

Scheme Name	Speed Management on Station Road (Tring) Speed Limit Compliance	
Scheme Reference	31	
Problem References	S14	Speeding on Station Rd
Links to other schemes:	UTP	13



Context	
	<p>Station Road is located on the eastern outskirts of Tring, connecting the town centre with Tring Railway Station and the Grand Union Canal. The route is used by many commuters to access the station by foot, bike or car.</p> <p>For most of Station Road, the speed limit is National Speed Limit, reducing to 30mph on approach to the canal bridge. However, at the transition between National Speed Limit to 30mph, drivers are failing to slow down. In addition, the current speeds result in an unsafe environment for pedestrians and cyclists using Station Road footpath to access Tring Station.</p> <p>The option has 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

Figure 1 Kings Road, Berkhamsted

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
31.1	Speed Buffer Zone (40mph for 600m before entry into 30mph zone)	<p>The introduction of 600m 40mph buffer zone is required as the speed reduction from National Speed Limit to 30mph is not effective in the immediate road section (as seen in Figure 2). The 'Key Criteria' for Buffer Zones suggest installation where speeds in the lower speed limit exceed the ACPO threshold speed. On Station Road, the ACPO speed is 35mph however, actual 85th percentile speed is 46.6mph eastbound and 47.3mph westbound.</p>	 <p>£10,000 to £15,000</p>

		<p>Following a review of accidents along this section of Station Road, it was found that 4 accidents have occurred since 2007 (see Table 2). The specific details suggest that, on more than one occasion, reducing the vehicles speed would have reduced the severity of the incident.</p> <p>The proposal includes 4 signs and posts, with associated Traffic Regulation Order. If accepted, further speed surveys would be required in order to ascertain a full set of accurate speed data at this location.</p>	
		<p>Deliverability – 1 to 2 years STANDARD</p>	

Supporting Evidence of Measures/Components

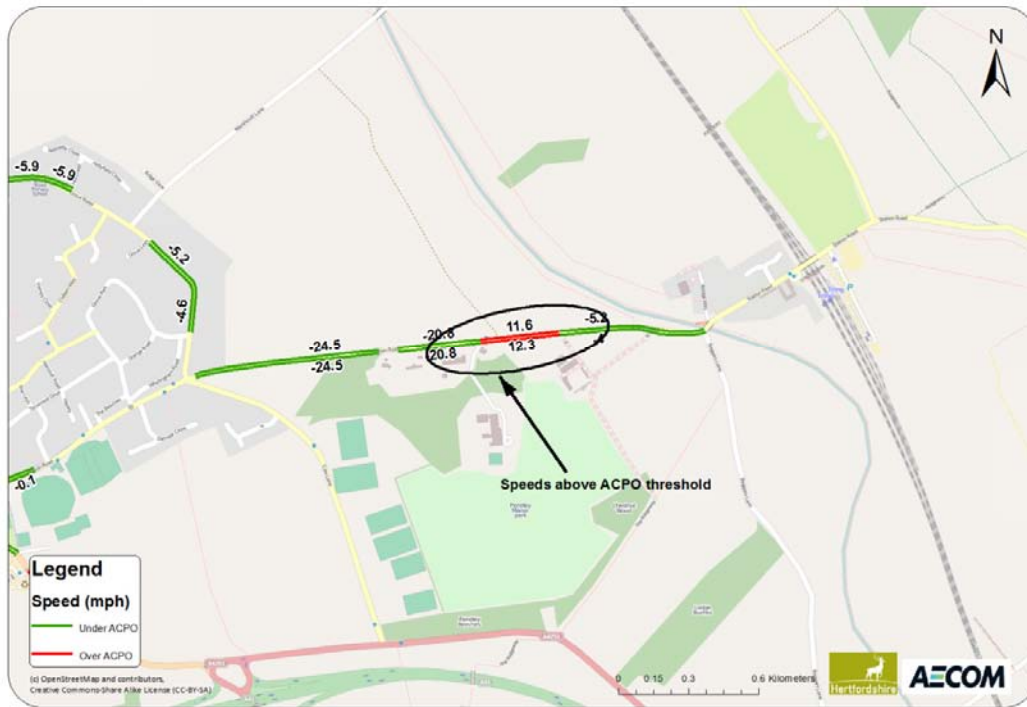


Figure 2 – Speeding Along Station Road (TrafficMaster Data for 2011)

Preferred Option

Implement measure 31.1, therefore reducing speeds on approach and within the 30mph zone along Station Road.

<p>Contribution to Objectives / Indicators</p>	<p>UTP Objectives</p>	
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
31.1	£10,000 to £15,000	
TOTAL COST FOR DELIVERY	£10,000 to £15,000	

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: <ul 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
4000000019203964A	1052	222.1	47.2	60	68	-20.8
4000000019231130A	1013	211.2	46.6	30	35	11.6
4000000019191813A	2917	388.7	29.8	30	35	-5.2
4000000019203964B	1052	222.1	47.2	60	68	-20.8
4000000019231130B	999	211.2	47.3	30	35	12.3
4000000019191813B	2801	388.7	31.0	30	35	-4.0

Table 1 TrafficMaster Data Analysis (Station 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.



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"> DTF Circular 1-06 Setting Local Speed Limits (pararachs 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, 45mph 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>


Figure 3 – Extract from Hertfordshire Speed Management Strategy (p18)


Date	Location	Description	Severity
15/11/2007	Station Road, Tring 600m NE of J/w Cow Lane	V1 car trav NE on Station Rd skidded on worn, uneven c/way into o/s hedge on raised verge, rebounding n/s and overturned on n/s verge	Slight
05/08/2007	Station Road, Tring 300m west of j/w Beggars Lane	V1 Car Trav Westbound On Station Rd With Driver And Passenger Having An Argument When V1 Left C/way, Whilst Driver Distracted, Colliding With A Telegraph Pole On N/s Verge	Serious
18/11/2009	Station Road, Tring 190m west of j/w Beggars Lane	V1 Car Trav West On Station Rd Turned Right To Enter Driveway, But Drove Across Footway/cycleway Into Path Of Cyclist Riding V2 West Along North Cycleway	Slight
23/03/2007	Station Road, Tring 12m west of j/w Beggars Lane	V1 car trav SW on Station Rd negotiated l/h bend of 'S' bend, but left c/way to n/s on r/h bend and collided with a lamp post	Slight



Table 2 Accident Data for Station Road at location of proposed 40mph 'buffer zone'

Scheme Name	Speed Management on London Road (Approaching Tring) Speed Limit Compliance	
Scheme Reference	32	
Problem References	S17	Speeding on London Road westbound into Tring
Links to other schemes:	UTP	08

Context	
	<p>The B4635 London Road provides the main southern route 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. Currently, the 85th percentile speed is 37.3mph entering Tring, and 39.1mph exiting Tring, exceeding the threshold for the provision of speed reduction schemes (35mph).</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
32.1	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 London Road, the ACPO speed is 35mph however, actual 85th percentile speed is 37.3mph inbound and 39.1mph outbound. As a result, it is proposed to install a 40mph buffer zone from the existing 30mph signs to the roundabout at the</p>	 <p>£8,000 to £10,000</p>

		<p>entrance to Tesco supermarket. The proposal would include 4 new speed signs and associated road markings. In addition, a Traffic Regulation Order (TRO) would need to be completed. 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.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	
32.2	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. 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 London Road.</p> <p>NOT DELIVERABLE</p>	

32.3	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 London Road, this intention fits with the hazards located along the northern sections, including local schools and supermarket access roundabout. They are relatively inexpensive to install and provide most benefit within rural settings.</p> <p>The proposed rumble strip would be located at the entrance to the existing 30mph zone. An associated TRO and consultation would be required, as rumble strips should not be located within 200m of dwellings due to the potential noise pollution.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	 <p>£2,000 to £4,000</p>
32.4	Introduction of Central Islands and Refuges along 30mph zone	<p>Central Islands can narrow the width of the driving lanes, and assist in reducing vehicle speeds. In addition, with bus stops and sporadic footpaths on either side of London Road, the measure will provide crossing facilities along its length and enhance the safety for vulnerable road users.</p> <p>However, if a cycle route is preferred along London Road, Central Islands can reduce the road space available for cyclists, and would therefore not be recommended. The measure would also be accompanied by relevant road markings, and would be located along the 30mph zone up to the supermarket roundabout.</p> <p>NOT DELIVERABLE</p>	
Supporting Evidence of Measures/Components			

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	Length (m)	85%ile speed	Speed Limit	ACPO (mph)	ACPO Diff
400000019203955B	2190	365.1	37.3	30	35	2.3
400000019203955A	2086	365.1	39.1	30	35	4.1

Table 1 TrafficMaster Data Analysis (London 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.

