the most southerly section there is a mixture of residential and commercial land uses. A 30mph speed limit is in place along the entire length within Borehamwood. There are several mini roundabout junctions, a number of controlled and uncontrolled pedestrian crossing facilities and a series of traffic islands.

Shenley Road (Town Centre) – This forms the main high street in Borehamwood with active frontages (mainly retail) on both sides of the road. The section in question is subject to a 30mph speed limit. Traffic calming measures are in place to control speeds including flat top road humps which also act as uncontrolled pedestrian crossing routes. The road is subject to strict parking management controls, with double yellow markings prohibiting parking and some parking bays provided in service roads to keep the main road clear of obstructions. A central island separates eastbound and westbound traffic.

In the development of scheme components, reference has been made to HCC's Speed Management Strategy in order to ensure design criteria is adhered to.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
22.1	Well End Road / Rowley Lane	Options are outlined below: a) *Review speed limit:* Review the appropriateness of the existing 30mph speed limit on Well End Road and Rowley Lane (subject to provision of more up to date speed data and reference to HCC's Speed Management Strategy) and potential change to 40mph. A raising of the speed limit to	**a) £1,200-£1,500** **b) £2,000-£6,000** **c)TBC** **d)TBC** **e)TBC**

		40mph may be appropriate because houses are only on one side of the road only, they are set back and are intermittent. The environment is also rural in nature which could be considered more appropriate for a 40mph speed limit. A 40mph speed limit will allow repeater signs to be placed on the entire length (repeater signs are not permitted with a 30mph speed limit) Subject to the outcome of the speed limit review a) above, the following components may be required to improve compliance with the current speed limit. b) *Introduce gateway features:* Introduction of gateway features to highlight the change to 30mph speed limit on entry to Well End from Shenley and from Rowley Lane (Trotters Bottom). Measures will include introduction of red surface colour incorporating 30mph roundel adjacent to terminal speed limit signs and 'dragons teeth'. Vegetation will be cut-back to increase visibility of signs on approach (see **Figure 2** for example roundel road marking and **Figure 4** for locations). c) *Line markings:* Introduce carriageway edge lines on Well End Road and Rowley Lane (currently this is only present at the southern end) as part of a road re-marking scheme (refreshing existing road markings) d) *Vehicle activated sign roundel*: displays the speed limit when approached in excess of the speed limit. A sign will act as a further reminder to drivers entering Well End (from the north) of the change from 40mph to 30mph speed limit. The sign will need to be positioned on the nearside to drivers (see **Figure 4** for potential indicative location, and **Figure 3** for example sign). e) *Potters Lane/Well End Road junction revision:* The existing Y-shaped priority junction between Potters Lane and Well End Road will be revised to become a simple T-junction (see **Figure 4**). f) *Rowley Lane/York Crescent T-junction:* replace the dedicated lane for left-turning traffic into York Crescent with marked diverge (see **Figure 4**). g) Accompanied Horse Warning Signs: A warning sign is located on Rowley Lane	**f)TBC** **g)TBC**

		indicating to northbound traffic of the potential for accompanied horses ahead. A similar sign is not evident for traffic entering Well End from the north. An additional sign (as shown in **Figure 10**) should be located near to the northern entry to Well End. Deliverability – 1-2 years STANDARD	
22.2	Melrose Avenue *(HCC scheme in preparation)*	This component is currently a scheme being prepared by HCC to introduce parking bays and flat top speed humps at three intervals on Melrose Avenue. Deliverability – 1-2 years STANDARD	***Scheme in develop-ment***
22.3	Tempsford Avenue	Flat top humps are proposed at two locations on Tempsford Avenue at the locations of existing kerb build-outs approximately 80m apart (see **Figure 5**). The proposed road humps will double as uncontrolled pedestrian crossing points linking the footway on the western side with Tempsford Green on the eastern side. No footway is provided on the eastern side of Tempsford Avenue. Tactile paving will be introduced for the benefit of pedestrians. Gateway features (coloured surfacing) at the priority T-junction with Newark Green and north of the priority crossroads with Wansford Road and Rye Close with signify to drivers that they are entering a traffic-calmed area. Deliverability – Less than 1 year SIMPLE	**£20,000-£40,000**
22.4	Theobald Street	Theobald Street is approximately 6.75m in width, with approximate lane widths of 3.4m. Lane widths are reduced to approximately 2.8m adjacent to traffic islands. Traffic calming measures are expressed as separate components which are designed to be complimentary to one another but could be introduced separately: a) Introduce 'dragons teeth' markings at the gateway in addition to coloured patches with '30' speed limit roundel to increase awareness and reinforce the change in speed limit on entry to Borehamwood (see **Figure 6**). b) Introduce three additional traffic islands (see **Figure 6**). c) Introduce central hatching (approximate width 1.15m along entire length of Theobald Street from most northerly refuge island to Shopping Park mini roundabout (northern	**a) £1,400-£1,800** **b) £25,000-£30,000** **c) £100,000 - £110,000** **d) £40,000-£60,000** **e) £30,000-£40,000** **f)TBC**

