Scheme Name	**Speed management along Northchurch High Street** Highways and Congestion	
Scheme Reference	40	
Problem References	S21	Speeding on Northchurch High Street
	S26	Northchurch - the main road is an accident waiting to happen
Links to other UTP schemes:		03, 05, 08, 26

Context

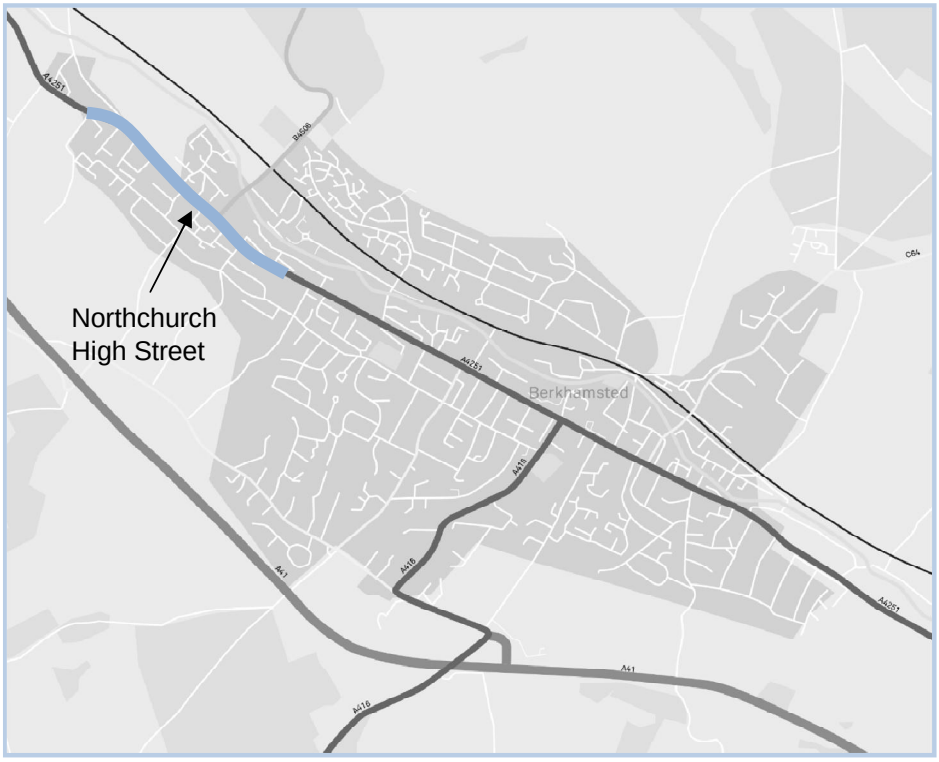

Figure 1 - Location Plan

Northchurch is a Hertfordshire village and lies between Berkhamsted and Tring. Northchurch High Street is therefore not only a residential and retail area but also a main route through Northchurch between these neighbouring towns.

The section of Northchurch High Street this proforma addresses is the 1km stretch from Birch Road in the north to Durrants Lane. At present there are a number of speed reducing measures in place. There is signage alerting drivers to the presence of a school and other vulnerable road users. Between Mandelyns Way and Darr's Lane there exists a central island enabling provision for a cycle line for this portion of the carriageway. There are further central islands to the north, which at present, are not self enforcing as an isolated measure.

Currently Northchurch High Street has a 30mph speed limit. Evidently this is exceeded by some vehicles, given that for the route in question, the average speed recorded (according to TrafficMaster data) in 14 of the 26 sections of road studied was above the 30mph limit (see **Table 1**). This, coupled with consultation with local residents and site visits to

Northchurch, identified this as a site where speeding is an existing issue.

More pertinent, when considering the need to implement speed management are the 85th percentile speeds (see **Figure 2**) which indicate the speed management measures currently in place for the Northchurch High Street are not 'self enforcing'. According to ACPO, for a 30mph limit, the 85th percentile speed for any given section of road is required to be below 35mph to qualify as self enforcing. Hertfordshire Highways stipulate that when this is the case, speed management measures are required. In more than 30% of the sections of road that make up this stretch of Northchurch, this threshold of 35mph is breached, highlighting the need for addition speed management.

Accident data collected over the 2007-2011 period shows there to have been 10 accidents between Birch Road and Durrants Lane along Northchurch High Street, two of which were reported as serious (see **Figure 3**). This increased number of accidents means that this stretch of road qualifies under Hertfordshire Highways' guidelines for some more elaborate speed reduction measures, such as speed and driver activated signs. This accident risk will likely be reduced by decreasing vehicle speed through this section of Northchurch High Street. An additional and advantageous effect of some speed management measures is their capacity to alert drivers to upcoming hazards, hazards that are more prevalent on a busy high street.

The options have been developed to fulfil the following overarching LTP Objective:

- 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

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
40.1	**Introduction of vertical speed reducing measures**	Speed bumps and cushions are often used to effectively reduce vehicle speeds[1] in built up areas. PTU design guidance recommends that measures need to be taken to ensure there is no parking adjacent to these structures and that the enforcement authority is consulted. It is also recommended to ensure that the road width is sufficient to adopt the measures proposed. This is a bus route and thus, horizontal measures are favoured to some degree over vertical, with passenger comfort in mind. Noise pollution, associated with speed bumps, also contributes to	

[1]Extract from Highways and Transport - Speed Management Strategy, Hertfordshire Highways, November 2009.

		this action be less favoured than Measure 40.2. *Deliverability - Measure 40.2 Preferred*	
40.2	**Introduction of central islands along Northchurch High Street**	Central islands are already in existence along specific sections of the High Street. Of note is the one stationed between Mandelyns Way and Darr's Lane which according to TrafficMaster data may have contributed to existing speeds being below the required 35mph self enforcing level (see **Figure 2** and **Table 1**). These are often preferred to vertical speed reduction measures, such as speed bumps along bus routes, of which Northchurch High Street is one, given that they contribute to a smoother ride for passengers. There is a requirement that a road of the nature and use of Northchurch High Street have carriageways of at least 3m in width. It is evident from inspection that, at some points along the high street, central islands simply will not fit given the geometry of the carriageway. In these cases it is anticipated that the narrowing will act as a speed reducing measure in itself.  Note these are to be installed in conjunction with VASR (see 40.3), in order to amplify their impact. Deliverability – 1 to 2 years **STANDARD**	£9,000 to £10,000 Per island and associated costs.

40.3	**Introduction of Vehicle Activated Sign Roundel (VASR)** on approach to the section between Darr's Lane and New Road (Northchurch)	The signs are simple, and easy to understand. However, VASR should not be deployed unless it is clear that fixed signage does not remedy the issue. This is clearly the case given that fixed signs are in use throughout the length of Northchurch High Street. It is proposed that a VASR is located on approach to the section between Darr's Lane and New Road (Northchurch).  The key criterion for the introduction of VASR suggests that at least three accidents need to have occurred on the route, and the 85th percentile speed exceeding the threshold speed 35mph. The speeds taken from TrafficMaster data support their introduction, as does the number of accidents at specific locations (see **Figure 3**). It must be established that the accidents are speed related in order to fully recommend this measure. If, after further investigation of accidents, with the correct accident period being used for analysis, this was the case it would be possible to implement this measure according to the Hertfordshire Highways' guidelines. Note these are to be installed in conjunction with central islands, in order to amplify their impact. Deliverability – 1 to 2 years **STANDARD**	£8,000 to £10,000 Per sign and associated costs.
40.4	**Introduction of Ripple Print**	 Ripple Print is used in order to alert drivers to take greater care in advance of a hazard or junction. In the case of the built up area of Northchurch. Ripple print is favoured over rumble strips given the additional noise pollution generated by strips and the locality of private	

		residences. Ripple print is used approaching a hazardous area, and in this case signage to this affect already exists both north and south of Northchurch. Other, more visual measures are being considered for this stretch of Northchurch High Street. *Deliverability - Measure 40.3 Preferred*	
40.5	**Mini-roundabout at the Tring Road junction with Hamberlins Lane** (to reduce speeding and provide safe crossing points)	 Hamberlins Lane/Tring Road junction has been specified as a location where speeding is currently an issue. Due to the proximity of bus stops on both sides of Tring Road, and local residential areas, there is demand for safe crossing facilities at this location. To reduce speeds through the junction, a mini-roundabout is proposed. A brief feasibility sketch was produced for proposals, based on DfT Guidance Notes TD 54/07[2] and TD 16/07. The sketch suggests that the geometric features are feasible for a mini-roundabout, with further analysis required in terms of visibility and detailed junction modelling and design (see **Figure 4**). Guidance Note TD54/07 states "Mini-roundabouts must only be used on roads with a speed limit of 30mph or less and where the 85th percentile dry weather speed of traffic is less than 35mph within a distance of 70 metres from the proposed give way line on all approaches, unless installed in combination with speed reduction measures." As the speed limit along the primary route is above 30mph, and associated 85th percentile speed above 35mph, it	

[2] http://www.dft.gov.uk/ha/standards/dmrb/vol6/section2/td5407.pdf

		is recommended that an alternative solution is delivered at this location, with associated speed management to increase awareness that pedestrians cross Tring Road at this location. *Deliverability - Measure 40.7 Preferred*	
40.6	**Pedestrian refuge on Tring Road**, adjacent to junction with Hamberlins Lane	An alternative to a mini-roundabout at the Hamberlins Lane junction with Tring Road would be a pedestrian refuge on Tring Road, located directly to the east of the junction (see **Figure 5**). Thus allowing direct pedestrian access from the westbound bus stop to the residential areas to the north of Tring Road.  However, following a feasibility assessment of the crossing (to Local Transport Note 2/95[3] and Hertfordshire Highways Design Guide[4]), the visibility at this location is insufficient, considering the existing vehicle speeds travelling along Tring Road in the eastbound direction. In addition, the location of the adjacent bus stops and priority junction provides insufficient geometry and visibility to allow for the implementation of safe crossing facilities. *Deliverability - Measure 40.7 Preferred*	
40.7	**Pedestrian refuge on Tring Road** inbetween bus stops and junction with Boswick Lane	 A combination of high speeds along Tring Road,	£12,000 to £13,000

[3] http://assets.dft.gov.uk/publications/local-transport-notes/ltn-2-95.pdf, 1995

[4] http://www.hertsdirect.org/docs/pdf/r/rihsec4design.pdf, 2011

		poor visibility, and lack of crossing facilities have resulted in unsafe pedestrian accessibility to the bus stops located on Tring Road, adjacent to the old and new junctions with Boswick Lane. As a result, it is proposed that crossing facilities are provided at this location. Having reviewed measures at the junction with Hamberlins Lane, it was found that both visibility and geometry were insufficient to provide crossing facilities. However, with extensive visibility in both directions, sufficient crossing width to allow for a pedestrian refuge, it is recommended that an uncontrolled crossing is located between the bus stops and the existing highway junction with Boswick Lane. This measure will ensure safe accessibility to the westbound bus stop from Boswick Lane, staggering the crossing point with a pedestrian refuge. The proposals include: • 1.4m refuge width; • Tactile paving on both carriageway edges; • Coloured tarmac on hatched areas to the east and west approaches; • Reduced eastbound bus stop exit taper to increase distance between proposed crossing point and junction with Boswick Lane; • Bollards and pedestrian beacon on raised areas to improve awareness. For full details, refer to **Figure 6**. The details have been designed using DfT Local Transport Note 2/95 and Hertfordshire Highways Design Guide. Swept Path Analysis has also been completed for the proposals to ensure HGV's can leave Boswick Lane. Detailed design will require further investigation to ensure sufficient geometry for turning vehicles into and out of Boswick Lane. Deliverability – 1 to 2 years **STANDARD**	
Supporting Evidence of Measures/Components			
Refer to **Figures 2** to **6**.			

