

Scheme Name	Provide Pedestrian Crossing on Northchurch High Street near Bell Lane	
	Walking	
Scheme Reference	26	
Problem References	W4	Difficult to cross the road near Bell Lane due to narrow pavement
Links to other schemes:	UTP	05

Context



Figure 1 Location Plan

Northchurch High Street has a speed limit of 30mph, and is currently the main route for vehicles travelling southbound into Berkhamsted Town Centre, but also for interurban trips between Berkhamsted and Tring.

Pedestrians have to cross Northchurch High Street to access local trip generators, including Northchurch Baptist Church, Northchurch Social Centre and residential areas throughout the village. Currently, there are no safe pedestrian crossings on the High Street between junctions with Bell Lane and Billet Lane. In addition, there is no pavement on the south side of the High Street between Northchurch Baptist Church and Stoney Close, forcing people to cross the



busy High Street onto its north side.

Measures have therefore been considered to provide a safe crossing facility for pedestrians travelling along Northchurch High Street, and to fulfil the following overarching LTP Objectives:

- Enhance quality of life, health and the natural, built and historic environment for all residents
- Improve the safety and security of residents and other road users

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
26.1	Zebra crossing	<p>The provision of a zebra crossing is proposed at this location based on the amount of pedestrians wishing to cross the High Street at this point. With a variety of facilities located adjacent to the High Street, the crossing will provide a safe pedestrian route between north and south Berkhamsted. For location, see Figure 3.</p> <p>Consultation with the police, public notice and written notification to the Secretary of State are necessary before the crossing is established following guidance in the Road Traffic Regulation Act 1984.</p> <p>Following examination of geometry, it was found that there is insufficient space on either side of the High Street to provide for a drop kerb and adjacent footpath. In addition, the crossing is located adjacent to a private driving, increasing safety concerns for pedestrians.</p> <p>NOT DELIVERABLE</p>	
26.2	Build-outs on both sides of High Street	<p>Kerb build outs at this location can be deliverable, as it would improve the ability to cross the High Street by narrowing the highway.</p> <p>However, the main advantage of build outs is for improved visibility by pedestrians on a curved highway. As High Street is a relatively straight route, the implementation of a build out would not benefit pedestrians as much as a zebra crossing. In addition, as the High Street would be reduced to single file traffic, the measure would increase congestion along the High Street, resulting in increased journey times and localised pollution.</p> <p>NOT DELIVERABLE</p>	
Supporting Evidence of Measures/Components			



Figure 2 Example Zebra Crossing

Preferred Option

Two separate measures have been reviewed in order to improve pedestrian routing on Northchurch High Street (near Bell Lane), including a zebra crossing and build-outs on either side of the High Street. However, following analysis of geometry and alignment, it was found that neither measure would be feasible at this location. It is recommended that pedestrians use the existing signal controlled crossing outside the George and Dragon public house, located near New Road.

Contribution to Objectives / Indicators	UTP Objectives	<ul style="list-style-type: none"> Improve connectivity within and between local towns through a complete network of walking and cycling facilities
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Outline Cost Analysis of Preferred Option or Options

Design and Implementation	Indicative Cost	Notes
TOTAL COST FOR DELIVERY	£0	

Maintenance Liability	High Medium Low	
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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	None



Other Information/Additional Notes:

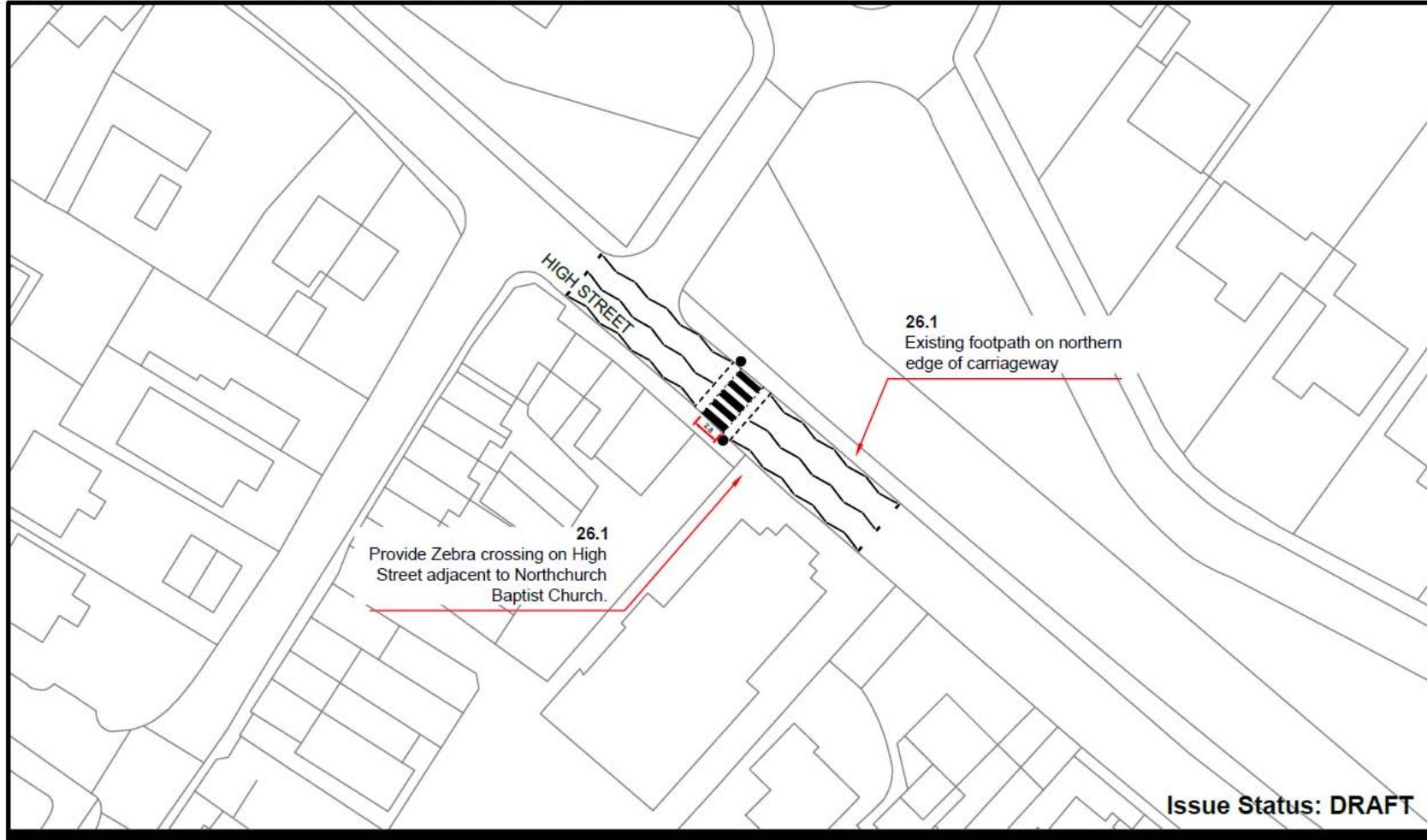
Tring, Northchurch and Berkhamsted UTP Scheme Proforma 26