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/restricted speed limits • 50mph speed limit between 40mph and derestricted speed limits 	<p>Advantages:</p> <ul style="list-style-type: none"> • Brings vehicle speeds down in the lower limit due to the approach in the buffer zone. <p>Disadvantages:</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 reallets 	<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>







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:</p> <p>Extract from LTN 1/07</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 6 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 1/07 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>
CENTRAL ISLANDS AND REFUGES				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>Centre islands and refuges can be installed in the middle of the carriageway to narrow the width of the driving lane and assist in reducing vehicle speeds. Such facilities will be accompanied by the relevant road markings.</p>	<p>Advantages:</p> <ul style="list-style-type: none"> Can effectively reduce vehicle speeds. Can reduce over taking manoeuvres. Can also provide crossing points for pedestrians. <p>Disadvantages:</p> <ul style="list-style-type: none"> Can reduce the road space available for cyclists. Driver frustration in having to wait can lead to increase in collisions. 		<ul style="list-style-type: none"> LTN 1/07 Traffic Calming - Section 6.6.3 TAL 7/95 Traffic islands for speed control 	<p>C50 – Central islands and refuges will only be used as a package of measures in order to reduce speeds. They will not be used in isolation.</p>


Figure 3 – Extract from Hertfordshire Speed Management Strategy (Section 4)

Scheme Name	Speed Management on Brook Street (Tring) Speed Limit Compliance	
Scheme Reference	33	
Problem References	S18	Speeding on Brook St, combined with poor visibility, narrow and no crossing facilities
Links to other schemes:	UTP	22, 13

Context	
 <p><i>Figure 1 Section of Brook Street</i></p>	<p>Brook Street provides a main through route for vehicles travelling north or south through Tring, and is a signposted route for both Icknield Way Industrial Estate and Ivinghoe to the northeast.</p> <p>The speed limit along the route between Tring High Street and Icknield Way is 30mph, with many side roads along its length providing access to residential areas and community facilities.</p> <p>The examination of TrafficMaster data (see Figure 2) suggests that the current speeds through the 30mph section warrants the provision of further speed management at this location. Currently, the 85th percentile speed is 37.9mph northbound and 38.6mph southbound, exceeding the threshold for the provision of speed reduction schemes (35mph).</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
33.1	Introduction of Vehicle Activated Sign Roundel (VASR) along Brook Street	 <p>Figures 2 and 3 for details. The signs are simple, and easy to understand.</p>	£8,000 to £10,000

		<p>However, VASR should not be deployed unless it is clear that fixed signage does not remedy the issue. It is proposed that a VASR is located in both directions on approach to the junction with Shugars Mill Lane.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	
33.2	Traffic Cushions	 <p>Traffic Cushions can effectively reduce speeds, without having a detrimental effect on buses, cyclists and noise pollution. Along Brook Street, it is proposed to implement traffic cushions where there is no adjacent on street parking.</p> <p>NOT DELIVERABLE</p>	
33.3	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 Brook Street, this intention fits with the hazards located at the junctions with High Street and Icknield Way. They are relatively inexpensive to install and provide most benefit within rural settings.</p> <p>The proposed rumble strips would be located at the northern and southern ends of Brook Street to encourage vehicles to slow down through the residential area.</p> <p>NOT DELIVERABLE</p>	

33.4	Introduction of Ripple Print along Icknield Way	 <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 Brook Street, due to the location of residential areas on both sides, it is proposed that Ripple Print 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 within the 30mph zone at the northern and southern ends of Brook Street.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	£30,000 to £34,000
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Supporting Evidence of Measures/Components

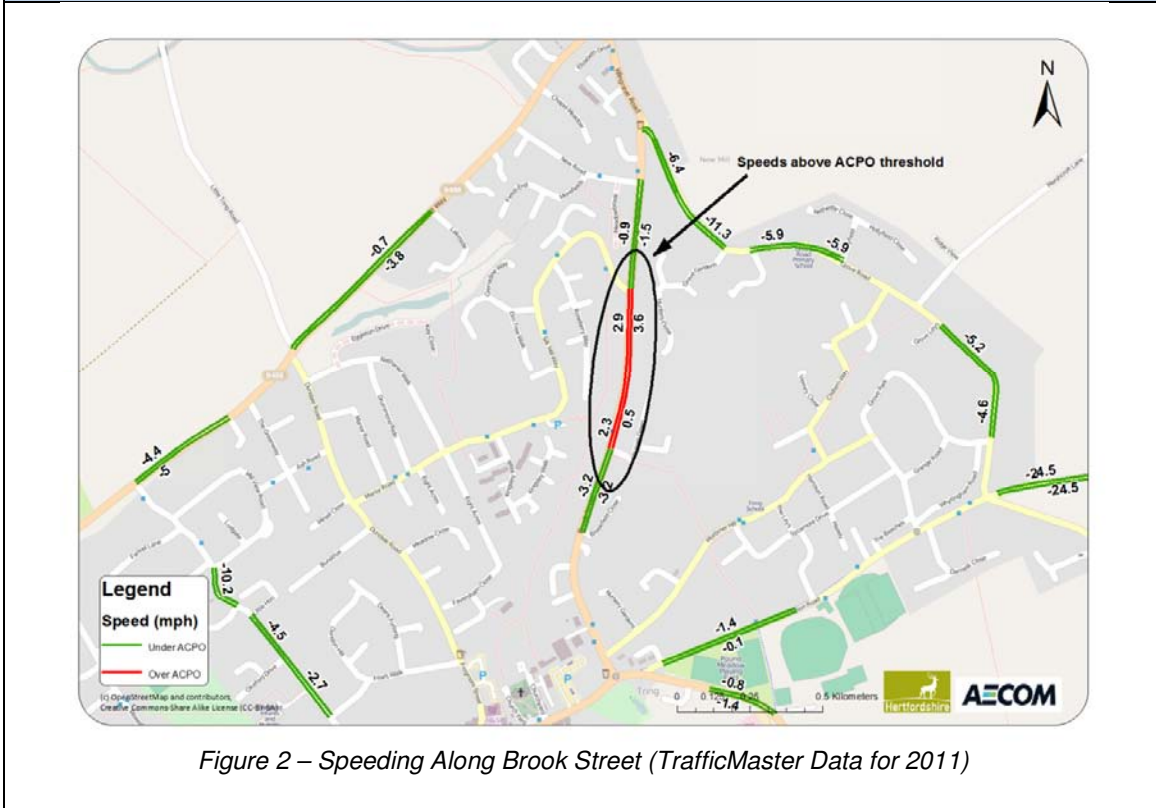




Figure 3 – Accident Locations Along Brook Street (since 2008)

Preferred Option

The preferred option includes measures 33.1 and 33.4, providing a low cost, yet effective solution to speeding along Brook Street. The combination of Vehicle Activated Sign Roundels and Rippleprint will increase the awareness of drivers to the local hazards, but also sustain the route as accessible for cyclists.

Contribution to Objectives / Indicators	UTP Objectives	
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
33.1	£8,000 to £10,000	Subject to speed surveys completed in Year 1 of IWP.
33.4	£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 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	Length (m)	85%ile speed	Speed Limit	ACPO (mph)	ACPO Diff
4000000019231122A	1320	187.4	31.8	30	35	-3.2
4000000019231122B	1320	187.4	31.8	30	35	-3.2
4000000019281022A	834	139.3	37.3	30	35	2.3
4000000019281022B	878	139.3	35.5	30	35	0.5
4000000019203962A	1210	205.2	37.9	30	35	2.9
4000000019203962B	1190	205.2	38.6	30	35	3.6
4000000019231123A	1545	235.6	34.1	30	35	-0.9
4000000019231123B	1573	235.6	33.5	30	35	-1.5

Table 1 TrafficMaster Data Analysis (Brook Street 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.

