



Benson Parish Council
Serving Our Community

Benson Neighbourhood Plan Plan Revision 2022-2035

Submission Version - Sept 2022

Appendix F - Transport Assessment

Appendix F was created for the Original Plan adopted in August 2018 and has been slightly updated in this Plan Revision to reflect developments since that time.



Appendix F – Transport Assessment

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1. Rationale

During the development of the Benson Neighbourhood Plan, it became clear that significant development outside Benson (e.g. Chalgrove Airfield, Berinsfield & Culham) could have serious traffic flow implications for the ancient road system in the centre of Benson. These developments, combined with the increase in Benson housing numbers and the general increase in housing numbers across the district, made it evident that the potential of a new Relief Road would feature heavily in the Plan. This specific study was considered necessary to provide a focused analysis of this Relief Road proposal, although supporting material appears in other sections as well.

2. The Current Context

Benson's Strategic Location

The location of Benson in the highway network is the key to many of its issues.

- Benson lies alongside the A4074, a principle route running north/south between Reading and Oxford.
- It is also approximately halfway along the B4009, a remarkably long B-road connecting Newbury with the Chilterns. The road runs east/west linking the M40 with the A4074/A34/M4 and the highway network around Oxford.

As a result, it is not only the traffic generated by developments in Benson which need to be considered here, but also traffic from developments across the wider area.