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Project Management Initials: Designer: RGH Checked: TM Approved: NBS ISO A4 210mm x 297mm



Tring and Berkhamsted
Urban Transport Plan
Hertfordshire County Council
Project No.: 60267074 Date: November 2012



Figure 3

Scheme Name	Improve Pedestrian Facilities along Icknield Way from Miswell Lane to Tring Industrial Estate	
	Walking	
Scheme Reference	27	
Problem References	W14	Lack of pedestrian facilities on Icknield Way to the industrial estate
Links to other schemes:	UTP	23

Context



Figure 1 Location Plan

Icknield Way is located to the north of Tring Town Centre, providing access to residential properties in the area, also acting as a through route from A41 to areas northeast of Tring.

Icknield Way also provides access to Tring Industrial Estate via a footpath on its southern edge from Miswell Lane (see **Figure 1** for location). It is perceived that access to the Industrial estate is poor, with staff choosing to drive to work instead of using sustainable modes (walking or cycling). In addition, there is currently no footpath on the western approach to the industrial estate.



Measures have therefore been developed to provide an improved pedestrian route in order to enhance and sustain the amount of sustainable trips to the industrial estate, and also to fulfil the following overarching LTP Objectives:

- Improve the safety and security of residents and other road users
- Improve transport opportunities for all and achieve behavioural change in mode choice

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
27.1	Maintain current footpath from Miswell Lane to Industrial Estate	The current footpath is in poor condition, with potholes along its entire length and becoming narrow due to the adjacent grass verge. It is therefore suitable for the footpath to be maintained in order to sustain the current levels of walking trips to the industrial estate. In addition, it may be suitable for the route to be upgraded to a mixed use walk/cycle path if targets are reached as part of a workplace travel plan for the industrial estate, in association with Hertfordshire's Business Travelwise programme. Deliverability – Less than 1 year SIMPLE	£1,000 per annum
Supporting Evidence of Measures/Components			

Preferred Option
The preferred option includes 27.1. Maintaining the current footpath is vital in sustaining and enhancing the amount of sustainable trips to the industrial estate. The provision of a footpath on the west approach to the industrial estate has been discussed, but concluded that the cost of the scheme meant that it would not be feasible based on the current demand. A full review would be required if support and demand for this scheme increased.

Contribution to Objectives / Indicators	UTP Objectives	
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
27.1	£1,000	Costs are related to the maintenance of the footpath between Miswell Lane and Tring Industrial Estate, and are annual.
TOTAL COST FOR	£1,000	

DELIVERY		
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Maintenance Liability	High Medium Low	
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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	

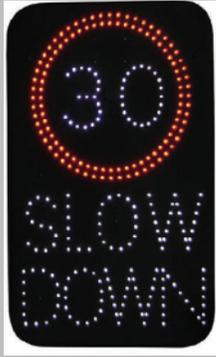
Other Information/Additional Notes:
The proposal is based on the existing footfall. Further enhancements would be required if pedestrian and cyclist demand increased as a result of implementing a successful Workplace Travel Plan at Tring Industrial Estate.

Scheme Name	Speed Management on Aylesbury Road (near Tring Gateway) Speed Limit Compliance	
Scheme Reference	28	
Problem References	S16	Speeding on Aylesbury Rd
	B18	Little specific cycle provision throughout the town
Links to other schemes:	UTP	8

Context	
	<p>Aylesbury Road (B4635) provides one of two main routes into Tring from the A41 bypass. At the entrance to Tring, the speed limit reduces from National Speed Limit to 30mph. There is a perception that speeding is an issue along this road, as vehicles do not slow down before the residential areas of Tring. The examination of TrafficMaster data (see Figure 2) suggests that the current speeds through the initial 30mph section warrants the provision of further speed management at this location.</p> <p>Currently, the 85th percentile speed is 40.5mph entering Tring, and 45mph exiting Tring, far exceeding the threshold for the provision of speed reduction schemes (35mph).</p> <p>Additionally, no dedicated cycle facilities are provided on Aylesbury Road between the Icknield Way roundabout to the north and the 30mph commencement to the south. This represents a 'missing link' in the cycle network. A high quality off-carriageway facility is provided on Tring Hill and through the two roundabouts at Icknield Way. There is however no onward link on either Icknield Way or Aylesbury Road to allow for connectivity to the town centre. A dedicated facility would improve the connections to the existing inter-urban network.</p> <p>The options have been developed, in line with Hertfordshire County Speed Management Strategy, to fulfil the following overarching LTP Objective:</p> <ul style="list-style-type: none"> • Improve the safety and security of residents and other road users; • Improve transport opportunities for all and achieve behavioural change in mode choice;

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
28.1	Speed Buffer Zone (40mph for 400m before entry into 30mph zone)	<p>The introduction of 40mph buffer zone is required as the immediate speed reduction from National Speed Limit to 30mph is not effective. The 'Key Criteria' for Buffer Zones suggest installation where speeds in the lower speed limit exceed the ACPO threshold speed. On Aylesbury Road, the ACPO speed is 35mph however, actual 85th percentile speed is 40.5mph inbound and 45mph outbound. In addition, recent accident data (see Table 2) suggests that reducing the approach speed at the turn adjacent to the cemetery could reduce risk of accidents taking place along Aylesbury Road.</p> <p>It is recommended that further speed surveys be completed at this location in order to ensure suitability for scheme progression, as TrafficMaster provides average road section speed, in contrast to radar data collection points.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	 <p>£10,000 to £15,000</p>
28.2	Speed Count Down Markers on approach to 30mph speed limit	<p>Countdown markers can be considered on the approach to speed limit terminal signs to highlight to drivers that they are approaching lower speed limits. Traffic authorities must apply for special authorisation from DfT before they can be installed.</p> <p>In addition, studies have suggested that these markers have little effect on the reduction in speeds, and therefore only provide additional sign clutter. Even though improvements would occur, this measure would be least effective in reducing approach speeds along Aylesbury Road.</p> <p>NOT DELIVERABLE</p>	

