

Appendix F – Transport Assessment

Contents

Appendix F – Transport Assessment.....	1
1. Rationale.....	3
2. The Current Context.....	3
Benson's Strategic Location.....	3
Benson's Current Road System.....	3
Journey Patterns.....	4
Pinch Points.....	4
The Existing Traffic Situation.....	4
3. The Future.....	4
4. Impacts.....	5
Anticipated Traffic Impact.....	5
5. Options to Deal with these Impacts.....	6
Currently Planned Mitigation.....	6
Possible Small Improvements.....	6
Transport Alternatives.....	6
A New Relief Road.....	6
6. The Routing of a New Road – The Sequential Test.....	7
7. Delivering the Relief Road.....	7
8. Effect of the Relief Road.....	8
Analysis:.....	8
Note:.....	8
9. Summary.....	9
Appendix F1 - Traffic Flow Sensitive Points.....	10
1. Castle Square.....	10
2. Church Rd/A4074/St Helens Ave.....	10
3. Watlington Rd/Littleworth Rd Junction.....	11
4. Oxford Rd.....	11

5. High St/Chapel Lane..... 12

Appendix F2 - Traffic Flow Summary 2016 13

Appendix F3 - Development Sites Potentially Affecting Benson 15

 Summary: 15

Appendix F4 - Anticipated Benson NP Traffic Growth on B4009 Benson/Watlington 16

Appendix F5 – Traffic Data..... 17

Appendix F6: FLOOD ZONE ASSESSMENT 19

1. Rationale

During the development of the Benson Neighbourhood Plan it became clear significant development outside Benson, eg Chalgrove Airfield, Berinsfield & Culham would have serious traffic flow implications for the ancient road system in the centre of Benson. These developments, together with the increase in Benson housing numbers and the general increase in housing numbers across the district made it evident that a possible new Relief Road would feature to a great extent, influencing the Plan throughout. Accordingly, this study was considered necessary to provide a focus on this aspect alone, although supporting material will appear in other sections as well.