Tring, Northchurch and Berkhamsted UTP Scheme Proforma 33



VEHICLE ACTIVATED SIGNS				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>VEHICLE ACTIVATED SIGN ROUNDTEL</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>Advantages:</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>Disadvantages:</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 1106 Setting Local Speed Limits, para 64 LTN 1107 Traffic Calming - Section 9 Vehicle activated devices ITAL 1103 Vehicle Activated Signs 	<p>C24 - The signing, lining and location of exiting 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, 45mph in a 40mph limit).</p> <p>C28 - Vehicle activated roundels should generally be considered as a package of measures.</p>
CUSHIONS				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>Cushions are now the favoured more commonly over road top and flat top humps.</p>	<p>Advantages:</p> <ul style="list-style-type: none"> Can effectively reduce vehicle speeds. Uses can traverse cushions allowing a smooth transition for passengers. Soft down cushions are manufactured and can be installed to exacting specifications. Allows cyclists to by-pass. Quieter than road top humps. <p>Disadvantages:</p> <ul style="list-style-type: none"> Can allow HGV's to traverse the cushions without the need to reduce speeds due to wider wheel base. 		<p>As Round Tops & Flat tops above, but also:</p> <ul style="list-style-type: none"> ITAL 1193 Speed cushion schemes ITAL 4/94 Speed cushions 	<p>C53 - PTU design guide recommends that measures need to be taken to ensure there is no parking adjacent to the cushions and that the enforcement authority is consulted.</p> <p>C54 - Bolt down cushions will be used.</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 1107</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 6 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 ribline 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 1107 Traffic Calming - Section 5 Rumble devices and overrun areas ITAL 1193 Rumble devices 	<p>C56 - 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>
CHICANES				
Introduction	Effectiveness / Advantages and Disadvantages / Case Studies	Photographs	Relevant Guidance	Key Criteria
<p>Chicane designs vary considerably but most fall into two broad categories:</p> <ul style="list-style-type: none"> Single lane working, consisting of staggered build outs, narrowing the road so that the traffic from one direction has to give way to opposing traffic. Two way working, using build outs to provide deflection, but with lanes separated by road markings or a central island. <p>A single-lane working chicane allows traffic in both directions, but there is only room for one vehicle to pass at a time. Generally priority is given to one direction, so that the possibility of vehicle conflicts is minimised. Priority should be given to vehicles leaving a traffic-calmed area, so that the speed of vehicles entering is reduced.</p> <p>Two way working chicanes take up more carriageway space than other chicanes, as they allow two vehicles to pass in opposite directions at the same time. Where chicanes do not have a central divider, vehicles can encroach into the opposing traffic lane, and this may result in less speed reduction being achieved, and / or safety being compromised.</p>	<p>Advantages:</p> <ul style="list-style-type: none"> Can effectively reduce vehicle speeds. Can reduce overtaking manoeuvres. <p>Disadvantages:</p> <ul style="list-style-type: none"> Driver frustration in having to wait can lead to increase in collisions. Can not be used on heavily trafficked roads. Only effective on roads where the flows in both directions are balanced. 	<p>Single Lane Working Chicane:</p> <p>Two Way Working Chicane:</p>	<ul style="list-style-type: none"> LTN 1107 Traffic Calming - Section 6.4 Chicanes. ITAL 12/97 Chicane Schemes ITAL 9/94 Horizontal Deflections 	<p>C46 - When using single way working, two way vehicle flows should not exceed 3,000 vehicles per day and will not exceed 4,000.</p> <p>C47 - Chicanes can be used on roads with a speed limit of 40mph or below.</p>

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

Scheme Name	Safer Routes to Schools Walking	
Scheme Reference	34	
Problem References	CH8	Charles St and Castle St school time congestion (drop-off areas)
	B01	No safe access for cyclists from High St to Durrants Ln
	B18	Little cycle specific provision throughout the town
	B28	Changes to the education system in Berkhamsted may alter travel behaviour with increased traffic to Ashlyn's School recognised as a potential issue
	T08	No formal crossing on Station Road between footpath 39 and cycle track across playing fields to Tesco (lots of schoolchildren observed doing this movement at lunchtime)
	T21	Problems for school children travelling to school by cycle are caused by congestion as a result of the number of pupils taken to school by car.
	PK10	Large number of vehicles stopping on Grove Rd at school peak times
	PT9	Lack of shuttle buses to schools
	W7	Billet Lane/Bridgewater Rd is very busy, and deters people from walking to nearby school
	W18	No pedestrian crossing on Miswell Lane (north of Beaconsfield Rd). Lots of pupils cross road here
Links to other schemes:	UTP	03, 15, 19, 23, 24, 25


Context
<p>Hertfordshire County Council has been developing the 'Safer Routes to School' programme of initiatives with schools across Hertfordshire for a number of years. The aim of a 'Safer Routes to School' project is 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. A mix of engineering and educational measure are used to achieve these aims and in doing so, reduce child accident casualties, improve the environment around the schools and promote (to both pupils and parents) the health benefits of walking and cycling.</p> <p>Specifically for Tring, Northchurch and Berkhamsted, there are a number of schools that have recently created School Travel Plans with associated targets and monitoring programmes. The purpose of this scheme is to focus on the delivery of SMART (Specific, Measurable, Attainable, Realistic and Timely) targets for mode shift, but also implement proposed infrastructure that will assist and encourage the safe access of schools throughout the study area. These hard measures are proposed in line with existing school specific SRtS feasibility reports.</p> <p>Interventions have therefore been developed to fulfil the following overarching LTP Objectives:</p>



- Support economic development and planned dwelling growth
- Improve transport opportunities for all and achieve behavioural change in mode choice
- 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

It is recommended that the following measures are implemented in parallel with those proposed in Scheme 23 – Package of Smarter Measures, as a joint mechanism to improve sustainable journeys to school.

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
34.1	Maintain and enhance School Travel Plans (STP's)	<p>The main purpose of implementing school travel plans is to promote safe and healthy journeys to school. The key benefits of STP's include:</p> <ul style="list-style-type: none"> • Reduces the number of school related vehicle trips; • Increases the safety of children travelling to and from school; • Improves the environment around schools; • Provides health benefits for children travelling to school; • Increases the number of cycling proficiency courses for school children. <p>School Travel Plans play a key role in addressing the immediate issues of child safety and reducing congestion as well as embedding the principles of sustainable travel within the younger generations in Tring, Northchurch and Berkhamsted.</p> <p>Hertfordshire County Council currently hold the following STP documents:</p> <ul style="list-style-type: none"> • Goldfield Primary School Action Plan; • Ashlyns School; • Bishop Wood; • Bridgewater School Action Plan; • Dundale School; • Greenway First School; • Grove Road; • St Marys; • St Thomas More; • Swing Gate; • Thomas Coram School; 	N/A

		<ul style="list-style-type: none"> • Tring School; • Victoria First School; • Westfield First School; • Berkhamsted School. <p>It is therefore proposed that STPs are reviewed each year, and kept on record at both Hertfordshire County Council and at each school, to ensure monitoring and achievement of targets. The main purpose of this measure therefore, is to maintain and deliver the objectives set out in each School Travel Plan, but also to provide SMART (Specific, Measurable, Attainable, Realistic and Timely) targets for mode shift from the private car in future years.</p> <p><i>Deliverability – Ongoing</i></p>	
34.2	Cycle and scooter parking at schools ¹	 <p><i>Figure 1 Example School Cycle Parking</i></p> <p>In order to increase the mode share of cycling for pupils travelling to school, there needs to be sufficient secure cycle parking at each of the schools. In addition to being an effective tool for schools to promote active travel, cycle parking is a striking way to publicise cycling and to help parents feel relaxed about the security of bikes. Sustrans have provided a useful 6-step guide for schools to assist in the delivery of cycle parking.² In summary, the steps include:</p> <ol style="list-style-type: none"> 1. Provision of spaces; 2. Funding sources; 3. Associated budget; 4. Location of parking within the school grounds; 	£6,000 to £10,000 (per school)