<p>28.3</p>	<p>Provision of an off-carriageway cycle facility lining Icknield Way Roundabout to Tring town</p>	<p>Provide a shared use footway on Aylesbury Road to link the existing segregated cycle facility at Icknield Way roundabout to Tring town centre. The existing northern footway varies between 1.5 and 1.8m wide, so some widening in to the grass verge would be required to allow for the minimum width of 2.0m as per 'Roads in Hertfordshire' design guidance.</p> <p>The footway width narrows on the northern side of Aylesbury Road approximately 350m from the roundabout. At this point, adjacent to a private access, cyclists would be required to cross the carriageway to link to a shared use facility on the southern side of Aylesbury Road. Again, footway widening would be required to allow for a 2.0m facility. It is anticipated that the footfall through this section is sufficiently low that a 2.0m shared use facility would be adequate. No land acquisition or retaining wall features are anticipated to facilitate this option.</p> <p>The shared use footway would continue for approximately 450m and into the 30mph section of Aylesbury Road. At this point cyclists would then be signed back on to the carriageway at the existing pedestrian refuge to continue towards the town centre. (Refer to Figure 3).</p>  <p>Deliverability – 1 to 2 years STANDARD</p>	<p>£100,000 to £150,000</p>
<p>28.4</p>	<p>Introduction of Vehicle Activated Sign Roundel (VASR) along Aylesbury Road</p>	<p>The key criteria for the introduction of VASR suggests that at least three accidents need to have occurred on the route, the 85th percentile speed exceeds the threshold speed 35mph, and VASR should not be deployed unless it is clear that fixed signage does not remedy the issue.</p>	

			<p>The signs are simple, and easy to understand. It is proposed that VASR's are implemented on Aylesbury Road adjacent to the cemetery only if the proposals for a 40mph buffer zone and associated signage do not reduce the existing speeds along this section.</p> <p>NOT DELIVERABLE</p>
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Supporting Evidence of Measures/Components

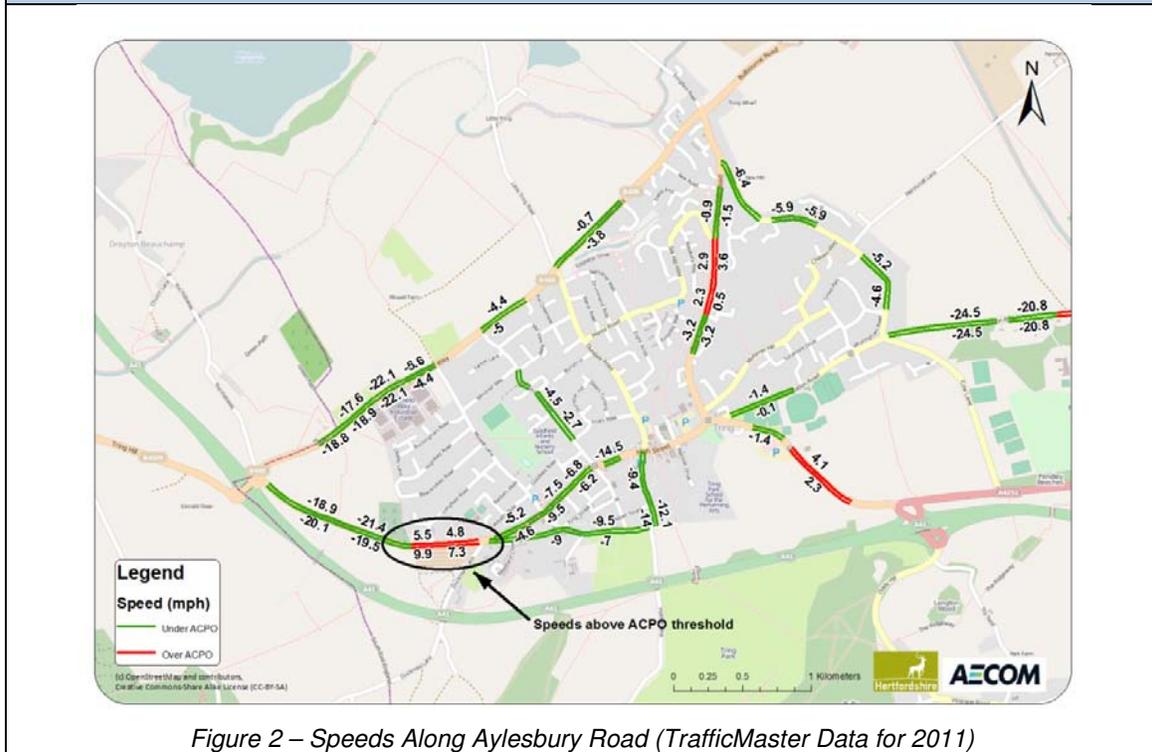


Figure 2 – Speeds Along Aylesbury Road (TrafficMaster Data for 2011)

