HIF Banwell Bypass and Highways Improvements Project

Wider Network Mitigation Measures Speed Limits Assessment Report

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Contents

1 The Project

1.1 Scheme Overview

1.1.1 The following section provides a brief description and overview of the Banwell Bypass and Highways Improvements Project.

1.1.2 The Scheme comprises the following distinct elements:

a) a bypass of the village of Banwell (referred to as the "Banwell Bypass");
b) a route connecting the A371 at Castle Hill and the A368 at East Street (referred to as the "Southern Link"); and
c) Mitigation and enhancement measures, which broadly consist of the following:

- Environmental mitigation and enhancement measures in connection with the Banwell Bypass and the Southern Link, examples of which include (but are not limited to) flood compensation areas, planting and habitat creation, attenuation basins etc.

- Placemaking improvements within Banwell, comprising mitigation and enhancement measures to the public realm; and

- Traffic mitigation in connection with the Banwell Bypass and the Southern Link, including Improvements to the wider local road network.

1.1.3 Together, these elements comprise the "Scheme". Each element as listed is described in more detail below.

Banwell Bypass

1.1.4 The Banwell Bypass would be located within the administrative area of North Somerset. The village of Banwell is located approximately 8km east of Weston-super-Mare. The Bypass would primarily consists of:

a) Signalisation and capacity improvements to the Summer Lane/Wells Lane junctions on the A371;
b) A 40mph single carriageway bypass, connecting the existing A371 (Knightcott Road, east of Summer Lane) to A368 (east of Towerhead Farm);
c) A 3 metre wide walking and cycling route provided along the majority of the Banwell Bypass providing a link from Weston-super-Mare and to Sandford;
d) Banwell Bypass West Junction - a three arm roundabout located east of Knightcott Industrial Estate at the western end of Banwell;
e) Wolvershill Road Junction – a traffic signalised junction, providing access for all users to the west, east, and north. Access to the south would be restricted to public transport and walking, cycling and horse-riders, and limited agricultural access only;
f) Riverside Crossing – an overbridge across Riverside and the River Banwell. There would not be a direct connection between Riverside and the Bypass;
g) A side road connection between Riverside and Moor Road; and
h) Banwell Bypass East Junction - A three-arm traffic signalised junction, with dedicated turning lanes from the bypass towards the Southern Link .

Southern Link Road

1.1.5 The Southern Link would be located within the administrative area of North Somerset and within the Mendip Hills Area of Outstanding Natural Beauty (AONB). The Southern Link would be a 30mph single carriageway, connecting the A368 (East Street) to the A371 at Castle Hill. The Southern Link would link into the Bypass at the Banwell Bypass East Junction. A T-junction located along the Southern Link would provide access into the east of Banwell (at East Street).

Mitigation Measures

Environmental mitigation and enhancement measures in connection with the Banwell Bypass and the Southern Link.

1.1.6 The Scheme would include mitigation measures which are provided to offset the impact of the Banwell Bypass proposal. These include (but are not limited to):

a) flood mitigation to ensure that the Banwell Bypass does not increase flood risk for third-party properties;
b) land for essential mitigation, such as ecology and landscape mitigation; and
c) sustainable urban drainage systems (e.g. attenuation basins and swales), and additional groundwater mitigation, to prevent adverse water quality impacts (including the Source Protection Zone (SPZ)).

Placemaking improvements within Banwell

1.1.7 As a result of the Banwell Bypass, there would be a reduction in traffic through Banwell. The reduction in traffic (and resulting reduction in congestion) through the village could result in higher traffic speeds without mitigation.

1.1.8 A reduced 20mph speed limit through Banwell would discourage vehicles from travelling at higher speeds, whilst also discouraging the use of the road as a through route (instead of the Banwell Bypass).

1.1.9 The reduction of traffic through Banwell due to the provision of the Banwell Bypass provides the opportunity to make improvements to the existing road and public spaces within Banwell to enhance the historic and urban setting of the village. These improvements would include, but are not limited to:

a) Alteration to the road and footways including resurfacing, widening, and narrowing (which would encourage drivers to comply with the posted 20mph speed limit);
b) Incorporation of active travel measures;
c) Soft landscaping and ecological improvements; and
d) Street signage improvements.

Improvements to the wider local road network

1.1.10 Improvements to the local road network and junctions including the surrounding villages of Churchill, Sandford and Winscombe are proposed to mitigate increases in traffic as a result of the Banwell Bypass and Southern Link. These mitigation measures would consist of:

a) Lowered speed limits:
   - 20mph: A368 through Churchill, A368 through Sandford, A371 through Winscombe.
   - 30mph: A368 between Churchill and Sandford Villages.

b) Gateway Features when entering and exiting the villages of Sandford, Churchill and Winscombe;
c) Non-physical traffic calming measures through and between villages (e.g. road markings and speed signage);
d) Capacity improvements to the Churchill Junction (A38/A371);
e) Provision of new / improvements to existing pedestrian and cycling crossings;
f) Active travel measures along the A368, with improved footway/cycleway access from Churchill and Langford to Churchill Academy;
g) Improvements to footways, shared pedestrian, and cycleway; and
h) Soft landscaping, native planting, rewilding, and ecological enhancements.

1.2 Context

1.2.1 North Somerset Council's (NSC) Housing Infrastructure Fund (HIF) proposal supports potential housing sites (subject to the emerging Local Plan 2038).

1.2.2 A business case was submitted to Homes England to secure funding for a package of infrastructure improvements in February 2019 and a successful funding announcement was made at the end of October 2019.

1.2.3 The Bypass would provide a highway connection to enable potential housing sites that may be allocated in the emerging Local Plan and alleviate the anticipated impact of further traffic

growth upon the already congested Banwell village.

1.2.4 NSC appointed Alun Griffiths (Contractors) Ltd, with Arup and TACP (the 'AGC Team') as their technical and environmental advisors, to develop a solution including optioneering, design and planning support of the proposed HIF Banwell Bypass and Highways Improvements Project Stage 1 (the "Scheme"). Stage 1 of the project includes: optioneering; preliminary design; Environmental Impact Assessment (EIA); planning permission; Statutory Processes. Stage 2 of the project is the detailed design and construction phase, following planning determination and land acquisition.

1.3 Scheme objectives

1.3.1 NSC's overall objectives for the Scheme are to deliver, within cost, quality, and programme targets:

a) Improve the local road network to deal with existing congestion issues.
b) Improve and enhance Banwell's public spaces by reducing traffic severance and improving the public realm.
c) Provide the opportunity to increase active and sustainable travel between local villages and Weston-super-Mare.
d) Deliver infrastructure that enables housing development (subject to Local Plan).
e) Ensure the development respects the local area and minimises visual impact upon the surrounding countryside and Mendip Hills Area of Outstanding Natural Beauty (AONB).
f) Innovative and efficient in reducing and offsetting carbon from the design and construction of the infrastructure.
g) Ensure the development provides the opportunity to increase Biodiversity Net Gain by at least 10%.
h) Proactively engage with stakeholders in a way that is both clear and transparent.

1.4 Purpose of this report

1.4.1 As set out in the scheme overview, mitigation measures to offset the impacts of the Banwell Bypass Scheme, within the wider road network (principally the A371 and A368), have been identified

and are shown in Figure 1. These are existing single carriageway roads that serve as primary east-west connections passing through Banwell village.

1.4.2 One element of the wider mitigation measures is proposed speed limit reductions. This speed limit assessment has therefore been carried out to review and assess the potential changes to local speed limits against national and local policy requirements, to confirm what changes to speed limits are justified, and what measures might be required to facilitate their introduction.

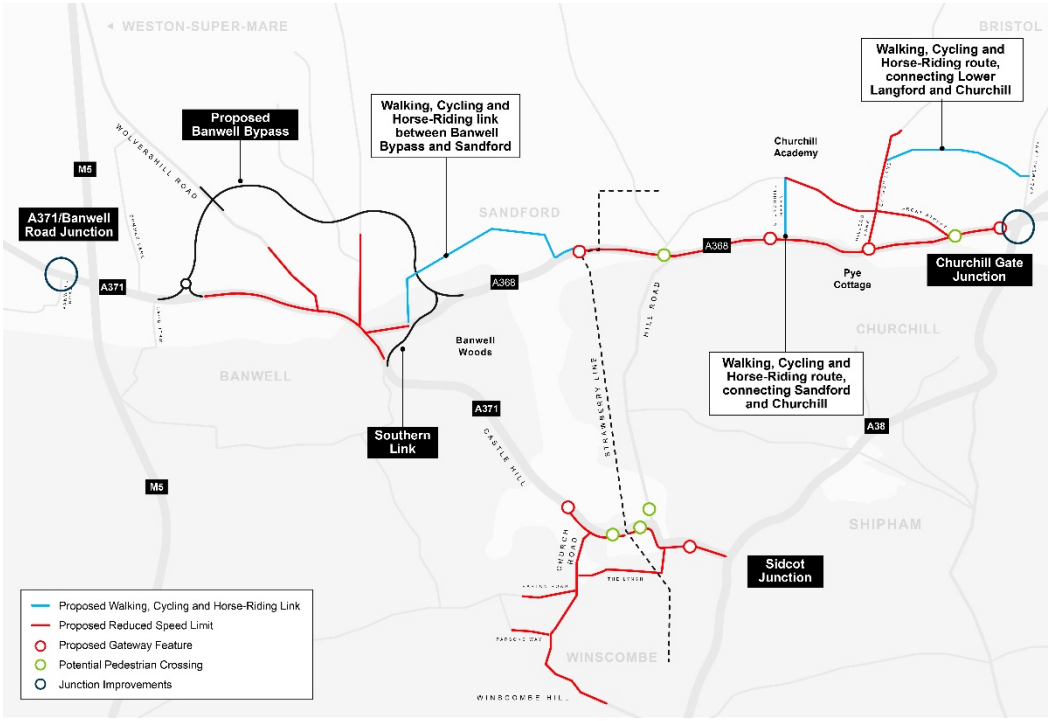


Figure 1 Proposed wider mitigation measures

1.4.3 Its outcome will require further consultation with NSC's road safety and traffic management teams, in addition to the Avon & Somerset Police for agreement and to inform final decision-making prior to the making of any Traffic Regulation Orders (TROs) to implement the proposed changes to speed limits. Further detail relating to the implementation of the speed limits, such as exact signing requirements and locations will be developed at the detailed design stage.

1.4.4 The scope of this assessment primarily involves the roads identified in red in Figure 1 following design development and through feedback received from NSC, the Parish Councils and the general public, however it should be noted that not all

changes to limits are considered as direct mitigation from the impacts of the Bypass – this is further discussed in the next section.

1.4.5 The main body of this report is presented in the following sections:

a) Section 2 outlines the key requirements identified and principles established and considered.

b) Section 3 provides an overview of the procedure followed when deciding whether to change the speed limits.

c) Section 4 provides additional supporting measures and recommendation that may be needed to ensure the successful management of the vehicle speeds.

2 Key Principles and Requirements

2.1 Guidance and Standards

2.1.1 This assessment has been carried out in accordance with the following standards and guidance:

a) National guidance – Setting local speed limits, Department for Transport Circular 01/2013, January 2013[1].

b) National guidance – ACPO Speed Enforcement Policy Guidelines 2011-2015: Joining Forces for Safer Roads, Association of Chief Police Officers, Version 3.0, May 2015.

c) National guidance - Traffic Management Act 2004: network management to support active travel, updated 1 April 2022[2].

d) Local guidance – 20mph Speed Limit Officer Guidance for villages, North Somerset Council.

e) National guidance – A Guide to 20mph Limits, Royal Society for Prevention of Accidents, October 2019[3]

2.2 Speed limits and speed management

2.2.1 Speed limits will be considered as part of a package of measures to manage vehicle speeds and improve road safety as a result of the impacts associated with increased traffic from the construction of the bypass. The following roads are within the scope of this assessment and are discussed in the following paragraphs in context of the proposed development:

a) Primary/major roads; and

b) Secondary/minor (side) roads.

2.2.2 Roads which are directly impacted as a result of the Scheme, and that are considered to require mitigation generally include the primary roads (unless otherwise stated). The roads that are directly impacted are;

a) A368;

b) A371;

c) Wolvershill Road; and

d) Church Road / Winscombe Hill.

2.2.3 Secondary/minor roads within the study area – which are not

directly impacted by the Bypass and as such not considered to require mitigation for direct impacts (i.e. significant increases in traffic flows) – have been included in this assessment for one or more of the following reasons:

a) Roads which share a similar function, or importance, or are directly linked to the primary (A) roads.

b) Roads classified as Green/Amber roads within the villages (in accordance with the NSC guidance – see paragraph 2.3.8).

c) Roads which have received feedback/support for revised speed limits, e.g., during the project's design development and/or through consultation with the Parish Councils and the public.

2.2.4 Residential roads are not considered in this assessment. However, once the extents of proposed speed limit reductions required as a result of the Scheme are established, further consideration should be given to the treatment of additional residential/minor roads to ensure a coherent approach to speed limits within individual communities is provided.

2.2.5 Prevailing mean speeds – in conjunction with the public's views and feedback – will be considered to avoid proposed speed limits from being disregarded/opposed, thus bringing the speed limit system into disrepute. In addition, reasonable speed limits will be proposed to ensure consistency with other areas of the country.

2.2.6 Any highway changes that may be required, commensurate to its intended use (such as capacity and geometry improvements and traffic calming) will be considered, to help encourage road users to adhere to the speed limits without increased police enforcement and to ensure its long-term success.

2.2.7 Guidance also states that the length of road over which a speed limit change is being considered should be at least 600m – this is to avoid many speed limit changes that could be confusing to the motorist within a short space. In some cases, however a slightly shorter length may be suitable which may complement a change in speed limit such as existing highway or roadside features that provide a natural threshold.