		approach) - breaking at junctions, controlled pedestrian crossings and refuge islands). Coloured red surfacing will provide additional emphasis. This measure will produce a continuous lane width of approximately 2.8m (as currently provided adjacent to the refuge islands). Provision of an edge line may also increase driver's perception of the narrowing and encourage lower speeds. d) Implement a raised table at four controlled crossings (see **Figure 6**). e) Introduce wider splitter islands with carriageway deflections at two locations – one where there is an existing traffic island and one at a new traffic island (see **Figure 6** for approximate location and **Figure 7** for example). f) Implement new signal-controlled crossing incorporating raised table in replacement of existing pedestrian refuge island, south of T-junction with Red Road (potentially at a location further south of existing refuge island where footway is wider and closer to the bus stops) (see **Figure 6**). Deliverability – 2-5 years **COMPLEX**	
22.5	Shenley Road (Town Centre)	Introduction of 20mph speed limit zone on the section of Shenley Road between the junction with Station Road/Allum Lane/Theobald Street and the Tesco roundabout with supporting signage (see **Figures 8** and **9**). No repeater signage is required in a 20mph zone. A 20mph zone is designed to be self-enforcing and should be complementary to the traffic calming measures already in place. Average speed data indicates that speeds are below 20mph. Speed limit will emphasise to motorists that they are entering a zone where pedestrian (and cyclist) movements are likely to be higher and the desire lines crossing the road are likely to be numerous. Whilst pedestrians do not have priority over traffic within the current arrangement, and there are no proposals to change this, the proposed speed limit reduction should give a clearer indication to motorists that they should more aware of pedestrian movements within the town centre Deliverability – 1-2 years **SIMPLE**	**£10,000-£20,000**

Supporting Evidence of Measures/Components

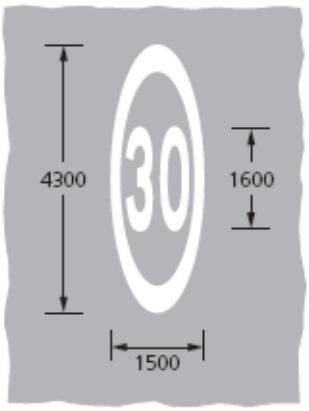


Figure 2 – Example Speed Limit Roundel (TSM Chapter 5 p.125)

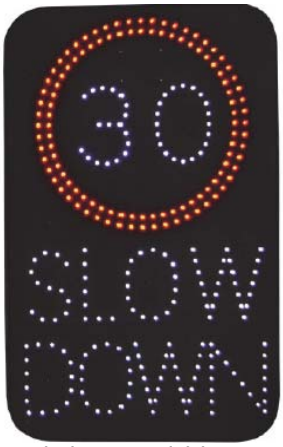


Figure 3 – Example Vehicle Activated Sign Roundel (HCC Speed Management Strategy p.20)