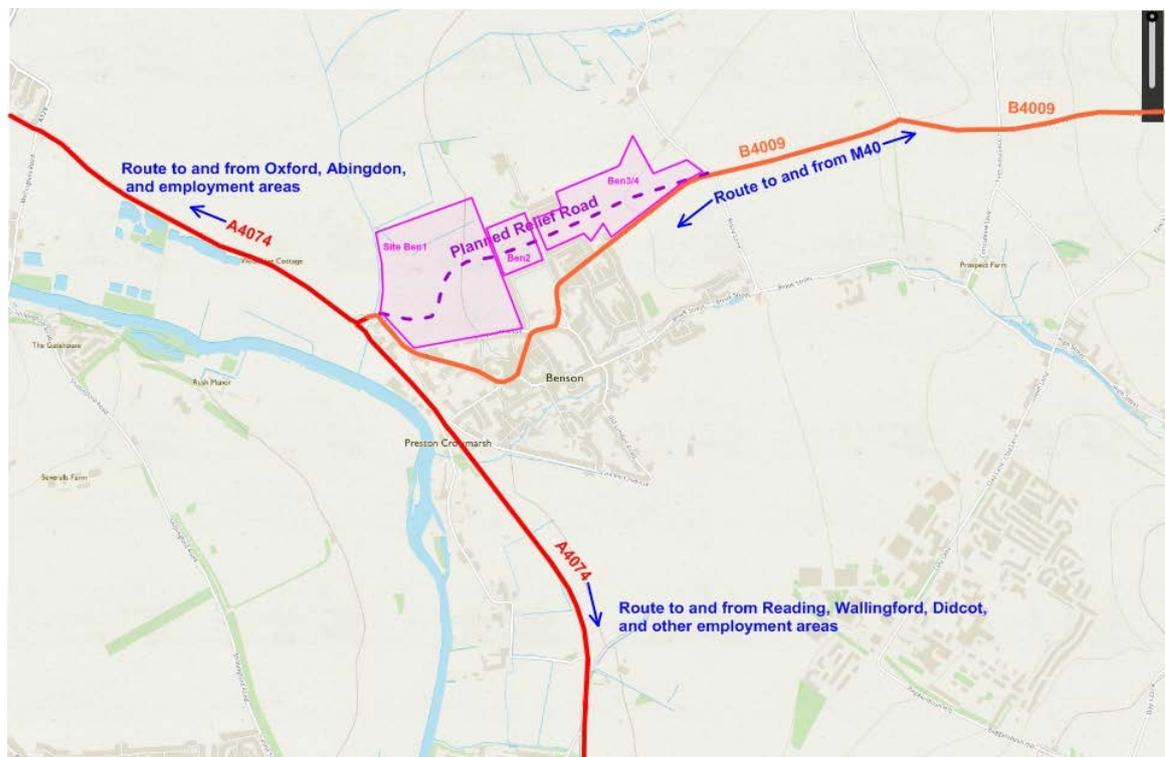
2. The Current Context

Benson's Strategic Location

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

- Benson lies alongside the A4074, a major trunk road running north/south between Reading and Oxford.
- It also is at the western end of the B4009, a strategic road running east/west linking the M40 with the A4074/A34/M4 and hence the highway network around Oxford.

As a result, it is not only the traffic generated by development in Benson which should be considered, but also development traffic in a wider area.



Benson's Current Road System

This is described fully in section 9.4 of the Neighbourhood Plan, but is largely a historic system with more recent estate roads added. The most recent major change was the re-

routing of the A4074 in WW2. The village centre has a complex arrangement of junctions which must be navigated by both local and through traffic – including children walking to school and other village facilities - and currently there are no formal pedestrian crossings

Journey Patterns

Modern Benson is a typical commuter village, with very little employment in Benson, most working people commute to work. The Community Questionnaire of 2016 (Appendix D) showed 56% of the respondents commuted, and of those 74% used their car. Some 38% of journeys were south on the A4074, 30% north on that road, and 20% used the B4009 towards Watlington

Pinch Points

The Traffic Flow Pinch Points are described in detail in sections 9.5.3 to 9.5.10 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 will examine 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 Rd	2116	2099
J3 A4074/Church Rd	2171	2090
J5 Church Rd/Oxford Rd	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 propose sites, but also likely developments outside Benson which will seriously affect the village.

These include:

- Local Sites (eg Watlington, Wallingford)
- Strategic Sites (eg Chalgrove, Culham, Berinsfield)
- Sites likely to use the B4009 (eg 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 present 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 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 given in paragraph 8 of this Appendix.

5. Options to Deal with these Impacts

- Do nothing to the highway network except present planned mitigation
- Make small improvements to the highway network.
- Improve alternative transport
- Plan now for a new relief road designed to accommodate the B4009 traffic

Currently Planned Mitigation

Currently, the only major planned improvement to the Benson road system will be the widened new two-way Littleworth Road associated with site BEN1, the development already underway there. However, this will be a modest improvement - at standard estate width it will not be wide enough to cater for heavy traffic such as is anticipated, will have a seriously narrow bottleneck at the eastern end, will have a weight and speed restriction and traffic calming build-outs to a single lane width. This improvement has been described in writing by OCC Highways as “an estate road and not a new through route.”

Possible Small Improvements

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 0.55m.

The only possible improvement would be to widen the Church Rd junction with the A4074, and this is not judged to offer a significant improvement overall to the flow of traffic or to road safety.

Transport Alternatives

Given that there is no commercial river transport, and no commercial air service from the airfield, any possible transport alternatives have to be highway orientated. Consideration has therefore been given to two planned transport initiatives – the proposed new Park & Ride south of Oxford (para 9.5.14 in the Neighbourhood Plan refers) and an improved strategic public transport service through Benson (para 9.6.4 in the Neighbourhood Plan refers).

A New Relief Road

The remaining alternative is a new road around the historic centre of Benson, avoiding the existing pinch points, whilst linking the new development sites. The road to be constructed to OCC's standards in order to accommodate HGV and public transport traffic.

6. The Routing of a New Road – The Sequential Test

Basic geography largely dictates the only feasible position of a new through road in/around Benson.

- To the north of the village there is a possible route where such a road has been suggested previously. This is the route now under consideration.
- Further north the settlement of Berrick/Roke would inhibit any new road.
- To the east the airfield and then the Chilterns AONB prevent any possible routing.
- Any new road from the east linking into Brook St & the existing road network would not avoid the Pinch Points to the west and south of the village and would therefore deliver no improvement.
- The river Thames to the south completes the fencing in of Benson, leaving just the one possible route from the B4009 in the north east, crossing Hale road and exiting along Oxford Rd near the Elm Bridge junction.