¹ Location – Newberries Primary School, Hertfordshire


² Sustrans website – Cycle parking for schools (Information for schools and school champions)
http://www.sustrans.org.uk/assets/files/Safe%20Routes/resources/infosheets/SRS_cycle_parking_for_schools.pdf

		<p>5. Installation and design; 6. Promotion of storage.</p> <p>It is proposed that each of the schools located within the study area implement sufficient cycle and scooter parking in order to encourage cycling to school.</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	
34.3	Provide zebra crossing on Miswell Lane	<p>There is wide support for a crossing to be provided at this location, as a result of safety issues and school pupils that cross Miswell Lane here to access Goldfield Infant School.</p> <p>It is proposed to provide a zebra crossing at this location (see Figure 3 for details), subject to an assessment based on LTN 1/95. The specific location is based on adjacent private access points, and the junction with Beaconsfield Road. In addition, it is proposed to locate the crossing slightly offset from the current footway alignment in order for pedestrians/cyclists to slow down on approach to Miswell Lane. Therefore, guardrailing will also be required on the existing alignment.</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	£40,000 to £45,000
34.4	Provide school crossing signs on approach along Miswell Lane	<p>Most pedestrians that cross Miswell Lane via Footpath 48 are accessing Goldfield Infant School, located directly to the east. There is a perception that speeding vehicles is an issue along Miswell Lane, creating an unsafe location for pedestrians to cross the road. To improve the awareness of the crossing point, it is proposed to implement school crossing signs on the approach to the current Footpath 48 alignment across Miswell Lane. 3 signs will be required (2 on Miswell Lane and 1 on Christchurch Road approach).</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	£2,000 to £4,000





34.5	Install formal Crossing Point on Bridgewater Road (off Billet Lane / Bridgewater Road junction)	<p>Crossing Bridgewater Road near to the junction with Billet Lane can be quite hazardous. Due to the amount of school pupils (Bridgewater School) that cross at this point, there is a need for an improved crossing facility, providing greater priority for pedestrians, and improving the safety for local school children. As part of the Safer Routes to Schools Feasibility Study for Westfield First School, a number of options were considered to improve pedestrian safety at this location, including the reduction of carriageway width and the removal of the existing central island.</p> <p>The SRtS report concluded that the most appropriate and beneficial option would be to install a zebra crossing on a raised plateau, including the removal of the existing speed cushions (at this location). The following details are included within the proposal:</p> <ul style="list-style-type: none"> • Approach ramps to be 1 in 15; • 5.8m width of central plateau; • Existing cycle link to be relocated to the western side of the crossing. <p>This UTP supports the recommendations of the SRtS Feasibility Study, and therefore, it is proposed that the crossing is implemented along with other measures along the Billet Lane corridor in order to enhance pedestrian routing in the local area. See Figure 4 for details of the proposed crossing.³</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	£60,000 to £70,000
34.6	Associated Marketing of Sustainable Travel to School	<p>A useful mechanism to increase mode share of sustainable journeys to school is for schools and cycling groups to market initiatives, outlining the associated benefits, including improved health and reduced congestion. For example, 'Bike to School Week' could be implemented and marketed for all schools within the study area during a specific week each year. This would result in greater awareness of cyclists, but also encourage others to take up cycling as a realistic alternative to the private car. In addition, it is recommended that school pupils have greater involvement in the creation of initiatives to increase walking and cycling trips to school. This</p>	£10,000 to £15,000 per annum



³ Extract from 'Safer Routes to School Programme Feasibility Report - Westfield First School & Nursery' – Hertfordshire Design team

		<p>could include cycle parking design, local route plans and school bike clubs. A number of initiatives have already been developed across the UK, as demonstrated on the Sustrans website.⁴</p> <p><i>Deliverability – Ongoing</i></p>	
34.7	<p>Connect Toucan crossing with shared use footway on south side of High Street (to Billet Lane junction)</p>	 <p>Proposed Measure 19.3 (detailed in Proforma 19) includes a cycle link from the canal towpath to the Billet Lane / Gossoms End junction. It is proposed to extend this cycle link along the footpath on the southern side of the High Street, as a link to Durrants Lane. Thus, provision is made for pedestrians and cyclists from Durrants Lane to Grand Union Canal and beyond. The proposed 400m route has sufficient footpath width to accommodate both pedestrians and cyclists (currently 2.0m wide with no off street parking).</p> <p>The measure would encourage sustainable travel to school, and also improve the safety for vulnerable road users.</p> <p>However, following consultation and a review of geometry, it was found that this route is already a busy route at peak times, with many pupils and parents with pushchairs using the existing footpath. As a result, there is insufficient width to provide a shared use path.</p> <p>NOT DELIVERABLE</p>	
34.8	<p>Provide Advanced Stop Lines at signalised junction for cyclists, shifting priority from private car and improving safety of junction</p>	<p>As per proformas 01 and 19, investigate the feasibility of implementing 4.0m Advanced Stop Lines (ASLs) on all approaches at the Durrants Lane Junction to increase priority for cyclists at the junction and improve conspicuousness.</p> <p>Where possible, suitable feeder lanes should be provided, however width restraints mean it is</p>	

⁴ <http://www.sustrans.org.uk/what-we-do/safe-routes-to-schools/resources/case-studies>

		likely ASLs would be gated. In addition, lack of visibility would prevent the implementation of the signals with ASLs. NOT DELIVERABLE	
34.9	Provide Zebra Crossing between Durrants Lane and Moore Road	A number of options have been considered to improve the crossing for pedestrians adjacent to the Durrants Lane/High Street junction. A signalised standalone pedestrian crossing facility does not meet the recommended distance from a junction (20m), and widening of the existing central islands as the available road width was insufficient to accommodate pedestrians with buggies. The most appropriate option for a standalone pedestrian crossing would be a zebra crossing between Durrants Lane and Moore Road. The distances from the side roads are sufficient for this type of crossing. In addition, the warning of the crossing can be highlighted further by advance warning signs. See Figure 5 for details. NOT DELIVERABLE	
34.10	Connect toucan crossing at proposed traffic signals with shared use footway on north side of High Street (to Billet Lane junction)	Proposed Measure 19.3 (detailed in Proforma 19) includes a cycle link from the canal towpath to the Billet Lane / Gossoms End junction. It is proposed to extend this cycle link along the footpath on the northern side of the High Street, as a link to Durrants Lane. Currently footway parking is frequent on the northern side of the High Street. As part of the Safer Routes to School scheme for Westfield School in Durrants Lane, there are proposals to provide on street parking outside Lagley House to the west of Billet Lane. These proposals (see Figure 6) should be incorporated to allow sufficient space for a shared use facility, and negate the need for vehicles to park on the footway. Some street furniture relocation (sign posts) may also be required to facilitate this option and eradicate pinch points. This shared use facility could then link to the proposed controlled pedestrian facilities at the Billet Lane junction (outlined in Proforma 13). Deliverability – 1 to 2 years STANDARD	£40,000 to £45,000

34.11	Raised crossing on Durrants Lane, Northchurch	<p>Crossing Durrants Lane directly outside of Westfield School can be quite hazardous. Due to the amount of school pupils that wish to cross at this point, and the safety concerns due to the adjacent roundabout, there is a need for an informal crossing facility, providing greater priority for pedestrians, and improving the safety for local school children.</p> <p>In addition, Durrants Lane is located on a bus route. As a result, an informal, extended raised plateau would be the most appropriate option. The following details are included within the proposal:</p> <ul style="list-style-type: none"> • Approach ramps to be 1 in 15; • 5.8m width of central plateau; <p>It is proposed that the informal crossing is implemented along with other measures along the Durrants Lane corridor, in order to enhance pedestrian routing in the local area.</p>  <p><i>Example Informal Crossing</i></p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	£25,000 to £30,000
34.12	Provide zebra crossing on Hilltop Road, Berkhamsted	<p>There is wide support for a crossing to be provided at this location, as a result of safety issues and school pupils that cross Hilltop Road here to access Ashlyns School.</p> <p>It is proposed to provide a zebra crossing at this location subject to an assessment based on LTN 1/95. Following an initial examination of visibility based on existing speeds (see Table 1 for details) there is sufficient visibility in both directions to ensure sufficient Stopping Sight Distance (SSD) and Visibility Splay. The introduction of traffic calming in conjunction with the proposed zebra crossing would ensure that visibility requirements are met.</p> <p>The proposal will result in greater priority for pedestrians at this location, with a reduced risk of accidents.</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	£60,000 to £65,000
34.13	Provide crossing signs on approach along Hilltop Road and Chesham Road, Berkhamsted	<p>Most pedestrians that cross Hilltop Road near Chesham Road are accessing Ashlyns School, located directly to the south. There are no speeding</p> 	£1,500 to £2,000