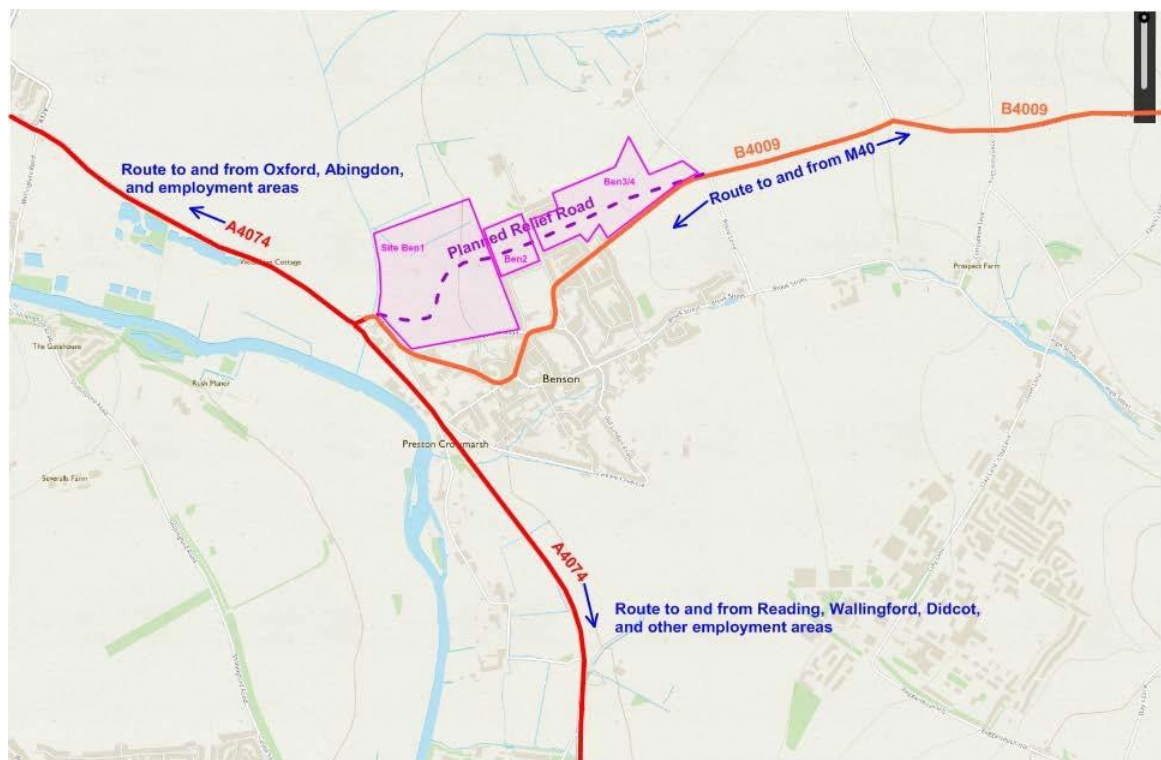


Figure 1 - Benson's Current Road System

Benson's Current Road System

This is described fully in section 9.4 of the Neighbourhood Plan, but is essentially an historical system with more recent estate roads added. The most recent major change was the de-trunking of the A4074 in 1993 when the Crowmarsh By-Pass was completed. Benson village centre has a complex arrangement of junctions which must be navigated by both local and through traffic – including children walking to school and to other village facilities.

Journey Patterns

Modern Benson is a typical commuter village, with very little employment in Benson and many working people commuting to work. The Community Questionnaire of 2016 (Appendix D) showed that 56% of respondents commuted to work and 74% of these used their car. Travel directions reported by these car drivers were 38% south on the A4074, 30% north on the A4074 and 20% east on the B4009 towards Watlington.

Pinch Points

The Traffic Flow Pinch Points are described in detail in sections 9.4.1 to 9.4.10 of the Neighbourhood Plan and in Appendix F1. These points are under pressure now, as will be shown in the queuing data as well as the Flow Data in Appendix F2.

The Existing Traffic Situation

There have been several Traffic Flow studies taken in Benson in 2016/17 associated with various planning applications. The traffic data used here is taken from the TA produced by Motion for the DWH application P17/S1964/O and is reproduced with their kind permission.

This Study examines the traffic flow at four key junctions in Benson, with the numbering being taken from the TA for simplicity.

2016 Base Level Traffic Flows		
	AM Peak Hour	PM Peak Hour
J1 A4074/Oxford Road	2116	2099
J3 A4074/Church Road	2171	2090
J5 Church Road/Oxford Road	968	1044
J6 Castle Square	969	853

3. The Future

In considering the future, it is appropriate to take into account not only Benson's proposed sites, but also likely developments outside Benson which will seriously affect the village.

These include:

- Local Sites (e.g. Watlington, Wallingford)
- Strategic Sites (e.g. Chalgrove, Culham, Berinsfield)
- Sites likely to use the B4009 (e.g. Chinnor, Cholsey)

Full details of all these are listed in Appendix F3, but it will be noted that together they add up to over 13,000 homes. All of these sites will generate vehicle movements along the B4009 to varying degrees.

4. Impacts

Notwithstanding the efforts being made with regard to sustainable transport, the transport impacts of the above future developments may be summarised as:

- More cars
- More journeys to/from work and school
- More Parking problems in certain areas
- Road Safety Issues at key junctions
- Air Quality Issues at certain junctions from queuing traffic

Anticipated Traffic Impact

A simple illustration of the impact is shown in an analysis of the traffic on the B4009 at the time of the Original NP and projected for 2033. The details of this are shown in Appendix F4 and include traffic from the Benson sites being brought forward by the NP, together with potential traffic from Chalgrove & Watlington. It does not include the other sites listed in Appendix F3 and is therefore likely to be a very conservative estimate.

Anticipated Traffic Growth on B4009 Benson/Watlington		
	AM Peak	PM Peak
2016 Baseline – both directions	680	720
Background growth to 2033	55	57
Site Ben 1 Phase I and II	45	45
Sites Ben 2/3/4	30	30
Anticipated Watlington growth	30	30
Anticipated Chalgrove development traffic	130	130
Increase in traffic	290	293
Revised total traffic	970	1012
Percentage Increase	43.00%	45.00%

These calculations show an increase in traffic for this period along the B4009 in Benson of more than 43%.

A traffic projection for the four key junctions in Benson, showing traffic growth over the 15-year period of the Plan is provided in paragraph 8 of this Appendix.

5. Options to Deal with these Impacts

New Relief Road

The plans for a Relief Road have now been approved and the construction of the new road will be fully funded by the developers and OCC. Construction is now underway with an anticipated completion date of 2025. The new Relief Road will be re-designated as the B4009 and will resolve many of the problems currently encountered at Pinch Points in the village.