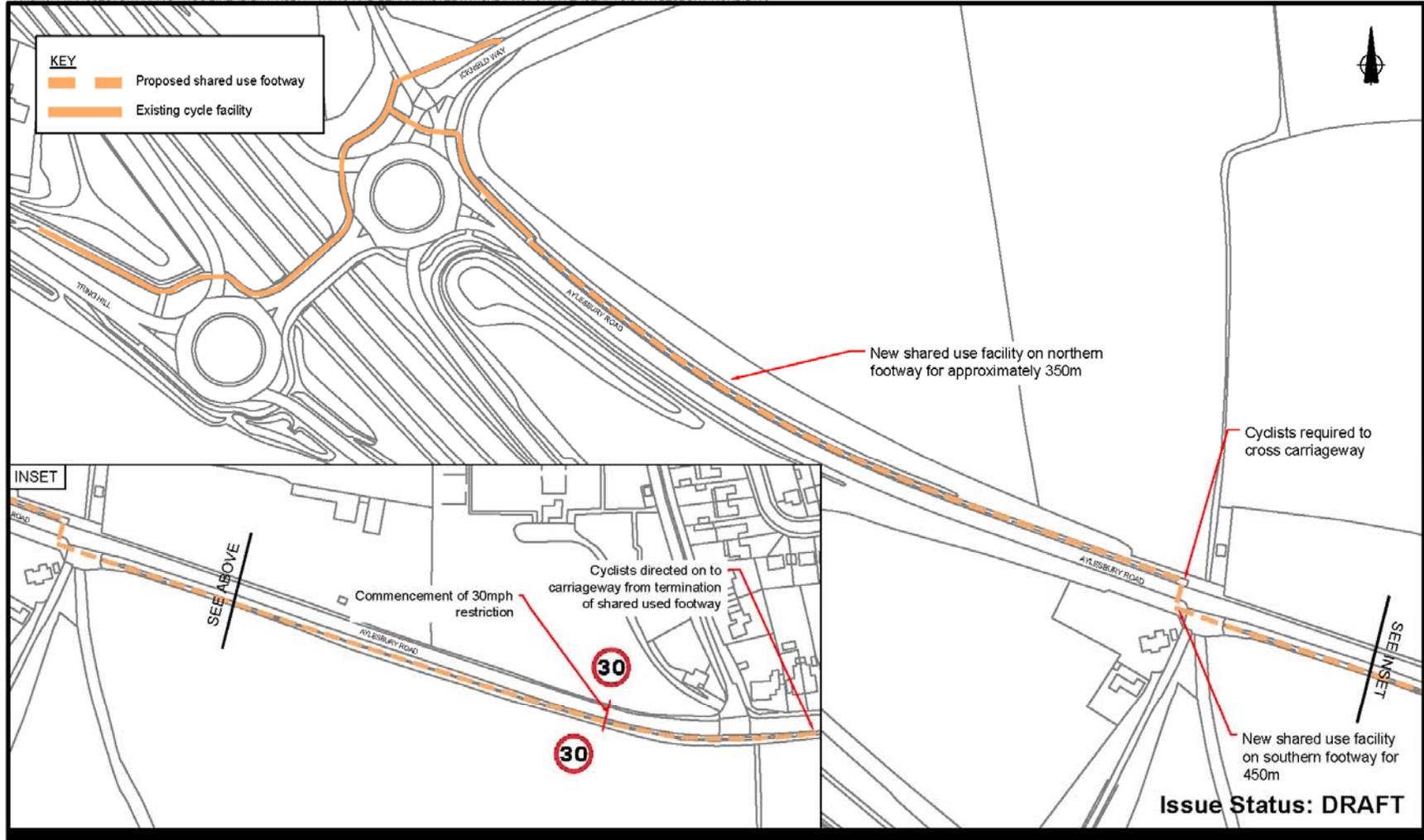
Tring, Northchurch and Berkhamsted UTP
Scheme Proforma 28



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Project Management Initials: Designer: MJA Checked: HCG Approved: ADR ISO A4 210mm x 297mm



**Tring and Berkhamsted
Urban Transport Plan**
Hertfordshire County Council
Project No.: 60267074 Date: 2012-09-24



Figure 3 - Proposed shared use facility Aylesbury Road

Preferred Option
<p>The preferred option includes Measure 28.1 'Introduction of Speed Buffer Zone'. This measure will provide the most effective solution in reducing speeds on approach to Tring. In addition, the combination of this measure with Gateway features would specifically highlight the change in speed limit, and reinforce Tring's identity. As mentioned, the ACPO threshold speed has been clearly surpassed by the 85th percentile actual speed, highlighting the need for this scheme.</p> <p>It is recommended that Measure 28.3 is progressed to feasibility to provide improvements to Tring's local cycle network and improve inter-urban connectivity.</p>

Contribution to Objectives / Indicators	UTP Objectives	
		<ul style="list-style-type: none"> Promote active travel modes throughout the study area to encourage active and healthy lifestyles; Improve connectivity within and between local towns through a complete network of walking and cycling facilities

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
28.1	£10,000 - £15,000	Subject to speed surveys completed in Year 1 of IWP.
28.3	£100,000 - £150,000	
TOTAL COST FOR DELIVERY	£110,000 to £165,000	

Maintenance Liability		
	High Medium Low	

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	<p>In order to implement measure 28.1, a staged approach is recommended:</p> <ol style="list-style-type: none"> Year 1 – speed surveys along section to validate existing TrafficMaster data; Year 2 – if survey data compliments TrafficMaster data, implement speed management measure.

Other Information/Additional Notes:

Schemes shown in grey have been considered but are not deemed to be feasible and are not recommended to be progressed.

TrafficMaster Data has been provided via the Department for Transport (DfT) in order to complete an assessment of speeding at particular locations. In raw form, TrafficMaster data relates to satellite navigation journey times. Specifically for Tring and Berkhamsted, the data was available for the whole of 2011, providing sufficient journey time information for the assessment of all links across the local highway network. The journey time was translated into speed based on highway link length information, and then compared against ACPO thresholds (as seen below).

TrafficMaster data provides an average speed across a link, including congestion at junctions, thus providing only an insight into speed conditions on highway sections, without reflecting actual speeds that vehicles reach between junctions. As a result, further speed surveys would be required to validate the TrafficMaster data and to fulfil the requirements for changes to speed limits.

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.

link_id	85th%ile time (1/100s)	Length (m)	85%ile speed (mph)	Speed Limit (mph)	ACPO (mph)	ACPO Diff
4000000019280787A	543	98.3	40.5	30	35	5.5
4000000019231034A	1153	205.3	39.8	30	35	4.8
4000000019280787B	490	98.3	44.9	30	35	9.9
4000000019231034B	1085	205.3	42.3	30	35	7.3

Table 1 TrafficMaster Data Analysis (Aylesbury Road only)

Date	Location	Description	Severity
23/11/2008	B4635 Aylesbury Road, Tring 267m SE Of Rbt J/w A41 Interchange	V1 Car Trav NW On B4635 Aylesbury Rd Skidded Out Of Control And Spun Into N/s Ditch	Slight
16/05/2007	B4635 Aylesbury Road, Tring 20m Nw Of J/w Donkey Lane	V1 Car Trav Se On B4635 Aylesbury Rd Skidded Out Of Control On Wet C/way On approach To L/h Bend And Spun Into N/s Cemetery Wall	Slight
10/09/2008	B4635 Aylesbury Road, Tring J/w Longfield Road	V1 Car Trav West On B4635 Aylesbury Rd Turned Right To Enter Longfield Rd. V1 Drove Into Path Of V2 M/c 50cc And Under Trav East	Slight