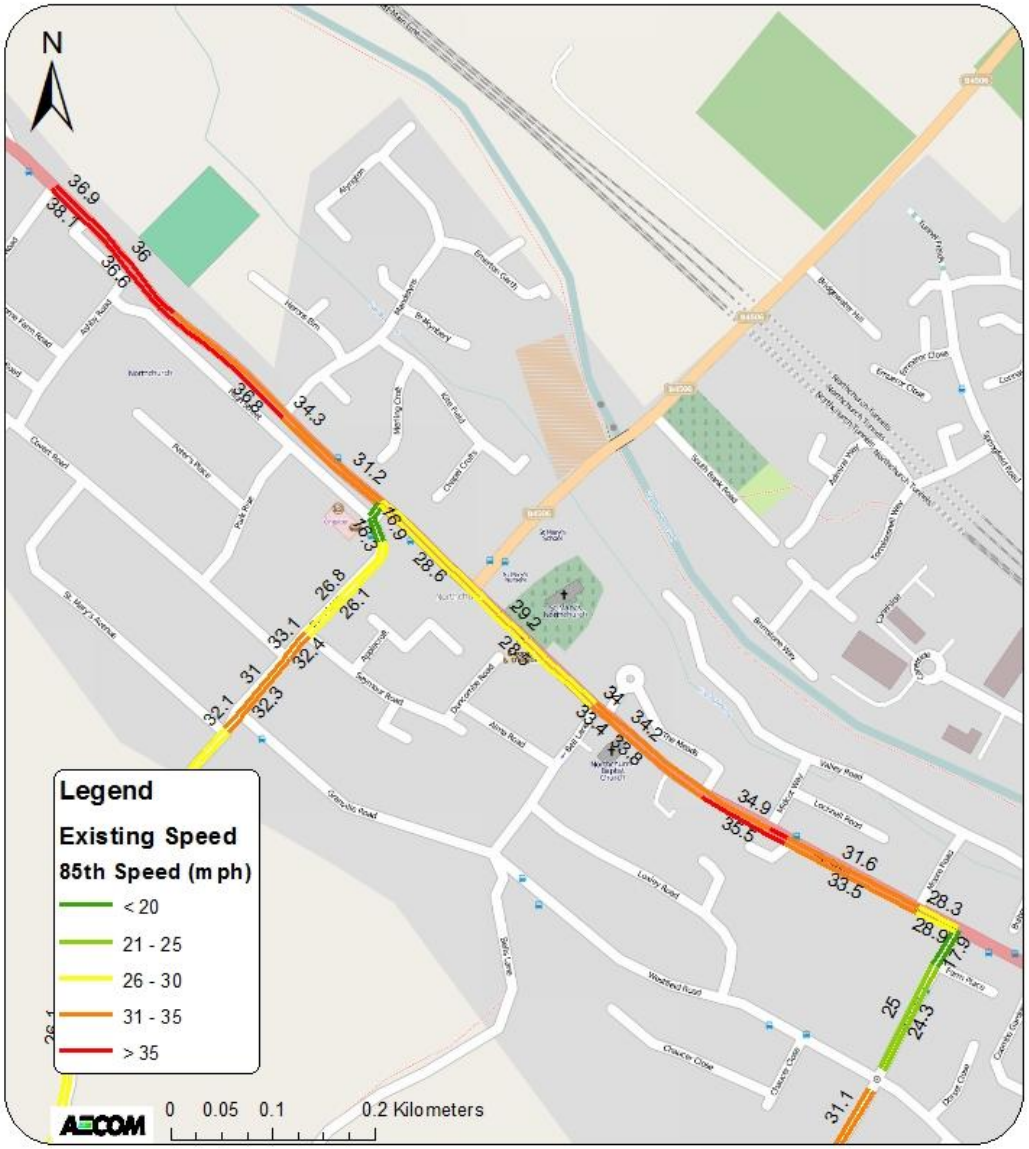

Figure 2 – 85th percentile speeds along Northchurch High St (TrafficMaster Data for 2011)

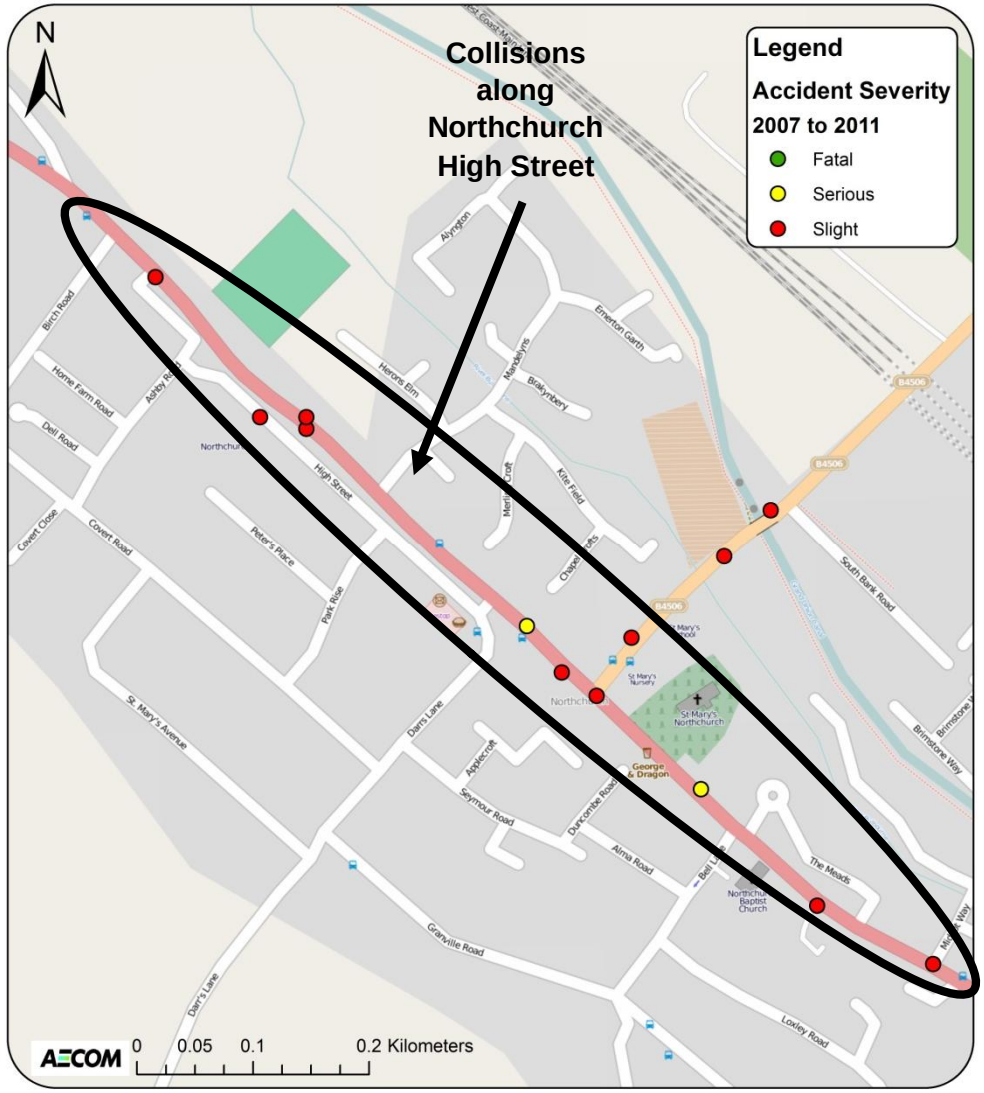

Figure 3 –Collision Locations along Northchurch High St (March 2007 – Feb 2012)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Northchurch High St	1.Birch Rd - Dropshot Cottage	SB	46.5	4798	57.8	36.9	34.2
	10.Midcot Way - Stoney Close	SB	19.2	7124	68.3	35.3	31.7
	11.Stoney Close - Moore Road	SB	146.7	7134	67.5	31.6	28.9
	12.Moore Road - Durrants Lane	SB	42.5	7198	68.4	28.3	20.3
	2.Dropshot Cottage - Mandelyns Way	SB	124.8	4800	55.8	36.0	33.7
	3.Dropshot Cottage - Mandelyns Way	SB	149.3	4791	56.1	34.3	31.9
	4.Mandelyns Way - Darr's Lane	SB	127.5	4986	51.1	31.2	25.8
	5.Darr's Lane - New Road	SB	126.0	5259	67.8	28.6	23.6
	6.New Road - Bell Lane	SB	162.8	7020	67.7	29.2	23.7
	7.Bell Lane - The Meads	SB	16.3	7080	68.7	34.0	30.6
	8.The Meads - The Meads	SB	123.2	475	67.9	34.2	30.8
	9.The Meads - Midcot Way	SB	73.1	7115	67.9	34.9	30.3
	1.Birch Rd - Dropshot Cottage	NB	46.5	4664	80.1	38.1	34.9
	10.Midcot Way - Stoney Close	NB	19.2	7255	75.5	36.8	32.9
	11.Stoney Close - Moore Road	NB	146.7	7247	74.4	33.5	31.6
	12.Moore Road - Durrants Lane	NB	42.5	7280	75.4	28.9	22.0
	2.Dropshot Cottage - Mandelyns Way	NB	124.8	4650	80.7	36.6	34.3
	3.Dropshot Cottage - Mandelyns Way	NB	149.3	4651	72.9	36.8	34.4
	4.Mandelyns Way - Darr's Lane	NB	127.5	646	72.9	34.3	30.4
	5.Darr's Lane - New Road	NB	126.0	5012	72.7	28.6	21.6
	6.New Road - Bell Lane	NB	162.8	7045	72.6	28.5	22.3
	7.Bell Lane - The Meads	NB	16.3	7207	74.4	33.4	26.8
	8.The Meads - The Meads	NB	123.2	7179	85.8	33.8	29.5
	9.The Meads - Midcot Way	NB	73.1	7232	74.7	35.5	32.2

Table 1 – Max, Ave and 85th percentile speeds along Northchurch High St (TrafficMaster Data for 2011)

Preferred Option
It is recommended that measures 40.2 and 40.3 be progressed, used in conjunction to complement one another. The introduction of central islands at either end of Northchurch High Street with VASR's on each. The placement of each has been informed by the location of recorded accidents along the stretch of road. Further central islands are to be considered, along the 1km stretch, where carriageway width allows. If not, it is recommended that, although undesirable from a bus travel and noise pollution point of view, vertical speed reduction measures are more strongly considered.

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

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost***	**Notes**
40.2	£9,000 to £10,000 - per refuge	
40.3	£8,000 to £10,000 - per sign	
40.7	£12,000 to £13,000	
TOTAL COST FOR DELIVERY	**£55,000 to £63,000**	Based on 3 islands (40.2) and 2 signs (40.3)

Maintenance Liability	~~High~~ ~~Medium~~ Low	

*All costs provided by HCC

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

Delivery Issues	

Other Information/Additional Notes:

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.

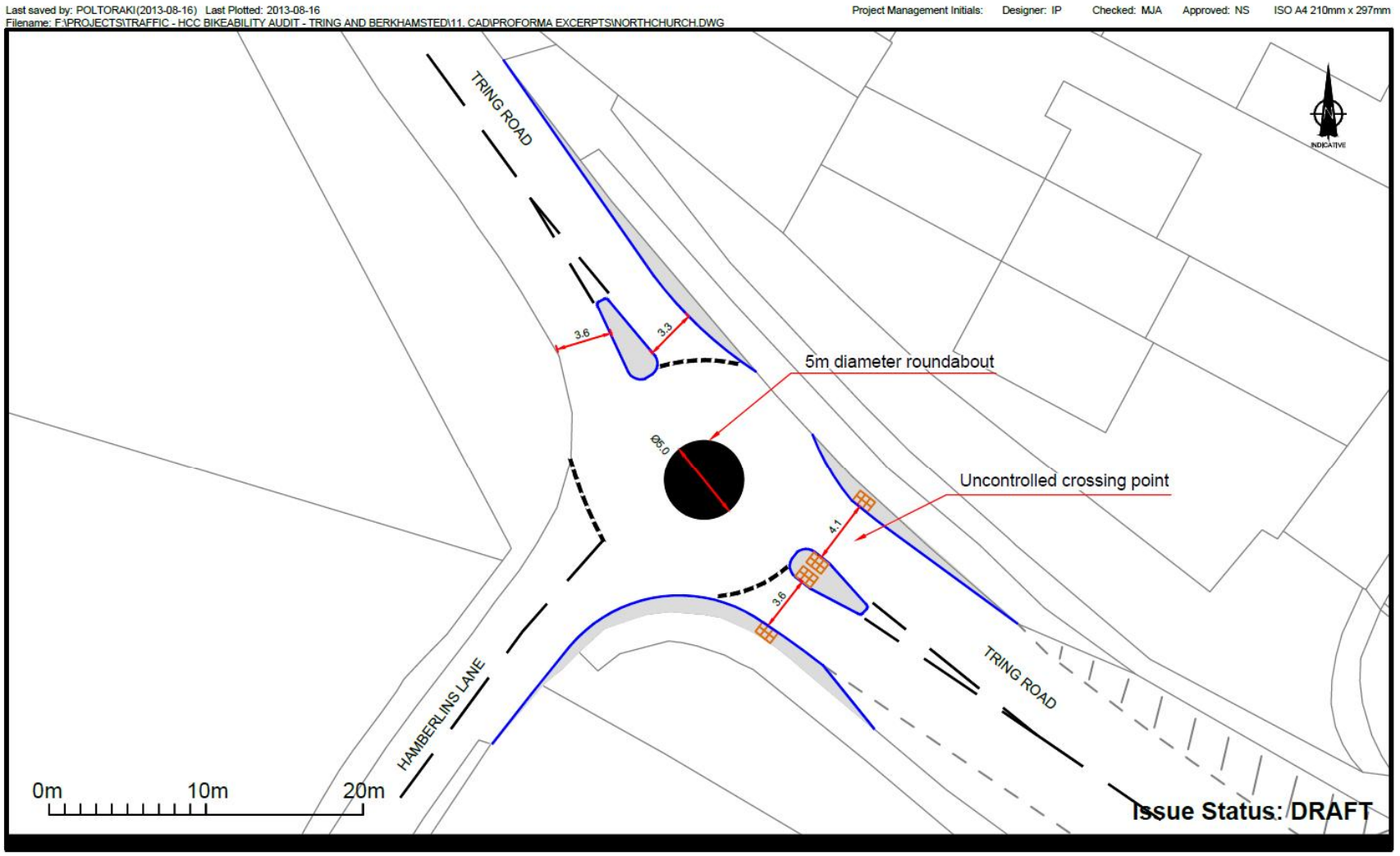

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Figure 4 - Roundabout on Tring Road