2.3 20mph speed limits

2.3.1 To ensure greater safety for pedestrians and cyclists, there is greater encouragement for local authorities to introduce more 20mph schemes (limits and zones) in urban areas and built-up village streets that are mainly residential. National guidance on setting local speed limits[4] (published January 2013) states "*such limits should not, however, be considered on roads with a strategic function or where the movement of motor vehicles is the primary function."*

2.3.2 Local guidance is less prescriptive than DfT Circular 01/2013, stating only that "*careful consideration should be carried out if roads with a strategic function are being considered because of the impact on congestion, efficiency of the network, displacement of traffic, and the local economy".*

2.3.3 Local guidance goes on to state that a 20mph speed limit should apply to streets that attract high pedestrian and cycling movement and where the nature of the road encourages compliance with this limit without the need for traffic calming.

2.3.4 Some of the roads in question form part of the A road network and are considered to perform a strategic function under the definition in NSC's guidance, and therefore impacts on congestion, network efficiency, traffic displacement and the local economy should be carefully considered. However, they are also residential areas, with high pedestrian footfall, particularly to/from local schools, and current traffic conditions do little to encourage cycling.

2.3.5 More recently, the DfT has published further statutory guidance relating to local authorities' network management duty under the Traffic Management Act 2004[5], including reducing speed limits to 20mph on through streets in built-up areas, stating that "*the step-change in their [and other traffic management measures] rollout should continue*", to provide a more attractive and safer environment for walking and cycling.

2.3.6 Reviewing the implementation of 20mph speed limits in other locales, for example Oxford and Bristol, both of which have introduced extensive 20mph limits in recent years, there are

numerous examples of sections of A roads with 20mph speed limits – predominantly in built-up areas. This demonstrates that current national guidance relating to 20mph speed limits on A roads is not an absolute barrier to implementation, but instead requires consideration on a case-by-case basis for specific section of A roads.

2.3.7 This principle is confirmed by DfT Circular 01/2013, which also states that "*Traffic authorities are asked to keep their speed limits under review with changing circumstances, and to consider the introduction of more 20 mph limits and zones, over time, in urban areas and built-up village streets that are primarily residential, to ensure greater safety for pedestrians and cyclists, using the criteria in Section 6.*" As the construction of the bypass represents a clear change in circumstances, with adverse effects (increased traffic flows) arising from its construction, there is a need to provide mitigation, including to ensure greater safety for pedestrians and cyclists. The introduction of 20mph speed limits is one such way in which the impacts of the bypass on the surrounding communities can be mitigated to some extent, as vehicle volumes cannot easily be reduced).

2.3.8 The following principles for villages, as set out in NSC's guidance, shall apply:

a) Location. A 20mph limit[6] will only be considered in the first instance within an existing 30mph limit. Areas/roads within villages should be identified for compliance with surrounding developments and vehicle speeds by using the following convention:

- **Green roads** – roads with high pedestrian and cyclist movement and estate roads.
- **Amber roads** – roads with high vehicle movement but some pedestrian and cyclist movement. Speed readings should be carried out as evidence of compliance.
- **Red roads** – roads with high vehicle movement but low pedestrian and cyclist movement. These roads will be considered non-compliant.

b) Speed readings. As mentioned above, speed readings are required for Amber roads. This can be done using a handheld speed reader. If found non-compliant and if the PC still wants the road to be included within the limit, then a formal reading should be carried out and be funded by the PC. If speed readings are 24mph or below, the 20mph

speed limit can be proposed using terminal and repeater signs alone and is likely to lead to general compliance. If speed readings are higher than 25mph[7], additional traffic calming measures[8] – known as a 20mph zone – would be required to bring down speeds. This may encourage a modal shift towards more active travel and may result in reductions in traffic flow on the road. Research has shown that 20 mph zones with traffic calming measures have been very effective in reducing speeds and casualties.

c) Measures. Terminal speed limit signage and standard gateway markings should be provided for 20mph limits. For areas requiring 20mph speed limits, a signage location plan can be prepared comprising upright terminal signage (on both sides of the road where possible), and repeater signage consisting of either upright signs or roundels on the road. Local preference should be sought for the type or combination of sign that should be installed. The frequency[9] of repeaters should be in accordance with Chapter 3 of the Traffic Signs Manual.

- For 20mph zones, relevant traffic calming measures[10] should be incorporated at 80m intervals. Signage and paint (as a measure) will only be acceptable if installed at alternate intervals to physical measures.
- Where existing speeds are high, it is possible to implement 20 mph schemes across an area that consist of a combination of physical features on some roads. Where speeds are already low signs alone can be implemented on other adjoining roads.

d) Speed limit extensions. If there are local concern areas outside of the identified area (such as Red roads), and if supported by the local community, then the Accident Record should be examined. An extension would be suitable by up to approximately 100m beyond the previously defined area[11]. Additional speed readings would need to be taken for the proposed extension areas and will need to be funded by the PC, including any new measures.

e) Consultation. Political approval should be sought from the Executive Member then the Local Member, followed by further consultation with the Police before final drawings are shared with the local community.

f) Future consideration. As suggested in the national guidance, speed limits are advised to be kept under review by traffic authorities and over time introduce more 20mph limits in residential areas. As such this may infer that Local Councils should attempt phased approaches to 20mph areas to promote a gradual shift in changing driver culture to accept

that the normal speed limits in residential areas will be 20mph rather than 30mph.

2.3.9 Where 20mph speed limits are proposed within villages, it might be appropriate to consider an intermediate speed limit of 30 or 40mph prior to the 20mph speed limit signs at the entrance to a village to avoid a reduction in speed from national speed limit to 20mph over a short distance. Minimum distances for new speed limits will make reference to the guidance within DfT Circular 01/2013.

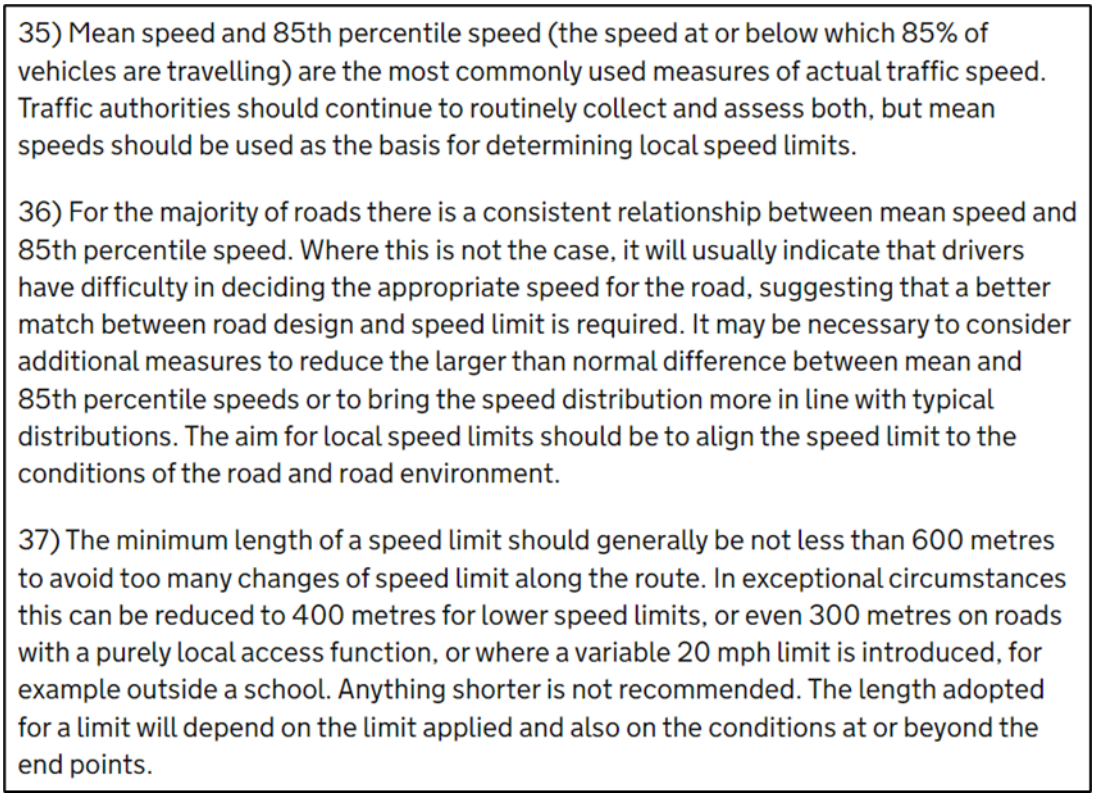
2.4 Speed limits in the vicinity of schools

2.4.1 Due to concerns over the safety of children outside schools, an overall assessment of the safety issues outside a school – such as parking or road crossing difficulties – shall be considered rather than considering the change of speed limit in isolation.

2.5 Speed surveys

2.5.1 The principles identified in Figure 2 shall generally apply when assessing survey speeds and determining local speed limits.

2.5.2 Guidance as identified in Figure 3 shall be used to show the predicted changes in mean speeds following a change to a new lower speed limit, and to determine whether traffic calming may be required to achieve the relevant speeds. The formulas used to calculate the values within the tables are taken from Annex A of Setting Local Speed Limits, Department for Transport Circular 01/2013.



35) Mean speed and 85th percentile speed (the speed at or below which 85% of vehicles are travelling) are the most commonly used measures of actual traffic speed. Traffic authorities should continue to routinely collect and assess both, but mean speeds should be used as the basis for determining local speed limits.

36) For the majority of roads there is a consistent relationship between mean speed and 85th percentile speed. Where this is not the case, it will usually indicate that drivers have difficulty in deciding the appropriate speed for the road, suggesting that a better match between road design and speed limit is required. It may be necessary to consider additional measures to reduce the larger than normal difference between mean and 85th percentile speeds or to bring the speed distribution more in line with typical distributions. The aim for local speed limits should be to align the speed limit to the conditions of the road and road environment.

37) The minimum length of a speed limit should generally be not less than 600 metres to avoid too many changes of speed limit along the route. In exceptional circumstances this can be reduced to 400 metres for lower speed limits, or even 300 metres on roads with a purely local access function, or where a variable 20 mph limit is introduced, for example outside a school. Anything shorter is not recommended. The length adopted for a limit will depend on the limit applied and also on the conditions at or beyond the end points.

Figure 2 Setting local speed limits (Source: Department for Transport Circular 01/2013)

Table 1 – Predicted change in mean speeds following a reduction to a 20 mph speed limit (with traffic calming)

Measured mean speed before	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Predicted mean speed after	14.9	15.1	15.3	15.5	15.8	16.0	16.2	16.5	16.7	16.9	17.1	17.4	17.6	17.8	18.1	18.3	18.5	18.7	19.0	19.2	19.4

Table 2 – Predicted change in mean speeds following a signed-only reduction in speed limit

Change from urban and rural 30 mph speed limit to 20 mph speed limit (without traffic calming)

Measured mean speed before	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Predicted mean speed after	19.9	20.6	21.4	22.2	23.0	23.7	24.5	25.3	26.1	26.8	27.6	28.4	29.2	29.9	30.7	31.5	32.2	33.0	33.8	34.6	35.3
	New lower speed limit allowed					New lower speed limit only allowed with supporting highway measures															

Change from urban 40 mph speed limit to 30 mph speed limit

Measured mean speed before	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Predicted mean speed after	30.5	30.7	30.9	31.2	31.4	31.7	31.9	32.2	32.4	32.7	32.9	33.2	33.4	33.7	33.9	34.1	34.4	34.6	34.9	35.1	35.4
	New lower speed limit allowed						New lower speed limit only allowed with supporting highway measures														

Change from rural village 40 mph speed limit to 30mph speed limit

Measured mean speed before	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Predicted mean speed after	29.3	30.1	30.9	31.6	32.4	33.2	33.9	34.7	35.4	36.2	37.0	37.7	38.5	39.3	40.0	40.8	41.6	42.3	43.1	43.8	44.6
	New lower speed limit allowed						New lower speed limit only allowed with supporting highway measures														

Figure 3 Change in mean speed guidance (Source: Surrey County Council[12])

3 Speed Limits Assessment and Outcomes

3.1 Scope of the assessment

3.1.1 This section describes the process that was carried out on deciding whether to change speed limits and to achieve a safe distribution of speeds on the roads outlined in Table 1. Proposed speed limits on all proposed new roads to be constructed as part of the scheme are detailed within the Highway Design Report (BNWLBP-ARP-HGN-XXXX-RP-CH-000001).

Table 1 Scope of Assessment

Ref	Area	Road	Location (from)	Location (up to)	Road type	Existing speed
1	Banwell	A371 Knightcott Road / A371 West Street / A368 East Street	Western bypass roundabout	Southern Link T-junction	Primary	30mph
2	Banwell	Church Street /Riverside	A371/Church Street	Riverside (c.30m north of Moor Road up to the end of the traffic calming measures)	Secondary	30mph
3	Banwell	Wolvershill Road	A371/West Street junction	South of Stonebridge Farm	Secondary	30mph
4	Sandford	A368 Station Road	A368/c.50m west of Mead Lane	A368/c.30m east of Greenhill Lane	Primary	30mph
5	Between Sandford/ Churchill	A368 Greenhill Road	A368/c.30m east of Greenhill Lane	A368 Dinghurst Road/Hillier's Lane	Primary	40mph
6	Churchill	A368 Dinghurst Road	A368 /Hillier's Lane	A368/A38 junction	Primary	30mph
7	Churchill	Hillier's Lane	A368/Hillier's Lane junction	Front Street/ Hillier's Lane junction	Secondary	30mph

Ref	Area	Road	Location (from)	Location (up to)	Road type	Existing speed
8	Churchill	Front Street	A368/Front Street junction	Front Street/ Hillier's Lane junction	Secondary	30mph
9	Churchill	Churchill Green	Front Street/ Hillier's Lane junction	Churchill Green/ Duck Street	Secondary	20mph (west) 30mph (east)
10	Churchill	Church Lane	Churchill Green/Church Lane	50m north from Churchill Academy access road	Secondary	30mph
11	Churchill	Church Lane	50m north from Churchill Academy access road	Footway further east off Church Lane towards Ladymead Lane	Secondary	60mph
12	Winscombe	A371	Banwell Road	A371/A38 junction	Primary	30mph
13	Winscombe	Church Road/ Winscombe Hill	A371/Church Road	Barton Drove	Secondary	30mph
14	Between Sandford/ Winscombe	Sandford Road / Hill Road	A371	A368	Secondary	30mph

3.1.2 The process first reviews whether the existing speed limit is appropriate for the type of road and mix of use by different groups of road users. The following key factors[13] have been considered:

a) road function
b) road geometry, engineering, and environment
c) composition of road users
d) existing traffic speeds
e) history of collisions
f) speed surveys
g) feedback
h) forecast traffic

3.2 Types of traffic calming

3.2.1 The types of traffic calming features and their relative performance[14] to engineer traffic speed is illustrated in Figure 4 (reproduced from LTN 1/07). This includes types of speed humps, rumble devices, narrowing road widths, types of chicanes, vehicle activated signs, and some road markings.