Table 2 Accident Data for Aylesbury Road

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BUFFER ZONES				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>On the outskirts of villages / urban areas, or where there is intermittent development beyond the existing 30mph, it may be appropriate to introduce a short (400-600m) section of intermediate speed limit if immediate speed reduction causes real difficulty or is likely to be less effective.</p> <p>In reality this means introducing either a</p> <ul style="list-style-type: none"> 40mph speed limit between 30mph and 50mph/derestricted speed limits 50mph speed limit between 40mph and derestricted speed limits 	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> Brings vehicle speeds down in the lower limit due to the approach in the buffer zone. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> Non-compliance can be apparent in the buffer zone due to the character of the road the buffer zone is on eg. rural single carriageway with no frontage development on approach to a village on an A road. 		<ul style="list-style-type: none"> DfT Circular 1-06 Setting Local Speed Limits (paragraphs 38 – 40) No specific TAL leaflets 	<p>C21 - Buffer zones should only be installed where speeds in the lower speed limit exceed the ACPO threshold speeds. (eg. 35mph in a 30mph limit, 46mph in a 40mph limit).</p> <p>C22 - Buffer zones should be no less than 600m. In exceptional circumstances lengths of between 400 – 600m will be considered by the Speed Management Group.</p>
COUNT DOWN MARKERS				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>Countdown markers can be considered on the approach to speed limit terminal signs to highlight to drivers that they are approaching a lower speed limit. However current legislation does not prescribe markers for this use. Therefore, traffic authorities must apply for special authorisation from DfT before they can be installed.</p>	<p>Research carried out by Mayhew & Smith (1998) showed that countdown markers have little or no effect on vehicle speeds and can add to sign clutter. If these are considered, this should only be as part of a package of measures.</p>		<ul style="list-style-type: none"> DfT Circular 1/06 Setting Local Speed Limits, para 65-66 TAL 1/04 – Village Speed Limits LTN 1/07 section 10.2.11 	<p>C23 - As count down markers need special authorisation from DfT, any applications shall be approved by the Speed Management Group to ensure a consistent approach is adopted across the County.</p>

Figure 4 – Extract from Hertfordshire Speed Management Strategy (p18)

Scheme Name	Speed Management on New Road (Northchurch) Speed Limit Compliance	
Scheme Reference	29	
Problem References	B05	Dangerous on New Road due to excessive speed
Links to other schemes:	UTP	03

Context	
 <p style="text-align: center;"><i>Figure 1 New Road (canal bridge)</i></p>	<p>New Road (B4506) accommodates a large proportion of through trips between Berkhamsted and Dunstable, due to the current signage and route choice through Northchurch and Berkhamsted.</p> <p>The southern section of New Road, Northchurch (south of the canal bridge) is narrow, with on street parking in addition to the location of St Marys' First School adjacent to the highway. As a result, the section of road is hazardous for vulnerable users.</p> <p>The northern section has a speed limit of 30mph for approximately 400m north of the canal bridge. At the location of the speed limit change to 40mph, the road narrows in an attempt to make drivers aware of the approaching hazards and residential area. However, due to the route being straight and wide, the current speeds far exceed the Association of Chief Police Officers (ACPO) threshold of 35mph. TrafficMaster speed data suggests an 85th percentile speed of 40.3mph in the northbound and 35.4mph in the southbound.</p> <p>The route has been identified as dangerous for cyclists due to excessive speeding. Measures have therefore been produced to improve the safety for vulnerable road users.</p> <p>The options have been developed, in line with Hertfordshire County Speed Management Strategy, to fulfil the following overarching LTP Objective:</p> <ul style="list-style-type: none"> • Improve the safety and security of residents and other road users;

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
29.1	20mph Speed Limit between High Street and Grand Union Canal bridge	 <p>Due to the layout and location of the highway along New Road, it is not feasible to propose improvements to the infrastructure, as the costs would be too high relative to the use of the road. It is therefore proposed to implement a 20mph self-enforced speed limit along the southern section of New Road, between Northchurch High Street and the canal bridge. This will encourage the reduction in speed along New Road, but also improve the safety for vulnerable users (school children, pedestrians and cyclists). This will also translate the current 30mph limit into a 400m buffer zone north of the canal bridge.</p> <p>However, it must be noted that the current (85th percentile) speeds along this section are 29.2mph northbound and 24.2mph southbound, exceeding the 25mph threshold in the northbound direction (see Table 1). Therefore, in order to implement this scheme with sufficient evidence, a speed survey would be required.</p> <p>In addition, Table 2 suggests that the main cause of accidents along New Road is the hazardous environment of this section (narrow with on-street parking), enhancing the proposal that a reduction in speed limit would be suitable for the environment.</p> <p>The change in speed limit would require an associated Traffic Regulation Order (TRO) to make it legally enforceable. The TRO would also need to be advertised to allow the public an opportunity to comment or object.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	£8,000 to £10,000

29.2	Introduction of Rumble Strips at entrance into 30mph buffer zone	<p>Rumble Strips are intended to alert drivers to take greater care in advance of a hazard or junction. Along New Road, this intention fits with the hazards located along the southern sections, including the school and canal bridge. They are relatively inexpensive to install and provide most benefit within rural settings. The proposed rumble strip would be located at the entrance to the existing 30mph zone. However, public consultation would be required to ensure local resident support for the measure, due to the proximity of dwellings to New Road. Hertfordshire's Speed Management Strategy suggests a 200m buffer is required between the strips and local dwellings.</p> <p>NOT DELIVERABLE</p>	
29.3	Introduction of Rippleprint at entrance into 30mph buffer zone	 <p>An alternative to rumble strips is to use Ripple Print in order to alert drivers to take greater care in advance of a hazard or junction. In the case of New Road, due to the location of residential areas, it is proposed that Rippleprint is implemented as opposed to rumble strips. Whilst reducing exterior noise pollution, the rippled effect increases noise levels within the vehicle. It is therefore proposed to implement this material at the entrance into the 30mph buffer zone, north of Bridgewater Hill.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	£30,000 to £34,000

Supporting Evidence of Measures/Components



Figure 2 – Speeding Along New Road (TrafficMaster Data for 2011)

Preferred Option

The preferred option includes the combination of Measures 29.1 and 29.3. This preferred option will provide the most significant benefit in reducing speeds along New Road. In doing so, the route will become a safer environment for vulnerable road users, with greater driver awareness of the existing hazards along the route.