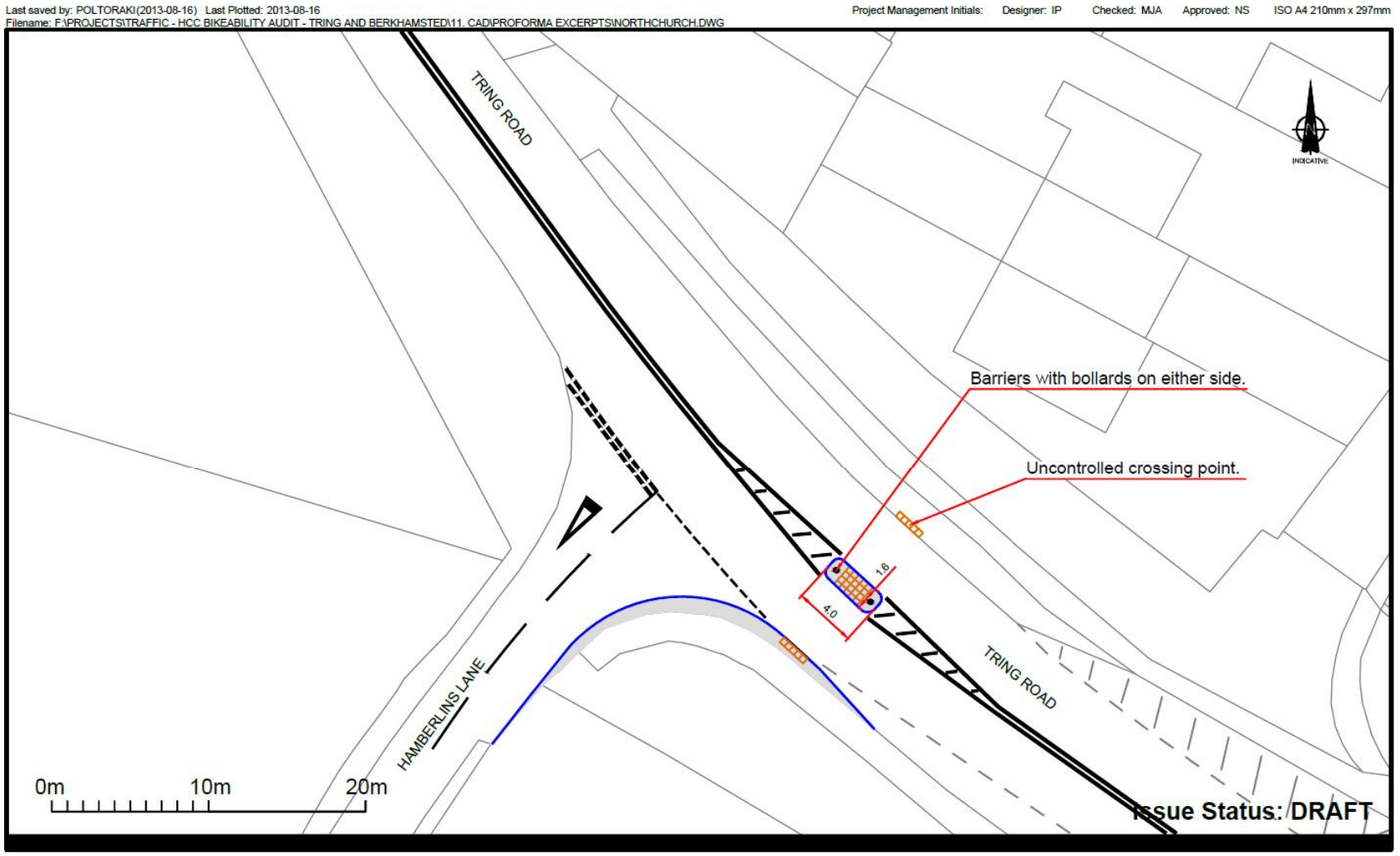

Figure 5 - Northchurch Measures

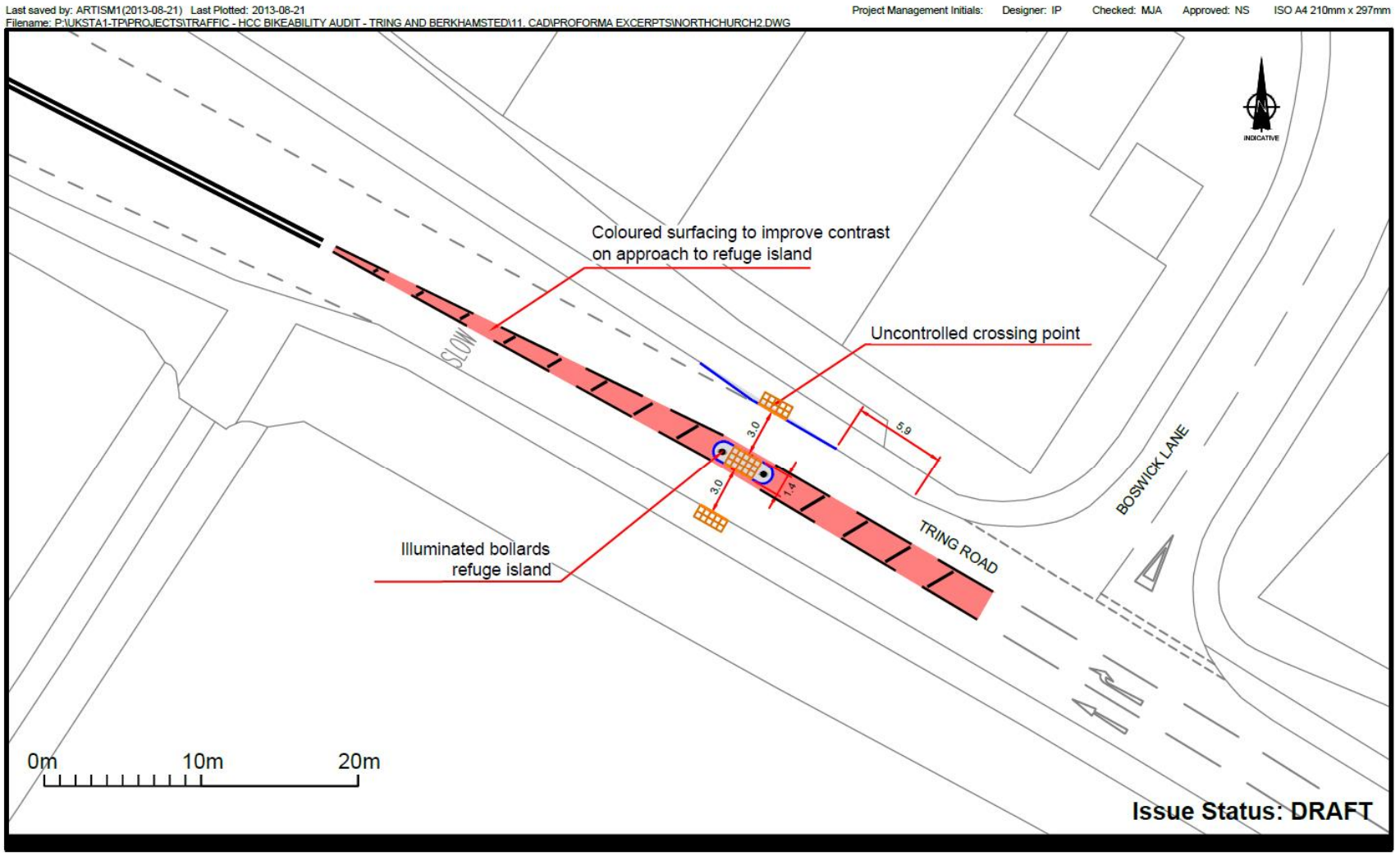

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Figure 6 - Northchurch Measures

Scheme Name	**Speed limits around schools to be reduced to 20mph** Highways and Congestion	
Scheme Reference	41	
Problem References	S24	Speed bumps on Grove Road do not deter speeding enough
	S28	Traffic calming measures should be considered more widely, existing roads and schools become extremely hazardous for school children and local residents due to parking around school areas for pick-up
	S29	could consideration be made to the installation of flashing speed signs, speed cameras, additional school warning signs
Links to other UTP schemes:		03, 05, 20, 34

Context

20mph zones are areas or a local road network in which all roads have a 20mph limit. These are particularly desirable around schools given the high concentration, at certain periods of the day, of vulnerable road users. According to Hertfordshire City Council's policy framework, they are committed to making Hertfordshire an even better place to live, one of the ways being, support for schools, pre-school children, pupils and parents. This takes many forms, not least ensuring their safe passage to and from school.

According to Hertfordshire Highways Speed Management Strategy, 20mph zones should be designed with self enforcing speed reducing measures to ensure that the maximum 85th percentile speed does not exceed 24mph once they are implemented. Therefore, where 85th percentile speeds exceed this threshold, it is not feasible to simply propose a 20mph zone.

Two options therefore remain for areas (schools within this proforma) where this 85th percentile speed exceeds 25mph:

1. Introduce speed reducing management measures to the area in order to bring the 85th percentile speed to such a level that, under ACPO guidelines, the area would qualify to become a zone;
2. Not implement a 20mph zone. This may be done because the speed management provision currently in place is adequate (at the 30mph level), both from a speed and an accident standpoint. Or because current speeds are simply too high and it would be unreasonable to assign a 20mph limit to a particular section of road. In these cases, it is still beneficial to introduce awareness measures (e.g. school signage).

Each School is addressed individually by this Proforma, with common measures outlined in the *Measures/Components* section.

Berkhamsted Baptist Pre School

The school falls within the previously studied Castle Road / Mill Road proposed 20mph zone in Proforma 38 (see **Figure 1**). It can be seen from the 85th percentile speed for the surrounding road, this location qualifies (under the ACPO guidelines) to form part of a 20mph zone. The proposal recommends that this happen in conjunction with measures set out in Proforma 38 regarding a larger 20mph zone.

IMPLEMENT 20MPH ZONE - See Measure 41.1

Berkhamsted Preparatory School

Berkhamsted Prep School main entrance is on Doctor's Commons Road, for which this proforma has established TrafficMaster data. Current 85th percentile speeds along this carriageway, in both directions, fall well below the threshold for introducing a 20mph zone (see **Figure 2**).

The recommendation of this proposal is to implement a 20pmh zone from Champions Court in the south, to the intersection with Charles Street.

IMPLEMENT 20MPH ZONE - See Measure 41.1

Thomas Coram Middle School

The Thomas Coram Middle School is situated on Swing Gate Bridge which to the south is a dead end and only serves a handful of properties. The little data that is available from TrafficMaster suggests that there are not a significant number of vehicles on the road. This proposal takes the view that to a further speed survey is required, ahead of implementing a 20mph zone along Swing Gate Bridge.

Further review required ahead of implementation of 20mph zone - See Measure 41.1

St Thomas More R.C. Primary and Greenway First Schools

Both establishments are served by Greenway, a road to the Northeast (see **Figure 3**). According to TrafficMaster data, the existing speeds fall below the 25mph threshold to introduce a self enforcing 20mph zone for the entire 200m stretch of Greenway.