		<p>issues at this location, with average speeds below 20mph. However, there are concerns that visibility is at the absolute minimum (40m in both directions) for areas with a speed limit of 30mph. To improve the awareness of the zebra crossing that is proposed it is proposed to implement crossing signs on approach to this identified crossing point. This is both to the south west on Chesham Road and to the north east on Hilltop Road.</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	
34.14	Raised crossing on Hilltop Road	<p>Due to the amount of school pupils that wish to cross Hilltop Road on its southern end near Chesham Road, there is a need for a crossing facility, providing greater priority for pedestrians, and improving the safety for local school children.</p> <p>In addition, Hilltop Road is located on a bus route. As a result, an informal, extended raised plateau would be the most appropriate option. The following details are included within the proposal:</p> <ul style="list-style-type: none"> • Approach ramps to be 1 in 15; • 5.8m width of central plateau; <p>It is proposed that the informal crossing is implemented only if Measure 34.12 does not meet the criteria for visibility, as Measure 34.12 would be the preferred option at this location. The crossing is proposed along with other measures near Ashlyns School, in order to enhance pedestrian routing in the local area.</p>  <p><i>Deliverability - Measure 34.12 Preferred</i></p>	
34.15	Extend footway on western edge of Chesham Road and provide informal crossing point across Chesham Road	<p>Due to the existing footfall across Chesham Road near to the junction with Kingshill Way, there is a requirement for a safe crossing in order to provide improved pedestrian access to Ashlyns School located to the east of Chesham Road. It is proposed that the footpath on the western</p> 	£8,000 to £10,000

		<p>edge at the southern end of Chesham Road is extended, with an uncontrolled crossing point provided where the footpath ends. In doing so, the crossing point will be located at a suitable distance from the roundabout, but also from the access point for Ashlyns Residential Home. Before delivery of the measure, land-take (Berkhamsted School playing fields) will be required to ensure suitable footpath width is provided for the extension.</p> <p>Figure 7 provides full details regarding proposed alignments and design considerations.</p> <p><i>Deliverability – 1 to 2 years</i> STANDARD</p>	
34.16	Relocate Arriva Bus stop (for Service 354) on Chesham Road from opposite Ashlyns School to within the school's main entrance	<p>Safety concerns and lack of pedestrian facilities at the existing bus stop location on the western edge of Chesham Road have been highlighted as a concern during the UTP process. A review of existing facilities have highlighted the following issues:</p> <ol style="list-style-type: none"> 1. Lack of crossing point for pupils from Ashlyns School to the bus stop; 2. Only a small section of pavement provided at the bus stop, with limited space for waiting. Due to the constrained conditions, there is limited scope to extend or widen the pavement; 3. No shelter or seating provided; 4. Insufficient access for pedestrians with limited mobility (e.g. no drop-kerb). <p>As a result, it is proposed to relocate the bus stop into the main entrance to Ashlyns School. As the majority of bus users who alight at this specific stop are pupils from the school, the revised location would provide a safer place to wait. In addition, as the number of pupils attending the school will be increasing by over 200 in 2013, it is likely that the number of bus users at this location will also increase.</p> <p>The proposal will be subject to the following:</p> <ul style="list-style-type: none"> • Approval from both the school and public transport provider; • An examination of sufficient space for bus turning circle. <p><i>Deliverability – Less than 1 year</i> SIMPLE</p>	£1,200 to £1,500
Supporting Evidence of Measures/Components			



Figure 2 Chesham Road Speed/Accident Analysis

Location	Direction	Length (m)	Observations	Average Time (s)	Max Time (s)	Min Time (s)	85th%ile	Min Speed (mph)	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Ashlyns Residential Home to Ashlyns Farm	NB	158.1	2096	12.77	568.8	7.11	9.98	0.6	49.7	35.4	27.7
Ashlyns Farm to Ashlyns School	NB	168.4	2448	13.76	604.8	7.38	9.75	0.6	51.1	38.6	27.4
Ashlyns School entrance	NB	29.7	2339	2.95	108	1.32	1.83	0.6	50.4	36.3	22.5
Ashlyns School to Acacia Grove	NB	127.0	1947	10.30	228.6	5.58	8.31	1.2	50.9	34.2	27.6
Acacia Grove to Hilltop Road	NB	42.2	2006	4.85	37.8	2.7	4.2	2.5	35.0	22.5	19.5
Hilltop Road	EB	118.3	1759	14.45	60.69	8.5	12.87	4.4	31.1	20.6	18.3
Ashlyns Farm to Ashlyns Residential Home	SB	158.1	2875	12.40	568.8	6.94	9.98	0.6	50.9	35.4	28.5
Ashlyns School to Ashlyns Farm	SB	168.4	2807	12.33	604.8	7.38	9.6	0.6	51.1	39.2	30.5
Ashlyns School entrance	SB	29.7	2360	2.45	216	1.3	1.74	0.3	51.2	38.2	27.2
Acacia Grove to Ashlyns School	SB	127.0	2441	10.38	228.6	6.02	8.79	1.2	47.2	32.3	27.4
Hilltop Road to Acacia Grove	SB	42.2	2528	5.65	37.8	2.04	4.58	2.5	46.3	20.6	16.7
Hilltop Road	WB	118.3	789	14.98	70.8	10.11	13.27	3.7	26.2	19.9	17.7

Table 1 TrafficMaster Data

Preferred Option

The preferred option includes measures 34.1 to 34.6, 34.10 to 34.13, 34.15 and 34.16 as they all contribute to improved choice of transportation to school. Through marketing of schemes and initiatives, delivery of School Travel Plan targets and implementation of proposed SRtS schemes, pupils will have greater access to travel options other than the private car, with safe and secure routes available.

It is also recommended that the proposal are implemented with those proposal in Scheme 20 (Durrants Lane / High Street junction) to maximise the benefits of improved cycling and walking facilities to Westfield School.

Contribution to Objectives / Indicators	UTP Objectives	<ul style="list-style-type: none"> • Improve connectivity between transport modes to allow for greater transport flexibility; • Promote active travel modes throughout the study area to encourage active and healthy lifestyles.
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
34.1	£70,000 to £80,000	Cost per annum
34.2	£6,000 to £10,000	Cost per school
34.3	£40,000 to £45,000	
34.4	£2,000 to £4,000	
34.5	£60,000 to £70,000	
34.6	£10,000 to £15,000	Cost per annum
34.10	£40,000 to £45,000	
34.11	£25,000 to £30,000	
34.12	£60,000 to £65,000	
34.13	£1,500 to £2,000	
34.15	£8,000 to £10,000	
34.16	£1,200 to £1,500	
TOTAL COST FOR DELIVERY	£323,700 to £377,500	

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	Measures 34.3, 34.4 and 34.11 require a TRO before



construction; hence the deliverability is "Standard".