Contribution to Objectives / Indicators	UTP Objectives	
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
29.1	£8,000 to £10,000	Subject to speed surveys completed in Year 1 of IWP.
29.3	£30,000 to £34,000	Subject to speed surveys completed in Year 1 of IWP.
TOTAL COST FOR DELIVERY	£38,000 to £44,000	

Maintenance Liability	High Medium	
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	Low	
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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	In order to implement measure 28.1, a staged approach is recommended: <ol style="list-style-type: none"> 1. Year 1 – speed surveys along section to validate existing TrafficMaster data; 2. Year 2 – if survey data compliments TrafficMaster data, implement speed management measure.

Other Information/Additional Notes:

TrafficMaster Data has been provided via the Department for Transport (DfT) in order to complete an assessment of speeding at particular locations. In raw form, TrafficMaster data relates to satellite navigation journey times. Specifically for Tring and Berkhamsted, the data was available for the whole of 2011, providing sufficient journey time information for the assessment of all links across the local highway network. The journey time was translated into speed based on highway link length information, and then compared against ACPO thresholds (as seen below).

link_id	85th%ile time (1/100s)	Length (m)	85%ile speed (mph)	Speed Limit (mph)	ACPO (mph)	ACPO Diff
4000000019231093A	1884	245.7	29.2	30	35	-5.8
4000000019231240A	1158	208.6	40.3	30	35	5.3
4000000019231241A	2002	367.4	41.1	30	35	6.1
4000000019231093B	2271	245.7	24.2	30	35	-10.8
4000000019231240B	1320	208.6	35.4	30	35	0.4
4000000019231241B	2202	367.4	37.3	30	35	2.3

Table 1 TrafficMaster Data Analysis (New Road only)

TrafficMaster data provides an average speed across a link, including congestion at junctions, thus providing only an insight into speed conditions on highway sections, without reflecting actual speeds that vehicles reach between junctions. As a result, further speed surveys would be required to validate the TrafficMaster data and to fulfil the requirements for changes to speed limits.

Date	Location	Description	Severity
01/06/2011	B4506 New Road, Berkhamsted, 50m NE J/w A4251 High Street.	V2 Car Trav NE Along New Road is held up due to parked vehicles. V1 Car trav SE for reasons unknown loses control and collides F/o/s To F/o/s with V2.	Slight
16/01/2009	B4506 New Road, Northchurch Gridded 80m Sw Of J/w Southbank Road	V1 Car travelling SW On B4506 New Rd when a deer ran into C/way and V1 swerved, collided with a tree on N/s verge	Slight
15/07/2010	B4506 New Road, Northchurch Gridded 24m	V1 Car trav in u/k direction on B4506 New Road moved out to pass V2 refuse truck,	Slight

	SW Of J/w South Bank Road	passed too close in order to avoid oncoming u/k veh and struck a wheelie bin that an operator was just loading onto V2, knocking it into operator
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Table 2 Recent Accident Data along New Road (between High Street and canal bridge)

20MPH LIMITS AND ZONES				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>20mph speed limit:</p> <ul style="list-style-type: none"> Uses signs and line marking only. Does not use physical engineering measures. Speeding is not a problem in this area. 85th percentile speeds are 25mph or less prior to a limit being introduced on a Hertfordshire road. A 20mph speed limit is self enforcing. A 20mph speed limit requires repeater signs to reinforce within the limit to reinforce it. Relatively low cost to implement. <p>20mph zone:</p> <ul style="list-style-type: none"> Uses physical engineering to bring speeds down. A 20mph zone is self enforcing. A 20mph zone does not require repeater signs. Signage is only required at the entrance points, therefore reducing clutter. Expensive to implement. Good at reducing vehicle speeds as physical measures need to be introduced. 	<p>Effectiveness:</p> <p>DfT Know Your Speed Limits (2004): The effect of a 20mph limit or zone will depend upon the circumstances at each particular location or area. The Department Transport released a document entitled <i>Speed: Know your limits</i> in 2004. It summarises the effectiveness of 20mph limits and zones as follows.</p> <p>20mph limits:</p> <ul style="list-style-type: none"> Speed limit signing without supporting traffic calming measures reduces speeds on average by 1mph. Research carried out by Mackie in 1996 stated that the average speed reduction is 2mph. (Please refer to DfT 1-6 paragraph 62). <p>20mph zones:</p> <ul style="list-style-type: none"> Average speeds within zones reduced by 9mph Accident frequency reduced by 60% Overall reduction in child accidents up to 87% Overall reduction in cyclist accidents up to 27% Traffic flow within zones reduced by up to 27%. <p>Portsmouth Case Study: A 20mph limit has been implemented in the City of Portsmouth during 2008 on all residential streets. This does not include arterial roads where the limit remains at 30mph. Speed counts were recorded on a 10% sample of all residential streets. The results showed that recorded average vehicle speeds were 24mph or under – therefore meeting central government guidance on implementing a limit.</p> <p>The limit was introduced due to the high number of collisions within the residential area. The purpose of the limit was to bring down the level of collisions. Anecdotal evidence suggests that collision levels are reducing. A full analysis will take place once the limit has been fully implemented for one year.</p> <p>Nationally most 20mph zones and limits around the country have been implemented because the collision history is high. In Hertfordshire limits and zones have been implemented through non-collision related funding targets. Eg (Local Transport Plan Mode Share to School target. See question 3 in relation to school and 20mph limits and zones.</p>		<ul style="list-style-type: none"> DETR Circular 5/99 (1999) – 20mph speed limits TAL 7-91 Speed Limit Zones TAL 9-99 20mph speed limits and zones TAL 12-00 Urban Street activity in 20mph zones DfT 1-06 Setting Local Speed Limits LTN 107 Traffic Calming – Section 3.2 Roads with 20 mph speed limits. HCC PTU Quality Bus Infrastructure in Hertfordshire – A Design Guide May 2004 	<p>20mph Limits and Zones:</p> <p>C13 – 20mph limits or zones will not be generally considered on the primary route network.</p> <p>C14 – All requests for 20mph limits and zones will be assessed by the Speed Management Group against the key criteria.</p> <p>20mph Zones:</p> <p>C15 – 20mph zones must be self enforcing.</p> <p>C16 – 20mph zones should have associated physical measures which will bring down vehicle speeds to a maximum of 24mph, or under.</p> <p>C17 – Repeater signs are not permitted within 20mph zones.</p> <p>C18 – The Passenger Transport Unit design guide states that if a 20mph zone is considered necessary on a bus route the length of the zone should be kept to a minimum so as not to adversely affect the quality of ride.</p> <p>C19 – Where possible all bus routes should be re-routed to avoid 20mph zones.</p> <p>Limits:</p> <p>C20 – 20mph speed limits will only be considered where the recorded 85th percentile vehicle speeds are 25mph or less.</p>