IMPLEMENT 20MPH ZONE - See Measure 41.1

Westfield First School and Nursery

The entrance to Westfield is on Durrants Lane, to the east (see **Figure 4**). This road is eligible to become a 20mph zone between High Street and the roundabout on Durrants Lane, given that 85th percentile speeds are 25mph and below along the short section. From current TrafficMaster data it is apparent some of the speeds on Durrants Lane are very close to the 25mph threshold. This would be more of a concern should additional measures not have already been recommended. These include a signalised junction at the High Street end and pedestrian and cyclist provision being improved. Additionally, proforma 40 works towards addressing the speeding issue on Northchurch High Street.

IMPLEMENT 20MPH ZONE – See Measure 41.1

Tring School

Tring School is situated on Mortimer Hill in East Tring. Mortimer Hill, from data collected from TrafficMaster is a free flowing carriageway. When considering the 25mph cut off, a threshold

required by ACPO in order to prescribe a 20mph zone, the vehicle speed is simply too fast at the 85th percentile level (see **Table 5**). Mortimer Road currently has a 30mph limit and this appears to be self enforcing coupled with the average speed falling below this level. For the period 2007-2011 no accidents were recorded on this stretch of the road. These two factors, together, lead this proposal to suppose a change to a 20mph zone an unnecessary one. Signage is recommended to alert drivers to the presence of the school and the likely associated pedestrian activity.

DO NOT IMPLEMENT 20MPH ZONE – See Measure 41.2

Dundale Primary School

Dundale Primary School is situated on Silk Mill Way in North Tring. At present, for the section of road where the school's entrance lies, the 85th percentile speed it at a level low enough to allow for the introduction of a 20mph limit. However, the section of Silk Mill Way north of the school does not. The 85th percentile speed for this part is at 32.3mph. Even allowing for the 1mph drop in speed brought about by signage, this is still far in excess of ACPO guidelines.

In order to implement a 20mph zone along Silk Mill Way, measures must be taken to reduce speed in this northern section (see **Figure 6**)

Speed cushions have been recommended to be installed in the north section of Silk Mill Way, in order to reduce the speed, particularly on approach to Dundale Primary School.

IMPLEMENT 20MPH ZONE– See Measure 41.1 in conjunction with Measure 41.3

Goldfield Infant School

Goldfield Infant School has an entrance on Christchurch Road in west Tring. There are already significant speed management measures in place along Christchurch Road, including school signage, road markings and a flashing amber sign, alerting to the presence of a school in the area.

TrafficMaster data analysis has identified the vehicle speeds on this portion of road to be well in excess of the ACPO's 25mph threshold, ruling an immediate recommendation for a 20mph zone unfeasible (see **Figure 7**).

Christchurch Road currently has a 30mph limit and this appears to be self enforcing given that 85th percentile speeds along it are below the 35mph limit for 30mph roads. There has been one accident over the 4 years studied (see **Figure 8**), which although undesirable does not match the criteria for introducing any more speed reducing measures, given that there are number in place already.

These two factors, together, lead this proposal to suppose a change to a 20mph zone an unnecessary one. The recommendation is that this site remains a 30mph zone.

DO NOT IMPLEMENT 20MPH ZONE – No action required.

Grove Road Primary School

Grove Road Primary School, situated on Grove Road is a 0.8 mile stretch of road running from Wingrave Road (B488) to the north to Station Road to the south. It is on the periphery of the village of Tring and thus may be used by transient traffic as well as local residents. Grove Road Primary School's entrance is on Grove Road, but notably, not the exit, which is

on Beacon Way.

TrafficMaster data has been studied and mapped to establish maximum, average and 85th percentile speeds for Grove Road (see **Table 8**). It is the 85th percentile speed which is most important, given guidelines by both the ACPO and Hertfordshire Highways, which site this as an indicative figure regarding potential enforcement action.

Grove Road is part of a built up area, and as such, at present there is a 30mph limit in force. Along the length of the road existing speed management techniques are in place. Speed cushions have been installed in proximity of the school entrance and school signage has been installed along the carriageway.

It can be seen that these speed reducing measures are having a significant effect, given that the 85th percentile speeds along the entirety of Grove Road fall well below the ACPO threshold of 35mph. this demonstrates that the speed management measures in place at present are self enforcing. This can be clearly seen in **Figure 9**, where no red sections of carriageway can be seen along the length of Grove Road, as 85th percentile speeds do not exceed 35mph at any point.

Average speeds have also been investigated along Grove Road (see **Table 8**). TrafficMaster data indicates that average speeds are significantly below the 30mph limit for the whole of Grove Road. Although average speed does not form part of either the ACPO or Hertfordshire Highways guidelines, it forms a useful cross-check, demonstrating that current measures are having the desired effect on driver speeds.

Average speed is not the only indicator of the successful implementation of speed management strategies on a road or in an area. It is pertinent to assess any accidents and their severity along Grove Rd, in order to say, with confidence, that the speed management measures in use are effective. In the years between 2007 and 2011, not one accident of any severity was reported on Grove Rd.

The inference from both acceptable average and 85th percentile speeds along Grove Road and its exemplary record regarding accidents (over the study period 2007-2011) is that the speed management measures currently in place are adequate and no further measures need be considered at this time. This conclusion should be review if and when road and traffic conditions change.

DO NOT IMPLEMENT 20MPH ZONE – No action required.

Egerton-Rothesay School

Egerton-Rothesay School is set back from the section of Durrant's Lane that runs from Shooters way to the island at Westfield Road. Speed management measures in place take the form of a school warning sign and road marking outside the school entrance. Just south of Egerton-Rothesay School there is a housing development planned.

TrafficMaster data analysis has identified the vehicle speeds on Durrants Lane be well in excess of the ACPO's 25mph threshold, ruling an immediate recommendation for a 20mph zone unfeasible (see **Figure 10**) without the implementation of physical engineering measures.

Durrants lane currently has a 30mph limit and this appears to be self enforcing given that 85th percentile speeds along it are below the 35mph limit for 30mph roads. There has been one accident over the 4 years studied (see **Figure 11**), which although undesirable does not

match the criteria for introducing any more speed reducing measures. These two factors, together, lead this proposal to suppose a change to a 20mph zone an unnecessary one.

The recommendation is that this site remains a 30mph zone for the present. It is also a recommendation of this proforma that this be reviewed once the planned development at the Plantation is in place.

DO NOT IMPLEMENT 20MPH ZONE – No action required (review following development)

The options have been developed to fulfil the following overarching LTP Objective:

- 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

Measures/Components			
Ref	Description	Assessment of Suitability	Cost
41.1	**Introduce a 20mph zone on the roads surrounding the identified school.** **Recommended for:** *Berkhamsted Baptist Pre-School* *Berkhamsted Preparatory School* *St Thomas Moore RC and Greenway* *Westfield First School* *Thomas Coram* *Dundale Primary School*	20mph zones are predominantly used in urban areas, both town centres and residential areas – and in the vicinity of schools.[1] 20mph zones are very effective at reducing collisions and injuries. This is confirmed in research that shows that the number of collisions involving injury to children may be reduced by up to two-thirds (Webster and Mackie, 1996). The hope and expectation is there introduction will bring about a reduction of the number and severity of speed associated collisions. An additional benefit of the zone would be its contribution to improving the environment for non-motorised users and conditions more conducive to cycling. A review of TrafficMaster data revealed that the 85th percentile speeds for many of the roads under investigation here fall well below the 25mph threshold given in the Hertfordshire Highways directive, with the inference of this being a 20mph limit in these areas would be self enforcing. Despite the benefits reducing the speed limit for many of these roads would bring, it is not feasible to introduce a blanket 20mph zone for all	£8,000 to £10,000

[1] Extract from *DfT Circular 01/2006, p18*

		schools at this stage. The TrafficMaster data shows that at 85th percentile speeds on roads surrounding some of the schools in this proforma exceed the 25mph directive. It is for this reason a 20mph zone can only be recommended for the 6 schools outlined to the left. Along with this recommendation is one to ensure that sufficient signage is installed in these new 20mph zones. These 6 schools and the proposed 20mph zones associated with them can be seen in **Figures 12** and **13**. Deliverability – 1 to 2 years STANDARD	
41.2	**Introduce additional signage and coloured Tarmac.** **Recommended for:** *Tring School*	Additional Signage is used for a number of key reasons. In the case of these school zones it is being used to reinforce the presence of a school, with school warning signs and road markings. Deliverability – 1 to 2 years STANDARD	£4,000 to £5,000
41.3	**Introduction of further speed cushions on Silk Mill Way** – in line with the recommendation that speed reducing measures are required to potentially introduce a 20mph in the future. **Recommended for:** *Dundale Primary School*	Speed cushions have the same speed reducing effect on vehicles as round or flat topped speed bumps, yet also provide additional advantages. Buses can traverse cushions allowing a smooth transition for passengers, they allows cyclists to by-pass more easily and are quieter than road top humps.[2]  Given that speed cushions are predominantly prefabricated and bolted in place, construction time is reduced and so is disruption during their installation. PTU design guide recommends that measures need to be taken to ensure there is no parking	£42,000 to £45,000

[2] Extract from Highways and Transport - Speed Management Strategy, Hertfordshire Highways, November 2009.

		adjacent to the cushions and that the enforcement authority is consulted. It is also recommended to ensure that the road width is sufficient to adopt the measures proposed. The recommendation is that speed cushions be implemented on Silk Mill Way, Tring in order to reduce the 85th percentile speeds to levels that would potentially qualify this road as eligible to become a 20mph zone in the future. Their benefits over speed bumps (round or flat) contribute to this recommendation. *Deliverability – 1 to 2 years* STANDARD	
41.4	**Introduction of central islands** as a horizontal speed reducing measure.	These are often preferred to vertical speed reduction measures, such as speed bumps along bus routes, given that they contribute to a smoother ride for passengers. There is a requirement that many of the roads looked at in this proforma have carriageways of at least 3m in width. It is evident from inspection that, at some points along the routes, central islands simply will not fit given the geometry of carriageways. In these cases it is anticipated that the narrowing will act as a speed reducing measure in itself.  *Deliverability - Measure 41.2 and 41.3 Preferred*	

41.5	**Introduction of Vehicle Activated Sign Roundel (VASR)** on approach to Tring station Bridge	 The signs are simple, and easy to understand. However, VASR should not be deployed unless it is clear that fixed signage does not remedy the issue. The key criterion for the introduction of VASR suggests that at least three accidents need to have occurred on the route, and the 85th percentile speed exceeding the threshold speed 35mph. The speeds taken from TrafficMaster data do not support their introduction at any of the school zones studies in this proforma. It is therefore not possible to implement this measure according to the Hertfordshire Highways' guidelines. Note these are to be installed in conjunction with central islands, in order to amplify their impact. *Deliverability - Measure 41.2 and 41.3 Preferred*	
41.6	**Introduction of Ripple Print in the 30 mph zone -** East and west of the bridge at Tring station.	 Ripple Print is used in order to alert drivers to take greater care in advance of a hazard or junction. In the case of the built up area of Northchurch. Ripple print is favoured over rumble strips given the additional noise pollution generated by strips and the locality of private residences. Ripple print is used approaching a hazardous area, and in this case signage to this affect already exists both north and south of Northchurch. Other, more visual measures are being considered for this stretch of Northchurch High Street. *Deliverability - Measure 40.3 Preferred*	
Supporting Evidence of Measures/Components			