3.2.2 The list in Figure 4 is not an exhaustive list, and there are many other forms of traffic calming such as pedestrian crossings, pedestrian refugees, roundabouts, footways and on road parking.

3.2.3 All of these types of engineering measures will be considered within the design development process and included within the general arrangement drawings where considered appropriate. This will need to reflect the individual characteristics for each road under consideration.

Type of measure	Chapter or Section in LTN	Impact on traffic speeds *** = largest reduction	Impact on traffic flows *** = largest reduction	Impact on injury accidents *** = largest reduction	Delays to emergency services *** = shortest delay	Relative public acceptability *** = most acceptable	Impact on vehicle emissions *** =smallest increase		
							CO	NOx	PM
Road hump									
Round-top	4.2	***	***	***	*	***	**	**	**
Flat-top	4.2	***	***	***	*	***	*	*	*
Raised junction	4.2	***	***	***	*	***	*	*	**
Sinusoidal	4.2	***	***	***	*	***	-	-	-
'H' hump	4.2	**	***	***	**	***	-	-	-
'S' hump	4.2	**	***	***	**	***	-	-	-
Thump	4.2	**	***	**	*	**	-	-	-
Cushion	4.2	**	***	***	**	**	**	**	**
Rumble device									
Area	5.1	*	*	**	***	**	-	-	-
Strip	5.1	*	*	**	***	*	-	-	-
Narrowing									
Island	6.3	*	*	*	***	-	-	-	-
Pinch point/build-out	6.3	* to ***	* to **	* to **	***	*	**	***	***
Chicane									
Single lane	6.4	***	**	**	**	*	*	***	*
Two-way	6.4	**	*	**	**	**	-	-	-
Gateway	7	**	*	**	***	**	-	-	-
Mini-roundabout	8	**	*	**	***	*	***	**	**
Vehicle activated device									
Vehicle activated signs	9.1	**	*	**	***	-	-	-	
Speed cameras	9.2	**	*	**	***	***	-	-	
Road markings, traffic signs and furniture									
Roundels	10.2	*	*	*	***	***	-	-	
Coloured surfacing	10.2	*	*	*	***	-	-	-	

Figure 4 DfT 2007 Traffic Calming measures and performance

3.2.4 One factor not set out in Figure 4 is the relative acceptability of different traffic calming features for bus routes, which the majority of roads under consideration form part of. As set out in LTN 1/07,

certain traffic calming features such as chicanes, and particularly those that provide vertical deflections (i.e. certain road humps), can result in discomfort to passengers, and are not viewed favourably by public transport operators. Consideration of measures suitable to public transport routes will also therefore be an important consideration.

3.2.5 Traffic calming measures will also be developed to be complementary to other mitigation measures proposed – for example, footway widening may be proposed to improve the environment for pedestrians, with the dual benefit of reducing vehicle speeds by narrowing the carriageway.

3.3 Road function

3.3.1 The roads forming part of this assessment, as shown in Figure 5 and further detailed in section 3.3, are single carriageway primary adopted A roads which are maintained by NSC (A368 and A371), with the exception of classified unnumbered roads. These are:

a) Wolvershill Road, a classified unnumbered road, which connects the A370 and A371.

b) Church Street /Riverside is a rural residential lane that connect East Rolstone and Banwell.

c) Front Street is a residential street that connects to the A368 and Hillier's Lane through Churchill.

d) Hillier's Lane provides a direct link from Front Street and A368

e) Churchill Green is a rural lane that extends westerly from Front Street leading traffic to Sandford.

f) Church Lane is a rural lane that connects Churchill Green to Brinsea, north of Churchill.

g) Church Road is a residential road within Winscombe connects to the A371.

h) Sandford Road is a residential road that provides a direct link from Winscombe to Sandford.

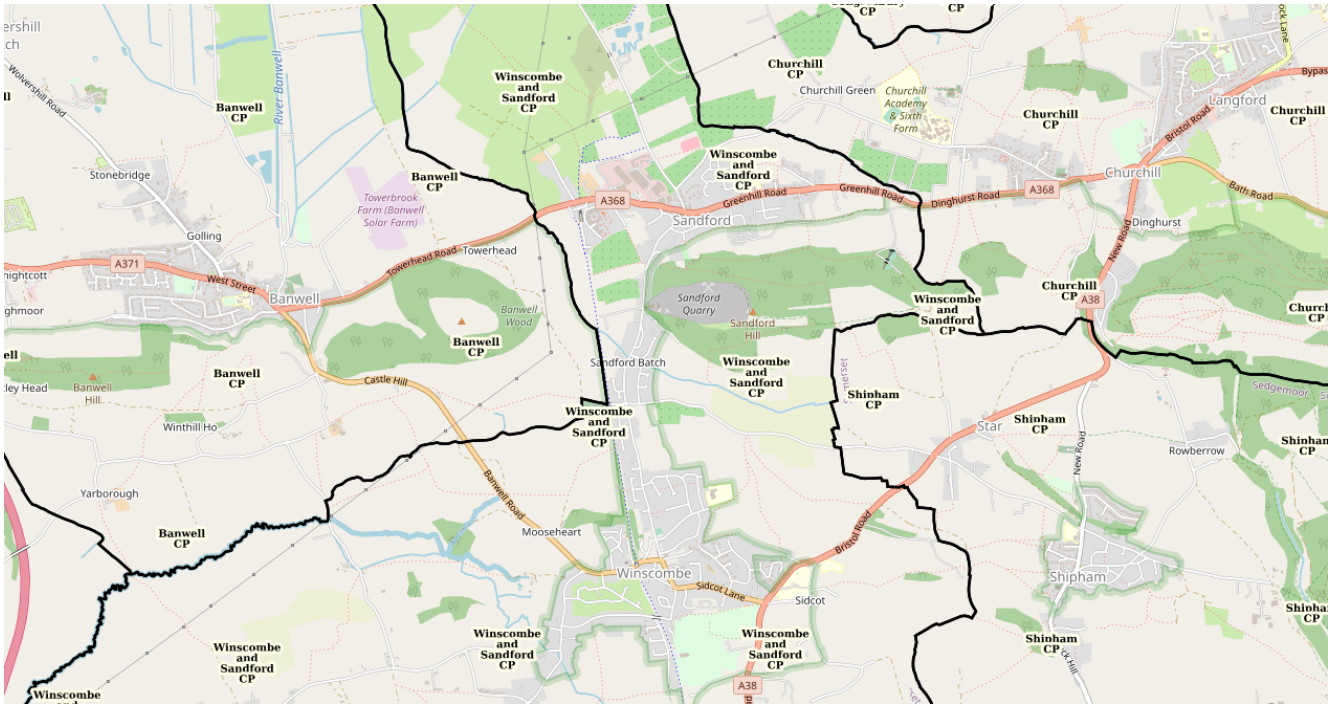


Figure 5 Assessment Study Area ©OpenStreetMap

3.4 Road geometry, engineering, and environment

3.4.1 The **A371 Knightcott Road** / **West Street** through Banwell has a width on average of between c.6-7m and allows for two-way traffic. The carriageway narrows substantially to the east of Banwell Primary School, with sufficient width for one-way traffic only. There are some engineering measures on this road to control traffic speed that consist of two zebra crossings at the eastern end of this road which are located on speed humps, and pedestrian footpaths and refugee islands on the western end. The road also has roundels and signs when entering to 30 mph zone. The primary land use is housing, a primary school, a medical practice followed by places of local employment i.e. a convenience store, and community facilities. Other facilities in the area include a café/bakery, a pub, village hall, places of worship, and a car garage. A car dealership is also located on the western end of Knightcott Road where the road widens.

3.4.2 The **A368 East Street** is similar in character to Knightcott Road, with residential properties on both sides of the road and a high volume of on-street parking on the southern side of the carriageway reducing the effective width. There are existing

speed humps between Dark Lane and Eastermead Lane, where the speed limit reduces for vehicles entering the village.

3.4.3 From West Street, the **A371 Castle Hill** towards Winscombe is a narrow lane of a width between 3 to 5m along its length and allows for two-way traffic for majority of its length. Southbound approximately 90m from East St/West St Junction, the lane reduces in width allowing for only a single car to pass through, forcing northbound traffic to give way to southbound traffic. Where the road width is narrow, engineering measures to control traffic speed include 'Slow' road markings to warn drivers of potential danger ahead. The land use of this road is residential only with a restaurant/pub located at the West St/East Street junction.

3.4.4 Within the urban area of Winscombe, the **A371** is far less linear and tortuous and has increased width in comparison to the other villages. The road width varies between 6.5-7m up to the A371/Hillyfields Way junction. The road width between the two sharp bends at Hillyfields Way and The Lynch is limited to c. 5.5m and thereafter widens between 6.5-8m up to the A371/A38 junction. The railway underbridge only allows for one vehicle to pass through at a time, and therefore eastbound traffic must give way to oncoming vehicles, which acts as a traffic calming features. Additional existing features that control vehicle speeds include a the zebra crossing, and on-street parking and loading bays along this road.

3.4.5 **Church Street /Riverside** to/from Banwell has an average width of c. 4-5m and ultimately only lets one vehicle to pass through. Existing traffic calming features (chicanes) are present in the vicinity of Riverside Crescent. The land use of this road is on street parking towards the southern end near multiple restaurants, and housing. Other amenities that are accessed by this road include a place of worship, and Banwell Football Club.

3.4.6 **Wolvershill Road** through Stonebridge from Banwell is a single carriage way for two-way traffic that is on average c. 4-5m in width. The primary use of this road is housing but also provide access to Stonebridge Farm caravan park. There are no engineering measures for controlling speed within vicinity of Banwell.

3.4.7 The **A368** through Sandford (Green Hill Road/Station Road) has a width on average of between c. 6-7m and follows a linear path, and widens locally between Thatcher's Cider and Hill Road to c.7-9m. The primary land use is housing, followed by places of local employment and community facilities. Other facilities in the area include a convenience store with a café, a pub, primary school, village hall, places of worship, a care home for the elderly and local businesses such as cider maker Thatchers. Some leisure use occurs west of Sandford where the Strawberry Line (NCR 33) crosses the A368. Existing features that control traffic speeds include three signalised pedestrian crossings, 'Slow' road markings, a localised narrowing of the carriageway in the vicinity of Dabinett Drive, and a 20mph school safety zone. On street parking is unrestricted, although is not extensive due to the busy nature of the road. However parked cars and delivery vehicles have been observed to reduce speeds due to vehicles needing to waiting for suitable gaps in oncoming traffic to overtake.

3.4.8 The A368 further east through Churchill (**Dinghurst Rd**) includes a range of local facilities such as a school, church, post office, local convenience shops, health centre, pub, hotel etc. Churchill serves the wider population and acts as a local hub for community facilities, employment, and services, including public transport. The road width in this village narrows from approximately 7.5-8m after Greenhill Lane to approximately 6.2m at Pye Cottage, with two further localised narrowing sections between The Drive and Front Street.

3.4.9 Further east at the junction between the A38 and A368 at Churchill Gate Junction, increased delays and queue lengths of vehicles are experienced and as such the junction will require capacity improvements to support the increased levels of forecast traffic.

3.4.10 Like the Dinghurst Road, **Front Street** runs parallel and serves the wider population of Churchill with a road that fluctuates in width between 3m only allowing one car to pass through, and 4-5m allowing for two cars to pass each other. It should be noted that this street is also used for on street parking. There are no engineering measures for controlling speed on this Street beyond the existing restricted carriageway width.

3.4.11 **Hillier's Lane** in Churchill is approximately 290 metre in length and 5-5.5m in width across its length. Its land use if only a small amount of housing. The main purpose of the lane is to connect A368 and Front Street which provides for the greater population of Churchill as described. There are no engineering measures for controlling speed on this road, although at peak times the volumes of school traffic, including parked school buses, does restrict vehicle speeds.

3.4.12 Continuing westbound from Front Street, **Churchill Green**, is a rural lane c. 4-5m in width. Outside Churchill Academy, the road is suitable for two-way traffic, whilst further west the road narrows to only allow one-way traffic (in part) with passing places. It is used by a very small population of Churchill providing access to housing and farms. There are no engineering measures for controlling speed on this Lane.

3.4.13 **Church Lane** (Churchill) on average has an approximate width of c. 5m. The primary land use of this lane is for Churchill Academy and Sixth form students, teachers, and visitors. Other community facilities include place of worship and access to a rural footpath which is assumed to be used by pedestrians primarily for education or leisure trips. There are no engineering measures for controlling speed on this Lane.

3.4.14 **Church Road** (Winscombe), has a typical width between 4-5m with localised narrow points and land use for housing and some local employment businesses. The density of housing reduces on Winscombe Hill as you travel away from Winscombe, with a number of sharp bends and sections with steeper gradients, where forward visibility is reduced. There are a number of existing signing and lining measures for controlling speed on this road, primarily as a result of the existing characteristics of the carriageway.

3.4.15 **Sandford Road** provides a direct link from Winscombe to Sandford with an average road width of c. 5-6m. The single carriage way allows for two-way traffic along its length and is used for primarily housing and community facilities. These include a community centre, bowling club, food/restaurants at the southern end of the road, access to Winscombe Primary School, and a Royal Mail delivery centre at the northern end. There are

no engineering measures for controlling speed on this road.