RUMBLE STRIPS				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>Rumble devices are designed to provide a vibratory and/or audible effect. They are intended to alert drivers to take greater care in advance of a hazard such as a bend or junction, and to help in reducing vehicle speeds.</p> <p>Reliance should not be placed on such traffic calming surfaces alone when seeking speed reduction.</p>	<p>Advantages:</p> <ul style="list-style-type: none"> Relatively inexpensive to install. Most effective in rural areas. <p>Disadvantages:</p> <ul style="list-style-type: none"> Research indicates minimal speed reduction of around 1mph. Not the most appropriate traffic calming for urban areas due to noise. <p>Effectiveness: Extract from LTN 107</p> <p>"A study of available information (Webster & Layfield, 1993), found that the overall effect of rumble strips and areas on vehicle speeds was a reduction of 3 mph (about 5 per cent). There was evidence from some sites that 'after' speeds increased slightly with time but were still below the 'before' installation speeds. Further rumble area and noise sites have been reported (Barker, 1997) with speed reductions of up to 6 mph, but again there was evidence from one site that the 'after' speeds increased over time."</p>		<ul style="list-style-type: none"> LTN 107 Traffic Calming - Section 5 Rumble devices and overrun areas TAL 11/93 Rumble devices. 	<p>C55 – Rumble strips should be used across the full width of the carriageway to avoid overtaking.</p> <p>C56 – Rumble strips can only be used at least 200m from a residential property.</p> <p>C57 – Rumble strips should only be considered as part of a package of measures.</p>

Figure 3 – Extract from Hertfordshire Speed Management Strategy (p26)

Scheme Name	Speed Management on Kings Road (between Shootersway and Berkhamsted High Street)	
	Speed Limit Compliance	
Scheme Reference	30	
Problem References	S6	Inappropriate speed on Kings Road
Links to other schemes:	UTP	01, 02, 04

Context



Figure 1 Kings Road, Berkhamsted

The A416 Kings Road provides one of three main routes into Berkhamsted, linking the A41 bypass with the High Street and surrounding residential areas. As one of the main access routes, Kings Road accommodates high levels of traffic, including public transport and HGVs.

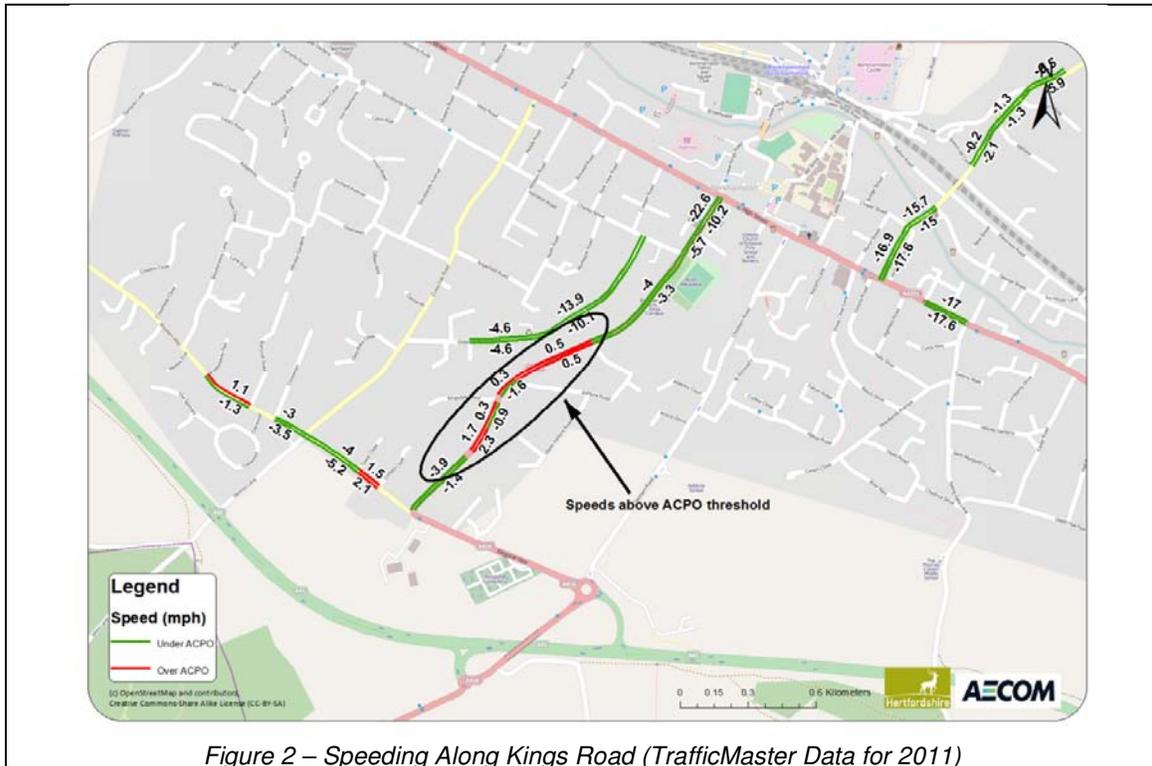
The speed limit along Kings Road is 30mph due to the adjacent residential areas and College, with congestion occurring during peak hours at the signalised junction with the High Street.

There is a perception that the route is unsafe due to vehicles speeding in both directions, even though visibility is poor and the route is narrow. Following examination of TrafficMaster data, it was found that the 85th percentile speed exceeds the 35mph threshold for a road with a 30mph speed limit (see **Table 1**). It is therefore evident that speed management measures are required to improve the safety for all transport users along Kings Road. However, as detailed in **Table 1**, the speeds are not excessively above the threshold, and therefore the most appropriate and feasible measures will be proposed. In addition, TrafficMaster data provides an average speed across a link, including congestion at junctions, thus providing only an insight into speed conditions on highway sections, without reflecting actual speeds that vehicles reach between junctions. As a result, further speed surveys would be required to validate the TrafficMaster data and to fulfil the requirements for changes to speed limits.