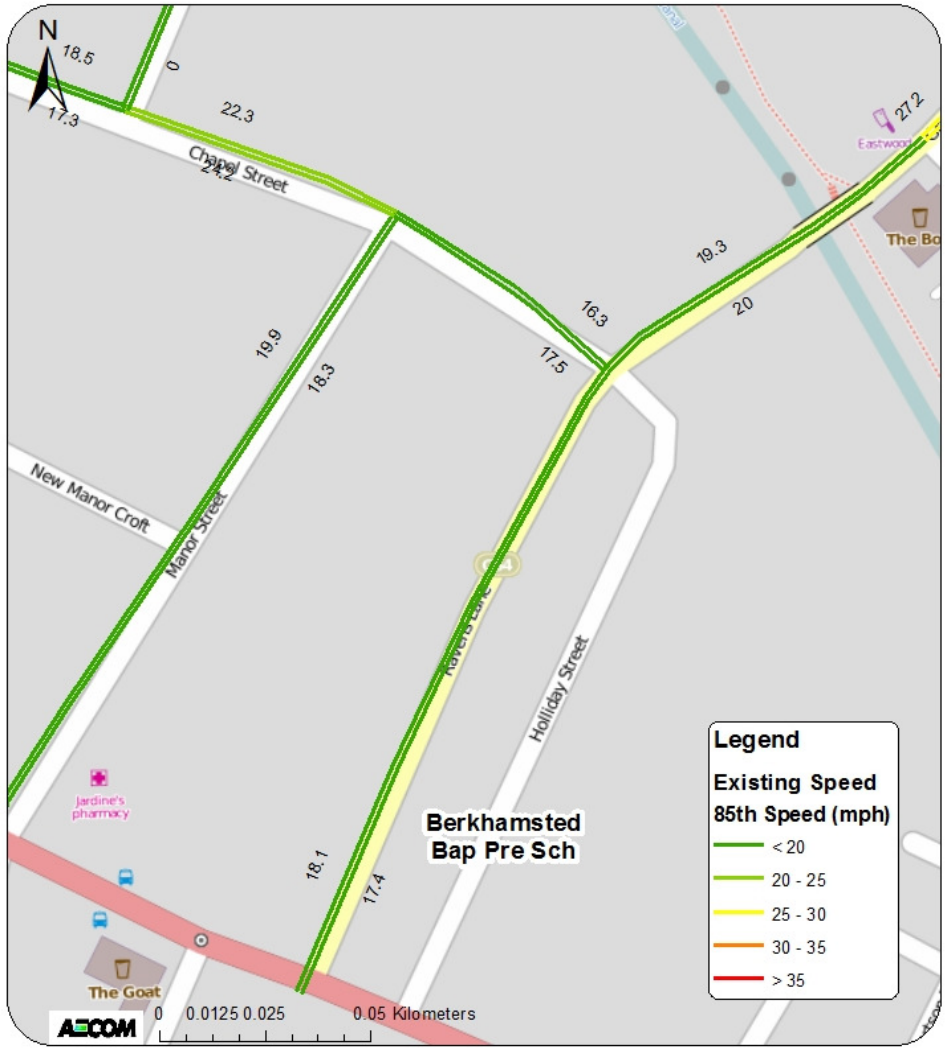


Figure 1 – 85th percentile speeds surrounding Berkhamsted Baptist Pre School (TrafficMaster Data for 2011)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Berkhamsted Baptist Church School	Manor St	NB	174.4	797	26.8	19.9	12.8
	Ravens Ln: High St - Chapel St	NB	165.3	1921	28.6	18.1	12.4
	Manor St	SB	174.4	175	36.1	18.3	7.0
	Ravens Ln: High St - Chapel St	SB	165.3	2782	37.3	17.4	11.1
	Chapel St: Ravens Ln - Manor St	EB	62.4	1000	39.4	16.3	11.5
	Ravens Ln: Chapel St - George St	EB	93.3	2809	29.9	19.3	14.2
	Chapel St: Ravens Ln - Manor St	WB	62.4	798	40.7	17.5	11.2
	Ravens Ln: Chapel St - George St	WB	93.3	3346	49.2	20.0	13.7

Table 1 – Max, Ave and 85th percentile speeds surrounding Berkhamsted Baptist Pre School (TrafficMaster Data for 2011)

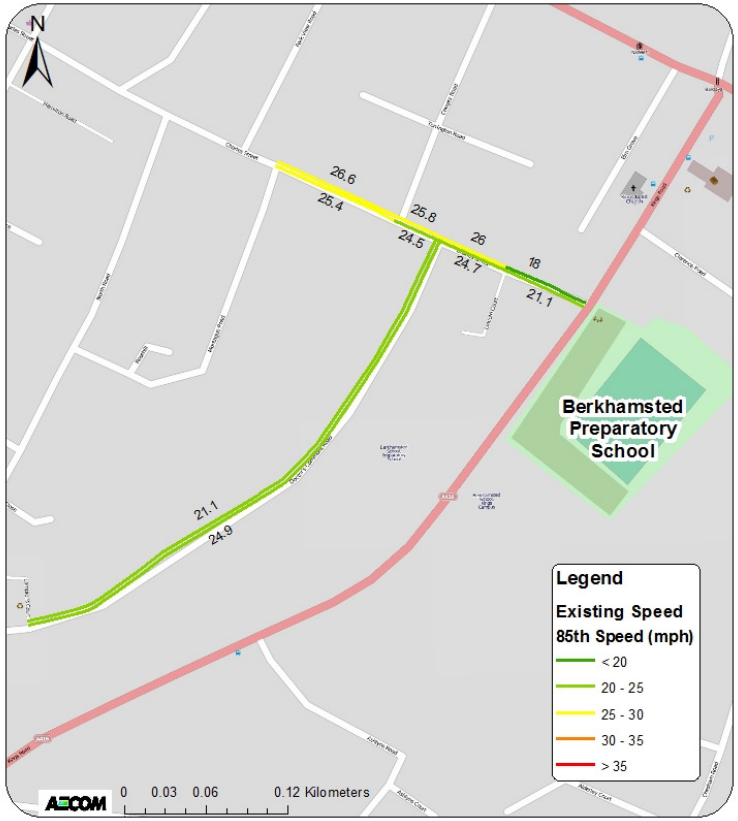


Figure 2 – 85th percentile speeds surrounding Berkhamsted Prep School (TrafficMaster Data for 2011)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Berkhamsted Prep School	Doctor's Commons Rd until Campions Ct	NB	430.2	167	**28.6**	**21.1**	**12.2**
	Doctor's Commons Rd until Campions Ct	SB	430.2	175	**30.5**	**24.9**	**14.6**
	Charles St: Cowper Rd - Doctor's C Rd	EB	35.3	2362	**41.4**	**25.8**	**15.0**
	Charles St: Doctor's C Rd - Lincoln Ct	EB	53.7	2306	**38.3**	**26.0**	**13.5**
	Charles St: Lincoln Ct - Kings Rd	EB	64.9	2354	**32.8**	**18.0**	**8.2**
	Charles St: Montague Rd - Cowper Rd	EB	95.8	1981	**41.5**	**26.6**	**17.7**
	Charles St: Cowper Rd - Doctor's C Rd	WB	35.3	1378	**45.2**	**24.5**	**8.8**
	Charles St: Doctor's C Rd - Lincoln Ct	WB	53.7	1545	**44.5**	**24.7**	**14.2**
	Charles St: Lincoln Ct - Kings Rd	WB	64.9	1555	**44.7**	**21.1**	**16.8**
	Charles St: Montague Rd - Cowper Rd	WB	95.8	1118	**34.1**	**25.4**	**17.0**

Table 2 – Max, Ave and 85th percentile speeds surrounding Berkhamsted Prep School (TrafficMaster Data for 2011)

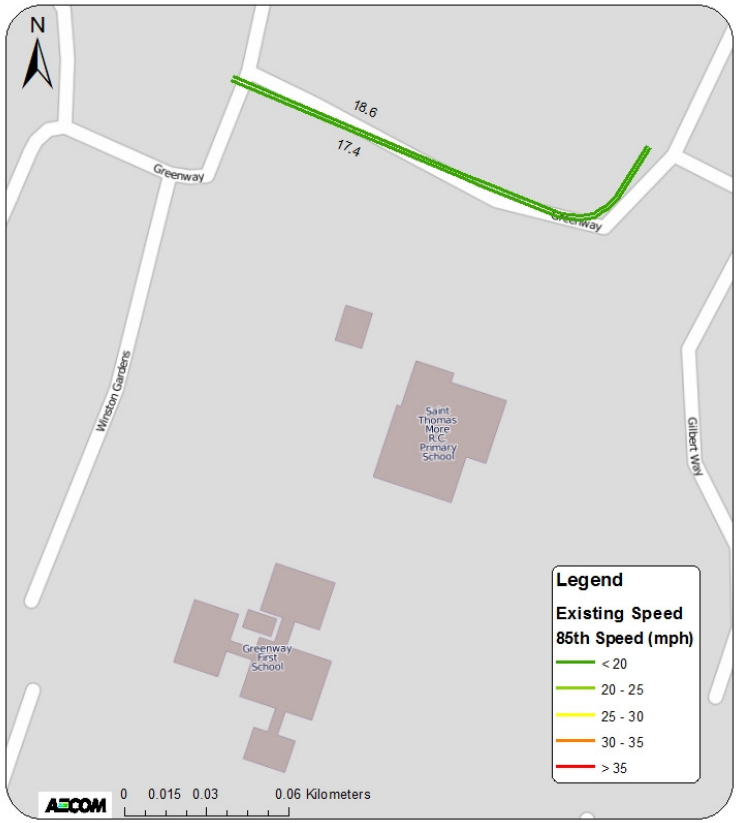


Figure 3 – 85th percentile speeds surrounding St Thomas More RC School (TrafficMaster Data for 2011)

	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
GREENWAY	EB	174.7	227.0	**21.7**	**18.6**	**12.3**
	WB	174.7	298.0	**23.0**	**17.4**	**14.0**

Table 3 – Max, Ave and 85th percentile speeds surrounding St Thomas More RC School (TrafficMaster Data for 2011)

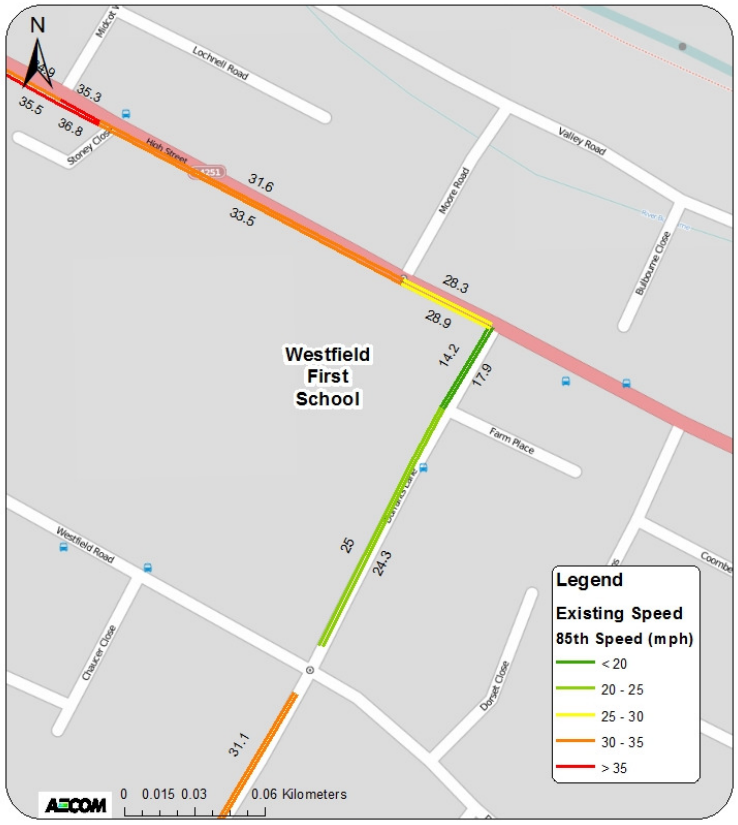


Figure 4 – 85th percentile speeds surrounding Westfield School (TrafficMaster Data for 2011)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Westfield First School	Durrants Ln: Durrants Rd - Shooters Way	NB	754.9	2150	**41.6**	**31.1**	**27.7**
	Durrants Ln: Farm Place - High St	NB	40.8	3377	**37.1**	**14.2**	**5.2**
	High St: Stoney Close - Moore Road	SB	146.7	7134	**67.5**	**31.6**	**28.9**
	High St: The Meads - Midcot Way	SB	73.1	7115	**67.9**	**34.9**	**30.3**
	Durrants Ln: Durrants Rd - Farm Place	NB	114.5	3303	**43.0**	**25.0**	**18.8**
	High St: Moore Road - Durrants Lane	SB	42.5	7198	**68.4**	**28.3**	**20.3**
	High St: Midcot Way - Stoney Close	SB	19.2	7124	**68.3**	**35.3**	**31.7**
	High St: Stoney Close - Moore Road	NB	146.7	7247	**74.4**	**33.5**	**31.6**
	Durrants Ln: Farm Place - High St	SB	40.8	3665	**47.6**	**17.9**	**14.2**
	High St: Moore Road - Durrants Lane	NB	42.5	7280	**75.4**	**28.9**	**22.0**
	Durrants Ln: Durrants Rd - Shooters Way	SB	754.9	2179	**45.4**	**31.1**	**26.2**
	Durrants Ln: Durrants Rd - Farm Place	SB	114.5	3608	**37.4**	**24.3**	**20.8**
	High St: The Meads - Midcot Way	NB	73.1	7232	**74.7**	**35.5**	**32.2**
	High St: Midcot Way - Stoney Close	NB	19.2	7255	**75.5**	**36.8**	**32.9**