3.5 Composition of road users

3.5.1 There is a higher proportion of Heavy Goods Vehicles (HGVs) on the A368 through Churchill and Sandford, as a result of the 7.5t weight restriction through Winscombe. Suitable road widths will need to be maintained as part of the design development of potential traffic calming features to allow for usage by HGVs and Public Service Vehicles.

3.5.2 In addition to vehicular traffic, the A368 and A371 are used by pedestrians and cyclists and provides access to basic facilities (as described above) that provide peoples' daily needs within Sandford, Churchill and Winscombe.

3.5.3 Vulnerable road users include pupils and elderly travelling to and from the following places:

a) Sandford Primary School
b) Winscombe Primary School
c) Churchill Academy
d) Sidcot School
e) The Rainbow Montessori Nursery School
f) The Russets Care Home in Sandford
g) Dunster Court retirement housing complex in Winscombe
h) Winscombe and Banwell Family Practice
i) NCR 33 – The Strawberry Line
j) Leisure facilities

3.5.4 A high proportion of elderly residents is known to exist on Church Road and Winscombe Hill, following engagement with the local community group and parish council.

3.5.5 Survey data relating to existing usage by Walkers, Cyclists and Horse-Riders (WCHs) has been reported on previously in the WCH Assessment Report (BNWLBP-ARP-ENM-XXXX-RP-CH-000001), and has been referred to as part of this assessment.

3.6 Existing traffic speeds

3.6.1 Some of the roads forming part of this assessment are classified as 'traffic sensitive', as shown on the one.network database, indicating that works or activities on these roads are likely to be particularly disruptive to other road users (i.e. are likely to cause congestion and reduced traffic speeds).

3.6.2 It can be inferred from this that the traffic sensitive roads are also likely to be more sensitive to the impacts of traffic calming measures, due to the factors that are necessary for their designation as traffic sensitive (e.g. higher baseline traffic flows, narrow carriageway, higher percentage of HGVs etc[15]). Hence, more minimal traffic calming interventions may be able to achieve the desired/required level of speed reduction on traffic sensitive roads.

3.6.3 The existing posted speed limits for the villages of Churchill, Sandford and Winscombe are shown in Figure 6, Figure 7 and Figure 8 respectively.

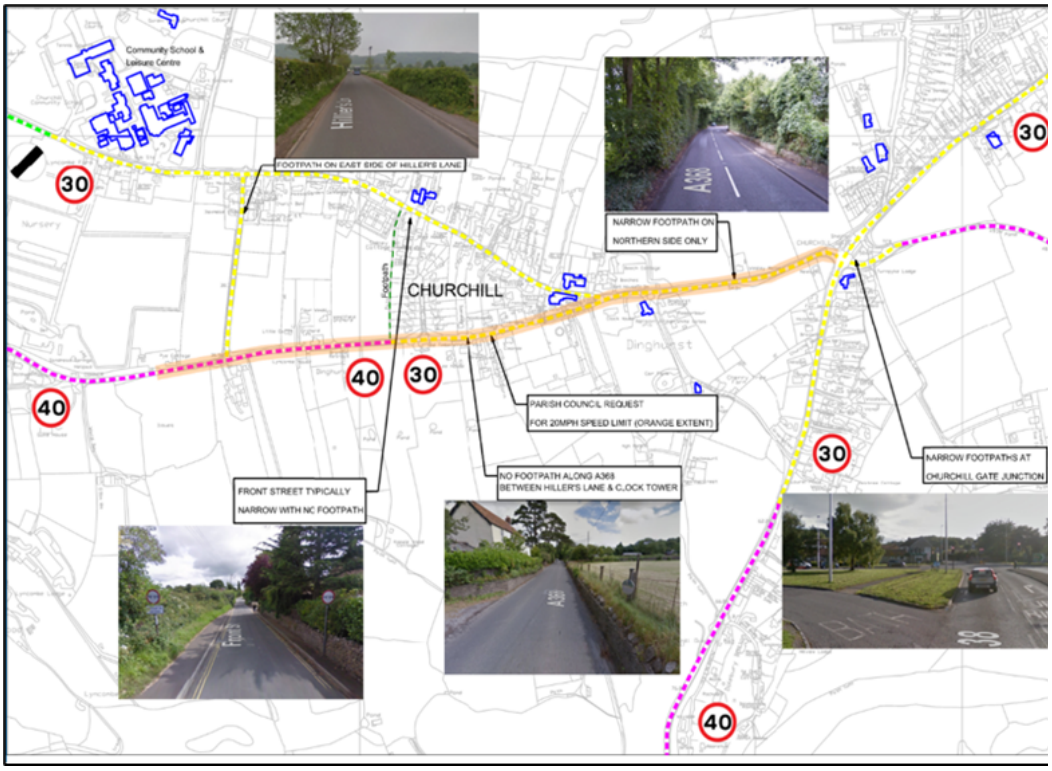


Figure 6 Current Speed Limits for Churchill

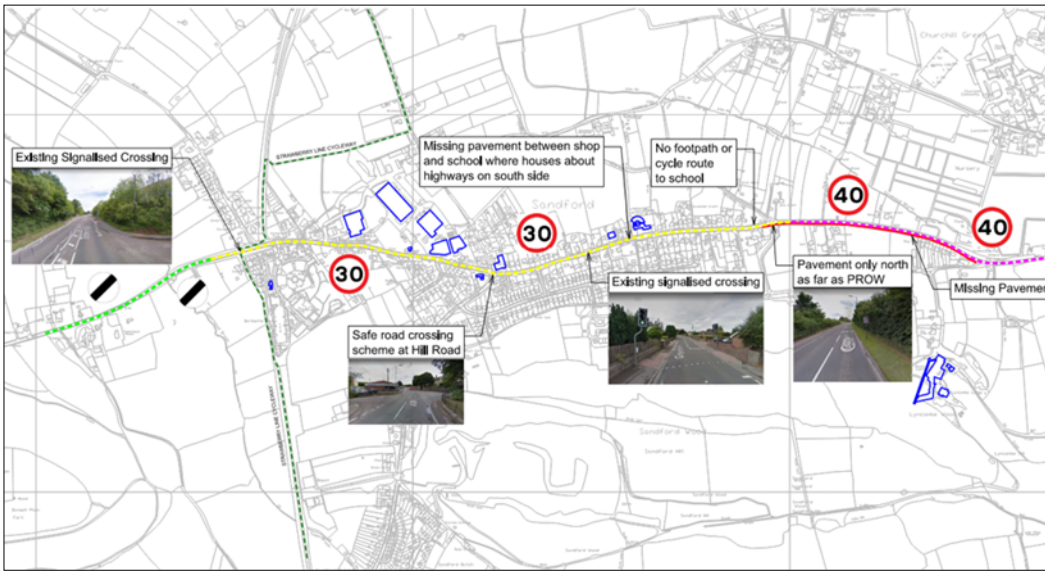


Figure 7 Current Speed Limits for Sandford

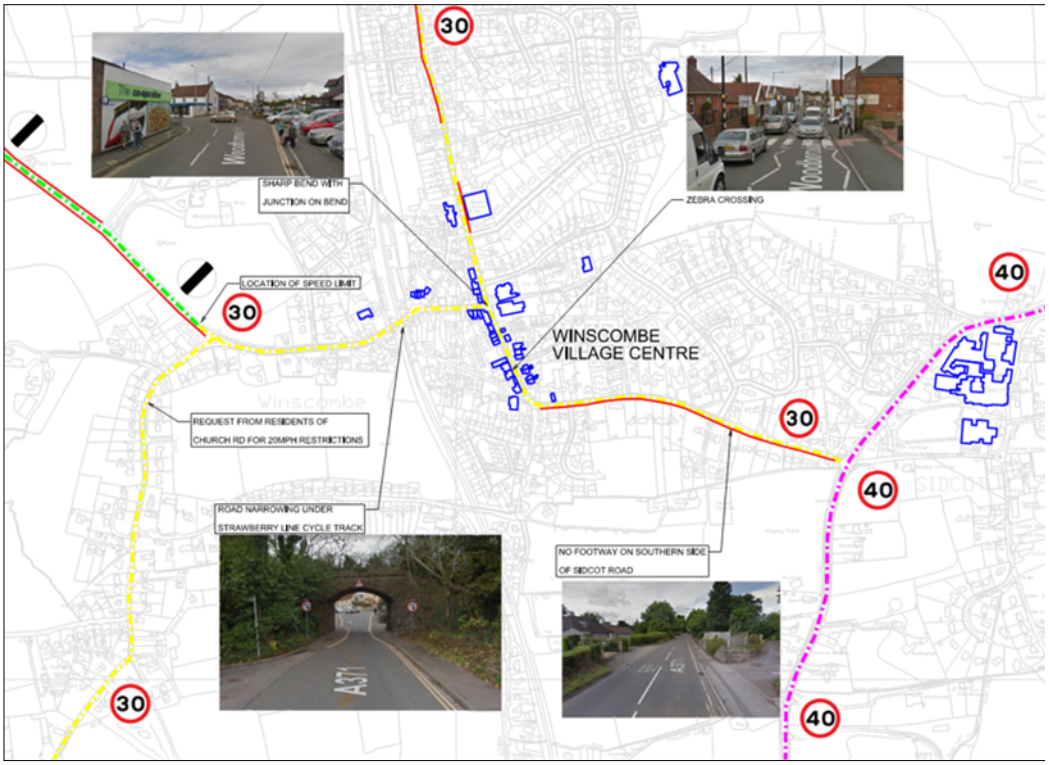


Figure 8 Current Speed Limits for Winscombe

3.7 History of collisions

3.7.1 According to research, reduced vehicle speeds reduce the risk of collisions and casualties and where collisions do occur, there is a lower risk of fatal and severe injury at lower speeds.

3.7.2 Figure 9, Figure 10 and Figure 11 show the accident data[16] for Sandford, Churchill and Winscombe respectively.

3.7.3 The information presented in the figures shows the slight, serious, and fatal accident data for 10 years (2011 to 2020). A 10-year period is being considered in this report to see if there are any trends over a longer period (compared to the normal 5 years) as there have been no significant updates to the road network over this period of time.