Other Information/Additional Notes:

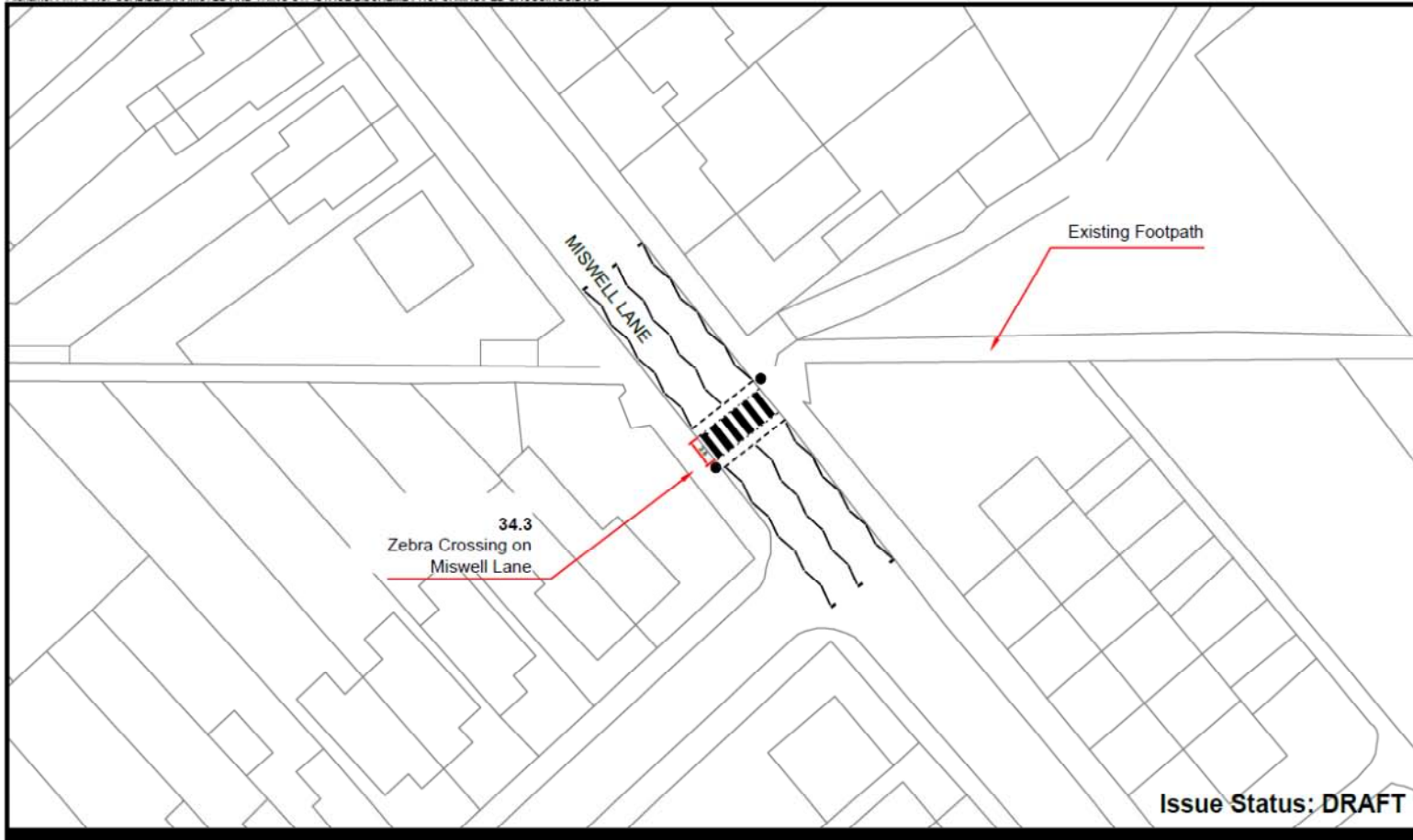
Tring, Northchurch and Berkhamsted UTP Scheme Proforma 34



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Tring and Berkhamsted
Urban Transport Plan
Hertfordshire County Council



Figure 3 Zebra Crossing on Miswell Lane

Tring, Northchurch and Berkhamsted UTP Scheme Proforma 34



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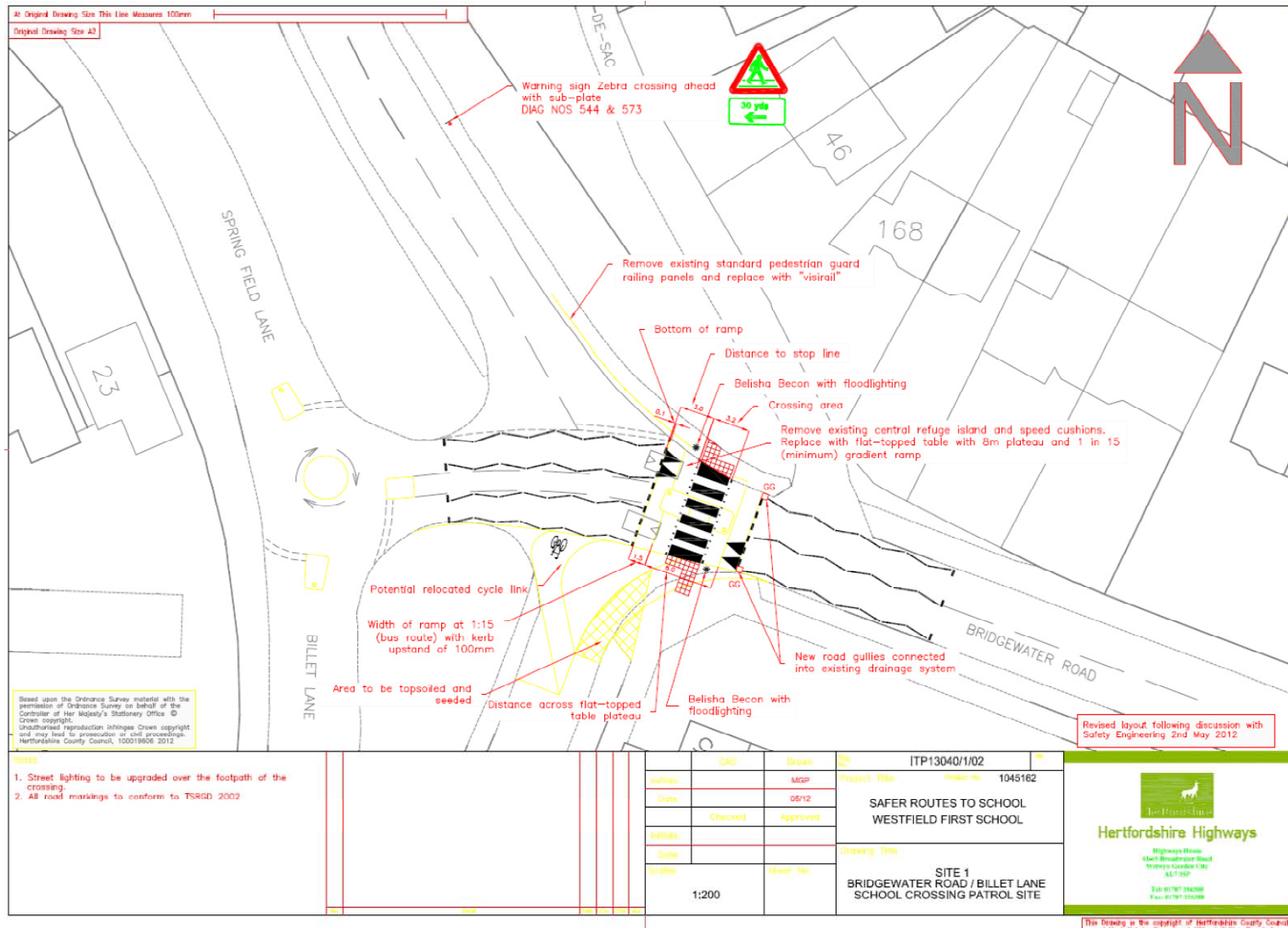