Table 4 – Max, Ave and 85th percentile speeds surrounding Westfield School (TrafficMaster Data for 2011)

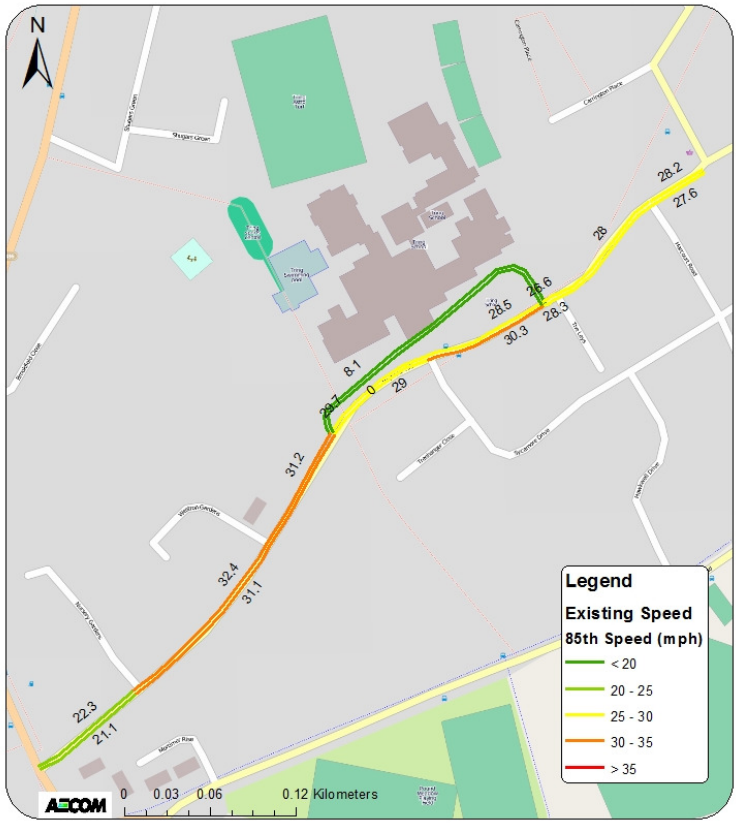


Figure 5 – 85th percentile speeds surrounding Tring School (TrafficMaster Data for 2011)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Tring School	Mortimer Hill: Brook St - Nursery Gds	NB	85.8	1011	50.8	22.3	17.4
	Mortimer Hill: East School Entrance - The Leys	NB	7.6	1028	48.5	26.6	17.5
	Mortimer Hill: Harcourt Rd - Chiltern Way	NB	43.4	988	51.3	28.2	20.6
	Mortimer Hill: Nursery Gds - Westron Gds	NB	139.4	976	41.7	32.4	25.6
	Mortimer Hill: Sycamore Dr - East School Entrance	NB	90.6	974	50.7	28.5	18.0
	Mortimer Hill: The Leys - Harcourt Rd	NB	97.1	966	51.0	28.0	21.5
	Mortimer Hill: West School Entrance - Sycamore Dr	NB	85.6	644	50.6	29.7	12.5
	Mortimer Hill: Westron Gds - West School Entrance	NB	90.4	802	44.9	31.2	22.0
	Road inside School Grounds	NB	216.6	10	8.7	8.1	3.2
	Mortimer Hill: Brook St - Nursery Gds	SB	85.8	984	50.8	21.1	12.3
	Mortimer Hill: East School Entrance - The Leys	SB	7.6	866	36.9	28.3	22.4
	Mortimer Hill: Harcourt Rd - Chiltern Way	SB	43.4	755	40.1	27.6	15.2
	Mortimer Hill: Nursery Gds - Westron Gds	SB	139.4	934	42.6	31.1	23.4
	Mortimer Hill: Sycamore Dr - East School Entrance	SB	90.6	864	39.0	30.3	21.4
	Mortimer Hill: The Leys - Harcourt Rd	SB	97.1	793	39.2	28.0	22.4
	Mortimer Hill: West School Entrance - Sycamore Dr	SB	85.6	703	37.1	29.0	19.5
	Mortimer Hill: Westron Gds - West School Entrance	SB	90.4	807	39.3	31.2	25.4
	Road inside School Grounds	SB	216.6	0	0.0	0.0	0.0

Table 5 – Max, Ave and 85th percentile speeds surrounding Tring School (TrafficMaster Data for 2011)

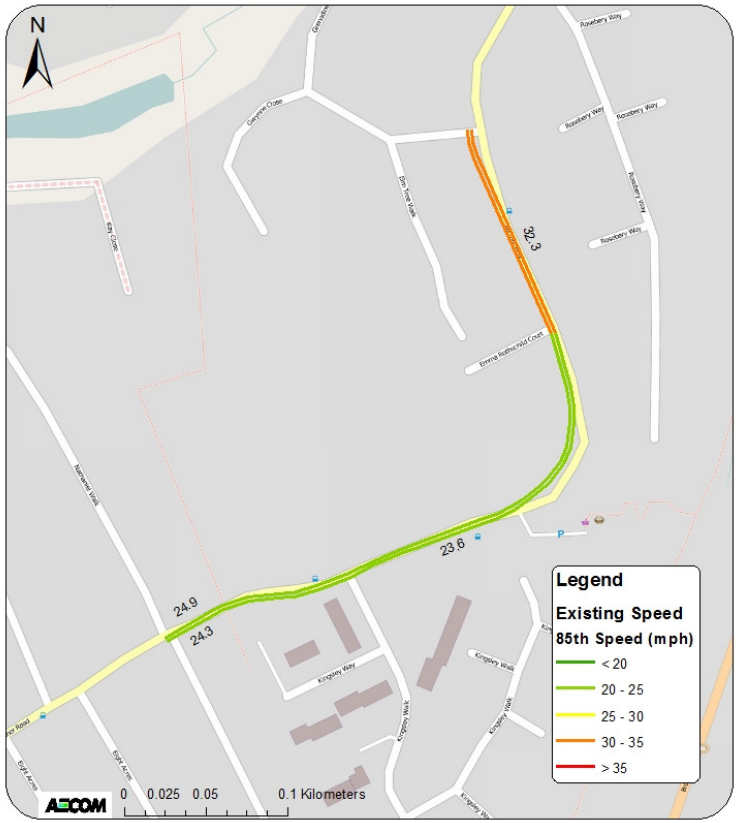


Figure 6 – 85th percentile speeds surrounding Dundale Primary School (TrafficMaster Data for 2011)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Dundale Primary School	Silk Mill Way: Emma Rothchild Ct - Elm Tree Walk	NB	135.1	1381	**42.9**	**32.3**	**25.3**
	Silk Mill Way: Kingsley Walk - Emma Rothchild Ct	NB	231.9	927	**31.1**	**23.6**	**18.0**
	Silk Mill Way: Emma Rothchild Ct - Elm Tree Walk	SB	135.1	871	**41.7**	**32.3**	**24.3**
	Silk Mill Way: Kingsley Walk - Emma Rothchild Ct	SB	231.9	616	**34.8**	**23.6**	**18.8**
	Silk Mill Way: Nathaniel Walk - Kingsley Walk	EB	121.1	1087	**35.5**	**24.9**	**20.3**
	Silk Mill Way: Nathaniel Walk - Kingsley Walk	WB	121.1	759	**34.2**	**24.3**	**19.1**

Table 6 – Max, Ave and 85th percentile speeds surrounding Dundale Primary School (TrafficMaster Data for 2011)

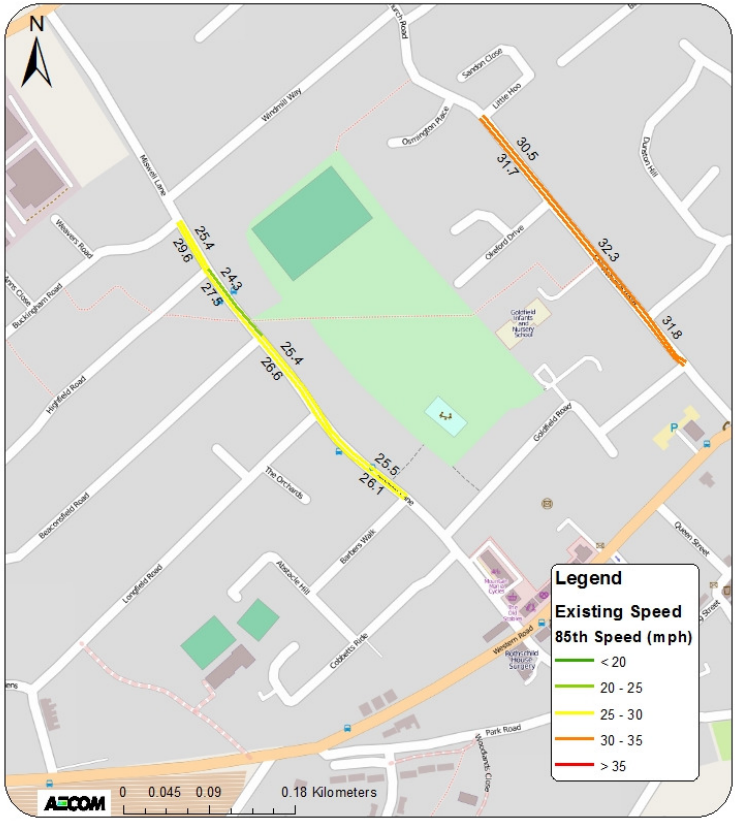


Figure 7 – 85th percentile speeds surrounding Goldfield School (TrafficMaster Data for 2011)

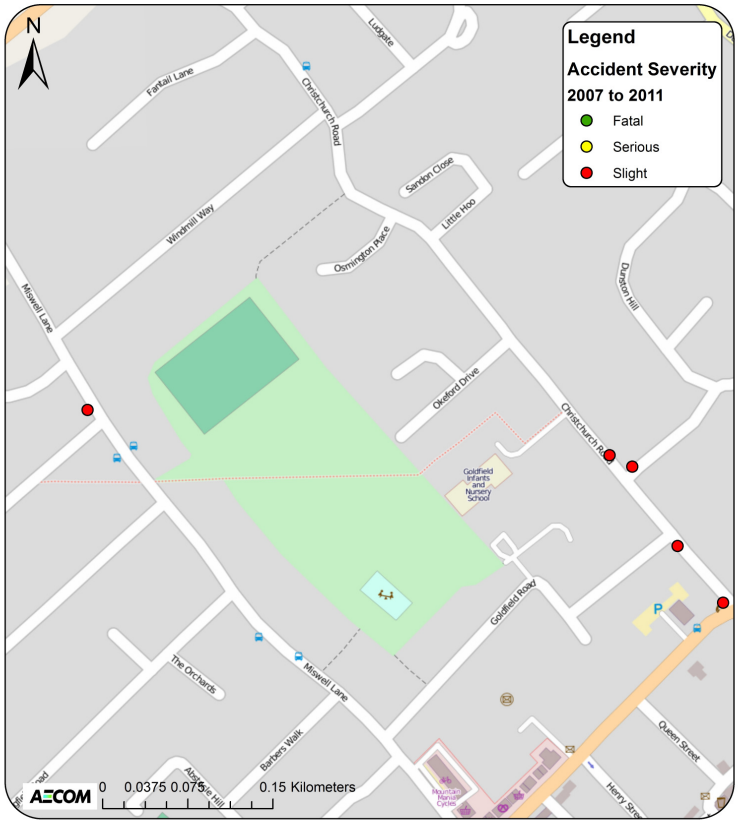


Figure 8 – Accidents surrounding Goldfield School (STATS19)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Goldfield Infant School	Christchurch Rd: Friars Walk - Okeford Dr	NB	159.0	1183	48.4	32.3	26.2
	Christchurch Rd: Goldfield Rd - Friars Walk	NB	64.3	1424	47.4	31.8	21.5
	Christchurch Rd: Okeford Dr - Little Hoo	NB	114.2	1287	49.8	31.7	26.6
	Miswell Ln: Beaconsfield Rd - Longfield Rd	NB	99.7	1046	40.3	26.6	18.9
	Miswell Ln: Buckingham Rd - Highfield Rd	NB	58.7	697	39.0	29.6	16.7
	Miswell Ln: Highfield Rd - Beaconsfield Rd	NB	90.4	1021	38.1	27.5	19.6
	Miswell Ln: Longfield Rd - Barbers Walk	NB	129.2	1004	42.9	26.1	18.5
	Christchurch Rd: Friars Walk - Okeford Dr	SB	159.0	1172	44.7	32.3	27.6
	Christchurch Rd: Goldfield Rd - Friars Walk	SB	64.3	1385	49.2	31.8	23.8
	Christchurch Rd: Okeford Dr - Little Hoo	SB	114.2	1312	42.3	30.5	26.5
	Miswell Ln: Beaconsfield Rd - Longfield Rd	SB	99.7	849	40.3	25.4	18.5
	Miswell Ln: Buckingham Rd - Highfield Rd	SB	58.7	707	38.3	25.4	15.3
	Miswell Ln: Highfield Rd - Beaconsfield Rd	SB	90.4	804	40.6	24.3	16.1
	Miswell Ln: Longfield Rd - Barbers Walk	SB	129.2	798	40.5	25.5	16.7