The new Relief Road will avoid the existing pinch points in the historic centre of Benson, while still linking the new development sites to the village. The road will to be constructed to OCC Highways standards with a 2m Footway, a 1.5 Cycleway separated from the carriageway by a 'Cambridge Kerb' and a 3.75m Carriageway in both directions – as shown below.



Widening of Pinch Points

Of the Pinch Points mentioned in Appendix F1, most are at narrow historic junctions where no realistic improvement is possible. At the entrance to Castle Square for example, the road width is only 4.7 m with buildings on either side and a pavement width of 0.6m.

Other Planned Mitigations

Along with the new Relief Road and a recently approved 'Toucan Crossing' on the A4074, an application for a 20mph Zone in the village has been submitted to OCC for approval. The plan for the Toucan crossing will require alteration of the junction of Church Road with the A4074.

Alternative Transport Options

Given that there is no commercial river transport and no commercial air service from the airfield, any realistic alternative transport options will have to be based on public transport. Consideration has therefore been given to two planned transport initiatives – the proposed new Park & Ride south of Oxford (para 9.5.4 in the Neighbourhood Plan refers) and an improved strategic public transport service through Benson (para 9.6.4 in the Neighbourhood Plan refers). The new Park & Ride is scheduled to open at Sandford in 2025 and we will promote its use to our community from the previous year. We have lobbied the Oxford Bus Company to divert some of its bus services to pick up passengers

from our new developments. So far, they have not been willing to countenance this, on the grounds that such a diversion will increase journey times, but we will continue to press for some form of compromise on this, as our development sites come on stream.

6. Delivering the Relief Road

The three developers involved with sites BEN1, BEN 2 and BEN 3 & 4 have each agreed to fund & construct the section of the new road transiting their sites. OCC Highways will construction and link the Relief Road with the A4074 at the Elmbridge Roundabout and with the B4009 on the Sands. The new Relief Road will be redesignated as the B4009. This will be a significant new piece of highway infrastructure provided at no cost to the taxpayer. In our discussions with the developers over all this, they have been supportive and committed to the Relief Road as an integral part of their developments.

7. Effect of the Relief Road

All traffic data in this section is again taken from the previously quoted TA by Motion.

The following table illustrates the projected traffic at the four key junctions in Benson as follows

- A Base Level of 2016 Traffic
- Projected 2023 Traffic with Littleworth Road mitigation included
- Projected 2033 Traffic with Relief Road and all NP sites included

	AM Peak Hour			PM Peak Hour		
	2016 Base	2023	2033	2016 Base	2023	2033
J1 A4074/Oxford Road	2116	2440	2950	2099	2447	3034
J3 A4074/Church Road	2171	2471	2817	2090	2404	2799
J5 Church Road/Oxford Road	968	935	939	1044	1003	1009
J6 Castle Square	969	875	916	853	728	772

Analysis:

- Traffic at J1 and J3 sees a large growth over the 15-year period as development increases
- Traffic at J5 and J6 reduces slightly by 2023 due to the introduction of the Littleworth mitigation
- Traffic at J5 and J6 sees a decrease in traffic levels by 2033 as the Relief Road takes effect

Note:

Motion assumed that traffic using the Relief Rd in 2033 would be 50% of the potential traffic, but this could vary or be influenced by traffic management in the future.

Traffic modelling in the TA shows a queuing issue with traffic on Church Road accessing

■ Benson Parish Neighbourhood Plan

■ 2018-2033

the A4074. However, it suggests that the introduction of a light controlled pedestrian crossing near the Marina would assist in creating gaps in the traffic on the A4074. We expect this will be achieved by the A4074 Toucan Crossing project to be implemented by OCC in 2022.

Finally, with regard to overall effect, the Relief Road will ensure that the key plan objective (referenced in Para 9.1 above) of “ensuring that new development contributes towards the free and safe flow of traffic whilst having a minimum impact on the existing roads system and on parking in the village” is fully met.