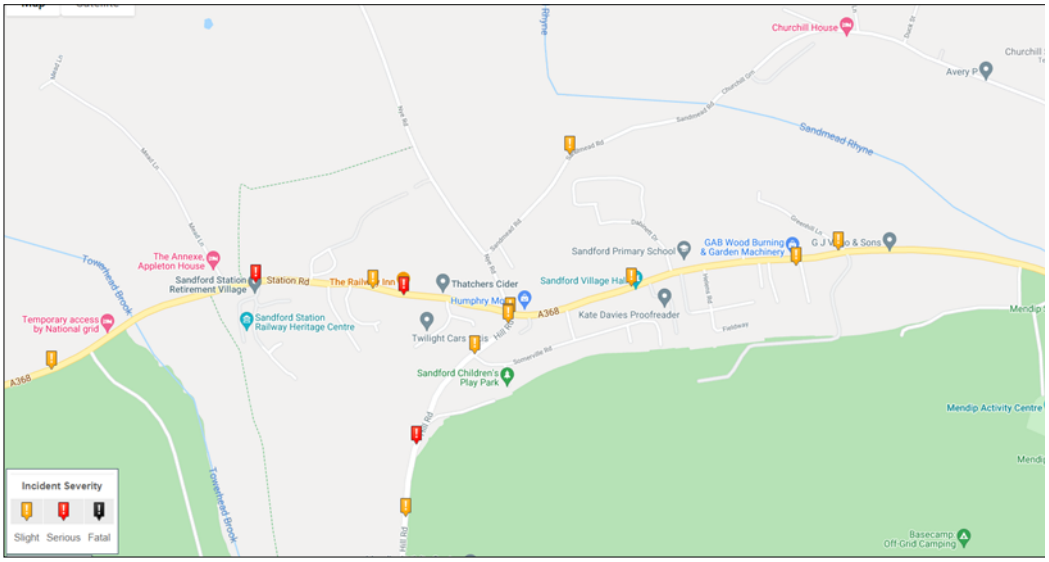


Figure 9 Accident Data, Sandford ©Crashmap

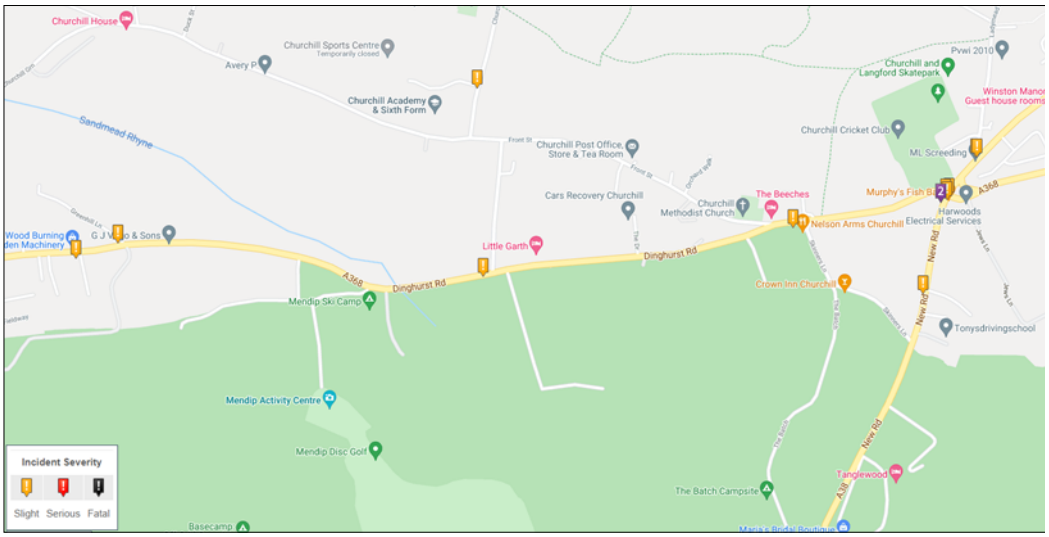


Figure 10 Accident Data, Churchill ©Crashmap

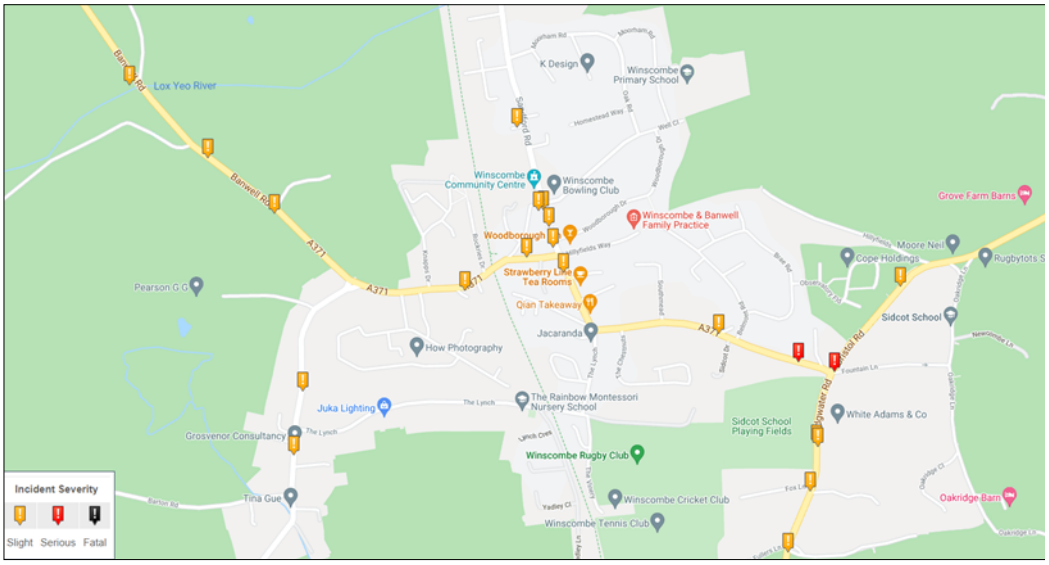


Figure 11 Accident Data, Winscombe ©Crashmap

3.7.4 The data shows that in more recent years (2018 to 2021), there has been a reduction in serious and fatal accidents. Accidents along the relevant road network recently tend to be slight only. It is also clear that year on year, accidents regularly occur along the major road networks therefore supporting the need to improve road safety.

3.7.5 The following section provides an initial review of these accident trends based on this information. A full accident analysis will be undertaken and included in the Transport Assessment (TA).

Sandford

3.7.6 Within Sandford there have been several isolated slight and serious accidents along the A368 towards Sandford, slight accidents along the bend of Castle Hill, and a cluster of accidents at the junction of Hill Road and A368 as shown in Figure 9. No significant clusters or trends involving Walking, Cycling and Horse-riding (WCH) user groups were found in Sandford.

Churchill

3.7.7 Within Churchill there have been a large cluster of accidents at the A368/A38 Churchill Junction as shown in Figure 10. No significant clusters or trends involving Walking, Cycling and Horse-riding (WCH) user groups were found in Churchill.

Winscombe

3.7.8 Within Banwell/Winscombe, isolated slight accidents have occurred along Castle Hill, Bridgwater Road and the A371. There is a cluster of accidents south of the Shipham Lane junction on the A38 Bristol Road and a large cluster of slight accidents in the centre of Winscombe at the junction of Sandford Road and A371.

3.7.9 Most notably, Figure 11 shows that throughout Winscombe, cluster of accidents generally occur where vehicles are entering or exiting onto Banwell Road (A371) and Bristol Road/Bridgwater Road (A38) from other minor roads. A serious collision involving a cyclist in the last five years occurred on 30 July 2017 in dry and light conditions at the A38 Bridgwater Road / A371 Sidcot Lane junction near Winscombe.

3.8 Speed surveys

3.8.1 The following section provides an analysis of the speed surveys per village.

Dataset 1 – Winscombe

3.8.2 Speed surveys[17] were undertaken on the following roads in Winscombe with a posted speed limit (PSL) with a view of introducing of 20mph limits/zones. See Figure 12 for indicative locations. Extracts of the speed information are presented in the tables below.

Table 2 Woodborough Road – between Knapps Drive and Woodborough Grange (new residential development).

Speed summary		Road:		A371 Woodborough Road	
		Existing posted speed limit:		30mph	
Direction	**7 Day Mean Speed**	**7 Day 50th Percentile**	**7 Day 85th Percentile**	**7 Day 95th Percentile**	**Percentage of Vehicles Travelling Over PSL**
Eastbound	26.5	26.5	30.2	33.1	16.24%
Westbound	32.8	32.5	38	42.3	71.43%

Table 3 Church Road – between The Square and the brook (East well).

Speed summary		Road:		Church Road	
		Existing posted speed limit:		30mph	
Direction	**7 Day Mean Speed**	**7 Day 50th Percentile**	**7 Day 85th Percentile**	**7 Day 95th Percentile**	**Percentage of Vehicles Travelling Over PSL**
Northbound	29.3	29.2	35.5	39.9	44.77%
Southbound	23.9	24	28.3	31.3	8.38%

Table 4 Sidcot Lane – between Belmont Road and bus stop

Speed summary		Road:		A371 Sidcot Lane	
		Existing posted speed limit:		30mph	
Direction	**7 Day Mean Speed**	**7 Day 50th Percentile**	**7 Day 85th Percentile**	**7 Day 95th Percentile**	**Percentage of Vehicles Travelling Over PSL**
Eastbound	26.9	27.2	31.2	34	22.76%
Westbound	31.5	31.4	36.6	40.5	62.91%

Table 5 Sandford Road – between the junctions of Broadleaze Way and Wimblestone Road.

Speed summary		Road:		Sandford Road	
		Existing posted speed limit:		30mph	
Direction	**7 Day Mean Speed**	**7 Day 50th Percentile**	**7 Day 85th Percentile**	**7 Day 95th Percentile**	**Percentage of Vehicles Travelling Over PSL**
Northbound	29.6	29.6	34	37.1	45.71%
Southbound	31.9	31.9	37.8	41.9	64.30%

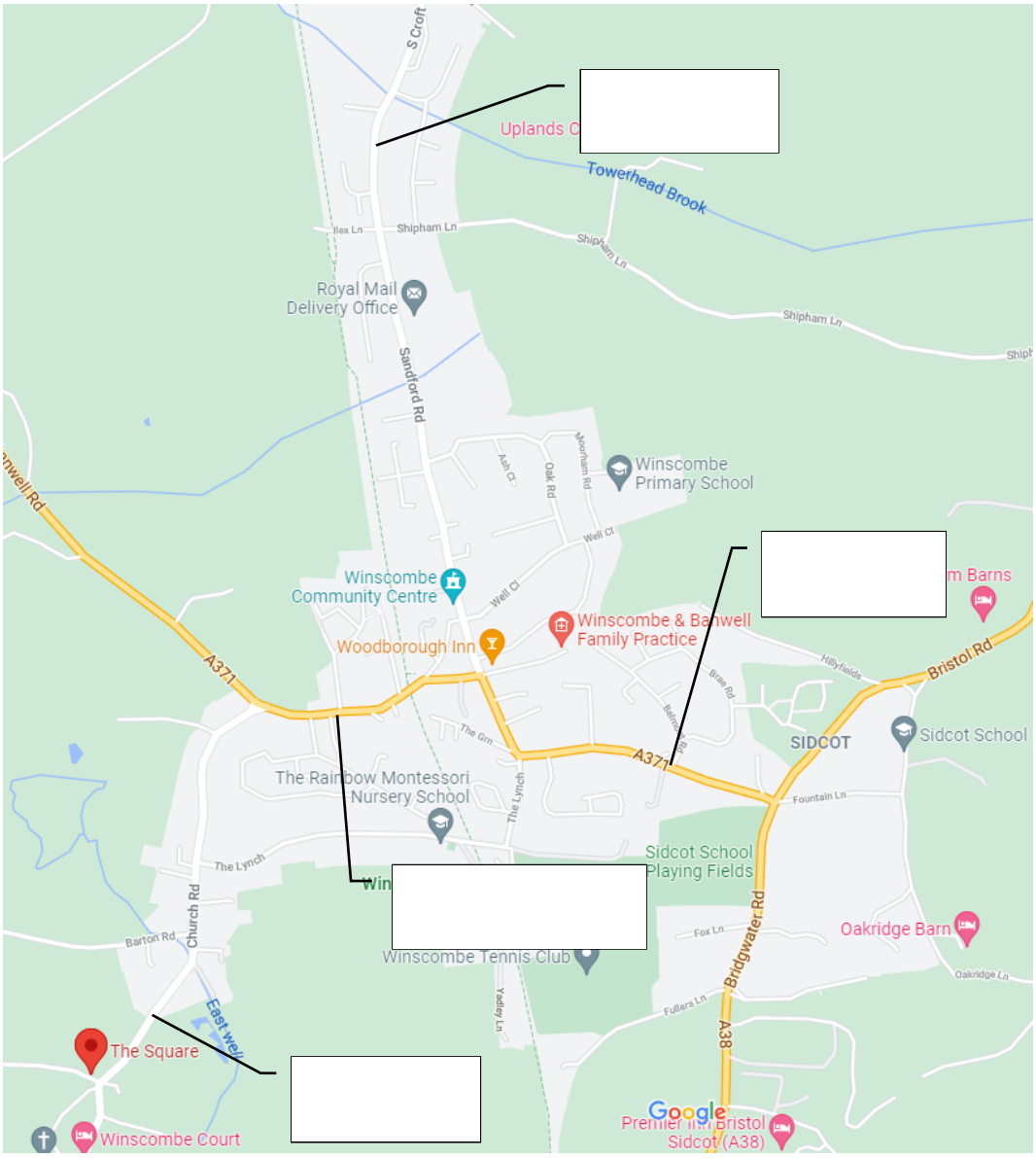


Figure 12 Speed Survey Locations, Winscombe.

3.8.3 The following observations can be made along the A371 based on the data available at survey locations (a) and (c):

a) On average, c. 70% of vehicles are above the posted speed limit on the westbound carriageway and c. 20% on the eastbound carriageway.

b) As shown by the 85th percentile speeds, actual traffic speeds are above the 30mph PSL on the A371.

3.8.4 Under half of the vehicles travel over the PSL along Church Road northbound (and only under 10% on the southbound carriageway). Similar is observed for Sandford Road northbound,

whilst on the southbound carriageway over half the vehicles travel over the PSL. Generally actual traffic speeds are above the 30mph PSL on Sandford Road (as shown by the 85th percentile speeds).

3.8.5 Mean speeds are greater than 25mph in both directions on Woodborough Road and Sidcot Lane, and northbound only on Church Road. In order to implement a 20mph PSL on these roads, traffic calming would be required to comply with NSC guidance to ensure compliance (taken as mean speeds below 24mph) with a 20mph PSL.

3.8.6 As part of the wider mitigation measures in Winscombe, additional pedestrian crossings (zebra crossings) are proposed, which will function as traffic calming features, with drivers needing to slow on approach while determining whether pedestrians are waiting to cross. Raised crossings may also be incorporated into the crossings at detailed design, pending engagement with local bus operators, as the vertical deflection provided by such raising would slow traffic further, but would need to be designed in such a way as to minimise discomfort to bus passengers (typically requiring wider raised crossing areas and shallower ramp gradients, which requires additional space that might not be available). Alternative measures could be considered if raised crossings are not deemed feasible.

3.8.7 On Church Road, the difference in speeds by direction reflects overall longitudinal gradient of the road, as traffic generally travels faster while descending Winscombe Hill northbound (although noting other localised changes in gradient exist). Reducing speeds on these sections should be a priority for traffic calming measures, including further consideration of vertical deflections features (e.g. speed humps), and horizontal deflections (e.g. chicanes, or kerb build-outs) if sufficient width and forward visibility allows within the constraints of the road.

Dataset 2 – Churchill

3.8.8 Speed surveys[18] were undertaken on Hillier's Lane and Front Street in Churchill (during September 2021) – this information has been summarised below. Figure 13 shows indicative locations where the surveys were undertaken.

Table 6 Hillier's Lane – between the junctions of Front Street and A368.

Table 7 Front Street – between the junctions of Hillier's Lane and A368.

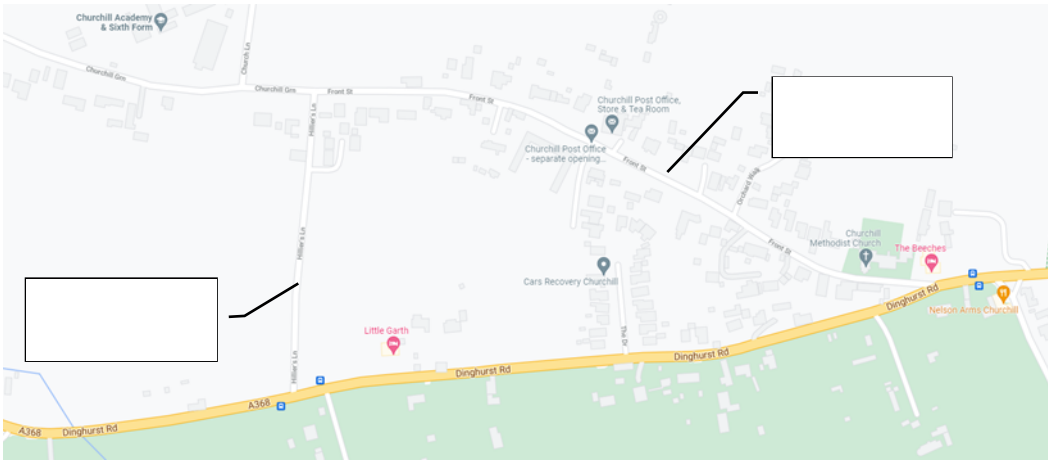


Figure 13 Speed Survey Locations, Churchill.

Table 8 Churchill Green – western end before Church Lane.