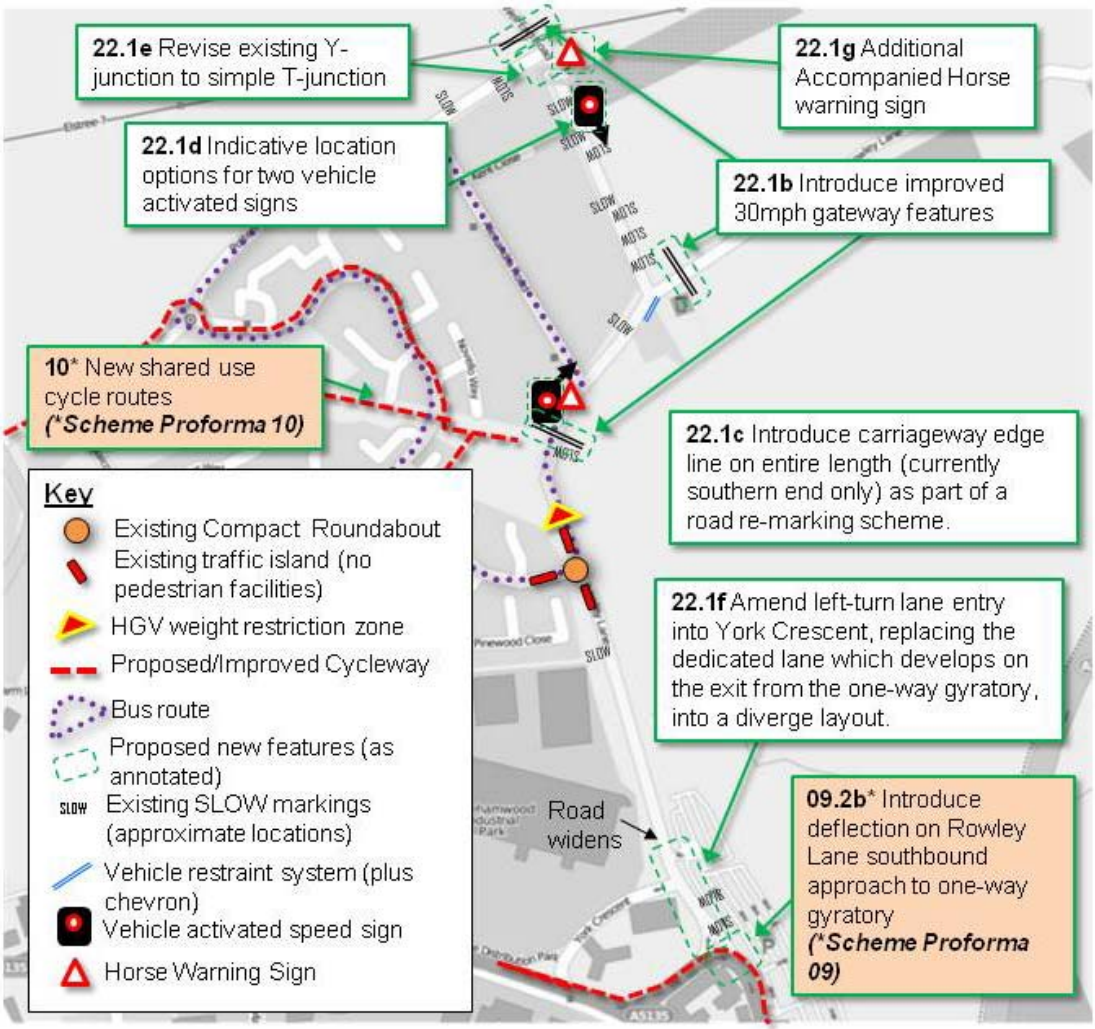


Figure 4 – Existing highway features on Well End Road and Rowley Lane plus potential measures