Table 7 – Max, Ave and 85th percentile speeds surrounding Goldfield School (TrafficMaster Data for 2011)

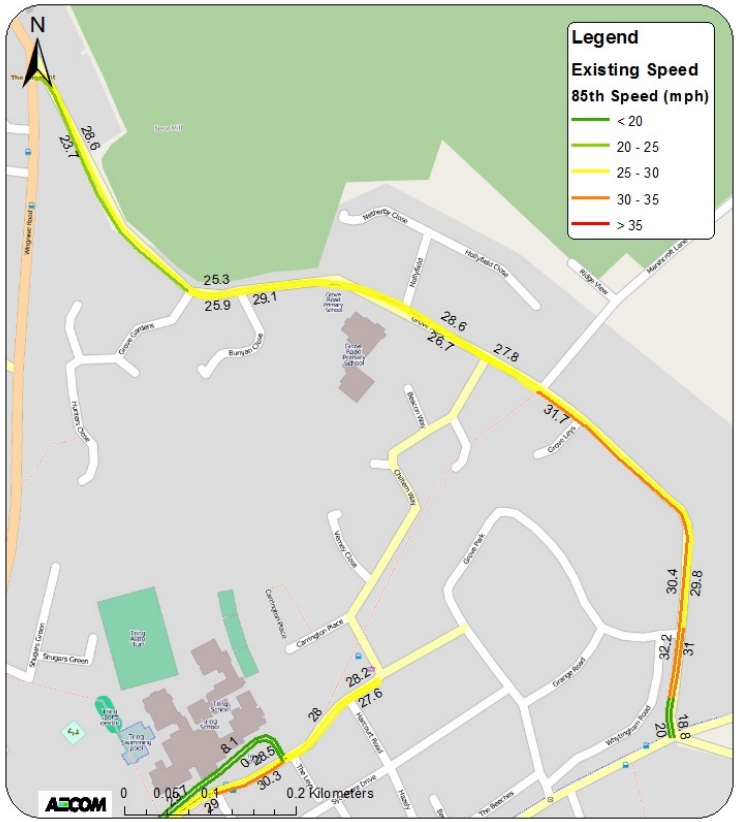


Figure 9 – 85th percentile speeds surrounding Grove Road School (TrafficMaster Data for 2011)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Grove Road	1.Station Rd	NB	47.4	1112	**33.2**	**20.0**	**15.4**
	2.Aston House - Grove Park	NB	82.9	1103	**42.2**	**32.2**	**26.7**
	3.Grove Park - Grove Leys	NB	289.9	1068	**41.0**	**30.4**	**23.2**
	4.Grove Leys - Marshcroft Lane	NB	67.9	1084	**39.1**	**31.7**	**24.6**
	5.Marshcroft Lane - Chiltern Way	NB	71.5	1086	**37.6**	**27.8**	**21.6**
	6.Chiltern Way - Hollyfield	NB	109.2	1028	**37.3**	**26.7**	**20.3**
	7.Hollyfield - Bunyan Close	NB	206.6	904	**37.2**	**29.1**	**24.4**
	8.Bunyan Close - Grove Gardens	NB	54.6	969	**33.9**	**25.9**	**21.4**
	9.Grove Gardens - B488	NB	317.1	945	**33.0**	**23.7**	**18.4**
	1.Station Rd	SB	47.4	932	**28.8**	**18.8**	**12.1**
	2.Aston House - Grove Park	SB	82.9	921	**42.2**	**31.0**	**21.2**
	3.Grove Park - Grove Leys	SB	289.9	889	**39.1**	**29.8**	**23.1**
	4.Grove Leys - Marshcroft Lane	SB	67.9	886	**42.2**	**29.8**	**21.8**
	5.Marshcroft Lane - Chiltern Way	SB	71.5	870	**43.2**	**27.8**	**20.0**
	6.Chiltern Way - Hollyfield	SB	109.2	908	**41.7**	**28.6**	**20.7**
	7.Hollyfield - Bunyan Close	SB	206.6	859	**37.2**	**29.1**	**24.0**
	8.Bunyan Close - Grove Gardens	SB	54.6	921	**33.9**	**25.3**	**20.7**
	9.Grove Gardens - B488	SB	317.1	897	**37.9**	**28.6**	**23.5**

Table 8 – Max, Ave and 85th percentile speeds surrounding Grove Road School (TrafficMaster Data for 2011)

Figure 10 – 85th percentile speeds surrounding Egerton-Rothesay School (TrafficMaster Data for 2011)

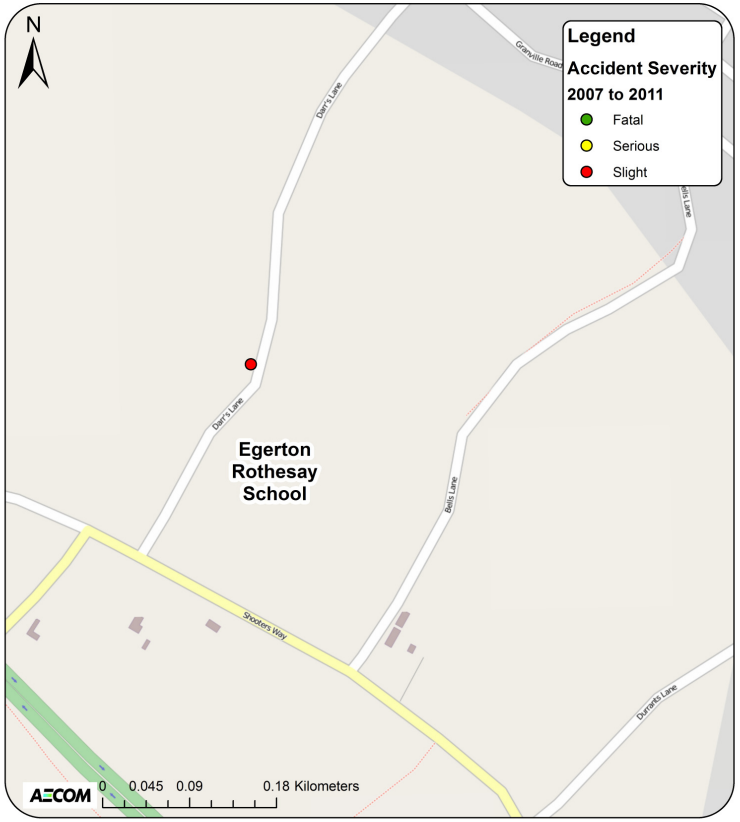


Figure 11 – Accidents surrounding Egerton-Rothesay School (STATS19)

	Location	Direction	Length (m)	Observations	Max Speed (mph)	85th%ile Speed (mph)	Average Speed (mph)
Egerton-Rothesay	Durrants Ln: Durrants Rd - Shooters Way	SB	754.9	2179	**45.4**	**31.1**	**26.2**
	Durrants Ln: Durrants Rd - Shooters Way	NB	754.9	2150	**41.6**	**31.1**	**27.7**

Table 9 – Max, Ave and 85th percentile speeds surrounding Egerton-Rothesay School (TrafficMaster Data for 2011)

Preferred Option
Recommendations for: It is recommended that Measures 41.1 to 41.3 are implemented to provide a safer environment for pupils directly outside of schools. Where appropriate, 20mph zones should be introduced to ensure vehicles are travelling at speeds below the ACPO threshold.

Contribution to Objectives / Indicators	UTP Objectives	• Promote active travel modes throughout the study area to encourage active and healthy lifestyles

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost***	**Notes**
41.1	£8,000 to £10,000	
41.2	£4,000 to £5,000	
41.3	£42,000 to £45,000	
TOTAL COST FOR DELIVERY	**£54,000 to £60,000**	

Maintenance Liability	~~High~~ ~~Medium~~ Low	

*All costs provided by HCC

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

Delivery Issues	No requirement for land acquisition envisaged. Traffic Regulation Order required for implementation of 20mph zone.

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.

Other Information/Additional Notes:

Figures 12 and **13** demonstrate the location and extent of the 20mph zones proposed, identifying which schools they correspond to.