Hence there would not appear to be any possible route a new Relief Road round Benson could take other than the one currently being proposed. The concept of using new development sited around the new road, with the development funding the construction, was suggested initially by the HCA's planners (GVA at the time) during discussions on Chalgrove.

When the details of the western section of this road (through the western edge of site BEN1) are finalised, consideration will need to be given to the land in Flood Zone 2 and 3. It is our belief at this stage that Zone 3 can be avoided, but even if it cannot, we are confident that an essential piece of strategic infrastructure can still be built under the Exception Test (NPPF, para 102). A more detailed site-specific flood risk assessment will be required as part of the detailed design for the Relief Road. An initial assessment of the Flood Zone implications has been made and is included in Appendix F6

It is judged that the above application of the Sequential Test will lead to the application of the Exception Test and it is believed that by being included in SODC's emerging Local Plan and satisfying Policy TRANS 1, the proposed new road should be designated as Essential Infrastructure.

7. Delivering the Relief Road

Several meetings have taken place with each of the three developers involved with sites BEN1, BEN 2 and BEN 3 & 4 and they have each agreed to fund & construct the section of the new road transiting their sites. They have also undertaken to fund and construct the eastern junction with the B4009 and the likely junction between BEN 2 and BEN 3 at Hale Rd. Discussions on the western junction with the B4009 are ongoing but are expected to result in a fully funded junction. Without detailed costings, it is estimated that at least 80% of the new road and highway junctions will be funded by the developers, with the likelihood that this will be 100% before delivery.

The developers concerned are meeting to discuss delivery, including timetables, and there is every reason to believe a satisfactory delivery plan will result.

Hence a significant new piece of highway infrastructure will be provided at minimal or 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.

8. Effect of the Relief Road

All traffic data in this section is again taken from the previously quoted TA by Motion, see Appendix F5 for references

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 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 Rd	2116	2440	2950	2099	2447	3034
J3 A4074/Church Rd	2171	2471	2817	2090	2404	2799
J5 Church Rd/Oxford Rd	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 Rd accessing the A4074. However, it is suggested that the introduction of a light controlled pedestrian crossing near the Marina would assist in creating gaps in the traffic on the A4074.

Finally, with regard to Effect, the statement made in the TA (para 7.9) is supportable in that the new road will.... “ensure the existing roads within Benson operate more efficiently than the current situation.”

9. Summary

- a) It is evident that development in Benson and in surrounding areas will be high, and that this will generate additional high volumes of traffic along the B4009 and through key Pinch Points in Benson.
- b) It is felt that currently planned mitigation will prove insufficient and that further small highway improvements would be of negligible worth
- c) It is therefore concluded that a new Relief Road is required for Benson, routed to avoid the existing pinch points its historic road system.
- d) It is also concluded that there is only one geographically satisfactory route for this new road
- e) Furthermore, it is judged that this will be an enabling piece of infrastructure, removing a traffic flow constraint on development in the local area and facilitating SODC's meeting their housing targets.
- f) Finally it is concluded that such a new road can be provided by development brought forward by the NP and delivered at minimal cost to the tax payer.

Appendix F1 - Traffic Flow Sensitive Points

The following sites have been identified as sensitive points in the Benson Traffic Flow:

1. Castle Square

This junction of the B4009/High St/Church Rd/Oxford Rd is the busiest junction inside the village. It is also a crossing point for school children and parents walking to school and with the School Crossing Patrol currently having been suspended is safety critical.

The severe bend on the Watlington Rd side, together with the narrowness of the road (only 5m) means large vehicles cannot pass side by side, which creates tail backs in busy times. OCC Highways have refused to extend the weight limit to this stretch of highway.

The junction with Church Rd in the vicinity of the War Memorial is a busy junction at peak hours, with no pedestrian assistance available.

OCC Highways Traffic Surveys reveal the following volumes of traffic:

Roads Surveyed	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
Oxford Rd	3346	4	369	6	395	6
Church Rd	5425	8	575	9	629	10
Combined	8771	12	944	15	1024	16

2. Church Rd/A4074/St Helens Ave

The junction at the southern end of Church Rd is a busy junction, with much of the traffic routing through Benson joining the A4074 main road- especially if turning left for Reading/Henley. This junction is one of Benson's busiest road junctions at peak hours, with any vehicle turning against the traffic flow creating a back log. It is made worse with traffic entering/exiting St Helens Ave just a few metres from the junction.