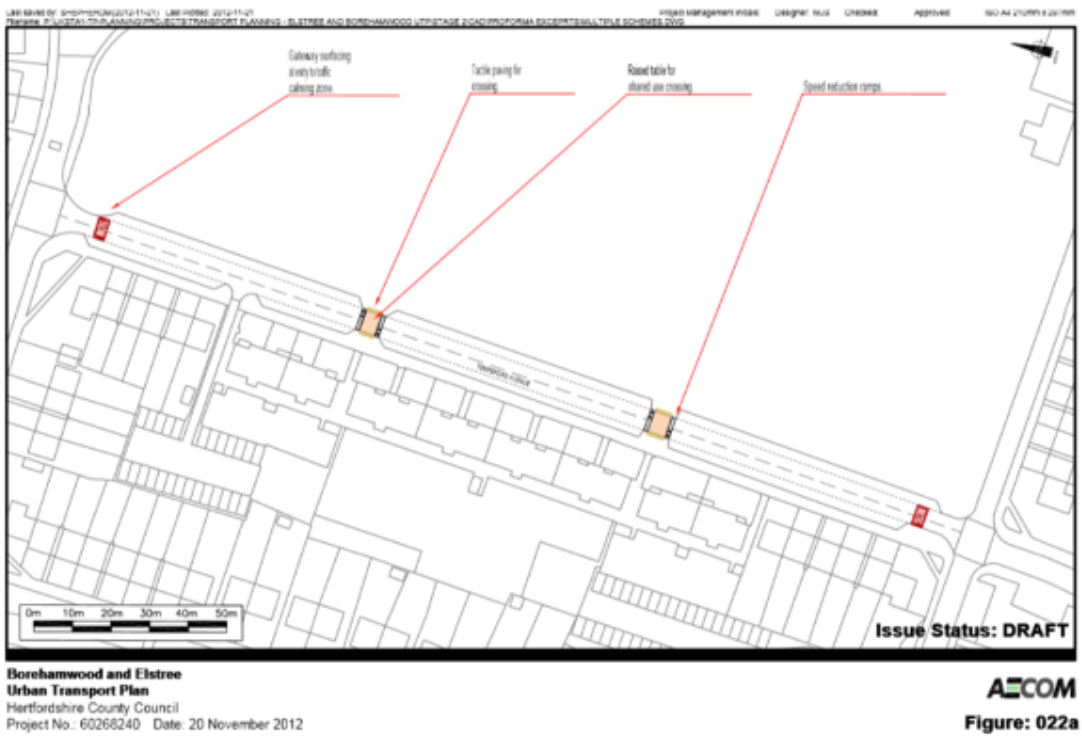


Figure 5 – Tempsford Avenue speed measures

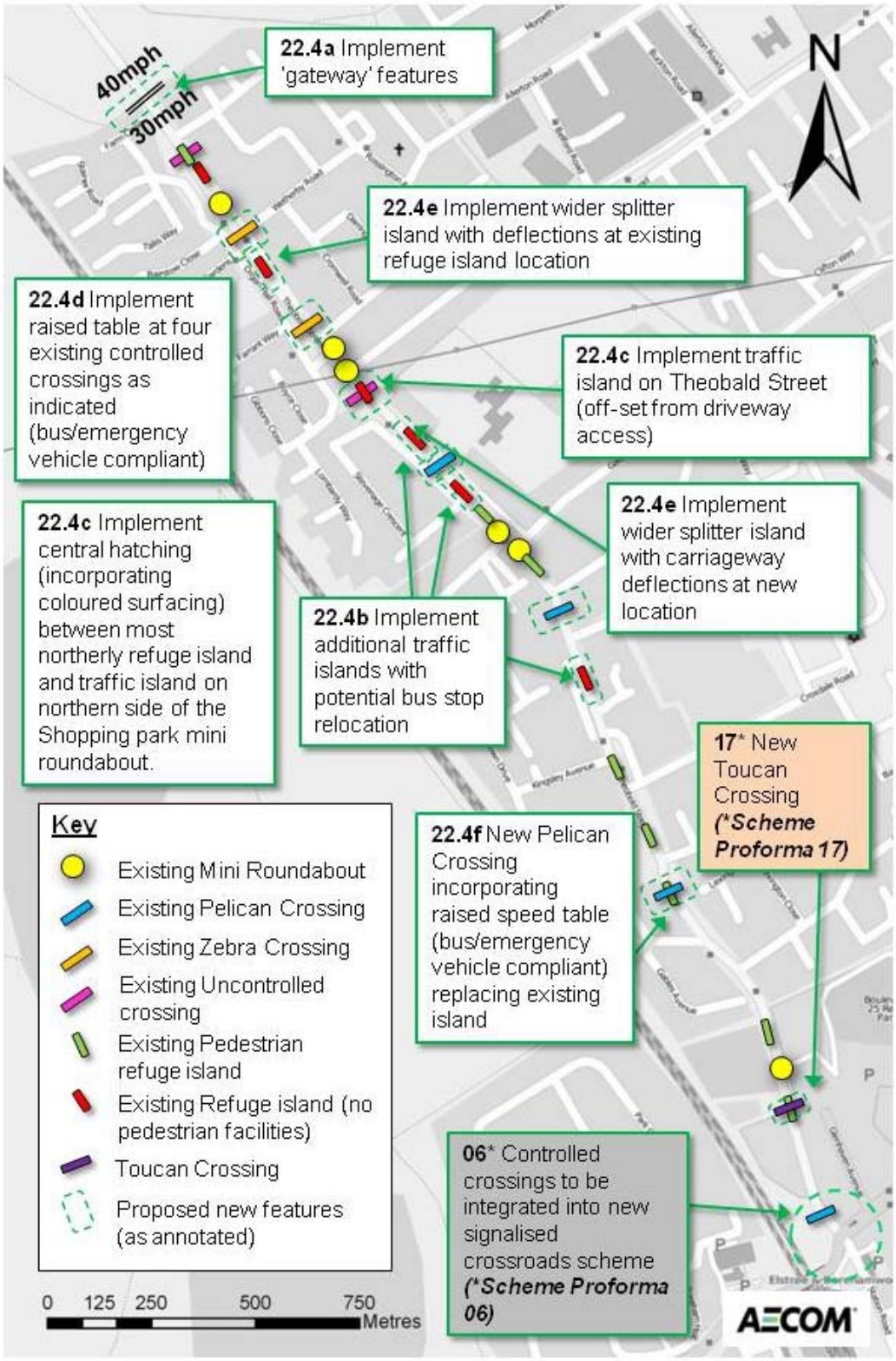