Figure 4 Formal Crossing at Bridgewater Road / Billet Lane

Tring, Northchurch and Berkhamsted UTP Scheme Proforma 34



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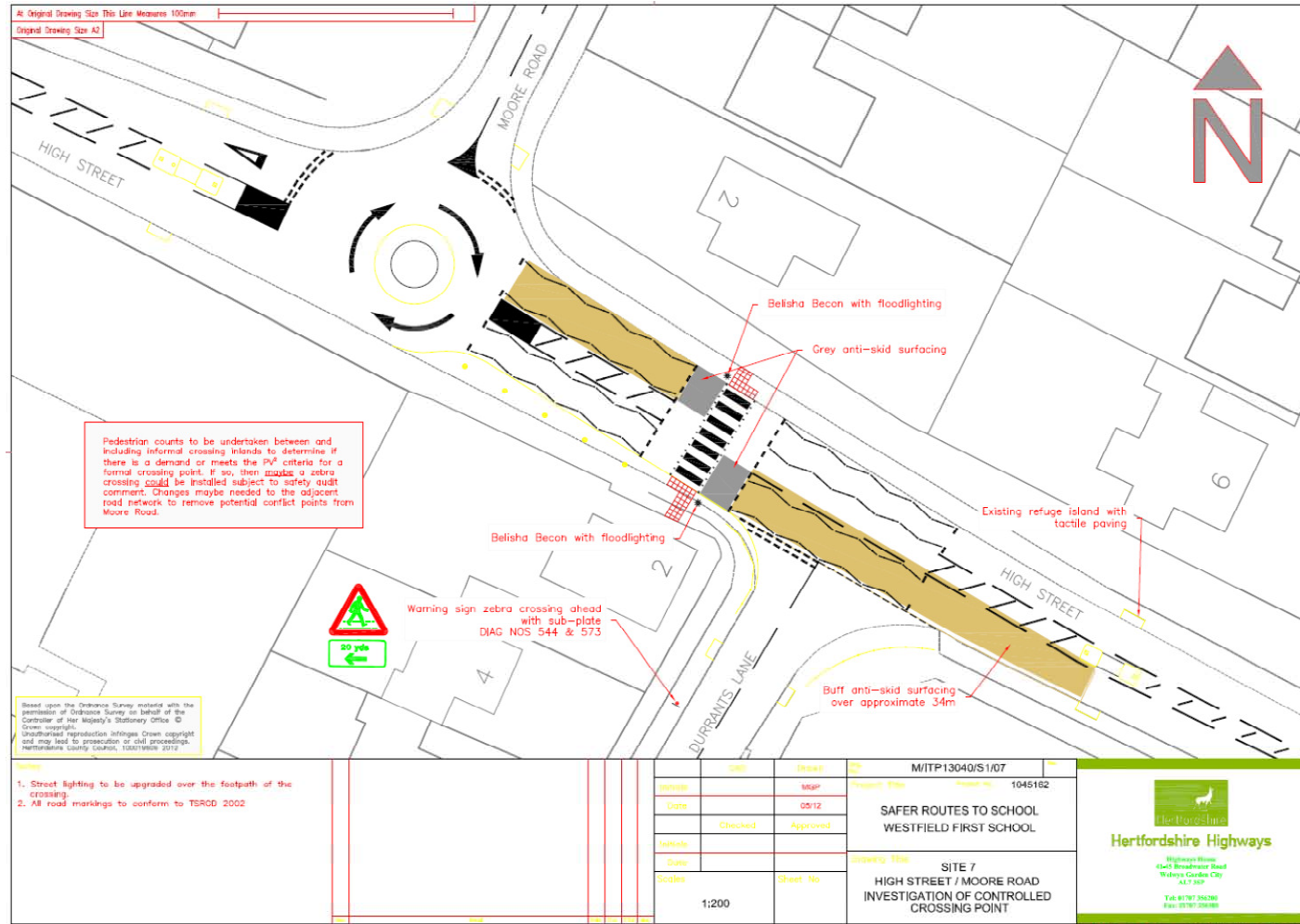


Figure 5 Measure 20.5 High Street Zebra Crossing

Tring, Northchurch and Berkhamsted UTP Scheme Proforma 34



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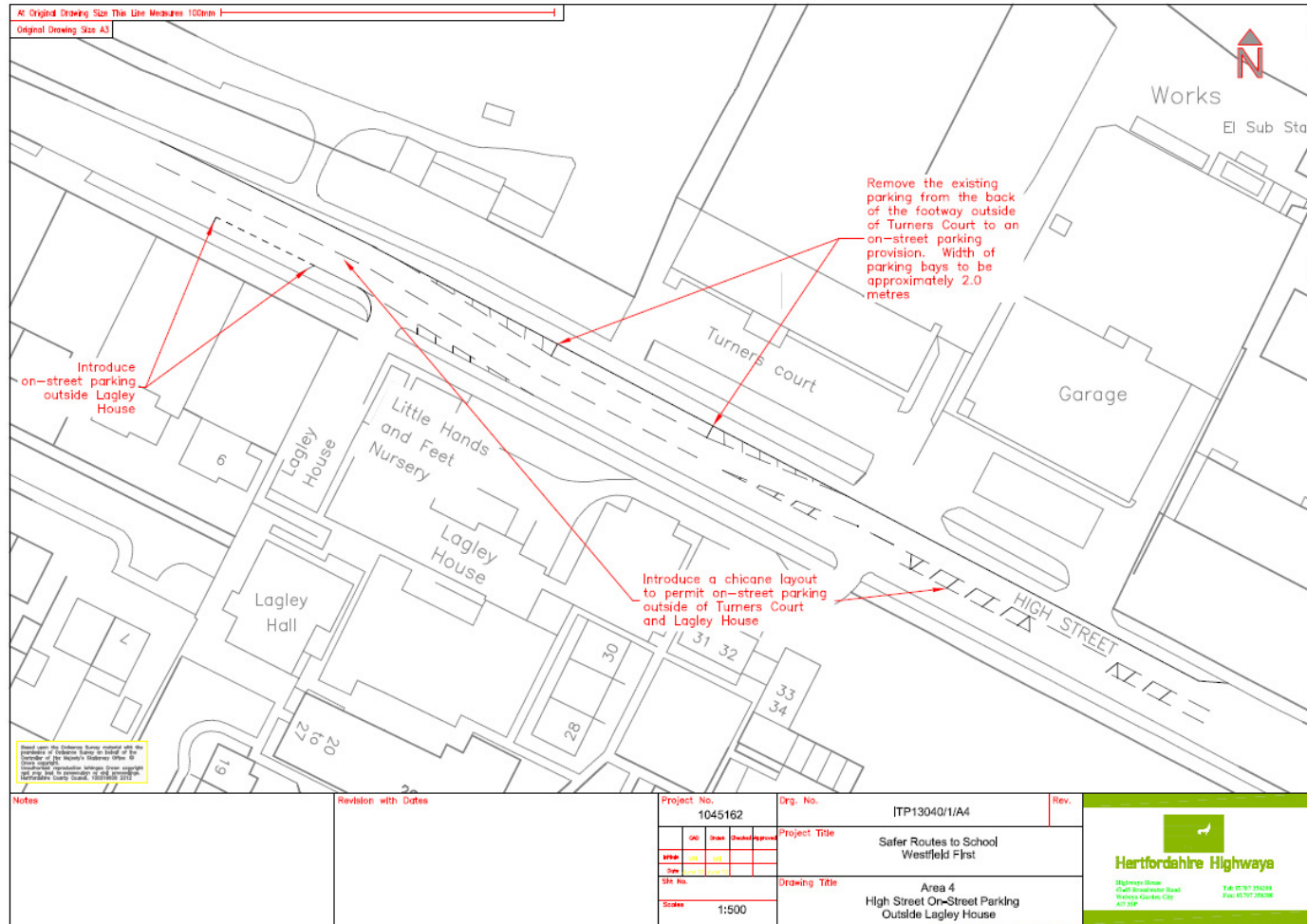