Berkhamsted Schools

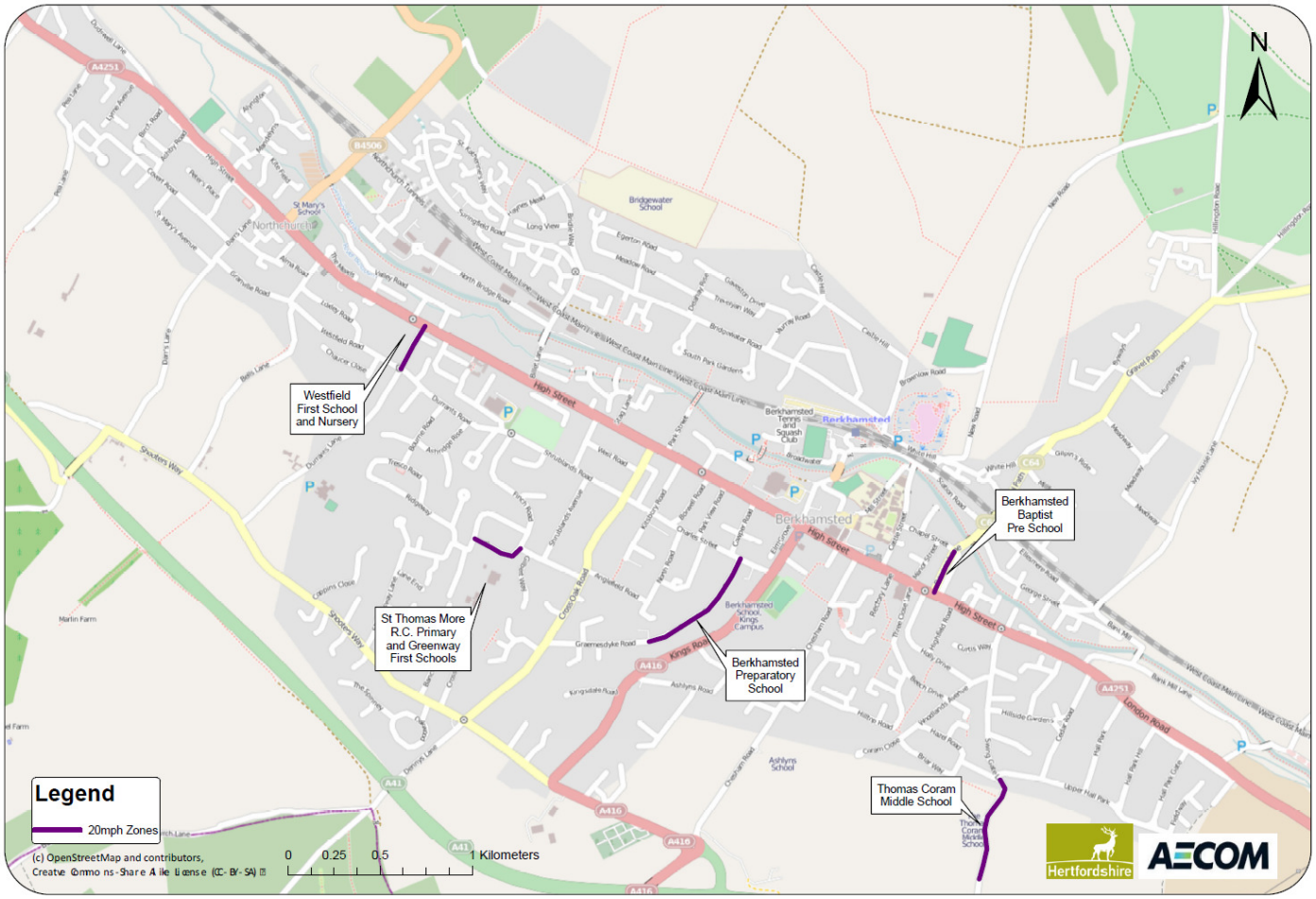


Figure 12 School 20mph zone location - Berkhamsted

Tring Schools

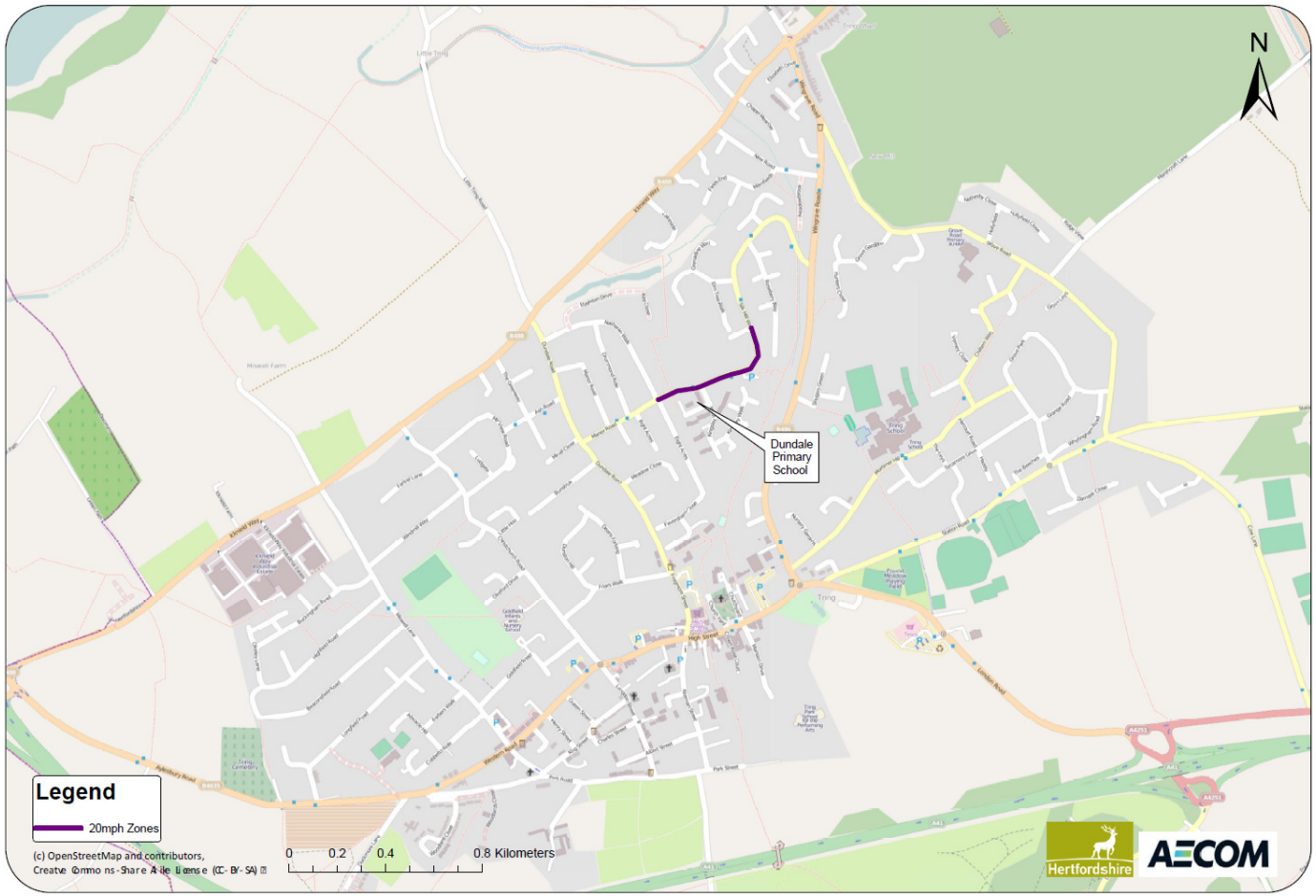


Figure 13 School 20mph zone location - Tring

Scheme Name	**Upgrade Pedestrian Crossing on Grove Road, Tring** Walking	
Scheme Reference	42	
Problem References	W32	Insufficient crossing facilities on Grove Road adjacent to Grove Road Primary School
Links to other UTP schemes:	N/A	

Context

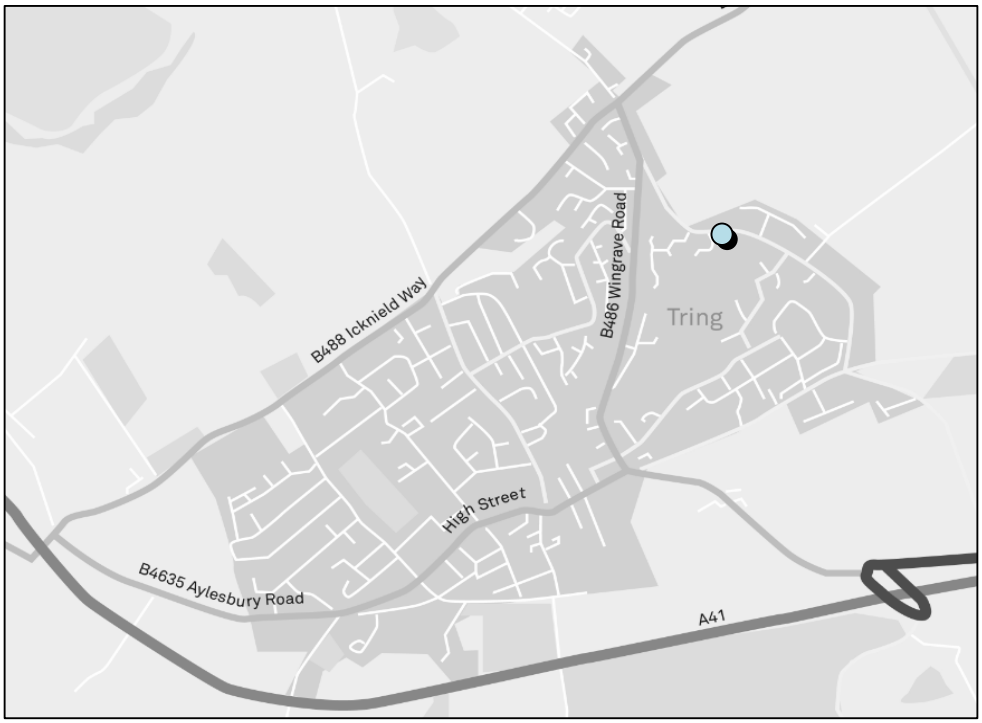


Figure 1 Location Plan

Grove Road is primarily a residential distributor between Wingrave Road and Station Road, providing access to communities in northeast Tring. In addition, Grove Road Primary School is located adjacent to the central section of this route, accommodating approximately 450 pupils.

In recent years, speed management infrastructure has been installed along Grove Road, including speed cushions and signage, to improve the conditions for vulnerable road users and school pupils. In addition, there is an informal pedestrian crossing located just to the east of Bunyan Close.

Existing pedestrian facilities along Grove Road, and feedback following consultation with local stakeholders suggest that a number of pupils wish to cross Grove Road to access and egress the primary school. Having

reviewed the School Travel Plan, there is a clear focus to increase the mode share of walking and cycling to school.

Measures have therefore been considered to provide a safe crossing facility for pedestrians travelling along Grove Road, 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
42.1	Zebra crossing to replace existing informal crossing point near Bunyan Close	The provision of a zebra crossing is proposed at this location based on the amount of pedestrians wishing to cross Grove Road at this point. With Grove Road Primary School located adjacent to the road, the crossing will assist in the provision of a safe pedestrian route between residential areas to the north and south of Grove Road. For location, see **Figure 3**. 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. Deliverability – 1 to 2 years **STANDARD**	£45,000 to £50,000

Supporting Evidence of Measures/Components

Figure 2 Example Zebra Crossing

Preferred Option

The preferred option includes Measure 42.1.

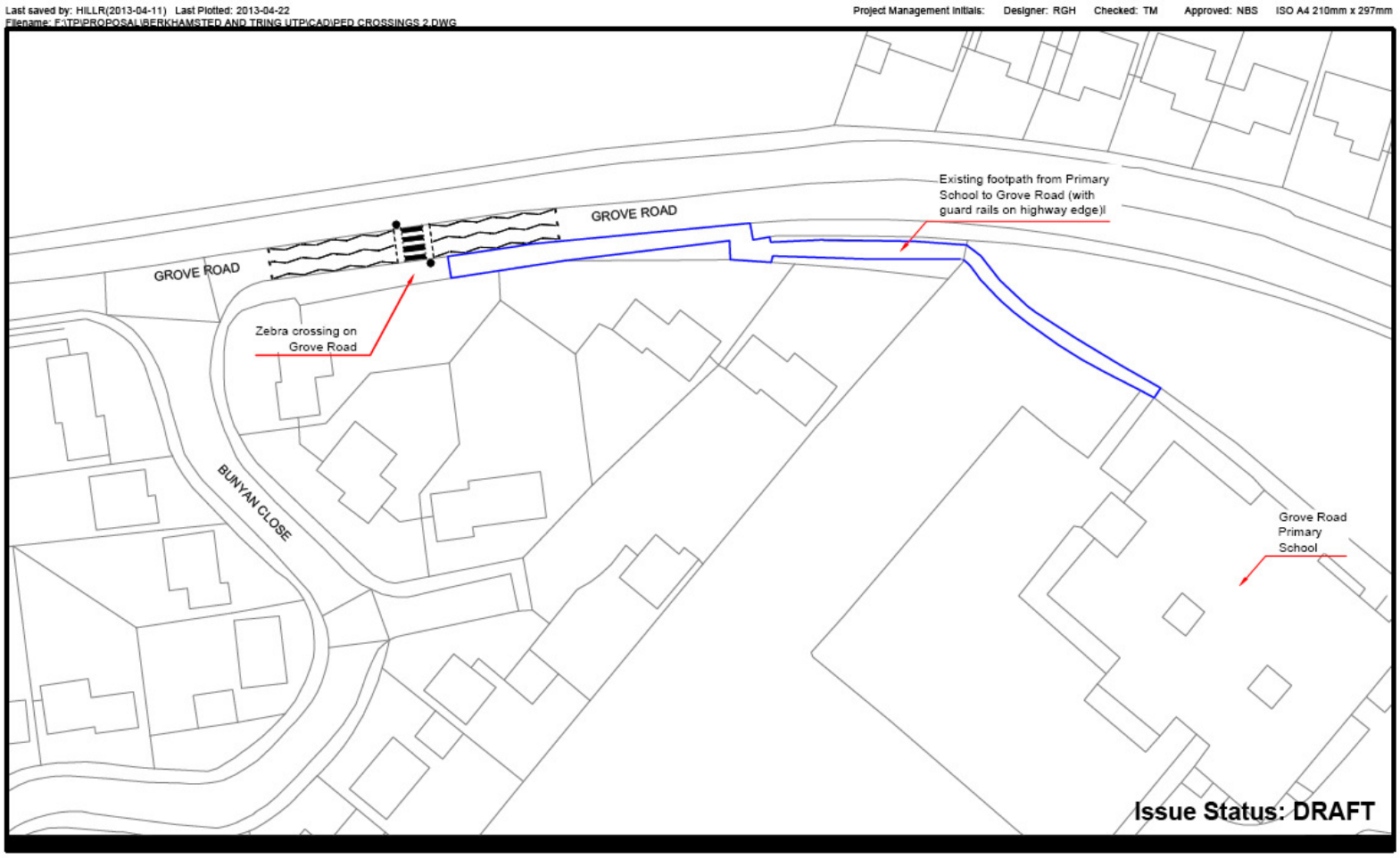
Contribution to Objectives / Indicators	UTP Objectives	• Improve connectivity within and between local towns through a complete network of walking and cycling facilities

Outline Cost Analysis of Preferred Option or Options		
Design and Implementation	**Indicative Cost**	**Notes**
42.1	£45,000 to £50,000	
TOTAL COST FOR DELIVERY	**£45,000 to £50,000**	

Maintenance Liability	~~High~~ ~~Medium~~ ~~Low~~	

Deliverability of Preferred Option	~~Simple – 'quick win', could be delivered within1 year~~
	Standard – could be delivered in 1 to 2 years, in line with IWP
	~~Complex – could not be delivered in 2 years, has some issues that require resolution before design~~
Delivery Issues	None

Other Information/Additional Notes:



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

Figure 3 - Grove Road Zebra Crossing Sketch