8. Summary

- a) It is evident that development in Benson and the surrounding areas will be high, and that this will generate additional high volumes of traffic along the B4009.
- b) The new Relief Road currently under construction will route the traffic away from the existing pinch points and avoid the historic village road system.

Appendix F1 - Traffic Flow Sensitive Points

The tables below analyse traffic flow for a number of Benson's key sites of concern. The data comes from two sources:

- Traffic Surveys conducted in 2016 by Motion on behalf of David Wilson Homes, as key inputs to their planning application
- Highways Traffic Surveys by Glanville Group in October 2020, commissioned by Benson Parish Council, as a prerequisite for 20mph Zone discussions and subsequent submission to OCC.

Note the Glanville Group survey work took place in October 2020, during a period of restrictions due to the Covid pandemic, and some traffic volumes will have been affected.

1. Castle Square

This is the junction of the B4009 Oxford Road, the High Street, Church Road and Watlington Road. It is the busiest junction inside the village and a main crossing point for school children and parents walking to school.

The severe bend on the Watlington Road side, together with the narrowness of the road (less than 5m) means large vehicles cannot pass side by side, which creates tailbacks in busytimes.

The junction with Church Road in the vicinity of the War Memorial is a busy junction at peak hours, without any pedestrian crossing points.

Survey Data (2020 only) for Oxford Road and Church Road into/out of Castle Square

Roads Surveyed	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
Oxford Road (Oct 2020)	3566	4.95	356	5.93	372	6.2
Church Road (Oct 2020)	5403	7.5	503	8.38	548	9.13
Combined (Oct 2020)	8969	12.45	859	14.3	920	15.3

2. Church Road / A4074 (including traffic out of St Helen's)

The junction at the southern end of Church Road is a busy junction with the A4074. This junction is one of Benson's busiest road junctions at peak hours, with any vehicle turning right onto the A4074 against the flow of traffic creating a tailback. Much of the traffic routing through Benson onto the A4074 main road from Church Road is turning left for Reading/Henley. This junction is made worse by traffic entering/exiting St Helens Avenue just a few metres from the junction.

The congestion is exacerbated whenever there is any Church event, due to on-road

parking outside of the Church, and such events can take place any day of the week. The traffic congestion at this junction will be alleviated when the new Relief Road is completed and redesignated as the B4009 providing a more efficient through route.

Traffic turning right out of Church Road onto the A4074 towards Oxford, has a detrimental effect on traffic waiting to turn left for Reading and creates delays. The provision of the new Relief Road and the redesign of the junction together with the introduction of the 'Toucan' Crossing should help resolve this situation.

The introduction of the 'Toucan' Crossing on the A4074 will resolve the safety issues for pedestrians crossing the A4074 to access the Riverside areas and Bus Stop.

Survey Data for Church Road/A4074 junction

	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
A4074 (July 2016)	16573	23	1967	32	1936	32
A4074 (Oct 2020)	11294	15.68	1086	18.1	1081	18
Church Rd (July 2016)	5425	8	575	9	629	10
(Oct 2020)	5403	7.5	503	8.38	548	9.13

3. Watlington Road / Littleworth Road Junction

This the junction of the Watlington Road with Chapel Lane, Littleworth Road, and Sunnyside.

It is not possible at this stage to quantify all the traffic using this junction, largely due to its complexity, however the OCC Surveys consistently show Watlington Rd to be the busiest road in Benson village.

Increased traffic exiting from Sunnyside and Littleworth Road could create safety issues in peak traffic.

The new Relief Road when completed and redesignated as the B4009 will provide a more direct route through Benson, reducing the traffic flow in this area.

The figures below were taken prior to the commencement of BEN 1 Phase I & II, and do not take into account the extra traffic which that development will generate.