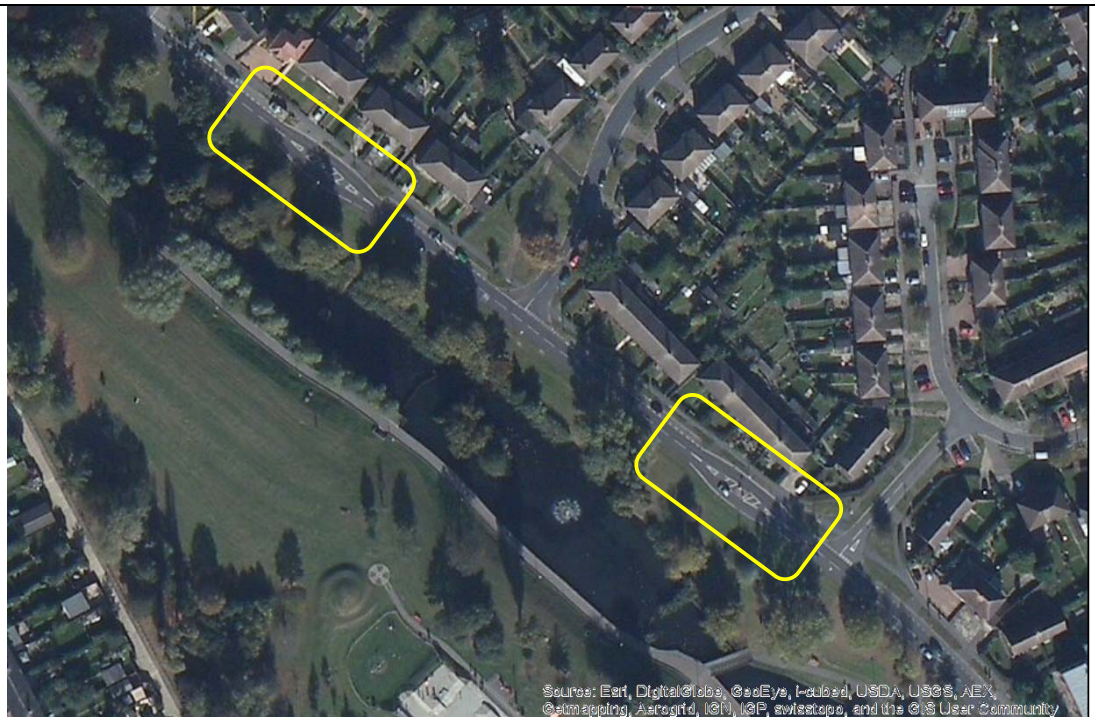


Figure 6 – Existing highway features on Theobald Street and proposed measures (approximate locations)