Speed summary	Road:	Churchill Green
	Existing posted speed limit:	30mph
Direction	**7 Day Mean Speed**	**7 Day 85th Percentile**

Eastbound	23.2	33.1
Westbound	24.7	33.4

Figure 14 Speed Survey Location, Churchill Green.

3.8.9 Actual traffic speeds on Hillier's Lane are generally below the 30mph PSL, whilst on Front Street 85% of the vehicles travel below the speed limit. Further west along Churchill Green, the 85th percentile exceeds the PSL in the vicinity of Churchill Academy as identified in Figure 14.

3.8.10 Mean speeds on Front Street demonstrate that the road would be suitable for a 20mph PSL implemented with signs only. Similarly, mean speeds on Churchill Green are below the 25mph threshold specified in NSC guidance. On Hillier's Lane however, mean speeds are higher suggesting that compliance would not be achieved with a signed-only 20mph PSL. The need for absolute compliance on this road is considered to differ from the neighbouring roads, due to the lack of trip generators/attractors and improved visibility for drivers, particularly outside of school pick-up/drop-off times, when parked vehicles result in significantly slower, speeds in these periods. Further consideration should be given to the relative costs and benefits of implementing sufficient traffic calming measures to achieve a more substantial speed reduction than could be achieved with a signed-only 20mph PSL.

3.8.11 Further east, a speed survey was carried out on the A368 Dinghurst Road (see Figure 15 for the location). As detailed

below, speeds are generally more than the 30mph PSL in both directions – on a 7-day average, 49% of vehicles are travelling over the PSL eastbound and 71% westbound. 8th percentile speeds are greater than 35mph in both direction, on a 7-day average. The higher speeds in the westbound direction may be explained by the proximity to the existing change in speed limit from 30mph to 40mph west of The Drive (towards Sandford), as drivers often accelerate towards the higher speed limit prior to the formal transition point. The traffic composition by class is summarised in Figure 16.

3.8.12 Mean speeds in both directions are greater than 30mph, so to implement a 20mph PSL on these roads, traffic calming would be required to comply with NSC guidance to ensure compliance (taken as mean speeds below 24mph) with a 20mph PSL. The proposed pedestrian crossing on Dinghurst Road, identified through the development of other wider mitigation measures to address the impacts of the scheme on local communities, is one such measure that will reduce speed below those observed.

Table 9 A368 Dinghurst Road – between The Drive and Front Street

Speed summary	Road: Existing posted speed limit:		A368 Dinghurst Road 30mph	
Direction	**7 Day Mean Speed**	**7 Day 85th Percentile**	**7 Day 95th Percentile**	**Percentage of Vehicles Travelling Over PSL**
Eastbound	30.4	35.1	39.0	49%
Westbound	32.5	37.7	41.7	71%

Figure 15 Speed Survey Location, Dinghurst Road.

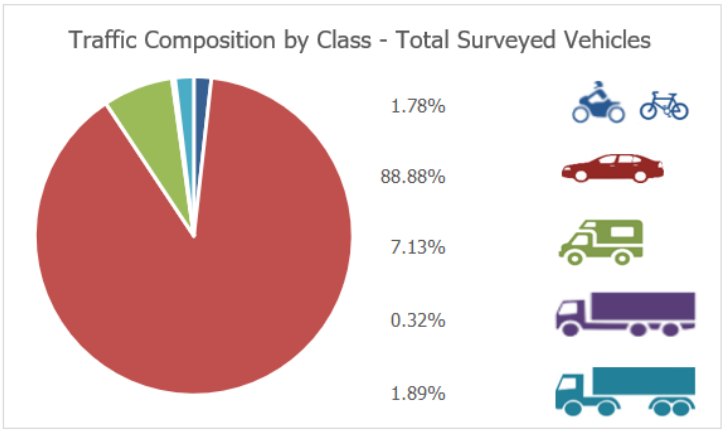


Figure 16 Traffic composition by class, Dinghurst Road

3.8.13 Table 10 provides a summary of the speed data obtained on the 60mph section of Church Lane (c. 50m north from Churchill Academy access road), at the location identified in Figure 17. Traffic speeds here are well within the PSL, demonstrating the existing road conditions do not necessitate the current 60mph national speed limit designation.

3.8.14 Mean speeds are such that relatively minor traffic calming interventions would achieve the required level of speed reduction to ensure compliance with a 20mph PSL in-line with NSC guidance. As part of the wider mitigation measures, a new footway is proposed in the wester verge between the PRoW towards Lower Langford and Churchill Academy, which will reduce the carriageway width and support lower vehicle speeds,

particularly when combined with the uncontrolled pedestrian crossing also proposed.

Table 10 Church Lane – Adjacent to St Johns Church.

Daily Average Speed summary	Road:	Church Lane
	Existing posted speed limit:	60mph
Direction	**7-Day Average Speed**	**7-Day 85th Percentile Speed**
Northbound	26.3	31.2
Southbound	26.5	32.2

Figure 17 Speed Survey Location, Church Lane.

Dataset 3 – Banwell

3.8.15 Table 11 presents a summary of the speed survey information South of Stonebridge Farm on Wolvershill Road (undertaken December 2017). Figure 18 indicates the survey location.

Table 11 Wolvershill Road – near Stonebridge Farm Caravan Park

Daily Average Speed summary	Road:	Wolvershill Road
	Existing posted speed limit:	30mph
Direction	**Average speed**	**85th Percentile speed**
Northbound	33.5	37.8
Southbound	33.0	36.9

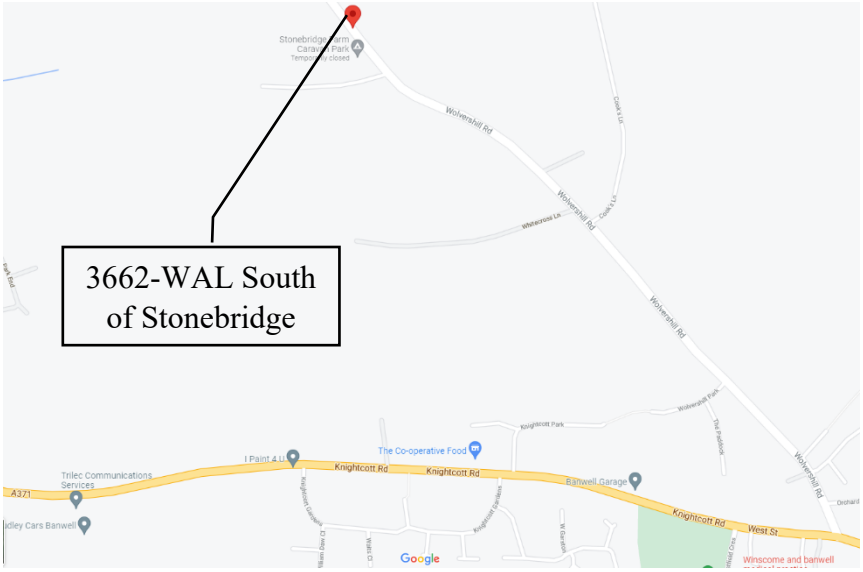


Figure 18 Speed Survey Location, Wolvershill Road.

3.8.16 Daily average speeds along this section of Wolvershill Road are above the 30mph PSL with the average maximum speeds just under 50mph reported in both directions. Traffic calming is therefore required to achieve compliance with a proposed 20mph PSL, in accordance with NSC guidance. This must reflect the potential use of the road as a bus route, which supports the use of horizontal deflections (e.g. narrowings/chicanes) over vertical deflections (i.e. speed humps).

3.8.17 Table 12 provides a summary of the speed data obtained along Riverside Road, at the location identified in Figure 19. It is evident that speeds are generally well within the PSL and average

speeds would support the reduction of the PSL to 20mph with signs only.

Table 12 Riverside Road – prior to Moor Road junction.

Daily Average Speed summary	Road:	Riverside Road
	Existing posted speed limit:	30mph
Direction	**7-Day Average Speed**	**7-Day 85th Percentile Speed**
Northbound	20.3	25.0
Southbound	19.1	23.2

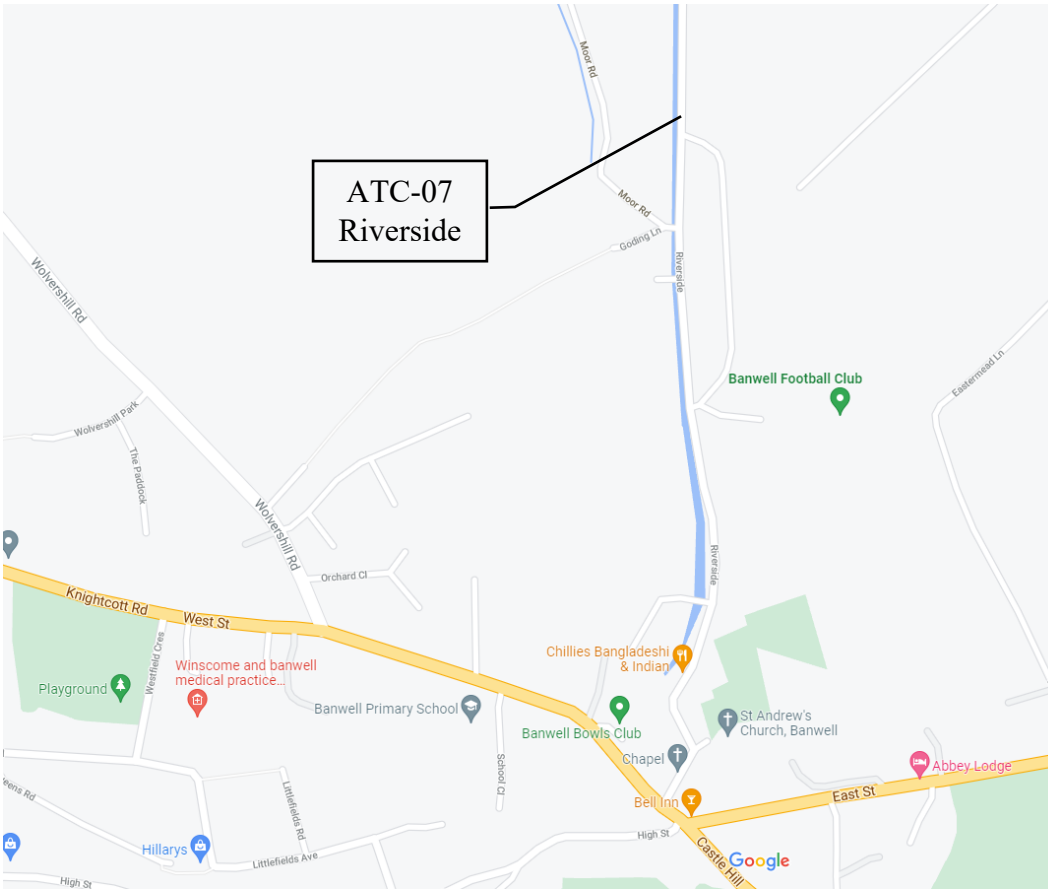


Figure 19 Speed Survey Location, Riverside.

3.8.18 Table 13 provides a summary of the speed data obtained on the 40mph section of A371 Knightcott Road west of Summer Lane, at the location identified in Figure 20. No speed survey data was available further east on Knightcott Road within the 30mph section of Banwell. Traffic speeds at the survey location are well within the PSL, but given the similar characteristics of the 30mph

section of Knightcott Road, compliance with the PSL at that point may not be as good east of Summer Lane.

3.8.19 It is likely therefore that some traffic calming features would be required on Knightcott Road, even once the geometry of a section of the road is modified to tie-in with the proposed western roundabout for the bypass. Such measures must reflect the use of the road as a bus route, which supports the use of horizontal deflections (e.g. narrowings/chicanes) over vertical deflections (i.e. speed humps).

Table 13 A371 Knightcott Road – west of Summer Lane

Daily Average Speed summary	Road:	A371 Knightcott Road
	Existing posted speed limit:	40mph
Direction	**7-Day Average Speed**	**7-Day 85th Percentile Speed**
Incoming	32.1	39.1

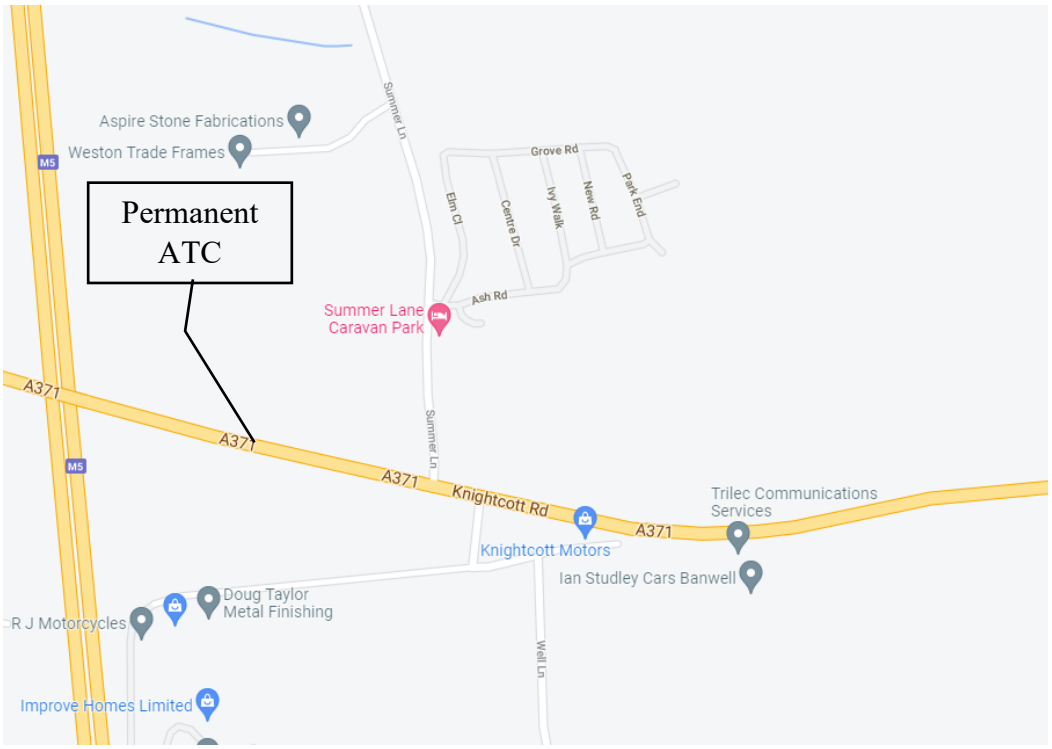


Figure 20 Speed Survey Location, A371 Knightcott Road

3.8.20 Table 14 provides a summary of the speed data obtained on the 30mph section of East Street (adjacent to Eastermead Lane), at the location identified in Figure 21. Traffic speeds here generally exceed the PSL, however, are expected to reduce the closer to

the village vehicles travel, due to the narrowing of the road through the presence of on-street parking, and speed cushions.