Survey Data for Watlington Road/Littleworth Road Junction

	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
Watlington Road (2016) Figures taken prior to the commencement of BEN1 development	6142	8	684	11	724	12
Watlington Road (2020)	5254	7.29	542	9	570	9.5
Littleworth Road (2016)	881	2	112	2	131	2

Note: This junction is also used to access the Parish Hall car park as well as Sunnyside itself and, when an event is being held, the traffic exiting the B4009 through this junction is considerable.

4. Oxford Road near Benson School

This stretch of the B4009 is problematic at certain times of day as it runs directly past Benson School. Hence at school drop off and pick up times (0815-0900 and 1430-1530 respectively) traffic can be heavy and extremely congested while at other times it is low and flows smoothly.

The parking outside the school in effect creates a single lane stretch of road, which slows traffic down but creates congestion. Parking spills over into adjacent roads (e.g., Horseshoes Lane) creating further problems.

Survey Data for Oxford Road near Benson School

	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
Oxford Road out of village (2016)	2238	3	270	4	252	4
Oxford Road out of village (2020)	1974	2.74	209	3.5	181	3
Oxford Road into village (2016)	1108	2	99	2	143	2
Oxford Road into village (2016)	1592	2.2	147	2.45	191	3.18
Combined (out of village)	3346	5	369	6	395	6
Combined (into village)	3566	4.95	356	5.9	372	6.2

5. High Street / Brook Street

The High Street, running between Castle Square and Crown Square is the main thoroughfare within the village. While traffic levels are not necessarily high, it is the presence of the village shops, parked vehicles and pedestrians crossing the road that makes this area sensitive. Traffic is constantly manoeuvring and turning, with pedestrians an added complication.

Pedestrians – particularly those less mobile and parents with young children and pushchairs - are at risk whilst crossing the highway, given the lack of any formal crossing point, and vehicles parking and restricted visibility increase the hazard levels. The parked vehicles west of Chapel Lane do serve as a traffic calming device in slowing traffic down, but do so by creating a single lane of traffic, while illegal parking frequently obscures vision.

Past suggestions have included introducing some form of crossing point, not necessarily controlled, so as not to lose valuable parking space. A lower speed restriction has also been suggested.

Survey Data for High Street near Benson School

	12 H Traffic	AM Peak Hour	PM Peak Hour
High Street (2015)	2932	293	344
Brook Street (2015)	2485	273	297
Brook Street (2020)	2185	327	394

Appendix F2 - Traffic Flow Summary 2016 / 2020

Road	Direction	Morning Peak Vol	Afternoon Peak Vol	12 H Volume	12H Ave Speed mph
Church Road 2016	East	261	362	2802	24.4
	West	314	267	2623	26.5
	Total	575	629	5425	
Church Road Oct 2020*	East	226	286	2641	24.48
	West	277	262	2762	25.48
	Total	503	548	5403	
* Survey taken during COVID Pandemic					
Oxford Road 2016	East	99	143	1108	26.1
	West	270	252	2238	29.9
	Total	369	395	3346	
Oxford Road Oct 2020*	East	147	191	1776	27.86
	West	209	181	1974	30.22
	Total	356	372	3750	
* Survey taken during COVID Pandemic					
Watlington Road 2016	East	309	376	3003	24.8
	West	375	348	3139	25.1
	Total	684	724	6142	
Watlington Road Oct 2020*	East	261	279	2541	30.21
	West	281	291	2713	29.0
	Total	542	570	5254	
* Survey taken during COVID Pandemic					
Brook Street 2015	East	112	152	1221	24.3
	West	161	145	1264	21.8
	Total	273	297	2485	
Brook Street Oct 2020*	East	167	206	1942	24.3
	West	160	188	1894	24.4
	Total	327	394	3836	
* Survey taken during COVID Pandemic					
St Helens Avenue 2016	East	41	63	395	29.1
	West	54	37	359	27.1
	Total	95	100	754	
High Street 2016	East	123	189	1492	19.4
	West	170	155	1440	19.9
	Total	293	344	2932	
Littleworth Road (One Way) Only 2013	East	112	121	881	23.5
	North	886	996	8199	
	South	1081	940	8374	
A4074 Oct 2020*	Total	1967	1936	16573	
	North	580	575	5953	36.94
	South	506	506	5341	36.08
* Survey taken during COVID Pandemic					