The situation is made worse whenever there is any Church activity due to the on road parking outside the Church, and activities can take place any day of the week. Consideration might be given to restricting parking to create passing places.

It is currently legally possible to turn right out of Church Rd onto the A4074 in the Oxford direction, but this has a detrimental effect on traffic waiting to turn left for Reading and creates delays. Consideration must be given to preventing this turn, albeit with appropriate signage.

There are safety issues for pedestrians attempting to cross the A4074 near this point, and consideration should be given to some form of crossing to assist them.

Parking in the vicinity of the junction, both legal and illegal creates problems with visibility and action needs to be taken to resolve this.

OCC Highways Traffic Surveys reveal the following volumes of traffic:

	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
A4074	16573	23	1967	32	1936	32
Church Rd	5425	8	575	9	629	10

3. Watlington Rd/Littleworth Rd Junction

This the junction of the B4009 Watlington Rd with Chapel Lane/Littleworth Rd/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/Littleworth could create safety issues in peak traffic.

There are also issues for pedestrians at its southern end.

The figures below are of course pre – Littleworth Phase I & II, and do not take into account the extra traffic which that development will generate.

Watlington Rd alone (measured some 200m north of the junction) and Littleworth Rd take the following traffic:

	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
Watlington Rd	6142	8	684	11	724	12
Littleworth Rd	881	2	112	2	131	2

Note:

- a) This is the access into the Parish Hall car park as well as Sunnyside itself, and when a major event is being held the traffic exiting the B4009 through this junction is considerable.
- b) The multiple junction at Wells Corner is currently very restricted. The Sunnyside/Littleworth exit for Chapel Lane/Castle Square is currently only some 2.6m wide, with traffic swinging round the corner from the opposite direction.

4. Oxford Rd

This stretch of the B4009 is problematical at certain times of day only, since it runs directly past the Benson School. Hence at school drop off and pick up time (say 0815-0900 and again at 1430-1530)

traffic can be heavy and extremely congested whilst at other times it is low and flows smoothly.

When present, the parking outside the school in effect creates a single carriageway stretch of road, which slows traffic down but creates jams. Parking spills over into adjacent roads (eg Horseshoes Lane) creating problems.

OCC Highways Traffic Surveys reveal the following volumes of traffic:

	12H Total Traffic		AM Peak Hour		PM Peak Hour	
	Totals	Per Min	Totals	Per Min	Totals	Per Min
Oxford Rd out of village	2238	3	270	4	252	4
Oxford Rd into village	1108	2	99	2	143	2
Combined	3346	5	369	6	395	6

5. High St/Chapel Lane

The High St, running between Castle Square and Crown Square is the main thoroughfare within the village. Whilst 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 mostly manoeuvring and turning, with pedestrians an added complication.

Pedestrians (including the less mobile, parents with young children, pushchairs etc) are at risk whilst crossing the highway given the lack of any crossing point, whilst vehicle 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, whilst illegal parking frequently obscures vision.

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

OCC Highways Traffic Surveys show the following volumes of traffic

	12 H Traffic	AM Peak Hour	PM Peak Hour
High St	2932	293	344
Brook St	2485	273	297

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Appendix F2 - Traffic Flow Summary 2016

Road	Direction	Morning Peak Vol	Afternoon Peak Vol	12 H Volume	12H Ave Speed mph
Church Rd	East	261	362	2802	24.4
2016	West	314	267	2623	26.5
	Total	575	629	5425	
High St	East	123	189	1492	19.4
2016	West	170	155	1440	19.9
	Total	293	344	2932	
Oxford Rd	East	99	143	1108	26.1
2016	West	270	252	2238	29.9
	Total	369	395	3346	
St Helens Ave	East	41	63	395	29.1
2016	West	54	37	359	27.1
	Total	95	100	754	
Watlington Rd	East	309	376	3003	24.8
2016	West	375	348	3139	25.1
	Total	684	724	6142	
Brook St	East	112	152	1221	24.3
2015	West	161	145	1264	21.8
	Total	273	297	2485	
Littleworth Rd	East	112	121	881	23.5
2013					
A4074	North	886	996	8199	
2012	South	1081	940	8374	
	Total	1967	1936	16573	

Notes:

1. The Traffic Surveys are electronic and conducted by OCC Highways
2. The Surveys are taken over a 24H period and over 7 consecutive days
3. Surveys are not taken during school holidays
4. The peak volumes quoted are the 5 Day averages, ie from Monday to Friday
5. The 12H period quoted is 07.00 to 19.00
6. The measuring site on St Helens Ave has changed and now includes St Helens Way traffic
7. Watlington Rd saw a 9.5% increase in 12H volume, with both directions up
8. Church Rd saw a 8.9% increase in 12H volume, with both directions up
9. 12H Ave Speeds remained fairly much the same as in 2013, with Watlington Rd slightly up

DR
13.7.2016

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 pending Autumn
Benson Ben 3/4	about 240	application made
Churchfield Care Home	60 beds	application approved
Other Benson Infill Sites	about 25	all built or approved
Chalgrove (HCA)	about 3,000	Strategic Site, listed in ELP 2033 application pending late 2017
Berinsfield	about 2,100	Strategic Site, listed in ELP 2033
Culham	about 3,500	Strategic Site, listed in ELP 2033
Watlington	about 250	NP near submission
Pyrton	about 100	NP underway
Wallingford	about 1,350	NP near submission
Crowmarsh Gifford	about 312	NP underway
Cholsey	about 612	not known
Chinnor	about 594	NP made
Sonning Common	about 377	NP made
Woodcote	about 225	NP made
Berrick & Roke	not known yet	NP underway
Ewelme	not known yet	NP underway

Summary:

Some 13,000 dwellings are possibly going to be built in and 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 (ave 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.
4. Figures taken from AECOM Traffic Impact Assessment. These are currently being updated but the latest data available has been used.

Appendix F5 – Traffic Data

The Traffic Data quoted in this Study was largely taken from the Transport Assessment produced by Motion for David Wilson Home's (DWH) planning application P17/S1964/O as follows:

Figures 3.1 & 3.2 2016 Traffic Base

Figures 6.1 & 6.2 Projected 2023 Traffic with Littleworth Rd mitigation

Figures 7.20 & 7.21 Projected 2033 Traffic including Strategic Development & Relief Rd

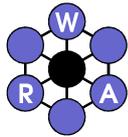
It is noted that the data will not now be totally accurate, in that it contained traffic projections for two sites in Benson which will not now be put forward by the NP, but there is one additional site (BEN 2) not included and neither are the infill windfall small sites. Hence mathematically there should be little difference.

High Level traffic projections were provided by the HCA planning team for the Chalgrove & Berinsfield sites:

AECOM Technical Notes Page 9, Doc F8/10 as updated

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

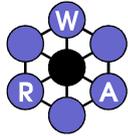
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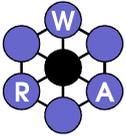
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3. NPPF paragraph 102 goes on to state that following application of the Sequential Test where it is not possible for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied.
4. For the Exception 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.

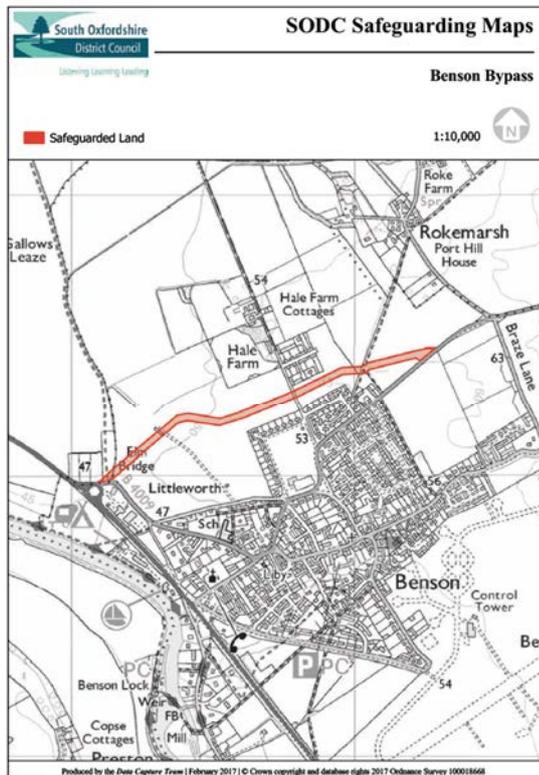
Both elements of the test will have to be passed for the development to be allocated or permitted.

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).



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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 NPPF rules.

Frank Farquharson
Partner and Company Secretary