3.8.21 It is likely therefore that additional traffic calming features would not be required here, as the geometry of this section of the road would be modified substantially to tie-in with the proposed eastern junction for the bypass, which would slow vehicles both entering and exiting the village.

Table 14 East Street

Daily Average Speed summary	Road:	East Street
	Existing posted speed limit:	30mph
Direction	**7-Day Average Speed**	**7-Day 85th Percentile Speed**
Incoming	28.2	36.7

Figure 21 Speed Survey Location, East Street

3.9 Feedback

3.9.1 A public consultation was undertaken between 5 July and 16 August 2021. The purpose of this consultation was to seek the public's views on the proposed Banwell Bypass including how the public uses the A371/A368 roads and what the existing problems are, and possible additional mitigation or enhancement measures within Banwell and the wider road network.

3.9.2 Out of other measures being considered for the wider network, traffic measures – such as consideration of speed limits, speed limit enforcement measures and traffic calming measures – were ranked almost as important to the public as highway improvements.

3.9.3 Specifically, a popular suggestion for highway improvements included implementing 20mph zones in Sandford, Churchill, Winscombe and Banwell. Other suggestions, which may support this indirectly, included: prohibiting Heavy Goods Vehicles (HGVs); creating safe cycling and walking links between villages, to the Strawberry Line and to the schools; creating safe routes for horse riders; introducing average speed cameras on A368/A371.

3.9.4 From early engagement with the public and through the consultation, there is considered to already be a publicly perceived traffic problem on the A371 and A368. Some of the main concerns raised at the Parish Council Working Group meetings were that: there is existing high speeds of traffic in speed restricted areas, with not all traffic obeying the speed limits, and that access to schools by pedestrians and cyclists is not safe.

3.9.5 Section 3.9 contains further detail on speed enforcement considerations after consultation with Avon and Somerset Police, and addresses the concerns from the public in regard to speed cameras and signage on the A368 through Sandford, and the A371 through Winscombe in particular.

3.9.6 A second public consultation was held from 10 March to 22 April

2022, seeking feedback on the design of the bypass, including the initial proposals for reduced speed limits in surrounding villages. Whilst there was general support overall for the proposed speed limit reductions, there was a range of feedback received around there implementation, including the need for more physical traffic calming measures, and the inclusion of additional roads within the proposals. Changes made to the proposals following the consultation are noted within the summary table in Section 4. Further details of the responses received can be found in the Second Consultation Analysis Report (BNWLBP-ARP-HAC-X_A368WCP_Z-RP-AX-000001).

3.10 Speed Enforcement

3.10.1 Consultation with Avon and Somerset Police on the Force Speed Stance regarding the introduction of speed restrictions has been undertaken which has been written to reflect the current speed environment.

3.10.2 Below states what speed management the police will support and how speed limits will be enforced:

"Speed limits are only one element of speed management and local speed limits should not be set in isolation. They should be part of a package with other measures to manage speeds, which include engineering, visible interventions and landscaping standards that respect the needs of all road users and raise the driver's awareness of their environment, together with education, driver information, training, and publicity.

The police service has to ensure all resources are used effectively in responding to community priorities. Avon and Somerset Constabulary will support all appropriate speed limits, including 20mph roads, where;

a) *The limit looks and feels like the limit, giving visiting motorists who wish to conform that chance;*

b) *The desired outcome has to be speeds at the limit chosen so as to achieve safe roads for other and vulnerable users, not high speeds and high enforcement;*

c) *The limit is self-enforcing (with reducing features) not requiring large scale enforcement;*

d) the limit is only introduced where mean speeds are already close to the limit to be imposed, (24mph in a 20mph limit) or with interventions that make the limit clear to visiting motorists;

e) speeding problems identified in an area must have the engineering, site clarity, and need re-assessed, not simply a call for more enforcement.

3.10.3 Enforcement will be considered in all clearly posted limits, given other priorities, and this will be by:

a) Targeted enforcement where there is deliberate offending and the limits are clear;

b) Where limits are not clear (that is they don't feel like or look like the limit or are on inappropriate roads), they will not be routinely enforced, only targeted where there is intelligence of obvious deliberate disregard which may result in increased threat, harm or risk to other road users.

c) Deliberate high harm offenders will always be targeted and prosecuted whereas enforcement against drivers who simply misread the road may not be appropriate.

None of the above should in anyway leave the impression that we will not enforce the law. As with all speed limits, and other enforcement work, we will use evidence to ensure that our resources are allocated in the most appropriate way using appropriate tactics. Enforcement of limits that do not comply with the above representations could lead to mistaken offending and could risk the loss of public support.

Enforcement cannot and must not take the place of proper engineering and or clear signing."

3.10.4 The current problem in the context of speed enforcement is considered to be in relation to the perception of drivers breaking the current speed limits from residents along the A368 and A371. Accident data shown in Section 3.6, illustrates the number of accidents and their severity over the past 10 years. These are summarised below:

a) Two 'slight' accidents on A368 (Greenhill Rd) in the past 10 years. There have been no serious or fatal injuries and there

does not appear to be any obvious safety issue caused by high speeds.

b) Seven 'slight' accidents, and one 'serious' accident on A371 in the past 10 years. There have been no fatal injuries and there does not appear to be any obvious safety issue caused by high speeds.

3.10.5 Given the low number of accidents of the past 10 years, the proposed engineering design and range of traffic calming measures that can be used to control the new speeds proposed, speed enforcement can be controlled through engineering and visible interventions as per the police requirements. Therefore, it is not recommended that fixed enforcement speed cameras are installed in any location along Greenhill Road or the A371, until further observations are made after proposals are implemented.

3.10.6 Vehicle activated signs can be used to address the problem of speeding which DfT guidance provides a range of solutions and circumstances on which they can be used[19]. Augmentation of vehicle signs could be introduced at a later date if initial monitoring of the proposed reduced speed limits shows a lack of compliance.

3.11 Forecast traffic

3.11.1 The proposed bypass will result in additional vehicles travelling through the surrounding villages. Increased traffic levels result in increased severance, due to increased difficulties crossing roads. This is exacerbated in areas without formal crossing provision, where pedestrians are reliant on waiting for safe gaps in the traffic to cross. Increased severance negatively impacts safe access to services, particularly for vulnerable users, and results in reduced physical activity, reducing human health outcomes.

3.11.2 As such road safety needs of pedestrians, cyclists and horse-riders will be considered particularly due to the increased traffic flows resulting from the proposed Bypass which may increase the likelihood of collisions, particularly in the context of other active travel improvements.

3.11.3 Reductions in traffic may also result in negative impacts,

particularly in locations where they can give rise to higher traffic speeds, for example through Banwell, where mean speeds are lowered significantly by current levels of congestion. In these locations traffic calming will need to be considered to mitigate against potential increased speeds.

3.11.4 The following is a summary of the anticipated changes in Annualised Average Daily Traffic (AADT) volumes for the 2039 forecast year (for roads represented in the traffic model):

a) 70% decrease on A371 through Banwell

b) 2% decrease on Riverside

c) 52% increase on the A368 through Sandford

d) 7% decrease on Hill Road/Sandford Road

e) 22% increase on A368 through Churchill

f) 22% increase on A371 through Winscombe

g) 4% increase on Church Road (Winscombe)

3.11.5 Further modelling of the proposed reductions in speed limits is to be undertaken in the traffic model, with the updated traffic volumes reported at a later date.

3.12 Monitoring

3.12.1 A programme of monitoring is recommended on the roads identified within this assessment following construction of the Scheme to collect data on the effectiveness of proposed speed limit reductions, in addition to the changes in traffic flows as a result of the scheme. When combined with updated collision data, this will enable an assessment to be made as to whether further measures to control vehicle speeds are required in the affected area.

4 Summary

4.1.1 Following the analysis carried out in the previous section, roads where speed limits are recommended to be changed are shown in Figure 22. Table 15 provides a summary schedule of recommendations, including where traffic calming measures are required.

4.1.2 The recommendations are on the basis of the mitigation required as a result of the direct impacts of the scheme on traffic flows, or change in utilisation of specific roads. When considering in further detail the TROs required to implement the changes to speed limits, a wider range of residential side roads / cul-de-sacs within the speed limit reduction should be considered, to provide a consistent approach for local residents in these areas. This could be implemented with minimal need for additional signage, as per national guidelines, or traffic calming, as speeds on this type of roads are likely already be close to 20mph.

4.1.3 The exact detail of the transition points for reduced speed limits, and associated requirements around signing, lining and traffic calming are to be developed further at the next stage of the design process. This may require additional transitional steps down in speed limit where 20mph limits are proposed – e.g. from 60mph to 40mph then to 20mph.

4.1.4 Further consultation will be required to seek political approval from the Executive Member, Local Member, in addition to the Police who will be responsible for enforcement, as set out in NSC's guidance.

4.1.5 Speed limits must be kept under review by traffic authorities as stated by DfT Guidance. A programme of monitoring is recommended on the roads identified within this assessment following construction of the Scheme. Over time, additional 20mph restrictions can be introduced around residential areas in a phased approach to gradually change driver culture in to accepting that, within residential areas the normal speed limit will be 20mph rather than 30mph. Future works programmes following the completion of the scheme may therefore allow for the expansion of a 20mph programme.

Table 15 Recommended speed limit changes

Ref	Area	Road	Road type	Existing PSL	Existing traffic calming measures	Speed survey analysis in Section 3	Recommended change to speed limit	Evidence or reasons for recommended speed limit change and approach to traffic calming	Traffic calming measures required (Yes/No)	Measures to be considered (not exhaustive)
1	Banwell	A371 Knightcott Road/ West Street/ East Street	Primary	30mph	Zebra crossing, speed bumps, narrow carriageway, pedestrian refugee island, roundels, and speed limit signs	No speed survey data was available within the existing 30mph section of Knightcott Road. However, due to the similar character of this section of the road to the 40mph PSL section further west (incoming average 32.1mph, 85th % 39.1mph) where speeds are close to the PSL, compliance with the 30mph PSL is expected to be poor (when uncongested).	20mph	Significant reduction in traffic as a result of scheme is likely to result in higher speeds. Existing mean speeds are above 25mph, so traffic calming measures are required for 20mph compliance, as per DfT guidance[20]	Yes	Build-outs and widened footway to narrow carriageway and create pinch points, in addition to signing and lining. Village gateway.
2	Banwell	Church Street /Riverside	Secondary	30mph	Chicanes, narrow carriageway	Survey results: a) Mean: 20.3mph NB (northbound), 19.1mph SB (southbound) b) 85th%: 25.0mph NB, 23.2mph SB Along Riverside, 85% of vehicles travel at lower speeds than the PSL.	20mph	Amber Road, with high pedestrian usage at its southern end. Existing traffic calming features result in compliant mean speeds.	No	Existing traffic calming features (chicanes) remain suitable. No further measures to be considered beyond signing.
3	Banwell	Wolvershill Road	Secondary	30mph	None	Survey results: a) Mean: 33.5mph NB, 33.0mph SB b) 85th%: 37.8mph NB, 36.9mph SB Speeds are generally above the existing PSL	20mph	Amber Road with some pedestrian usage and caravan park users. Significant reduction in traffic as a result of scheme may result in higher speeds, as existing mean speed not compliant, so traffic calming required.	Yes	Build-outs to narrow carriageway and create pinch points, in addition to signing and lining.
4	Sandford	A368 Towerhead Road/ A368 Station Road/ A368 Greenhill Road	Primary	30mph	Pedestrian crossing	Green Roads do not require speed analysis, as per NSC guidance.	20mph	Green Road with high pedestrian usage and many community facilities and schools. Potential for more pedestrians and cyclist usage with proposed active travel link. Traffic calming measures proposed to support 20mph compliance.	Yes	Signing, lining, planters, carriageway narrowing and widened footway/cycleway (in places) and new pedestrian crossing. Village gateway.
5	Between Sandford/ Churchill	A368 Greenhill Road	Primary	40mph	Pedestrian crossings, narrow carriageway, road markings, 20mph school safety zone	See comment below on Dinghurst Road	30mph	Amber Road with some pedestrian usage and many community facilities and schools. Potential of more pedestrians and cyclist usage with proposed active travel link.	Yes	Signing, lining. Village gateway.
6	Churchill	A368 Dinghurst Road	Primary	30mph	Pedestrian refuge island, narrow carriageway, road markings	Survey results: a) Mean: 30.4mph EB, 32.5mph WB b) 85th%: 35.1mph EB, 37.7mph WB Speeds are generally more than the existing PSL on both sides of the carriageway	20mph	Amber Road with some pedestrian usage and many community facilities and schools. Existing mean speeds are above 25mph, so traffic calming measures are required for 20mph compliance.	Yes	Signing, lining, new pedestrian crossing. Village gateway.