Notes:

1. The October 2020 Traffic Surveys were electronic and conducted by Glanville Group Consultancy for OCC Highways.
2. The Surveys were taken over a 24H period and over seven consecutive days
3. Surveys were not taken during school holidays
4. The peak volumes quoted are the 5 Day (Monday to Friday) averages
5. The 12H period quoted is 07.00 to 19.00
6. The measuring site on St Helen's Ave was changed and now includes St Helen's Way traffic.
7. Watlington Rd saw a 9.5% increase in 12H volume, with both directions up on the 2013 data.
8. Church Rd saw an 8.9% increase in 12H volume, with both directions up on the 2013 data.
9. 12H Ave Speeds remained much the same as in 2013, with Watlington Rd slightly up.
10. * The Covid 19 Pandemic would possibly account for instances where there is a reduction in traffic numbers during the time of the survey.

Appendix F3 -

Development Sites Potentially Affecting Benson

Site	Number of Dwellings	State of Progress
Benson Ben 1, Phase 1 & 2	about 428	Application Approved
Benson Ben 2	about 84	Application Approved
Benson Ben 3/4	about 240	Application approved
Churchfield Care Home	60 beds	Built
Other Benson Infill Sites	about 25	all built or approved
Chalgrove (HCA)	about 3,000	Strategic Site, listed in SODC LP 2035 application pending
Berinsfield	about 1,700	Strategic Site, listed in SODC LP 2035
Culham	about 3,500	Strategic Site, listed in SODC LP 2035
Watlington	about 250	Adopted
Pyrton	about 15	Adopted
Wallingford	about 1,350	Adopted
Crowmarsh Gifford	about 500	NP underway
Cholsey	about 650	Adopted
Chinnor	about 950	Adopted
Sonning Common	about 280	NP made
Woodcote	about 225	NP at Consultation
Berrick Salome	not known yet	Adopted
Ewelme	not known yet	Adopted

Summary:

Up to 13,000 dwellings may be built in, or in close proximity to, Benson over the next 15 years. All these will generate traffic, of which a proportion will use the B4009 through Benson.

Appendix F4 - Anticipated Benson NP Traffic Growth on B4009 Benson/Watlington

		AM Peak	PM Peak
		07.30-08.30	16.30-17.30
2016 Baseline Traffic – both directions	Note 1	680	720
Background growth over 15 years to 2033 (avg 8%)	Note 2	55	57
Site Ben 1 Phase I and II – 420 dwellings	Note 3	45	45
Site Ben 2/3/4 – 320 dwellings	Note 3	30	30
Anticipated Watlington & Pyrton Developments – 300 dwellings		30	30
Anticipated Chalgrove Development traffic	Note 4	130	130
Increase in Traffic		290	293
Revised Total Traffic		970	1012
Percentage Increase		43.00%	45.00%

Notes:

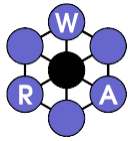
1. Figures taken from OCC Highways Survey 30.6.16 to 6.7.16.
2. Watlington's 2014 Transport Study assumed a TEMPRO factor of 1.076, giving about 8% growth over a similar period. The same growth rate has been assumed here.
3. Trip generation calculated using formula for currently approved sites, but Trip assignment is in line with Benson HNS of 2016 showing 20% of commuters on this route.

NEIGHBOURHOOD PLAN REVISION NOTE RE APPENDIX F6

This Appendix F6 is retained in the Revised Version of Benson's Neighbourhood Plan purely as a historical reference document, as planning permission has now been granted to OCC for their works on the western link of the Relief Road, including Flood Mitigation Measures.