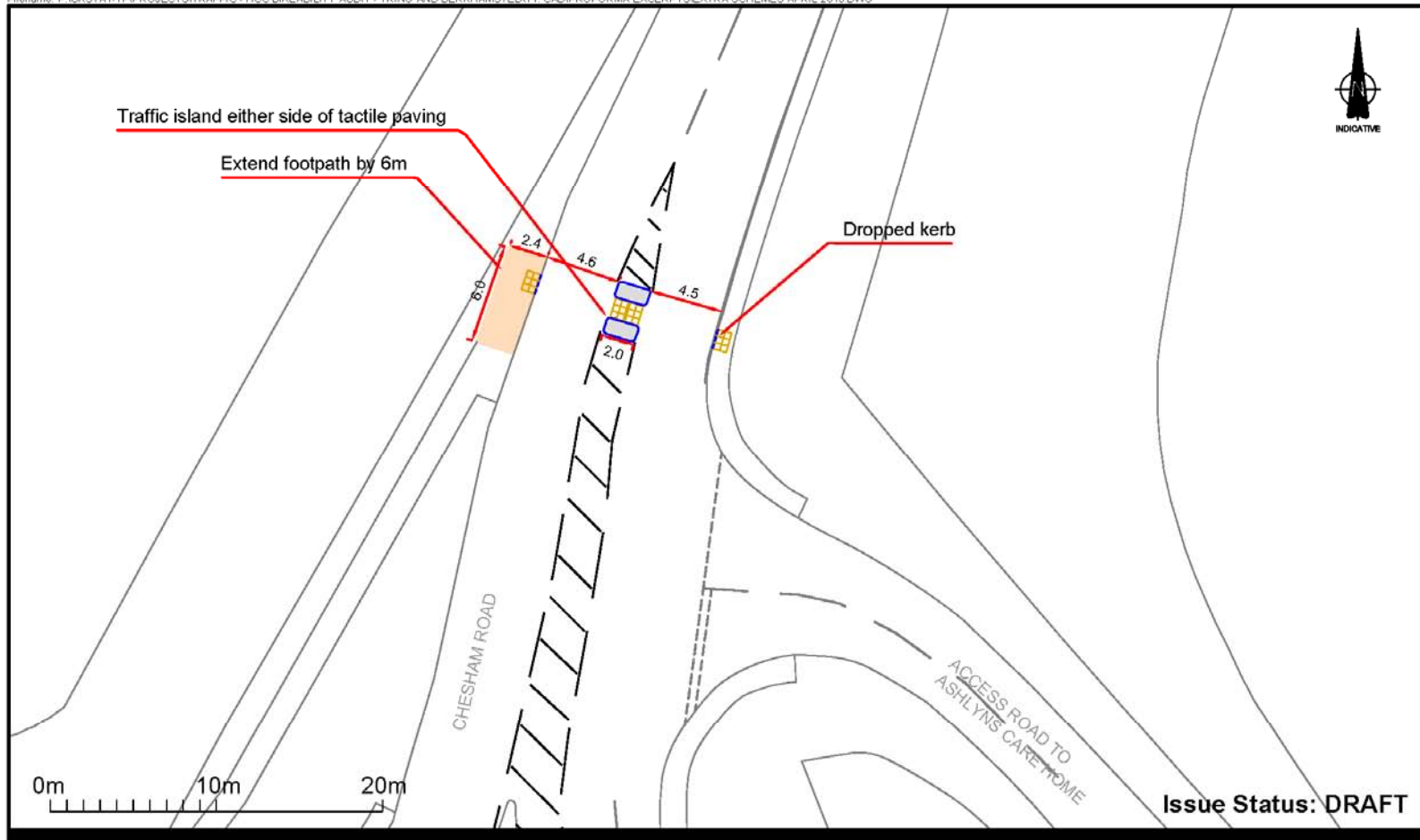
Figure 6 Measure 20.6 High Street on Street Parking

Tring, Northchurch and Berkhamsted UTP Scheme Proforma 34



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**Tring and Berkhamsted
Urban Transport Plan**
Hertfordshire County Council
Project No.: 60267074 Date: April 2013





Figure 7 - Pedestrian Crossing on Chesham Road

Scheme Name	Speed Management on Icknield Way Speed Limit Compliance	
Scheme Reference	35	
Problem References	S20	Speeding on Icknield Way
Links to other schemes:	UTP	

Context	
 <p><i>Figure 1 Icknield Way</i></p>	<p>The B488 Icknield Way provides the main northern through route from the A41 bypass into Bulbourne and Church End. Due to the location of Tring Industrial Estate and residential areas fronting onto Icknield Way, the route carries a high level of both strategic and local traffic. There is a perception that speeding is an issue along this road as vehicles do not slow down before the residential areas of Tring as the speed limit reduces from 40mph to 30mph. The examination of TrafficMaster data (see Figure 2) suggests that the current speeds through the 30mph section warrants the provision of further speed management at this location. Currently, the 85th percentile speed reaches 40.8mph in the eastbound direction, and 40.5mph in the westbound direction, exceeding the threshold for the provision of speed reduction schemes (35mph).</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
35.1	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 Icknield Way, this intention fits with the hazards located along the north eastern sections, including residential areas and the roundabout with Wingrave Road. They are relatively inexpensive to install and provide</p>	



		<p>most benefit within rural settings. The proposed rumble strip would be located at the entrance to the existing 30mph zone. However, an associated TRO and consultation would be required, as rumble strips should not be located within 200m of dwellings due to the potential noise pollution.</p> <p>NOT DELIVERABLE</p>	
35.2	Introduction of Ripple Print along Icknield Way	 <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 Icknield Way, due to the location of residential areas on both sides of Icknield Way, it is proposed that Ripple Print is implemented as opposed to rumble strips. Whilst reducing exterior noise pollution, the rippled effect increases noise levels within the vehicle.</p> <p>It is therefore proposed to implement this material within the 30mph zone, north of Longbridge Close and southwest of Icknield Green.</p> <p>Deliverability – 1 to 2 years STANDARD</p>	£12,000 to £14,000
35.3	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. 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 London Road.</p>  <p>NOT DELIVERABLE</p>	
Supporting Evidence of Measures/Components			

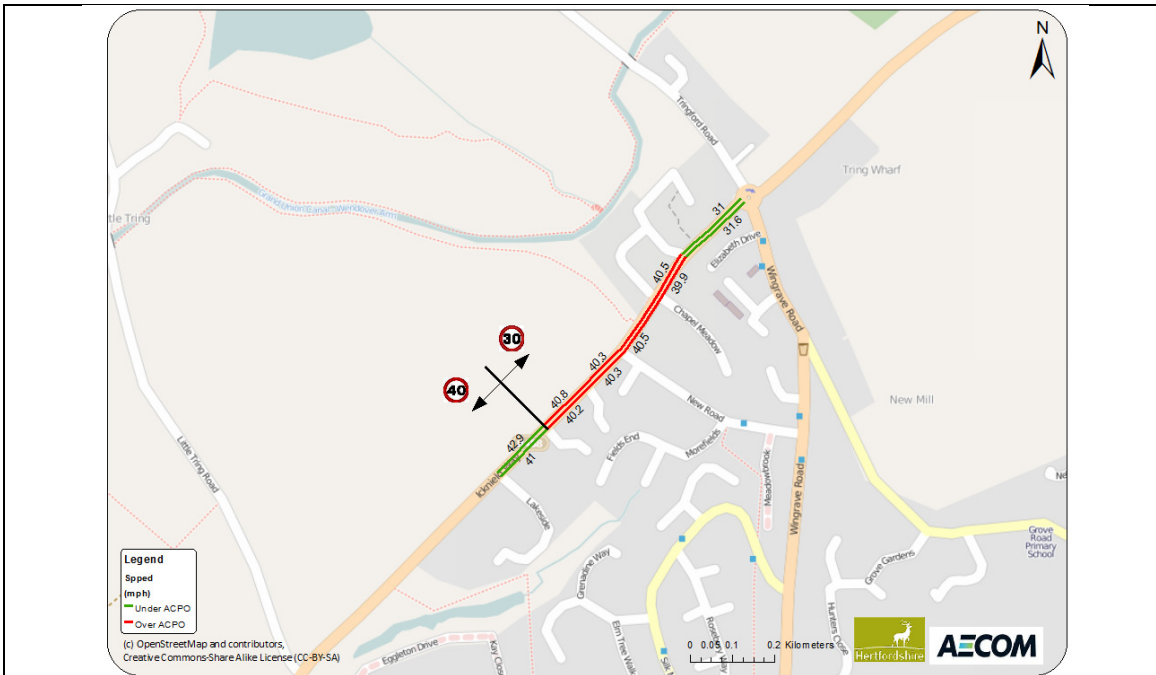


Figure 2 – Speeding Along Icknield Way (TrafficMaster Data for 2011)

Preferred Option

The preferred option includes measure 35.2, providing a low cost, yet effective solution to speeding along Icknield Way.

Contribution to Objectives / Indicators	UTP Objectives	
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Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	Indicative Cost	Notes
35.2	£12,000 to £14,000	
TOTAL COST FOR DELIVERY	£12,000 to £14,000	

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	TRO's would be required for implementation of speed management infrastructure
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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).

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.

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 1/07.</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 6 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 ribline 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 1/07 Traffic Calming - Section 5 Rumble devices and overrun areas LTAL 11/93 Rumble devices. 	<p>C56 – 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 (Section 4)