The options have been developed, in line with Hertfordshire County Speed Management Strategy, to fulfil the following overarching LTP Objective:

- Improve the safety and security of residents and other road users;

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
30.1	Introduction of speed limit signs along Kings Road between Shootersway and Ashlyns Road	 <p>30mph speed limit signs have recently been added along Kings Road on the section where speeding is an issue. The introduction of further signs could improve the awareness for road users, and result in the reduction of speeds. However, as the existing signs have had little impact, it is suggested that more robust measures are implemented.</p> <p>NOT DELIVERABLE</p>	
30.2	Introduction of Vehicle Activated Sign Roundel (VASR) on approach to corners along Kings Road	 <p>The key criteria for the introduction of VASR suggest that at least three accidents need to have occurred on the route (1 of which relating directly to speeding), and the 85th percentile speed exceeds the ACPO threshold of 35mph. At this location, the speed does exceed 35mph in both directions, and 3 accidents have occurred along Kings Road in the last 3 years (see Table 2).</p> <p>The signs are simple, and easy to understand. It is clear that existing signage does not prevent speeding along Kings Road. It is therefore proposed that VASRs are introduced at the following locations:</p> <ol style="list-style-type: none"> 1. Southbound – south of Ashlyns Road; 2. Northbound - opposite Newbury Grove. <p>Deliverability – 1 to 2 years STANDARD</p>	£8,000 to £10,000
Supporting Evidence of Measures/Components			



Preferred Option

The preferred option would be to implement measure 30.2 in order to increase the awareness of the speed limit and local hazards. In addition to highway improvements at the Shootersway / Kingshill Way junction, it is envisaged that the measures will assist in the reduction of speeds along Kings Road.

Preliminary examination of existing street furniture along Kings Road would be required to ascertain the feasibility of speed limit signs along this stretch. It is apparent that some measure is required at this location to improve safety and reduce speeding.

Contribution to Objectives / Indicators	UTP Objectives	
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
30.2	£8,000 to £10,000	Subject to speed surveys completed in Year 1 of IWP.
TOTAL COST FOR DELIVERY	£8,000 to £10,000	Measure 30.2 to be implemented following full feasibility assessment.

Maintenance Liability	High Medium Low	
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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	In order to implement measure 28.1, a staged approach is recommended: <ol style="list-style-type: none"> 1. Year 1 – speed surveys along section to validate existing TrafficMaster data; 2. Year 2 – if survey data compliments TrafficMaster data, implement speed management measure.

Other Information/Additional Notes:

TrafficMaster Data has been provided via the Department for Transport (DfT) in order to complete an assessment of speeding at particular locations. In raw form, TrafficMaster data relates to satellite navigation journey times. Specifically for Tring and Berkhamsted, the data was available for the whole of 2011, providing sufficient journey time information for the assessment of all links across the local highway network. The journey time was translated into speed based on highway link length information, and then compared against ACPO thresholds (as seen below).

link_id	85th%ile time (1/100s)	Length (m)	85%ile speed (mph)	Speed Limit (mph)	ACPO (mph)	ACPO Diff
4000000019231158A	1472	233.3	35.5	30	35	0.5
4000000019332500A	404	63.7	35.3	30	35	0.3
4000000019281109A	499	78.8	35.3	30	35	0.3
4000000019671259A	452	74.1	36.7	30	35	1.7
4000000019231158B	1472	233.3	35.5	30	35	0.5
4000000019332500B	427	63.7	33.4	30	35	-1.6
4000000019281109B	517	78.8	34.1	30	35	-0.9
4000000019671259B	444	74.1	37.3	30	35	2.3

Table 1 TrafficMaster Data Analysis (Kings Road only)

Date	Location	Description	Severity
31/01/2011	A416 Kings Road, Berkhamsted 195m SW of J/w Kingsdale Road outside No 102	V1 car trav NE on A416 Kings Rd skidded on ice - water frozen from burst pipe which had run downhill. V1 left c/way to o/s and struck skip on driveway to property	Serious
29/12/2009	A416 Kings Road, Berkhamsted gridded 80m NE of J/w Ashlyns Road	V2 car trav In u/k direction on A416 Kings Rd into l/h bend where it was confronted by V1 car, stationary, broadside across c/way. V2 swerved o/s, braked, but collided f/n/s with o/s of V1	Slight
24/11/2010	A416 Kings Road, Berkhamsted 162m NE of J/w Ashlyns Road	V1 car trav SW on A416 Kings Rd slowing through ped x/ng area when a child ran from n/s Kerb, between parked vehs, within zig-zag lines at x/ng exit and into sns wing of V1 rebounding into c/way	Slight

Table 2 Recent Accident Data along New Road (between High Street and canal bridge)

TrafficMaster data provides an average speed across a link, including congestion at junctions, thus providing only an insight into speed conditions on highway sections, without reflecting actual speeds that vehicles reach between junctions. As a result, further speed surveys would be required to validate the TrafficMaster data and to fulfil the requirements for changes to speed limits.

VEHICLE ACTIVATED SIGNS				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>VEHICLE ACTIVATED SIGN ROUNDEL</p> <p>A Roundel VAS displays the speed limit when approached in excess of the speed limit. Roundels are not repeater signs as they only display the speed limit when it is exceeded.</p> <p>(Please see section on Innovation for section on Vehicle Activated LED Chevron Signs).</p>	<p><u>Advantages:</u></p> <ul style="list-style-type: none"> Simple, clear and easy for motorists to understand Suitable for a wide range of locations and installation types. Some models can be set to display different speed limits, increasing their flexibility. Signs are blank when not activated limiting their visual intrusion. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> Without explanatory wording, does not give motorists the reason of the need to slow down. Only gives motorists a limited amount of information about their speed. 		<ul style="list-style-type: none"> DfT Circular 106 Setting Local Speed Limits, para 64 LTN 107 Traffic Calming - Section 9 Vehicle activated devices TAL 103 - Vehicle Activated Signs 	<p>C24 - The signing, lining and location of existing signs must be reviewed prior to a vehicle activated roundel being considered.</p> <p>C25 - A vehicle activated roundel should not be deployed unless it is clear that fixed signing can not remedy the problem.</p> <p>C26 - At least 3 personal injury collisions have been recorded that are relevant to the location of the vehicle activated roundel within the last three years, with at least 1 being attributed to speed.</p> <p>C27 - When considering a vehicle activated roundel, existing 85th percentile vehicle speeds must exceed the ACPO threshold speeds (eg. 35mph in a 30mph limit, 46mph in a 40mph limit).</p> <p>C28 - Vehicle activated roundels should generally be considered as a package of measures.</p>

Figure 3 – Extract from Hertfordshire Speed Management Strategy (p19)