Appendix F6: FLOOD ZONE ASSESSMENT

Appendix F6 – Flood Zone Assessment



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25th August 2017

Ref: Benson Neighbourhood Plan

In a response to the Pre-submission Neighbourhood Plan (NP) of February 2017 Messers EdenvaleYoung suggested that the proposed connection of the edge road (now referred to as a 'Relief road' in the final NP) to the A4074 would be difficult because it would require crossing Flood Zones 2 and 3 (FZ2 is the flood extent of the 1 in 100-year flood risk and FZ3 that for the 1 in 1,000-year risk). EdenvaleYoung pointed out that neither the Sequential Test nor Exception Test had yet been applied in support of this proposal and that a more detailed flood risk assessment report was required before this proposed road could be considered within the NP.

Whilst this is a valid objection we suggest that the issue should not preclude inclusion of the relief road within the Benson NP for a number of reasons.

1. The A4074 around Elm Bridge roundabout is already within flood zone 2 (see map below), but the proposed relief road would be required to cross less than 50m to 100m of this flood zone (see proposed routing on following drawing):

Directors

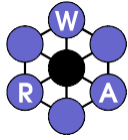
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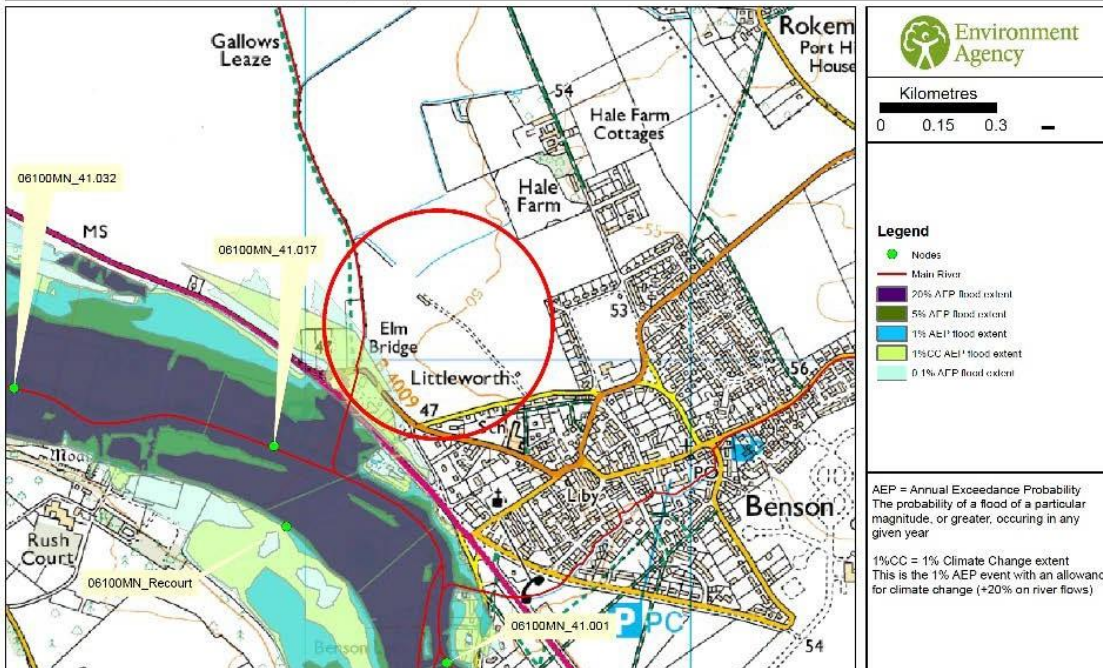
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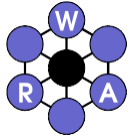
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**Model Map centred on Littleworth Road and Watlington Road, Benson.
Created 15/11/2013 REF OX_0440_01**



Route of proposed Relief Road shown as dotted line (reproduced from drawing on SODC Planning Portal website for application P16/S1139/O)

- Paragraph 101 of NPPF emphasises that the Sequential Test should be applied such that development or infrastructure is directed towards areas with lowest probability of flooding. Unfortunately, this would not be possible for the proposed relief road as it must connect to either Oxford Road or to the A4074, both of which are already within FZ2. Hence there is only one viable routing for a relief road for Benson, particularly because the RAF station to the east of Benson precludes any possibility of routing a relief road anywhere other than north of the village.