Sources: ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 7 – Example of wide splitter island with carriageway deflections to encourage lower speeds (Brook Road, Borehamwood)

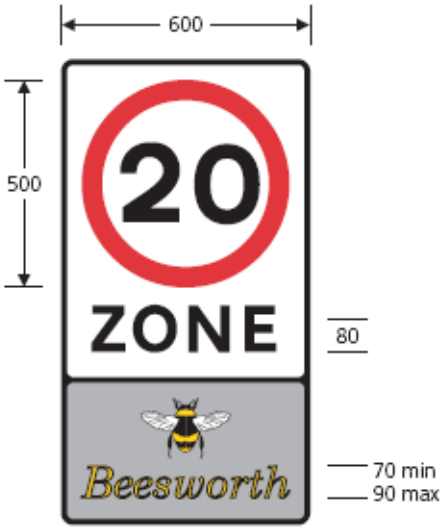


Figure 8 – Example 'Entrance to a 20mph speed limit zone' sign (TSM Chapter 3, p.121)

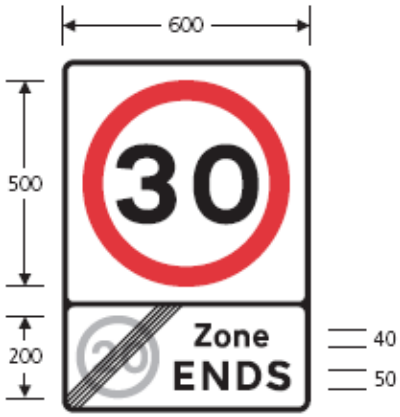


Figure 9 – Example 'End of a 20 mph speed limit zone' sign (TSM Chapter 3, p.121)

Figure 10 – A warning sign indicating the potential for accompanied horses in the road (Traffic Signs Manual Chapter 4 page 40)

Preferred Option

Component 22.1a is considered necessary as an initial measure. **Component options 22.1b, 22.1c** and **22.1g** are also considered essential and should be considered first before proceeding to component options **22.1d** – **22.1f** which are likely to be more costly.

Component 22.2 is a scheme currently in development by HCC.

Components 22.3 is proposed on Tempsford Avenue where speeds do not exceed ACPO thresholds, therefore further consideration of the measure will be required in light of this.

Component 22.4 comprises of a comprehensive package of individual measures. All are recommended to be taken forward, however 22.4c (central hatching) may be considered superfluous.

Component 22.5 is recommended. Speed data indicates that speeds currently fall below

20mph therefore existing measures are self enforcing. A 20mph speed limit will help to reinforce the need for motorists to reduce their speed and be more aware of pedestrians and cyclists within the town centre.

Contribution to Objectives / Indicators	UTP Objectives	• Promote active travel modes throughout the study area to encourage active and healthy lifestyles • Reduce congestion at key traffic hotspots throughout the study area

Outline Cost Analysis of Preferred Option or Options		
Design and implementation	**Indicative Cost**	**Notes**
22.1a	£1,200-£1,500	
22.1b	£30,000-£50,000	
22.1c	£TBC	
22.1d	£TBC	
22.1e	£TBC	
22.1f	£TBC	
22.1g	£TBC	
22.2	N/A	*HCC scheme in development*
22.3	£20,000-£40,000	
22.4a	£1,400-£1,800	
22.4b	£25,000-£30,000	
22.4c	£100,000-£110,000	
22.4d	£40,000-£60,000	
22.4e	£30,000-£40,000	
22.4f	£TBC	
22.5	£10,000-£20,000	
TOTAL COST FOR DELIVERY	**TBC> £257,600-£353,300**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	*Normal maintenance for traffic calming works and signing*

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	~~Standard – could be delivered in 1 to 2 years, in line with IWP~~
	Complex – could not be delivered in 2 years, has some issues that require resolution before design
Delivery Issues	***22.4e*** *– potential implications of accommodating wider splitter islands with carriageway deflections including statutory undertakers plant, diversion of footway. Bus stops may need to be relocated northwards to provide sufficient space.*

Other Information/Additional Notes:

Aerial photography has been sourced from ArcGIS Online. Sources**:** ESRI, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, aerogrid, IGN, IGP, swisstope, and the GIS User Community