Ref	Area	Road	Road type	Existing PSL	Existing traffic calming measures	Speed survey analysis in Section 3	Recommended change to speed limit	Evidence or reasons for recommended speed limit change and approach to traffic calming	Traffic calming measures required (Yes/No)	Measures to be considered (not exhaustive)
7	Churchill	Hillier's Lane	Secondary	30mph	None	Survey results: a) Mean: 28.9mph NB, 28.4mph SB b) 85th%: 34.5mph NB, 33.4mph SB Actual traffic speeds on Hillier's Lane are generally above the 30mph PSL.	20mph	Amber Road with high pedestrian usage and connects to Front Street and A368 which could be used as a 'rat run'. At peak times (when most vulnerable road users are expected) volumes of school traffic, including parked school buses, restrict vehicle speeds to suitable levels below 25mph. Thus, no further measures are suggested.	No	Signing, lining only
8	Churchill	Front Street	Secondary	30mph	Narrow carriageway	Survey results: a) Mean: 21.7mph EB, 19.6mph WB b) 85th%: 29.2mph EB, 24.8mph WB On Front Street 85% of the vehicles travel below the PSL	20mph	Amber Road with high pedestrian usage and many community facilities and schools Existing traffic calming features result in compliant mean speeds.	No	Signing, lining only
9	Churchill	Churchill Green	Secondary	30mph	Narrow carriageway	Survey results: a) Mean: 23.2mph EB, 24.7mph WB b) 85th%: 33.1mph EB, 33.5mph WB Actual traffic speeds in the vicinity of Churchill Academy exceed the existing PSL	20mph	Amber Road with high pedestrian usage, providing access to Churchill Academy Existing traffic calming features result in compliant mean speeds.	No	Signing, lining only
10	Churchill	Church Lane (south)	Secondary	30mph	None	See below	20mph	Road would be used to connect to proposed active travel route towards Lower Langford	Yes	Signing, lining, carriageway narrowing (through widening of footway),
11	Churchill	Church Lane (north)	Secondary	60mph	None	Survey results: a) Mean: 26.3mph NB, 26.5mph SB b) 85th%: 31.2mph NB, 32.2mph SB Along Church Lane, 85% of road users travel under the PSL	20mph	Road would be used to connect to proposed active travel route towards Lower Langford. Pedestrian and cyclist usage due to the church and Churchill Academy & Sixth Form. 60mph PSL is excessive based on speed readings, but traffic calming is required for 20mph compliance.	Yes	Signing, lining, carriageway narrowing (through widening of footway), pedestrian crossing
12	Winscombe	A371 Woodborough Road/Sidcot Lane	Primary	30mph	On street parking, zebra crossings and a sharp bend in road.	Survey results Sidcot Lane: a) Mean: 26.5mph EB, 32.8mph WB b) 85th%: 30.2mph EB, 38mph WB Survey results Woodborough Rd: a) Mean: 26.9mph EB, 31.5mph WB b) 85th%: 31.2mph WB, 36.6mph WB Actual traffic speeds are above the existing PSL on the A371.	20mph	Amber Road, which has high pedestrian and cyclist usage. Existing mean speeds are above 25mph, so traffic calming measures are required for 20mph compliance	Yes	Signing, lining, new zebra crossing. Village gateway.
13	Winscombe	Church Road	Secondary	30mph	Narrow carriageway,	Survey results:	20mph	Amber Road with high pedestrian usage.	Yes	Signing, lining, vertical deflections

Ref	Area	Road	Road type	Existing PSL	Existing traffic calming measures	Speed survey analysis in Section 3	Recommended change to speed limit	Evidence or reasons for recommended speed limit change and approach to traffic calming	Traffic calming measures required (Yes/No)	Measures to be considered (not exhaustive)
					sharp bends, road markings	a) Mean: 29.3mph NB, 23.9mph SB b) 85th%: 35.5mph NB, 28.3mph SB Nearly half of the vehicles travel over the PSL along Church Road NB (and only under 10% SB)		Existing mean speeds are above 25mph NB, so traffic calming measures are required for 20mph compliance		
14	Between Sandford/ Winscombe	Sandford Road	Secondary	30mph	None	Survey results: a) Mean: 29.6mph NB, 31.9mph SB b) 85th%: 34mph NB, 37.8mph SB Generally actual traffic speeds are above the 30mph PSL on Sandford Road	None	Limited impact on a traffic flows as a result of scheme, and general compliance with existing PSL means no change is proposed.	N/A	N/A
15	Sandford	A368 Towerhead Road	Primary	60mph[21]	None	N/A – change introduced following consultation feedback	30mph eastbound 30/40mph westbound	To provide transition from national speed limit to 20mph, and reduce speeds adjacent to active travel route on eastern section of Towerhead Road	Yes	Road narrowing created by construction of active travel route partly within verge. Village gateway.
16	Churchill	King Road	Secondary	60mph	Sharp bends and narrow carriageway where Church Lane becomes King Road	N/A – change introduced following consultation feedback	20mph	Consultation feedback identified benefit in moving 20mph gateway proposed on Church Lane further north onto King Road	Yes	Existing features suitable. Roundels and signing only.
17	Winscombe	The Lynch	Secondary	30mph	On street parking and narrow carriageway.	N/A – change introduced following consultation feedback	20mph	Consultation feedback identified strong support for extending 20mph in Winscombe to include The Lynch, to prevent rat-running	Yes	Existing features suitable. Signing and lining only.
18	Winscombe	Parsons Way	Secondary	30mph	Narrow carriageway	N/A – change introduced following consultation feedback	20mph	Consultation feedback identified strong support for extending 20mph in Winscombe to include Barton Road. 30mph transition from National Speed Limit to also be provided.	Yes	Existing features suitable. Village gateway and signing and lining only.
19	Winscombe	Barton Road	Secondary	30mph	Narrow carriageway	N/A – change introduced following consultation feedback	20mph	Consultation feedback identified strong support for extending 20mph in Winscombe to include Barton Road. 30mph transition from National Speed Limit to also be provided.	Yes	Existing features suitable. Signing and lining only.
20	Winscombe	A371 Banwell Road	Primary	60mph	N/A	N/A – change introduced following consultation feedback	30mph	To provide transition from national speed limit to 20mph entering Winscombe	No	N/A

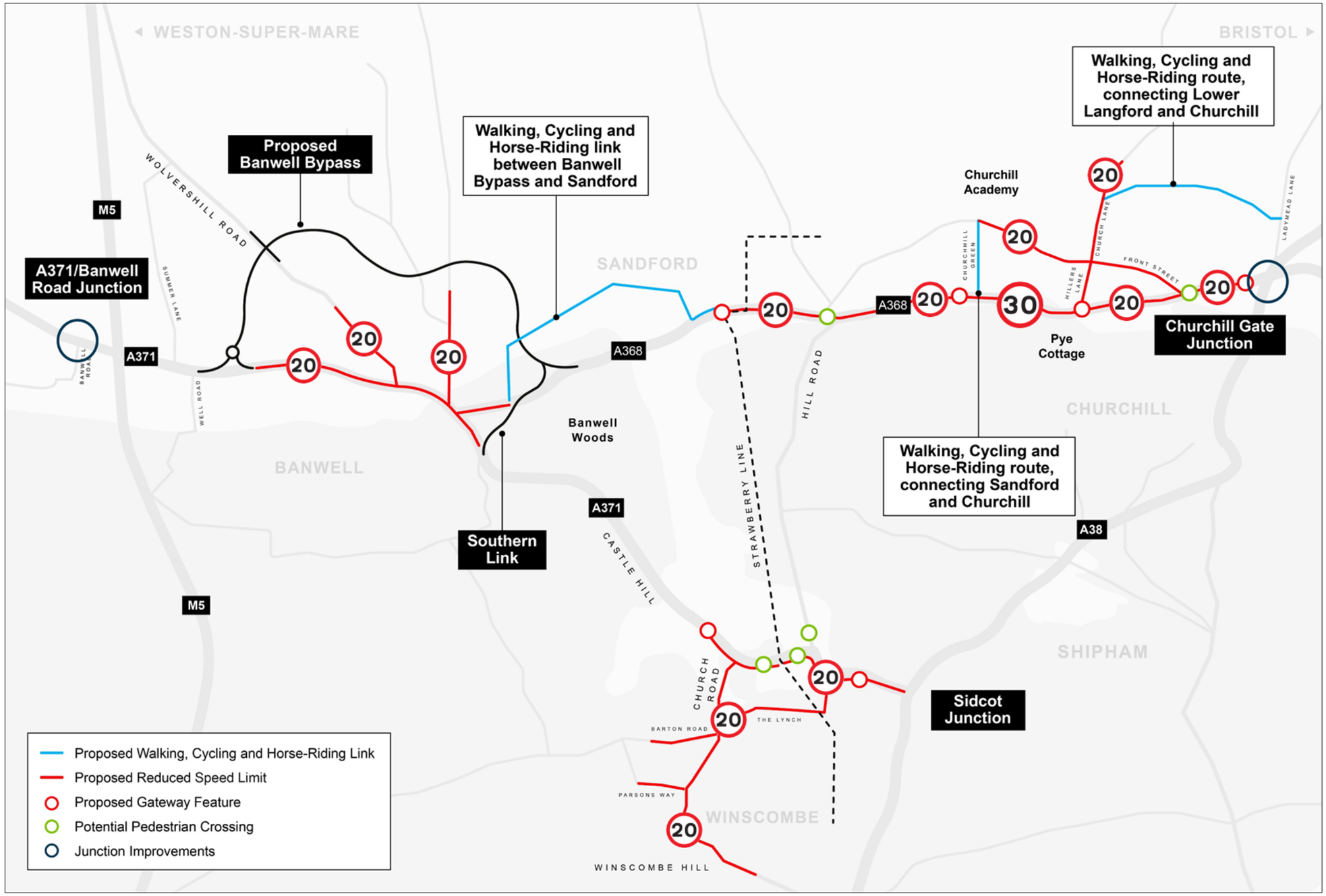


Figure 22 Proposed speed limit changes to address Scheme impacts

5 Reference

5.1.1 [1]https://www.gov.uk/government/publications/setting-local-speed-limits/setting-local-speed-limits [Accessed online 19 January 2022.]

5.1.2 [2] https://www.gov.uk/government/publications/reallocating-road-space-in-response-to-covid-19-statutory-guidance-for-local-authorities/traffic-management-act-2004-network-management-in-response-to-covid-19 [Accessed online 12 April 2022]

5.1.3 [3] https://www.rospa.com/media/documents/road-safety/a-guide-to-20mph-limits.pdf [Accessed online 18 May 2022]

5.1.4 [4] DfT Circular 01/2013 Setting Local Speed Limits (January 2013)

5.1.5 [5] Statutory guidance Traffic Management Act 2004: network management to support active travel, updated 1 April 2022. Accessed: https://www.gov.uk/government/publications/reallocating-road-space-in-response-to-covid-19-statutory-guidance-for-local-authorities/traffic-management-act-2004-network-management-in-response-to-covid-19

5.1.6 [6] For 20mph limits, the identified roads require existing mean speeds to be 24mph or less (in accordance with DfT guidance). Meeting this criterion should be exercised by judgement instead of taking speed readings.

5.1.7 [7] As suggested in the local guidance, roads with observed speeds of 25mph would be acceptable for a signed only limit because a reduction of vehicle speeds by 1mph can be expected with signs alone.

5.1.8 [8] If the PC require these roads to be included, a cost estimate for the traffic calming measures should be provided for their consideration and funding.

5.1.9 [9] A maximum distance of 200m between consecutive signs on alternate sides of the carriageway, or a maximum distance of 300m between consecutive signs on the same side of the carriageway.

5.1.10 [10] Traffic calming measures can consist of the following as identified in the local guidance: Road Humps, Build Outs, Chicanes, Gateways, Pedestrian Islands, Overrun Areas, Pinch Points, Rumble Devices, Upright 20 signs, Painted 20 roundels, Natural calming such as Narrow Roads, (5.5m) or Sharp Bends etc.

5.1.11 [11] If the Accident Record shows there has been at least 3 personal injury accidents in the last five years with excessive speed as a causation factor.

5.1.12 [12] Setting Local Speed Limits – Surrey County Council's Policy, December 2013. Available at: https://mycouncil.surreycc.gov.uk/documents/s12562/ROAD%20SAFETY%20POLICY%20Ann%20A%20Local%20Speed%20Limits.pdf Accessed 17 January 2022

5.1.13 [13] As suggested in the Setting Local Speed Limits Department for Transport Circular 01/2013

5.1.14 [14] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918429/ltn-1-07_Traffic-calming-guidance.pdf

5.1.15 [15] In line with the requirements of the New Roads and Streetworks Act 1991 (Section 64) and the Geo-place Traffic Sensitive Streets Guidance Notes (2017). Accessed at: https://static.geoplace.co.uk/downloads/JAG-UK-Traffic-Sensitivity-guidance-notes.pdf

5.1.16 [16] Sourced from www.crashmap.co.uk.

5.1.17 [17] Each survey was undertaken for a duration of seven days during October 2021. Source: Winscombe and Sandford PC.

5.1.18 [18] As part of a planning application for housing on Front Street and Church Lane (ref. 21/P/2049/OUT). Source: https://planning.n-somerset.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=QWHPQDLPGKB00. [Accessed online 25 January 2022.]

5.1.19 [19] https://webarchive.nationalarchives.gov.uk/ukgwa/20120606202850/http://assets.dft.gov.uk/publications/tal-1-03/tal-1-

03.pdf

5.1.20 [20], DfT guidance states that signed-only 20mph limits are most appropriate for areas where speeds are already low, with means speeds at or below 25mph, as research has shown that terminal and repeater signs will lead to general 20mph PSL compliance on these roads. NSC guidance states that 20mph limit will be considered (without traffic calming) on roads with a mean speed of up to 25mph, as compliance is considered as a reduction to of mean speed to 24mph below (which would be expected to be achieved with signs only). Where mean speeds are above 25mph, traffic calming measures are required to bring down actual speeds to comply with 20mph in accordance with local NSC guidance. DfT guidance does not however preclude the introduction of 20mph limits on roads with these limits, as there are still benefits in terms of speed reduction, even if the reduction is not of a sufficient magnitude to ensure general compliance with the 20mph PSL.

5.1.21 [21] A section of A368 Towerhead Road is currently subject to a temporary 30mph speed limit for the construction access for National Grid, which would revert to 60mph national speed limit once construction of the National Grid works is complete. The Scheme proposes to retain these temporary restrictions, with the amendments proposed.