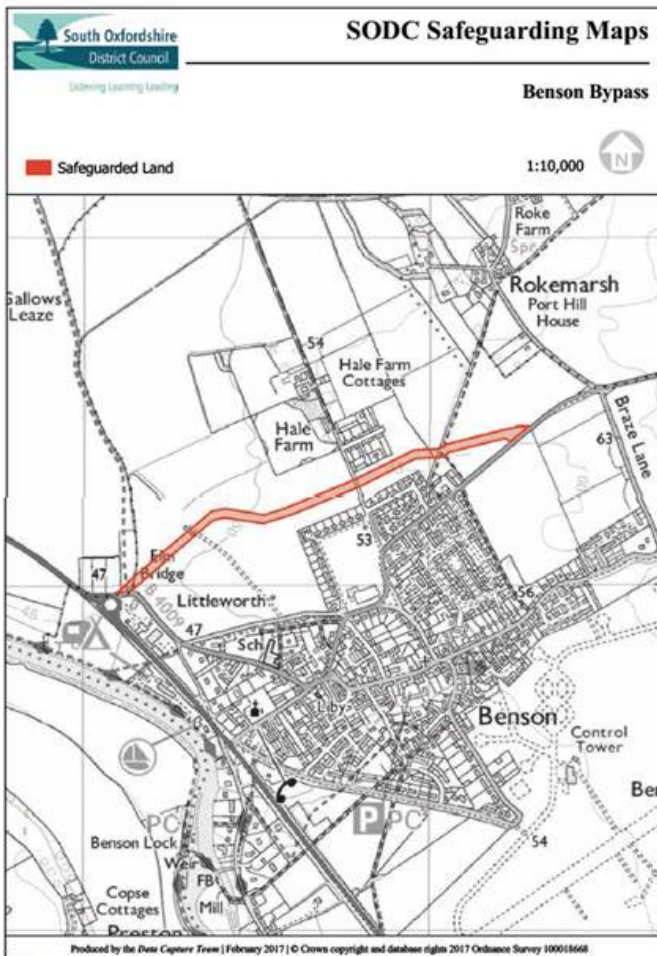
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A network of consultants in hydrology, water resources and environmental issues

3. NPPF paragraph 102 goes on to state that following application of the Sequential Test where it is not possible for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied.
4. For the Exception Test to be passed:
 - a. it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and
 - b. a site-specific flood risk assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

Both elements of the test will have to be passed for the development to be allocated or permitted.

5. A Strategic Flood Risk Assessment report for South Oxfordshire was produced in 2013 (<http://www.southoxon.gov.uk/services-and-advice/planning-and-building/planning-policy/evidence-studies/district-flood-risk>) and this identified that the area around the Elm Bridge roundabout as being in FZ2, agreeing with the EA flood risk map shown above.
6. A site-specific flood risk assessment (FRA) was undertaken for Phase 2 of the Littleworth Road site by Peter Brett Associates supported by hydrological modelling work by EdenvaleYoung. This report demonstrated that only the western extent of the site was within FZ2 and 3. The relief road will have to pass across some 50 to 100m of this zone in order to connect to Oxford Road and hence to the A4074.
7. We agree that this FRA will need to be revised and potentially some more detailed hydraulic modelling undertaken by the developers before final designs for the relief road can be agreed. However, we see no reason why the road should not be permitted as the road has been identified by SODC in their emerging local plan as 'Essential Infrastructure' with the route to be safeguarded for a Benson Bypass (see map below).
8. Thus, because the route has been recognised by SODC as essential infrastructure its development would be permitted under the Exception Test (NPPF paragraphs 102 & 103).



9. Although additional detailed hydraulic modelling of the area around the extreme western end of the proposed relief road is required during detailed design studies we can see no substantive reason why construction of the relief road and connection to Oxford Road and to the A4074 should not be permitted under NPF rules.

Frank Farquharson
Partner and Company Secretary
